№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.8	Опаковка	Опъвателните конзоли трябва да бъдат пакетирани в картонена или друга подходяща опаковка, на която е залепен етикет на български език със следната информация: наименованието и/или логото на производителя; наименование и означение; броя на съдържащите се в опаковката конзоли; годината на производство; и референтния номер на стандарта - NFC 33 – 041 или еквивалентно/и.	Опъвателните конзоли са пакетирани в картонена или друга подходяща опаковка, на която е залепен етикет на български език със следната информация: наименованието и/или логото на производителя; наименование и означение; броя на съдържащите се в опаковката конзоли; годината на производство; и референтния номер на стандарта - NFC 33 – 041.
3.9	Тегло на една конзола, g	Да се посочи	200

Наименование на материала: Опъвателен комплект за въздушно окачване на трижилни кабели 12/20 kV, усукани в сноп около носещо стоманено въже със сечение 50 mm^2

Съкратено наименование на материала: Опъвателен комплект за ВКЛ 20 kV

Област: В – Въздушни електропроводни линии СрН **Категория:** 5 - Арматури, клеми за ВЕЛ

Мерна единица: Брой **Аварийни запаси:** Да

Характеристика на материала:

Опъвателен комплект, включващ опъвателна клема, съединителен възел (скоба) и конзола, както са показани графично на фиг. 1 по-долу, за механично закрепване на носещото стоманено въже на трижилни кабели с номинално напрежение 12/20 kV, съответстващи на БДС HD 620 S2 или еквивалентно/и, към стоманобетонови стълбове.

Използване:

Опъвателният комплект се използва за механично закрепване на сноп трижилни усукани кабели с носещо въже към електрически стълбове при изграждане, ремонт и експлоатация на въздушни електропроводни линии 20 kV.

Съответствие на предложеното изпълнение със стандартизационните документи:

Опъвателният комплект трябва да отговаря на БДС EN 61284:2003 "Въздушни линии. Изисквания и изпитвания на съединителна арматура IEC 61284:1997)" или еквивалентно/и, включително на техните валидни изменения и допълнения или еквивалентно.

Изисквания към документацията и изпитванията:

№ по ред	Документ	Приложение № (или текст)
1.	Точно означение на типа на опъвателния комплект, производителя и страната на производство (произход) и последно издание на каталога на производителя	2.1.
2.	Техническо описание, конструктивни механични характеристики, гарантирани параметри, чертежи с размери, тегло и др.	2.1.
3.	Протоколи от изпитвания на английски или на български език, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	2.2.
4.	Сертификат/акредитация от независимата изпитвателна лаборатория, провела типовите изпитвания - заверено копие	2.3.
5.	Инструкции за монтаж и експлоатация; изисквания за съхранение и транспортиране	2.5.
6.	Декларация за съответствие на изпълнението с изискванията на стандартизационните документи	2.4.
7.	Експлоатационна дълготрайност, min 30 год.	2.6.

Забележка: Всички оригинални документи трябва да бъдат на български език или с превод на български език. (Каталозите и протоколите от изпитванията могат да бъдат и само на английски език). Документите следва да бъдат представени на хартиен носител.

Технически данни

1. Параметри на електрическата разпределителна мрежа

№ по ред	Параметър	Стойност
1.1	Номинално напрежение	20 kV
1.2	Максимално работно напрежение	24 kV
1.3	Номинална честота	50 Hz
1.4	Брой на фазите	3
1.5	Начин на заземяване на звездния център	• през активно съпротивление; • през дъгогасителна бобина; • изолиран звезден център

2. Характеристики на работната среда

№ по ред	Характеристика	Стойност/място
2.1	Максимална температура на околната среда	До +40°C
2.2	Минимална температура на околната среда	Не по-ниска от минус 25°C
2.3	Относителна влажност при 25°C	До 100%

2.4	Надморска височина	До 2000 m
2.5	Условия на работа	На открито

3. Технически характеристики

№ по ред	Характеристика	Изискване	Гарантирано предложение
3.1	Конструкция	Опъвателният комплект включва опъвателна клема, съединителен възел (скоба) и конзола за стоманобетонов стълб, както са изобразени графично на фиг. 1 по-долу.	Опъвателният комплект включва опъвателна клема, съединителен възел (скоба) и конзола за стоманобетонов стълб, както са изобразени графично на фиг. 1 по-долу.
3.2	Опъвателна клема	а) Конструкцията на опъвателната клема включва: тяло, изработено от високоякостна устойчива на корозия алуминиева сплав; клиновиден съединител за затягане на носещото стоманено въже с номинален диаметър 9 mm без необходимост от използването на специализирани инструменти; и стоманен око-болт с диаметър на стеблото min Ø16 за свързване със съединителния възел.	Конструкцията на опъвателната клема включва: тяло, изработено от високоякостна устойчива на корозия алуминиева сплав; клиновиден съединител за затягане на носещото стоманено въже с номинален диаметър 9 mm без необходимост от използването на специализирани инструменти; и стоманен око-болт с диаметър на стеблото min Ø16 за свързване със съединителния възел.
		б) Клиновидният съединител трябва да бъде защитен от проникване на вода посредством устойчиво на механични и атмосферни въздействия пластмасово изолационно покритие.	Клиновидният съединител е защитен от проникване на вода посредством устойчиво на механични и атмосферни въздействия пластмасово изолационно покритие.
		в) Пластмасовото изолационно покритие трябва да издържа напрежение 6 kV-50 Hz / 1 min.	Пластмасовото изолационно покритие издържа напрежение 6 kV-50 Hz / 1 min.

№ по ред	Характеристика	Изискване	Гарантирано предложение
		г) Издържаното от съединението „Клиновиден съединител – носещо стоманено въже" механично натоварване не трябва да бъде по-малко от 65 kN.	Издържаното от съединението „Клиновиден съединител – носещо стоманено въже" механично натоварване не е по-малко от 65 kN.
3.3	Конзола	а) Конструкцията на конзолата включва вертикална част с два отвора за закрепване към стоманобетонов стълб посредством болтове/шпилки M16 и скоба, както е показано на графичното изображение на фиг. 1 по-долу.	Конструкцията на конзолата включва вертикална част с два отвора за закрепване към стоманобетонов стълб посредством болтове/шпилки M16 и скоба, както е показано на графичното изображение на фиг. 1 по-долу.
		б) Препоръчително разстояние между центровете на отворите на вертикалната част за закрепване към стоманобетоновия стълб – 200 mm (да се посочи)	Препоръчително разстояние между центровете на отворите на вертикалната част за закрепване към стоманобетоновия стълб – 200 mm
		в) Вертикалната част и скобата са свързани посредством шарнирно съединение (хоризонталент шарнирен болт) с диаметър на стеблото min Ø18.	Вертикалната част и скобата са свързани посредством шарнирно съединение (хоризонталент шарнирен болт) с диаметър на стеблото min Ø18.
		г) Шарнирното съединение е осигурено с R - шплент срещу разединяване в експлоатационни условия.	Шарнирното съединение е осигурено с R - шплент срещу разединяване в експлоатационни условия.
3.4	Съединителен възел	а) Конструкцията на съединителния възел осигурява възможност за отклонение на опъвателната клема на ъгъл не по-малък от 45° от оста на носещото въже.	Конструкцията на съединителния възел осигурява възможност за отклонение на опъвателната клема на ъгъл не по-малък от 45° от оста на носещото въже.

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№ по ред	Характеристика	Изискване	Гарантирано предложение
		б) Съединителната скоба е свързана към око-болта от опъвателната клема посредством шарнирно съединение (вертикален шарнирен болт), с диаметър на стеблото min Ø18.	Съединителната скоба е свързана към око-болта от опъвателната клема посредством шарнирно съединение (вертикален шарнирен болт), с диаметър на стеблото min Ø18.
		в) Шарнирното съединение е осигурено с R - шплент срещу разединяване в експлоатационни условия.	Шарнирното съединение е осигурено с R - шплент срещу разединяване в експлоатационни условия.
3.5	Материали	-	-
3.5a	Метални материали	а) Всички метални материали трябва да бъдат устойчиви или да бъдат защитени от корозия, включително при транспорт, съхранение и в експлоатационни условия.	Всички метални материали са устойчиви или защитени от корозия, включително при транспорт, съхранение и в експлоатационни условия.
		б) Всички болтови съединения трябва да бъдат защитени от корозия чрез горещо или електрохимично поцинковане с дебелина на покритието в съответствие с приложимите стандарти: БДС EN ISO 1461; БДС EN ISO 4042 или еквивалентно/и.	Всички болтови съединения са защитени от корозия чрез горещо или електрохимично поцинковане с дебелина на покритието в съответствие с приложимите стандарти: БДС EN ISO 1461; БДС EN ISO 4042
		в) Поцинкованите резби трябва да позволяват свободно навиване на гайките.	Поцинкованите резби позволяват свободно навиване на гайките.
3.5b	Неметални материали	Неметалните материали трябва да бъдат устойчиви на лъчения в ултравиолетовия диапазон и на вредни атмосферни влияния.	Неметалните материали са устойчиви на лъчения в ултравиолетовия диапазон и на вредни атмосферни влияния.
3.6	Маркировка	а) Отделните елементи на опъвателния комплект трябва да бъдат маркирани четливо и неизтриваемо съгласно БДС EN 61284 или еквивалентно/и.	Отделните елементи на опъвателния комплект са маркирани четливо и неизтриваемо съгласно БДС EN 61284.

ИКОН ДОСТА... София

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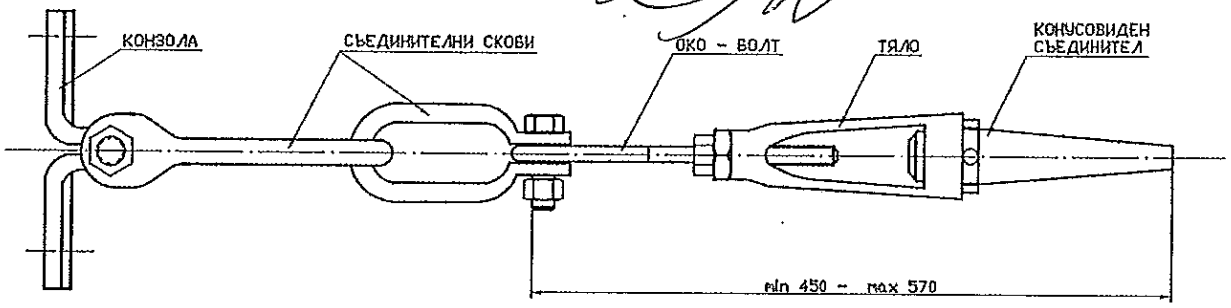
№ по ред	Характеристика	Изискване	Гарантирано предложение
		б) Върху клиновидния съединител трябва да има надпис за дължината от носещото въже, на която трябва да бъде снета защитната обвивка.	Върху клиновидния съединител има надпис за дължината от носещото въже, на която е снета защитната обвивка.
3.7	Експлоатационна дълготрайност	min 30 години	30 години
3.8	Общо тегло, kg	Да се посочи	3,7

Фиг. 1 – Опъвателен комплект за въздушни кабелни линии 20 kV (Код на EdF 68 50 121 или еквивалентно/и)



Наименование на материала: Носителен комплект за въздушно окачване на трижилни кабели 12/20 kV, усукани в сноп около носещо стоманено въже със сечение 50 mm^2

Съкратено наименование на материала: Носителен комплект за ВКЛ 20 kV

Област: В – Въздушни електропроводни линии СрН **Категория:** 5 - Арматури, клеми за ВЕЛ

Мерна единица: Брой **Аварийни запаси:** Да

Характеристика на материала:

Носителен комплект, включващ носителна клема, подвижни (шарнирни) връзки и конзола, както са показани графично на фиг. 1 по-долу, за механично закрепване на носещото стоманено въже на трижилни кабели с номинално напрежение 12/20 kV, съответстващи на БДС HD 620 S2 или еквивалентно/и, към стоманобетонови стълбове.

Използване:

Носителният комплект се използва за механично закрепване на сноп трижилни усукани кабели с носещо въже към електрически стълбове при изграждане, ремонт и експлоатация на въздушни електропроводни линии 20 kV.

Съответствие на предложеното изпълнение със стандартизационните документи:

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Носителният комплект трябва да отговаря на БДС EN 61284:2003 "Въздушни линии. Изисквания и изпитвания на съединителна арматура IEC 61284:1997)" или еквивалентно/и, включително на техните валидни изменения и допълнения.

Изисквания към документацията и изпитванията:

№ по ред	Документ	Приложение № (или текст)
1.	Точно означение на типа на носителния комплект, производителя и страната на производство (произход) и последно издание на каталога на производителя	2.1.
2.	Техническо описание, конструктивни механични характеристики, гарантирани параметри, чертежи с размери, тегло и др.	2.1.
3.	Протоколи от изпитвания на английски или на български език, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	2.2.
4.	Сертификат/акредитация от независимата изпитвателна лаборатория, провела типовите изпитвания - заверено копие	2.3.
5.	Инструкции за монтаж и експлоатация; изисквания за съхранение и транспортиране	2.5.
6.	Декларация за съответствие на изпълнението с изискванията на стандартизационните документи	2.4.
7.	Експлоатационна дълготрайност, min 30 год.	2.6.

Забележка: Всички оригинални документи трябва да бъдат на български език или с превод на български език. (Каталозите и протоколите от изпитванията могат да бъдат и само на английски език). Документите следва да бъдат представени на хартиен носител.

Технически данни

1. Параметри на електрическата разпределителна мрежа

№ по ред	Параметър	Стойност
1.1	Номинално напрежение	20 kV
1.2	Максимално работно напрежение	24 kV
1.3	Номинална честота	50 Hz
1.4	Брой на фазите	3
1.5	Начин на заземяване на звездния център	• през активно съпротивление; • през дъгогасителна бобина; • изолиран звезден център

2. Характеристики на работната среда

№ по ред	Характеристика	Стойност/място
2.1	Максимална температура на околната среда	До +40°C
2.2	Минимална температура на околната среда	Не по-ниска от минус 25°C
2.3	Относителна влажност при 25°C	До 100%
2.4	Надморска височина	До 2000 m
2.5	Условия на работа	На открито

3. Технически характеристики

№ по ред	Характеристика	Изискване	Гарантирано предложение
3.1	Конструкция	Носителният комплект включва носителна клема, подвижно свързващо звено и конзола за стоманобетонов стълб, както са изобразени информативно на фиг. 1 по-долу или еквивалентно.	Носителният комплект включва носителна клема, подвижно свързващо звено и конзола за стоманобетонов стълб, както са изобразени информативно на фиг. 1 по-долу.
3.2	Носителна клема	а) Конструкцията на носителната клема включва: носително тяло (седло) и планка, която придържа носещото стоманено въже към тялото посредством защитено от корозия болтово съединение.	Конструкцията на носителната клема включва: носително тяло (седло) и планка, която придържа носещото стоманено въже към тялото посредством защитено от корозия болтово съединение.
		б) Носителното тяло (седло) и придържащата планка трябва да бъдат изработени от високоякостна алуминиева сплав.	Носителното тяло (седло) и придържащата планка са изработени от високоякостна алуминиева сплав.
		в) Издържаното от носителната клема механично натоварване не трябва да бъде по-малко от 2000 daN.	Издържаното от носителната клема механично натоварване не е по-малко от 2000 daN.

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№ по ред	Характеристика	Изискване	Гарантирано предложение
3.3	Подвижно свързващо звено	а) Конструкцията на подвижното свързващо звено включва двойна съединителна скоба и две хоризонтални шарнирни оси с диаметър min Ø14 за закрепване съответно към тялото на носителната клема и към конзолата посредством око-болт и шарнирно съединение или U-болт.	Конструкцията на подвижното свързващо звено включва двойна съединителна скоба и две хоризонтални шарнирни оси с диаметър min Ø14 за закрепване съответно към тялото на носителната клема и към конзолата посредством око-болт и шарнирно съединение или U-болт.
		б) Шарнирните съединения позволяват колебателни движения около оста на носещото въже до ъгъл 20º по посока на стълба и до 60º в противоположната посока.	Шарнирните съединения позволяват колебателни движения около оста на носещото въже до ъгъл 20º по посока на стълба и до 60º в противоположната посока.
		в) Шарнирните съединения трябва да бъдат осигурени с R - шплентове срещу разединяване на съединенията в експлоатационни условия.	Шарнирните съединения са осигурени с R - шплентове срещу разединяване на съединенията в експлоатационни условия.
3.4	Полиестерна лента	а) За придържане на жилата на кабела в сноп към носителния комплект в комплекта трябва да бъде включена полиестерна лента.	За придържане на жилата на кабела в сноп към носителния комплект в комплекта е включена полиестерна лента.
		б) Полиестерната лента трябва да бъде устойчива на лъчения в ултравиолетовия диапазон и на вредни атмосферни влияния.	Полиестерната лента е устойчива на лъчения в ултравиолетовия диапазон и на вредни атмосферни влияния.
3.5	Конзола	а) Конструкцията на конзолата трябва да бъде както е показано по-долу на фиг. 1 или еквивалентно.	Конструкцията на конзолата е както е показано по-долу на фиг. 1 или еквивалентно.
		б) Разстоянието от точката на окачване на подвижното свързващо звено до повърхността на стоманобетоновия стълб, към който се фиксира конзолата, трябва да бъде 250 mm.	Разстоянието от точката на окачване на подвижното свързващо звено до повърхността на стоманобетоновия стълб, към който се фиксира конзолата, е 250 mm.

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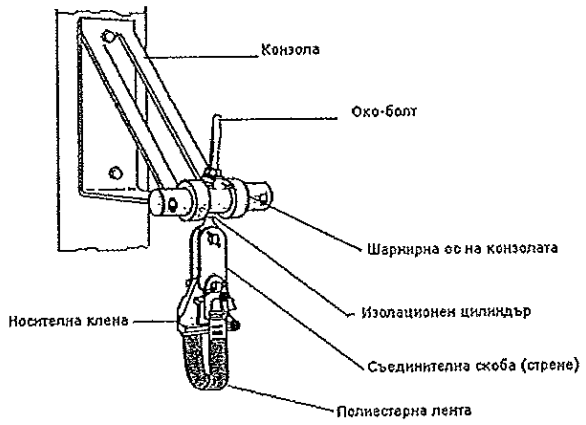
№ по ред	Характеристика	Изискване	Гарантирано предложение
		в) За закрепването на конзолата към стоманобетонов стълб на вертикална част са направени препоръчително два отвора за болтове/шпилки M16, с разстояние между центровете 200 mm. (Кандидатите могат да предложат изпълнение с един отвор.)	За закрепването на конзолата към стоманобетонов стълб на вертикална част са направени препоръчително два отвора за болтове/шпилки M16, с разстояние между центровете 200 mm.
		г) Конзолата е съоръжена с изолационни втулки/планки, издържащи напрежение 6 kV-50 Hz / 1 min, изолиращи металните детайли на подвижното свързващо звено.	Конзолата е съоръжена с изолационни втулки/планки, издържащи напрежение 6 kV-50 Hz / 1 min, изолиращи металните детайли на подвижното свързващо звено.
		д) Ортогоналните компоненти на издържаното от конзолата механично натоварване не трябва да бъдат по-малки от: • вертикална компонента Q=1700 daN; • хоризонтална компонента H=1400 daN; • надлъжна компонента L=300 daN.	Ортогоналните компоненти на издържаното от конзолата механично натоварване не са по-малки от: • вертикална компонента Q=1700 daN; • хоризонтална компонента H=1400 daN; • надлъжна компонента L=300 daN.
3.6	Антикорозионна защита	а) Всички стоманени части трябва да бъдат защитени от корозия чрез горещо поцинковане съгласно БДС EN ISO 1461 или еквивалентно/и с дебелина на цинковото покритие не по-малко от 80 µm.	Всички стоманени части са защитени от корозия чрез горещо поцинковане съгласно БДС EN ISO 1461 с дебелина на цинковото покритие не по-малко от 80 µm.
		б) Всички болтови съединения трябва да бъдат защитени от корозия чрез горещо или електрохимично поцинковане с дебелина на покритието в съответствие с приложимите стандарти: БДС EN ISO 1461; БДС EN ISO 4042 или еквивалентно/и.	Всички болтови съединения са защитени от корозия чрез горещо или електрохимично поцинковане с дебелина на покритието в съответствие с приложимите стандарти: БДС EN ISO 1461; БДС EN ISO 4042.

№ по ред	Характеристика	Изискване	Гарантирано предложение
		в) Поцинкованите резби трябва да позволяват свободно навиване на гайките.	Поцинкованите резби позволяват свободно навиване на гайките.
3.6	Маркировка	Четливо и неизтриваемо съгласно БДС EN 61284 или еквивалентно/и.	Четливо и неизтриваемо съгласно БДС EN 61284
3.7	Експлоатационна дълготрайност	min 30 години	30 години
3.8	Общо тегло, kg	Да се посочи	6

Фиг. 1 – Носителен комплект за въздушни кабелни линии 20 kV (Код на EdF 68 50 101 или еквивалентно/и)



Наименование на материала: Кабелни глави за кабели 0,6/1 kV с PVC изолация и обвивка, от 16 mm^2 до 240 mm^2, топлосвиваеми, за монтиране на открито

Съкратено наименование на материала: Каб. глави НН, 16÷240 mm^2, топлосв., ОМ

Област: D - Кабелни линии НН

Категория: 11 - Кабелни комплекти, кабелни накрайници, клеми, конектори

Мерна единица: Брой комплекти

Аварийни запаси: Да

Характеристика на материала:

Топлосвиваемите кабелни глави НН за монтиране на открито са комплектувани с:

• четири топлосвиваеми тръби за защита на изолацията на токопроводимите жила на присъединявания кабел от лъчения в ултравиолетовия диапазон;

• една специално формована топлосвиваема част, както е показана графично на фиг. 1, херметизираща разделката на кабела, с форма на ръкавица - с ръкав от едната страна, обхващащ присъединявания кабел, и с четири ръкава (пръста), от другата страна, обхващащи топлосвиваемите тръби за защита на изолацията на токопроводимите жила от лъчения в ултравиолетовия диапазон;

• четири топлосвиваеми тръби (маншети), обхващащи кабелните обувки и топлосвиваемите тръби за защита на изолацията на токопроводимите жила от лъчения в ултравиолетовия диапазон; и

• комплект други монтажни/помощни материали, ако се изискват от технологията за монтиране.

Тръбите за защита на изолацията на токопроводимите жила, херметизиращата „ръкавица" и тръбите (маншетите), херметизиращи цилиндричната част на кабелните обувки и краищата на тръбите за защита на изолацията на токопроводимите жила, са изработени от устойчив на лъчения в ултравиолетовия диапазон и на климатични влияния еластомерен изолационен материал с черен цвят.

Върху вътрешните повърхности на топлосвиваемата херметизираща „ръкавица" и топлосвиваемите маншети е нанесен термотопим лепилен слой.

Лепилният слой притежава висока адхезионна способност и гарантира висока степен на херметизация на съединението през целия експлоатационен период на съединителната муфа.

Токопроводимите кабелни жила на присъединяваните кабели се обработват с доставени от възложителя пресови кабелни накрайници (обувки), отговарящи на стандарт DIN 46 329 „Cable lugs for compression connections, ring type for aluminum conductors" или еквивалентно/и.

Диапазонът на свиване на тръбите позволява използването на една кабелна глава за няколко кабелни сечения.

Топлосвиваемите кабелни глави са предназначени за присъединяване на четирижилни кабела с номинално напрежение 0,6/1 kV, с алуминиеви токопроводими жила без концентрично полагане, с поливинилхлоридна изолация и с поливинилхлоридна обвивка съгласно БДС 16291, БДС HD 603 S1 или еквивалентно/и.

Топлосвиваемите кабелни глави могат да се съхраняват преди да бъдат монтирани най-малко три години от датата на производство.

Всяка топлосвиваема кабелна глава се придружава с подробна добре илюстрирана монтажна инструкция на български език и списък на монтажните елементи и материали, чиито означения съответстват на посочените в списъка.

Използване:

Топлосвиваемите кабелни глави за се използват за херметизиране на монтирани на открито четирижилни кабела 0,6/1 kV с PVC изолация и обвивка.

Съответствие на предложеното изпълнение със стандартизационните документи:

Топлосвиваемите кабелни глави трябва да отговарят на БДС EN 50393:2006 „Методи за изпитване и изисквания за принадлежности за използване при разпределителни кабели с обявено напрежение 0,6/1,0 (1,2) kV" или еквивалентно/и, включително на неговите валидни изменения и поправки.

Забележка: Кандидатите могат да предложат кабелни глави, които са изпитани по друг еквивалентен стандарт на международно призната организация по стандартизация. В този случай трябва да бъде представен превод на еквивалентния стандарт на български език, направен от заклет преводач.

Изисквания към документацията и изпитванията:

№ по ред	Документ	Приложение № (или текст)
1.	Точно означение на типа, производителя и страната на производство (произход) и последно издание на каталога на производителя	2.1.
2.	Техническо описание, чертежи с нанесени размери, изисквания за приложимост на диаметрите на топлосвиваемите тръби/елементи към външните диаметри на изолираните токопроводими жила и външните диаметри на кабелите, информация за свиването на тръбите/елементите по дължина и т.н.	2.1.
3.	Протоколи от типови изпитвания на английски или на български език съгласно БДС EN 50393 или еквивалентно/и, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	2.2.
4.	Сертификат/акредитация на независимата изпитвателна лаборатория, провела типовите изпитвания по т. 3 по-горе - заверено копие	2.3.
5.	Декларация за съответствие на предлаганото изпълнение с изискванията на техническата спецификация на този стандарт за материал, вкл. на параграфи „Характеристика на материала" и „Съответствие на предложеното изпълнение със стандартизационните документи" по-горе	2.4.
6.	Инструкция за монтиране и изисквания за условията на съхранение	2.5
7.	Експлоатационна дълготрайност, min 25 год.	2.6.

Забележка: Всички оригинални документи трябва да бъдат на български език или с превод на български език. (Каталозите и протоколите от изпитванията могат да бъдат и само на английски език). Документите следва да бъдат представени на хартиен носител.

Технически данни

1. Параметри на електроразпределителната мрежа НН

№ по ред	Параметър	Стойност

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1.1	Номинално напрежение	400 / 230 V
1.2	Максимално работно напрежение	440 / 253 V
1.3	Номинална честота	50 Hz
1.4	Брой проводници в разпределителната мрежа	4 - проводникова (L1, L2, L3, PEN)
1.5	Схема на разпределителната мрежа	TN-C

2. Характеристики на работната среда

№ по ред	Характеристика	Стойност
2.1	Максимална температура на въздуха на околната среда	+ 40°C
2.2	Минимална температура на въздуха на околната среда	Минус 25°C
2.3	Средна стойност на температурата на въздуха на околната среда, измерена за период от 24 h	+ 35°C
2.4	Относителна влажност	До 100 %
2.5	Надморска височина	До 1000 m

3. Общи технически параметри, характеристики и др. данни

№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.1	Обявено напрежение, *[U_0/U (U_m)]*	0,6/1,0 (1,2) kV	0,6/1,0 (1,2) kV
3.2	Издържано напрежение с промишлена честота 50 Hz	min 4 kV/1 min	4 kV/1 min
3.3	Технология на свиване на монтажните елементи	Топлосвиваема	Топлосвиваема
3.4	Приложимост на кабелните съединителни муфи към:	-	-
3.4a	вида на кабелите	Четирижилни кабели с PVC изолация и обвивка със сечение от 16 mm^2 до 240 mm^2	Четирижилни кабели с PVC изолация и обвивка със сечение от 16 mm^2 до 240 mm^2
3.4b	конструкцията на кабелите	Съгласно БДС 16291, БДС HD 603 S1 или еквивалентно/ии	Съгласно БДС 16291, БДС HD 603 S1
3.4c	материала на токопроводимите кабелни жила	Алуминий	Алуминий
3.4d	кабелните накрайници (обувки)	Пресови алуминиеви кабелни накрайници (обувки) съгласно DIN 46 329 или еквивалентно/и	Пресови алуминиеви кабелни накрайници (обувки) съгласно DIN 46 329
3.5	Устойчивост на лъчения в ултравиолетовия диапазон и на климатични влияния	Да	Да

№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.6	Комплектация	а) Една термосвиваема тръба (шлаух) за защита на изолацията на токопроводимите жила от UV лъчи, от която се отрязват отделни парчета за четирите токопроводими жила на присъединявания кабел в зависимост от конкретното изпълнение на мрежата/разпределителната уредба.	Една термосвиваема тръба (шлаух) за защита на изолацията на токопроводимите жила от UV лъчи, от която се отрязват отделни парчета за четирите токопроводими жила на присъединявания кабел в зависимост от конкретното изпълнение на мрежата/разпределителната уредба.
		б) Една херметизираща ръкавица	Една херметизираща ръкавица
		в) Четири херметизиращи маншети	Четири херметизиращи маншети
		г) Монтажни/помощни материали, ако се изискват от технологията за монтиране.	Монтажни/помощни материали, ако се изискват от технологията за монтиране.
		д) Размерите на комплектуващите елементи на кабелните глави съответстват на посочените в таблиците в т. 4 по-долу.	Размерите на комплектуващите елементи на кабелните глави съответстват на посочените в таблиците в т. 4 по-долу.
3.7	Опаковка	Всяка кабелна глава е пакетирана в подходяща опаковка, която предпазва от механични повреди и атмосверни влияния при транспорт и съранение. .	Всяка кабелна глава е пакетирана в подходяща опаковка, която предпазва от механични повреди и атмосверни влияния при транспорт и съранение.

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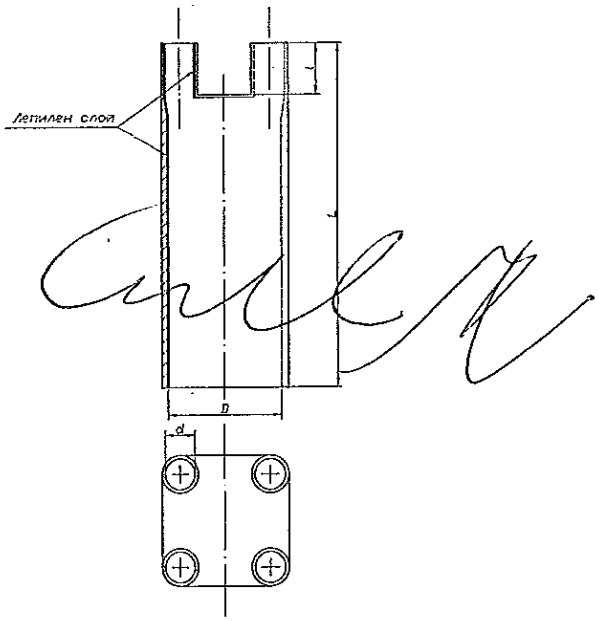
№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.8	Маркировка	Съгласно т. 6.4.2 от БДС EN 50393 или еквивалентно/и , включително: наименованието и/или логото на производителя; наименованието и означението на кабелната глава; сечението на токопроводимите жила, за които е предназначена; датата на производство; референтния номер на стандарта – (БДС) EN 50393 или еквивалентно/и.	Съгласно т. 6.4.2 от БДС EN 50393, включително: наименованието и/или логото на производителя; наименованието и означението на кабелната глава; сечението на токопроводимите жила, за които е предназначена; датата на производство; референтния номер на стандарта – (БДС) EN 50393.
3.9	Монтажна инструкция	На български език във всяка опаковка	На български език във всяка опаковка
3.10	Списък на монтажните елементи и материали	На български език във всяка опаковка	На български език във всяка опаковка
3.11	Означение на монтажните елементи и материали	Да	Да
3.12	Срок на съхранение (считано от датата на производството)	min 36 мес.	36 мес.
3.13	Експлоатационна дълготрайност	min 25 год.	25 год.

Фиг. 1 – Топлосвиваема херметизираща „ръкавица"



4. Кабелни глави за кабели 0,6/1 kV с PVC изолация и обвивка, топлосвиваеми, за монтиране на открито

4.1 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-16 mm^2, за монтиране на открито

Номер на стандарта		**Тип/референтен номер съгласно каталога на производителя**	
20 11 2240		E4R 10-35 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-16 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 16 mm^2, топлосв., ОМ	
№ по ред	**Технически параметър**	**Изискване**	**Гарантирано предложение**
4.1.1	Номинално сечение на кабела	4x16 mm^2	4x16 mm^2
4.1.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 10-35
4.1.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.1.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.1.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.1.3c	вътрешен диаметър след свободно свиване	≤ 6,0 mm	5,0 mm
4.1.3d	вътрешен диаметър преди свиване	Да се посочи	10 mm
4.1.3e	дължина	min 6000 mm	6000 mm
4.1.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 10-35

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.1.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.1.5a	*L*	Да се посочи	85 mm
4.1.5b	*l*	Да се посочи	25 mm
4.1.5c	D след свободно свиване	≤ 18 mm	15 mm
4.1.5d	D преди свиване	Да се посочи	35 mm
4.1.6e	d след свободно свиване	≤ 7,2 mm	3 mm
4.1.6f	d преди свиване	Да се посочи	15 mm
4.1.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 25-100
4.1.8	Размери на херметизиращите „маншети"	-	-
4.1.8a	радиална дебелина след свиване	min 1,3 mm	1,9 mm
4.1.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.1.8c	вътрешен диаметър след свободно свиване	≤ 7,2 mm	6 mm
4.1.8d	вътрешен диаметър преди свиване	≥ 11 mm	25 mm
4.1.8e	дължина	min 50 mm	100 mm

4.2 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-25 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2241		E4R 10-35 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-25 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 25 mm^2, топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.2.1	Номинално сечение на кабела	4x25 mm^2	4x25 mm^2
4.2.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 10-35
4.2.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.2.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.2.3b	радиална дебелина преди свиване	Да се посочи	1,1
4.2.3c	вътрешен диаметър след свободно свиване	≤ 7,2 mm	5,0 mm
4.2.3d	вътрешен диаметър преди свиване	Да се посочи	10 mm
4.2.3e	дължина	min 6000 mm	6000 mm

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.2.4	Топлосвиваема херметизираща „ръкавица”	Тип съгласно каталога на производителя	E4R 10-35
4.2.5	Размери на херметизиращата „ръкавица” съгл. фиг. 1:	-	-
4.2.5a	*L*	Да се посочи	85 mm
4.2.5b	*l*	Да се посочи	25 mm
4.2.5c	D след свободно свиване	≤ 21 mm	15 mm
4.2.5d	D преди свиване	Да се посочи	35 mm
4.2.6e	d след свободно свиване	≤ 8,5 mm	3 mm
4.2.6f	d преди свиване	Да се посочи	15 mm
4.2.7	Топлосвиваема херметизиращи „маншети”	Тип съгласно каталога на производителя	FRM 25-100
4.2.8	Размери на херметизиращите „маншети”	-	-
4.2.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.2.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.2.8c	вътрешен диаметър след свободно свиване	≤ 8,5 mm	6 mm
4.2.8d	вътрешен диаметър преди свиване	≥ 15 mm	25 mm
4.2.8e	дължина	min 50 mm	100 mm

4.3 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-35 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2242		E4R 10-35 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-35 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 35 mm^2, топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.3.1	Номинално сечение на кабела	4x35 mm^2	4x35 mm^2
4.3.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 10-35
4.3.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.3.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.3.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.3.3c	вътрешен диаметър след свободно свиване	≤ 8,2 mm	5,0 mm
4.3.3d	вътрешен диаметър преди свиване	Да се посочи	10 mm
4.3.3e	дължина	min 6000 mm	6000 mm
4.3.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 10-35
4.3.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.3.5a	*L*	Да се посочи	85 mm
4.3.5b	*l*	Да се посочи	25 mm
4.3.5c	D след свободно свиване	≤ 26 mm	15 mm
4.3.5d	D преди свиване	Да се посочи	35 mm
4.3.6e	d след свободно свиване	≤ 9,5 mm	3 mm
4.3.6f	d преди свиване	Да се посочи	15 mm
4.3.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 25-100
4.3.8	Размери на херметизиращите „маншети"	-	-
4.3.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.3.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.3.8c	вътрешен диаметър след свободно свиване	≤ 9,5 mm	6 mm
4.3.8d	вътрешен диаметър преди свиване	≥ 17 mm	25 mm
4.3.8e	дължина	min 100 mm	100 mm

4.4 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-50 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2243		E4R 50-150 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-50 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 50 mm^2, топлосв., ОМ	
№ по ред	**Технически параметър**	**Изискване**	**Гарантирано предложение**
4.4.1	Номинално сечение на кабела	4x50 mm^2	4x50 mm^2
4.4.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 50-150

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.4.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:		
4.4.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.4.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.4.3c	вътрешен диаметър след свободно свиване	≤ 9,7 mm	6 mm
4.4.3d	вътрешен диаметър преди свиване	Да се посочи	20 mm
4.4.3e	дължина	min 6000 mm	6000 mm
4.4.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.4.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.4.5a	*L*	Да се посочи	130 mm
4.4.5b	*l*	Да се посочи	45 mm
4.4.5c	D след свободно свиване	≤ 27 mm	25 mm
4.4.5d	D преди свиване	Да се посочи	60 mm
4.4.6e	d след свободно свиване	≤ 11,0 mm	6 mm
4.4.6f	d преди свиване	Да се посочи	25 mm
4.4.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.4.8	Размери на херметизиращите „маншети"	-	-
4.4.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.4.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.4.8c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	9 mm
4.4.8d	вътрешен диаметър преди свиване	≥ 19,5 mm	30 mm
4.4.8e	дължина	min 100 mm	200 mm

4.5 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-70 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2244		E4R 50-150 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-70 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 70 mm^2, топлосв., ОМ	
№ по ред	**Технически параметър**	**Изискване**	**Гарантирано предложение**
4.5.1	Номинално сечение на кабела	4x70 mm^2	4x70 mm^2

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.5.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 50-150
4.5.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.5.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.5.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.5.3c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	6 mm
4.5.3d	вътрешен диаметър преди свиване	Да се посочи	20 mm
4.5.3e	дължина	min 6000 mm	6000 mm
4.5.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.5.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.5.5a	*L*	Да се посочи	130 mm
4.5.5b	*l*	Да се посочи	45 mm
4.5.5c	D след свободно свиване	≤ 30 mm	25 mm
4.5.5d	D преди свиване	Да се посочи	60 mm
4.5.6e	d след свободно свиване	≤ 12,0 mm	6 mm
4.5.6f	d преди свиване	Да се посочи	25 mm
4.5.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.5.8	Размери на херметизиращите „маншети"	-	-
4.5.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.5.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.5.8c	вътрешен диаметър след свободно свиване	≤ 12,0 mm	9 mm
4.5.8d	вътрешен диаметър преди свиване	≥ 22 mm	30 mm
4.5.8e	дължина	min 100 mm	200 mm

4.6 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-95 mm^2, за монтиране на открито

Номер на стандарта	Тип/референтен номер съгласно каталога на производителя
20 11 2245	E4R 50-150 GRP-FRM
Наименование на материала	Кабелна глава за PVC кабели 0,6/1 kV-95 mm^2, топлосвиваема, за монтиране на открито
Съкратено наименование на материала	Каб. глава НН, 95 mm^2, топлосв., ОМ

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Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.6.1	Номинално сечение на кабела	4x95 mm^2	4x95 mm^2
		3x95 mm^2 + 1x50 mm^2	3x95 mm^2 + 1x50 mm^2
4.6.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 50-150
4.6.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.6.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.6.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.6.3c	вътрешен диаметър след свободно свиване	≤ 9,7 mm	6 mm
4.6.3d	вътрешен диаметър преди свиване	Да се посочи	20 mm
4.6.3e	дължина	min 6000 mm	6000 mm
4.6.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.6.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.6.5a	L	Да се посочи	130 mm
4.6.5b	l	Да се посочи	45 mm
4.6.5c	D след свободно свиване	≤ 33 mm	25 mm
4.6.5d	D преди свиване	Да се посочи	60 mm
4.6.6e	d след свободно свиване	≤ 11,0 mm	6 mm
4.6.6f	d преди свиване	Да се посочи	25 mm
4.6.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.6.8	Размери на херметизиращите „маншети"	-	-
4.6.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.6.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.6.8c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	9 mm
4.6.8d	вътрешен диаметър преди свиване	≥ 26 mm	30 mm
4.6.8e	дължина	min 100 mm	200 mm

4.7 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-120 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2246		E4R 50-150 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-120 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 120 mm^2, топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.7.1	Номинално сечение на кабела	4x120 mm^2	4x120 mm^2
		3x120 mm^2 + 1x70 mm^2	3x120 mm^2 + 1x70 mm^2
4.7.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 50-150
4.7.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.7.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.7.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.7.3c	вътрешен диаметър след свободно свиване	≤ 11 mm	6 mm
4.7.3d	вътрешен диаметър преди свиване	Да се посочи	20 mm
4.7.3e	дължина	min 6000 mm	6000 mm
4.7.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.7.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.7.5a	*L*	Да се посочи	130 mm
4.7.5b	*l*	Да се посочи	45 mm
4.7.5c	D след свободно свиване	≤ 36 mm	25 mm
4.7.5d	D преди свиване	Да се посочи	60 mm
4.7.6e	d след свободно свиване	≤ 12,0 mm	6 mm
4.7.6f	d преди свиване	Да се посочи	25 mm
4.7.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.7.8	Размери на херметизиращите „маншети"	-	-
4.7.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.7.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.7.8c	вътрешен диаметър след свободно свиване	≤ 12,0 mm	9 mm
4.7.8d	вътрешен диаметър преди свиване	≥ 27 mm	30 mm
4.7.8e	дължина	min 150 mm	200 mm

4.8 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-150 mm^2, за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2247		E4R 50-150 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-150 mm^2, топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 150 mm^2, топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.8.1	Номинално сечение на кабела	4x150 mm^2	4x150 mm^2
		3x150 mm^2 + 1x70 mm^2	3x150 mm^2 + 1x70 mm^2
4.8.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 50-150
4.8.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.8.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.8.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.8.3c	вътрешен диаметър след свободно свиване	≤ 11 mm	6 mm
4.8.3d	вътрешен диаметър преди свиване	Да се посочи	20 mm
4.8.3e	дължина	min 6000 mm	6000 mm
4.8.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.8.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.8.5a	*L*	Да се посочи	130 mm
4.8.5b	*l*	Да се посочи	45 mm
4.8.5c	D след свободно свиване	≤ 40 mm	25 mm
4.8.5d	D преди свиване	Да се посочи	60 mm
4.8.6e	d след свободно свиване	≤ 12,0 mm	6 mm
4.8.6f	d преди свиване	Да се посочи	25 mm
4.8.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.8.8	Размери на херметизиращите „маншети"	-	-
4.8.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.8.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.8.8c	вътрешен диаметър след свободно свиване	≤ 12,0 mm	9 mm
4.8.8d	вътрешен диаметър преди свиване	≥ 30 mm	30 mm

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.8.8e	дължина	min 150 mm	200 mm

4.9 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-185 mm², за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2248		E4R 240 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-185 mm², топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 185 mm², топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.9.1	Номинално сечение на кабела	4x185 mm²	4x185 mm²
		3x185 mm² + 1x95 mm²	3x185 mm² + 1x95 mm²
4.9.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 240
4.9.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.9.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.9.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.9.3c	вътрешен диаметър след свободно свиване	≤ 12,8 mm	12 mm
4.9.3d	вътрешен диаметър преди свиване	Да се посочи	40 mm
4.9.3e	дължина	min 6000 mm	6000 mm
4.9.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 240
4.9.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.9.5a	*L*	Да се посочи	170 mm
4.9.5b	*l*	Да се посочи	65 mm
4.9.5c	D след свободно свиване	≤ 44 mm	33 mm
4.9.5d	D преди свиване	Да се посочи	100 mm
4.9.6e	d след свободно свиване	≤ 14,0 mm	12,8 mm
4.9.6f	d преди свиване	Да се посочи	35 mm
4.9.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 35-150
4.9.8	Размери на херметизиращите „маншети"	-	-

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.9.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.9.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.9.8c	вътрешен диаметър след свободно свиване	≤ 14,0 mm	12 mm
4.9.8d	вътрешен диаметър преди свиване	≥ 34 mm	38 mm
4.9.8e	дължина	min 150 mm	150 mm

4.10 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-240 mm², за монтиране на открито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2249		E4R 240 GRP-FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-240 mm², топлосвиваема, за монтиране на открито	
Съкратено наименование на материала		Каб. глава НН, 240 mm², топлосв., ОМ	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.10.1	Номинално сечение на кабела	4x240 mm²	4x240 mm²
		3x240 mm² + 1x120 mm²	3x240 mm² + 1x120 mm²
4.10.2	Топлосвиваема тръба за защита на изолацията на токопроводимите жила от UV лъчи	Тип съгласно каталога на производителя	GRP 240
4.10.3	Размери на тръбата за защита на изолацията на токопроводимите жила от UV лъчи:	-	-
4.10.3a	радиална дебелина след свиване	min 0,75 mm	0,75 mm
4.10.3b	радиална дебелина преди свиване	Да се посочи	1,1 mm
4.10.3c	вътрешен диаметър след свободно свиване	≤ 14,0 mm	12 mm
4.10.3d	вътрешен диаметър преди свиване	Да се посочи	40 mm
4.10.3e	дължина	min 6000 mm	6000 mm
4.10.4	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 240
4.10.5	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.10.5a	*L*	Да се посочи	170 mm
4.10.5b	*l*	Да се посочи	65 mm
4.10.5c	D след свободно свиване	≤ 50 mm	33 mm
4.10.5d	D преди свиване	Да се посочи	100 mm
4.10.6e	d след свободно свиване	≤ 15,3 mm	12,8 mm
4.10.6f	d преди свиване	Да се посочи	35 mm

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Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.10.7	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 35-150
4.10.8	Размери на херметизиращите „маншети"	-	-
4.10.8a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.10.8b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.10.8c	вътрешен диаметър след свободно свиване	≤ 15,3 mm	12 mm
4.10.8d	вътрешен диаметър преди свиване	≥ 38 mm	38 mm
4.10.8e	дължина	min 150 mm	150 mm

Наименование на материала: Кабелни глави за кабели 0,6/1 kV с PVC изолация и обвивка, от 16 mm^2 до 240 mm^2; топлосвиваеми, за монтиране на закрито

Съкратено наименование на материала: Каб. глави НН, 16÷240 mm^2, топлосв., 3М

Област: D - Кабелни линии НН

Категория: 11 - Кабелни комплекти, кабелни накрайници, клеми, конектори

Мерна единица: Брой комплекти

Аварийни запаси: Да

Характеристика на материала:

Топлосвиваемите кабелни глави НН за монтиране на закрито са комплектувани с:

- една специално формована топлосвиваема част, както е показана графично на фиг. 1, херметизираща разделката на кабела, с форма на ръкавица - с ръкав от едната страна, обхващащ присъединявания кабел, и с четири ръкава (пръста), от другата страна, обхващащи изолацията на токопроводимите жила;
- четири топлосвиваеми тръби (маншети), обхващащи кабелните обувки и краищата на изолацията на токопроводимите жила; и
- комплект други монтажни/помощни материали, ако се изискват от технологията за монтиране.

Херметизиращата „ръкавица" и тръбите (маншетите), херметизиращи цилиндричната част на кабелните обувки и краищата на изолацията на токопроводимите жила, са изработени от устойчив на климатични влияния еластомерен изолационен материал с черен цвят.

Върху вътрешните повърхности на топлосвиваемата херметизираща „ръкавица" и топлосвиваемите маншети е нанесен термотопим лепилен слой.

Лепилният слой притежава висока адхезионна способност и гарантира висока степен на херметизация на съединението през целия експлоатационен период на съединителната муфа.

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Токопроводимите кабелни жила на присъединяваните кабели се обработват с доставени от възложителя пресови кабелни накрайници (обувки), отговарящи на стандарт DIN 46 329 „Cable lugs for compression connections, ring type for aluminum conductors" или еквивалентно/и.

Диапазонът на свиване на тръбите позволява използването на една кабелна глава за няколко кабелни сечения.

Топлосвиваемите кабелни глави са предназначени за присъединяване на четирижилни кабела с номинално напрежение 0,6/1 kV, с алуминиеви токопроводими жила без концентрично полагане, с поливинилхлоридна изолация и с поливинилхлоридна обвивка съгласно БДС 16291, БДС HD 603 S1 или еквивалентно/и.

Топлосвиваемите кабелни глави могат да се съхраняват преди да бъдат монтирани най-малко три години от датата на производство.

Топлосвиваемите кабелни глави се доставят пакетирани поотделно в подходящ полиетиленов плик, който е надписан със следната информация: наименованието и/или логото на производителя; наименованието и означението на кабелната глава; сечението на токопроводимите жила, за които е предназначена; датата на производство; и референтния номер на стандарта – (БДС) EN 50393 или еквивалентно/и.

Всяка топлосвиваема кабелна глава се придружава с подробна добре илюстрирана монтажна инструкция на български език и списък на монтажните елементи и материали, чиито означения съответстват на посочените в списъка.

Използване:

Топлосвиваемите кабелни глави за се използват за херметизиране на монтирани на закрито четирижилни кабела 0,6/1 kV с PVC изолация и обвивка.

Съответствие на предложеното изпълнение със стандартизационните документи:

Топлосвиваемите кабелни глави трябва да отговарят на БДС EN 50393:2006 „Методи за изпитване и изисквания за принадлежности за използване при разпределителни кабели с обявено напрежение 0,6/1,0 (1,2) kV" или еквивалентно/и , включително на неговите валидни изменения и поправки.

Изисквания към документацията и изпитванията:

№ по ред	Документ	Приложение № (или текст)
1.	Точно означение на типа, производителя и страната на производство (произход) и последно издание на каталога на производителя	2.1.
2.	Техническо описание, чертежи с нанесени размери, изисквания за приложимост на диаметрите на топлосвиваемите тръби/елементи към външните диаметри на изолираните токопроводими жила и външните диаметри на кабелите, информация за свиването на тръбите/елементите по дължина и т.н.	2.1.

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№ по ред	Документ	Приложение № (или текст)
3.	Протоколи от типови изпитвания на английски или на български език съгласно БДС EN 50393 или еквивалентно/и, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	2.2.
4.	Сертификат/акредитация на независимата изпитвателна лаборатория, провела типовите изпитвания по т. 3 по-горе - заверено копие	2.3.
5.	Декларация за съответствие на предлаганото изпълнение с изискванията на техническата спецификация на този стандарт за материал, вкл. на параграфи „Характеристика на материала" и „Съответствие на предложеното изпълнение със стандартизационните документи" по-горе	2.4.
6.	Инструкция за монтиране и изисквания за условията на съхранение	2.5.
7.	Експлоатационна дълготрайност, min 25 год.	2.6.

Забележка: Всички оригинални документи трябва да бъдат на български език или с превод на български език. (Каталозите и протоколите от изпитванията могат да бъдат и само на английски език). Документите следва да бъдат представени на хартиен носител.

Технически данни

1. Параметри на електроразпределителната мрежа НН

№ по ред	Параметър	Стойност
1.1	Номинално напрежение	400 / 230 V
1.2	Максимално работно напрежение	440 / 253 V
1.3	Номинална честота	50 Hz
1.4	Брой проводници в разпределителната мрежа	4 - проводникова (L1, L2, L3, PEN)
1.5	Схема на разпределителната мрежа	TN-C

2. Характеристики на работната среда

№ по ред	Характеристика	Стойност
2.1	Максимална температура на въздуха на околната среда	+ 40°C
2.2	Минимална температура на въздуха на околната среда	Минус 5°C
2.3	Средна стойност на температурата на въздуха на околната среда, измерена за период от 24 h	+ 35°C
2.4	Относителна влажност	До 100 %
2.5	Надморска височина	До 1000 m

3. Общи технически параметри, характеристики и др. данни

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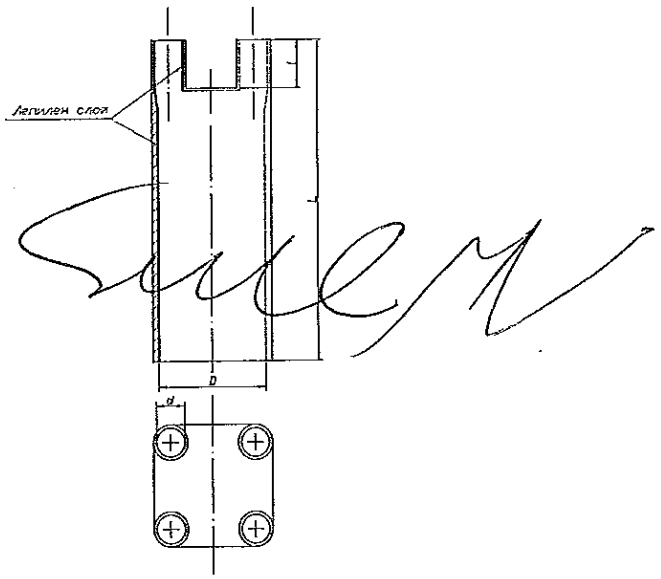
№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.1	Обявено напрежение, $[U_0/U\ (U_m)]$	0,6/1,0 (1,2) kV	0,6/1,0 (1,2) kV
3.2	Издържано напрежение с промишлена честота 50 Hz	min 4 kV/1 min	4 kV/1 min
3.3	Технология на свиване на монтажните елементи	Топлосвиваема	Топлосвиваема
3.4	Приложимост на кабелните съединителни муфи към:		-
3.4a	вида на кабелите	Четирижилни кабели с PVC изолация и обвивка със сечение от 16 mm^2 до 240 mm^2	Четирижилни кабели с PVC изолация и обвивка със сечение от 16 mm^2 до 240 mm^2
3.4b	конструкцията на кабелите	Съгласно БДС 16291, БДС HD 603 S1 или еквивалентно/и	Съгласно БДС 16291, БДС HD 603 S1
3.4c	материала на токопроводимите кабелни жила	Алуминий	Алуминий
3.4d	кабелните накрайници (обувки)	Пресови алуминиеви кабелни накрайници (обувки) съгласно DIN 46 329 или еквивалентно/и	Пресови алуминиеви кабелни накрайници (обувки) съгласно DIN 46 329
3.5	Устойчивост на климатични влияния	Да	Да
3.6	Комплектация	а) Една херметизираща ръкавица	Една херметизираща ръкавица
		б) Четири херметизиращи маншети	Четири херметизиращи маншети
		в) Монтажни/помощни материали, ако се изискват от технологията за монтиране.	Монтажни/помощни материали, ако се изискват от технологията за монтиране.
		г) Размерите на комплектуващите елементи на кабелните глави съответстват на посочените в таблиците в т. 4 по-долу.	Размерите на комплектуващите елементи на кабелните глави съответстват на посочените в таблиците в т. 4 по-долу.
3.7	Опаковка	Всяка кабелна глава е опакована в подходяща опаковка, която предпазва от механнични въздействия и атмосверни влияния при транспорт и съхранение.	Всяка кабелна глава е опакована в подходяща опаковка, която предпазва от механнични въздействия и атмосверни влияния при транспорт и съхранение.

№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.8	Маркировка	Съгласно т. 6.4.2 от БДС EN 50393 или еквивалентно/и, включително: наименованието и/или логото на производителя; наименованието и означението на кабелната глава; сечението на токопроводимите жила, за които е предназначена; датата на производство; референтния номер на стандарта – (БДС) EN 50393 или еквивалентно/и.	Съгласно т. 6.4.2 от БДС EN 50393, включително: наименованието и/или логото на производителя; наименованието и означението на кабелната глава; сечението на токопроводимите жила, за които е предназначена; датата на производство; референтния номер на стандарта – (БДС) EN 50393
3.9	Монтажна инструкция	На български език във всяка опаковка	На български език във всяка опаковка
3.10	Списък на монтажните елементи и материали	На български език във всяка опаковка	На български език във всяка опаковка
3.11	Означение на монтажните елементи и материали	Да	Да
3.12	Срок на съхранение (считано от датата на производството)	min 36 мес.	36 мес.
3.13	Експлоатационна дълготрайност	min 25 год.	25 год.

Фиг. 1 – Топлосвиваема херметизираща „ръкавица"



4. Кабелни глави за кабели 0,6/1 kV с PVC изолация и обвивка, топлосвиваеми, за монтиране на закрито

4.1 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-16 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2340		E4R 10-35 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-16 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 16 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.1.1	Номинално сечение на кабела	4x16 mm^2	4x16 mm^2
4.1.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 10-35
4.1.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.1.3a	*L*	Да се посочи	85 mm
4.1.3b	*l*	Да се посочи	25 mm
4.1.3c	D след свободно свиване	≤ 18 mm	15 mm
4.1.3d	D преди свиване	Да се посочи	35 mm
4.1.3e	d след свободно свиване	≤ 6 mm	3 mm
4.1.3f	d преди свиване	Да се посочи	15 mm
4.1.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 25-100
4.1.5	Размери на херметизиращите „маншети"	-	-

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.1.5a	радиална дебелина след свиване	min 1,3 mm	1,9 mm
4.1.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.1.5c	вътрешен диаметър след свободно свиване	≤ 6 mm	6 mm
4.1.5d	вътрешен диаметър преди свиване	≥ 11 mm	25 mm
4.1.5e	дължина	min 50 mm	100 mm

4.2 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-25 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2341		E4R 10-35 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-25 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 25 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.2.1	Номинално сечение на кабела	4x25 mm^2	4x25 mm^2
4.2.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 10-35
4.2.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.2.3a	*L*	Да се посочи	85 mm
4.2.3b	*l*	Да се посочи	25 mm
4.2.3c	D след свободно свиване	≤ 21 mm	15 mm
4.2.3d	D преди свиване	Да се посочи	35 mm
4.2.3e	d след свободно свиване	≤ 7,2 mm	3 mm
4.2.3f	d преди свиване	Да се посочи	15 mm
4.2.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 25-100
4.2.5	Размери на херметизиращите „маншети"	-	-
4.2.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.2.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.2.5c	вътрешен диаметър след свободно свиване	≤ 7,2 mm	6 mm
4.2.5d	вътрешен диаметър преди свиване	≥ 13,2 mm	25 mm
4.2.5e	дължина	min 50 mm	100 mm

4.3 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-35 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2342		E4R 10-35 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-35 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 35 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.3.1	Номинално сечение на кабела	4x35 mm^2	4x35 mm^2
4.3.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 10-35
4.3.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.3.3a	*L*	Да се посочи	85 mm
4.3.3b	*l*	Да се посочи	25 mm
4.3.3c	D след свободно свиване	≤ 26 mm	15 mm
4.3.3d	D преди свиване	Да се посочи	35 mm
4.3.3e	d след свободно свиване	≤ 8,2 mm	3 mm
4.3.3f	d преди свиване	Да се посочи	15 mm
4.3.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 25-100
4.3.5	Размери на херметизиращите „маншети"	-	-
4.3.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.3.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.3.5c	вътрешен диаметър след свободно свиване	≤ 8,2 mm	6 mm
4.3.5d	вътрешен диаметър преди свиване	≥ 15,4 mm	25 mm
4.3.5e	дължина	min 100 mm	100 mm

4.4 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-50 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2343		E4R 50-150 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-50 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 50 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.4.1	Номинално сечение на кабела	4x50 mm^2	4x50 mm^2

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.4.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.4.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.4.3a	*L*	Да се посочи	130 mm
4.4.3b	*l*	Да се посочи	45 mm
4.4.3c	D след свободно свиване	≤ 27 mm	25 mm
4.4.3d	D преди свиване	Да се посочи	60 mm
4.4.3e	d след свободно свиване	≤ 9,7 mm	6 mm
4.4.3f	d преди свиване	Да се посочи	25 mm
4.4.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.4.5	Размери на херметизиращите „маншети"	-	-
4.4.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.4.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.4.5c	вътрешен диаметър след свободно свиване	≤ 9,7 mm	9 mm
4.4.5d	вътрешен диаметър преди свиване	≥ 17,5 mm	30 mm
4.4.5e	дължина	min 100 mm	200 mm

4.5 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-70 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2344		E4R 50-150 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-70 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 70 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.5.1	Номинално сечение на кабела	4x70 mm^2	4x70 mm^2
4.5.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.5.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.5.3a	*L*	Да се посочи	130 mm
4.5.3b	*l*	Да се посочи	45 mm
4.5.3c	D след свободно свиване	≤ 30 mm	25 mm

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Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.5.3d	D преди свиване	Да се посочи	60 mm
4.5.3e	d след свободно свиване	≤ 11,0 mm	6 mm
4.5.3f	d преди свиване	Да се посочи	25 mm
4.5.4	Топлосвиваема херметизиращи „маншети”	Тип съгласно каталога на производителя	FRM 30-200
4.5.5	Размери на херметизиращите „маншети”	-	-
4.5.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.5.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.5.5c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	9 mm
4.5.5d	вътрешен диаметър преди свиване	≥ 20,5 mm	30 mm
4.5.5e	дължина	min 100 mm	200 mm

4.6 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-95 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2345		E4R 50-150 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-95 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 95 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.6.1	Номинално сечение на кабела	4x95 mm^2	4x95 mm^2
		3x95 mm^2 + 1x50 mm^2	3x95 mm^2 + 1x50 mm^2
4.6.2	Топлосвиваема херметизираща „ръкавица”	Тип съгласно каталога на производителя	E4R 50-150
4.6.3	Размери на херметизиращата „ръкавица” съгл. фиг. 1:	-	-
4.6.3a	*L*	Да се посочи	130 mm
4.6.3b	*l*	Да се посочи	45 mm
4.6.3c	D след свободно свиване	≤ 33 mm	25 mm
4.6.3d	D преди свиване	Да се посочи	60 mm
4.6.3e	d след свободно свиване	≤ 9,7 mm	6 mm
4.6.3f	d преди свиване	Да се посочи	25 mm
4.6.4	Топлосвиваема херметизиращи „маншети”	Тип съгласно каталога на производителя	FRM 30-200

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Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.6.5	Размери на херметизиращите „маншети"	-	-
4.6.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.6.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.6.5c	вътрешен диаметър след свободно свиване	≤ 9,7 mm	9 mm
4.6.5d	вътрешен диаметър преди свиване	≥ 25 mm	30 mm
4.6.5e	дължина	min 100 mm	200 mm

4.7 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-120 mm², за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2346		E4R 50-150 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-120 mm², топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 120 mm², топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.7.1	Номинално сечение на кабела	4x120 mm²	4x120 mm²
		3x120 mm² + 1x70 mm²	3x120 mm² + 1x70 mm²
4.7.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.7.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.7.3a	*L*	Да се посочи	130 mm
4.7.3b	*l*	Да се посочи	45 mm
4.7.3c	D след свободно свиване	≤ 36 mm	25 mm
4.7.3d	D преди свиване	Да се посочи	60 mm
4.7.3e	d след свободно свиване	≤ 11,0 mm	6 mm
4.7.3f	d преди свиване	Да се посочи	25 mm
4.7.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.7.5	Размери на херметизиращите „маншети"	-	-
4.7.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.7.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.7.5c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	9 mm

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Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
4.7.5d	вътрешен диаметър преди свиване	≥ 26 mm	30 mm
4.7.5e	дължина	min 150 mm	200 mm

4.8 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-150 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2347		E4R 50-150 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-150 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 150 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.8.1	Номинално сечение на кабела	4x150 mm^2	4x150 mm^2
		3x150 mm^2 + 1x70 mm^2	3x150 mm^2 + 1x70 mm^2
4.8.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 50-150
4.8.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.8.3a	*L*	Да се посочи	130 mm
4.8.3b	*l*	Да се посочи	45 mm
4.8.3c	D след свободно свиване	≤ 40 mm	25 mm
4.8.3d	D преди свиване	Да се посочи	60 mm
4.8.3e	d след свободно свиване	≤ 11,0 mm	6 mm
4.8.3f	d преди свиване	Да се посочи	25 mm
4.8.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 30-200
4.8.5	Размери на херметизиращите „маншети"	-	-
4.8.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.8.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.8.5c	вътрешен диаметър след свободно свиване	≤ 11,0 mm	9 mm
4.8.5d	вътрешен диаметър преди свиване	≥ 28 mm	30 mm
4.8.5e	дължина	min 150 mm	200 mm

4.9 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-185 mm^2, за монтиране на закрито

Номер на стандарта	Тип/референтен номер съгласно каталога на производителя

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2348		E4R240 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-185 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 185 mm^2, топлосв., 3М	
№ по ред	Технически параметър	Изискване	Гарантирано предложение
4.9.1	Номинално сечение на кабела	4x185 mm^2	4x185 mm^2
		3x185 mm^2 + 1x95 mm^2	3x185 mm^2 + 1x95 mm^2
4.9.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 240
4.9.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.9.3a	*L*	Да се посочи	170 mm
4.9.3b	*l*	Да се посочи	65 mm
4.9.3c	D след свободно свиване	≤ 44 mm	33 mm
4.9.3d	D преди свиване	Да се посочи	100 mm
4.9.3e	d след свободно свиване	≤ 12,8 mm	12,8 mm
4.9.3f	d преди свиване	Да се посочи	35 mm
4.9.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 35-150
4.9.5	Размери на херметизиращите „маншети"	-	-
4.9.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.9.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.9.5c	вътрешен диаметър след свободно свиване	≤ 12,8 mm	12 mm
4.9.5d	вътрешен диаметър преди свиване	≥ 31,5 mm	38 mm
4.9.5e	дължина	min 150 mm	150 mm

4.10 Топлосвиваема кабелна глава за PVC кабели 0,6/1 kV-240 mm^2, за монтиране на закрито

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
20 11 2349		E4R240 FRM	
Наименование на материала		Кабелна глава за PVC кабели 0,6/1 kV-240 mm^2, топлосвиваема, за монтиране на закрито	
Съкратено наименование на материала		Каб. глава НН, 240 mm^2, топлосв., 3М	
№ по	Технически параметър	Изискване	Гарантирано предложение

Номер на стандарта		Тип/референтен номер съгласно каталога на производителя	
ред			
4.10.1	Номинално сечение на кабела	4x240 mm^2	4x240 mm^2
		3x240 mm^2 + 1x120 mm^2	3x240 mm^2 + 1x120 mm^2
4.10.2	Топлосвиваема херметизираща „ръкавица"	Тип съгласно каталога на производителя	E4R 240
4.10.3	Размери на херметизиращата „ръкавица" съгл. фиг. 1:	-	-
4.10.3a	*L*	Да се посочи	170 mm
4.10.3b	*l*	Да се посочи	65 mm
4.10.3c	D след свободно свиване	≤ 50 mm	33 mm
4.10.3d	D преди свиване	Да се посочи	100 mm
4.10.3e	d след свободно свиване	≤ 14,0 mm	12,8 mm
4.10.3f	d преди свиване	Да се посочи	35 mm
4.10.4	Топлосвиваема херметизиращи „маншети"	Тип съгласно каталога на производителя	FRM 35-150
4.10.5	Размери на херметизиращите „маншети"	-	-
4.10.5a	радиална дебелина след свиване	min 1,9 mm	1,9 mm
4.10.5b	радиална дебелина преди свиване	Да се посочи	2,3 mm
4.10.5c	вътрешен диаметър след свободно свиване	≤ 14,0 mm	12 mm
4.10.5d	вътрешен диаметър преди свиване	≥ 36 mm	38 mm
4.10.5e	дължина	min 150 mm	150 mm

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Приложение № 2.1.

Renvois d'angles - Pince de suspension

Angle clamps - Suspension clamp

Apoyos para angulos - Pinza de suspensión

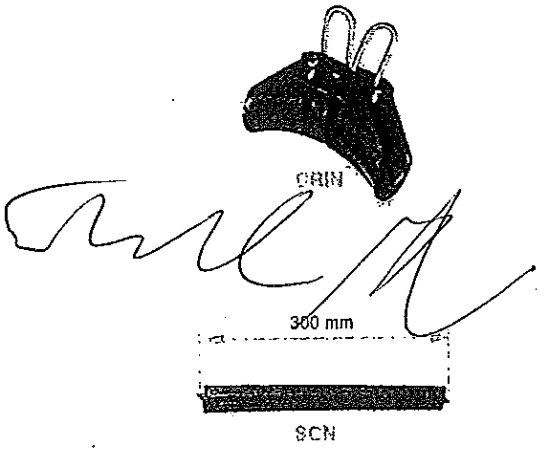
BT

CRIN

Croissant isolé.
- Corps en matière isolante de haute résistance mécanique.
- Anneaux démontables en acier inoxydable.
- Réf. EDF : RA 25 (CRIN + SCN) / Code EDF : 68 28 030.

Angle clamp.
- *High mechanical and weather resistant insulating material.*
- *Stainless steel eyes can be removed.*

Apoyo para ángulos.
- *Cuerpo de material aislante de alta resistencia mecánica.*
- *Anillas desmontables en acero inoxidable.*



SCN

Séparateur cruciforme en néoprène.
A insérer à l'intérieur de la torsade afin de séparer les phases.

Neopren cruciform type cable spreader.
To be inserted inside bundle, in order to separate the phases.

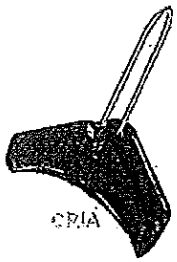
Separador cruciforme en neopreno.
Para insertar en el interior del haz trenzado, con el fin de separar las fases.

CRIA

Croissant isolé.
- Corps en matière isolante de haute résistance mécanique.
- Anneau démontable en acier inoxydable.

Angle clamp.
- *High mechanical and weather resistant insulating material.*
- *Stainless steel eye can be removed.*

Apoyo para ángulos.
- *Cuerpo de material aislante de alta resistencia mecánica.*
- *Anilla desmontable en acero inoxidable.*

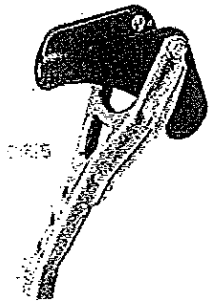


CRIS

Croissant isolé.
- Corps en matière isolante de haute résistance mécanique.
- Patte de fixation en alliage aluminium résistant à la corrosion.
- Fixation par vis ou par scellement.

Angle clamp.
- *High mechanical and weather resistant insulating material.*
- *To be sealed or bolted on walls.*
- *To be fixed by screws or by sealing.*

Apoyo para ángulos.
- *Cuerpo de material aislante de alta resistencia mecánica.*
- *Brazo de fijación en aleación de aluminio, resistente a la corrosión.*
- *Fijación por tornillos o por empotramiento.*



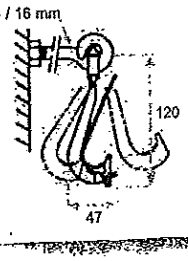
PSP 85

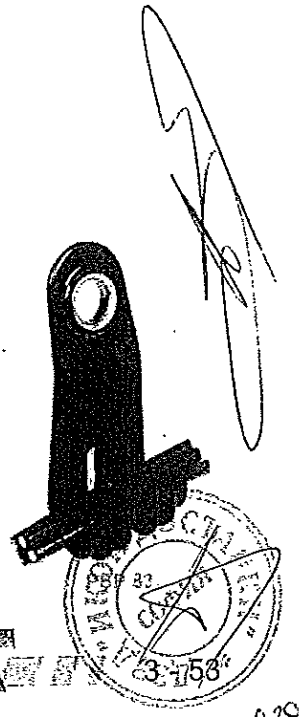
Pince de suspension pour réseaux ou branchements aériens BT (2x16 / 4x25 mm²).
- En matière isolante à haute tenue mécanique et climatique.
- Insert en acier inoxydable pour éviter toute usure par les vibrations.
- **Option "T" :** Peau de friction dans le logement de la torsade.

Specification technique Sicame
Sicame technical specifcation
Especificación técnica Sicame
STU 03002

Suspension clamp for LV networks or service (2x16 / 4x25 mm²).
- *High climatic and mechanical resistant insulating material.*
- *Stainless steel insert to avoid any abrasion due to the vibrations.*
- ***"T" option** : Additionnal soft plastic insert in the aerial bundle cable groove for cable protection.*

Pinza de suspensión para redes o acometidas BT (2x16 / 4x25 mm²).
- *Materia aislante de alta resistencia mecánica y climática.*
- *Anillo de acero inoxidable para evitar desgaste por vibraciones.*
- ***Opción "T" :** Banda de plástico que evita la fricción entre el cable torsado y la pinza.*





SIGAME Group

Pinces de suspension pour réseaux torsadés autoportés

Suspension clamps for twisted self supporting networks

Pinzas de suspensión para redes trenzadas autoportadas

BT

Série PS ...

Norme / *Standard* / *Norma*
VDE 0211

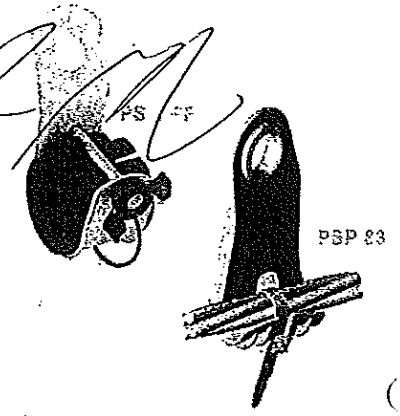
Pinces de suspension pour torsade autoportée constituée par :

PS .. PF

- Un berceau support en acier galvanisé à chaud avec vis de serrage papillon fusible (5 mN) imperdable. Démontage et remontage ultérieurs par clé H 17.
- Un insert thermoplastique à haute performance mécanique, climatique et diélectrique pour maintien et protection de la torsade.
- **Option "M"** : anneau en acier inoxydable pour éviter toute usure par les vibrations (Ø 22 mm)

PSP 83

- Un berceau en matière isolante à haute tenue mécanique et climatique avec collier de serrage.
- Un insert en acier inoxydable pour éviter toute usure par les vibrations (Ø 18 mm).



Suspension clamps for self supporting bundle *comprising :*

PS .. PF

- *A hot dip galvanized steel body with a unloosable fusible (5 mN) wing nut. Removal and further installation by H17 wrench.*
- *A high mechanical and climatic resistant insulating insert for cable support and protection.*
- ***"M" option** : stainless steel ring to avoid any abrasion due to the vibrations (Ø 22 mm).*

PSP 83

- *A high body climatic and mechanical resistant insulating material with tightening strap.*
- *A stainless steel insert to avoid any abrasion due to the vibrations (Ø 18 mm).*

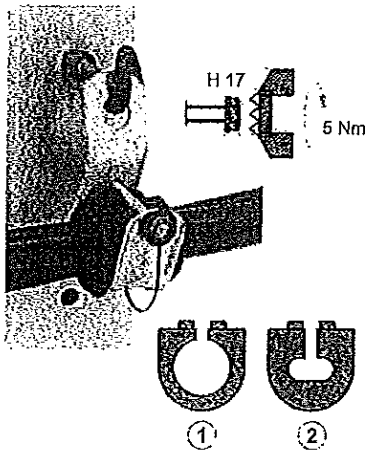
Pinzas de suspensión para cables trenzados autoportados *constituídas por :*

PS .. PF

- *Una cuña soporte en acero galvanizado en caliente con tornillo mariposa de apriete fusible (5 mN) imperdible. Desmontaje y nuevo montaje por llave H 17.*
- *Una inserción termoplástica de altas características mecánica, climática y dieléctrica para mantenimiento y protección de los cables trenzados*
- ***Opción "M"** : anillo de acero inoxidable para evitar desgaste por vibraciones (Ø 22 mm).*

PSP 83

- *Un cuerpo de materia aislante de alta resistencia mecánica y climática con brida de apriete.*
- *Un anillo de acero inoxidable para evitar desgaste por vibraciones (Ø 18 mm).*



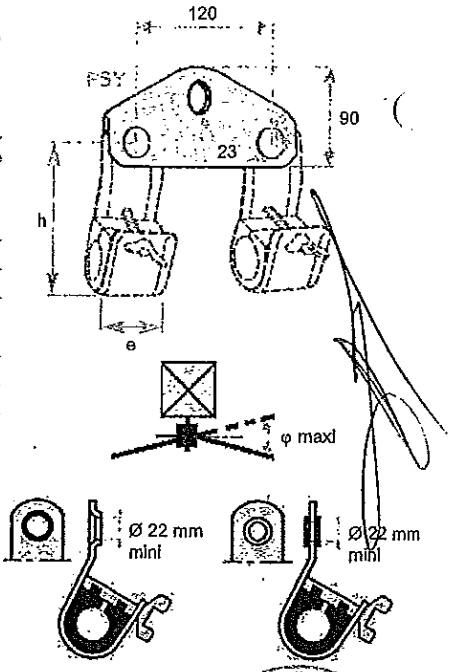
PSY

Palonnier en acier galvanisé à chaud, pour suspension en angles de déviation jusqu'à 60°.

Hot dip galvanized steel yoke for suspensions with deviation angle up to 60°.

Yugo, en acero galvanizado en caliente, para suspensión en ángulos de derivación, de hasta 60°.

Réf.	Version *Version* *Versión*	Ø torsade *Bundle Ø* *Ø del haz* (mm)	Nbre de câbles *Cable number* *Número cables*	φ (maxi) (deg)	h (mm)	e (mm)	Charge maxi *Maxi load* *Carga máxima* (N)	Charge de rupture *Breaking load* *Carga de rotura* (N)
PSP 83		8 - 25 *	2 / 4 x (16 / 25 mm²)	30	115	60	2 000	5 000
PS 16 PFA	①	15 - 23	4 x (16 / 25 mm²)	30	105	40 / 54	2 000	5 000
PS 16-2 PFA	②	12 - 19	2 x (16 / 25 mm²) / 4 x (16 mm²)	30	105	40 / 54	2 000	5 000
PS 27-2 PFA	②		2 x (35 / 50 mm²)	30	105	40 / 54	3 000	7 500
PS 27 PFA	①	22 - 27	4 x (35 mm²)	30	105	40 / 54	3 000	7 500
PS 30 PFA	①	27 - 30	4 x (50 mm²)	30	105	40 / 54	3 000	7 500
PS 33 PFA	①	31 - 33	4 x (70 mm²)	30	105	40 / 54	3 000	7 500
PS 40 PFA	①	37 - 40	4 x (95 mm²)	30	105	40 / 54	3 000	7 500
PS 43-2 PFA	②		2 x (95 mm²)	30	105	40 / 54	3 000	7 500
PS 33 PF	①	31 - 33	4 x (70 mm²)	45	125	48 / 64	3 500	8 750
PS 40 PF	①	37 - 40	4 x (95 mm²)	45	125	48 / 64	3 500	8 750
PS 43 PF	①	39,5 - 43,5	4x(95/120mm²)	45	125	48 / 64	3 500	8 750
PS 47 PF	①	42 - 47	4 x (120 / 150 mm²)	45	125	48 / 64	3 500	8 750



PS Standard *Standard* *Standard*

PS Option "M" *"M" option* *Opción "M"*

PS : Sur demande / *On request* / *Sobre pedido :*

- **Papillon non fusible** / *Non fusible wing nut* / *Mariposa que no sea fusible* : (Réf. **PS xx P**).
- **Anneau Inox "M"** / *Stainless steel ring "M"* / *Anillo inoxidable "M"* : (Réf. **PS xx PFM**).

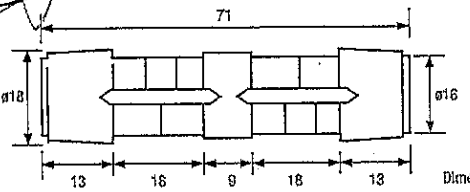
*** Capacité câbles torsadés et Télécom**

Capacity of twisted cables and "Telecom" / Capacidad de los cables trenzados y "Telecom".

240

Preinsulated sleeve E140

K038



Dimensions in mm

MICHAUD

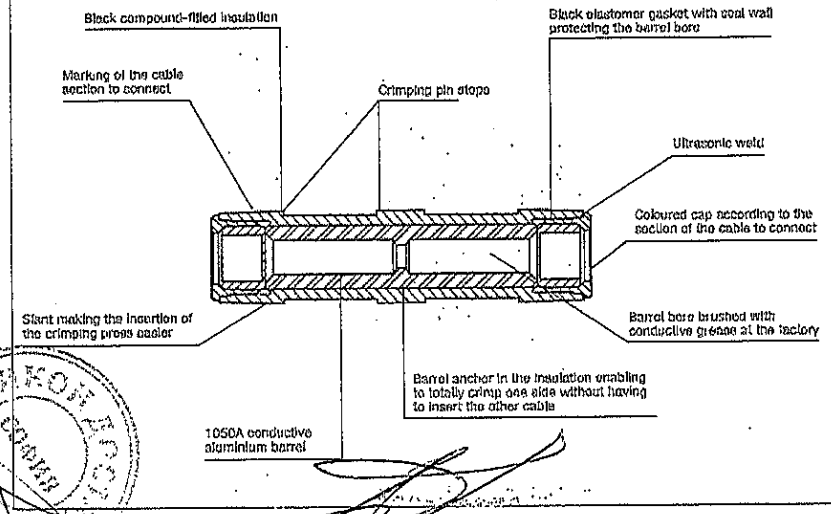
Application

This preinsulated sleeve is designed for the connection of copper or aluminium stranded core overhead insulated conductors with traction or with no mechanical load.
It is used for the installation, repair or modification of low voltage service lines.
The junction can be established between two conductors of equal or unequal sections. All combinations of sections are possible.
The section of the cables ranges goes from 6 up to 35mm².

Description

- The sleeve can be used in mechanical traction.
- The sleeve has got an excellent dielectric strength, greater than 6kV.
- The materials are protected against UV.

This preinsulated sleeve meets the requirements of the **NF C 33-021** and **EN 50-483** standards.



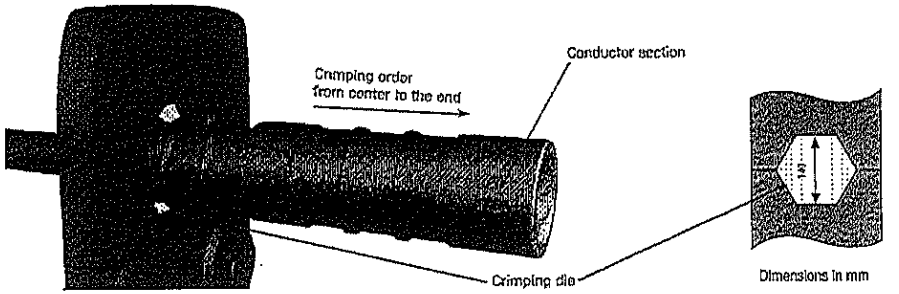
Implementation

Preparation of the conductors to be connected:

- Cut the cables using a device that does not scratch the core.
- Strip the conductors over a length of 23mm.
- Brush the conductors to be connected using neutral grease to remove the oxide film. Do not wipe the conductors cleaned in this way.
- Insert the conductors fully into the sleeve bores.

Crimping:

- Both conductors do not need to be inserted before crimping.
  You can insert one, crimp it, insert the second one and crimp it.

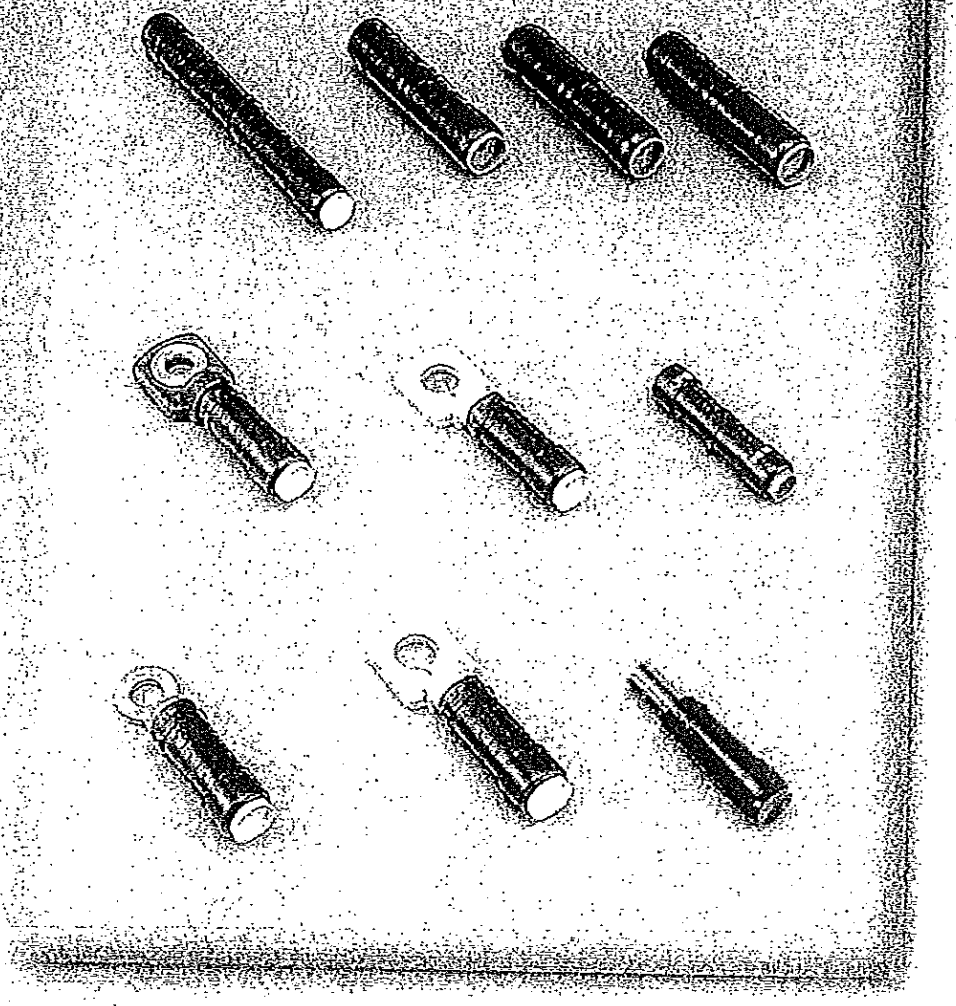


Implementation video available on www.michaud-export.com
(tab Documentation > Implementation videos)

Code	Designation	Leading-in cable section (mm²)	Leading-in colour	Leading-out cable section (mm²)	Leading-out colour	Weight (kg)	Sales unit
K030	PREINSULATED SLEEVE (E140) MJPB 6	6	BROWN	6	BROWN	0.030	10
K031	PREINSULATED SLEEVE (E140) MJPB 10-6	10	GREEN	6	BROWN	0.030	10
K032	PREINSULATED SLEEVE (E140) MJPB 16-6	16	BLUE	6	BROWN	0.030	10
K033	PREINSULATED SLEEVE (E140) MJPB 25-6	25	ORANGE	6	BROWN	0.030	10
K035	PREINSULATED SLEEVE (E140) MJPB 10	10	GREEN	10	GREEN	0.030	10
K036	PREINSULATED SLEEVE (E140) MJPB 16-10	16	BLUE	10	GREEN	0.030	10
K037	PREINSULATED SLEEVE (E140) MJPB 25-10	25	ORANGE	10	GREEN	0.030	10
K039	PREINSULATED SLEEVE (E140) MJPB 16	16	BLUE	16	BLUE	0.030	10
K040	PREINSULATED SLEEVE (E140) MJPB 25-16	25	ORANGE	16	BLUE	0.030	10
K053	PREINSULATED SLEEVE (E140) MJPB 35-16	35	RED	16	BLUE	0.020	10
K042	PREINSULATED SLEEVE (E140) MJPB 25	25	ORANGE	25	ORANGE	0.020	10
K054	PREINSULATED SLEEVE (E140) MJPB 35-25	35	RED	25	ORANGE	0.020	10
K055	PREINSULATED SLEEVE (E140) MJPB 35	35	RED	35	RED	0.020	10

SEE SHEET
INSTALLATION / Hydraulic crimping tool

Réseaux aériens isolés BT
LV insulated overhead networks
Redes aéreas aisladas BT



Accessoires de connexion préisolés
Preinsulated connection accessories
Accesorios de conexión preaislados

ВЯРНО СОРЕГИНАЛА

3 - 31

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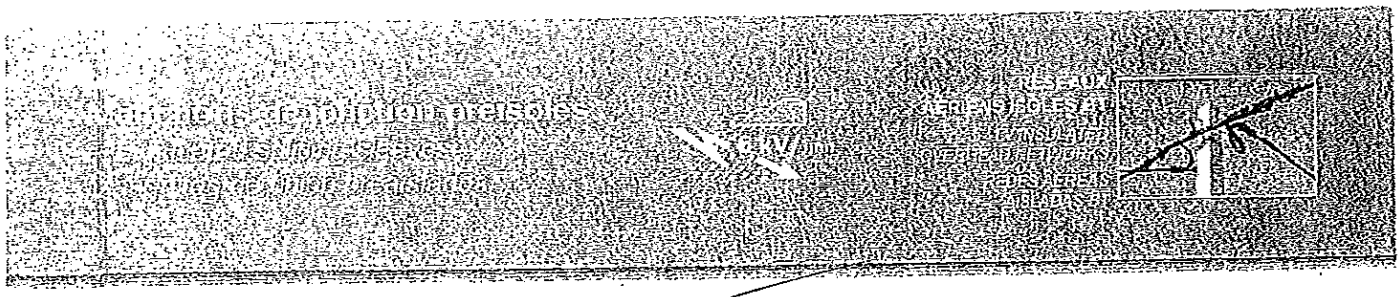


MJPB ... CG

4 - 35 mm²

Manchons en aluminium préisolés pour les phases et le neutre enduits intérieurement de graisse de contact.

- Continuité d'isolation du câble par gaine résistante à la compression et joints d'étanchéité (essai d'homologation pour isolation : 6 kV dans l'eau pendant une minute).
- L'étanchéité de la connexion permet le raccordement Alu / Alu , Alu / Cu et Cu / Cu.
- Le manchon mentionne :
  - Le nombre et l'ordre des rétreints à effectuer.
  - La longueur à dénuder des conducteurs (avec arête saillante pour marquage de la gaine.
  - La section des conducteurs, la matrice à utiliser.
- Bouchon joint de couleur pour identification rapide de la section.
- Mise en oeuvre : sertissage par rétreint hexagonal.

CONFORME A LA NORME NF C 33-021 (06-98).

Preinsulated aluminium sleeves for phases, and neutral covered inside with contact grease.

- *Insulation of the cable with a sheath resistant to compression and with water-tightness joints (type test for insulation : 6 kV in water for one minute).*
- *Tightness of the connection allows to connect Alu / Alu , Alu / Cu and Cu / Cu.*
- *The sleeve mentions :*
  - *Number and order of compressions to be made.*
  - *Length to be stripped on the conductors (with sharp edge to mark the sleeve).*
  - *Section of conductors, die to use.*
- *End coloured joint to identify quickly the section.*
- *Installation : crimping by hexagonal compression.*

IN ACCORDANCE WITH NF C 33-021 (06-98) STANDARD.

Manguitos preaislados de aluminio para las fases y el neutro cubierto interioramente con grasa de contacto.

- *Aislamiento del cable por funda resistente a la compresión y por tapones (prueba de homologación para aislamiento : 6 kV en agua durante una minuto).*
- *La conexión estanca permite conectar Alu / Alu , Alu / Cu y Cu / Cu.*
- *El manguito indica :*
  - *El número y el ordén de las compresiones a efectuar.*
  - *La longitud a desnudar de los conductores (con pico saliente para marcar la funda).*
  - *La sección de los conductores, la matriz a utilizar.*
- *Capuchón de estanqueidad de color para identificar rápidamente la sección.*
- *Instalación : por compresión hexagonal.*

CONFORME A LA NORMA NF C 33-021 (06-98).

mm²	Code couleur joint *Code colour joint* *Codigo color junta*
4	Ivoire / *Ivory* / *Marfil*
6	Marron / *Brown* / *Marrón*
10	Vert / *Green* / *Verde*
16	Bleu / *Blue* / *Azul*
25	Orange / *Orange* / *Naranjo*
35	Rouge / *Red* / *Rojo*

Réf.		Condition. *Packaging* *Acondicio.*	S (mm²)		Ø A (mm)		L (mm)	Matrice *Die* *Matriz* E (mm)	Code EDF
			S 1	S 2	A 1	a 1			
MJPB 4 CG	◑	10	4	4	2,8	2,8	82	14	
MJPB 6- 4 CG	◑	10	6	4	3,4	2,8	82	14	
MJPB 6 CG	◑	10	6	6	3,4	3,4	82	14	67 32 115
MJPB 10- 6 CG	◑	10	10	6	4,3	3,4	82	14	67 32 116
MJPB 10 CG	◑	10	10	10	4,3	4,3	82	14	67 32 101
MJPB 16- 4 CG	◑	10	16	4	5,3	2,8	82	14	
MJPB 16- 6 CG	◑	10	16	6	5,3	3,4	82	14	67 32 117
MJPB 16-10 CG	◑	10	16	10	5,3	4,3	82	14	67 32 103
MJPB 16 CG	◑	10	16	16	5,3	5,3	82	14	67 32 107
MJPB 25- 6 CG	◑	10	25	6	7	3,4	82	14	67 32 118
MJPB 25-10 CG	◑	10	25	10	7	4,3	82	14	67 32 105
MJPB 25-16 CG	◑	10	25	16	7	5,3	82	14	67 32 109
MJPB 25 CG	◑	10	25	25	7	7	82	14	67 32 111
MJPB 35 - 6 CG	◑	10	35	6	8	3,4	82	14	
MJPB 35-10 CG	◑	10	35	10	8	4,3	82	14	
MJPB 35-16 CG	◑	10	35	16	8	5,3	82	14	67 32 058
MJPB 35-25 CG	◑	10	35	25	8	7	82	14	67 32 060
MJPB 35 CG	◑	10	35	35	8	8	82	14	

◑ **Tension mécanique réduite** / *Reduced mechanical strain* / *Tensión mecánica reducida.*

groupe sicame
sicame
B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél. (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - E-mail : info@sicame.fr

MJPT

10 - 185 mm²

Manchons préisolés en aluminium pour les phases, en alliage d'aluminium pour le neutre porteur enduit intérieurement de graisse de contact.

- Continuité d'isolation du câble par gaine résistante à la compression et joints d'étanchéité (essai d'homologation pour isolation : 6 kV dans l'eau pendant une minute).
- L'étanchéité de la connexion permet le raccordement Alu / Alu, Alu / Cu et Cu / Cu.
- Le manchon mentionne :
  - Le nombre et l'ordre des rétreints à effectuer.
  - La longueur à dénuder des conducteurs (avec arête saillante pour marquage de la gaine.
  - La section des conducteurs, la matrice à utiliser.
- Bouchon joint de couleur pour identification rapide de la section.
- Mise en oeuvre : sertissage par rétreint hexagonal.

CONFORME A LA NORME NF C 33-021 (06-98).

Preinsulated aluminium sleeves for phases, aluminium alloy for neutral messenger covered inside with contact grease.

- *Insulation of the cable with a sheath resistant to compression and with water-tightness joints (type test for insulation : 6 kV in water for one minute).*
- *Tightness of the connection allows to connect Alu / Alu, Alu / Cu and Cu / Cu.*
- *The sleeve mentions :*
  - *Number and order of compressions to be made.*
  - *Length to be stripped on the conductors (with sharp edge to mark the sleeve).*
  - *Section of conductors, die to use.*
- *End coloured joint to identify quickly the section.*
- *Installation : crimping by hexagonal compression.*

IN ACCORDANCE WITH NF C 33-021 (06-98) STANDARD.

Manguitos preaislados de aluminio para fases de aleación de aluminio para el neutro fiador cubierto interioramente con grasa de contacto.

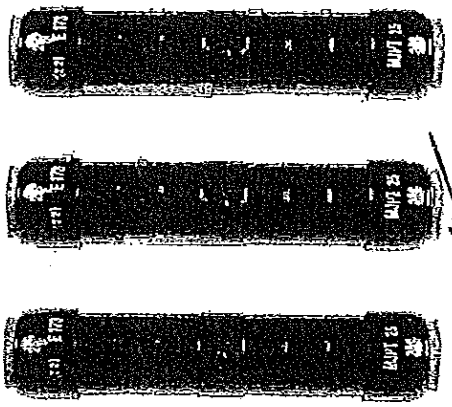
- *Aislamiento del cable por funda resistente a la compresión y por tapones (prueba de homologación para aislamiento : 6 kV en agua durante una minuto).*
- *La conexión estanca permite conectar Alu / Alu, Alu / Cu y Cu / Cu.*
- *El manguito indica :*
  - *El número y el ordén de las compresiones a efectuar.*
  - *La longitud a desnudar de los conductores (con pico saliente para marcar la funda).*
  - *La sección de los conductores, la matriz a utilizar.*
- *Capuchón de estanqueidad de color para identificar rápidamente la sección.*
- *Instalación : por compresión hexagonal.*

CONFORME A LA NORMA NF C 33-021 (06-98).

Manchon du neutre porteur / *Sleeve for neutral messenger / Manguito de neutro mensajero*
MJPT ... N

mm²	Code couleur bague *Code colour ring* *Codigo color anillo*
10	Vert / *Green / Verde*
16	Bleu / *Blue / Azul*
25	Orange / *Orange / Naranjo*
29,5	Marron / *Brown / Marrón*
35	Rouge / *Red / Rojo*
50	Jaune / *Yellow / Amarillo*
54,6	Noir / *Black / Negro*
70 / 75	Blanc / *White / Blanco*
80	Ivoire / *Ivory / Marfil*
95	Gris / *Grey / Gris*
120	Rose / *Rose / Rosa*
150	Violet / *Violet / Violeta*
185	Rouge / *Red / Rojo*

Manchons de phase / *Sleeves for phase / Manguitos de fase*
MJPT ...



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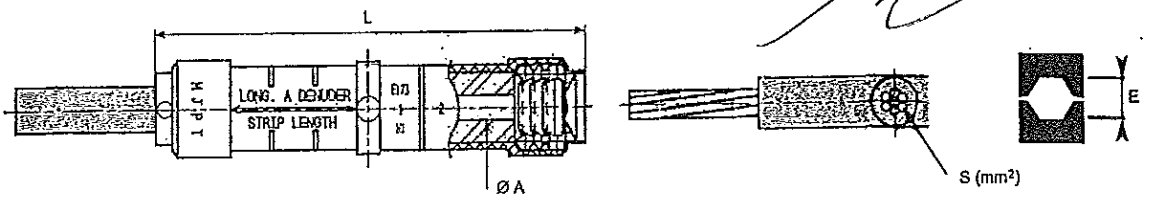
MJPT

10 - 185 mm²



Réf.	Neutre porteur *Neutral messenger Neutro mensajero* Almélec / AAAC	Condition. *Packaging Acondicio.*	S (mm²)		Ø A (mm)		L (mm)	Matrice *Die Matriz* E (mm)	Code EDF
			S 1	S 2	A 1	A 2			
MJPT 25N	● *	10	25	25	6,6	6,6	130	17,3	
MJPT 25N-(14)	● *	10	25	25	6,6	6,6	102	14,0	
MJPT 29N	● *	10	29,5	29,5	7,5	7,5	130	17,3	
MJPT 35N	● *	10	35	35	8	8	130	17,3	
MJPT 50N	● *	10	50	50	9,7	9,7	148	17,3	
MJPT 54	● *	10	54,6	54,6	10	10	148	17,3	67 22 665
MJPT 54-29N	● *	10	54,6	29,5	10	7,5	130	17,3	
MJPT 70N	● *	10	70	70	10,7	10,7	168	17,3	67 22 667
MJPT 70N-54	● *	10	70	54,6	10,7	10	148	17,3	67 22 666
MJPT 75N	● *	10	75	75	11,2	11,2	168	17,3	
MJPT 80N	● *	10	80	80	12,5	12,5	178	21,5	
MJPT 80N-54	● *	10	80	54	12,5	10	178	21,5	
MJPT 95N	● *	10	95	95	13,5	13,5	178	21,5	
MJPT 120N	● *	10	120	120	15	15	178	21,5	
MJPT 10	●	10	10	10	4,3	4,3	108	17,3	
MJPT 16	●	10	16	16	5,3	5,3	108	17,3	
MJPT 25	●	10	25	25	6,5	6,5	108	17,3	
MJPT 25-16	●	10	25	16	6,5	5,3	108	17,3	
MJPT 35	●	10	35	35	8	8	108	17,3	67 22 652
MJPT 35-16	●	10	35	16	8	5,3	108	17,3	
MJPT 35-25	●	10	35	25	8	6,5	108	17,3	
MJPT 50	●	10	50	50	9	9	108	17,3	67 22 655
MJPT 50-10	●	10	50	10	9	4,3	108	17,3	
MJPT 50-16	●	10	50	16	9	5,3	108	17,3	
MJPT 50-25	●	10	50	25	9	6,5	108	17,3	67 22 653
MJPT 50-35	●	10	50	35	9	8	108	17,3	67 22 654
MJPT 54R	◑ *	10	54,6	54,6	10	10	108	17,3	
MJPT 70	●	10	70	70	10,7	10,7	108	17,3	67 22 658
MJPT 70-25	●	10	70	25	10,7	6,5	108	17,3	
MJPT 70-35	●	10	70	35	10,7	8	108	17,3	67 22 656
MJPT 70-50	●	10	70	50	10,7	9	108	17,3	67 22 657
MJPT 75	●	10	75	75	11,4	11,4	108	17,3	
MJPT 95	◑	10	95	95	12,5	12,5	108	17,3	
MJPT 95-35	●	10	95	35	12,5	8	108	17,3	
MJPT 95-50	●	10	95	50	12,5	9	108	17,3	
MJPT 95-70	●	10	95	70	12,5	10,7	108	17,3	
MJPT 95(21)	●	10	95	95	12,5	12,5	108	21,5	
MJPT 120	●	10	120	120	13,7	13,7	108	21,5	
MJPT 120-50	●	10	120	50	13,7	9	108	21,5	
MJPT 150	◑	10	150	150	15,5	15,5	108	21,5	67 22 662
MJPT 150-70	●	10	150	70	15,5	10,7	108	21,5	67 22 661
MJPT 150-95	●	10	150	95	15,5	12,5	108	21,5	
MJPT 185	◑	10	185	185	17,5	17,5	121	26,0	
EJPT 35 - 54,6		1	Trousse / *Kit / Estuche* 3 MJPT 35 + 1 MJPT 54						
EJPT 50 - 54,6		1	Trousse / *Kit / Estuche* 3 MJPT 50 + 1 MJPT 54						67 22 676
EJPT 70 - 70N		1	Trousse / *Kit / Estuche* 3 MJPT 70 + 1 MJPT 70N						67 22 673
EJPT 70/35 - 54,6		1	Trousse / *Kit / Estuche* 3 MJPT 70-35 + 1 MJPT 54						67 22 678
EJPT 70/35 - 70N/54,6		1	Trousse / *Kit / Estuche* 3 MJPT 70-35 + 1 MJPT 70N-54						67 22 670
EJPT 70 - 54,6		1	Trousse / *Kit / Estuche* 3 MJPT 70 + 1 MJPT 54						67 22 677
EJPT 70/70 - 54,6/70N		1	Trousse / *Kit / Estuche* 3 MJPT 70 + 1 MJPT 70N-54						67 22 672
EJPT 95 - 70N		1	Trousse / *Kit / Estuche* 3 MJPT 95 + 1 MJPT 70N						
EJPT 150 - 70N		1	Trousse / *Kit / Estuche* 3 MJPT 150 + 1 MJPT 70N						67 22 681
EJPT 150/70 - 70N/54,6		1	Trousse / *Kit / Estuche* 3 MJPT 150-70 + 1 MJPT 70N-54						67 22 680
EJPT 150/70 - 70N		1	Trousse / *Kit / Estuche* 3 MJPT 150-70 + 1 MJPT 70N						67 22 674
EJPT 150/95 - 70N		1	Trousse / *Kit / Estuche* 3 MJPT 150-95 + 1 MJPT 70N						

● **Pleine tension mécanique** / *Full mechanical strain / Plena tensión mecánica.*

◑ **Tension mécanique réduite** / *Reduced mechanical strain / Tensión mecánica reducida.*

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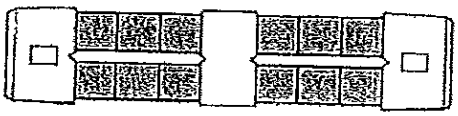
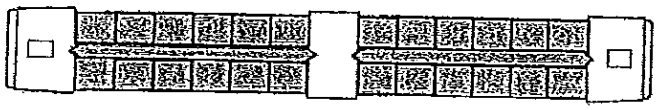
PREINSULATED SLEEVE

REQUIRING A 173
HEXAGONAL CRIMPING DIE

Phase sleeve



Neutral sleeve

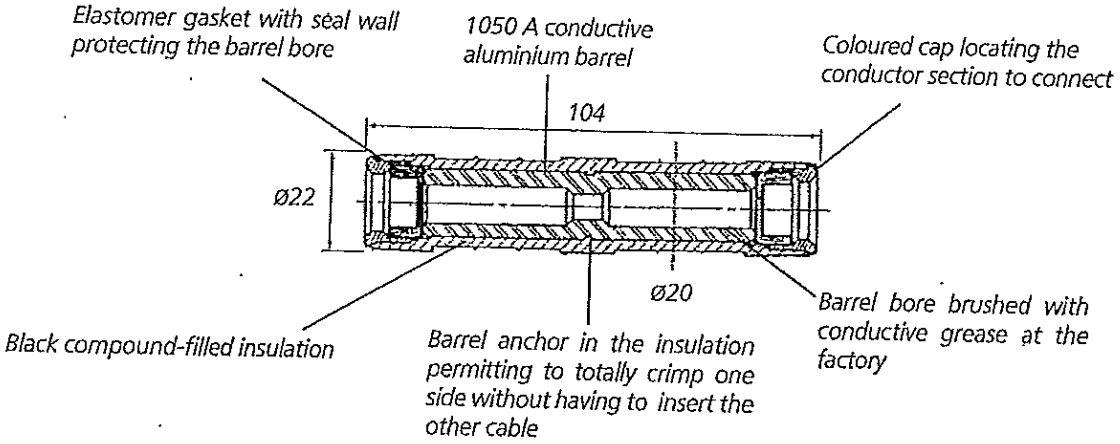


APPLICATION

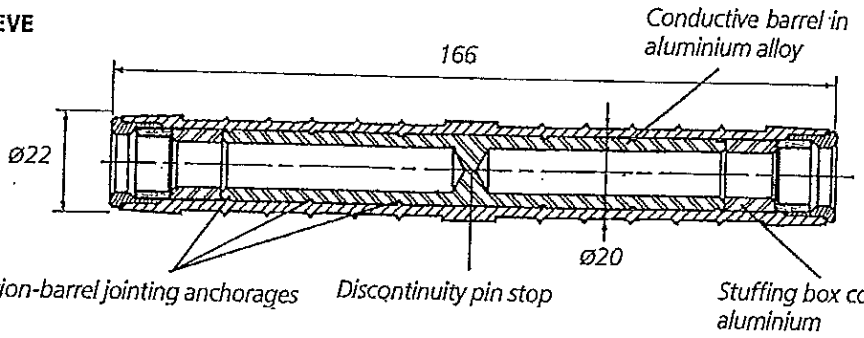
This preinsulated sleeve is used for the connection of low voltage A.B.C. (Aerial Bundled Conductor) to each other.
A junction can be established between two conductors of equal or unequal sections. All section combinations are possible.
The neutral carrier is dimensioned to resist to a tensile strength greater than 1600 daN for the 54,6 mm² section and over 2000 daN for the 70 mm² section.
Cable sections from 16 up to 95 mm² can be connected.

DESCRIPTION

PHASE SLEEVE



NEUTRAL SLEEVE



* Length in mm

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MICHAUD

PREINSULATED SLEEVE REQUIRING A 173 HEXAGONAL CRIMPING DIE

PACKAGING

PHASE SLEEVES

Code	Designation	EDF Nomenclature	Unit sale	Leading-in cable section Insul. Al-Cu (mm²)	Leading-in colour	Output cable section Insul. Al-Cu (mm²)	Output colour	Unit weight
K 101	PREINSULATED SLEEVE (173) MJPT 16	-	10	16	BLUE	16	BLUE	0,060 kg
K 103	PREINSULATED SLEEVE (173) MJPT 25	-	10	25	ORANGE	25	ORANGE	0,060 kg
K 106	PREINSULATED SLEEVE (173) MJPT 35	67 22 652	10	35	RED	35	RED	0,060 kg
K 108	PREINSULATED SLEEVE (173) MJPT 50-25	67 22 653	10	50	YELLOW	25	ORANGE	0,060 kg
K 109	PREINSULATED SLEEVE (173) MJPT 50-35	67 22 654	10	50	YELLOW	35	RED	0,050 kg
K 110	PREINSULATED SLEEVE (173) MJPT 50	67 22 655	10	50	YELLOW	50	YELLOW	0,055 kg
K 114	PREINSULATED SLEEVE (173) MJPT 54-50	-	10	54	BLACK	50	YELLOW	0,050 kg
K 118	PREINSULATED SLEEVE (173) MJPT 70-35	67 22 656	10	70	WHITE	35	RED	0,055 kg
K 119	PREINSULATED SLEEVE (173) MJPT 70-50	67 22 657	10	70	WHITE	50	YELLOW	0,055 kg
K 120	PREINSULATED SLEEVE (173) MJPT 70-54	-	10	70	WHITE	54	BLACK	0,050 kg
K 121	PREINSULATED SLEEVE (173) MJPT 70	67 22 658	10	70	WHITE	70	WHITE	0,050 kg
K 122	PREINSULATED SLEEVE (173) MJPT 95-70	67 22 659	10	95	GREY	70	WHITE	0,050 kg
K 123	PREINSULATED SLEEVE (173) MJPT 95	67 22 660	10	95	GREY	95	GREY	0,050 kg

NEUTRAL SLEEVES

Code	Designation	EDF Nomenclature	Unit sale	Leading-in cable section Insul. (mm²)	Leading-in colour	Output cable section Insul. (mm²)	Output colour	Unit weight
K 115	PREINSULATED SLEEVE (173) MJPT 54	67 22 665	10	54,6N	BLACK	54,6N	BLACK	0,080 kg
K 117	PREINSULATED SLEEVE (173) MJPT 70-54	67 22 666	10	70N	WHITE	54,6N	BLACK	0,080 kg
K 116	PREINSULATED SLEEVE (173) MJPT 70	67 22 667	10	70N	WHITE	70N	WHITE	0,080 kg

**EDF : French Electricity Board*

VARIATION

A set consisting of 3 phase sleeves and 1 neutral sleeve packed in 1 bag can be provided.

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ВЯРНО С ОРИГИНАЛА

247

CPTA / CPTAU

Cosses préisolées Aluminium ou bi-métal Aluminium-Cuivre (soudée par friction).

- Le fût aluminium est enduit intérieurement de graisse de contact pour un meilleur contact électrique.
- Une gaine résistante à la compression mentionne :
  – le nombre et l'ordre des rétreints à effectuer,
  – la longueur à dénuder du conducteur,
  – la section des câbles, l'outillage à utiliser, et assure la protection de la jonction bimétallique (CPTAU).
- Un joint d'étanchéité rend hermétique la connexion et permet donc le raccordement des câbles cuivre ou aluminium.
- Un bouchon joint de couleur permet l'identification rapide de la section.
- Mise en oeuvre : sertissage par rétreint hexagonal.

CONFORME A LA NORME NF C 33-021 (06-98).

Preinsulated Aluminium or Aluminium-Copper bi-metallic crimping lugs (friction-welded).

- *Aluminium inside covered with contact grease for a best electrical contact.*
- *A sheath resistant to compression mentions :*
  – number and order of compressions to be made,
  – length to be stripped on the conductor,
  – cables section and tools to use, and ensures the protection of the bimetallic connection (CPTAU).
- *A seal-joint makes tight the connection and allows to connect the copper or aluminium cables.*
- *A coloured joint to identify quickly the section.*
- *Installation : crimping by hexagonal compression.*

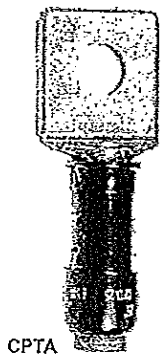
IN ACCORDANCE WITH NF C 33-021 (06-98) STANDARD.

Terminales preaislados de Aluminio o bi-metálicos Aluminium-Cobre (soldado por fricción).

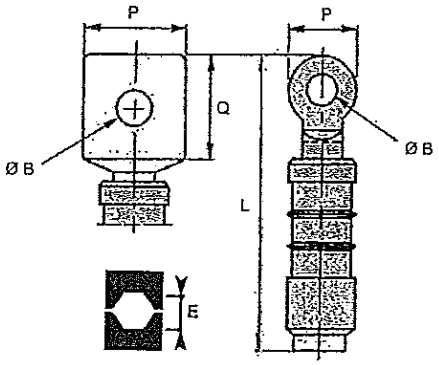
- *Interior de aluminio cubierto con grasa de contacto para un mejor contacto eléctrico.*
- *Una funda resistente a la compresión menciona :*
  – el número y el orden de las compresiones a efectuar,
  – la longitud a desnudar sobre el conductor,
  – la sección de los cables, el utillaje a utilizar, y asegura la protección de la conexión bimetálica (CPTAU).
- *Una juntura para estancar hace hermetica la conexión y permite conectar el cable de cobre o de aluminio.*
- *Un capuchón de estanquiedad de color permite identificar rápidamente la sección.*
- *Puesta en obra : por compresión hexagonal.*

CONFORME A LA NORMA NF C 33-021 (06-98).

mm²	Code couleur bague *Code colour ring* *Codigo color anillo*
16	Bleu / *Blue* / *Azul*
25	Orange / *Orange* / *Naranjo*
35	Rouge / *Red* / *Rojo*
50	Jaune / *Yellow* / *Amarillo*
54	Noir / *Black* / *Negro*
70	Blanc / *White* / *Blanco*
80	Ivoire / *Ivory* / *Marfil*
95	Gris / *Grey* / *Gris*
120	Rose / *Rose* / *Rosa*
150	Violet / *Violet* / *Violeta*
185	Argent / *Silver* / *Plata*


CPTA


CPTAU



Réf Borne *Transformer clamp* *Borne* Alu	Réf Borne Cu	Section *Area* *Sección* (mm²)	L (mm) Alu	L (mm) Cu	Plage / *Tongue* / *Pala* Alu Ø B (mm)	Alu P x Q (mm)	Cu Ø B (mm)	Cu P (mm)	Matrice *Die* *Matriz* E (mm)	Code EDF Alu	Code EDF Cu
CPTA 16	CPTAU 16	16	110	77	13	32 x 33	10,5	20	14,0	67 23 951	67 34 451
CPTA 16-17 *	CPTAU 16-17 *	16	110	92	16	32 x 33	10,5	25	17,3		
CPTA 25	CPTAU 25	25	110	77	13	32 x 33	10,5	20	14,0	67 23 952	67 34 452
CPTA 25-17 *	CPTAU 25-17 *	25	110	92	16	32 x 33	10,5	25	17,3		
CPTA 35	CPTAU 35	35	110	92	16	32 x 33	12,8	25	17,3	67 23 953	67 34 453
CPTA 50	CPTAU 50	50	110	92	16	32 x 33	12,8	25	17,3	67 23 954	67 34 454
CPTA 54	CPTAU 54	54	110	92	16	32 x 33	12,8	25	17,3	67 23 955	67 34 455
CPTA 70	CPTAU 70	70	110	92	16	32 x 33	12,8	25	17,3	67 23 956	67 34 456
CPTA 70-21	CPTAU 70-21	70	125	110	16	37 x 37	12,8	30	21,5		
	CPTAU 80 N SP	80		110			12,8	30	21,5		
CPTA 95	CPTAU 95	95	110	92	16	32 x 33	12,8	25	17,3		67 34 457
CPTA 95-21	CPTAU 95-21	95	125	110	16	37 x 37	12,8	30	21,5		
CPTA 120	CPTAU 120	120	125	110	16	37 x 37	12,8	30	21,5		
CPTA 150	CPTAU 150	150	125	110	16	37 x 37	12,8	30	21,5		67 34 458
CPTA 185	CPTAU 185	185	130	115	16	37 x 37	12,8	30	26,0		
ERPBA 35	ERPBU 35	Trousse / *Kit* / *Estuche* : 3 x 35 + 54								67 23 973	67 34 473
ERPBA 50	ERPBU 50	Trousse / *Kit* / *Estuche* : 3 x 50 + 54								67 23 974	67 34 474
ERPBA 70	ERPBU 70	Trousse / *Kit* / *Estuche* : 3 x 70 + 54								67 23 976	67 34 476
ERPBA 70-70 N	ERPBU 70-70 N	Trousse / *Kit* / *Estuche* : 3 x 70 + 70 N									67 34 480
ERPBA 150	ERPBU 150	Trousse / *Kit* / *Estuche* : 3 x 150 + 70 N							21,5	67 23 977	67 34 477

*** Peuvent être livrées avec un perçage Ø B = 12,8 mm, ajouter P13 à la référence (ex. CPTAU 16-17 P13).**
Can be delivered with a drill Ø B = 12,8 mm, add P13 to the reference.
Pueden ser suministrados con a taladro Ø B = 12,8 mm, añadir P13 a la referencia.

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CPT A
CPT2AU

Aluminium / *Aluminium* / *Aluminio*
Aluminium-Cuivre / *Aluminium-Copper* / *Aluminio-Cobre*
(Brevet SICAME / *SICAME patent* / *Patente SICAME*)

Cosses préisolées Aluminium (CPTA) ou bimétal Aluminium-Cuivre (CPT2AU).
Les cosses bimétalliques comportent deux rondelles en alliage de cuivre surmoulées sur la plage aluminium.

- Le fût aluminium est enduit intérieurement de graisse de contact pour un meilleur contact électrique.
- Une gaine résistante à la compression mentionne :
  – Le nombre et l'ordre des rétreints à effectuer,
  – La longueur à dénuder du conducteur.
  – La section des câbles, l'outillage à utiliser, et assure la protection de la jonction bimétallique (CPT2AU).
- Un joint d'étanchéité rend hermétique la connexion et permet donc le raccordement des câbles cuivre ou aluminium.
- Une bague de couleur permet l'identification rapide de la section.
- Mise en oeuvre : sertissage par rétreint hexagonal.

CONFORME A LA NORME NF C 33-021 (06-98).

Preinsulated aluminium (CPTA) or Aluminium-Copper (CPT2AU) bimetallic crimping lugs.
Bimetallic lugs are equipped with two copper alloy washers overmolded on the aluminium lug.

- *Aluminium inside covered with contact grease for a best electrical contact.*
- *A sheath resistant to compression mentions :*
  – Number and order of compressions to be made.
  – Length to be stripped on the conductor.
  – Cables section and tools to use;and ensures the protection of the bimetallic connection (CPT2AU).
- *A seal-joint makes tight the connection and allows to connect the copper or aluminium cables.*
- *A coloured ring allows to identify quickly the section.*
- *Operation : crimping by hexagonal compression.*

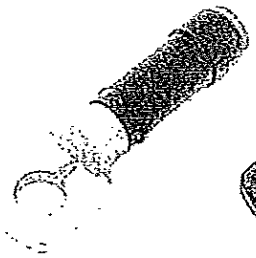
IN ACCORDANCE WITH NFC 33-021 (06-98) STANDARD.

Terminales preaislados de Aluminio (CPTA) o bimetal Aluminio-Cobre (CPT2AU).
Las terminales preaislados bi-metálicos comportan dos arandelas de aleación de cobre sobremoldadas en la parte de aluminio.

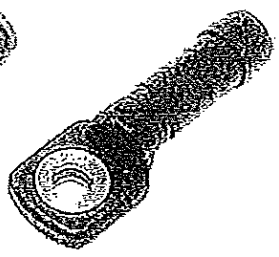
- *Interior de aluminio cubierto con grasa de contacto para un mejor contacto eléctrico.*
- *Una funda resistente a la compresión menciona :*
  – El número y el ordén de las compresiones a efectuar.
  – La longitud a desnudar sobre el conductor.
  – La sección de los cables, el utillaje a utilizar, y asegura la protección de la conexión bimetálica (CPT2AU).
- *Una juntura para estancar hace hermetica la conexión y permite conectar el cable de cobre o de aluminio.*
- *Un anillo de color permite identificar ràpidamente la sección.*
- *Puesta en obra : por compresión hexagonal.*

CONFORME A LA NORMA NFC 33-021 (06-98).

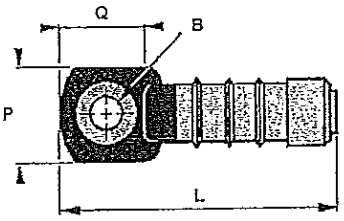
mm²	Code couleur bague *Code colour ring* *Codigo color anillo*
35	Rouge / *Red* / *Rojo*
50	Jaune / *Yellow* / *Amarillo*
54	Noir / *Black* / *Negro*
70	Blanc / *White* / *Blanco*
95	Gris / *Grey* / *Gris*
150	Violet / *Violet* / *Violeta*



CPTA



CP2TAU



Borne *Transformer clamp* *Borne*		Condition. *Packaging* *Acondicio.*	Section *Area* *Sección* (mm²)	L (mm)		Plage / *Tongue* / *Pala*				Matrice *Die* *Matriz*
						Alu		Cu		
Réf. Alu	Réf. Cu			Alu	Cu	B (mm)	P x Q (mm)	B (mm)	P x Q (mm)	E (mm)
CPTA 35	CPT2AU 35	10	35	110	108	16	32 x 33	13	35 x 33	17,3
CPTA 50	CPT2AU 50	10	50	110	108	16	32 x 33	13	35 x 33	17,3
CPTA 54	CPT2AU 54	10	54	110	108	16	32 x 33	13	35 x 33	17,3
CPTA 70	CPT2AU 70	10	70	110	108	16	32 x 33	13	35 x 33	17,3
CPTA 70-21	CPT2AU 70-21	10	70	130	115	16	37 x 37	13	40 x 37	21,5
CPTA 95	CPT2AU 95	10	95	110	108	16	32 x 33	13	35 x 33	17,3
CPTA 95-21	CPT2AU 95-21	10	95	130	115	16	37 x 37	13	40 x 37	21,5
CPTA 150	CPT2AU 150	10	150	130	115	16	37 x 37	13	40 x 37	21,5
ERPBA 35	ERPB2U 35	1	**Trousse** / *Kit* / *Estuche* : 3 x 35 + 54							17,3
ERPBA 50	ERPB2U 50	1	**Trousse** / *Kit* / *Estuche* : 3 x 50 + 54							17,3
ERPBA 70	ERPB2U 70	1	**Trousse** / *Kit* / *Estuche* : 3 x 70 + 54							17,3
ERPBA 70-70	ERPB2U 70-70	1	**Trousse** / *Kit* / *Estuche* : 3 x 70 + 70							17,3
ERPBA 150	ERPB2U 150	1	**Trousse** / *Kit* / *Estuche* : 3 x 150 + 70							21,5

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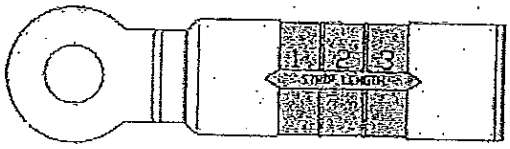
ВЯРНО СЪРГИНАЛА

3 ↑ 38

249

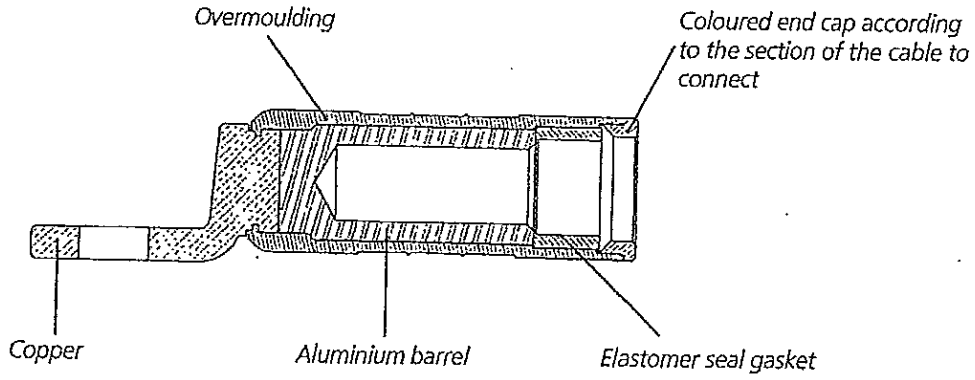
SPIN-WELDED PREINSULATED CPTAU LUG



CPTAU APPLICATION

This preinsulated lug is used to connect low voltage A.B.C. (Aerial Bundled Conductor) to copper equipment terminals. Cable sections from 16 up to 95 mm² can be connected.

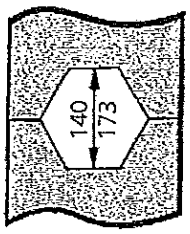
DESCRIPTION



IMPLEMENTATION

Crimping

- Use a press fitted with the advised hexagonal crimping die.
- Crimp in the provided area, starting from the palm and working towards the end of the lug.



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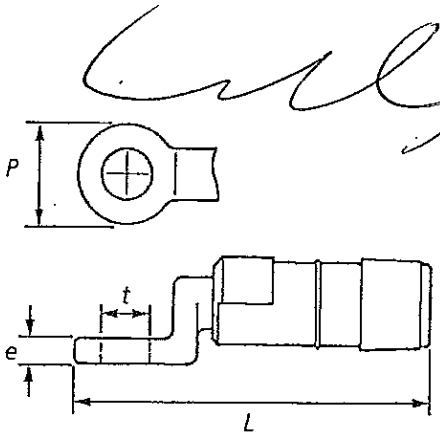
SPIN-WELDED PREINSULATED CPTAU LUG

PACKAGING



SPIN-WELDED PREINSULATED LUG REQUIRING A 140 CRIMPING DIE (2 crimps, each 9 mm wide)

Code	Designation	EDF Nomenclature	Unit sale	Insul. Al-Cu cable (mm²)	Dimensions in mm				Unit weight
					P	e	t	L	
K 159	Cu TERMINAL LUG (140) CPTAU 16	67 34 451	10	16	20	5	10,3	72	0,040 kg
K 160	Cu TERMINAL LUG (140) CPTAU 25	67 34 452	10	25	20	5	10,3	72	0,040 kg

SPIN-WELDED PREINSULATED LUG REQUIRING A 173 CRIMPING DIE (3 crimps, each 9 mm wide)

Code	Designation	EDF Nomenclature	Unit sale	Insul. Al-Cu cable (mm²)	Dimensions in mm				Unit weight
					P	e	t	L	
K 163	Cu TERMINAL LUG (173) CPTAU 35	67 34 453	10	35	25	5	12,8	92	0,075 kg
K 164	Cu TERMINAL LUG (173) CPTAU 50	67 34 454	10	50	25	5	12,8	92	0,075 kg
K 165	Cu TERMINAL LUG (173) CPTAU 54	67 34 455	10	54	25	5	12,8	92	0,070 kg
K 166	Cu TERMINAL LUG (173) CPTAU 70	67 34 456	10	70	25	5	12,8	92	0,070 kg
K 167	Cu TERMINAL LUG (173) CPTAU 95	-	10	95	25	5	12,8	92	0,070 kg

**EDF : French Electricity Board*

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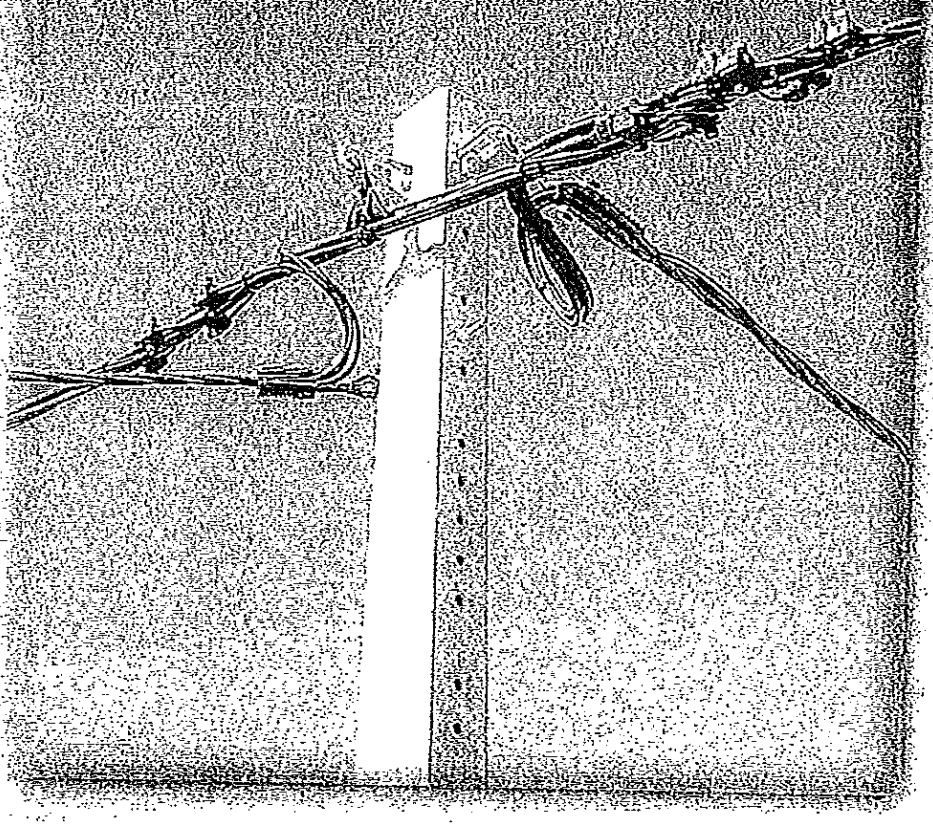
Réseaux aériens isolés BT
LV insulated overhead networks
Redes aéreas aisladas BT



Connecteurs 6 kV
6 kV connectors
Conectores 6 kV

Série TTD ... FA / FTA

Ligne : Cu ou Alu isolé.
Dérivation : Cu ou Alu isolé.

Travail sous tension ou hors tension au contact.

- Connecteurs étanches à tenue diélectrique 6 kV dans l'eau ayant une structure isolante de haute résistance mécanique et climatique.
- Facilité de pose et sécurité d'utilisation.
- Perforation simultanée en principal et dérivé.
- Visserie galvanisée, hors potentiel.
- Bouchon amovible isolant avec graisse d'étanchéité permettant de reconstituer l'isolement de l'extrémité du conducteur dérivé et le départ de la dérivation à droite ou à gauche.
- Serrage contrôlé par vis à tête fusible. Après rupture de l'embout fusible, démontage éventuel possible.
- **Clé de maintien (KJ 17 M)** : facilite la mise en oeuvre des connecteurs un boulon à couple de serrage élevé (F 1318 A).
- Pour certains modèles (T), un dispositif interne maintient le connecteur ouvert lors de l'approche. Pour les autres modèles maintien par cale fusible **en option** : ajouter "T" à la référence.
- **Option "C"** : Connecteur livré avec circlips sur tête fusible pour repérage rupture tête (Ajouter "C" à la référence : ex TTD 101 FAC).

CONFORME AUX NORMES :
– NF C 33-020 (diélectrique et électrique)
– UL 486 B (électrique).
– CEI 60695-2-1 (auto-extinguible 750°C / 30s).

Main line : insulated Cu or Alu.
Tap line : insulated Cu or Alu.

On contact live or dead line work.

- *Watertight connector withstanding 6 kV flashover in water. Its insulating body is highly climatic and mechanically resistant.*
- *Easy to install and safe to use.*
- *Simultaneous insulation piercing on main and tap.*
- *Potential free tightening galvanized screws.*
- *Protection against water of the branch cable by removable rigid cap sealed with grease, branch can be on the left or on the right.*
- *Tightening controlled by shear head screw. Once the shear head is broken, removal remains possible.*
- ***Holding wrench** (KJ 17 M) : to install easily one bolt connectors with high tightening torque (F 1318 A).*
- *Some models (T) have an internal device which holds the connector open during the approach. For the other models, optional shear block: add "T" to the reference.*
- ***"C" Option** : The connector comes with a circlip on the shear head for head breakage identification (Add "C" to the Part Number : e.g. TTD 101 FAC).*

IN ACCORDANCE WITH STANDARDS :
– NF C 33-020 (dielectric and electric)
– UL 486 B (electrical).
– CEI 60695-2-1 (self-extinguishing 750°C / 30s).

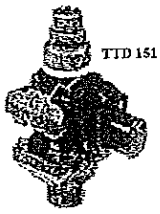
Línea : Cu o Alu aislado.
Derivado : Cu o Alu aislado.

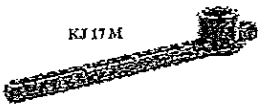
Trabajos en tensión o sin tensión.

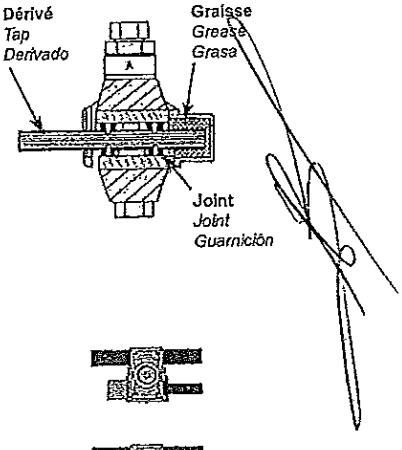
- *Conector con estanqueidad dieléctrica a 6 kV, en agua. Su estructura aislante es de alta resistencia mecánica y climática.*
- *Facilidad de colocación y seguridad de utilización.*
- *Perforación simultánea en principal y derivado.*
- *Tornillería galvanizada, sin potencial.*
- *Capuchón de extremidad aislante amovible con grasa de estanqueidad para conductor derivado. La derivación se puede ser a la derecha o a la izquierda.*
- *Apriete controlado por tornillo con cabeza fusible. Tras la rotura de la cabeza fusible, desmontaje posible.*
- ***Llave de mantenimiento** (KJ 17 M) : para facilitar la instalación de los conectores un perno con par de apriete alto (F 1318 A).*
- *Para algunos modelos (T), un dispositivo interno mantiene el conector abierto durante la aproximación. Para el resto de modelos se mantiene con cala fusible opcional : añadir "T" a la referencia.*
- ***Opción "C"** : Conector suministrado con circlips en cabeza fusible para localizar rotura de cabeza (Añadir "C" a la referencia : ej·TTD 101 FAC).*

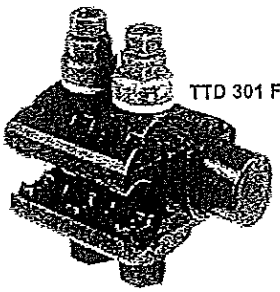
CONFORME A LAS NORMAS :
– NF C 33-020 (dieléctrico y eléctrico)
– UL 486 B (eléctrico).
– CEI 60695-2-1 (auto extinguible 750° C / 30s).

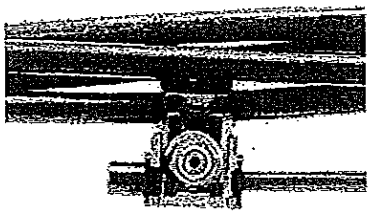
Option "C"
"C" option
Opción "C"











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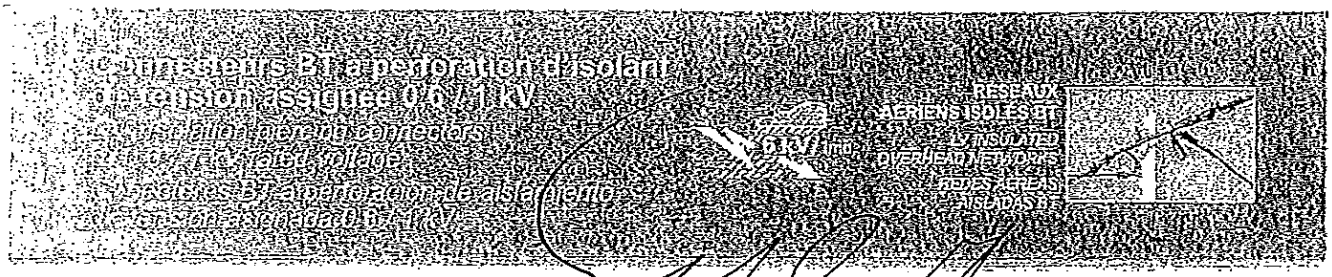


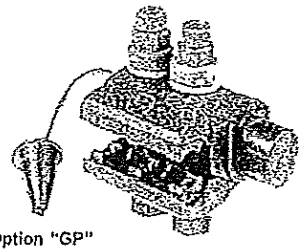
Série TTD ... FA / FTA

Ligne : Cu ou Alu isolé.
Dérivation : Cu ou Alu isolé.
Travail sous tension ou hors tension au contact.

Main line : insulated Cu or Alu.
Tap line : insulated Cu or Alu.
On contact live or dead line work.

Línea : Cu o Alu aislado.
Derivado : Cu o Alu aislado.
Trabajos en tensión o sin tensión.

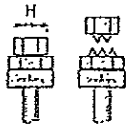
TTD 151 AFA



Option "GP"
"GP" option
Opción "GP"

TTD 301 FAGP

Option "C"
"C" option
Opción "C"



Réf.	Principal *Main Principal* (mm²)	Dérivé *Tap Derivado* (mm²)	I maxi (A) NF C15-100	Boulon / *Bolt / Tornillo*		Couple de serrage *Tightening torque Par de apriete* (Nm)	Embout fusible *Shear head Cabeza fusible*
				Nombre *Number Número*	H (mm)		
TTD 041 FTA	6 - 35	1,5 - 10	86	1 x M 8	13	9	F 1309 A
TTD 051 FTA	16 - 95	1,5 - 10	86	1 x M 8	13	9	F 1309 A
TTD 061 FA	35 - 120	1,5 - 10	86	1 x M 8	13	9	F 1309 A
TTD 071 FA	50 - 185	1,5 - 10	86	1 x M 8	13	9	F 1309 A
TTD 081 FA	70 - 240	1,5 - 6	63	1 x M 8	13	9	F 1309 A
TTD 101 FA	6 - 54	(2,5) 6 - 35	200	1 x M 8	13	9	F 1309 A
TTD 101-2 FA *	6 - 25	(2,5) 6 - 16	115	1 x M 8	13	14	F 1314 A
TTD 121 FA	25 - 95	2,5 - 25	161	1 x M 8	13	9	F 1309 A
TTD 151 AFA	16 - 95	(2,5) 6 - 35	200	1 x M 8	13	14	F 1314 A
TTD 171 FTA	25 - 120	(2,5) 6 - 35	200	1 x M 8	13	14	F 1314 A
TTD 181 FA	10 - 54	10 - 54	242	1 x M 8	13	14	F 1314 A
TTD 201 AFA	25 - 95	25 - 95	377	1 x M 8	13	18	F 1318 A
TTD 201-2 FA *	25 - 70	16 - 70	310	1 x M 8	13	18	F 1318 A
TTD 211 FA	35 - 120	16 - 70	310	1 x M 8	13	18	F 1318 A
TTD 231 FA	25 - 95	10 - 50	242	1 x M 8	13	14	F 1314 A
TTD 241 FTA	50 - 150	(2,5) 6 - 35	200	1 x M 8	13	14	F 1314 A
TTD 251 FA	50 - 150	25 - 95	377	1 x M 8	13	18	F 1318 A
TTD 251-9 FA	50 - 185	25 - 95	377	1 x M 8	13	18	F 1318 A
TTD 271 FA	35 - 120	35 - 120	437	1 x M 8	13	18	F 1318 A
TTD 281 FA	50 - 185	(2,5) 6 - 35	200	1 x M 8	13	14	F 1314 A
TTD 371 FTA	35 - 150	35 - 150	504	1 x M 8	13	18	F 1318 A
TTD 301 FA	25 - 95	25 - 95	377	2 x M 8	13	14	F 1314 A
TTD 351 FA	50 - 150	35 - 95	377	2 x M 8	13	14	F 1314 A
TTD 401 FTA	50 - 185	50 - 150	504	2 x M 8	13	18	F 1318 A
TTD 401-9 FTA	35 - 150	35 - 150	504	2 x M 8	13	18	F 1318 A
TTD 411 FTA	50 - 185	16 - 95	377	2 x M 8	13	14	F 1314 A
TTD 421 FA	50 - 185	50 - 185	530	2 x M 10	17	25	F 1725 A
TTD 431 FA	70 - 240	16 - 95	377	2 x M 10	17	20	F 1720 A
TTD 441 FA	95 - 240	50 - 150	504	2 x M 10	17	25	F 1725 A
TTD 451 FA	95 - 240	95 - 240	530	2 x M 10	17	25	F 1725 A
TTD 551 FA	120 - 400	95 - 240	679	2 x M 10	17	37	F 1737 A

- Option vis inox, ajouter "X" à la réf. / *Stainless steel screw option, add "X" to ref. / Opción tornillo inoxidable, añadir "X" a la ref.* (ex. TTD 101 XFA).
- Option vis électro-zinguée, ajouter "EG" à la réf. / *Electro-galvanized screw option, add "EG" to ref. / Opción tornillo electro-galvanizado, añadir "EG" a la ref.* (ex. TTD 101 EGFA)
- Option GP, connecteur livré avec un bouchon souple pour jonction étanche / *GP option, connector delivered with a soft end cap for watertight splicing Opción GP, conector suministrado con a tapón sople para unión estanca.*

* Pour câble double isolation / *For double insulation conductor / Para conductor de doble aislamiento.*

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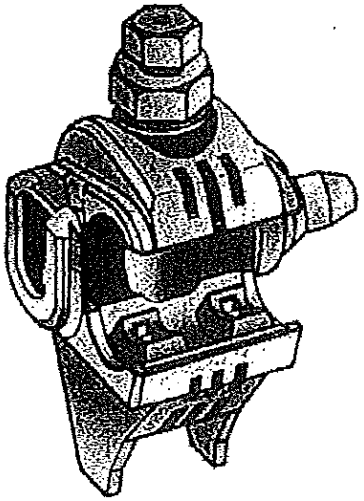
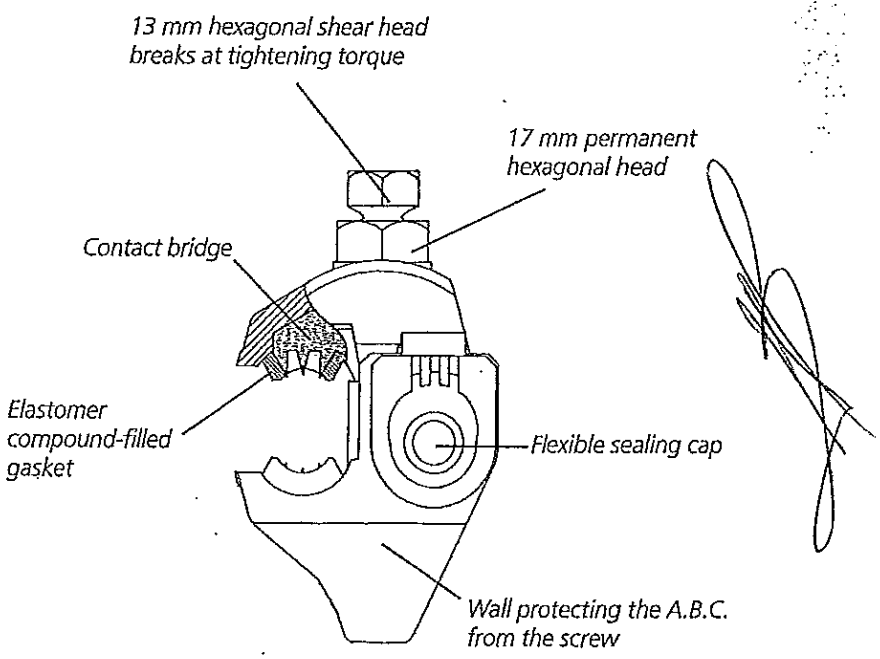
I.P.C. FOR A.B.C. CONNECTION (SMALL SIZE)



APPLICATION

This I.P.C. (Insulation Piercing Connector) is used to establish a tap connection from a low voltage A.B.C. (Aerial Bundled Conductor).



DESCRIPTION

- Insulation piercing of the main line and the tap line is carried out simultaneously in a single tightening operation.
- Dielectric strength in water is over 6 kV.
- Tightening screw, which is the only accessible metal part, is potential free.
- Tightening efficiency is ensured by shear head screw.

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MICHAUD

I.P.C. FOR A.B.C. CONNECTION (SMALL SIZE)

IMPLEMENTATION

- Insert the insulated tap conductor in the connector so that its end seats in the flexible sealing cap.
- Use a 13 mm spanner, tighten the connector onto the conductor until shear head breaks.
- The 17 mm permanent head is only provided for eventual disassembly, do not use it to tighten the screw further after the 13 mm shear head has snapped.
- Implementation can be carried out on a live-line but without load on the tap conductor.

PACKAGING

Code	Designation	EDF Nomenclature	EDF conductor range		Real conductor range		Unit sale	Unit weight
			Main line	Tap line	Main line	Tap line		
K 321	EDF CONNECTOR CES/CT 70 (Street lighting)	67 37 630	16-70	1,5-6	10-70	1,5-6	12	0,110 kg
K 322	EDF CONNECTOR CBS/CT 25	67 37 631	16-25	16-25 16M-35M	16-25	6-25 6M-35M	12	0,120 kg
K 323	EDF CONNECTOR CBS/CT 70	67 37 640	35-70	16-25 16M-35M	16-70	6-25 6M-35M	12	0,120 kg
K 324	EDF CONNECTOR CBS/CT 150	67 37 650	54-150	16-25 16M-35M	16-150	6-25 6M-35M	12	0,125 kg

M : indicates solid core conductor

EDF connectors contact bridges are in aluminium alloy.

Code	Designation	Contact bridge	Main line Insulated Al-Cu (mm^2)	Tap line Insulated Al-Cu (mm^2)	Unit sale	Unit weight
K 327	CONNECTOR LT CES/CT 95 (Street lighting)	Tinned brass	10-95	1,5-6	30	0,105 kg
K 331	CONNECTOR LT CBS/CT 70	Tinned brass	16-70	4-25	30	0,130 kg
K 332	CONNECTOR LT CBS/CT 95	Tinned brass	16-95	2,5-35	30	0,130 kg
K 330	CONNECTOR LT CBS/CT 150	Tinned brass	35-150	6-35	30	0,135 kg

**EDF : French Electricity Board*

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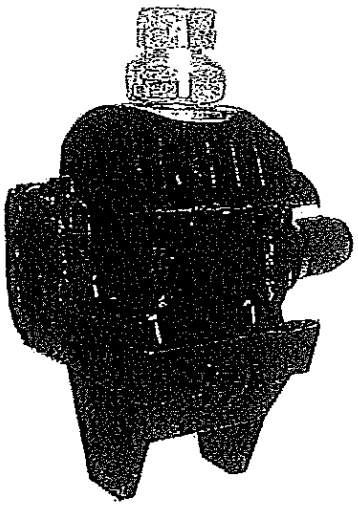
I.P.C. FOR A.B.C. CONNECTION (SERVICE)

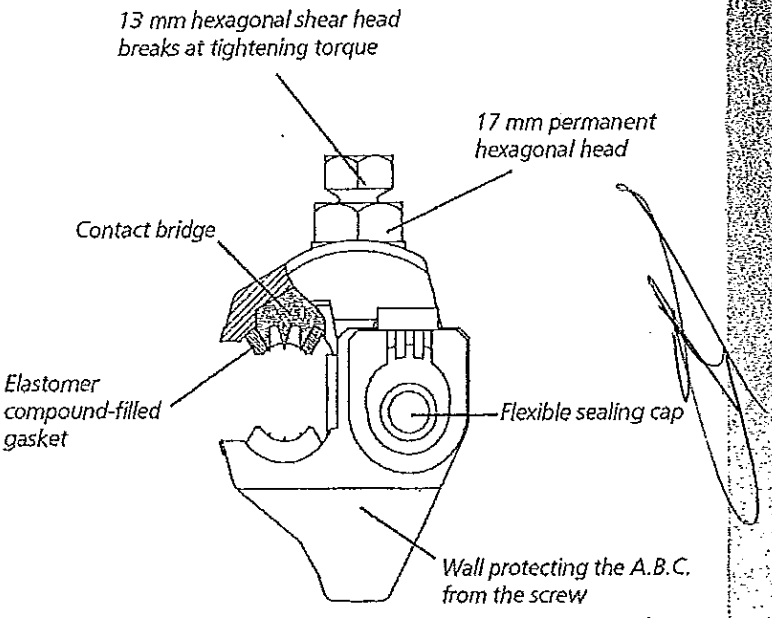


APPLICATION

This I.P.C. (Insulation Piercing Connector) is used to establish a tap connection from a low voltage A.B.C. (Aerial Bundled Conductor).

DESCRIPTION

- Insulation piercing of the main line and the tap line is carried out simultaneously in a single tightening operation.
- Tightening screw is potential free.
- Tightening efficiency is ensured by shear head screw made of aluminium.



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25

MICHAUD

I.P.C. FOR A.B.C. CONNECTION (SERVICE)

IMPLEMENTATION

- Insert the insulated tap conductor in the connector so that its end seats in the flexible sealing cap.
- Use a 13 mm spanner, tighten the connector onto the conductor until shear head breaks.
- The 17 mm permanent head is only provided for eventual disassembly, do not use it to tighten the screw further after the first shear head has snapped.
- Implementation can be carried out on a live-line but without load on the tap conductor.

PACKAGING

Code	Designation	Contact bridge	Main line Insulated Al-Cu (mm^2)	Tap line Insulated Al-Cu (mm^2)	Unit sale	Unit weight
K 222	CONNECTOR CBS/CT 35	Tinned brass	6-35	6-35	30	0.133 kg
K 232	CONNECTOR CBS/CT 95	Tinned brass	16-95	2.5-35	30	0.133 kg

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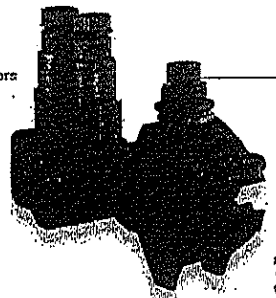
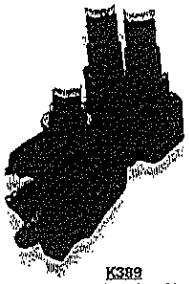
Multitap service connector

2 tap conductors

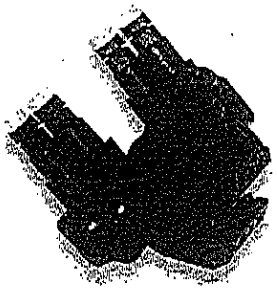


K390

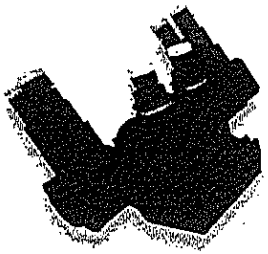


K389
with yellow shear head indicator

4 tap conductors



K346
with yellow shear head indicator



K434
with yellow shear head indicator

Application

This connector is designed to connect from 2 to 4 insulated service conductors to the low voltage A.B.C. (Aerial Bundled Conductors).

Description

Connector general features:

- The dielectric strength in water is greater than 6kV.
- The tightening screws are potential free.
- Tightening efficiency is ensured by shear head screws.
- The tap conductor of K391 and K393 versions uses the stripping technology. It uses the insulation piercing technology for the other versions.
- This independent tightening tap conductor can accommodate solid or stranded core aluminium or copper insulated conductors with sections between 6 and 35mm².
- Connectors K389, K434 and K346 are fitted with a yellow shear head indicator that disappears when head is sheared-off, being a clear visual confirmation of good tightening from ground level. It increases head height by 10mm.
- This connector meets the criteria of the **NF C 33-020** and **EN 50-483** standards.

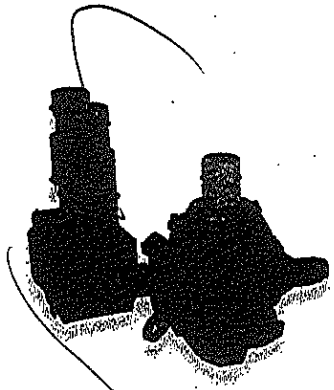
Connector end cap (2 conductors):

- The connector end cap is flexible so that to feel good tap conductor insertion simply by hand.
- It is carrying membranes instead of grease, granting watertightness around tap conductor end on long term basis.
- It is glued on connector body so that to avoid eventual loss during handling, installation and environment (wind, bad weather...).
- It can be equipped with a hard end cap, gripping and covering so, in case rigid cover is required. (Part Number K246: please enquire for further information).

Code	Designation	Contact bridge	Capacities Main insulated Al-Cu (mm²)	Capacities Tap insulated Al-Cu (mm²)	Weight (kg)	Sales unit
ZINC-PLATED STEEL FASTENERS (ZF)						
K390	PIERCING CONNECTOR CB 2p/CT 150 ZF	Tinned copper	35-150	2 x 6-35	0.260	10
K391	STRIPPING CONNECTOR CB 2d/CT 150 ZF	Tinned copper	35-150	2 x 6-35	0.260	10
K392	PIERCING CONNECTOR CB 2p/CT 70 ZF	Tinned copper	16-70	2 x 6-35	0.260	10
K393	STRIPPING CONNECTOR CB 2d/CT 70 ZF	Tinned copper	16-70	2 x 6-35	0.260	10
K394	PIERCING CONNECTOR CB 2p/CT 95 ZF	Tinned copper	16-95	2 x 6-35	0.260	10
STAINLESS STEEL FASTENERS (SF) + YELLOW SHEAR HEAD INDICATOR						
K389	PIERCING CONNECTOR CB 2p/CT 150 SF	Tinned copper	35-150	2 x 6-35	0.260	10
K346	4 TAPS IPC 25-95 SF	Tinned brass	25-95	4 x 6-35	0.300	20
K434	4 TAPS IPC 35-150 SF	Tinned brass	35-150	4 x 6-35	0.380	10

Option: Service connector with movable seal cap

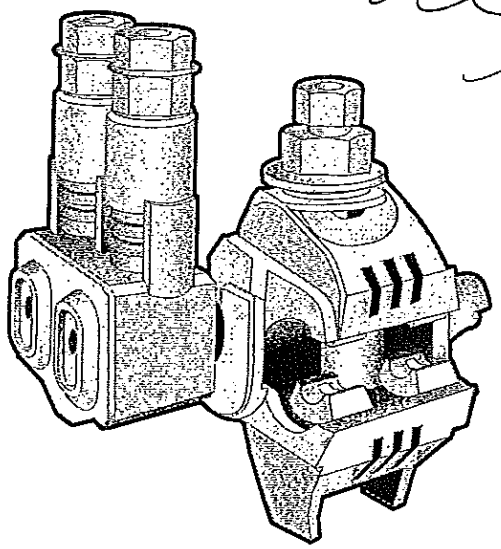
This connector is used for connecting 2 insulated service conductors to the low voltage A.B.C (Aerial Bundled Conductors). The movable seal cap enables a tap connection on the right or on the left.
The main conductor connection and the tap ones use the insulation piercing technology.



Code	Designation	Contact bridge	Capacities Main insulated Al-Cu (mm²)	Capacities Tap insulated Al-Cu (mm²)	Weight (kg)	Sales unit
K594	PIERCING IPC CB 2p/CT 95 ZF A	Tinned brass	16-95	2 x 6-35	0.250	10

SEE SHEET
INSTALLATION / LV insulated toolings

CONNECTEUR DE BRANCHEMENT MULTIDERIVES A PERFORATION D'ISOLANT



UTILISATION

Ce connecteur s'utilise pour réaliser la dérivation de 2 conducteurs isolés sur un réseau aérien BT en conducteurs isolés.
Alors que la connexion du conducteur principal est à perforation d'isolant, celle du dérivé est soit à perforation d'isolant (versions K 390 & K 392), soit à dénudage (versions K 391 & K 393).

DESCRIPTION

- La tenue diélectrique dans l'eau est supérieure à 6 kV.
- Les vis de serrage, qui sont les seules parties métalliques accessibles, sont hors tension électrique.
- L'efficacité du serrage est assurée par des vis à tête fusible.
- Les versions K 390 - K 392 à perforation d'isolant sur les dérivés peuvent admettre des conducteurs isolés en cuivre ou en aluminium à âmes câblées ou massives de sections comprises entre 6 et 35 mm².
- Les versions K 391 - K 393 à dénudage sur les dérivés peuvent admettre des conducteurs isolés en cuivre ou en aluminium à âmes câblées ou massives de sections comprises entre 6 et 35 mm².

ВЯРНО СЪС ОРИГИНАЛА

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Network accessories

Connection:

MIRELEC


L 256


K 232


L 227

Application

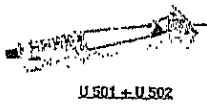
These connectors are used to connect aerial insulated conductors. Three models are available:
- Service connector used to make a tap connection from a network to home (capacity: 16-95 / 2.5-35mm²),
- Network connector used to make a tap connection between aerial networks (capacity: 25-95 / 25-95mm²),
- Street light connector for powering a lamp from a network (capacity: 16-95 / 1.5-10mm²).

Packaging

Code	Designation	Weight (kg)	Unit sale
K 232	CONNECTOR CBS / CT 95	0.130	30
L 256	CONNECTOR CDRS / CT 95	0.190	50
L 227	CONNECTOR CES / CT 95	0.060	20

Accessories for main network:

MIRELEC


U 501 + U 502


U 503

The anchoring clamp PA 54.6 is used for single or double dead-ending of A.B.C. (aerial bundled conductors) with insulated neutral messenger 54.6mm². It is fixed on a bracket type CA 54.6.

The suspension assembly ES 54.6 is used for up-holding A.B.C. (aerial bundled conductors) with insulated neutral messenger 54.6mm².

Packaging

Code	Designation	Weight (kg)	Unit sale
U 501	ANCHORING CLAMP 54.6mm² - PA 54.6	0.410	50
U 502	ANCHORING BRACKET 54.6mm² - CA 54.6	0.235	50
U 503	SUSPENSION ASSEMBLY 54.6mm² - ES 54.6	0.510	30

Accessories for secondary and ending networks:


K 307


K 265

MICHAUD

These accessories are used for anchoring and up-holding secondary or ending networks of type 2 x 6 up to 4 x 25mm².

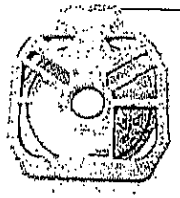
Packaging

Code	Designation	Weight (kg)	Unit sale
K 307	ANCHORING CLAMP WITH HANDLE - PA 25	0.105	50
K 265	BELT SUSPENSION WITH RING	0.020	25

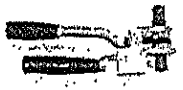
Note: - For pole hardware (BOC) supply, please enquire.
- For the fixing clamp PF25 L304, enabling fixing of PA25, please end on page 21 of this catalogue.

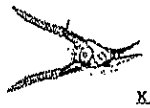
Fixing:

MICHAUD


K 93x


K 952


K 960


K 961

This strap packed in 50m winder is available in four dimensions:
- 10x0.4mm,
- 10x0.7mm,
- 20x0.4mm,
- 20x0.7mm.

Packaging

Code	Designation	Weight (kg)	Unit sale
K 930	50m WINDER STAINLESS STEEL STRAP 10x0.4mm	1.850	5
K 931	50m WINDER STAINLESS STEEL STRAP 10x0.7mm	2.950	5
K 932	50m WINDER STAINLESS STEEL STRAP 20x0.4mm	3.450	5
K 933	50m WINDER STAINLESS STEEL STRAP 20x0.7mm	5.800	5
K 952	SET OF 100 REINFORCED BUCKLES FOR 10mm STRAP	0.320	1
K 953	SET OF 100 REINFORCED BUCKLES FOR 20mm STRAP	1.510	1
K 960	BINDING TOOL RATCHET TYPE FOR STRAP	1.950	1
K 961	CUTTING TOOL FOR STRAP	0.550	1

L227 CES/CTEC 95

CONNECTEURS DE BRANCHEMENT A PERFORATION D'ISOLANT

INSULATION PIERCING CONNECTOR FOR AERIAL BUNDLED CONDUCTOR

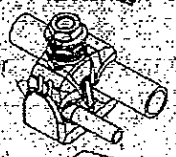
	real capacity	EDF capacity
Conducteur principal / Main conductor	10^2 - 95^2	16^2 - 95^2
Conducteur dérivé / Tap conductor	$1,5^2$ - 10^2	$1,5^2$ - 10^2

Introduire le conducteur dérivé à fond dans la tétine du connecteur (dans le cas d'un conducteur dérivé cuivre, double isolation U1000 RO2V, retirer la 1ère isolation).

Insert the insulated tap conductor fully within the cap of the connector (if the tap conductor is copper with double insulation U1000 RO2V, strip the first insulation).

Positionner le connecteur sur le conducteur principal.

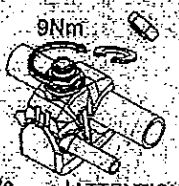
Place the connector on the main conductor.



Préserrer à la main pour maintenir le connecteur sur le conducteur principal.

Hand tighten to keep the connector on the main conductor.

Serrer avec une clé 6 pans de 13 jusqu'à rupture de la tête (9Nm) en veillant à un positionnement correct des conducteurs.



Tighten with a 13 mm hexagonal wrench until shear-head breaks (9Nm) looking after a correct position of the conductors.

ATTENTION : La seconde tête hexagonale de 13 est uniquement prévue pour un démontage éventuel. Ne pas s'en servir pour resserrer le connecteur après la rupture de la première tête de 13.

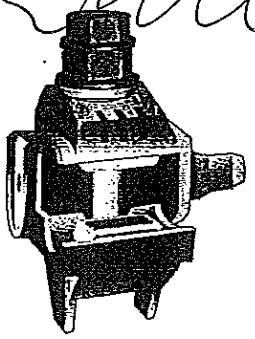
ATTENTION : The second 13mm hexagonal head is only for an eventual dismouting. Do not use it to tighten the connector after the first 13mm head shear-off.

12.03 MICHAUD

ВЯРНО СОРИГИРАЛ

261

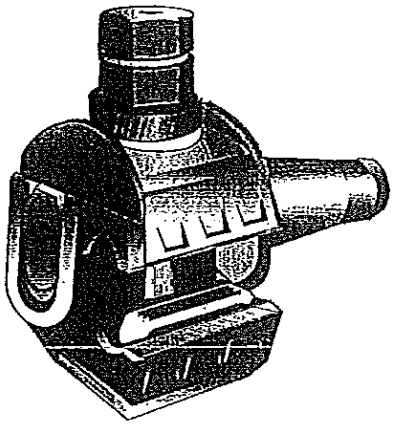
K 470 - K 471



I.P.C. FOR AL AND CU BARE CONDUCTORS

(STAINLESS STEEL FASTENER)

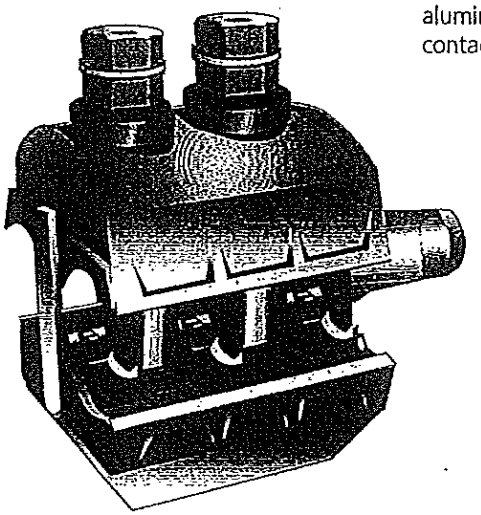
K 472 - K 473



APPLICATION

This I.P.C. (Insulation Piercing Connector) is used to establish a tap connection from a low voltage A.B.C. (Aerial Bundled Conductor) to a low voltage Aluminium alloy or Copper bare main conductor.
3 models are available, according to the conductor cross-sectional areas to connect.
Each model is offered either with aluminium alloy or with rough brass contact bridges.

K 474 - K 475



DESCRIPTION

- Fastener is stainless steel.
- Tightening screws are potential free.
- Tightening efficiency is ensured by shear-off head screw.
- Connection on the tap conductors uses insulation piercing technology.

MICHAUD

I.P.C. FOR AL AND CU BARE CONDUCTORS (STAINLESS STEEL FASTENER)

IMPLEMENTATION

- Insert the insulated conductor in the connector so that its end seats in the flexible cap.
- Respectively, use a 13 mm spanner or 17 mm for K 470, K 471 or K 472 to K 475. Tighten the connector on the bare conductor until shear head breaks.
- The 17 mm permanent hexagonal head is only provided for eventual disassembly. Do not use it to tighten the screw further after the first screw head has snapped.
- Implementation can be carried out on a live-line but without load on the tap conductor.

PACKAGING

Code	Designation	Contact bridge	Main line Bare (mm^2)	Tap line Insulated Al-Cu (mm^2)	Unit sale	Unit weight
K 470	IPC abc 6-35 / Cu 7-95	Copper Alloy	Cu 7-95	6-35	1	0,150 kg
K 471	IPC abc 6-35 / Al 7-95	Aluminium Alloy	Al 7-95	6-35	1	0,130 kg
K 472	IPC abc 25-95 / Cu 7-120	Copper Alloy	Cu 7-120	25-95	1	0,265 kg
K 473	IPC abc 25-95 / Al 7-120	Aluminium Alloy	Al 7-120	25-95	1	0,230 kg
K 474	IPC abc 35-150 / Cu 50-240	Copper Alloy	Cu 50-240	35-150	1	0,645 kg
K 475	IPC abc 35-150 / Al 50-240	Aluminium Alloy	Al 50-240	35-150	1	0,550 kg

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Connecteurs BT à perforation d'isolant

LV installation piercing connectors

Conectores BT a perforación de aislamiento

Série NTD ... FA

Ligne aérienne : Cu ou Alu nu.
Dérivation : Cu ou Alu isolé.

Dérivation d'une ligne isolée sur une ligne nue. Travail sous tension ou hors tension au contact.

- Corps en matière isolante de haute résistance mécanique et climatique.
- Côté principal : Transfert électrique par lames de contact sur ligne nue et maintien ferme des câbles sur cales semi-rigides avec graisse :
  - Modèles AFA Cales couleur blanche, Lames en alliage d'aluminium.
  - Modèles FA Cales couleur rouge, Lames en alliage cuivre.
  - Modèles EFA Cales couleur rose, Lames en alliage cuivre étamé.
- Côté dérivé : Protection contre les pénétrations d'eau dans le câble isolé par joint d'étanchéité. Bouchon amovible isolant avec graisse d'étanchéité permettant de reconstituer l'isolement de l'extrémité du conducteur dérivé et le départ de la dérivation à droite ou à gauche.
- Facilité de pose et sécurité d'utilisation.
- Visserie de serrage galvanisée équipée d'un embout fusible permettant le contôle du couple de serrage. Après rupture de l'embout fusible, démontage éventuel possible.

CONFORME AUX NORMES NF C 33-020 ET NEMA CC 3.

Main line : overhead bare Cu or Alu.
Tap line : insulated Cu or Alu.

Used to tap an insulated conductor from a bare overhead line.
Live or dead line work on contact.

- *Body is made of high mechanical and weather resistant insulating material.*
- *Main side : Electrical transfert by contact bridges on bare line. Firmly positionning of conductors on a semi-rigid wedges with grease :*
  - *AFA models White colour wedges, Aluminium alloy blades.*
  - *FA models Red colour wegdges, Copper alloy blades.*
  - *EFA models Pink colour wedges, Tinned copper alloy blades.*
- *Tap side : Protection against water penetration in insulated conductor by a water tightness joint. Protection against water of the tap cable by removable rigid cap sealed with grease. Tapping can be realized on the left or on the right.*
- *Easy to install and safe to use.*
- *Galvanized tightening screw fitted with a shear head to ensure tightening torque. Once the shear head is broken, removal remains possible.*

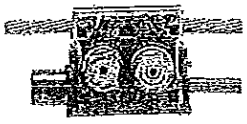
IN ACCORDANCE WITH STANDARDS NF C 33-020 AND NEMA CC 3.

Línea aérea : Cu o Alu desnudo.
Derivado : Cu o Alu aislado.

Para derivar un conductor aislado de una línea desnuda.
Para trabajos en caliente o sin tensión en contacto.

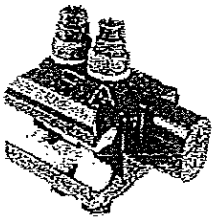
- *Cuerpo en materia aislante de alta resistencia mecánica y climatica.*
- *Lado principal : Tranferencia electrica por cuñas de contacto sobre linea desnuda. Mantenimiento firme de los conductores sobre cuñas semi-rigidas con grasa :*
  - *Modelos AFA Cuñas de color blanca, Láminas de aleación de Alu.*
  - *Modelos FA Cuñas de color roja, Láminas de aleación de cobre.*
  - *Modelos EFA Cuñas de color rosa, Láminas de aleación de cobre estañado.*
- *Lado derivado : Protección contra penetración de agua en la línea aérea por una junta de estanqueidad. Capuchón de extremidad aislante con grasa de estanqueidad para conductor derivado. La derivación se puede ser a la derecha o a la izquierda.*
- *Facilidad de instalación.*
- *Tornilleria de apriete galvanizada equipada con cabeza fusible que permite el control del par de apriete. Tras la rotura de la cabeza fusible, desmontaje posible.*

CONFORME A LAS NORMAS NF C 33-020 Y NEMA CC 3.

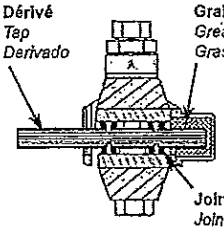


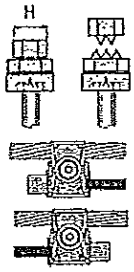
Option "C"
"C" option
Opción "C"

NTD 101 FA



NTD 301 AFA

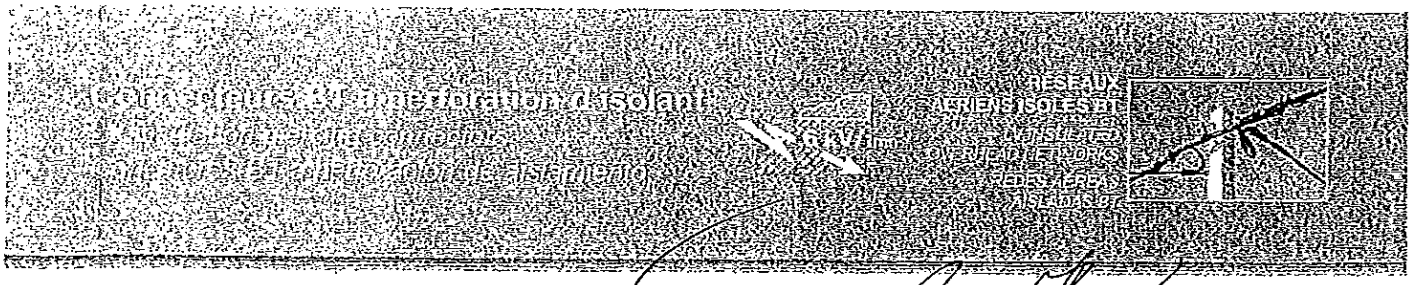




Réf.	Principal *Main Principal* (mm²)	Dérivé isolé *Insulated tap Derivado aislado* Alu / Cu (mm²)	Vis *Screws Tornillos*	H (mm)	Couple de serrage *Tightening torque Par de apriete* (Nm)	Embout fusible *Shear head Cabeza fusible*	Réf. EDF	Code EDF
NTD 051 FA	Cu 16 - 95	1,5 - 10	1 x M 8	13	9	F 1309 A		
NTD 051 AFA	Alu 16 - 95	1,5 - 10	1 x M 8	13	9	F 1309 A		
NTD 101 FA	Cu 6 - 70	2,5 - 35	1 x M 8	13	14	F 1314 A		
NTD 101 AFA	Alu 6 - 54	2,5 - 35	1 x M 8	13	14	F 1314 A		
NTD 151 FA	Cu 10 - 95	2,5 - 35	1 x M 8	13	14	F 1314 A		
NTD 151 AFA	Alu 16 - 95	2,5 - 35	1 x M 8	13	14	F 1314 A		
NTD 151 EFA	16 - 95	2,5 - 35	1 x M 8	13	14	F 1314 A		
NTD 201 FA	Cu 7 - 95	25 - 95	1 x M 8	13	18	F 1318 A		
NTD 201 AFA	Alu 7 - 95	25 - 95	1 x M 8	13	18	F 1318 A		
NTD 241 FA	Cu 50 - 150	6 - 35	1 x M 8	13	14	F 1314 A		
NTD 241 AFA	Alu 50 - 150	6 - 35	1 x M 8	13	14	F 1314 A		
NTD 251 FA	Cu 50 - 150	35 - 95	1 x M 8	13	18	F 1318 A		
NTD 251 AFA	Alu 50 - 150	35 - 95	1 x M 8	13	18	F 1318 A		
NTD 301 FA	Cu 7 - 95	35 - 95	2 x M 8	13	14	F 1314 A	CDR CNU 1S 70	67 21 663
NTD 301 AFA	Alu 7 - 95	35 - 95	2 x M 8	13	14	F 1314 A	CDR CNA 1S 70	67 21 653
NTD 301 EFA	7 - 95	35 - 95	2 x M 8	13	14	F 1314 A	CDR CN 1S 70	67 21 673
NTD 351 FA	Cu 50 - 150	35 - 95	2 x M 8	13	14	F 1314 A		
NTD 351 AFA	Alu 50 - 150	35 - 95	2 x M 8	13	14	F 1314 A		
NTD 401 FA	Cu 50 - 150	50 - 150	2 x M 8	13	18	F 1318 A	CDR CNU 1S 150	67 21 664
NTD 401 AFA	Alu 50 - 150	50 - 150	2 x M 8	13	18	F 1318 A	CDR CNA 1S 150	67 21 654
NTD 401 EFA	50 - 150	50 - 150	2 x M 8	13	18	F 1318 A	CDR CN 1S 150	67 21 674
NTD 431 AFA	Alu 95 - 240	35 - 95	2 x M 10	17	20	F 1720 A		
NTD 451 AFA	Alu 95 - 240	95 - 150	2 x M 10	17	25	F 1725 A		
NTD 461 AFA	Alu 50 - 150	95 - 185	2 x M 8	13	18	F 1318 A		

Option vis inox, ajouter "X" à la réf. */ Stainless steel screw option, add "X" to ref./ Opción tornillo inoxidable, añadir "X" a la ref.* **(ex. NTD 051 XFA).**

groupe sicame
B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél. (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - E-mail . info@sicame.fr sicame



Série TTD . CCA / NTD .. CCA

Connecteur de prise de courant temporaire pour mise en court-circuit et à la terre.

- Connecteur à structure isolante de haute résistance mécanique et climatique.
- Bloc de dérivation équipé d'une fiche mâle de sécurité, à verrouillage par baïonnette normalisée percée en extrémité d'un trou pour mesure de tension. Protégée par un capot isolant avec ouverture basse munie d'index amovibles pour identification phases et neutre.
- Système d'étanchéité assurant la reconstitution d'isolement (tenue diélectrique 6 kV dans l'eau).
- Facilité de pose et d'utilisation : perforation d'isolant (TTD . CCA), tête fusible, visserie hors potentiel, extrémité de la fiche mâle protégée contre tout contact éventuel.
- NTD .. CCA : version pour neutre nu Aluminium, ACSR ou Cuivre.
- Option "B" : Version prise de potentiel bleue pour identification optionnelle du neutre.

CONFORME A LA NORME NF C 33-020 (06-98).

Connectors are used for temporary power take off or short circuiting.

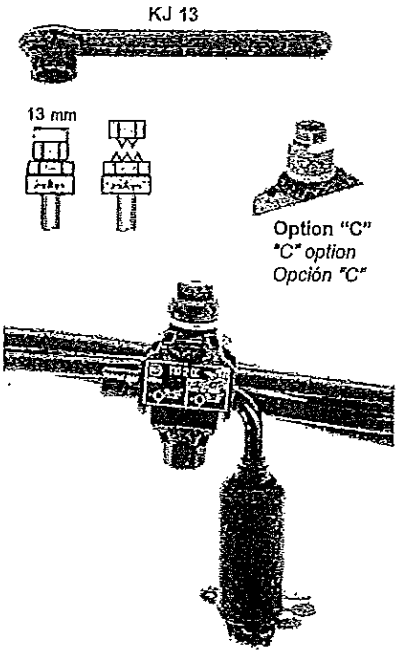
- *Connector with an insulated structure getting a highly mechanical and climatic resistance.*
- *Tap side equipped with a security stud fitted with a bayonet locking and its extremity drilled for voltage testing prove connector is insulated by a cap. This cap is fitted with removable indexes for phases, neutral identification.*
- *Water tightness system to restore insulation (flashover resistance 6 kV deeped in water).*
- *Easy to use and install : insulating piercing (TTD . CCA), shear head, srews never on potential, stud protected against direct contact.*
- *NTD .. CCA : version for Aluminium, ACSR or Copper bare neutral.*
- *"B" option : blue potential socket for neutral identification.*

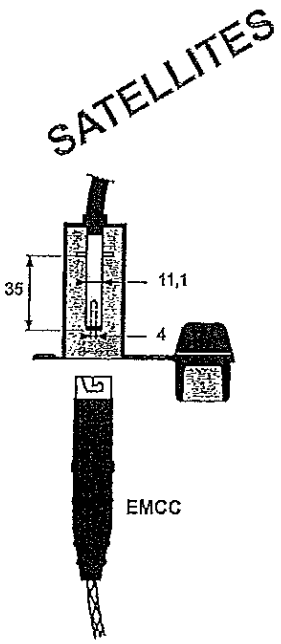
IN ACCORDANCE WITH NF C 33-020 (06-98) STANDARD.

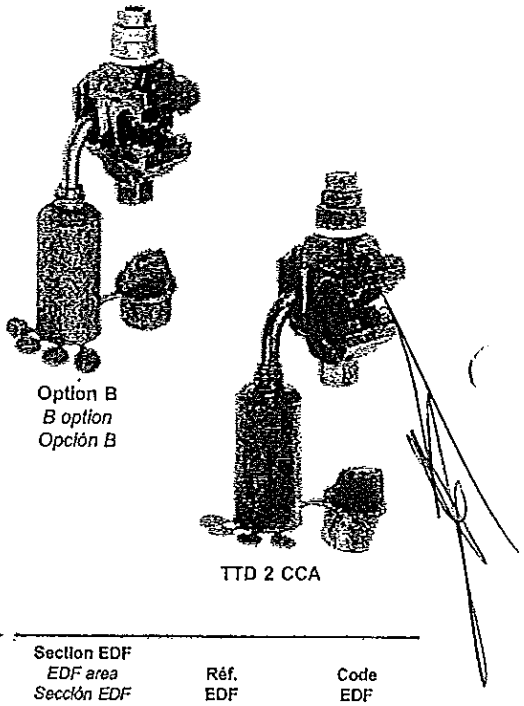
Conector para toma de corriente temporal o para puesta a tierra y corto circuito.

- *Conector con estructura aislante de alta resistencia mecánica y climatica.*
- *Bloque de derivación equipado con una clavija macho de securidad con bloqueo por bayoneta normalizada abierta en un extremo para la medida de tensión. Protegida por un capuchon aislante, abierto por debajo provisto de indices amovibles para identificacion fases y neutro.*
- *Sistema de estanquidad para el aislamiento (resistencia dielectrica 6 kV en agua).*
- *Facilitad de utilización y de instalación : perforación tornillera sin potential (TTD . CCA), cabeza fusible y extremidad de la clavija macho protejida de un contacto eventual.*
- *NTD .. CCA : versión para neutro desnudo de Aluminio, ACSR o cobre.*
- *Opción "B" : Toma de potencial azul para identificación del neutro.*

CONFORME A LA NORMA NF C 33-020 (06-98).





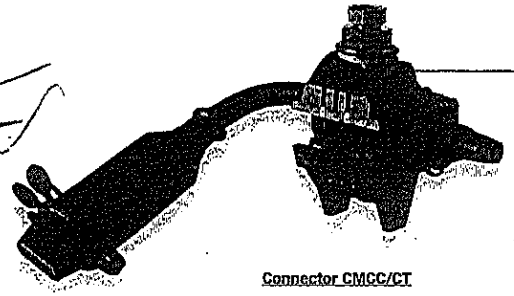


Réf.	Section *Area* *Sección* (mm²)	Vis *Screws* *Tornillos*	Couple de serrage *Tightening torque* *Par de apriete* (Nm)	Section EDF *EDF area* *Sección EDF* (mm²)	Réf. EDF	Code EDF
TTD 1 CCA	16 - 35	1 x M 8	9	16 - 25	CMCC / CT 25	67 31 481
TTD 2 CCA	16 - 95	1 x M 8	14	35 - 70	CMCC / CT 70	67 31 483
TTD 3 CCA	50 - 185	1 x M 8	14	54 - 150	CMCC / CT 150	67 31 485
TTD 4 CCA	70 - 240	1 x M 8	14			
NTD 1 CCA	7 - 54 Cu nu / *bare* / *desnudo*	1 x M 8	14			
NTD 2A CCA	35 - 95 Al nu / *bare* / *desnudo*	1 x M 8	14			

Bloc de dérivation disponible sur demande / *Tapping module available on request* / *Module de derivación disponible sobre pedido.*

groupe sicame
B.P. n° 1 - 19230 POMPADOUR - CEDEX - FRANCE - Tél. (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - E-mail : info@sicame.fr sicame

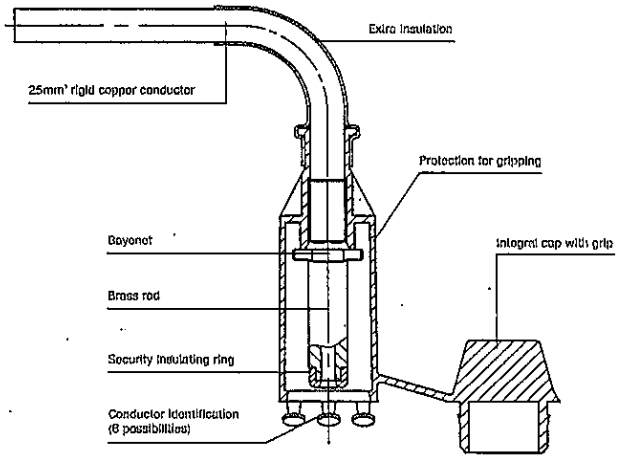
Insulation piercing connector for measures and short-circuiting



Connector CMCC/CT

Application

This I.P.C. (Insulation Piercing Connector) is used for short-circuiting or earth system of low voltage A.B.C. (Aerial Bundled Conductors). It is also used for taking voltage measurements.



PMCC
(K 368)

Description

- Connection is established by insulation piercing technology.
- Dielectric strength in water is greater that 6kV.
- Tightening screw is the only accessible metal part and is potential free.
- Tightening efficiency is ensured by shear head screw.
- The end socket is protected by an integral cap preventing the water penetration and corrosion.
- This I.P.C. meets the requirements of the **NF C 33-020** and **EN 50-483**.

Implementation

- Check that the tap socket is completely inserted in the connector.
- Position the connector on the main conductor.
- Use a 13mm spanner and tighten the connector on the insulated conductor of the A.B.C. until shear head breaks.
- The 17mm permanent head is only provided for possible dismantling, and must not be used to re-tighten the screw after the 13mm shear head has broken.

References

- Zinc-plated Fastener (ZF):

Code	Designation	Capacities Main Insulated Al-Cu (mm)	Weight (kg)	Sales unit
K 362	CONNECTOR CMCC/CT 25 ZF	16 - 25	0.225	10
K 363	CONNECTOR CMCC/CT 70 ZF	16 - 70	0.226	10
K 361	CONNECTOR CMCC/CT 95 ZF	16 - 95	0.228	10
K 364	CONNECTOR CMCC/CT 150 ZF	16 - 150	0.234	10

The connector K 362 is adapted from an ERDF connector type K 322 (CBS/CT 25).
The connector K 363 is adapted from an ERDF connector type K 323 (CBS/CT 70).
The connector K 364 is adapted from an ERDF connector type K 324 (CBS/CT 150).

Accessories

PMCC Socket

The short-circuiting and earth system socket (PMCC) can be sold separately.
This tap socket can be used with the entire range of 6kV CBS/CT MICHAUD connectors.

Code	Designation	Weight (kg)	Sales unit
K 368	SHORT-CIRCUITING AND EARTH SYSTEM SOCKET	0.102	25

SEE SHEET
Tools & Accessories / LV insulated toolings

SICAME Group

Pinces d'ancrage de branchement réglables

Adjustable service dead-end clamps

Pinzas de anclaje de acometida regulables

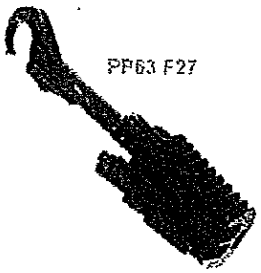
Série PP 63 ... / PPCR 63 ... / PAB 25

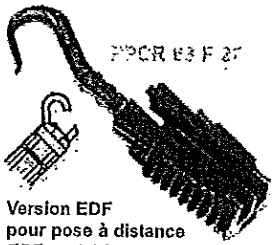
Norme / *Standard* / *Norma*
EN 61 284-2 (07-2005)
NF C 33-042 (02-93)

Pinces d'ancrage pour branchements aériens BT.

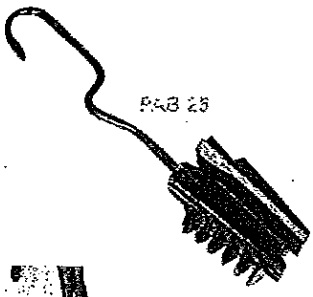
Câbles isolés ronds ou torsadés.
Travail sous tension au contact.

- En matière isolante à haute tenue mécanique et climatique. Aucune pièce perdable.
- Ces pinces sont constituées de :
  - Un corps ouvert.
  - Deux coins assurant le serrage et la répartition des pressions sur les conducteurs.
  - **PP 63 :** Une attache avec loquet de sécurité de type crochet en matériau composite, à position réglable en longueur dans les deux sens (course de réglage 6 cm environ).
  - **PPCR 63 :** Un crochet en matériau composite, à position réglable en longueur dans les deux sens (course de réglage 6 cm environ).
  - **PAB 25 :** Un crochet en acier traité, à position réglable en longueur dans les deux sens (course de réglage 6 cm environ). Elle peut aussi être utilisée pour la pose à distance.
- Ces pinces auto-serrantes, permettent un réglage précis et facile de la tension du branchement.





Version EDF
pour pose à distance
EDF model for remote work
Modelo EDF para trabajo a distancia



LV service clamps.

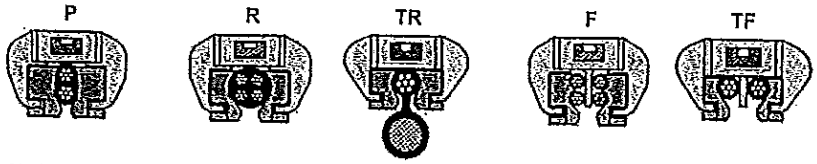
Insulated twisted or overall sheathed cables.
Live line work on contact.

- *Made of high climatic and mechanical resistant insulating material. No loosable parts.*
- *Comprises :*
  - *An open body.*
  - *Two wedges ensuring a positive and pressure reparted grip on conductors.*
  - ***PP 63 :** A fastener with a hook type safety latch of composite material, with position adjustable in length in both directions (adjusting range about 6 cm).*
  - ***PPCR 63 :** A hook of composite material, with position adjustable in length in both directions (adjusting range about 6 cm).*
  - ***PAB 25 :** A heat-treated steel hook, with position adjustable in length in both directions (adjusting range about 6 cm). It can also be used for remote work.*
- *These self locking clampss allows an easy and precise adjustment of the service sag.*

Pinzas de anclaje para acometidas aéreas BT.

Cables aislados, planos, redondos o trenzados.
Trabajos en tensión al contacto.

- *En material aislante, de alta resistencia mecánica y climática. Ninguna pieza perdible.*
- *Pinzas constituidas por :*
  - *Un cuerpo abierto.*
  - *Dos cuñas que aseguran el apriete y el reparto de las presiones sobre los conductores.*
  - ***PP 63 :** abrazadera con cierre de seguridad tipo gancho de material composite, con posición de longitud regulable en las dos direcciones (carrera de regulación de 6 cm aprox.).*
  - ***PPCR 63 :** gancho de material composite, con posición de longitud regulable en las dos direcciones (carrera de regulación de 6 cm aprox.).*
  - ***PAB 25 :** Gancho de acero tratado, con posición de longitud regulable en las dos direcciones (carrera de regulación de 6 cm aprox.). También se puede utilizar para la colocación a distancia.*
- *Esta pinza auto-blocante permite un reglaje presiso y fácil de la tensión de la acometida.*



Câbles plats P *Twin cables* *Cables planos* (2 x S mm²) — **Réf.**	**Câbles ronds R** *Round cables* *Cables redondos* (Ø mm)
PP63 TR9	4 / 9 mm
PP63 R17	9 / 17,5 mm
PP63 R22	14 / 22 mm
PP63 RA5	17 / 32 mm
PP63 F2	2 x 6 / 2 x 16 mm²
PP63 F3	2 x 16 / 2 x 25 mm²

Câbles torsadés *Twisted cables* *Cables trenzados* — **Réf.**	**Section câble** *Cable area* *Sección cable* (mm²)
PP63 TF5	2 x 6 / 2 x 25
PP63 F27	2 x 6 / 4 x 35
PAB 25	
PP63 F29	2 x 2,5 / 4 x 13
PPCR63 F27	2 x 6 / 4 x 35
PAB 25	

Réf. SICAME	**Réf. EDF**	**Code EDF**
PP63 F27	PACR 25	68 28 504
PAB 25		
PPCR 63 F27	PAD 25 réglable	68 28 508
PAB 25		

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SICAME Group

Pinces d'ancrage de branchement à crochet

Dead-end service clamps with hook

Pinzas de anclaje de acometida con gancho

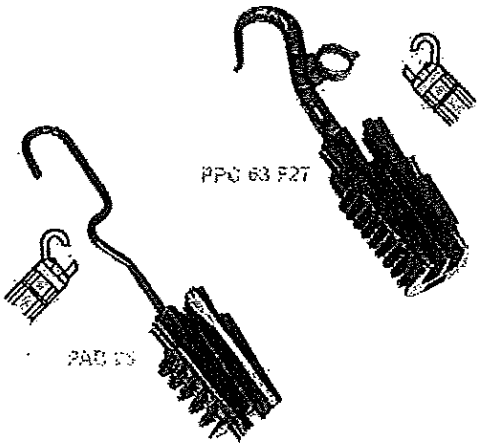
Série PPC 63 ... / PAB 25

Norme / *Standard* / *Norma*
EN 50 483-2 (07-2009)
NF C 33-042 (12-98)

Pinces d'ancrage pour branchements aériens BT.

Câbles isolés ronds ou torsadés.
Travail sous tension à distance.

- En matière isolante à haute tenue mécanique et climatique. Aucune pièce perdable.
- Ces pinces sont constituées de :
  - Un corps ouvert.
  - Deux coins assurant le serrage et la répartition des pressions sur les conducteurs.
  - **PPC 63** : Une attache de type crochet de 28 mm d'ouverture en matériau composite, avec anneau de préhension solidaire du corps de la pince pour pose à distance.
  - **PAB 25** : Un crochet de 28 mm d'ouverture en acier traité avec bossage de préhension pour perche. Elle est réglable et peut être utilisée au contact.



LV service clamps.

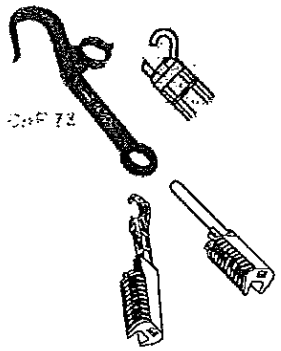
Insulated twisted or overall sheathed cables.
Live line remote work.

- *Made of high climatic and mechanical resistant insulating material. No loosable parts.*
- *Comprises :*
  - *An open body.*
  - *Two wedges ensuring a positive and pressure reparted grip on conductors.*
  - *PPC 63 : A hook type fastener of composite material with 28 mm hook opening, with grip ring integral with the clamp for remote work.*
  - *PAB 25 : A heat-treated steel hook with 28 mm hook opening, with grip boss for a stick. It is adjustable and can be used in contact.*

Pinzas de anclaje para acometidas aéreas BT.

Cables aislados, redondos o trenzados.
Trabajos en tensión a distancia.

- *Pinzas de anclaje para acometidas aéreas BT, en material aislante, de alta resistencia mecánica y climática. Ninguna pieza perdible.*
- *Pinzas constituidas por :*
  - *Un cuerpo abierto.*
  - *Dos cuñas que aseguran el apriete y el reparto de las presiones sobre los conductores.*
  - *PPC 63 : abrazadera de tipo gancho de 28 mm de apertura de material composite, con anillo prensor unido al cuerpo de la pinza para la colocación a distancia.*
  - *PAB 25 : gancho de 28 mm de apertura de acero tratado con saliente de prensión para pértiga. Es regulable y se puede utilizar en contacto.*

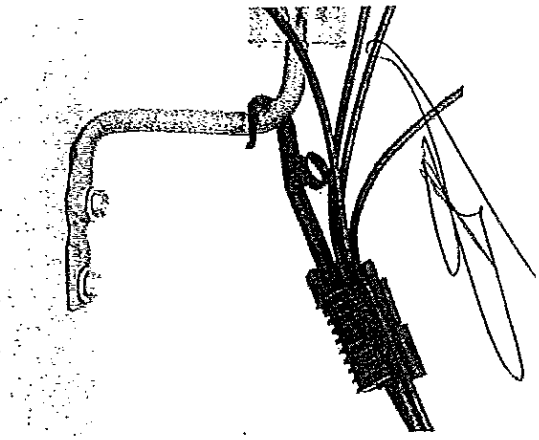


CAP 72

Crochet isolant de 28 mm d'ouverture pour travail à distance, utilisable avec pinces de branchements non équipées pour le travail à distance.

Separate hook *28 mm opening to be used with clamps not equipped for live line work.*

Gancho aislante *de 28 mm de abertura, para trabajos a distancia, utilizable con pinzas de acometida, no equipadas para trabajos a distancia.*



R

F

Câbles ronds *Round cables* *Cables redondos*		Câbles torsadés *Twisted cables* *Cables trenzados*		Réf. SICAME	Réf. EDF	Code EDF
Réf.	Ø câble (mm)	Réf.	Section câble (mm²) *Cable area* *Sección cable*			
PPC63 R1T	9 / 17,5	PPC63 F2T	2 x 6 / 4 x 35	PPC63 F2T	PAD 25 (PAC 25)	68 28 508 (502)
PPC63 R2T	14 / 22	PAB 25		PAB 25	PAD 25 (PACR 25)	68 28 508 (504)
PPC63 RAB	17 / 32			PPC63 RAB	PAS 35	68 28 657
				CAP 72	CPA 25	68 27 322

Pinces d'ancrage de branchement
Service dead-end clamps
Pinzas de anclaje de acometida

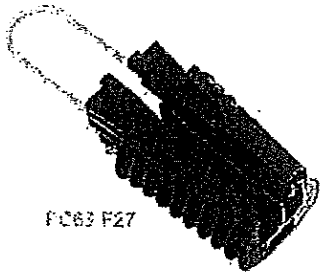
Série PC 63 ...

Pinces d'ancrage pour branchements aériens BT.

Pour câbles isolés ronds ou torsadés.
Travail sous tension au contact.

- En matière isolante à haute tenue mécanique et climatique.
- Cette pince est constituée de :
  - Un corps ouvert.
  - Deux coins imperdables assurant le serrage et la répartition des pressions sur les conducteurs.
  - Anneau d'ancrage amovible en acier inoxydable.

Norme / *Standard / Norma*
EN 50 483-2 (01-2009)
NF C 33-042 (02-98)

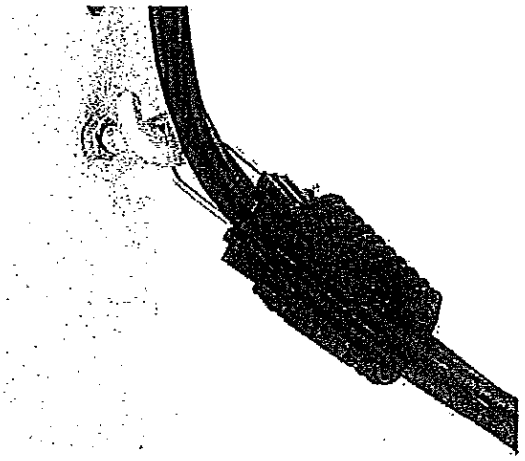


PC63 F27

LV service clamps.

For insulated twisted or single sheat service conductors.
Live line work contact.

- *Made of high climatic and mechanical resistant insulating material.*
- *Clamp comprises :*
  - *An open body.*
  - *Two unloosable wedges ensuring a positive and pressure reparted grip on conductors.*
  - *An anchoring rigid bail made of stainless steel.*

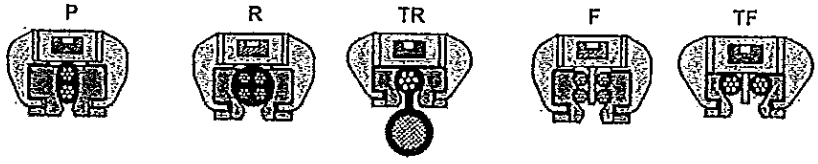


Pinzas para amare de acometidas BT.

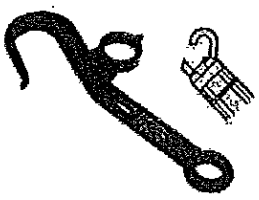
Para cables aislados redondos ó trenzados.
Apta para trabajos en tensión al contacto.

- *En material aislante de alta resistencia mecánica y climática.*
- *Constulda por :*
  - *Un cuerpo abierto*
  - *Dos cuñas imperdibles asegurando el apriete positivo y el reparto de presión sobre los conductores.*
  - *Un enganche de amare amovible de acero inoxidable.*

P R TR F TF



CAP 73
Crochet pour travail à distance
Hook for remote work
Gancho para trabajo a distancia

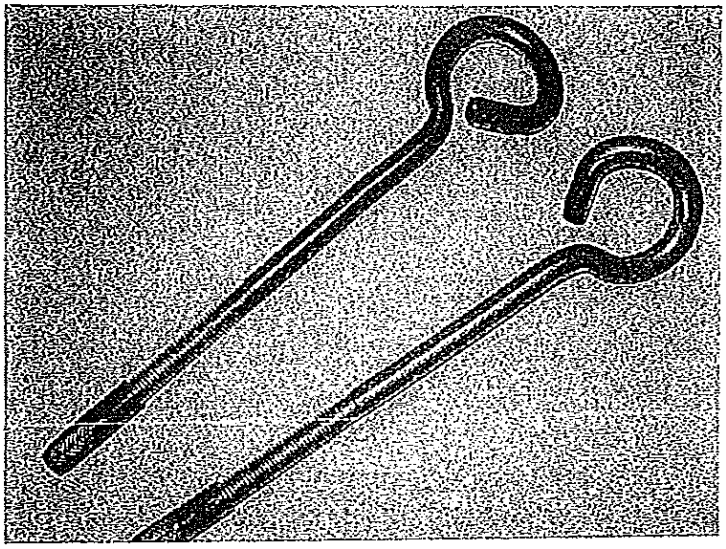


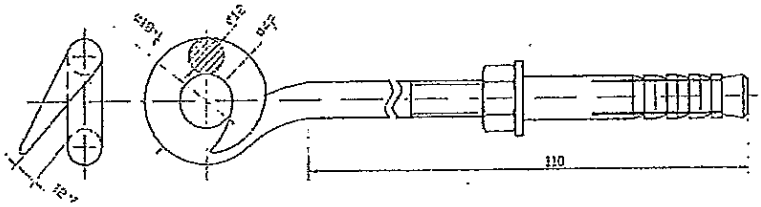
Câbles plats P *Twin cables* *Cables planos* (2 x S mm²)	Câbles ronds R *Round cables* *Cables redondos* (Ø mm)	Câbles torsadés *Twisted cables* *Cables trenzados*		Réf. SICAME	Réf. EDF	Code EDF
Réf.		Réf.	Section câble *Cable area* *Sección cable* (mm²)			
PC63 TR8	4 / 9 mm	PC63 TF8	2 x 6 / 2 x 25	CAP 73	CPA 25	68 27 322
PC63 R17	9 / 17,5 mm	PC63 F27	2 x 6 / 4 x 35	PC63 F27	PA 25	68 28 501
PC63 R22	14 / 22 mm	PC63 F25	2 x 2,5 / 4 x 13	PC63 F27 + CAP 73	PAC 25	68 28 502
PC63 RA3	17 / 32 mm					
PC63 P2	2 x 6 / 2 x 16 mm²					
PC63 P3	2 x 16 / 2 x 25 mm²					

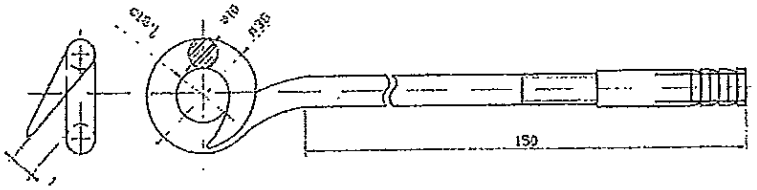
"ИВКОМ - 63" ЕООД

гр. Костенец 2030, ул. "Кирил и Методий" №52
тел./факс: 07142/42 66; e-mail: iv.kom@abv.bg

Куки с ухо „свинска опашка" – анкерни, за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV, М10 х 150 и М12 х 110







Куки с ухо „свинска опашка" – анкерни, за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV

№ на стандарта	Означение	Резба	L, mm	Тегло, kg
20 05 3601	М10 х 150	М10	150	0.185
20 05 3602	М12 х 110	М12	110	0.185

Антикорозионно покритие-електрохимично поцинковане

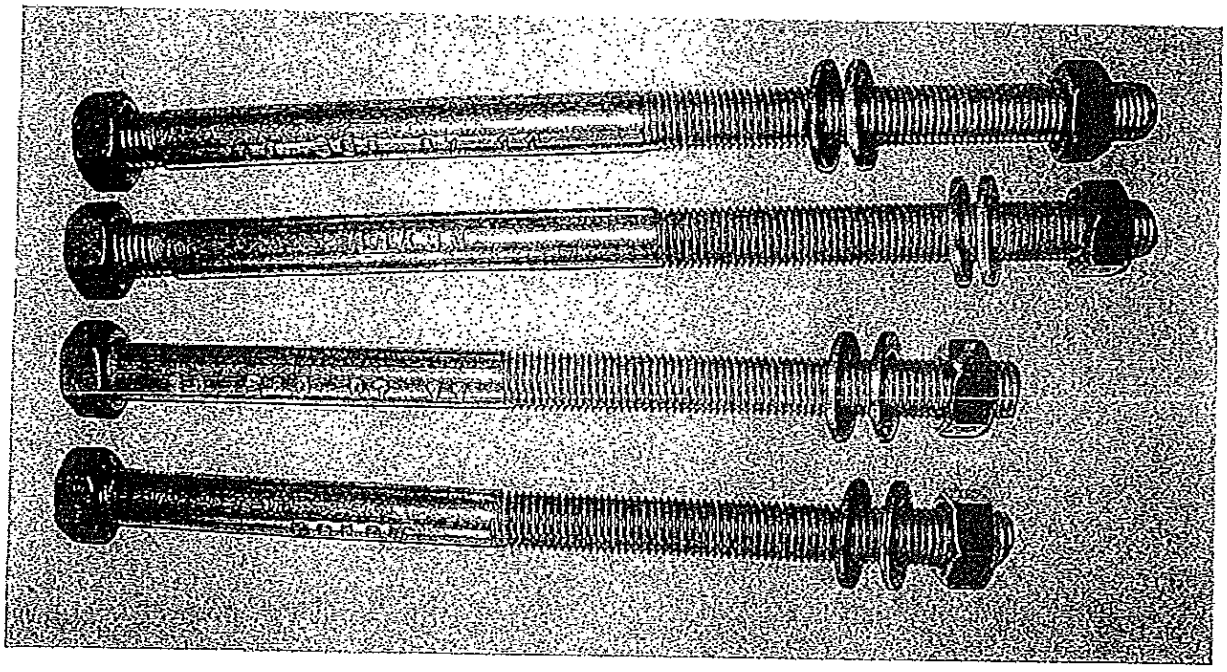
ВЯРНО С ОРИГИНАЛА

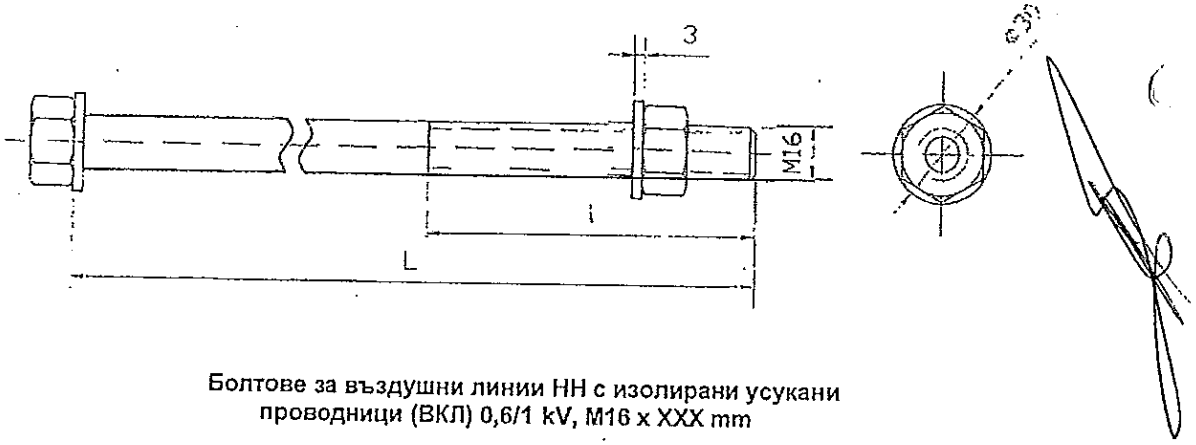
270

"ИВКОМ - 63" ЕООД

гр. Костенец 2030, ул. "Кирил и Методий" №52
тел./факс: 07142/42-66; e-mail: iv.kom@ abv.bg

Болтове за въздушни линии НН с изолирани усукани проводници (ВКЛ) 0,6/1 kV, М16 х ХХХ mm





Болтове за въздушни линии НН с изолирани усукани проводници (ВКЛ) 0,6/1 kV, М16 х ХХХ mm

№ на стандарта	Означение	Резба	L, mm	l, mm	Тегло, kg
20 05 3901	М16 х 260	М16	260	140	0.45
20 05 3902	М16 х 300		300	140	0.51

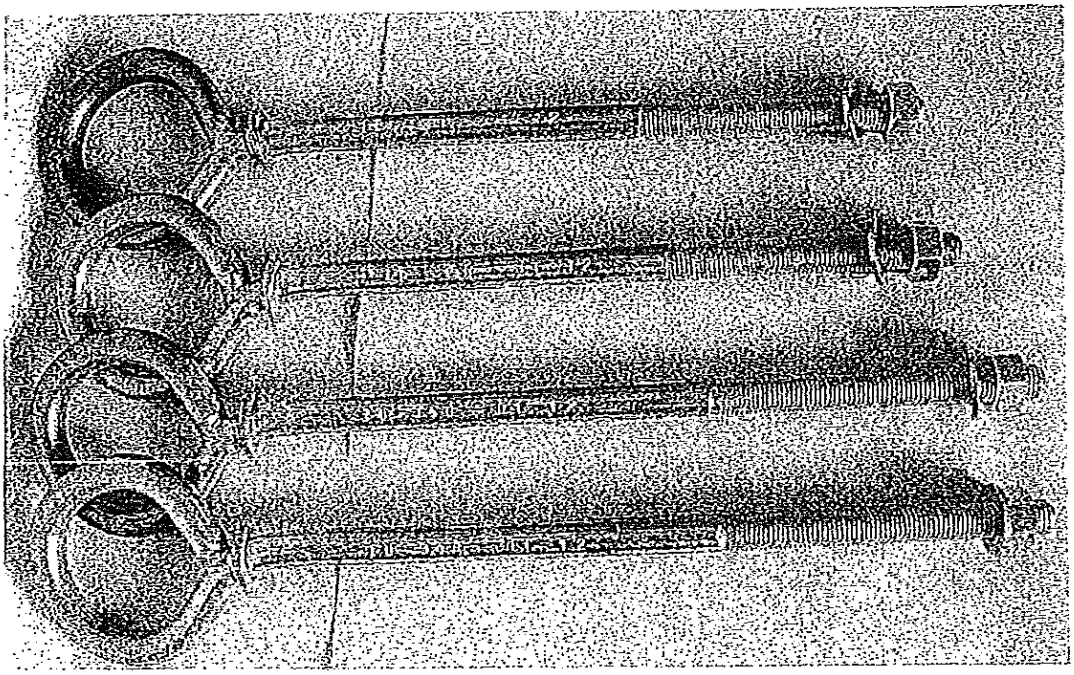
Антикорозионно покритие-електрохимично поцинковане

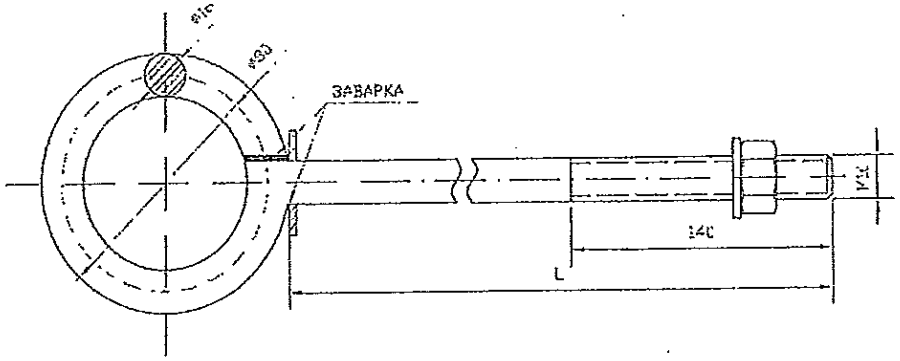
ВЯРНОСОРИГИНАЛА

"ИВКОМ - 63" ЕООД

гр. Костенец 2030, ул. "Кирил и Методий" №52
тел./факс: 07142/42 66; e-mail: iv.kom@ abv.bg

Куки с ухо за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV, M16 x XXX mm





Куки с ухо за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV, M16 x XXX mm

№ на стандарта	Означение	Резба	L, mm	Тегло, kg
20 05 3911	M16 x 300	M16	300	0.895
20 05 3912	M16 x 340		340	0.955

Антикорозионно покритие-електрохимично поцинковане

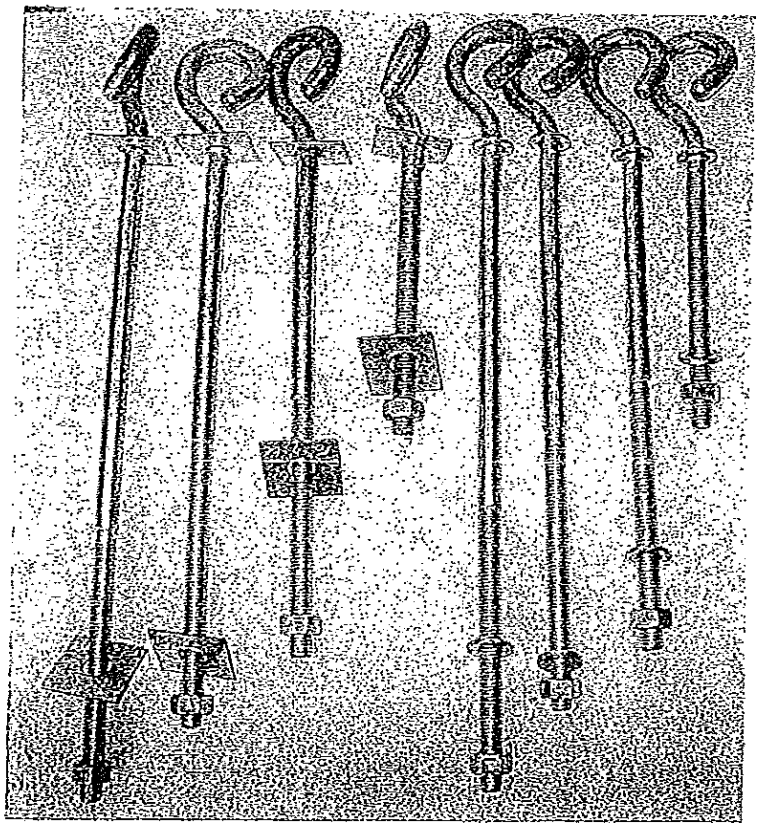
ВЯРНО С ОРИГИНАЛА

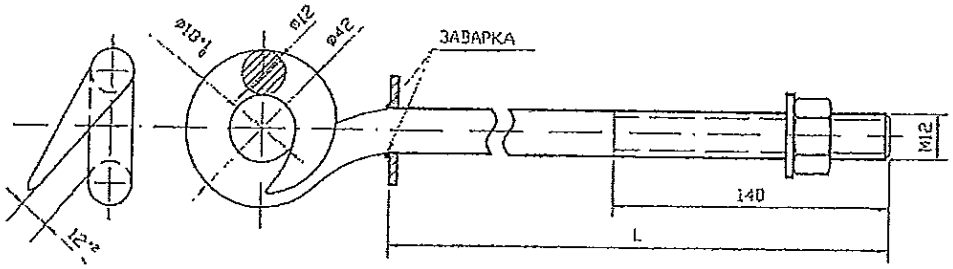
212

"ИВКОМ - 63" ЕООД

гр. Костенец 2030, ул. "Кирил и Методий" №52
тел./факс: 07142/42 66; e-mail: iv.kom@abv.bg

Куки с ухо „свинска опашка" за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV, M12 x XXX mm





Куки с ухо „свинска опашка" за окачване на опъвателни клеми за изолирани усукани проводници (ВКЛ) 0,6/1 kV, M12 x XXX mm

№ на стандарта	Означение	Резба	L, mm	Тегло, kg
20 05 3920	M12 x 150	M12	150	0.285
20 05 3921	M12 x 260		260	0.380
20 05 3922	M12 x 300		300	0.420
20 05 3923	M12 x 340		340	0.455

Антикорозионно покритие-електрохимично поцинковане

ВЯРНО С ОРИГИНАЛА

2 3

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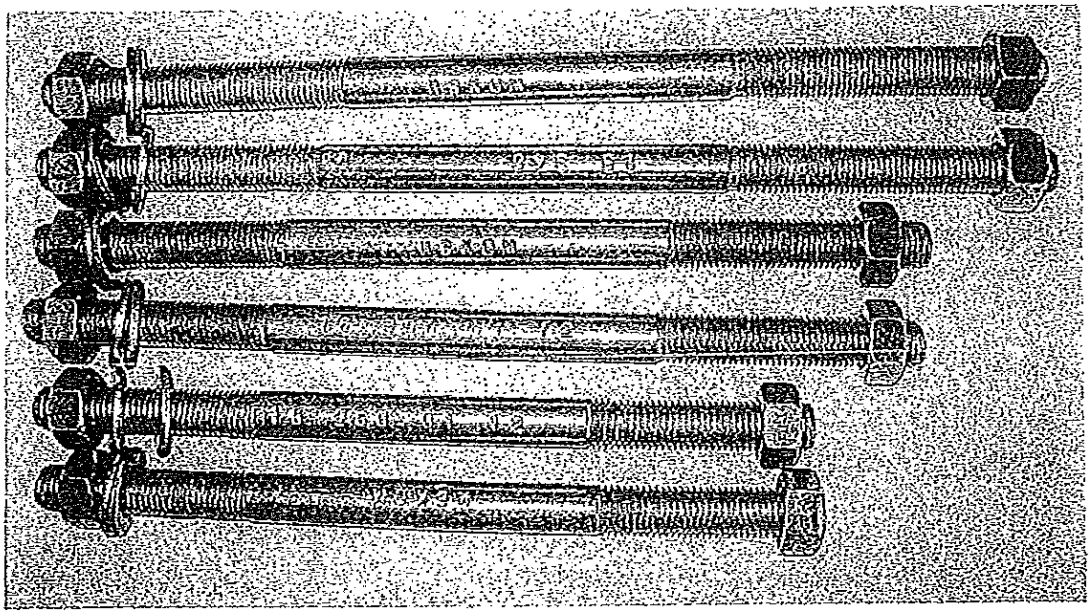
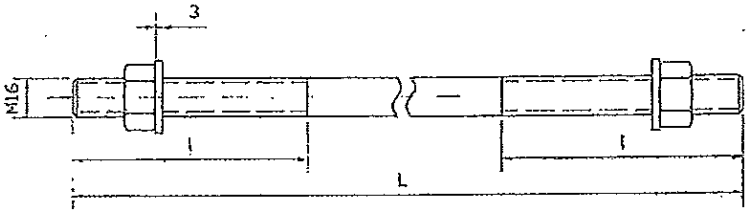
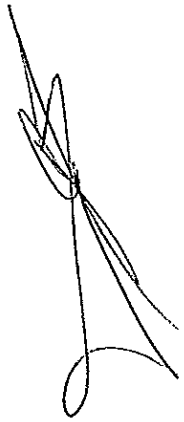
Шпилки за въздушни линии НН с изолирани усукани проводници (ВКЛ) 0,6/1 kV, М14 х 300 mm и М16 х ХХХ mm







Шпилки за въздушни линии НН с изолирани усукани проводници (ВКЛ) 0,6/1 kV, М14 х 300 mm и М16 х ХХХ mm

№ на стандарта	Означение	Резба	L, mm	l, mm	Тегло, kg
20 05 3930	М14 х 300	М14	300	85	0.380
20 05 3931	М16 х 260	М16	260	60	0.435
20 05 3932	М16 х 340		340	100	0.555

Антикорозионно покритие-електрохимично поцинковане

ВЯРНО С ОРИГИНАЛА

Feuillards

Feuillards inoxydables

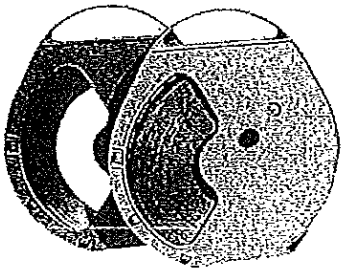
Bande en acier inoxydable de nuances AISI 430 / AISI201 / AISI304.
Feuillards ébavurés, bords non coupants. Dévidoir plastique recyclable.

Caractéristiques des différentes nuances disponibles :

Nuance	Désignation symbolique	Résistance à la traction (N/mm²)	Allongement à la rupture	Agrément
AISI201	X12CrMnNN17-7-5	750 à 950	45% mini	EDF / FT
AISI304	X5CrNi18-10	540 à 750	45% mini	EDF / FT
AISI430	X6Cr17	450 à 600	20% mini	FT

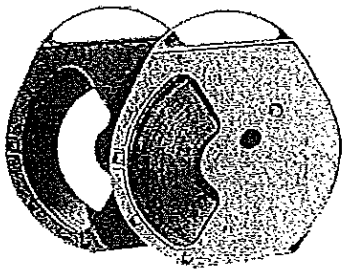
Bobines de 50m sous dévidoir plastique. Conditionnement en cartons de 5 dévidoirs.

	Nuance :	AISI 430	AISI 201	AISI 304
Désignation	Référence	Code	Code	Code
Feuillard inox 20x0.7 mm / 50 m	SB207	0038	0341	5729
Feuillard inox 20x0.4 mm / 50 m	SB204	0037	6618	6582
Feuillard inox 20x0.4 mm marron / 50 m	SB204 M	-		1774
Feuillard inox 10x0.7 mm / 50 m	SB107	0040	0343	6661
Feuillard inox 10x0.4 mm / 50 m	SB104	0039	8403	0349



Bobines de 30m sous dévidoir plastique. Conditionnement en cartons de 5 dévidoirs.

	Nuance :	AISI 201	AISI 304
Désignation	Référence	Code	Code
Feuillard inox 3/4"x 0.03" / 30 m	SB2075	0327	4225
Feuillard inox 5/8"x 0.03" / 30 m	SB1675	1867	8404
Feuillard inox 1/2"x 0.03" / 30 m	SB1375	8405	1868
Feuillard inox 1/2"x 0.016" / 30 m	SB1345	4524	8258
Feuillard inox 3/8"x 0.03" / 30 m	SB1075	1869	8406



Conditionnement en dévidoir carton possible. Nous consulter.

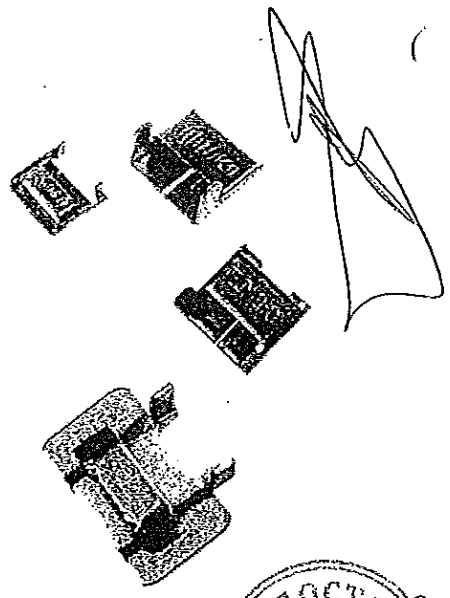
Boucles standards et renforcées

Boucles standard. Acier inoxydable AISI430.

Code	Désignation	Référence	Cond.
0046	Boucle 10 mm - 3/8" / sachet de 100	B10	unité
0047	Boucle 20 mm - 3/4" / sachet de 100	B20	unité
1793	Boucle 20 mm marron / sachet de 100	B20M	unité

Boucles renforcées. Acier inoxydable AISI304.

Code	Désignation	Référence	Cond.
0027	Boucles renforcée 10 mm - 3/8" / sachet de 100	BIB10	unité
4268	Boucles renforcée 1/2" / sachet de 100	BIB13	unité
5617	Boucles renforcée 5/8" / sachet de 100	BIB16	unité
0045	Boucles renforcée 20 mm - 3/4" / sachet de 100	BIB20	unité



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Извадков превод

Ленти

Неръждаеми стоманени ленти

Тип на стомана	Символно обозначение	Устойчивост на опън (N/mm^2)	Удължение при скъсване	Съгласно
AISI201	X12CrMnNiN17-7-5	750 до 950	Минимум 45 %	EDF / FT
AISI304	X5CrNi18-10	540 до 750	Минимум 45 %	EDF / FT
AISI430	X6Cr17	450 до 600	Минимум 45 %	FT

		AISI430	AISI201	AISI304
Описание	Тип	Код	Код	Код
Неръждаема лента 20x0.7 mm/50m	SB207	0038	0341	5729
Неръждаема лента 20x0.4 mm/50m	SB204	0037	6618	6582
Неръждаема лента 20x0.7 mm кафяв / 50m	SB204 M	-	-	1774
Неръждаема лента 10x0.7 mm/50m	SB107	0040	0343	6661
Неръждаема лента 10x0.4 mm/50m	SB104	0039	8403	0349

Скоби

Код	Описание	Тип	Конд.
0046	Скоба 10 mm – 3/8" / в плик по 100	B10	единица
0047	Скоба 20 mm – 3/4" / в плик по 100	B20	единица
1793	Скоба 20 mm кафяв в плик по 100	B20M	единица

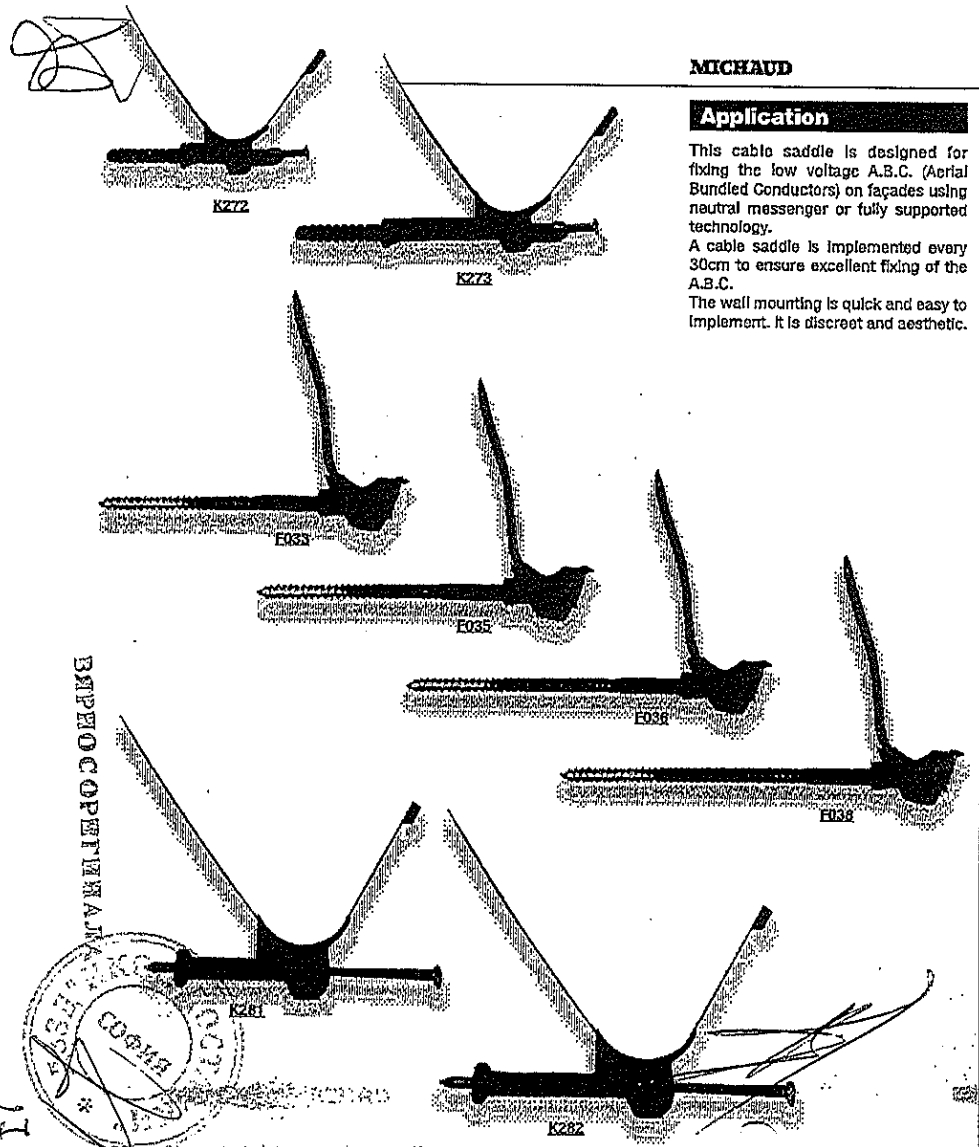
На основание чл. 2
от ЗЗЛД

ЕВРОПА ДОСТАВКА СОФИЯ

976

Cable saddle

Façade fixing



MICHAUD

Application

This cable saddle is designed for fixing the low voltage A.B.C. (Aerial Bundled Conductors) on façades using neutral messenger or fully supported technology.
A cable saddle is implemented every 30cm to ensure excellent fixing of the A.B.C.
The wall mounting is quick and easy to implement. It is discreet and aesthetic.

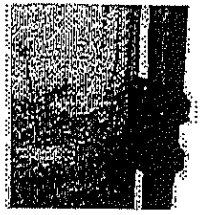
Description

- Three types of cable saddles are available:
  - **BRPF:** cable saddle to be fixed on façades by a nail (12mm Ø hole).
  - **BRPV:** cable saddle to be fixed on façades by a screw and dowel pin (12mm Ø hole).
  - **BRTV:** cable saddle to be fixed on façades by a reinforced screw and dowel pin assembly (16mm Ø hole).
- The body and cable tie are made of UV resistant synthetic material.
- The opening under the saddle allows the use of an extra tie (not provided) to install a second conductor.
- The cable tie has outside teeth for:
  - Excellent protection of conductor insulation,
  - Excellent fixing of service and network conductors.

This cable saddle meets the criteria of the **NF C 33-040** and **EN 50-483** standards

Code	Designation	A.B.C. capacity (mm²)	Wall clearance (mm)	Weight (kg)	Sales unit
K272	CABLE SADDLE - BRPF1	2x16 to 4x35 4x35 to 3x150 + 95N+16	10	0.040	25
K273	CABLE SADDLE - BRPF6		60	0.060	25
F033	CABLE SADDLE - BRPV1	3x25+54.6N+16 to 3x150+95N+16	10	0.070	50
F035	CABLE SADDLE - BRPV6		60	0.080	50
F036	CABLE SADDLE - BRTV10		100	0.175	20
F038	CABLE SADDLE - BRTV17		170	0.240	20
K281	CABLE SADDLE - BRPF4	3x25 + 54.6N to 3x150 + 95N + 16	90	0.056	100
K282	CABLE SADDLE - BRPF9		40	0.065	100

Pole fixing



Application

This saddle is used to fix cable trunking on poles.
It is fixed using a strap.
It is made of UV protected thermoplastic material.
The F042 is sealed with a cable tie for 15 to 30mm diameter cables, the F039 for 30 to 50mm diameter cables, and the F037 for 50 to 90mm cables.

Code	Designation	Weight (kg)	Sales unit
F042	CABLE SADDLE B/C 15/30 WITHOUT CABLE TIE	0.010	100
F042	CABLE SADDLE B/C 15/30 + CABLE TIE 8X180mm	0.015	100
F039	CABLE SADDLE B/C 30/50	0.070	100
F037	CABLE SADDLE B/C 50/90	0.110	100

BRPF / BRTF — A frapper avec cheville / *Hammer type with plug / A martillar con taco*
BRPV — A visser avec cheville / *Screw type with plug / A tornillar con taco*

Berceaux isolés pour réseaux sur façades.

- Supports en matière isolante de haute résistance mécanique.
- Verrouillage du câble sur le support par collier intégré ré-ouvrable. (Capacité de serrage : Ø 20 à 50 mm).
- Protection de la tête de pointe par capuchon.
- Possibilité de fixer un 2ème câble en utilisant un collier supplémentaire.
- Se fixe à sec au marteau (BRPF / BRTF) ou se visse (BRPV) dans tout matériau dur. Perçage Ø 12 ou 16 mm, profondeur 70 mm.

CONFORME A LA NORME NF C 33-040 (02-99).

Insulated supports for networks on facade walls.

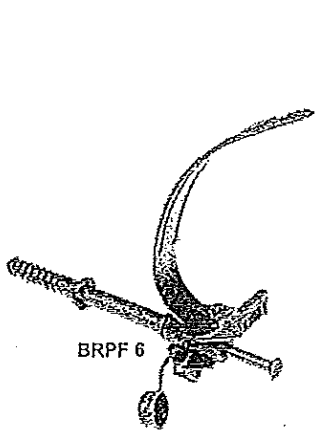
- *Supports of very high mechanical strengh insulating material.*
- *Cable is locked on support by integrated re-opening strap. (Tightening capacity : Ø 20 to 50 mm).*
- *Head nail protection by cap.*
- *Possibility od fixing a 2nd service cable using an additional strap.*
- *Can be hammered (BRPF / BRTF) or screwed (BRPV) into all hard materials. Drilling Ø 12 or 16 mm, depth 70 mm.*

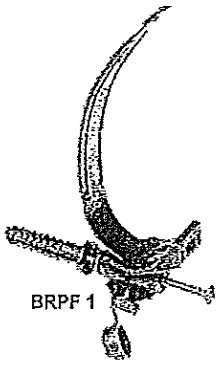
IN ACCORDANCE WITH STANDARD NF C 33-040 (02-99).

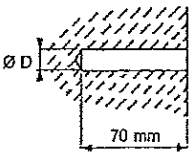
Soportes aislados para redes sobre fachadas.

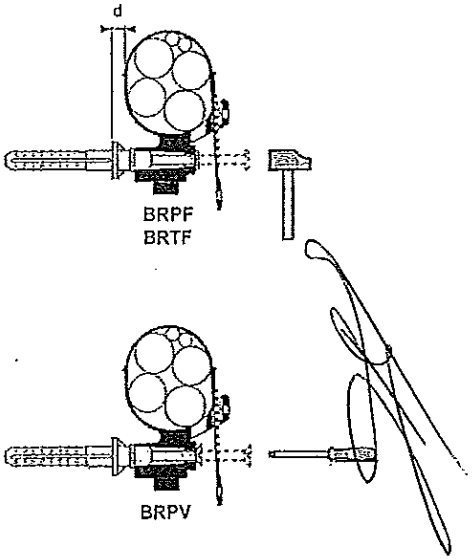
- *Soportes en materia aislante de alta resistencia mecánica.*
- *Bloqueo del cable sobre el soporte por brida integrada re-abiertada. (Capacidad de apriete : Ø 20 a 50 mm)*
- *Protección de la cabeza del punta por capuchón.*
- *Posibilidad de colocar un 2nd cable, utilizando una segunda brida.*
- *Se fija con un martillo (BRPF/BRTF) o se enroscada (BRPV) en todos materiales duros. Taladro Ø 12 or 16 mm, profundidad 70 mm.*

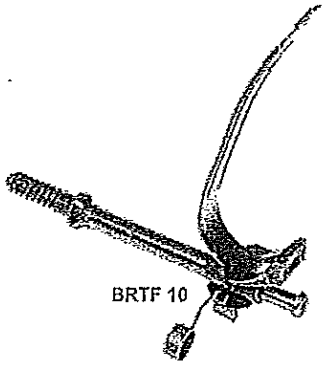
CONFORME A LA NORMA NF C 33-040 (02-99).











Réf.	Perçage *Drill* *Taladro* Ø D (mm)	Ecartement mural *Wall spacing* *Separación a pared* d (mm)	*Réf EDF*	*Code EDF*
BRPF 1	12	10	BRPF 1	68 26 001
BRPF 6	12	60	BRPF 6	68 26 002
BRTF 10	16	100	BRTF 10	68 26 016
BRTF 17	16	170	BRTF 17	68 26 017
BRPV 1	12	10	BRPV 1	68 26 003
BRPV 6	12	60	BRPV 6	68 26 004

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Accessories for wall

Wall saddles

Capacity
For cables Ø 6 thru 20 mm

Resistance to corrosion
Excellent in industrial areas and sea coast environment.

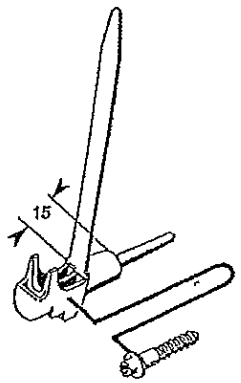
Accessoires de façade

Berceaux pour branchement sur façade

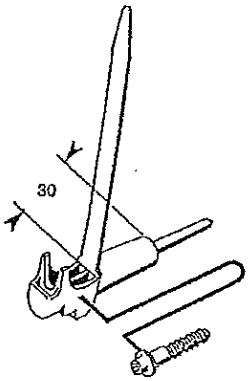
Capacité
Pour câbles de Ø 6 à 20 mm

Résistance à la corrosion
Excellente en milieu industriel et atmosphère saline.

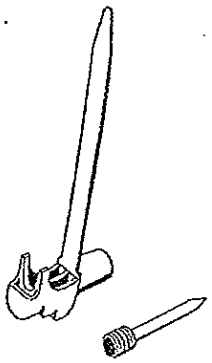
BBPF 35 15



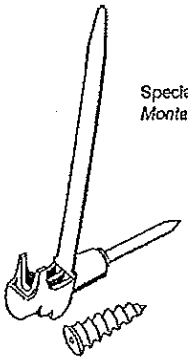
BBPF 35 30



BBPF 35 C



BBPF 35 CPO



Special Installat
Montage spécia

Reference	Material *Matière*		Weight *Masse*		Packing *Conditionnement*
	Body/*Corps*	Nail/*Vis*	lbs	kg	
BBPF 35 15	UV resistant thermoplastic *Thermoplastique protégée UV*	UV resistant thermoplastic *Thermoplastique protégée UV*	2,20	1,00	100
BBPF 35 30					
BBPF 35 C	Black as standard *Noirs de série* (*)	Protected steel *Acier traité*	2,09	0,95	40
BBPF 35 CPO			1,23	0,56	

(*) The BBPF 35 15 and BBPF 35 30 may be delivered with following colours (UV resistant) :
- Grey : BBPF 35 - G
- Ivory : BBPF 35 - V
- Maroon : BBPF 35-M

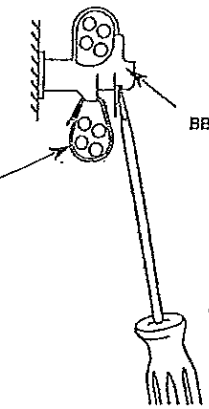
(*) Les BBPF 35 15 et BBPF 35 30 peuvent être livrés dans les couleurs suivantes (protection UV assurée) :
- *Gris : BBPF 35 - G*
- *Ivoire : BBPF 35 - V*
- *Marron : BBPF 35-M*

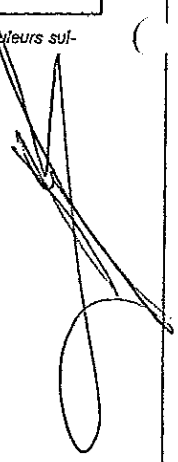
Installation
- Hard walls : drill at Ø 8 mm
- Softer walls : drill at Ø 7 mm
- Drill at 40 mm deep

The BBPF locking device may be released with a screw driver.

Montage
- *Matériau dur : percer au Ø 8 mm*
- *Matériau friable : percer au Ø 7 mm*
- *Profondeur de perçage : 40 mm*

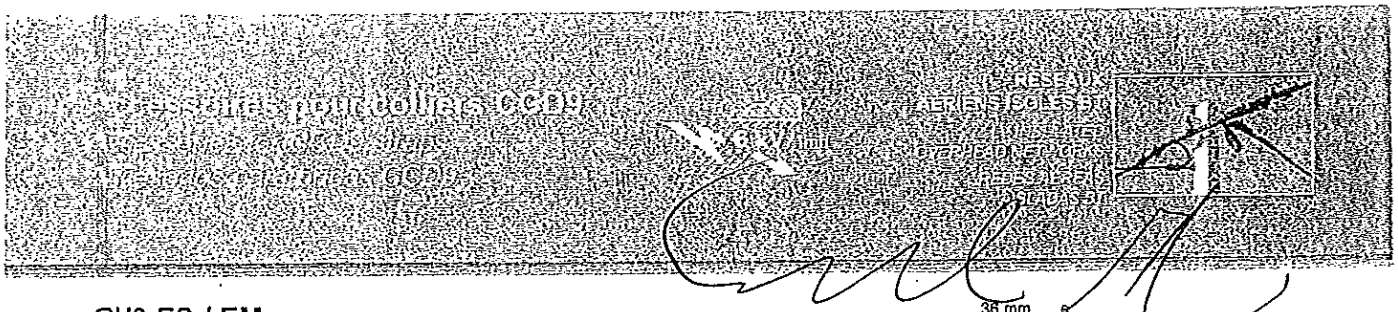
Possibilité de réouverture à l'aide d'un tournevis.





For other accessories for wall : see page 87.

Pour autres accessoires de façade : voir page 87.



CH8 ES / EM

Embases de fixation murale à cheville.

Pose à sec au marteau après perçage d'un trou Ø 8 mm.

CH8-ES
Ecartement mural (e) : 6 mm.

CH8-EM
Ecartement mural (e) : 12 mm

Wall type strap supports / hammer in type.

Hammered into hole Ø 8 mm drilled into wall.

CH8-ES
Spacing to wall (e) : 6 mm.

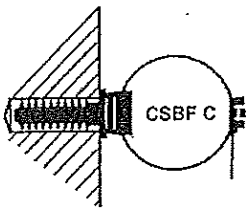
CH8-EM
Spacing to wall (e): 12 mm.

Tacos para fijación mural con clavija.

Se coloca, con martillo, en un taladro de Ø 8 mm.

CH8-ES
Separación a pared (e)6 mm.

CH8-EM
Separación a pared (e) 12 mm



CH8 C

Supports isolés pour branchement d'abonné.

Pose à sec au marteau après perçage d'un trou Ø 8 mm.
Ecartement mural : 12 mm.
Collier cranté démontable.

Capacité de serrage :
CH8 C25 : Ø 10 - 25 mm.
CH8 C32 : Ø 10 - 32 mm.

Insulated supports for LV service connections.

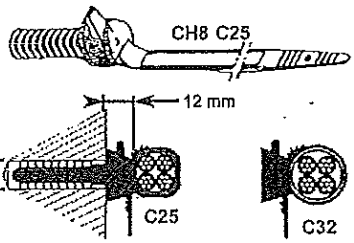
Hammered into hole Ø 8 mm drilled into wall.
Spacing to wall 12 mm.
Removable notched strap.

Range capacity :
CH8 C25 : Ø 10 - 25 mm.
CH8 C32 : Ø 10 - 32 mm.

Soportes aislados para acometidas de abonados BT

Se coloca, con martillo, en un taladro de Ø 8 mm.
Separación a pared : 12 mm.
Brida dentada desmontable.

Capacidad de apriete :
CH8 C25 : Ø 10 - 25 mm.
CH8 C32 : Ø 10 - 32 mm.



EM 7

Embase murale à visser.

Se fixe sur pointe filetée à 7 / 150 de type SPIT ou HILTI
Ecartement mural 12 mm.

EM 750 V (C)
Embase EM 7 avec vis à bois (et collier).
Capacité : 6 - 50 mm.

Wall type strap support / screw type.

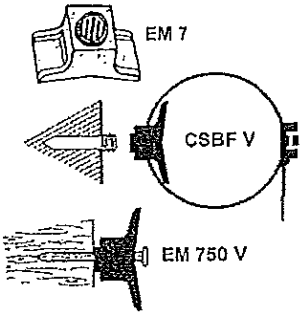
Is screwed on 7 / 150 nail SPIT or HILTI type.
Spacing to wall 12 mm.

EM 750 V (C)
Strap EM 7 with wood type screw (and cable tie).
Capacity : 6 - 50 mm.

Taco mural a atornillar.

Para clavo roscado 7 / 150 de SPIT ó HILTI.
Separación a pared 12 mm.

EM 750 V (C)
Taco EM 7 con tornillo para madera (y brida).
Capacidad : 6 - 50 mm.

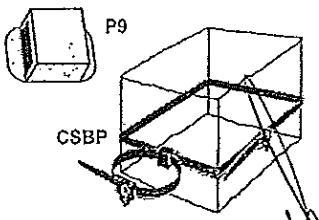


P 9

Passant.
Permet le montage d'un collier sur un autre collier.

Sleeve.
Allows to interconnect 2 straps.

Presilla.
Permite le montaje de dos bridas.



ACCESSOIRES CONFORMES A LA SPECIFICATION STS 0101

ACCESSORIES IN ACCORDANCE WITH SPECIFICATION STS 0101.

ACCESORIOS COMFORMES A LA ESPECIFICACIÓN STS 0101.

	Polyamide noir 11/12 *Black polyamid 11/12* *Poliamida negro 11/12* Réf. SICAME	EDF HN 33-S-62 (07-76) Réf.	EDF HN 33-S-62 (07-76) Code	Code N 7 FRANCE TELECOM	Composition *Composition* *Composición*	Polyamide noir 6-6 *Black polyamid 6-6* *Poliamida negro 6-6* Réf. SICAME	EDF HN 33-S-62 (04-97) Réf.	EDF HN 33-S-62 (04-97) Code
Accessoires *Accessories* *Accesorios*	CH8 ES	EC8 ES	68 28 786			CH8 ES P2	ECF	
	CH8 EM	EC8 EM	68 28 787	787 816 S		CH8 EM P2	ECF EM	
	EM 7	EV 7	68 28 788	818 302 R		EM7 P2	EV	
	P9	EO	68 28 792			P9 P2	EPC	
Ensembles EDF *EDF assembles* *Conjuntos EDF*	CSBF C	CSBF C	68 28 770		CCD9-42 + CH8 ES			
	CSBF V	CSBF V	68 28 772		CCD9-42 + EM 7			
	CSBP	CSBP	68 28 774		CCD9-42 + P 9 + CCD9-92			
					CCD9-42 P2 + CH8 ES P2	BIS 120/180 CF	BIS 120/180 CF	68 27 646/676
					CCD9-42 P2 + CH8 EM P2	BIS 120/180 CFEM	BIS 120/180 CF	68 27 648/678
					CCD9-42 P2 + EM7 P2	BIS 120/180 V	BIS 120/180 V	68 27 640/670
					CCD9-42 P2 + P9 P2	BIS 120/180 PC	BIS 120/180 PC	68 27 650/680
					CCD9-62 P2 + CH8 ES P2	BIS 260 CF	BIS 260 CF	68 27 706
					CCD9-62 P2 + CH8 EM P2	BIS 260 CFEM	BIS 260 CF	68 27 708
					CCD9-62 P2 + EM7 P2	BIS 260 V	BIS 260 V	68 27 700
					CCD9-62 P2 + P9 P2	BIS 260 PC	BIS 260 PC	68 27 710

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EM 86

Embases pour bracelet, en matière isolante de haute résistance mécanique et climatique pour fixation des câbles sur supports ou parois. EM 86-2 : embase double.

Mise en oeuvre :
- soit par feuillard ① existant ou par feuillard de largeur maxi : 20 mm, épaisseur maxi : 0,7 mm,
- soit par vis à bois 6 x 60 mm ②,
- soit par pointe filetée ③.

Verrouillage du câble sur l'embase par collier cranté démontable (type CCD 9).

Dans le cas de positionnement sur feuillard, un collier disposé en position Ⓐ assure, outre le serrage du câble, le blocage de l'embase.

CONFORME A LA SPECIFICATION EDF HN 33-S-62 (04-97)

***Strap brackets** made of high mechanical and climatic resistant insulating material to maintain conductors on walls or poles.*
EM 86-2 : double bracket.

To be installed :
- *using already installed steel strap ① or steel strap maxi width 20 mm, thickness maxi 0,7 mm,*
- *or wood type screws 6 x 60 mm ②,*
- *or threaded nail ③.*

Cable is maintained on bracket using a notched strap (CCD 9 type).

When used with metallic strip a notched strap as shown in Ⓐ ensures at the same time cable holding and locking of strap bracket.

IN ACCORDANCE WITH EDF SPECIFICATION HN 33-S-62 (04-97)

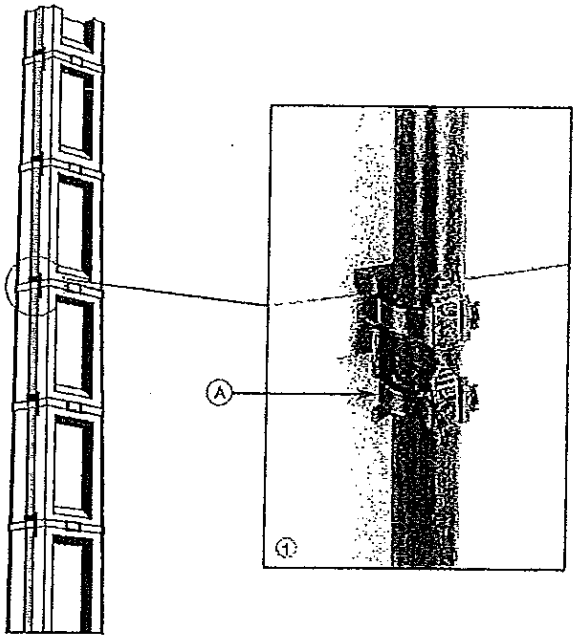
***Soportes con brida**, en materia aislante de alta resistencia mecánica y climática, para fijación de los cables sobre postes o paredes.*
EM 86-2 : soporte doble.

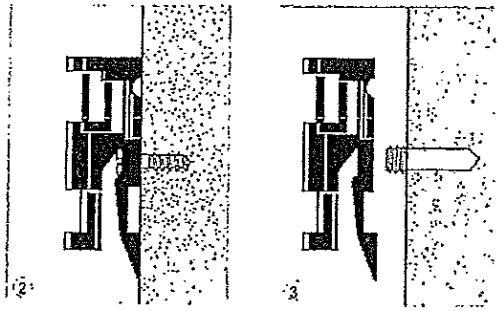
Instalación :
- *por fleje ① existente o por fleje de 20 x 0,7 mm,*
- *por tornillo para madera 6 x 60 mm ②,*
- *por clavo roscado ③.*

Bloqueo del cable sobre la base, por brida dentada desmontable (tipo CCD 9).

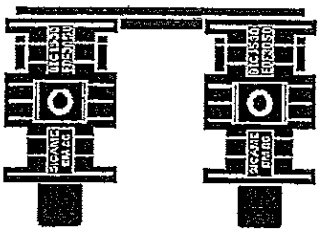
En caso de utilización de fleje, una brida colocada en Ⓐ, asegura el cable y además, bloquea la base.

CONFORME A LA ESPECIFICACIÓN EDF HN 33-S-62 (04-97)





EM 86-2



Réf.	Capacité *Capacity* *Capacidad* Ø (mm)	Pointe filetée *Threaded nail* *Clavo roscado*	Composition *Composition* *Composición*	Réf. EDF	Code EDF
EM 86-30 P2	15 - 30	6 / 100	(EM 86 + CCD 9-42 P2)	BIS 120 / 180 PF	68 27 652 / 682
EM 86-50 P2	15 - 50	6 / 100	(EM 86 + CCD 9-62 P2)	BIS 260 PF	68 27 712
EM 86-90 P2	50 - 90	8 / 125	(EM 86 + 2 CCD 9-92 P2)	BIC 50-90	68 86 661
EM 86-2-50 P2	30 - 50	6 / 100	(EM 86-2 + 2 CCD 9-62 P2)	BIS 260 PFVD	68 86 674
EM 86	(15 - 50)	6 / 100		EFV	68 86 680
EM 86-2	(15 - 50)	6 / 100		EDFV	68 86 681

Avec vis à bois, ajouter "V" à la réf. / *With wood type screw, add "V" to the ref.* / *Con tornillo para madera, añadir "V" a la ref.:* (ex. EM 86-30 P2 V)

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Installation Cable Ties

General features

CCI series

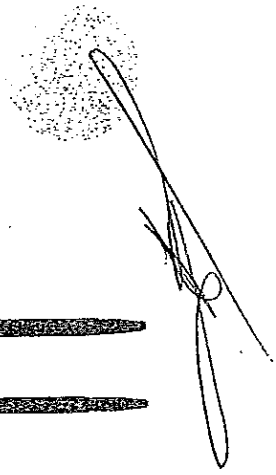
- ✔ Material: RoHS copolymer.
- ✔ Halogen free.
- ✔ Melting temperature: 186°C.
- ✔ External notches.
- ✔ Flammability rating : UL 94 HB.
- ✔ Limit oxygen index (LOI): 22%.
- ✔ Operating temperature: -45°C to +85°C.
- ✔ Assembling temperature: -30°C to +60°C.
- ✔ Regain of humidity: < 1%.
- ✔ Good resistance to: bases, oils, greases, hydrocarbons, salt fog.
- ✔ Good resistance to ultra-violet rays.
- ✔ Fumes corrosivity: NFC 20-453: <5%.
- ✔ Non resistant to chlorinated solvents.

Item code	100 /box Part No.	Max. Bundle Ø (mm)	Min. tensile strength (daN)	Length (mm)	Width (mm)
7101000	CCI0-115	25	28	115	6
7101010	CCI0-180	45	28	180	6
7101020	CCI0-290	78	28	290	6
7101030	CCI0-360	100	28	360	6
7101035	CCI0-132	27	39	132	9
7101040	CCI0-180	40	39	180	9
7101050	CCI0-260	62	54	260	9
7101060	CCI0-360	93	54	360	9
7101070	CCI0-510	140	55	510	9
7101080	CCI0-760	220	55	760	9

General features

CCM series

- ✔ Material: black polyamide 6.6.
- ✔ Halogen free.
- ✔ Melting temperature: 261°C.
- ✔ External notches.
- ✔ Flammability rating: UL 94 V2.
- ✔ Limit oxygen index (LOI): 26%.
- ✔ Operating temperature: -30°C to +80°C.
- ✔ Assembling temperature: -15°C to +60°C.
- ✔ Regain of humidity: 2.5%.
- ✔ Resistance to external agents: bases, oils, greases, hydrocarbons, salt fog.
- ✔ Resistance to ultra-violet and ozone.
- ✔ Limited resistance to acids.
- ✔ Non resistant to chlorinated solvents, phenols.



Item code	100 /box Part No.	Max. Bundle Ø (mm)	Min. tensile strength (daN)	Length (mm)	Width (mm)
7102101	CCM0-185	42	35	185	9
7102111	CCM0-273	62	51	273	9
7102121	CCM0-360	92	51	360	9

Packing

Unless otherwise stated all dimensions are in millimeters.

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CCI серия

- Материал : RoHS съполимер
- Без халогенен
- Температура на топене:186°C
- Външни резки
- Устойчивост на огън : UL 94 HB
- Граничен кислороден индекс(LOI):22%
- Температура:
  - на използване : - 45 до 80 °C
  - на монтаж : - 30 до 60 °C
- Остатъчна влажност : < 1 %
- Добра устойчивост на: основи, масла, смазки, въглеводороди, атмосферни соли
- Добра устойчивост на ултравиолетови лъчи
- Склонност към корозия при излалане на пушек: NFC 20-453:<5%
- Не са устойчиви на хлорирани разтворители

Код на продукта	Тип	Макс пакет ϕ (мм)	Мин устойчивост на разтягане (daN)	Дължина (мм)	Ширина (мм)
7101000	CCI6-115	25	28	115	6
7101010	CCI6-180	45	28	180	6
7101020	CCI6-290	78	28	290	6
7101030	CCI6-360	100	28	360	6
7101035	CCI9-132	27	39	132	9
7101040	CCI9-180	40	39	180	9
7101050	CCI9-265	62	54	260	9
7101060	CCI9-360	93	54	360	9
7101070	CCI9-510	140	55	510	9
7101080	CCI9-760	220	55	760	9

CCM серия

- Материал : черен полиамид 6.6.
- Без халогенен
- Температура на топене:261°C
- Външни резки
- Устойчивост на огън : UL 94 V2
- Граничен кислороден индекс(LOI):26%
- Температура:
  - на използване : - 30 до 80 °C
  - на монтаж : - 15 до 60 °C
- Остатъчна влажност : 2,5 %
- Добра устойчивост на: основи, масла, смазки, въглеводороди, атмосферни соли
- Добра устойчивост на ултравиолетови лъчи
- Не са устойчиви на киселини
- Не са устойчиви на хлорирани разтворители и феноли

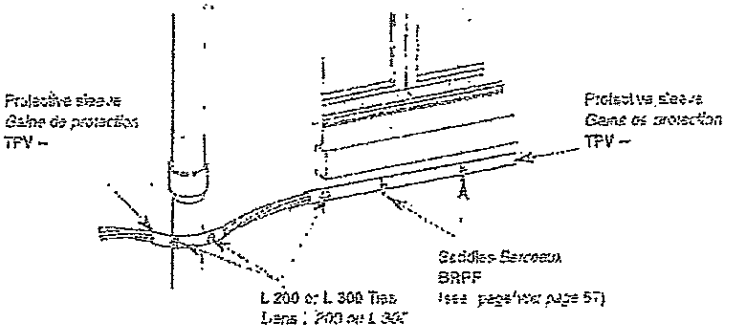
Код на продукта	Тип	Макс пакет ϕ (мм)	Мин устойчивост на разтягане (daN)	Дължина (мм)	Ширина (мм)
7102101	CCM9-42	42	35	185	9
7102111	CCM9-62	62	51	273	9
7102121	CCM9-92	92	51	360	9

ВЯРНО СОРЕГИНАЛА

Fittings
Accessoires

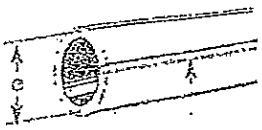
Protective sleeves and links

Gaines de protection et liens

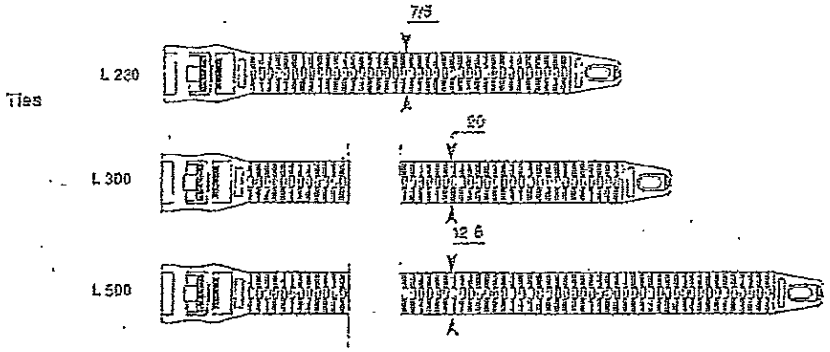


Protective sleeves — *Gaines de protection*

Reference	EDF Code	Bundle capacity max. *Capacité max.* Ø mm	Material *Matière*	Weight *Masse* (10 x 2,5 m) lbs	kg
TPV 70	68 29 859	40	Specialty UV protected flexible thermoplastic *Thermoplastique flexible protégée UV*	24,2	11,0
TPV 150	68 29 857	60		27,0	12,5

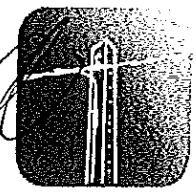


Pre-cutting *Pré-découpé*



Reference	EDF Code	Bundle range *Capacité* mm²(*)	Ø mm	Material *Matière*	Weight *Masse* (100 pcs) lbs	kg
L 230	68 26 749	4 x 25 - 3 x 150 + 70 + 2 x 25 Protective sleeve/*Gaine de protection*	30 - 50	UV resistant thermoplastic *Thermoplastique protégée UV*	1,2	0,6
L 300	–	3 x 240	50 - 90		1,5	0,7
L 500	–	3 x 240	90 - 120		1,2	1,1

(*) Self supported (4 x -) ABC bundles : Ø max. bundle O.D. / Ø mm — *(*) Pour torsade homogène (4 x -) se référer au Ø extérieur*



CRB ... / CRR ...

Capuchons d'extrémités thermo-rétractables
avec compound d'étanchéité pour conducteurs.
Heat shrink cable ends with sealing compound for conductors.
Extremidades de cables termoretractables con compound de estanquidad para conductores.

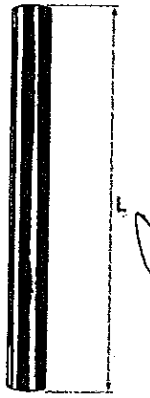
Réf.	Section *Area* *Sección* (mm²)	Ø avant rétreint *Ø before shrink* *Ø antes retracción* (mm)	Ø après rétreint *Ø after shrink* *Ø después retracción* (mm)	L (mm)	Code EDF
CRB 6-16	6 - 16	10	3	35	
CRB 10-25	10 - 35	15	4,5	45	67 29 403
CRR 16-70	16 - 95	20	6	63	67 29 408
CRR 150	95 - 150	25	8,5	70	67 29 410

CRB / CRR

FRM ...

Fourreaux thermo-rétractables
pour manchons avec compound d'étanchéité.
Heat shrink midspan joint protectors with sealing compound.
Protectores termoretractables para manguitos con compound de estanquidad.

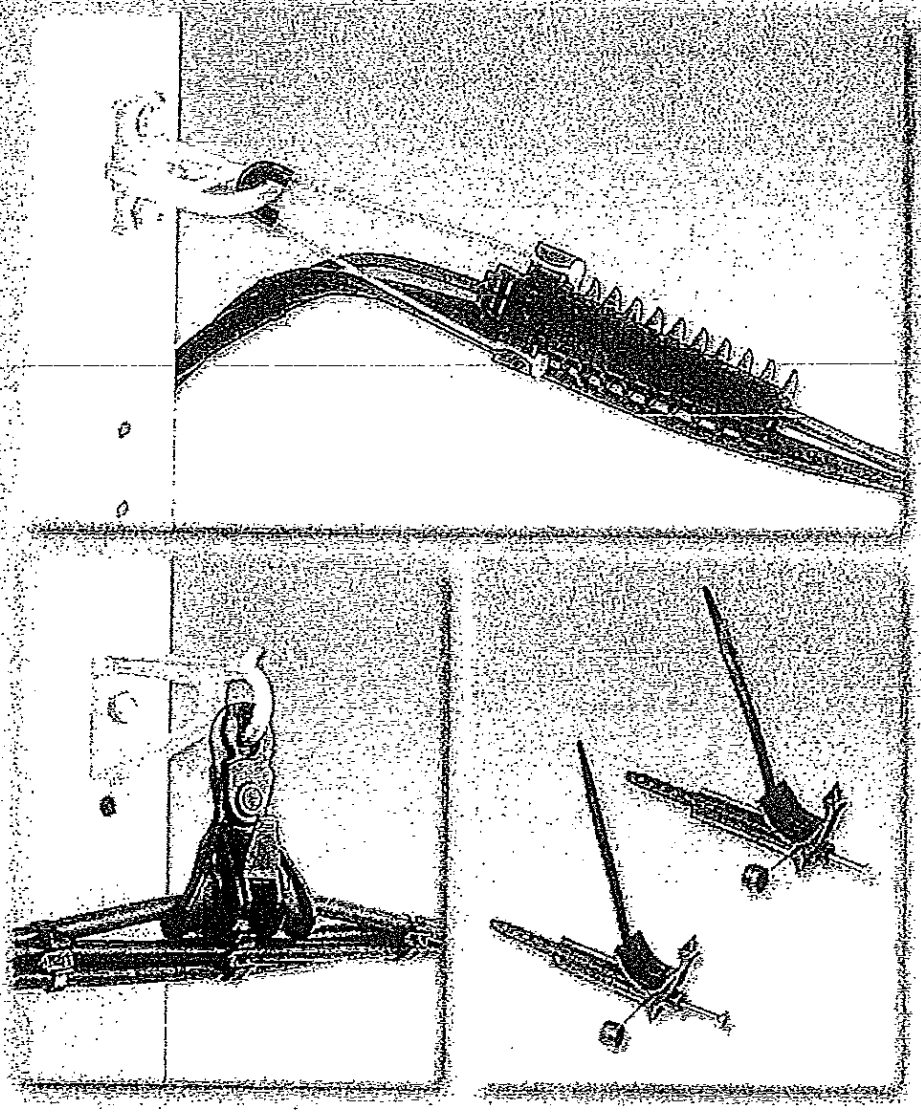
Réf.	Section *Area* *Sección* (mm²)	Ø avant rétreint *Ø before shrink* *Ø antes retracción* (mm)	Ø après rétreint *Ø after shrink* *Ø después retracción* (mm)	L (mm)	Code EDF
FRM 25-100	35 - 95	25	6	100	67 98 362
FRM 25-200	35 - 95	25	6	200	67 98 364
FRM 25-250	35 - 95	25	6	250	67 98 365
FRM 25-300	35 - 95	25	6	300	
FRM 30-100	95 - 150	30	9	100	67 98 373
FRM 30-200	95 - 150	30	9	200	67 98 374
FRM 30-400	95 - 150	30	9	400	
FRM 35-150	150 - 240	38	12	150	67 98 383
FRM 35-250	150 - 240	38	12	250	67 98 385
FRM 35-500	150 - 240	38	12	500	
FRM 40-100	240 - 630	40	12	100	
FRM 40-350	240 - 630	40	12	350	
FRM 40-500	240 - 630	40	12	500	



FRM

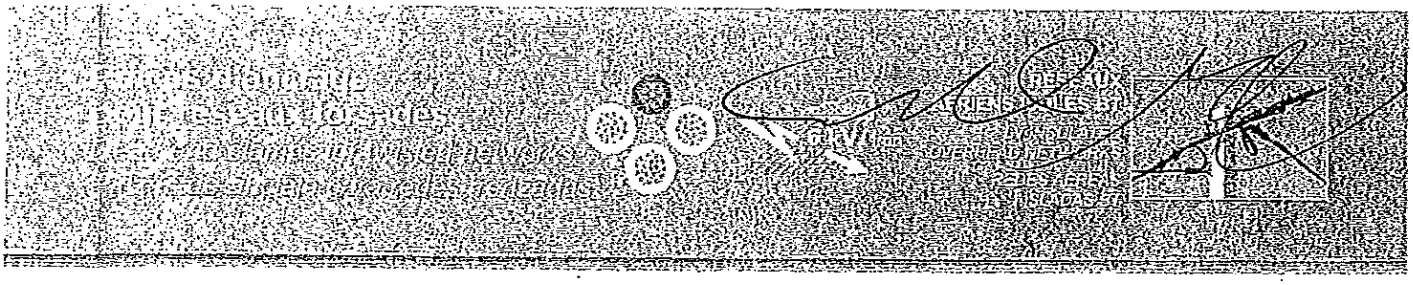
ВЯРНО С ОРИГИНАЛА

Réseaux aériens isolés BT
LV insulated overhead networks
Redes aéreas aisladas BT



Accessoires pour réseaux aériens BT
Accessories for LV overhead networks
Accesorios para redes aéreas BT

Fr 0821 03 / 02-2005



PA Neutre porteur isolé / *Insulated neutral messenger* / *Neutro portador aislado*

Pinces à coincement conique.

Utilisation sur câbles de section 16 à 120 mm² et constituées de :

- Un corps ouvert, en matière thermoplastique de haute résistance mécanique et d'excellente tenue aux agents extérieurs et au vieillissement.
- Une fourrure intérieure réalisée par deux clavettes en matière plastique isolante assurant le serrage du neutre porteur sans détériorer l'isolant.
- Une attache imperdable : cablette souple en acier inoxydable comportant une selle anti-usure mobile en matière isolante et deux embouts sertis aux extrémités pour assurer le verrouillage sur le corps de la pince.

CONFORME A LA NORME C 33-041 (02-99).

Conical wedge clamps.

Ranging from 16 to 120 mm² messenger cables and constitued by :

- *An opened thermoplastic body with very high mechanical and climatic resistance.*
- *An inner sheath consisting of two insulating plastic wedges ensuring the clamping of the neutral messenger without damaging cable insulation.*
- *An unloosable stainless steel flexible bail equipped with a movable insulating wear-resistant saddle and two sleeves compressed on the ends to be locked on the clamp body.*

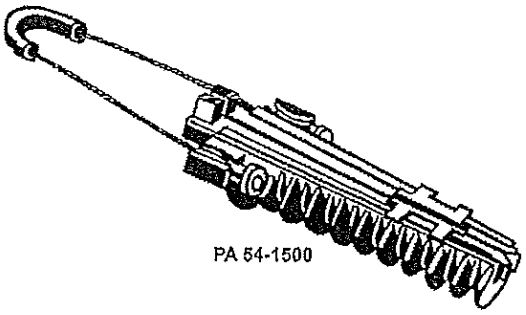
IN ACCORDANCE WITH C 33-041 (02-99) STANDARD.

Pinzas de acuñamiento cónico.

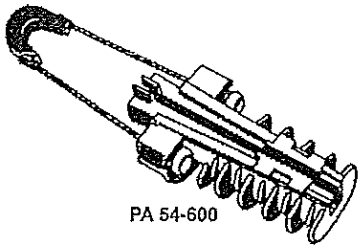
Utilización sobre cables portadores de 16 a 120 mm² y constituidas por :

- *Un cuerpo abierto, de materia termoplastic, de alta resistencia mecánica y excelente resistencia a los agentes exteriores y al envejecimiento.*
- *Un cuerpo interior, formado por dos cuñas en materia plástica aislante, que aseguran el apriete del neutro portador sin dañar su aislamiento.*
- *Un cablete flexible en acero inoxidable con guardacabo en plástico aislante y dos topes engastados en los extremos para asegurar el bloqueo, en el cuerpo de la pinza.*

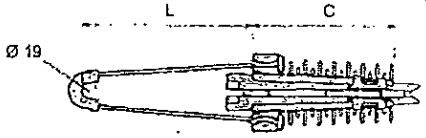
CONFORME A LA NORMA C 33-041 (02-99).



PA 54-1500



PA 54-600



Réf.	Section *Area* *Sección* (mm²)	Diamètre *Diameter* *Diámetro* (mm)	Rupture *Breaking* *Rotura* (Kg)	L (mm)	C (mm)	Réf. EDF	Code EDF
PA 120-2000	95 - 120	15 - 17,5	1 950	265	210		
PA 120-1100	95 - 120	15 - 17,5	1 100	215	176		
PA 95-2000	70 - 95	13 - 16	1 950	265	210		
PA 95-1100	70 - 95	13 - 16	1 100	215	176		
PA 95-600	70 - 95	13 - 16	600	128	133		
PA 70-2000	54 - 70	12 - 14	1 950	265	210	PA 2000	68 27 108
PA 70-900	50 - 70	11 - 14	900	215	174		
PA 70-600	50 - 70	11 - 14	600	128	133		
PA 54-1500	50 - 54	11 - 13,5	1 500	215	174	PA 1500	68 27 104
PA 54-600	35 - 54	10 - 13	600	128	133	PA 600	68 27 100
PA 50-1500	35 - 54	10 - 13	1 500	215	174		
PA 35-1000	25 - 35	8 - 11	1 000	130	133		
PA 35-600	25 - 35	8 - 11	600	130	133		
PA 29-800	29,5	9,5 - 10,4	780	130	133		
PA 25-600	16 - 25	6 - 9,5	600	130	130		
PA 25-200	16 - 25	6 - 9,5	200	130	73		
PA 16-400	16 - 25	6 - 9,5	400	130	130		

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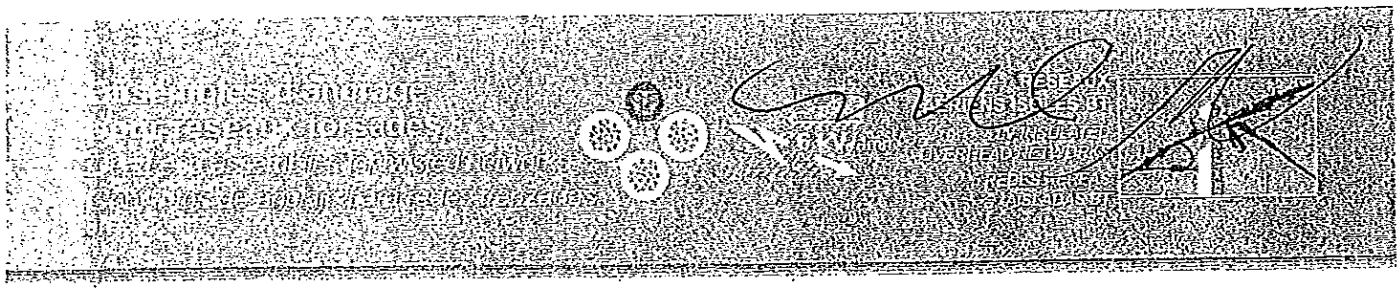


EAS / EADS / PA — Neutre porteur isolé / *Insulated neutral messenger / Neutro portador aislado*

Ancrages simples (EAS) ou doubles (EADS) des câbles préassemblés avec neutre porteur isolé.
Utilisation sur câbles porteurs de section 25 à 95 mm² et constitués de :

CONSOLE CS 10
Monobloc en alliage d'aluminium permettant l'ancrage simple ou double.
Fixation sur poteaux par deux liens en acier inoxydable 20 x 0,7 mm ou par boulons Ø 14 ou 16 mm.
CS 10 : 2 boulons (type EDF) pour 54,6 mm².
CS 10-2000 : 2 boulons (type EDF) pour 70 mm².
CS 10-3 : 1 ou 2 boulons.
CS 10-3-2000 : 1 ou 2 boulons.
CS 10-1500 : ancrage simple 1500 daN.

PINCE D'ANCRAGE PA
Pince à coincement conique constituée de :
- Un corps ouvert, en matière thermoplastique de haute résistance mécanique et d'excellente tenue aux agents extérieurs et au vieillissement.
- Une fourrure intérieure réalisée par deux clavettes en matière plastique isolante assurant le serrage du neutre porteur sans détériorer l'isolant.
- Une attache imperdable : cablette souple en acier inoxydable comportant une selle anti-usure mobile en matière isolante et deux embouts sertis aux extrémités pour assurer le verrouillage sur le corps de la pince.

CONFORME A LA NORME C 33-041 (02-99).

Single (EAS) or double (EADS) anchoring of twisted cables with insulated neutral messenger.
Ranging from 25 to 95 mm² messenger cables constituted by :

CS 10 BRACKET
Single piece, made of aluminium alloy allowing single or double anchoring.
Fixing on poles by two 20 x 0,7 mm stainless steel straps or by 14 or 16 mm diameter bolts.
CS 10 : 2 bolts (EDF type) for 54,6 mm².
CS 10-2000 : 2 bolts (EDF type) for 70 mm².
CS 10-3 : 1 ou 2 bolts.
CS 10-3-2000 : 1 or 2 bolts.
CS 10-1500 : single anchoring 1500 daN.

ANCHORING CLAMP PA
Conical wedge clamp composed of :
- *An opened thermoplastic body with very high mechanical and climatic resistance.*
- *An inner sheath consisting of two insulating plastic wedges ensuring the clamping of the neutral messenger without damaging cable insulation.*
- *An unloosable stainless steel flexible ball equipped with a movable insulating wear-resistant saddle and two sleeves compressed on the ends to be locked on the clamp body.*

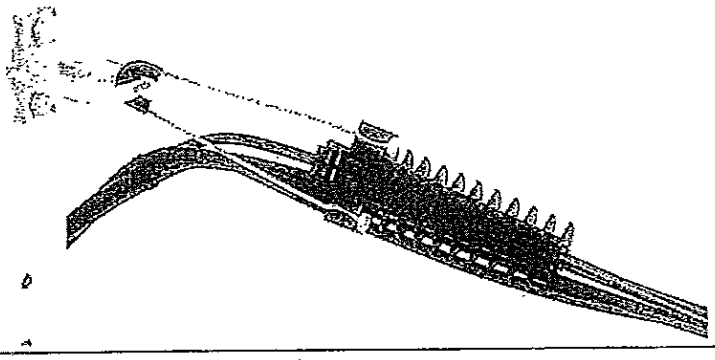
IN ACCORDANCE WITH C 33-041 (02-99) STANDARD.

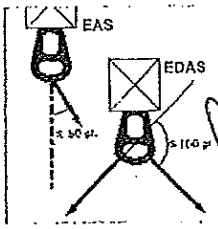
Anclajes simples (EAS) o dobles (EADS) de cables trenzados con neutro portador aislado.
Utilización sobre cables portadores de 25 a 95 mm² de sección y constituidos por :

CONSOLA CS 10
Monobloc en aleación de aluminio, permitiendo el anclaje simple o doble.
Fijación al poste, por dos flejes de acero inoxidable de 20 x 0,7 mm, o por pernos de Ø 14 o 16 mm.
CS 10 : 2 pernos (tipo EDF) para 54,6 mm².
CS 10-2000 : 2 pernos (tipo EDF) para 70 mm².
CS 10-3 : 1 o 2 pernos.
CS 10-3-2000 : 1 o 2 pernos
CS 10-1500 : anclaje simple 1500 daN.

PINZA DE ANCLAJE PA
Pinza de acuñamiento cónico, constituida por :
- *Un cuerpo abierto, de matreria termoplastic, de alta resistencia mecánica y excelente resistencia a los agentes exteriores y al envejecimiento.*
- *Un cuerpo interior, formado por dos cuñas en material plástico aislante, que aseguran el apriete del neutro portador sin dañar su aislamiento.*
- *Un cablete flexible en acero inoxidable con guardacabo en plástico aislante y dos topes engastados en los extremos para asegurar el bloqueo, en el cuerpo de la pinza.*

CONFORME A LA NORMA C 33-041 (02-99).





Console CS 10 permettant l'ancrage simple ou double.
CS 10 bracket allowing single or double anchoring.
Consola CS 10 para anclaje simple o doble.

Réf.	Section *Area* *Sección* (mm²)	Diamètre *Diameter* *Diámetro* (mm)	Rupture *Breaking* *Rotura* (kg)	Composition *Composition* *Composición*	Réf. EDF	Code EDF
PA 120-2000	95 - 120	15 - 17,5	2 000			
PA 95-2000	70 - 95	13 - 16	1 950			
PA 70-2000	54 - 70	12 - 14	1 950		PA 2000	68 27 108
PA 54-1500	50 - 54	11 - 13,5	1 500		PA 1500	68 27 104
PA 35-1000	25 - 35	8 - 11	1 000			
PA 25-600	16 - 25	6 - 9,5	600			
EAS 95-10 / EAS 95-3 *				1 CS 10-2000 / 1 CS 10-3-2000 + 1 PA 95-2000		
EAS 70-10 / EAS 70-3 *				1 CS 10-2000 / 1 CS 10-3-2000 + 1 PA 70-2000	EA 2000	68 25 034
EADS 70-10 / EADS 70-3 *				1 CS 10-2000 / 1 CS 10-3-2000 + 2 PA 70-2000	EAD 2000	68 25 042
EAS 54-10 / EAS 54-3 *				1 CS 10 / 1 CS 10-3 + 1 PA 54-1500	EA 1500	68 25 030
EADS 54-10 / EADS 54-3 *				1 CS 10 / 1 CS 10-3 + 2 PA 54-1500	EAD 1500	68 25 038
EAS 35-10 / EAS 35-3 *				1 CS 10 / 1 CS 10-3 + 1 PA 35-1000		
EADS 35-10 / EADS 35-3 *				1 CS 10 / 1 CS 10-3 + 2 PA 35-1000		
EAS 54-1500				1 CS10-1500 + 1 PA 54-1500		

*** Ensemble avec console 3 trous** / *Assembly with 3 holes bracket / Conjunto con consola 3 agujeros*

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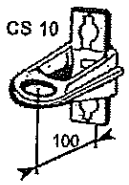
CS 10 / CS 10-3

Consoles pour simple ou double ancrage sur poteaux.
Fixation par 1 ou 2 boulons (CS 10 : 2 boulons) ou feuillard.

Brackets allowing single or double fixation to poles.
Fixing by 1 or 2 bolts (CS 10 : 2 bolts) or strap.

Consolas para simple o doble anclaje sobre postes.
Fijación por 1 o 2 pernos (CS 10 : 2 pernos) o fleje.

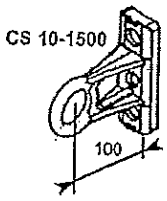


CS 10-1500

Console simple ancrage sur poteaux.
Fixation par 1 ou 2 boulons ou feuillard.

Bracket allowing single fixation to poles.
Fixing by 1 or 2 bolts (CS 10 : 2 bolts) or strap.

Consola para simple anclaje sobre postes.
Fijación por 1 o 2 pernos (CS 10 : 2 pernos) o fleje.

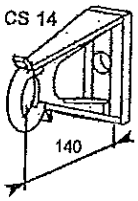


CS 14

Console de suspension pour alignement.
Fixation par boulon ou feuillard.

Suspension bracket.
Fixing by bolts or strap.

Consola de suspensión para alineado.
Fijación por pernos o fleje.

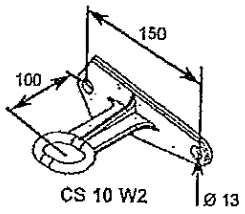


CS 10 W2

Console bipode pour ancrage simple dans le plan de la façade.

Double-point fixing bracket for single dead ending on walls front-face.

Consola bipode para anclaje simple en el plano de la fachada.

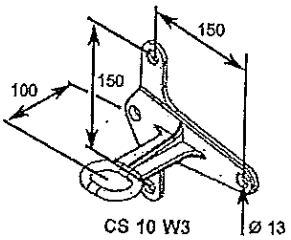


CS 10 W3

Console tripode pour ancrage simple perpendiculaire à la façade et pour ancrage double.

Triple-point fixing bracket to be used perpendicularly to wall front face for single and double dead ending.

Consola trípode para anclaje simple y doble perpendicular a la fachada.



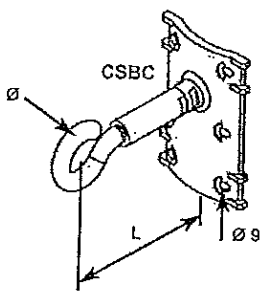
CSBC

Consoles "crochet" en acier galvanisé à chaud pour ancrage ou suspension sur poteau ou façade.
Fixation par 4 ou 6 boulons Ø 8 mm ou feuillard.

Hot dip galvanized steel hook brackets for dead end or suspension to pole or wall.
Fixing by 4 or 6 bolts Ø 8 mm or strap.

Consolas "gancho" de acero galvanizado en caliente para anclaje o suspensión sobre poste o fachada.
Fijación por 4 o 6 pernos Ø 8 mm o fleje.

Réf.	Ø (mm)	L (mm)
CSBC 1207	12	70
CSBC 1407	14	70
CSBC 1607	16	70
CSBC 2007	20	70
CSBC 1413	14	130
CSBC 1613	16	130

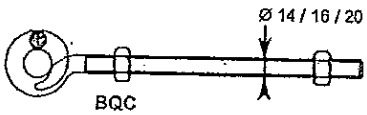


BQC 14 / 16 / 20

Boulons queue de cochon en acier galvanisé à chaud.

Pigtail bolts made of hot dip galvanized steel.

Pernos cola de cerdo en acero galvanizado en caliente.

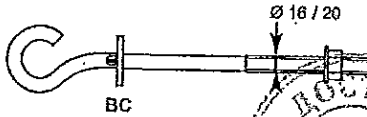


BC 16 / 20

Boulons crochet en acier galvanisé à chaud.

Hook bolts made of hot dip galvanized steel.

Pernos en acero galvanizado en caliente con gancho.



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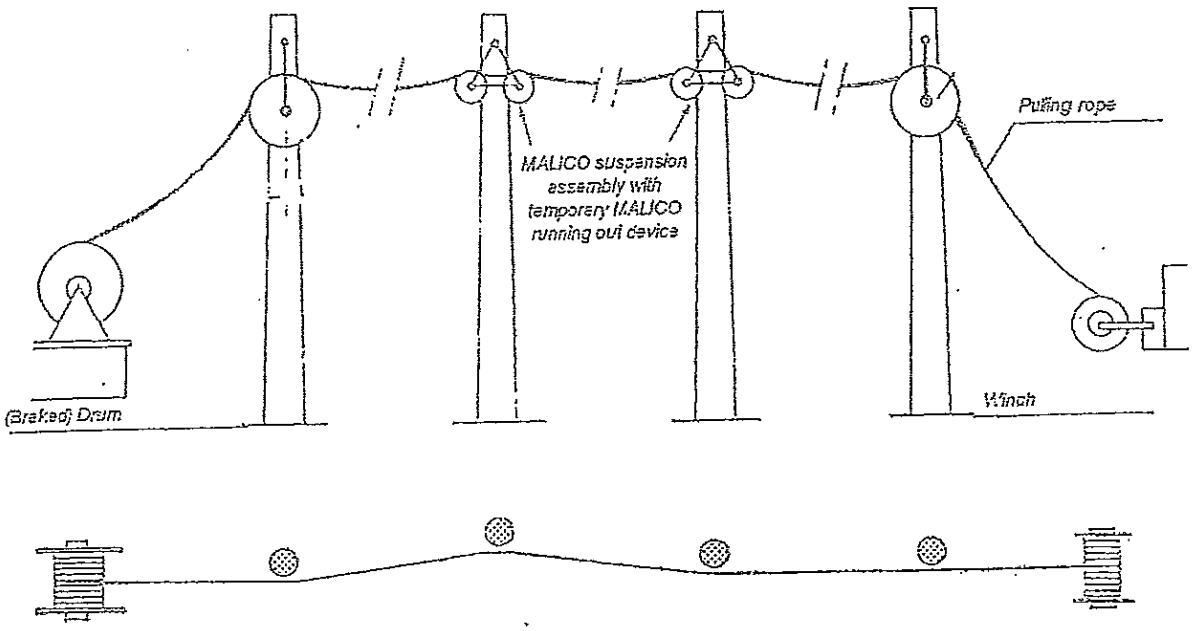
RUNNING OUT AND STRINGING A M.V. ABC WITH MALICO SPECIALIZED ACCESSORIES

3.1

FRONT VIEW



Although they have been introduced several years ago, messengers M.V. ABC cables running out and stringing are not simple operations.
Whilst dead-ends are rather easy to install, suspension accessories require a special attention.

In view of :

- cutting the installation time and relevant cost,
- guaranteeing the safety of the lineman,
- eliminating the use of bucket trucks, etc, ...
- maintaining the total integrity of the cable, and easing the running out of a trunk of line,

MALICO has developped in the early 80 ies and manufactures since, a safe and easy to operate running out and stringing roller device that is hung from the bracket of the suspension assembly to provide a safe suspension point during the running out and stringing operations till the final tensioning is effected.

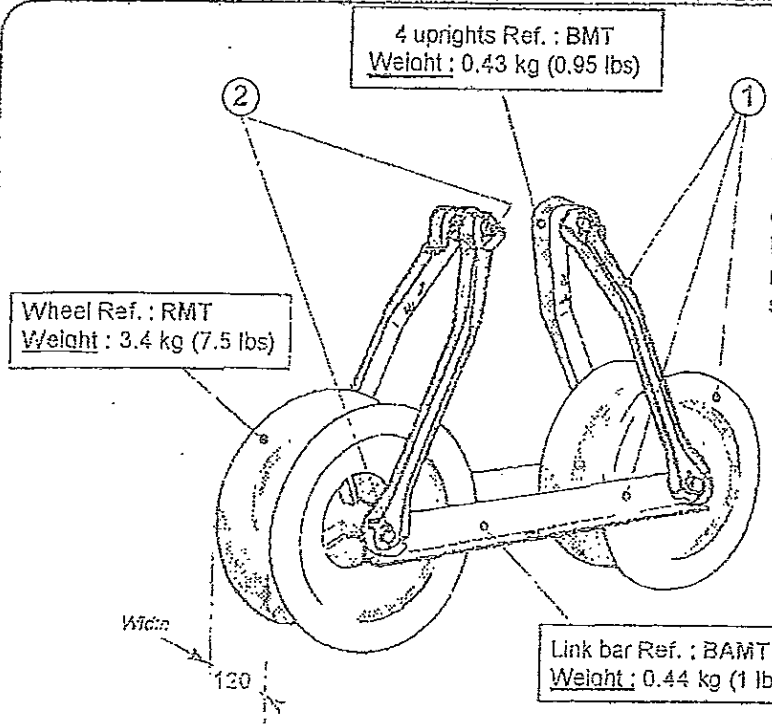
The device which has been developped under the guideance of Electricité de FRANCE is :

- light and simple to use, being temporarily hooked under the suspension assembly.
- money saving.
- highly efficient.

as it enables a lineman alone to complete a suspension.

RUNNING OUT AND STRINGING DEVICE (PULLEYS) (for M.V. ABC cable)

3.2



Reference MALICO : PO 1500 MTI

This is a simple and handy device that allows easy and safe running and stringing of an ABC M.V. line. It is easily hooked under the bracket of a ES 50 25 suspension assembly and may be quickly removed as soon as the ABC messenger has been transfered in the suspension clamp saddle.

Materials :

① aluminium alloy.
② steel.
Pins : stainless steel.
The groove of the pulley wheel is covered with epoxy.

Total weight : 0.10 kg (0.22 lbs)

Pulleys wheels shafts are mounted onto self lubricated bearings.
All parts can be quickly disassembled with a hammer and a broach.

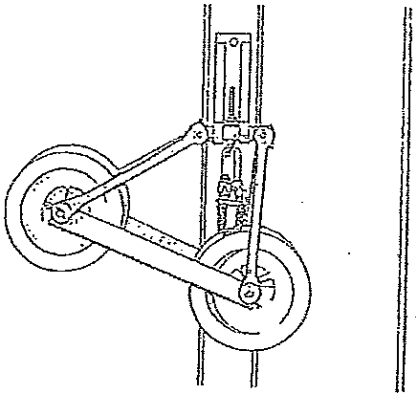
Guaranteed failing load : 3.000 daN

Outside dimensions (folded) : 600 x 300 x 250 mm

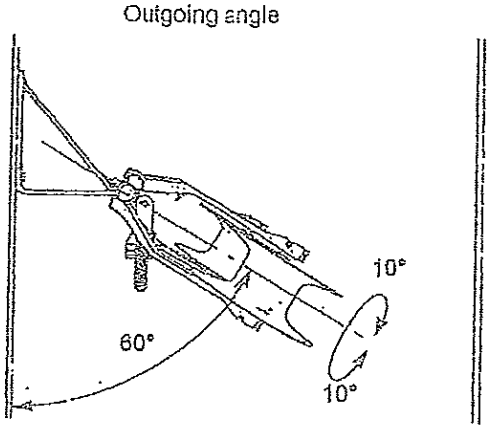
Feature : When transfering the steel messenger into the suspension clamp saddle the whole ABC remains captured inside the 4 uprights of the assembly for a total safety of the linesman.

Possible movement during running out and stringing :

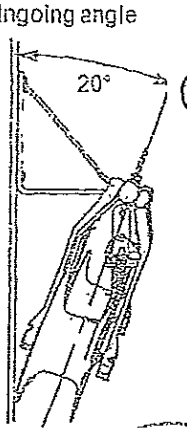
Up-hill and down-hill poles



Outgoing angle

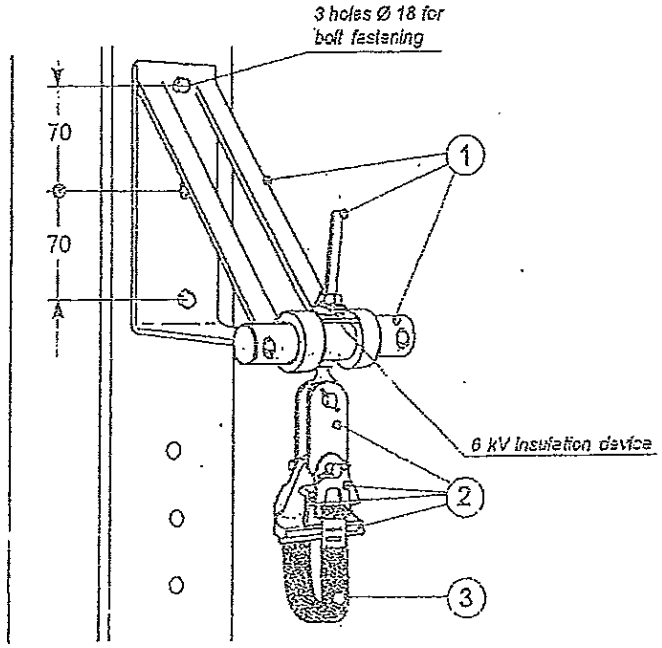


Ingoing angle



SUSPENSION ASSEMBLY
(for M.V. ABC with 50 and 70 mm² steel messenger)

3.3



E.D.F. reference : ES 50 25
E.D.F. nomenclature : 68 50 101

Materials :

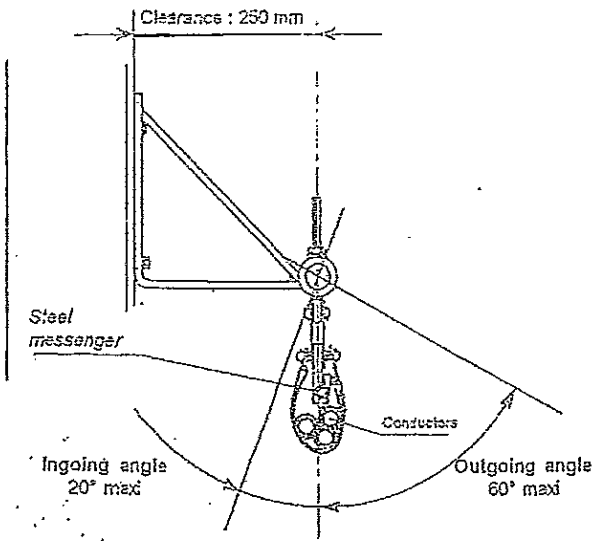
① Bracket, rod and eye bolt : hot dip galvanized steel.
② Links and suspension clamp : high strength alu. alloy.
③ Suspension strap : polyester.

Weight : 6 kg (13.2 lbs)

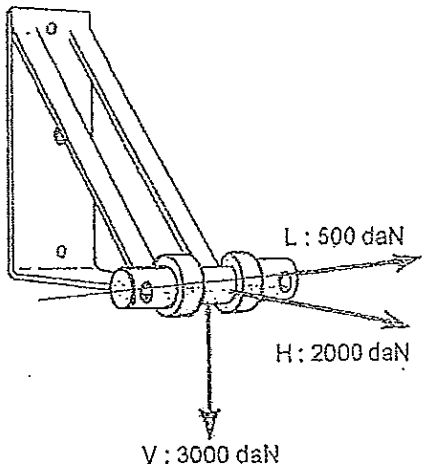
Guaranteed failing load of the alu. alloy, suspension clamp alone : 2000 daN

Feature : The eye bolt enables to fit the suspension clamp easily and safely by merely turning the hexagonal nut.

Possible movement



Guaranteed failing loads (*)



(*) Loads are not applied simultaneously.

) reserves the right to modify specifications without prior notice.

ВЯРНО СЪОТВЕТНАЛА

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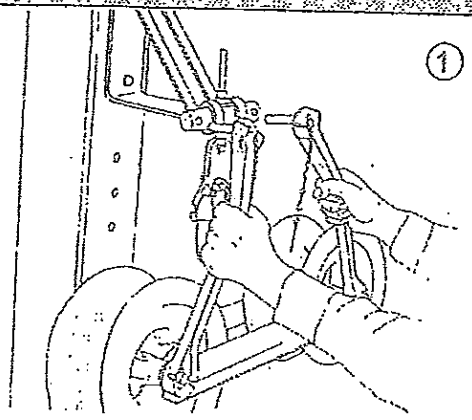
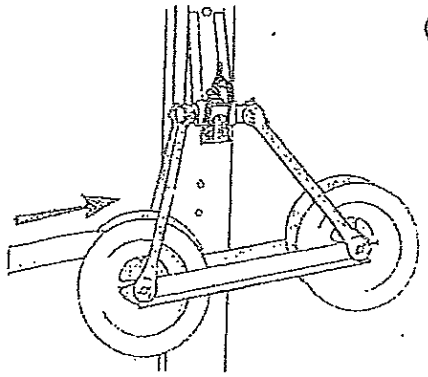
INSTALLING AND REMOVING THE RUNNING OUT DEVICE AFTER FINAL TENSIONING

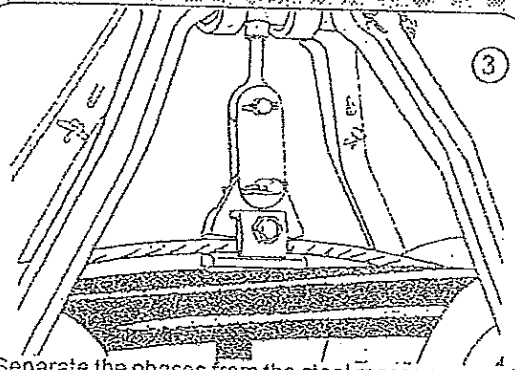
3.4



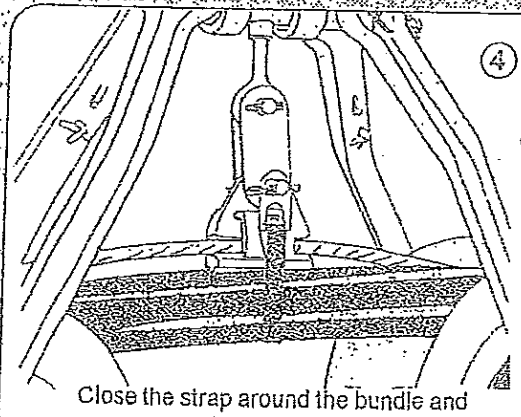
Hang the device to the bracket rod as shown.



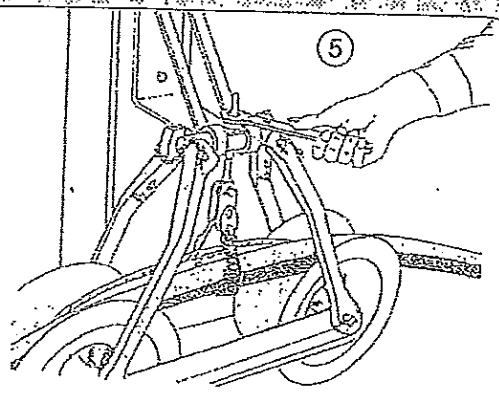
Run the ABC through the pulleys and tension it.



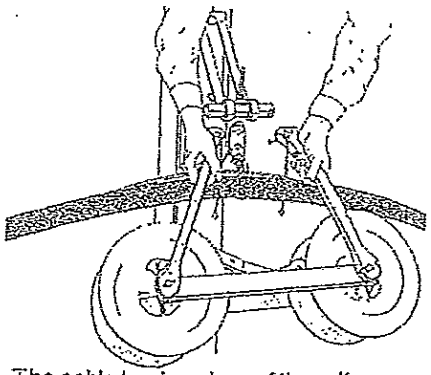
Separate the phases from the steel messenger and install same in the saddle of the cast aluminium alloy suspension clamp.



Close the strap around the bundle and lock its end.



Lift the messenger by tightening the hex. nut till stop.

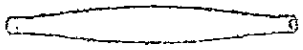


The cable beeing clear of the rollers, remove the running out device.

ВЯРНО СЪОТГИНАЛА

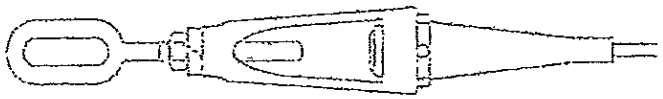
MECHANICAL ACCESSORIES
(for M.V. ABC cable with 50 mm² covered or not steel messenger (*))

3.5



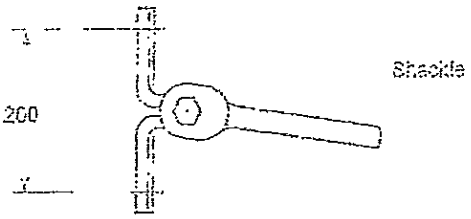
Automatic wedge type.

PREINSULATED MID-SPAN FULL TENSION JOINT
Reference : MJCC 50
E.D.F. nomenclature : 87 25 201
Weight : 0.7 kg (1.6 lbs)



Automatic wedge type.

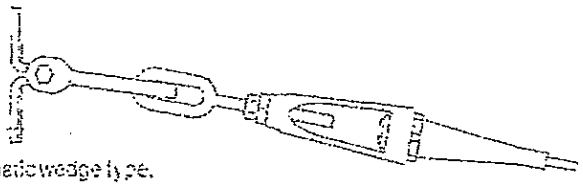
ANCHOR CLAMP
Reference : MACC 50
E.D.F. nomenclature : 68 50 111
Weight : 1.3 kg (3 lbs)



The shackle is also suitable for a double dead-end.

BRACKET
Reference : CSA 10

Weight : 2.4 kg (5.5 lbs)

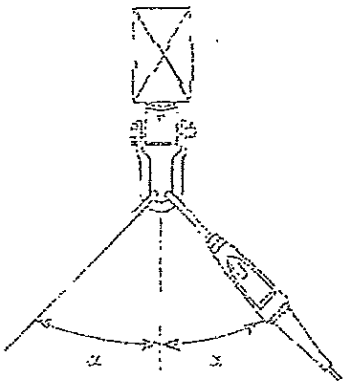


Automatic wedge type.

SINGLE DEAD-END ASSY
Reference : EACC 50 10
E.D.F. nomenclature : 68 50 121
Weight : 3.7 kg (8 lbs)

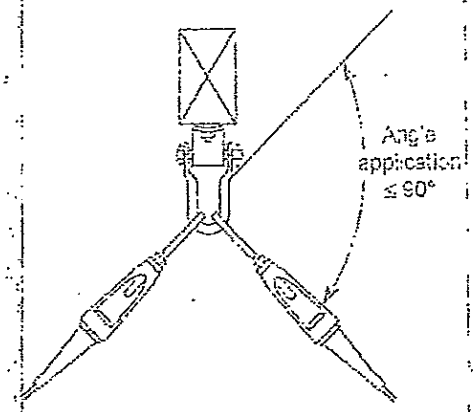
APPLICATION LIMITS

Single dead-end



Angle α <= 45°

Double dead-end



(*) Other sizes of accessories and compression fittings : consult

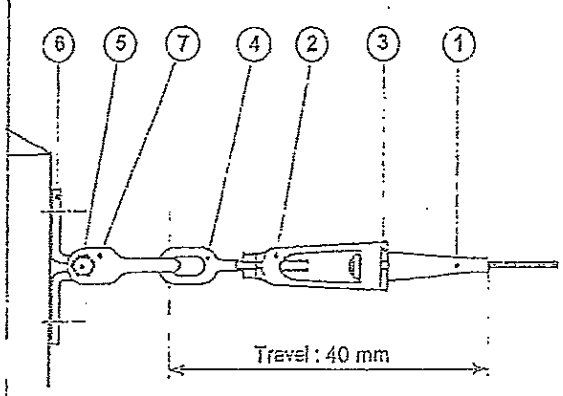
Protection by height to ensure specified safety clearance to ground.

ВЯРНО С ОРИГИНАЛА

294

INSTRUCTIONS FOR INSTALLATION AND OPERATION OF WEDGE-TYPE ANCHOR CLAMPS AND MID-SPAN FULL TENSION JOINTS FOR 50 mm² STEEL MESSENGERS

3.6



ANCHOR CLAMP MACC 50

Is composed of :

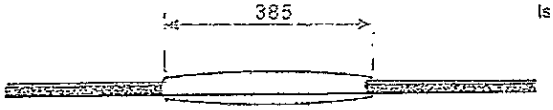
- a high strength alu alloy tapered outer sleeve 1 which is factory insulated with a heat shrink tube.
- cadmium plated toothed jaws sliding in the tapered bore of the alu alloy sleeve grip and hold the stripped end of the steel messenger.
- a cable guide plus a seal arranged inside the mouth of the alu alloy sleeve (span side) which provide a funnel entry of the messenger yet seal out the connection and the messenger against the ingress of moisture and pollutants.
- a high strength alu alloy tensioner body 2 that enables to finely adjust the stringing tension.
- a high strength alu alloy installation ring 3
- a galvanized steel eye-type threaded rod 4.

On the tapered sleeve outer surface are clearly indicated the stripped length of the messenger (152 mm) as well as the anchor reference MACC 50.

BRACKET ASSEMBLY CSA 10

Is composed of :

- a base 6 and a shackle 7 both hot dip covered with RILSAN which are free to rotate about a hinge-bolt 5.
- a highly resistant thermoplastic sleeve surrounds the bolt 5 and electrically insulates the anchor clamp from the pole.



MID-SPAN FULL TENSION JOINT MJCC 50

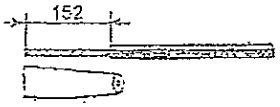
Is composed of :

- a high strength alu alloy double tapered sleeve which is factory insulated with a heat shrink tube.
- a set of cadmium plated toothed jaws in either half bore of the joint sleeve which grip the stripped end of the corresponding messenger end.
- a cable guide plus a seal arranged inside each mouth of the alu alloy sleeve which provide a funnel entry of the messenger yet seal out the connection and the spliced messengers against the ingress of moisture and pollutants.

On the tapered sleeve outer surface are clearly indicated the stripped lengths (152 mm) as well as the joint reference (MJCC 50).

INSTALLATION

1

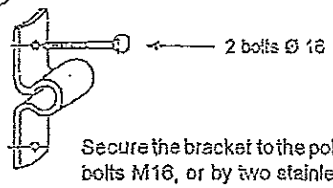


Remove the messenger insulation on the length indicated on the outer sleeve i. e. 152 mm.

2

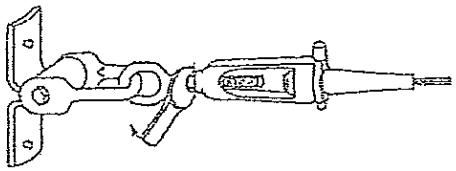
Introduce the messenger in the anchor clamp or joint (both sides) till stop as shown.

3



Secure the bracket to the pole, either by two bolts M16, or by two stainless steel straps 20 x 0,7 mm.

4



Insert the shackle in the eye end of the anchor and install the hinge-bolt with its insulating sleeve as shown.
The stringing tension may be finely adjusted by driving the anchor clamp tensioner body with a 27 mm A/F spanner : the outer sleeve kept fixed by holding the installation ring stud with a short piece of tube.

ВЯРНО СОРИГИНАЛА

295

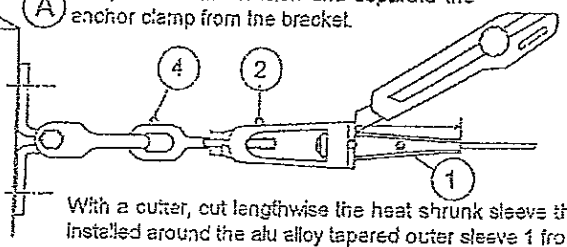
INSTRUCTIONS FOR OPERATION OF WEDGE-TYPE ANCHOR CLAMPS AND MID-SPAN FULL TENSION JOINTS FOR 50 mm² STEEL MESSENGERS

3.7

- Important :

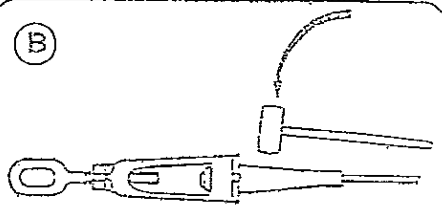
The tapered outer sleeve 1 homes a "fool proof" automatic clamping device integrating toothed jaws that grip and hold the stripped end of the messenger when and only when its stripped end is fully introduced. It is therefore totally useless to proceed to a control of this insertion.
Indeed, the eye-type threaded rod alone 4 allows by itself for a sufficient travel to finely adjust the stringing tension in the span.
Releasing - removal of the anchor clamp MACC 50.
The releasing-removal of the messenger may only be done in case of absolute necessity, since the anchor clamp will be lost, when, for instance, the adjustment of the stringing tension in the span is no longer possible because the necessary precaution that had to be taken i.e. : the initial position "eye threaded rod 4 relative to the body 2" has not been taken.

(A) First, release the tension and separate the anchor clamp from the bracket.



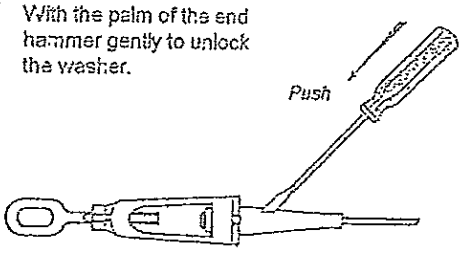
With a cutter, cut lengthwise the heat shrunk sleeve that is installed around the alu alloy tapered outer sleeve 1 from its pole side end to its messenger side end, taking care of not hurting the messenger insulation.
Remove and throw away the sleeve.

(B)

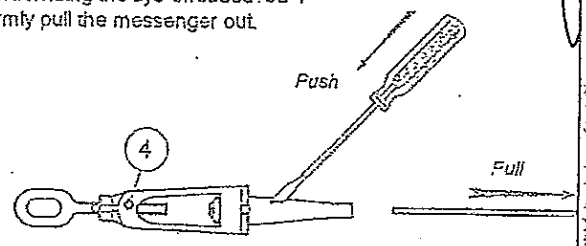


With a wooden hammer, hammer gently the outer sleeve 1 to loosen the internal toothed jaws.

(C) A slot will appear in which the 5 to 7 mm wide tip of a screwdriver may be introduced and rest on a visible washer.
With the palm of the end hammer gently to unlock the washer.



(D) Keeping the pressure on the screwdriver and holding the eye-threaded rod 4 firmly pull the messenger out.



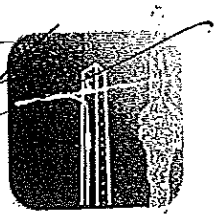
It is recommended not to reinstall an anchor clamp that has undergone the preceeding operation since first the messenger might not be properly inserted and second it is necessary to install a new heat shrink sleeve to guarantee the watertightness of the messenger.

FULL TENSION JOINT MJCC 50

The releasing operation will never be required since, like for the anchor clamp MACC 50, each of the two internal automatic clamping devices does not grip the matching messenger until same is fully introduced thereby guaranteeing a "fool-proof" installation.
So never try to release a joint.

1134

ВЯРНО СОРЕГУНАЛА

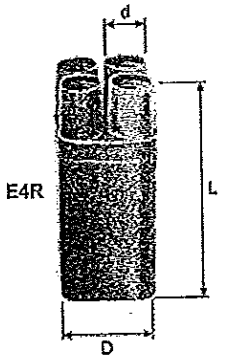


E2R ... / E4R ...

Extrémités thermo-rétractables avec compound d'étanchéité pour câbles à deux ou quatre conducteurs.
Two or four conductors heat shrink terminations with sealing compound.
Terminaciones termoretractables con compound de estanquidad para cables de dos o cuatro conductores.

Réf.	Section Area Sección (mm²)	D (mm) a	D (mm) b	d (mm) a	d (mm) b	L (mm) a	L (mm) b	Code EDF
E2R 10-35	4 - 35	30	8	14	3	70	100	67 98 316
E4R 1,5-10	1,5 - 10	28	8,5	10	1,8	72	85	
E4R 10-35	4 - 35	35	15	15	3	85	125	67 98 302
E4R 50-150	50 - 150	60	25	25	6	130	170	67 98 303
E4R 240	95 - 240	100	33	35	12,8	170	220	67 98 304

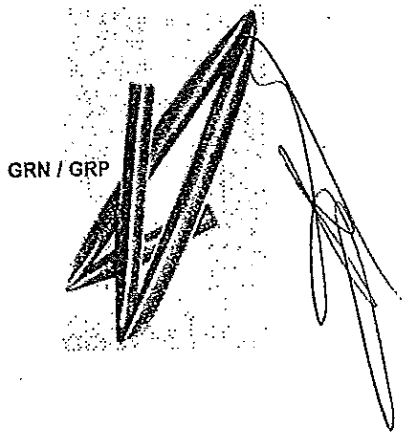
a : Avant rétreint / *Before shrink* / *Antes retracción.*
b : Après rétreint / *After shrink* / *Después retracción.*



GRN ... / GRP ...

Gaines thermo-rétractables pour câbles souterrains sans compound d'étanchéité.
Heat shrink sheaths for underground cables without sealing compound.
Vainas termoretractables para cables subterráneos sin compound de estanquidad.

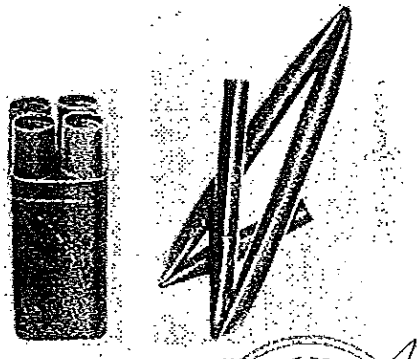
Réf.	Section Area Sección (mm²)	Ø avant rétreint Ø before shrink Ø antes retracción (mm)	Ø après rétreint Ø after shrink Ø después retracción (mm)	Cdt Packag. Acodiciona.	Code EDF
GRN 10-35	10 - 35	10	5	10 m	67 98 323
GRN 35-95 / GRP 50-150	35 - 150	20	6	10 m	67 98 325 / 331
GRP 240	70 - 240	40	12	10 m	67 98 333
GRP 500	240 - 500	50	25	10 m	

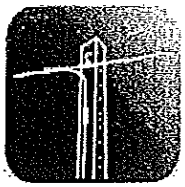


E2R ... GRN / E4R ... GRN

Extrémités et gaines thermo-rétractables pour câbles souterrains de branchement.
Heat shrink terminations and sheaths for underground service cables.
Terminaciones y vainas termoretractables para cables subterráneos de acometida.

Réf.	Section Area Sección (mm²)	Conditionnement Packaging Acodicionamiento	Code EDF
E2R 10-35 GRN	10 - 35	E2R 10-35 + 1 m GRN 10-35	67 98 329
E4R 10-35 GRN	10 - 35	E4R 10-35 + 3 m GRN 10-35	67 98 330

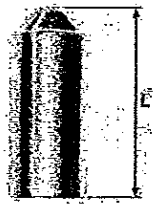




CRB ... / CRR ...

Capuchons d'extrémités thermo-rétractables avec compound d'étanchéité pour conducteurs.
Heat shrink cable ends with sealing compound for conductors.
Extremidades de cables termoretractables con compound de estanquidad para conductores.

Réf.	Section *Area* *Sección* (mm²)	Ø avant rétreint *Ø before shrink* *Ø antes retracción* (mm)	Ø après rétreint *Ø after shrink* *Ø después retracción* (mm)	L (mm)	Code EDF
CRB 6-16	6 - 16	10	3	35	
CRB 10-25	10 - 35	15	4,5	45	67 29 403
CRR 16-70	16 - 95	20	6	63	67 29 408
CRR 150	95 - 150	25	8,5	70	67 29 410

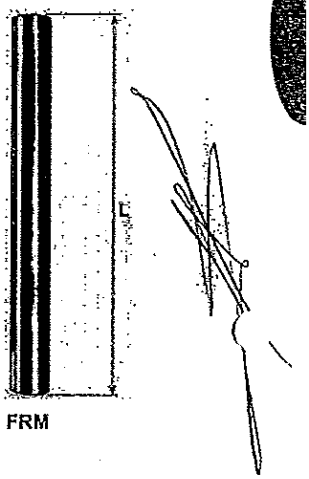


CRB / CRR

FRM ...

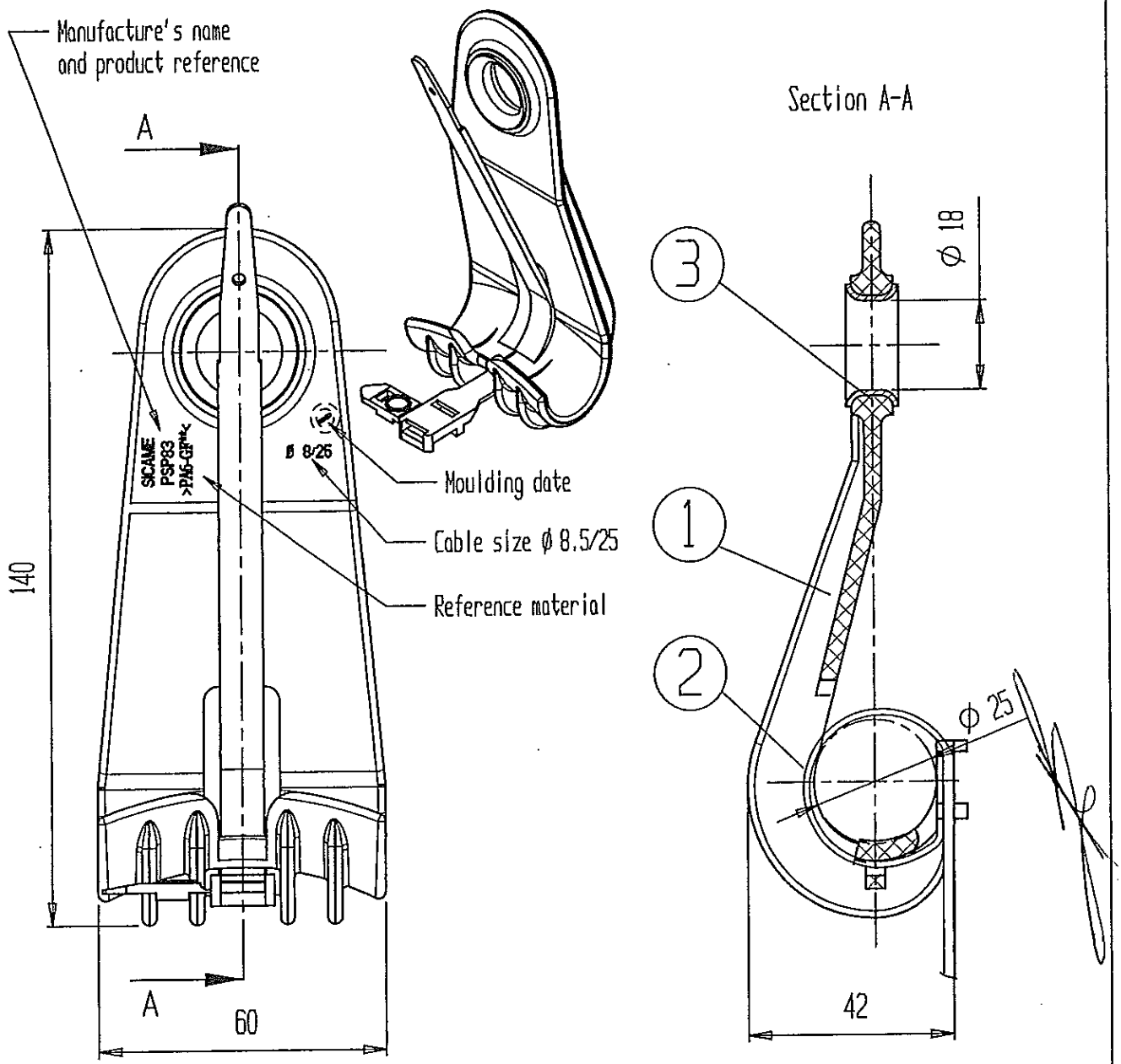
Fourreaux thermo-rétractables pour manchons avec compound d'étanchéité.
Heat shrink midspan joint protectors with sealing compound.
Protectores termoretractables para manguitos con compound de estanquidad.

Réf.	Section *Area* *Sección* (mm²)	Ø avant rétreint *Ø before shrink* *Ø antes retracción* (mm)	Ø après rétreint *Ø after shrink* *Ø después retracción* (mm)	L (mm)	Code EDF
FRM 25-100	35 - 95	25	6	100	67 98 362
FRM 25-200	35 - 95	25	6	200	67 98 364
FRM 25-250	35 - 95	25	6	250	67 98 365
FRM 25-300	35 - 95	25	6	300	
FRM 30-100	95 - 150	30	9	100	67 98 373
FRM 30-200	95 - 150	30	9	200	67 98 374
FRM 30-400	95 - 150	30	9	400	
FRM 35-150	150 - 240	38	12	150	67 98 383
FRM 35-250	150 - 240	38	12	250	67 98 385
FRM 35-500	150 - 240	38	12	500	
FRM 40-100	240 - 630	40	12	100	
FRM 40-350	240 - 630	40	12	350	
FRM 40-500	240 - 630	40	12	500	

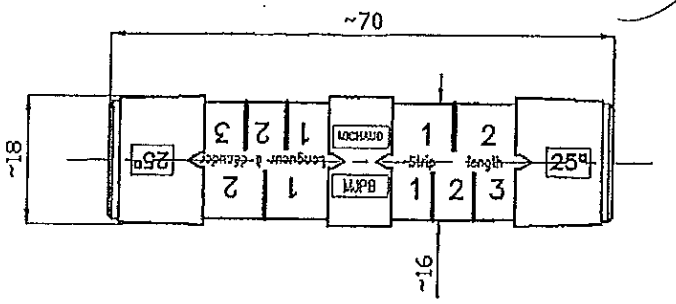


FRM

REFERENCE	TITLE	N° E02 105 00
PSP 83	SUSPENSION ASSEMBLY PSP 83	Revision N° : B Date/By: 14/02/06 DD Verified by:



Prt	Qty	Description	Material
1	1	Suspension clamp PSP 83	Polyamid GF - Black
2	1	Strap CCD 9-42	Polyamid - Black
3	1	Metal insert	Stainless steel



CODE	DESIGNATION
K30	MANCHON PREISOLE (140) MJPB 6
K31	MANCHON PREISOLE (140) MJPB 10-6
K32	MANCHON PREISOLE (140) MJPB 16-6
K33	MANCHON PREISOLE (140) MJPB 25-6
K35	MANCHON PREISOLE (140) MJPB 10-
K36	MANCHON PREISOLE (140) MJPB 16-10
K37	MANCHON PREISOLE (140) MJPB 25-10
K39	MANCHON PREISOLE (140) MJPB 16
K40	MANCHON PREISOLE (140) MJPB 25-16
K53	MANCHON PREISOLE (140) MJPB 35-16
K42	MANCHON PREISOLE (140) MJPB 25
K54	MANCHON PREISOLE (140) MJPB 35-25
K55	MANCHON PREISOLE (140) MJPB 35

REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
01.04.04	RB	GB		

SERIE(S)

DOT: DOSEXP
PRODUITS

COMPOSANT | SOUS-COMPOSANT

MJPB

MICHAUD BUREAU D'ETUDES
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

ECHELLE 1:1
A4

INDICE
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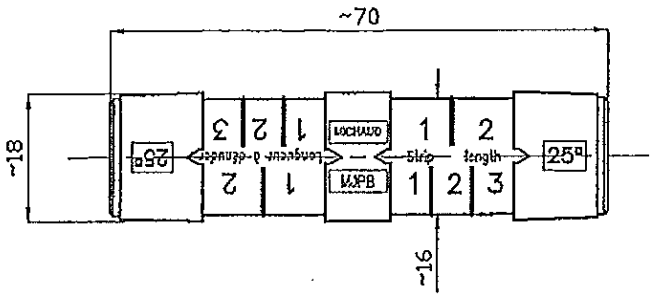
D741

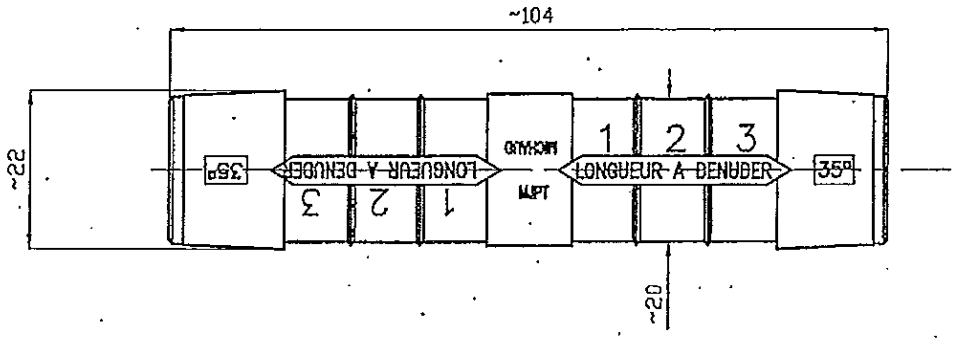
	REFERENCE	TITLE	N° E12 106 22
		MJPB	Revision 8 Date/By 22-01-2002 LD Checked by



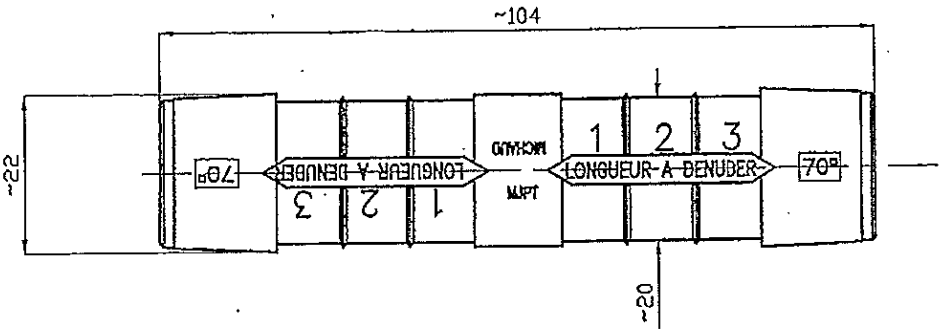
DESIGNATION
MANCHON PREISOLE (140) MJPB 6
MANCHON PREISOLE (140) MJPB 10-6
MANCHON PREISOLE (140) MJPB 16-4
MANCHON PREISOLE (140) MJPB 16-6
MANCHON PREISOLE (140) MJPB 25-6
MANCHON PREISOLE (140) MJPB 10-
MANCHON PREISOLE (140) MJPB 16-10
MANCHON PREISOLE (140) MJPB 25-10
MANCHON PREISOLE (140) MJPB 16
MANCHON PREISOLE (140) MJPB 25-16
MANCHON PREISOLE (140) MJPB 35-16
MANCHON PREISOLE (140) MJPB 25
MANCHON PREISOLE (140) MJPB 35-25
MANCHON PREISOLE (140) MJPB 35

RETREINT HEXAGONAL 140

REFERENCE	TITLE	N° E12 206 22
	MJPT 35	Revision B Date/By 22-11-2002 LD Checked by

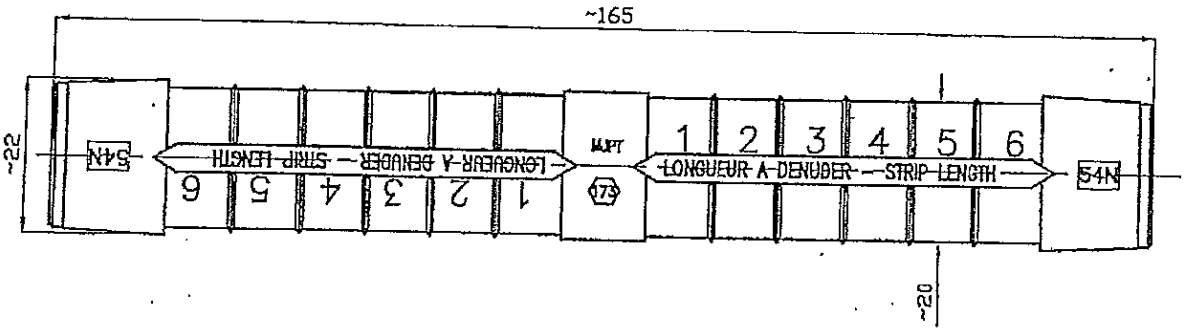


REFERENCE	TITLE	N° E12 226 22
	MJPT 70	Revision B Date/By 20-11-2002 LD Checked by



RETREINT
HEXAGONAL
173

303



REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE
DATE	DESSINE	VERIFIE	MODIFICATIONS		INDICE
16.08.01	CG				

SERIE(S)

DOSEXP
PRODUITS

ECHELLE 1:1

MJPT 54N
K115

MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

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A4

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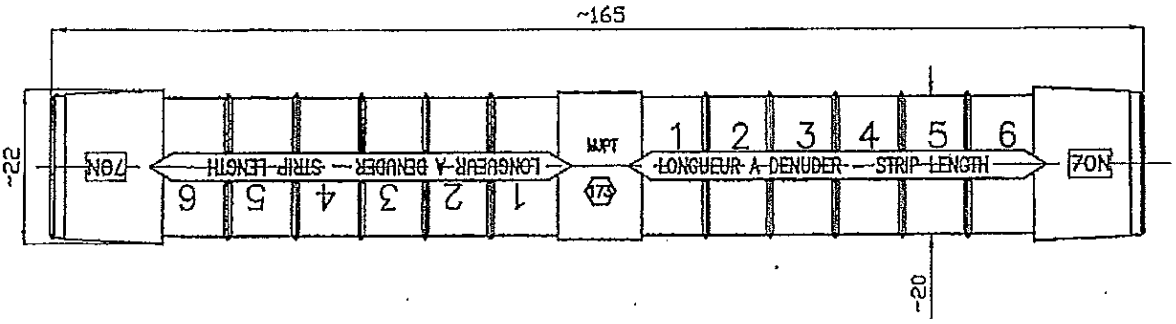


REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

DOSEXP
PRODUITS

ECHELLE 1:1

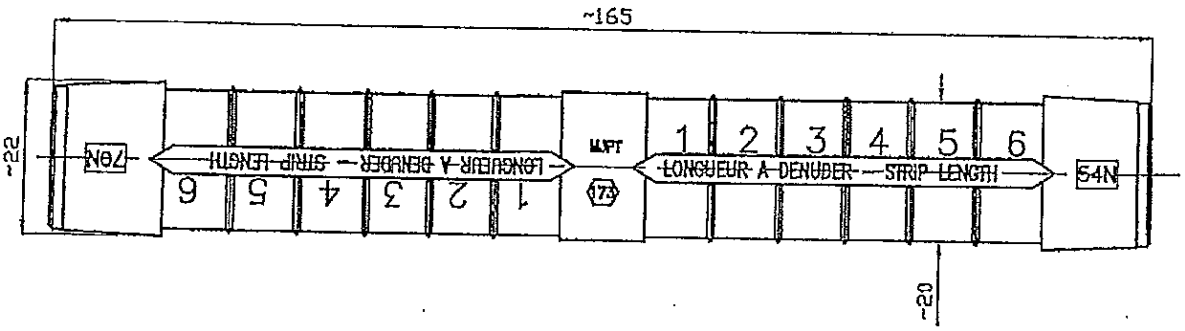
MJPT 7ON
K116

MICHAUD

Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

A4	D669	00

ВЯРНО С ОРИГИНАЛА



REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

DOSEXP
PRODUITS

ECHELLE 1:1

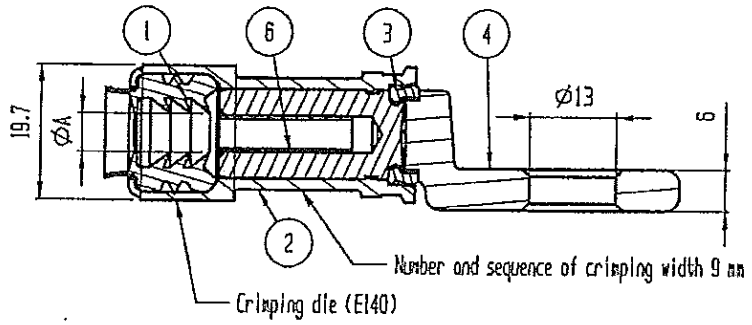
MJPT 70-54N
K117

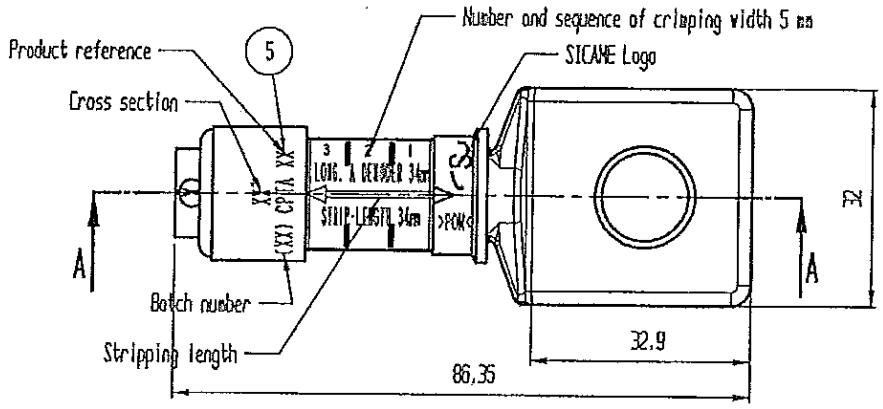
MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

A4	D670	QD

	REFERENCE	TITLE	N E1100300
SICAME 19 AVIAC POMPADOUR FRANCE	CPTA 16 CPTA 25	CPTA .. (E140)	Revision : C Date/By : 21/11/07 JS Verified :

SECTION A-A





Reference	MJP8 Seal	Ø A
	Colour	
CPTA 16	Blue	5.3
CPTA 25	Orange	6.5

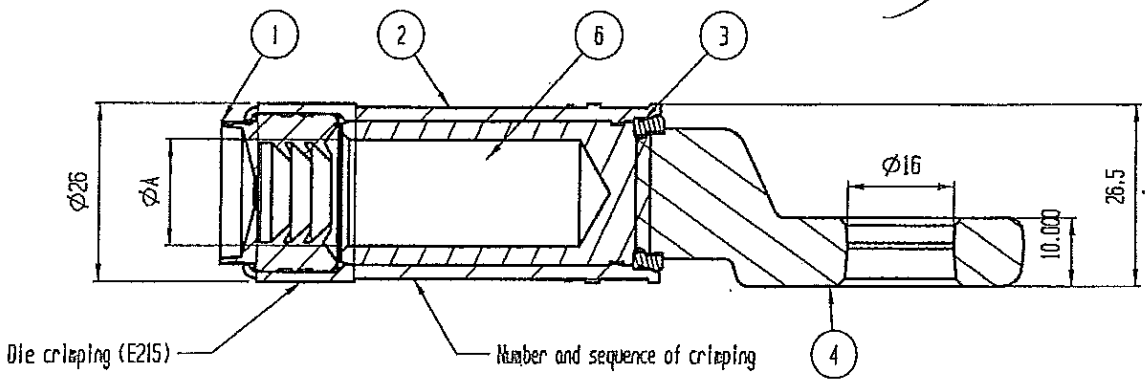
Prt	Qty	Description	Material
6	1	Contact grease	Mineral base + particule
5	1	Marking	Colour - White
4	1	Plug CPTA 14	Aluminium
3	1	Central seal 14	Thermoplastic rubber - Black
2	1	Sleeve E140	Acetal resin - Black
1	1	MJP8 Seal .. E140	Thermoplastic rubber

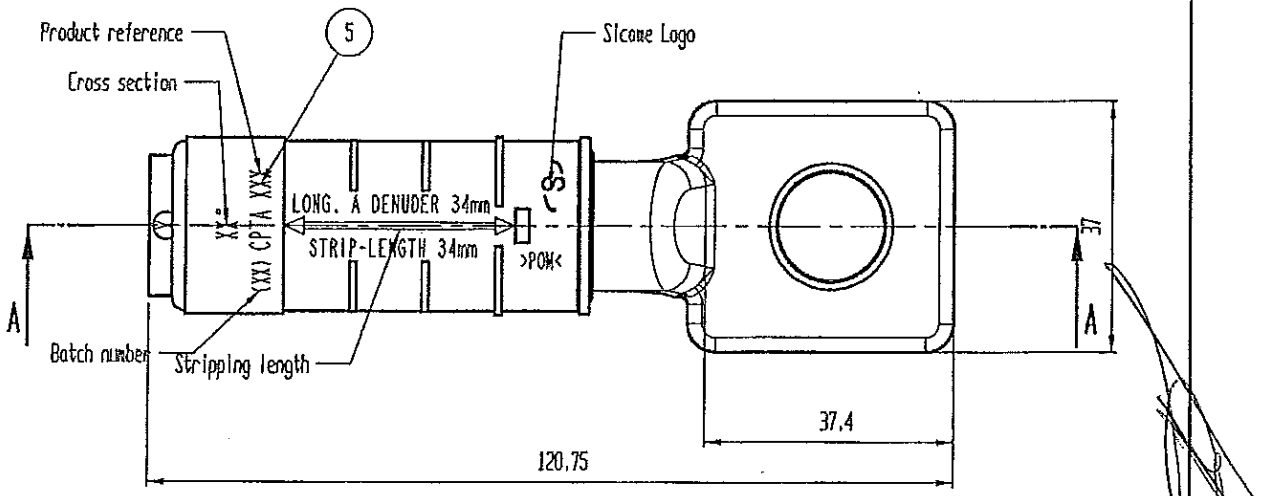
EII 003-00 | —

304

	REFERENCE	TITLE	N E1100320
19 AVAC POMPADOUR FRANCE	CPTA 70-21 CPTA 95-21 CPTA 120 CPTA 150	CPTA .. (E215)	Revision : E Date/By : 30/11/07 / JS Verified :

SECTION A-A



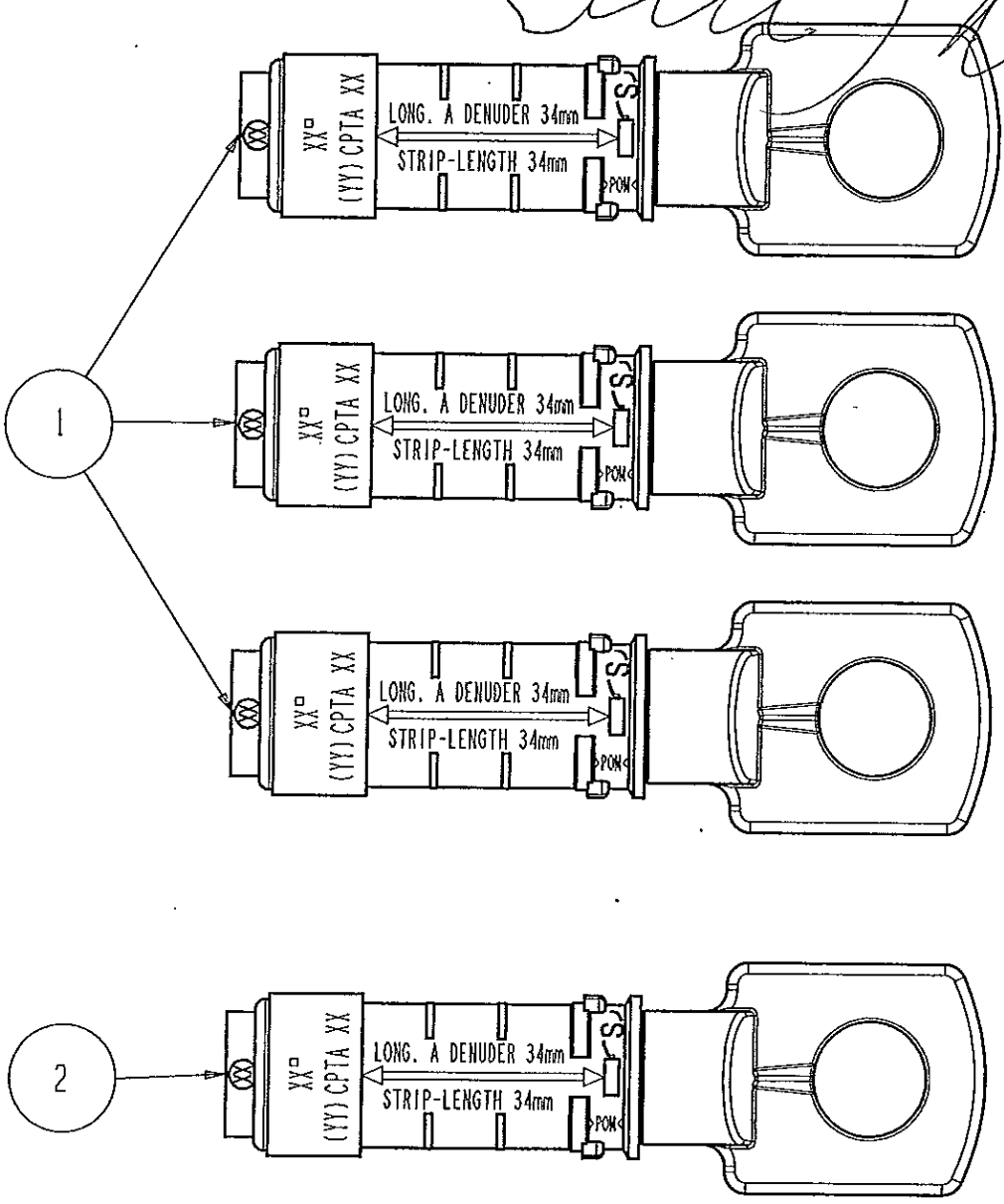


Reference	Seal Colour	ØA
CPTA 70-21	White	10,7
CPTA 95-21	Gray	12,5
CPTA 120	Pink	13,7
CPTA 150	Purple	15,5

Prt	Qty	Description	Material
6	1	Contact grease	Mineral base + particule
5	1	Marking	Colour - White
4	1	Plug CPTA 21	Aluminium
3	1	Central Seal	Thermoplastic rubber - Black
2	1	Sleeve E215	Resin homopolymere of acetal - Black
1	1	MJPT Seal	Thermoplastic rubber

E11 003.20

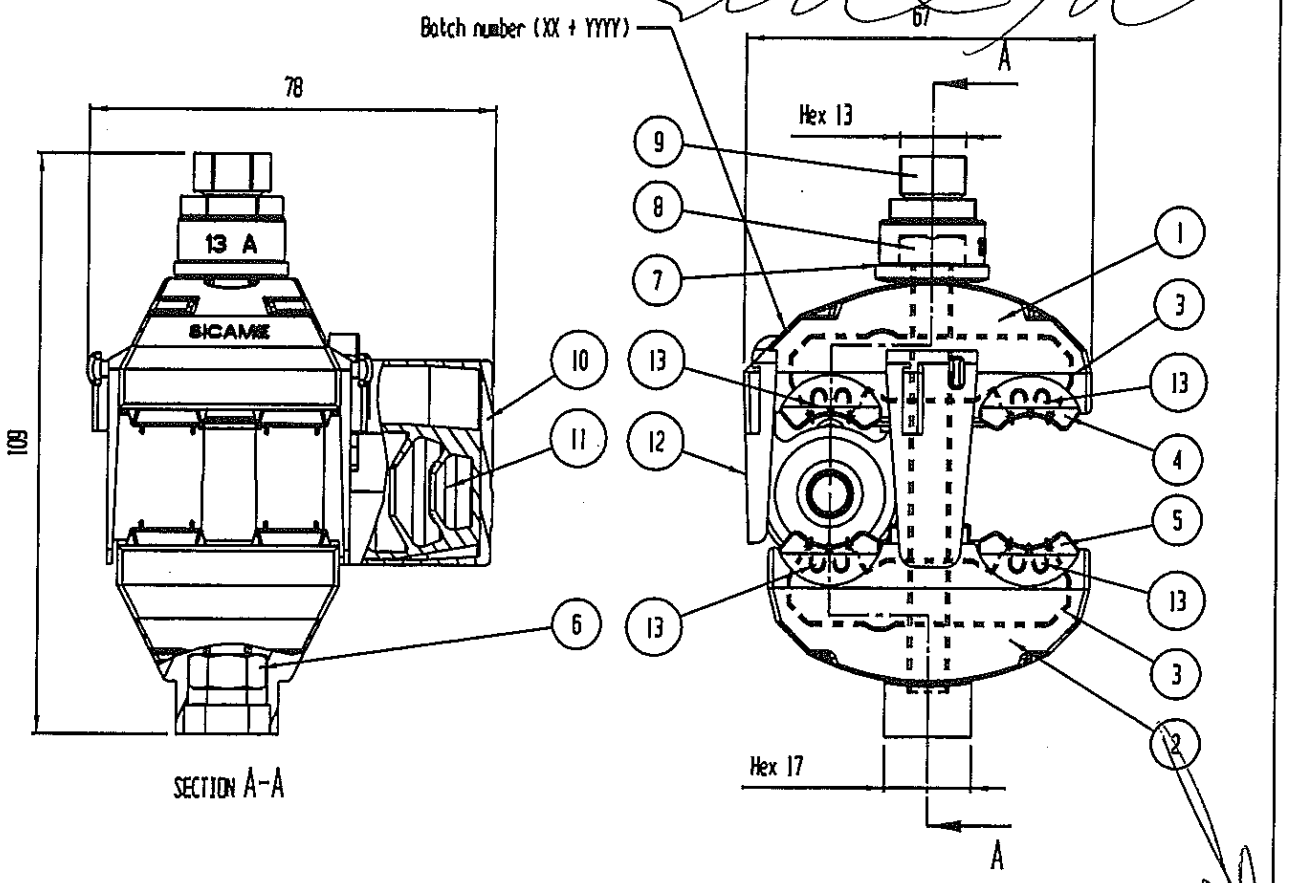
	REFERENCE	TITLE	N° E11 003 40
Sicame	Voir tableau	ERPBA ..	Revision A Date/By 05/02/08 / JS Verified



Reference	CPTA (Phase)	CPTA (Neutral)
ERPBA 35	CPTA 35	CPTA 54
ERPBA 50	CPTA 50	CPTA 54
ERPBA 70	CPTA 70	CPTA 54
ERPBA 70-70N	CPTA 70	CPTA 70
ERPBA 150	CPTA 150	CPTA 70

Prt	Qty	Description	Material
1	3	CPT2AU .. (phase)	Aluminium + plastic
2	1	CPT2AU .. (neutral)	Aluminium + plastic

	REFERENCE	TITLE	N E0671310
SICAME 19 AVNUE POMPADOUR FRANCE	TTD 371 FJTA TTD 371 XFJTA	TTD 371 .F TA	Revision : E Date/By : 31/03/2011 AT Verified :

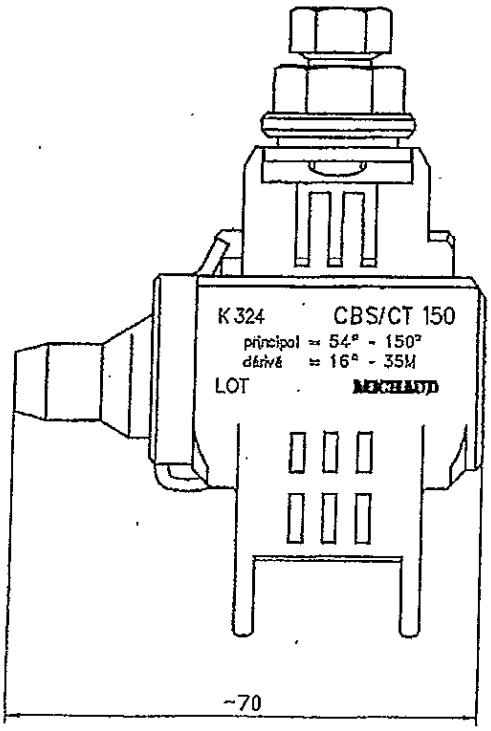


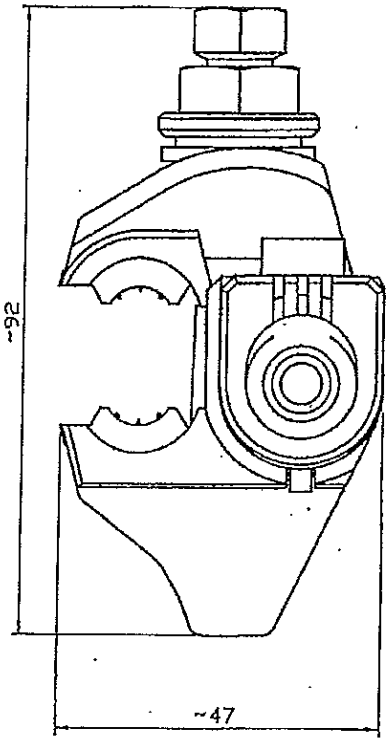
Reference	Screw		Nut	
	Galvanised steel	Stainless steel	Galvanised steel	Stainless steel
TTD 371 FJTA	Y	N	Y	N
TTD 371 XFJTA	N	Y	N	Y

Prt	Qty	Description	Material
13		Blend n°191	Silicone based
12	1	Marking	White colour
11	1	Cap seal	Thermoplastic rubber - Purple
10	1	End cap	Polyamide GF - Black
9	1	Shearhead	Polycarbonate GF - Natural
8	1	Screw	Galvanised steel or Stainless steel (see table)
7	1	Washer	Stainless steel
6	1	Nut	Galvanised steel or Stainless steel (see table)
5	1	Seal nut side	Thermoplastic rubber - Black
4	1	Seal screw side	Thermoplastic rubber - Black
3	8	Electrical contact blade	Tinned copper
2	1	Body nut side	Polyamide GF - Black
1	1	Body screw side	Polyamide GF - Black

E06 713/10

310





REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

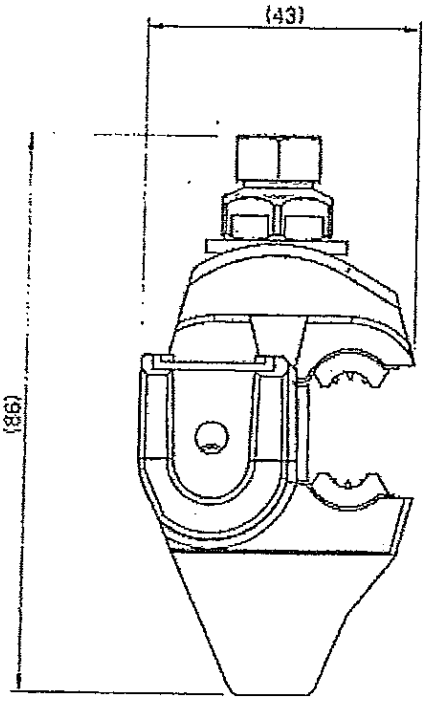
DOSEXP
PRODUITS

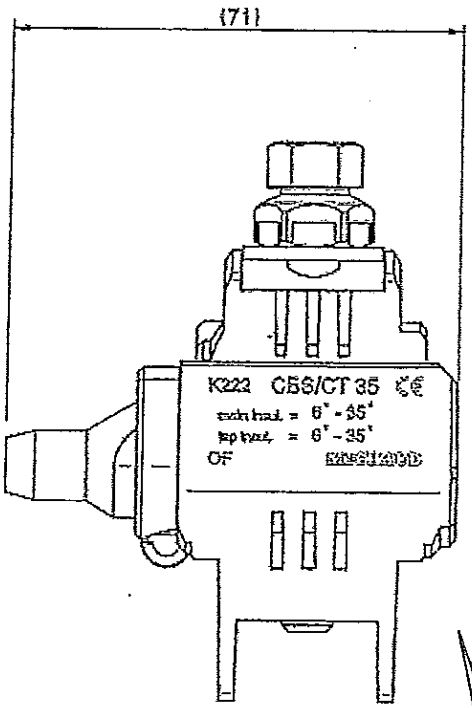
ECHELLE 1:1

CBS/CT 150
K324

MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

A4	D643	09





Mark	Code	Designation	Material	Observations	Nb

Date	Drawn	Checked	Comments	Rating
13/10/2006	RB	GB		

SERIE(S)

DOT: DOS EXP PRODUITS

COMPONENT | UNDER-COMPONENT

CBS/CT 35 AL HEAD - K222

MICHAUD BUREAU D'ETUDES

Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

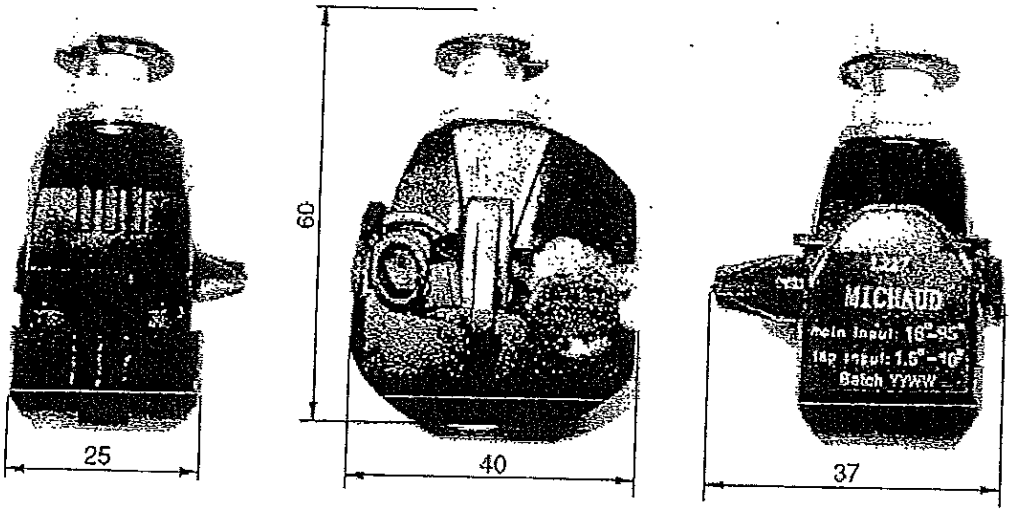
Scale : 1:1

A4

Rating

K222

00



Date	Drawn	Checked
03.12.09	RB	PC

SERIES

DOT:

COMPONENT	UNDER-COMPONENT
UP K	

Comments

Rating

CONNECTEUR CES L227

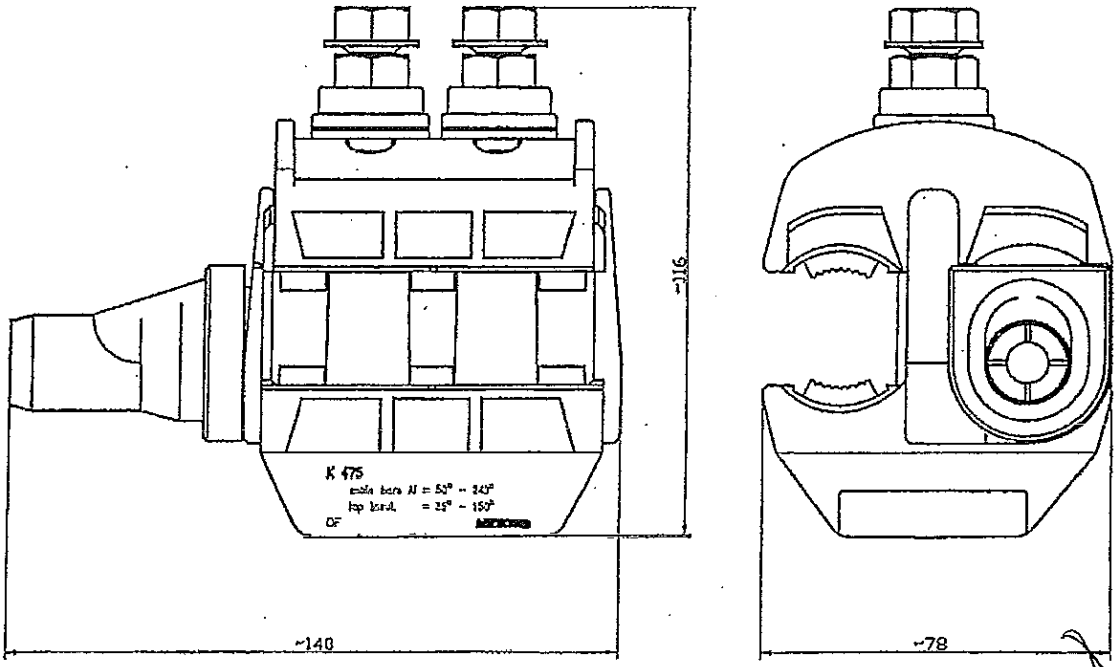
MICHAUD BUREAU D'ETUDES

Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

Scale : -

A4

Rating 02



MARK	CODE	DESIGNATION	MATERIAL	OBSERVATIONS	NUMBER

DATE	DRAWN	CHECKED	COMMENTS	RATING
15.03.00	YD		SCALE 3:2	

SERIE(S)

DOSEXP

K475: INSULATION PIERCING CONNECTOR
abc 35-150/BARE Al 50-240

MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

A4	D605_Item 6	00

SICAME
19 AVIAC POMPADOUR FRANCE

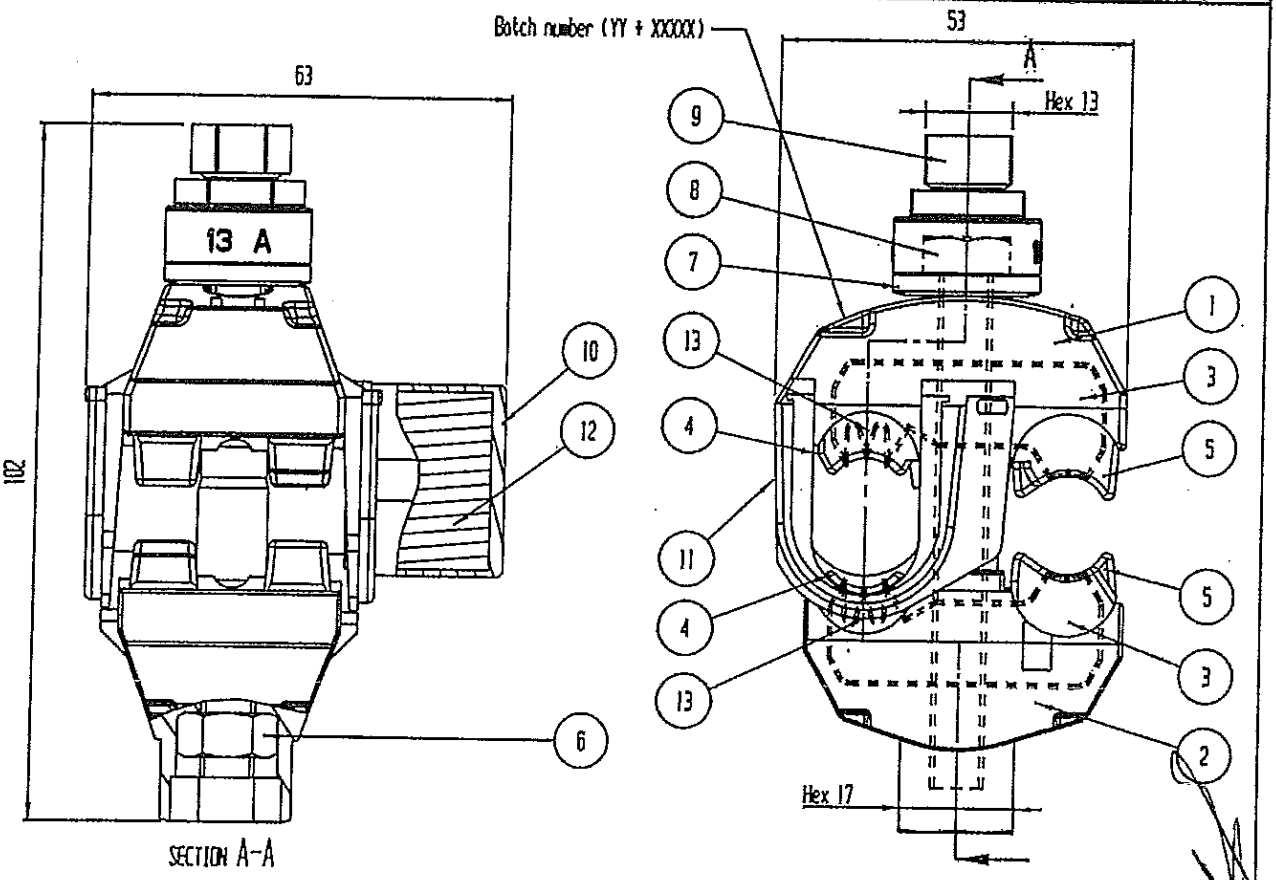
REFERENCE
NTD 201 FA
NTD 201 AFA

TITLE

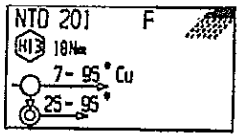
NTD 201 AFA

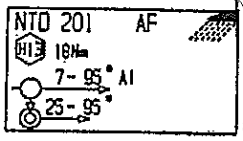
N E1251245

Revision : G
Date/By : 28/06/13 AC
Verified:



Reference	Blade material	Wedge colour
NTD 201 FA	Brass	Red
NTD 201 AFA	Aluminium	White





Prt	Qty	Description	Material
13		Blend	Silicone based
12	1	Neutral grease	Mineral based
11	1	Marking	Colour - White
10	1	End cap	Polyamide GF - Black
9	1	Shearhead	Polycarbonate GF - Natural
8	1	Screw	Galvanised steel
7	1	Washer	Galvanised steel
6	1	Nut	Galvanised steel
5	2	Wedge	Polyethylene hd - See table
4	2	Seal	Thermoplastic rubber - Black
3	4	Electrical contact blade	See table
2	1	1/2 body, nut side	Polyamide GF - Black
1	1	1/2 body, screw side	Polyamide GF - Black

SICAME
19 AVENUE POMPADOUR
FRANCE

REFERENCE
NTD 151 FA
NTD 151 AFA
NTD 151 EFA

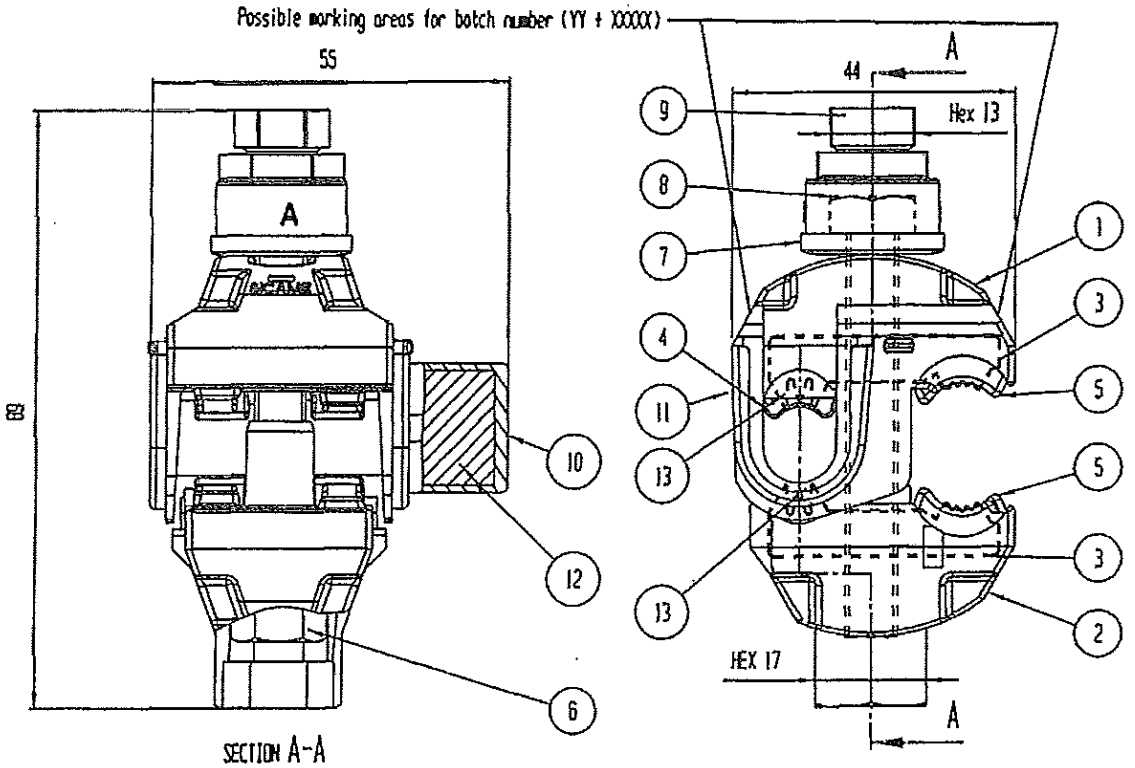
TITLE.

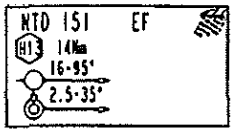
NTD 151 AFA

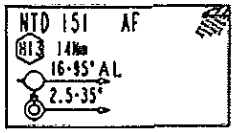
N E0580265

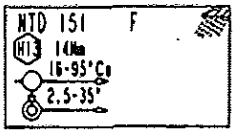
Revision : G
Date/By : 31/05/11 AC
Verified by :

Possible marking areas for batch number (YY + XXXXX)









REFERENCE	Aluminium	Brass	Tinned brass	Wedge color	Blend n°191 Main	Blend n°191 Top
NTD 151 F		x		Red	N	Y
NTD 151 AF	x			White	N	Y
NTD 151 EF			x	Pink	Y	Y

Prt	Qty	Description	Material
13		Blend n°191	Silicone based
12		Neutral grease	Mineral based
11	1	Marking	Colour white
10	1	Cap	Polyamide GF - black
9	1	Shearhead	Polycarbonate GF - black
8	1	Screw	Galvanised steel
7	1	Washer	Galvanised steel
6	1	Nut	Galvanised steel
5	2	Wedge	Polyamide GF - see table
4	2	Seal	Thermoplastic rubber - Black
3	4	Electrical contact blade	See table
2	1	1/2 body, nut side	Polyamide GF - black
1	1	1/2 body, screw side	Polyamide GF - black

ВЯРНО С ОРИГИНАЛА

SICAME
19 ARNAC POMPADOUR
FRANCE

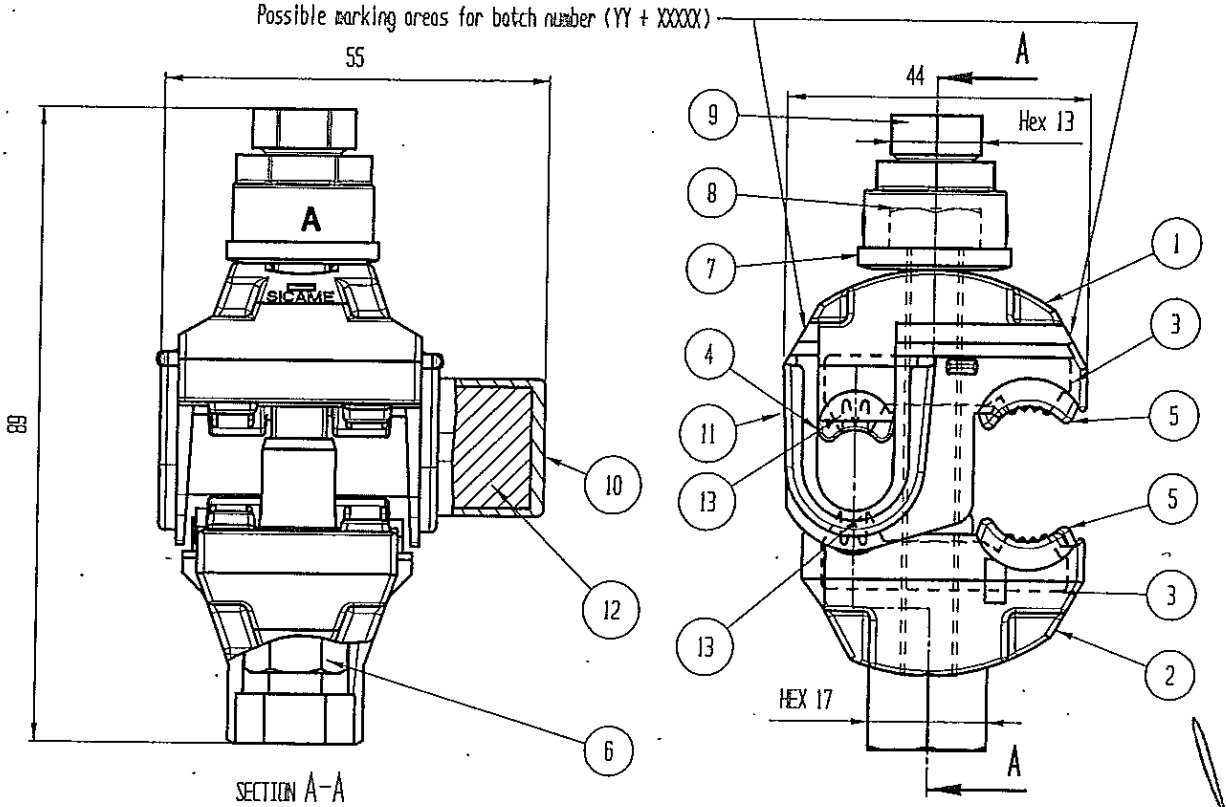
REFERENCE
NTD 151 FA
NTD 151 AFA
NTD 151 EFA

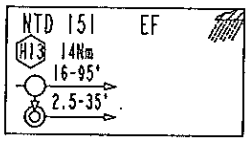
TITLE

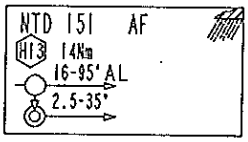
NTD 151 .FA

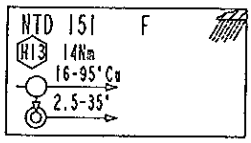
N° E0580265

Revision : G
Date/By : 31/05/11 AC
Verified by:



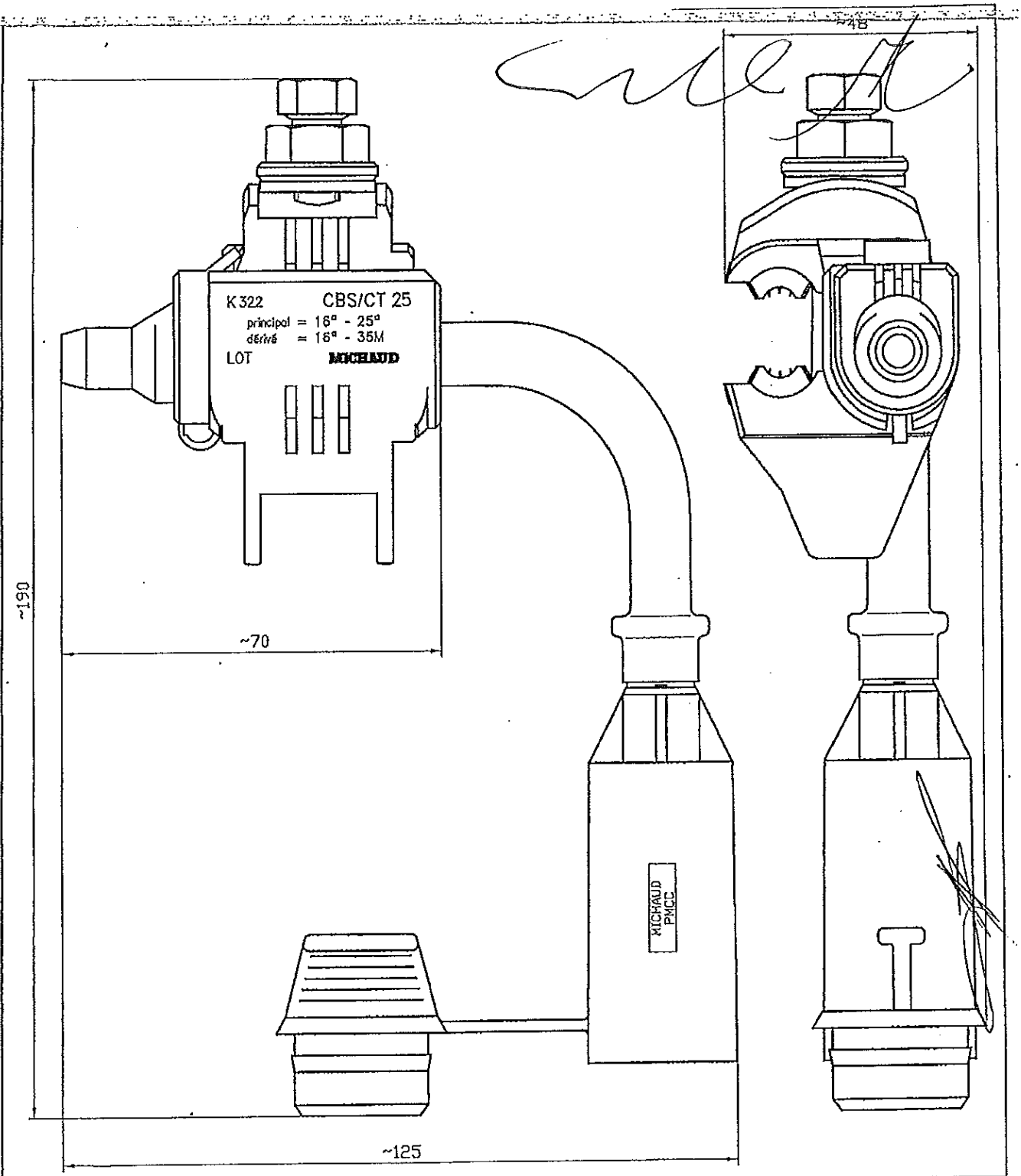






REFERENCE	Aluminium	Brass	Tinned brass	Wedge color	Blend n°191 Main	Blend n°191 Top
NTD 151 F		x		Red	N	Y
NTD 151 AF	x			White	N	Y
NTD 151 EF			x	Pink	Y	Y

Prt	Qty	Description	Material
13		Blend n°191	Silicone based
12		Neutral grease	Mineral based
11	1	Marking	Colour white
10	1	Cap	Polyamide GF - black
9	1	Shearhead	Polycarbonate GF - black
8	1	Screw	Galvanised steel
7	1	Washer	Galvanised steel
6	1	Nut	Galvanised steel
5	2	Wedge	Polyamide GF - see table
4	2	Seal	Thermoplastic rubber - Black
3	4	Electrical contact blade	See table
2	1	1/2 body, nut side	Polyamide GF - black
1	1	1/2 body, screw side	Polyamide GF - black



REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

DOSEXP
PRODUITS

ECHELLE 1:1

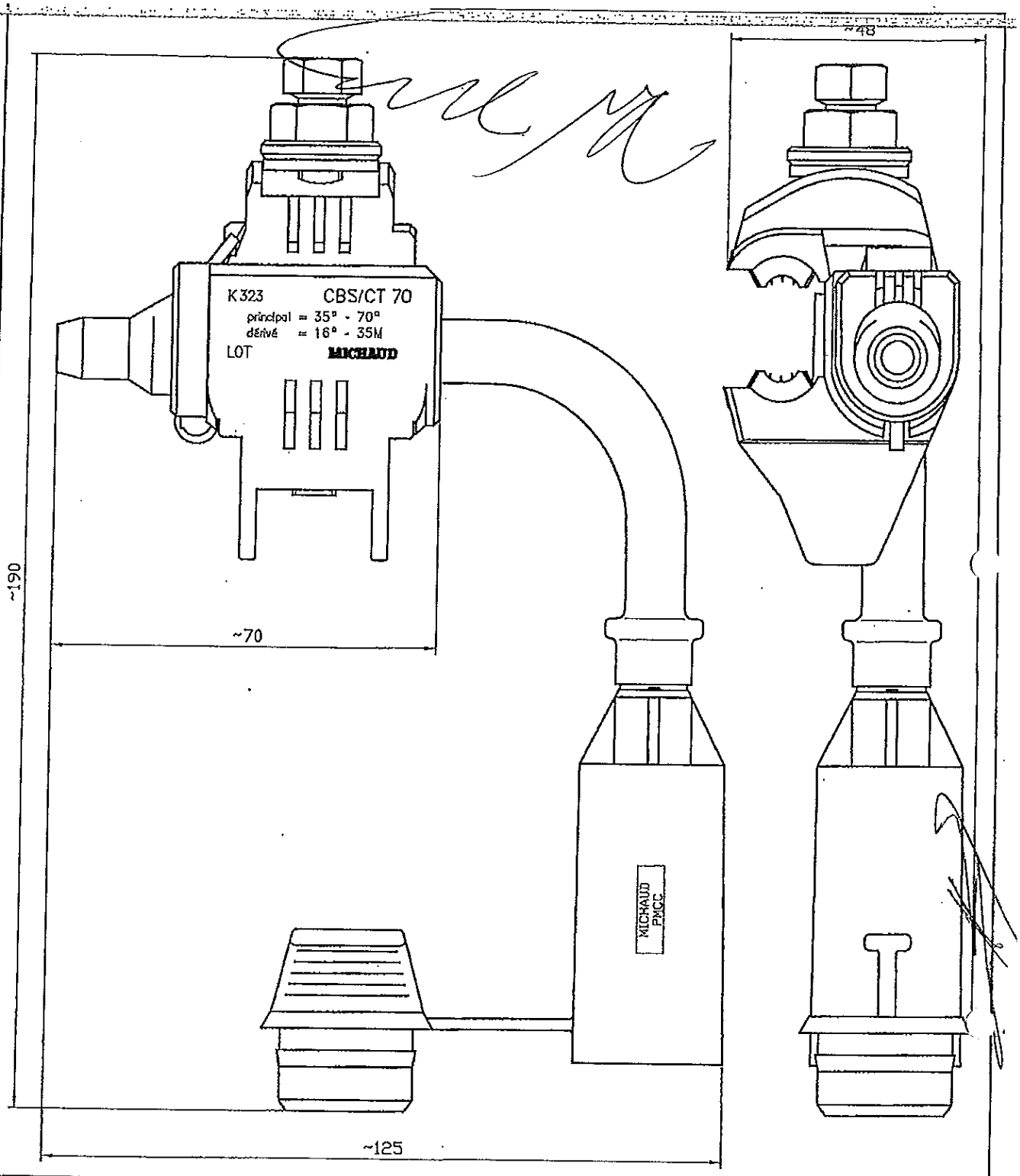
CMCC/CT 25
K362

MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

C.00

A4 D644

218



REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

DOSEXP
PRODUITS

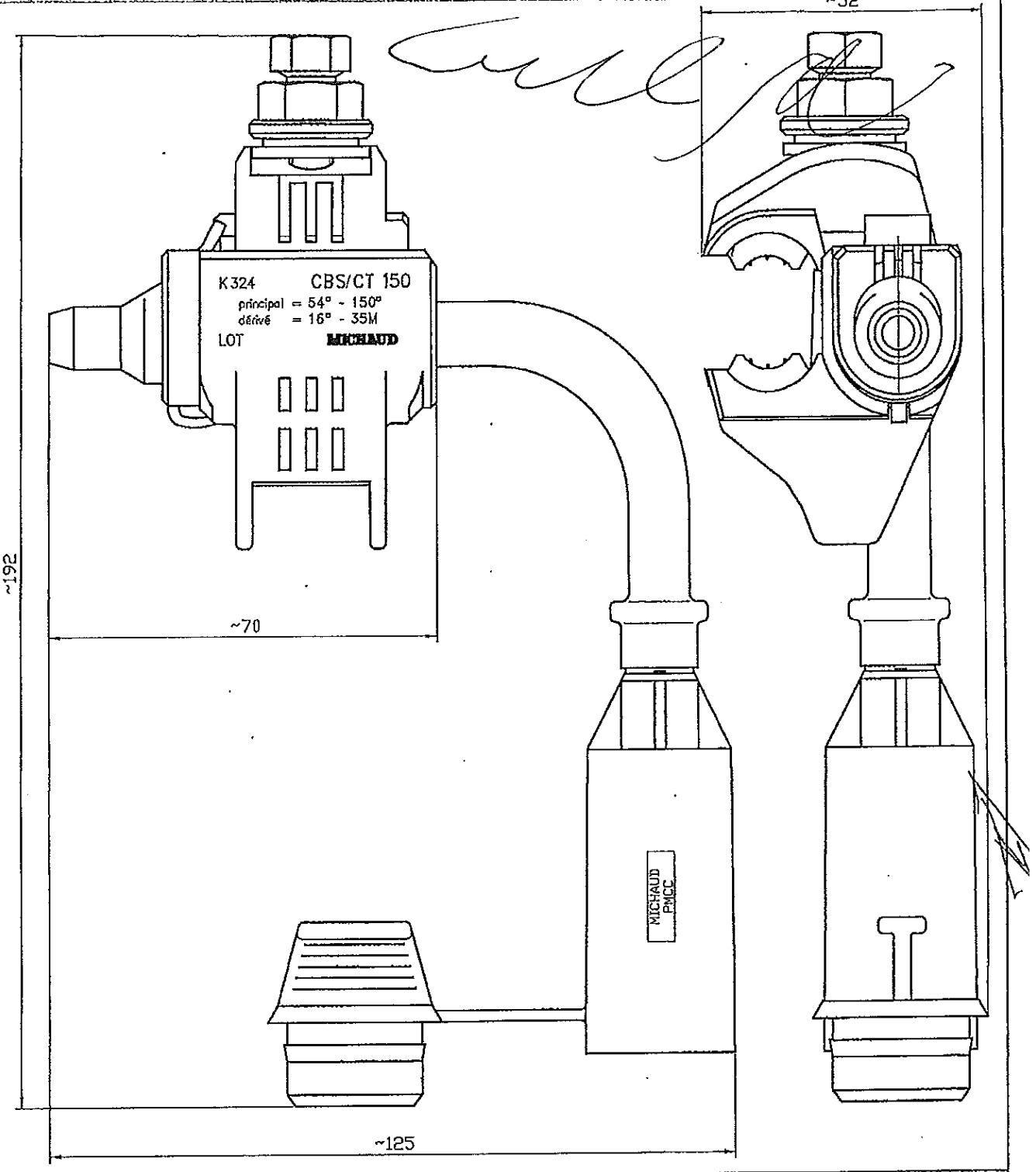
ECHELLE 1:1

CMCC/CT 70
K363

MICHAUD
Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

A4 D645

ВЕРНО С ОРИГИНАЛА



REPERE	NUMERO	DESIGNATION	MATIERE	OBSERVATIONS	NOMBRE

DATE	DESSINE	VERIFIE	MODIFICATIONS	INDICE
16.08.01	CG			

SERIE(S)

DOSEXP
PRODUITS

ECHELLE 1:1

CMCC/CT 150
K364

MICHAUD

Z.I. LE BLANCHON B.P. 11
01160 PONT D'AIN (FRANCE)

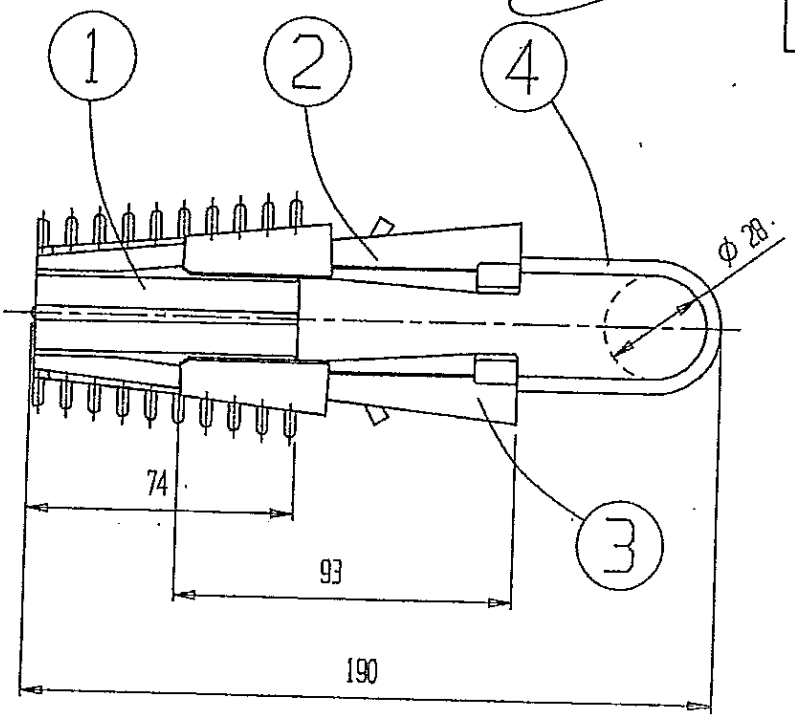
00

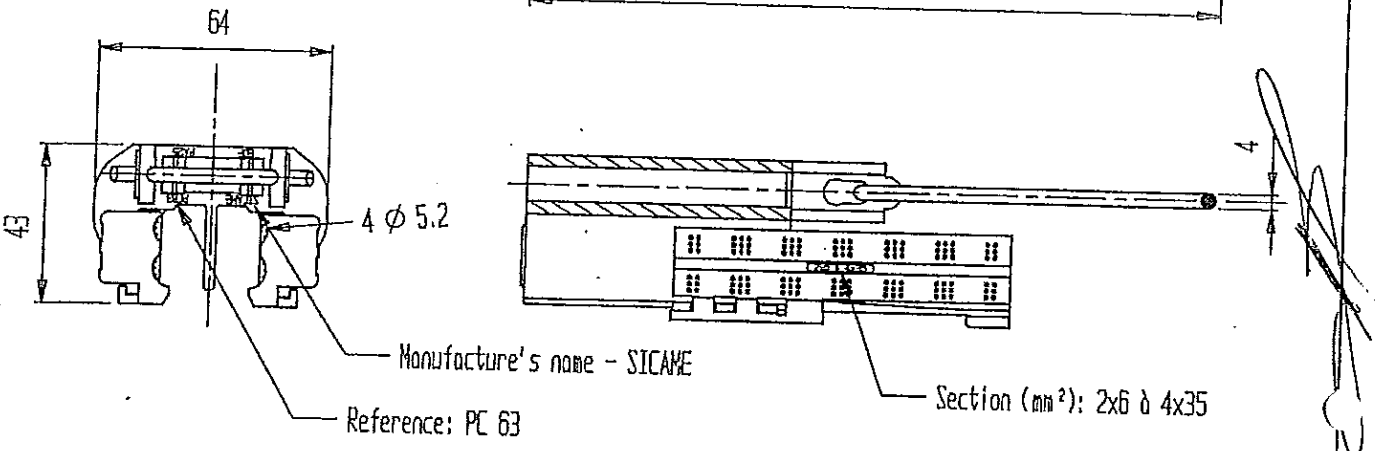
A4

D646

390

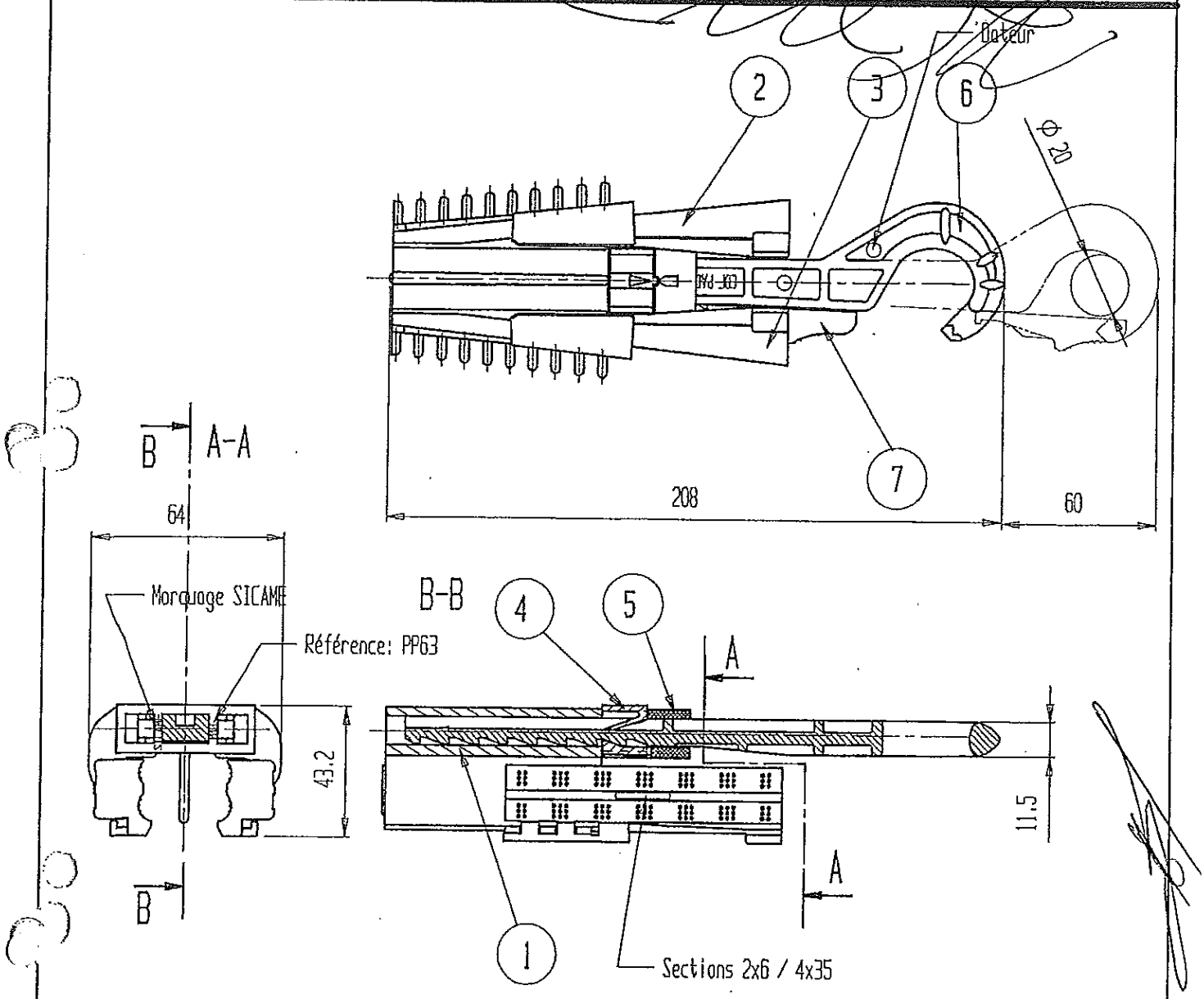
REFERENCE	TITLE	N° E10,803,00
PC 63 F 27	PC 63 F 27	Revision E Date by 22-06-98 MS Verified by



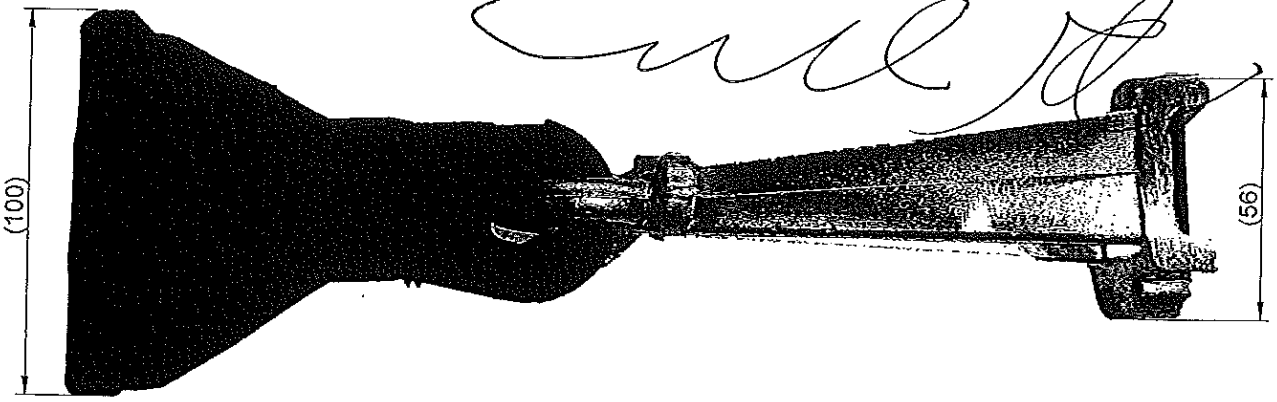


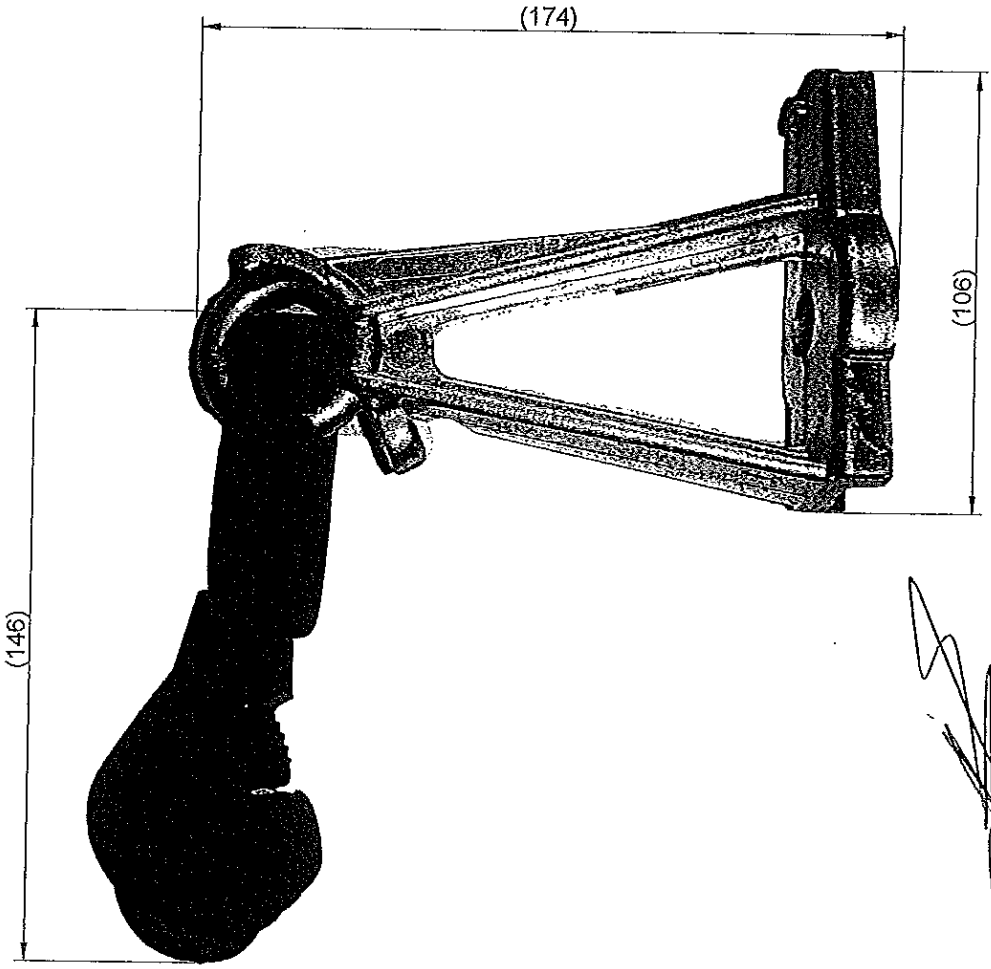
Rep	Qty	Description	Drawing N°	Material
1	1	Body PC 63	E10 802 01	Polyamid GF - black
2	1	Wedge PP 63 - PC 63	E10 802 06	Polypropylene - black
3	1	Wedge PP 63 - PC 63	E10 802 07	Polypropylene - black
4	1	Ball PC 63	E10 803 01	Stainless steel

REFERENCE	NOMENCLATURE	N°E10 802 00
PP 63 F 27	PP 63 F 27	Indice de modif. E Date/Par 24-10-97 DB Vérifié



Rep	Qté	Désignation	Matière
1	1	Corps PC 63	Polyamide FV - noir
2	1	Coin PP 63 - PC 63	Polypropylene - noir
3	1	Coin PP 63 - PC 63	Polypropylene - noir
4	1	Cliquet PP 63	Polyarilamide - noir
5	1	Support cliquet PP 63	Polyamide FV - noir
6	1	Crochet PP 63	Polyamide FV - noir
7	1	Verrou PP 63	Polyamide FV - noir





Date / Date	Dessiné / Drawn	Vérifié / Checked	Approuvé / Approuved
04.12.15	JT	MV	MEX

SERIES

DOT: DOS EXP

PRODUITS

COMPOSANT / COMPONENT	SOUS-COMPOSANT / UNDER-COMPONENT

BdD DIFFERENTE
Sté :

PLAN EQUIVALENT
Code :

Modifications / Comments

Indice / Rating

SUSPENSION ASSEMBLY 54.6mm² - ES 54.6

MICHAUD export
499 Rue du Revermont
ZAC de la Cambuse
01440 VIRIAT - FRANCE

Echelle / Scale : -

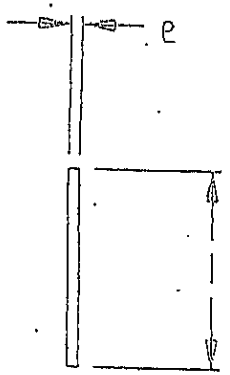
A4

Indice / Rating

U503 ВЯРНОСОРИГИНАЛ

00

Feuillard	l	e
SB 104.50	10 $^{+0.2\,m}_{-0.1\,m}$	0.4 $^{\pm 0.03\,m}$
SB 107.50	10 $^{+0.2\,m}_{-0.1\,m}$	0.7 $^{\pm 0.07\,m}$
SB 204	20 $^{+0.2\,m}_{-0.1\,m}$	0.4 $^{\pm 0.03\,m}$
SB 204 M	20 $^{+0.2\,m}_{-0.1\,m}$	0.4 $^{+0.1\,m}_{0}$
SB 207	20 $^{+0.2\,m}_{-0.1\,m}$	0.7 $^{\pm 0.07\,m}$



Rep	Nb	DESIGNATION	MATIERE	OBSERV.
		SB 204 M (narron)	X10 CrNi 18-8 + époxy narron ép. 15 microns mini	Ral 8011 ou 8016
		SB../50-SB ..-SB../50-SB..	X10 CrNi 18-8	

FEUILLARD

No	MODIFICATIONS	Visa	Date
C	Changement désignation matière suite changement norme et modification	GH	03/06/97
C	épaisseur feuillard narron		
B	Modification des tolérances pour marché EDF	JMB	12/12/95
A	Ajouté SB 204 M (narron)	GV	11/04/94

Echelle

Tol. Gen.

No ENSEMBLE

No de PIECE

Feuille UT

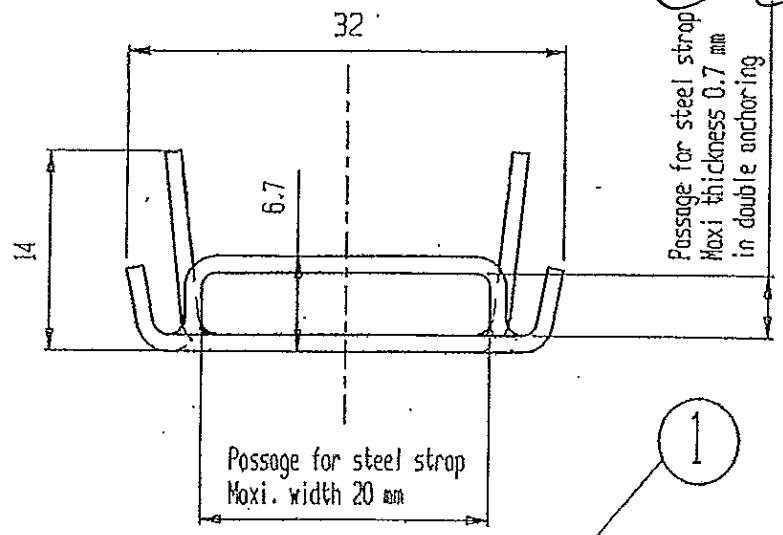
No de PLAN E12 003 05

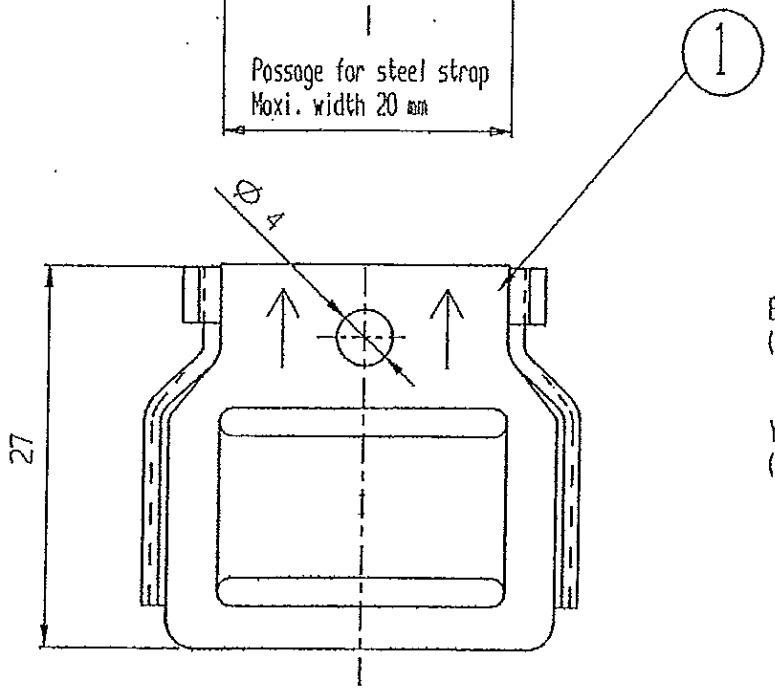
Télécommunications Ingénierie Câblage — Telenco

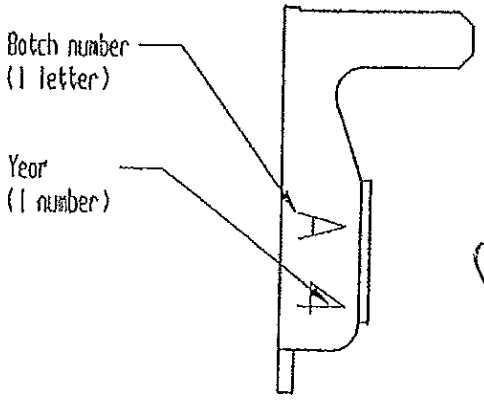
Dessiné le 15.02.94 par GH

Vérifié

Telecommunication Engineering Company Telenco	REFERENCE B 20	TITLE B 20	N° E12 003 10
			Revision --
			Date/by 24-06-98 MS
			Verified by



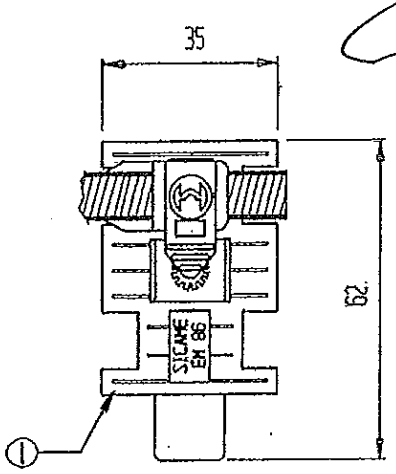


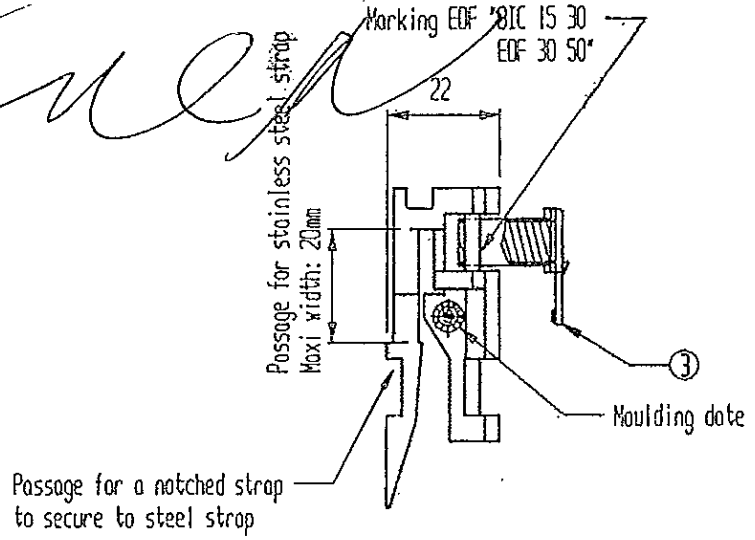


Rep	Q.ty	Description	Droving N°	Material
1	1	Yokes B 20	E12 003 01	Stainless steel

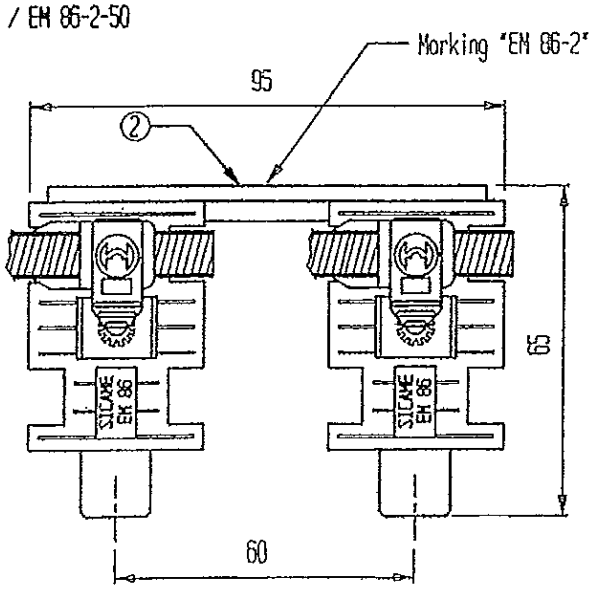
REFERENCE	TITLE	N° E12 101 20
EM 86 EM 86-2 EM 86-30 EM 86-50 EM 86-2-50	EM 86..	Revision A Date/by 24-06-98 MS Verified by

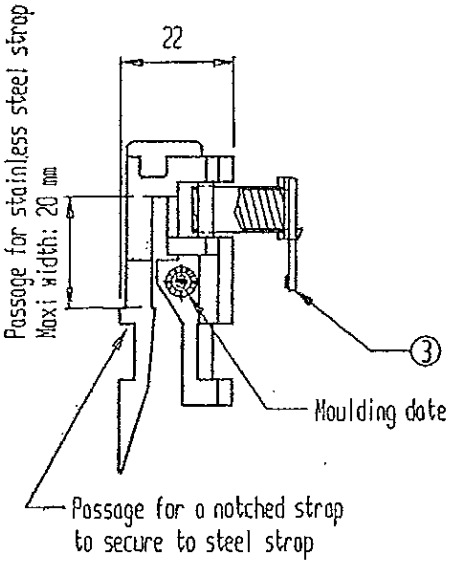
EM 86 / EM 86-30 / EM 86-50



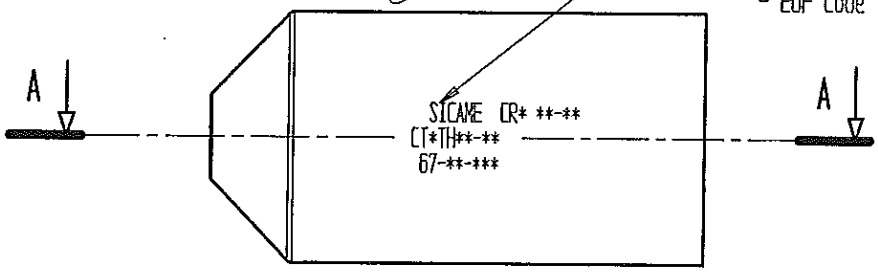


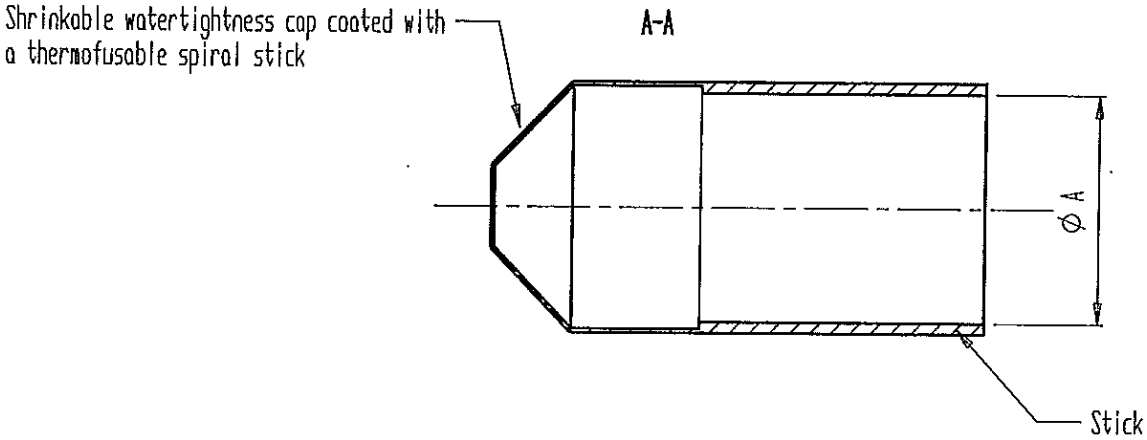
EM 86-2 / EM 86-2-50





	EMBASE					COLLIER				
REFERENCE	Rep	Nb	DESCRIPTION	DRAWING N°	MATERIAL	Rep	Nb	DESCRIPTION	DRAWING N°	MATERIAL
EM 86	1	1	EM 86	E12 101 02	Polycarbonate GF - black					
EM 86-2	2	1	EM 86-2	E12 101 00	Polycarbonate GF - black					
EM 86-30	1	1	EM 86	E12 101 02	Polycarbonate GF - black	3	1	CC D 9-42	E04 103 01	Polyamid - black
EM 86-50	1	1	EM 86	E12 101 02	Polycarbonate GF - black	3	1	CC D 9-62		
EM 86-2-50	2	1	EM 86-2	E12 101 00	Polycarbonate GF - black	3	2	CC D 9-62		





REFERENCE	EDF CODE	Diameter before shrinking A (min)	Diameter after shrinking A (max)	Length
SICAME CRB 6-16	/	10	3	35
SICAME CRB 10-25	67 29 403	15	4,5	45
SICAME CRR 16-70	67 29 408	20	6	63
SICAME CRR 150	67 29 410	25	8,5	70
SICAME CRC 16-27	67 98 607	40	14,5	102
SICAME CRC 26-48	67 98 609	63	24	118
SICAME CRC 40-70	/	75	32	120
SICAME CRC 46-80	67 98 612	78	38	130

Prt	N°	DESCRIPTION	MATERIAL	HEAT TREATMENT	COMMENTS

CR* **-**

Scale 1/2

Tolerance

ASSEMBLY N°

PART N°

Sheet 1/1

Drawing N° F0460103

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FRANCE

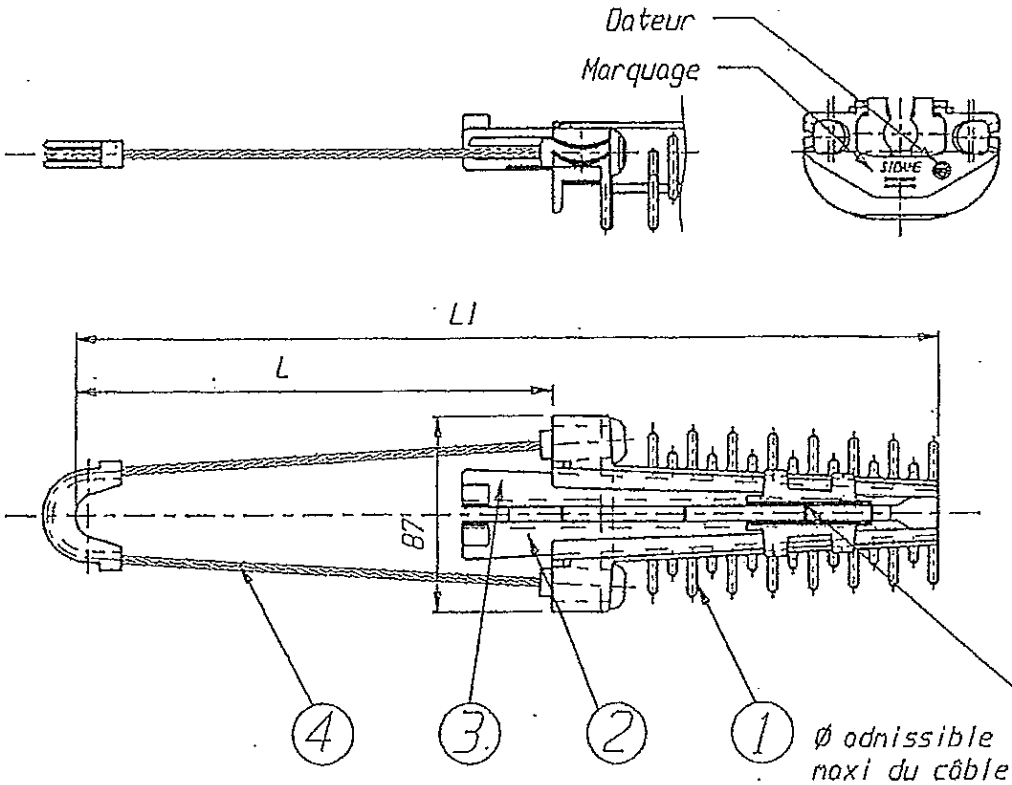
Revision: -

Date/by: 14/11/07 CC

Verified by:

N°	MODIFICATIONS		
C		LG	22/12/10
B		CR	19/02/08
A		CC	06/12/07

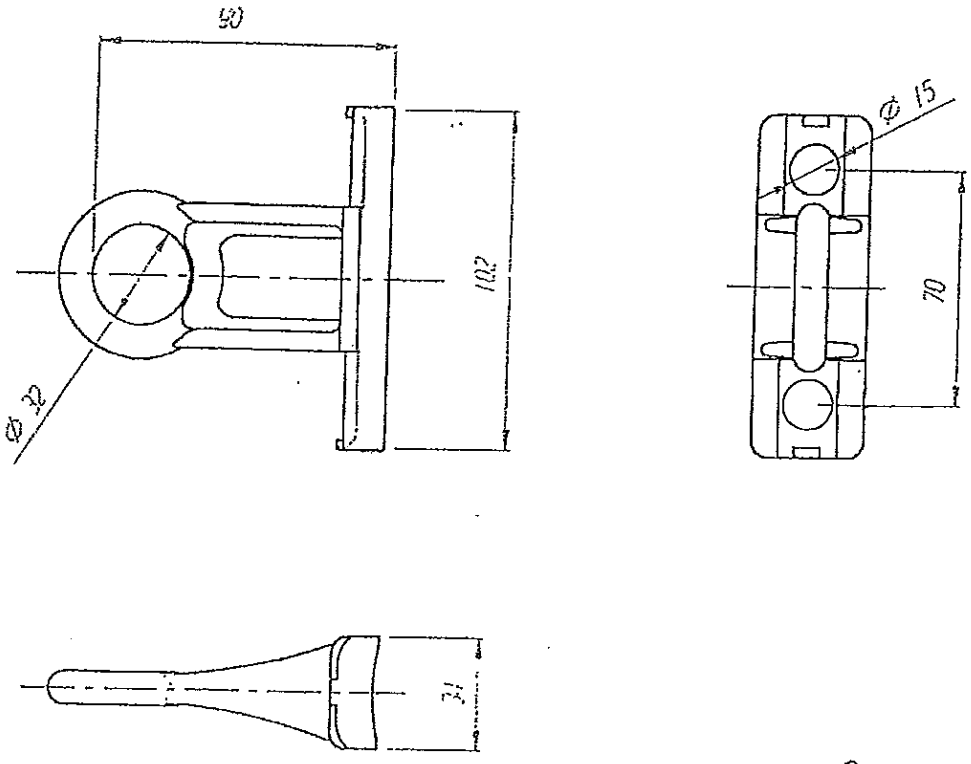
	REFERENCE PA 54 - 1500 PA 54 - 1500 L PA 54 - 1500 LPPC	NOMENCLATURE PA 54 - 1500	N° E0290550 Indice de modif. D Date/Par 09/96 G.H. Vérifié



Rep	Qté	Désignation	Plan N°	Matière
1	1	CORPS	E02 905 51	Polyamide FV noir
2	1	COIN PA 92 (droit)	E02 905 52	ABS
3	1	COIN PA 92 (gauche)	E02 905 53	ABS
4	1	ANNEAU (voir tableau)	E02 905 04	Polyamide FV noir + inox + alliage alu

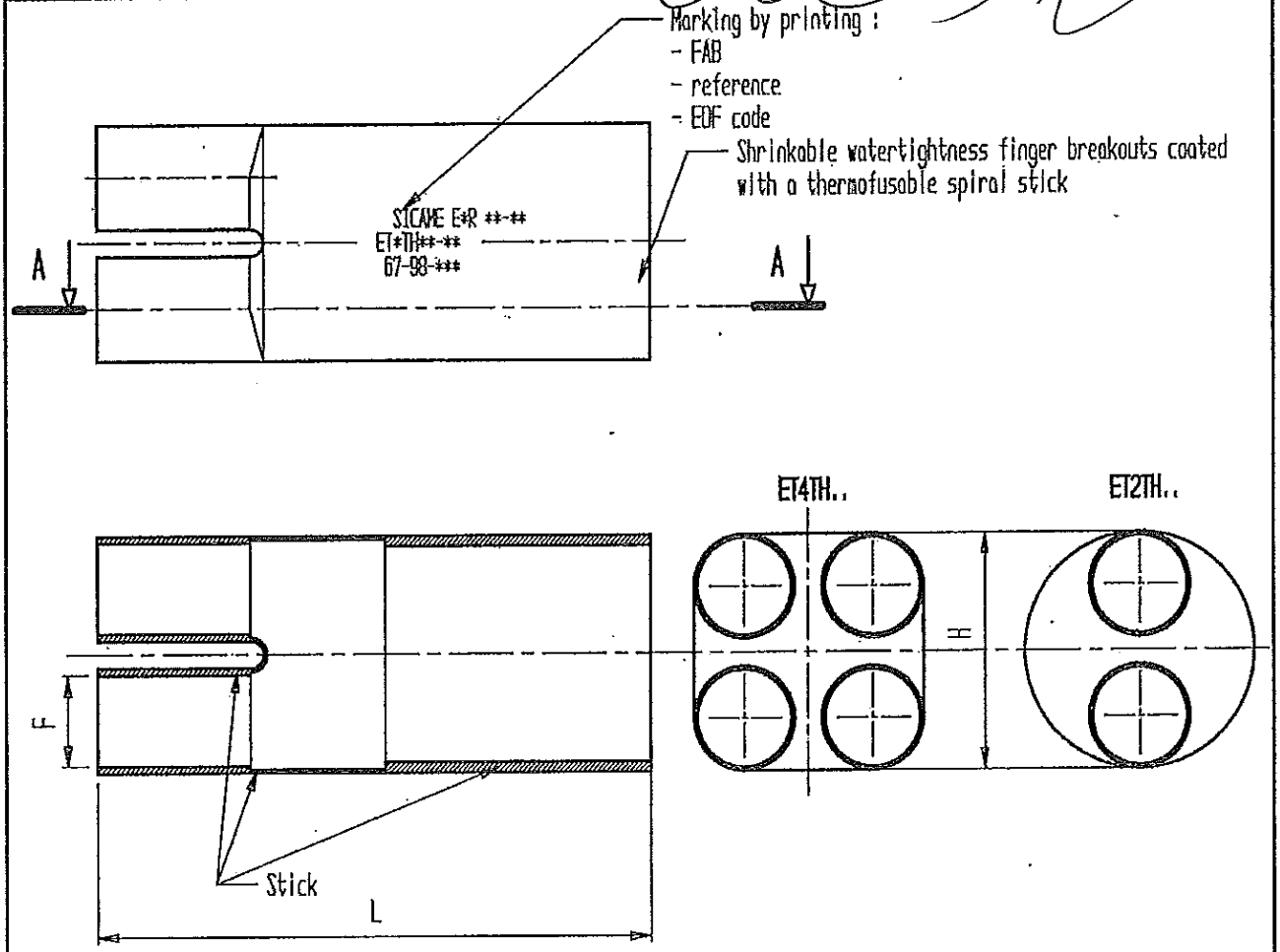
Référence	Réf anneau	L	L1
PA 54-1500	Anneau 1500	213	387
PA 54-1500 L	Anneau 1500L	268	442
PA 54-1500 LPPC	Anneau 1500L	268	442

	REFERENCE	NOMENCLATURE	N° E1190304
Sicame	CS10-3	CONSOLE CS10	Indice de modif. - Date/Par : 06/10/97 SH Vérifié,



Rep	Qté	Désignation	Plan N°	Matière
1	1	CONSOLE CS 10-3	E1190304	Alliage d'Aluminium

ВЕРНО С ОРИГИНАЛА



REFERENCE	EDF CODE	H before shrinking H (min)	H after shrinking H (max)	F before shrinking F (min)	F after shrinking F (max)	L before shrinking L (min)	L after shrinking L (max)
SICAME E2R 10-35	67 98 316	33	10	14	3	75	90
SICAME E4R 1.5-10		28	8.5	10	1.8	72	85
SICAME E4R 10-35	67 98 302	38	14	15	3,2	90	105
SICAME E4R 50-150	67 98 303	72	22	25	8.5	165	190
SICAME E4R 240	67 98 304	100	33	35	12.8	180	215

Prt	N°	DESCRIPTION	MATERIAL	HEAT TREATMENT	COMMENTS

E*R **-**

Scale 1/2

Tolerance

ASSEMBLY N°

PART N°

Sicame

19 ARNAC POMPADOUR FRANCE

Sheet LIT

Drawing N° F0460102

Revision: -

Date/by: 14/11/07 CC

Verified by:

N°	MODIFICATIONS		
B		JS	07/09/09
A		CC	06/12/07

Приложение № 2.2.

sicame

Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Thermal test.**
Test number	**: 02 09 451**
Product brand	**: SICAME**
Product type	**: PSP83**

Demander of the test : DER

Starting date of the test : 02/09/2002

Report emission date : 15 AVR. 2003

According to standard : ESI 43-14 (1990) §8.3.2.2

This report contains : 4 pages and 0 annex

Conclusion : The tested SICAME suspension clamps PSP83 conform to the requirements of ESI 43-14 (1990) §8.3.2.2 standard.

This is an English translation. The original French test report is the only reference version

На основание чл. 2
от ЗЗЛД

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

ВЯРНО С ОРИГИНАЛА

1 Equipment used during test.

Equipment used :

N° U.T.	Designation	Characteristic
94 03 10	Traction bench 3 tons	Class 1
95 00 87	Electrical rack n°9	Transformer 1200 A/7V thyristor unit controlled used in the primary circuit. Thermal regulation by eurotherm.
91 02 69	Dielectrimeter BOUCHET	Accuracy 0,5mA and 200V
92 02 82	Stop watch	Accuracy 1s
99 00 41	Conductimeter	Accuracy 30µS/cm

Cables :

Section	4 x 25
Nature	Aluminium
Standard	NF C 33-209
From	France
Identification n°	9973

2 Product tested.

Designation : PSP83

Number : 2

Project number : E 0210276A

Batch number : 02M104860

Reception date : at the laboratory on the 02/09/2002.

Visa
Supervisor
of the test

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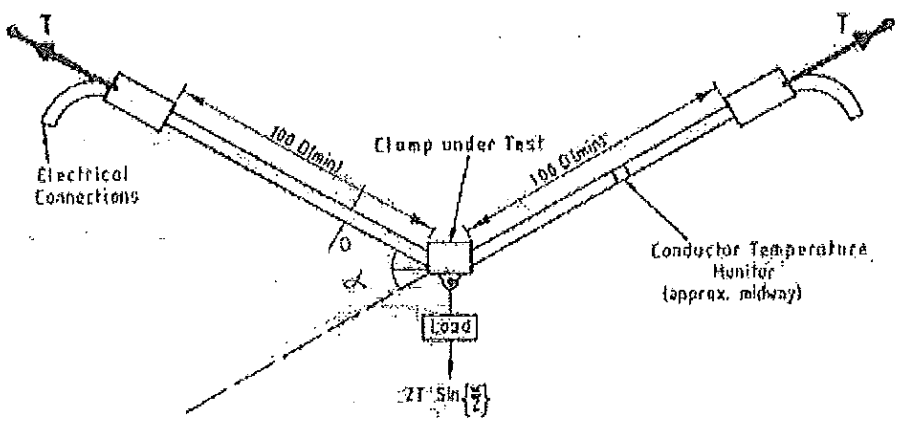
3 Test procedure

Clamps are tested according to ESI 43-14 (1990) §8.3.2.2.



Three fittings are tested.
The test is performed on two samples mounted on bundle of English origin with cable sizes 4 x 25 mm².
The ABC is adjusted so that angle α corresponds to the maximum angle of deviation for which the fitting is designed. The fitting is subjected to a load equivalent to that which will be generated at the requisite angle by the ABC bundle at the 'tension at 10°C' as given in table 3 of ESI 43-14 standard. This load, ± 10%, is maintened for the duration of the test. Currents is passed through the phase conductors so as to raise their temperature to 75°C. This temperature, ± 5°C, is maintened for two hours. The current is switched off and all test components allowed to return to ambient temperature (less than 25°C). This cycle is repeated 100 times.

4 Requirements and measures

The mid-span load of 4,2 kg is choosen to give an initial angle of 2,5°, according to nominal maximum angle of the cable when used on a pole.

Visa
Supervisor
of the test

ВЯРНО С ОРИГИНАЛА

	Tension in bundle (kN)	Sag due to the mid-span load of 4,2 kg (cm)
Start of test	0,95	/
After 2h at 75°C	0,75	8
After 24h of test	0,50	15
After 6 days of test	0,50	16

At the end of test, no damage had occurred to either the fitting or the cable which would prevent their continued use.

Voltage test - cable

Immersed time in water for cables (h)	4	4
Resistivity of water	< 100 Ωm	135 µS/cm so 74,1 Ωm
4kV, 50Hz for 1 min	No breakdown	No breakdown

Voltage test - fitting

Size of the bars (mm)	8,7	8,7
4kV, 50Hz for 1 min	No breakdown	No breakdown

5 Requirements

At the end of test, no damage nor breakdown occurred to either the fitting or the cable which would prevent their continued use.

Visa
Supervision of the test

sicame

Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Tensile test on suspension clamp for self supporting bundles**
Test number	**: 0603380**
Product brand	**: SICAME**
Product type	**: PSP 83**

Demander of the test : SICAME EXPORT DEPARTMENT

Starting date of the test : 21/03/2006

Report emission date : 22 MARS 2006

According to standard : NF C 33-040 § 2.3.2 (february 99)

This report contains : 3 pages

Conclusion : The tested SICAME suspension clamps for self supporting bundles PSP 83 conform to the requirements of NF C 33-040 § 2.3.2 (february 99) standard.

This is an English translation. The original French test report is the only reference version

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

B.P. N° 16231 POMPADOUR - CEDEX - FRANCE - Tel (33) 05 55 73 69 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

1 Equipment used during test.

Equipment used :

N° U.T.	Designation	Characteristic
94 03 10	Traction bench	Class 1

2 Product tested.

Designation : PSP 83

Number : 4

Project number : E0210500

Batch number : 05M495680

Identification : 1, 2, 3 and 4

Reception date : at the laboratory on the 20/03/2006

Visa
Supervisor
of the test
B. Cassagnol

3 Test procedure

Suspension clamps are tested according to NF C 33-040 § 2.3.2 (february 99)

The assembly is secured to a device similar to the one used for anchorage on the support. The strength is applied in direction T using a device adapted to the wall support of the suspension clamp (annex B of the standard).
The strength is increased as per requirements of sub-clause 2.3 up to T_n. The strength is maintained at this value for 1 min and then increased up to T_r and released.
The value of strengths to be applied is given in Table 4 of the standard.

4 Results

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 and 35°C Between 25 % and 75 % HR	23°C 44%HR
T_n during 1 minute (N)	1600	Suspension clamp n°1 : 1600 Suspension clamp n°2 : 1600 Suspension clamp n°3 : 1600 Suspension clamp n°4 : 1600
Tr Maximum load without breakdown (N)	Before 5000 no breakdown	Suspension clamp n°1 : OK Suspension clamp n°2 : OK Suspension clamp n°3 : OK Suspension clamp n°4 : OK

5 Requirements

No breakdown are observed before Tr.

ВЯРНО С ОРИГИНАЛА

Visa
Supervisor
of the test
"B. Cassagnol

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СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА НОСАЧ ТИП PSP 83

1. Изпитване за термична устойчивост – тест № 0209451;
2. Изпитване на сила на якост за носач - тест № 0603380.

Съставил:

MICHAUD
MATERIEL ELECTRIQUE

BP 11 - Z.I. LE BLANCHON - 01160 PONT D'AIN - (FRANCE)

LABORATOIRE D'ESSAIS
TEST LABORATORY

RAPPORT D'ESSAIS
TEST REPORT

ESSAIS DE QUALIFICATION DES MANCHONS DE JONCTION MJPB (K30, K32, K35, K39, K42 ET K55)
N°130-06-02-02

QUALIFICATION TESTS OF MJPB SLEEVES (K30, K32, K35, K39, K42 AND K55)
N° 130-06-02-02

06/03/2006

DEMANDEUR : Bureau d'Etudes MICHAUD SA
REQUESTED BY : MICHAUD SA's Research Department

PRESENTATION : Ce document regroupe les essais de qualification des manchons de jonction MJPB (K30, K32, K35, K39, K42 et K55). Les materiels testes sont de fabrication MICHAUD SA.
Les modalités d'essais retenues sont celles de la norme NF C 33-021 de Juin 1998.

INTRODUCTION : This document gathers the qualification tests of MJPB sleeves (K30, K32, K35, K39, K42 and K55). Tested products are of MICHAUD's manufacture.
The test procedures are the ones of the standard NF C 33-021 dated June 1998.

На основание чл. 2
от ЗЗЛД

DIFFUSION : Le 06/03/2006 - 1 exemplaire original UR (LE)
Le 17/03/2011 - 1 exemplaire original COM (Classement Client)

ISSUANCE : On the 06/03/2006 - 1 original to UR (LE)
On the 17/03/2011 - 1 original to COM (Customer filing)

Ce document comporte 23 pages (y compris la présente page 1).
This document includes 23 pages (including this page 1).

ВЯРНО СЪОТВЕТНАЛА

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CONTENTS

(*) The numbers of paragraph are given in the standard NF C 33-021 dated June 1998.

I) INTRODUCTION

1.1 Subject

This document gathers the qualification tests of MJPB sleeves (K30, K35, K39, K42 and K55). Tested products are of MICHAUD's manufacture.

Test procedures are the ones of the standard NF C 33-021 dated June 1998.

For each test, there is a test sheet gathering procedures and results.

1.2 Tested products

Tested products are preinsulated sleeves for aerial conductors according to the technical file «MJPB». These products are coming from an industrial series and have been delivered to Test Laboratory on 12/01/2006.

DESIGNATION	REFERENCE	N° OF BATCH
PREINSULATED SLEEVE (140) MJPB 6	K30	04 40 14
PREINSULATED SLEEVE (140) MJPB 10	K35	05 39 28
PREINSULATED SLEEVE (140) MJPB 16	K39	05 01 50
PREINSULATED SLEEVE (140) MJPB 25	K42	06 02 12
PREINSULATED SLEEVE (140) MJPB 35	K55	05 10 09

1.3 Order of test

Tests are performed on 8 sleeves MJPB6 , MJPB 10 and MJPB 25, on 12 sleeves MJPB 16 and on 16 sleeves MJPB 35.

NUMBER OF SAMPLES			TESTS
MJPB 6, MJPB 10 AND MJPB 25	MJPB 16	MJPB 35	
/	/	1 and 2	2.3.1 Mechanical tests – Crimping aptitude test
1 and 2	1 and 2	3 and 4	2.3.2 Mechanical tests – Tensile test
3 up to 6	3 up to 6	5 up to 8	2.4 Dielectric and watertightness tests 2.6 Climatic ageing test
7 and 8	7 and 8	9 and 10	2.5 Low temperature assembly test 2.4 Dielectric and watertightness tests 2.3.2 Mechanical tests – Tensile test
/	/	11 up to 16	2.8 Electric ageing test
/	9 up to 12	/	2.9 Endurance test under mechanical and thermal stresses 2.3.2 Mechanical tests – Tensile test

II) STANDARD DOCUMENTS REFERRED TO IN THIS REPORT

- *French standards*

C 20-540 : *June 2002,*
«Environmental test - Test methods - Climatic ageing test of equipment and synthetic materials for outdoor use».

NF C 32-201-3 : *October 1998 + Additive 1 dated November 2000,*
«Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V - Part 3 : Non-sheathed cables for fixed wiring».

NF C 33-004 : *June 1998,*
«Insulated cables and their accessories for power systems - Connecting equipment for overhead distributions and services of rated voltage 0,6/1kV with at least one insulated core - Electrical ageing test».

NF C 33-021 : *June 1998,*
«Insulated cables and their accessories for power systems - Preinsulated compression type connecting equipment for overhead distributions and services of rated voltage 0,6/1kV with bundle assembled cores».

NF C 33-209 : *July 1996,*
«Insulated or shielded cables for power systems - Bundle assembled cores for overhead systems of rated voltage 0,6/1kV».

III) GENERAL CONDITIONS

- *Temperature*

Tests are carried out at the room temperature of the test laboratory between 20°C and 26°C.

- *Cores used*

STANDARD	*NAME OF MANUFACTURER*	*NOMINAL CROSS-SECTIONAL AREA (in mm²)*	*NUMBER OF STRANDS AND COMPOSITION OF CORE*	*Ø OVER INSULANT (in mm)*	*Ø OVER CORE (in mm)*
NF C 33-209	*NEXANS*	*35*	*7 strands aluminium*	*10,6*	*7,1*
		25	*7 strands aluminium*	*9,0*	*6,0*
		16	*7 strands aluminium*	*7,4*	*4,8*
NF C 32-201-3		*10*	*7 strands copper*	*5,9*	*3,7*
		6	*7 strands copper*	*4,5*	*3,0*

Before tests, cores are conditioned, according to § 2.2.2 of the standard NF C 33-021 as follows : they are put in an enclosure during 1 h at 120°C, then the door of enclosure is opened so that conductors come back to room temperature. Furthermore, sheath and insulant are removed from main conductors.

IV) TESTS

On the following pages, sheets of each performed test can be found.

TEST DESCRIPTION : 2.3.1 Mechanical tests – Crimping aptitude test

DATE : 31/01/2006
PLACE : MICHAUD test laboratory

OPERATOR : AC. BERNARD

N° OF SAMPLES : 1 and 2 for sleeves MJPB 35

TEST EQUIPMENTS

- Measure equipment for traction / compression

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.3.1 of standard NF C 33-021 dated June 1998.

Samples are fitted on 35mm² aluminium cores stripped over the length indicated on the sleeve.

Then, they are crimped with the measure equipment for traction / compression, according to the installation instructions. Crimping is performed with 9mm width dies type E140.

The crimping strength applied is 3 000 daN.

At the end of the test, the two half-dies must be in contact : a 0,05 mm thick wedge does not go in.

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER CRIMPING	FOLLOWING TEST
MJPB 35	1	/	35mm² Al	Satisfactory : The 0,05 mm thick wedge does not go in	/
	2			Satisfactory : The 0,05 mm thick wedge does not go in	

Page 1/2

TEST DESCRIPTION : 2.3.2 Mechanical tests – Tensile test

DATE : 17/01/2006, 18/01/2006, 27/02/2006
PLACE : MICHAUD test laboratory

OPERATOR : AC. BERNARD

N° OF SAMPLES : 3, 4, 9 and 10 for sleeves MJPB 35
1, 2, 7 up to 12 for sleeves MJPB 16
1, 2, 7 and 8 for the other types of sleeves

TEST EQUIPMENTS

- Measure equipment for traction / compression
- Mechanical tensile strength and endurance bench

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.3.2 of standard NF C 33-021 dated June 1998.

Samples are fitted on 30cm length cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

Then, the assembly sleeve - cores is installed between the clamping jaws of the tensile strength machine. Then, an increasing tensile strength is applied on the conductor core which progress is comprised between 1 000N/min and 5 000N/min up to the following F1 values :

- 130N for 6mm² Cu conductor,
- 220N for 10mm² Cu conductor,
- 600N for 16mm² Al, 25mm² Al and 35mm² Al conductors.

The strength is maintained during 1 minute. Then, it is raised until the following F2 values, then it is released :

- 260N for 6mm² Cu conductor,
- 440N for 10mm² Cu conductor,
- 1 200N for 16mm² Al, 25mm² Al and 35mm² Al conductors.

No slip shall be noticed.

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	F1 STRENGTH APPLIED DURING THE STEP	F2 STRENGTH APPLIED (in N)	COMMENTS	FOLLOWING TEST
MJPB 6	1	/	6mm² Cu	130	260	Satisfactory	/
	2		6mm² Cu	130	260	Satisfactory	
	7	2.4	6mm² Cu	130	260	Satisfactory	
	8		6mm² Cu	130	260	Satisfactory	
MJPB 10	1	/	10mm² Cu	220	440	Satisfactory	/
	2		10mm² Cu	220	440	Satisfactory	
	7	2.4	10mm² Cu	220	440	Satisfactory	
	8		10mm² Cu	220	440	Satisfactory	

ЕАД "МКОН ДОСТАВ" СОФИЯ

ВЯРНО С ОРИГИНАЛА

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TEST DESCRIPTION : 2.3.2 Mechanical tests – Tensile test

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	F1 STRENGTH APPLIED DURING THE STEP	F2 STRENGTH APPLIED (in N)	COMMENTS	FOLLOWING TEST
MJPB 16	1	/	16mm² Al	600	1 200	Satisfactory	/
	2		16mm² Al	600	1 200	Satisfactory	
	7	2.4	16mm² Al	600	1 200	Satisfactory	
	8		16mm² Al	600	1 200	Satisfactory	
	9	2.9	16mm² Al	600	1 200	Satisfactory	
	10		16mm² Al	600	1 200	Satisfactory	
	11		16mm² Al	600	1 200	Satisfactory	
	12		16mm² Al	600	1 200	Satisfactory	
MJPB 25	1	/	25mm² Al	600	1 200	Satisfactory	/
	2		25mm² Al	600	1 200	Satisfactory	
	7	2.4	25mm² Al	600	1 200	Satisfactory	
	8		25mm² Al	600	1 200	Satisfactory	
MJPB 35	3	/	35mm²Al	600	1 200	Satisfactory	/
	4		35mm²Al	600	1 200	Satisfactory	
	9	2.4	35mm²Al	600	1 200	Satisfactory	
	10		35mm²Al	600	1 200	Satisfactory	

TEST DESCRIPTION : 2.4 **Dielectric and watertightness tests** Page 1/2

DATE : 12/01/2006, 13/01/2006, 16/01/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC. BERNARD
JP. RAPY

N° OF SAMPLES : 5 up to 10 for sleeves MJPB 35
3 up to 8 for the other type of sleeves

TEST EQUIPMENTS

- Measure equipment for traction / compression
- Dielectric test equipment A 1105

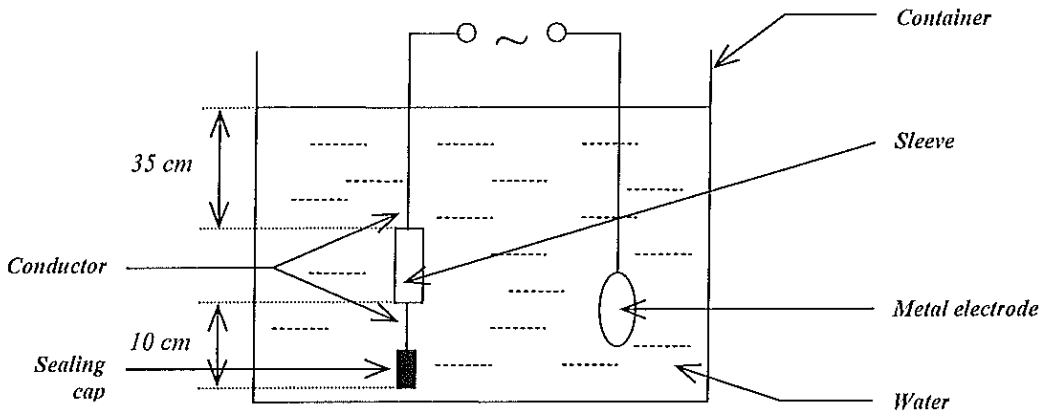
PROCEDURES

Procedures and acceptance criteria are the ones of § 2.4 of standard NF C 33-021 dated June 1998.

Samples are fitted on cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

After having put a sealing cap on one of the stripped extremities of the conductor, assemblies sleeve - cores are installed vertically in water, as shown below :



Voltage generator used is regulated to release under a 10 mA leakage current.
After 30 min under water, a dielectric test is performed on the assembly under a 6 kV voltage at an industrial frequency for 1 min. The increase of voltage is performed at 1 kV/s speed.
No breakage (release of voltage source) shall occur.

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER 1 min UNDER 6kV	FOLLOWING TEST
MJPB 6	3	/	6mm² Cu	Satisfactory	2.6
	4		6mm² Cu	Satisfactory	
	5		6mm² Cu	Satisfactory	
	6		6mm² Cu	Satisfactory	

TEST DESCRIPTION : 2.4 Dielectric and watertightness tests

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER 1 min UNDER 6kV	FOLLOWING TEST
MJPB 16	7	2.5	6mm² Cu	Satisfactory	2.3.2
	8		6mm² Cu	Satisfactory	
MJPB 10	3	/	10mm² Cu	Satisfactory	2.6
	4		10mm² Cu	Satisfactory	
	5		10mm² Cu	Satisfactory	
	6		10mm² Cu	Satisfactory	
	7	2.5	10mm² Cu	Satisfactory	2.3.2
	8		10mm² Cu	Satisfactory	
MJPB 16	3	/	16mm² Al	Satisfactory	2.6
	4		16mm² Al	Satisfactory	
	5		16mm² Al	Satisfactory	
	6		16mm² Al	Satisfactory	
	7	2.5	16mm² Al	Satisfactory	2.3.2
	8		16mm² Al	Satisfactory	
MJPB 25	3	/	25mm² Al	Satisfactory	2.6
	4		25mm² Al	Satisfactory	
	5		25mm² Al	Satisfactory	
	6		25mm² Al	Satisfactory	
	7	2.5	25mm² Al	Satisfactory	2.3.2
	8		25mm² Al	Satisfactory	
MJPB 35	5	/	35mm² Al	Satisfactory	2.6
	6		35mm² Al	Satisfactory	
	7		35mm² Al	Satisfactory	
	8		35mm² Al	Satisfactory	
	9	2.5	35mm² Al	Satisfactory	2.3.2
	10		35mm² Al	Satisfactory	

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TEST DESCRIPTION : 2.5 Low temperature assembly test

DATE : 16/01/2006
PLACE : MICHAUD test laboratory

OPERATOR : AC. BERNARD

N° OF SAMPLES : 9 and 10 for sleeves MJPB 35
7 and 8 for the other types of sleeves

TEST EQUIPMENTS

- Enclosure with regulated temperature - 25°C + 45°C
- Measure equipment for traction / compression

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.5 of standard NF C 33-021 dated June 1998.

Each sleeve as well as cores which are ready to be fitted, are installed in the enclosure with regulated temperature - 25°C + 45°C, at a temperature of - 11°C.

After one hour, the assembly being kept in the enclosure, the sleeve is crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

3 h after its exit of the enclosure with regulated temperature - 25°C + 45°C, the sleeve being fitted is subjected to the dielectric and watertightness tests, then to the tensile test (respectively § 2.4 and 2.3.2 of this test report).

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS DURING THE ASSEMBLY AT –11°C	FOLLOWING TEST
MJPB 6	7	/	6mm² Cu	Satisfactory	2.4
	8		6mm² Cu	Satisfactory	
MJPB 10	7	/	10mm² Cu	Satisfactory	2.4
	8		10mm² Cu	Satisfactory	
MJPB 16	7	/	16mm² Al	Satisfactory	2.4
	8		16mm² Al	Satisfactory	
MJPB 25	7	/	25mm² Al	Satisfactory	2.4
	8		25mm² Al	Satisfactory	
MJPB 35	9	/	35mm² Al	Satisfactory	2.4
	10		35mm² Al	Satisfactory	

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TEST DESCRIPTION : 2.6 Climatic ageing test

DATE : FROM 13/01/2006 TO 28/02/2006
PLACE : MICHAUD laboratory test

OPERATORS : A. BERNARD
JP. RAPY

N° OF SAMPLES : 5 up to 8 for sleeves MJPB 35
3 up to 6 for the other types of sleeves

TEST EQUIPMENTS

- Climatic ageing enclosure XR 35

PROCEDURES

Procedure and acceptance criteria are the ones of § 2.6 of standard NF C 33-021 dated June 1998.

CLIMATIC TEST

Procedures of this test are the ones of standard C 20-540 dated June 2002.

Samples support 6 weekly cycles, the enclosure temperature being 70 (± 2) °C for the conditionings A and C.

ACCEPTANCE CRITERIA

At the end of the climatic ageing cycles, the samples shall comply with the following tests, after being placed in the test laboratory atmosphere for at least 24 h without exceeding 72 h :

◊ Dielectric test :
* The assembly, placed horizontally, is covered with lead balls, over 1 to 2cm. After 1min, a dielectric test is performed on the assembly at a 6kV voltage at an industrial frequency during 1min. Increase of voltage is performed at a 1kV/s speed.
No breakage shall occur.
* A dielectric test is performed on the assembly under a 1kV voltage, according to § 2.4 of this test report.
No breakage shall occur.

◊ Visual control :
* At the end of the tests, marking of the pieces shall be legible when examined with normal or correction vision without magnification.

TEST RESULTS

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPB 6	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	

ВЯРНО С ОРИГИНАЛА

TEST DESCRIPTION : 2.6 **Climatic ageing test**

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6kV TEST IN LEAD	1kV TEST IN WATER		
MJPB 6	5	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
MJPB 10	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
MJPB 16	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	

TEST DESCRIPTION : 2.6 Climatic ageing test

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPB 25	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
MJPB 35	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV)	No breakage	No breakage	Satisfactory	

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TEST DESCRIPTION : 2.8 **Electric ageing test**

DATE : FROM 26/01/2006 TO 10/02/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC. BERNARD

N° OF SAMPLES : 11 up to 16 for sleeves MJPB 35

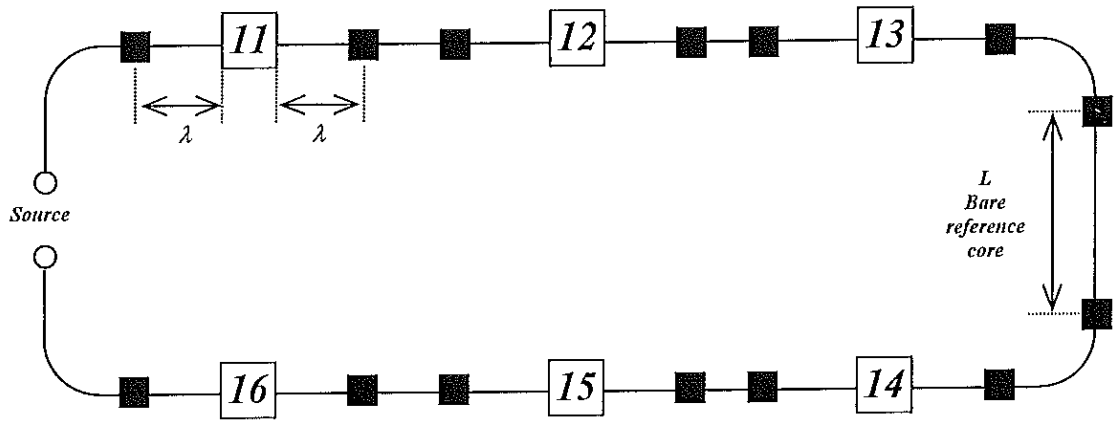
TEST EQUIPMENTS

- Measure equipment for traction / compression
- N° 1 electric ageing bench
- Measure station NI2

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.8 of standard NF C 33-021 dated June 1998 which refers to standard NF C 33-004 dated June 1998.

The test loop carried out according to standard NF C 33-004 is the loop "A" in "U" form :



LEGEND

- Sleeve
- Voltage measure point
- NF C 33-209 35mm² Al core

1. Preparation of the loop

- Parameters of the loop are calculated :

λ	L
150mm	300mm

- Voltage measure points are performed by means of equalizers (welding method : «TIG», metal filler : 1 050A aluminium). They are placed as shown on the previous schema.
- Conductors linked to the source or the bench are equipped with terminal lugs.
- The reference core is stripped.

2. Assembly of the loop

- Samples are fitted on cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.
- So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.
- Conductors equipped with terminal lugs are linked to the electric ageing bench by means of bolts.
- Voltage measure points are installed.
- Temperature measure points are installed as follows :

	TYPE OF THERMOCOUPLE	PLACE OF FIXING	TYPE OF HOLD
Sleeve	- type «k», «sheathed» in a tube of inconel, - diameter 1 mm.	- at the middle of the sleeve, in a 1,2mm diameter hole.	- covered with «thermoconductor» grease - holding with a mastic type «polyurethane»
Reference core	- type «k», - diameter 0,5 mm.	- at the «middle» of the reference conductor core.	- holding through a splice (copper wire diameter 0,4mm) - covered with «thermoconductor» grease
Room temperature	- type «k», «sheathed» in a tube of inconel, - diameter 1 mm.	- at the middle of the loop in the horizontal level containing the sleeves.	/

3. Process of a cycle

Heating at 120°C of the reference core	Duration	4 min
	Intensity	~ 260A
Step at 120°C of the reference core	Duration	50 min
	Intensity	~ 180A
Temperature measure every 10 cycle		
Cooling	Duration	35min
Resistance measure every 10 cycle		
Total duration of a cycle	Duration	89min

4. Performing of the test - Measures

- Resistance measure is performed under a direct current of 15A every 10 cycle.
- Rj resistance values of each sleeve are calculated according to § 5.3.3.4 of standard NF C 33-004 dated June 1998.
- The test consists of 200 cycles of electrical ageing.

ВЯРНО С ОРИГИНАЛА

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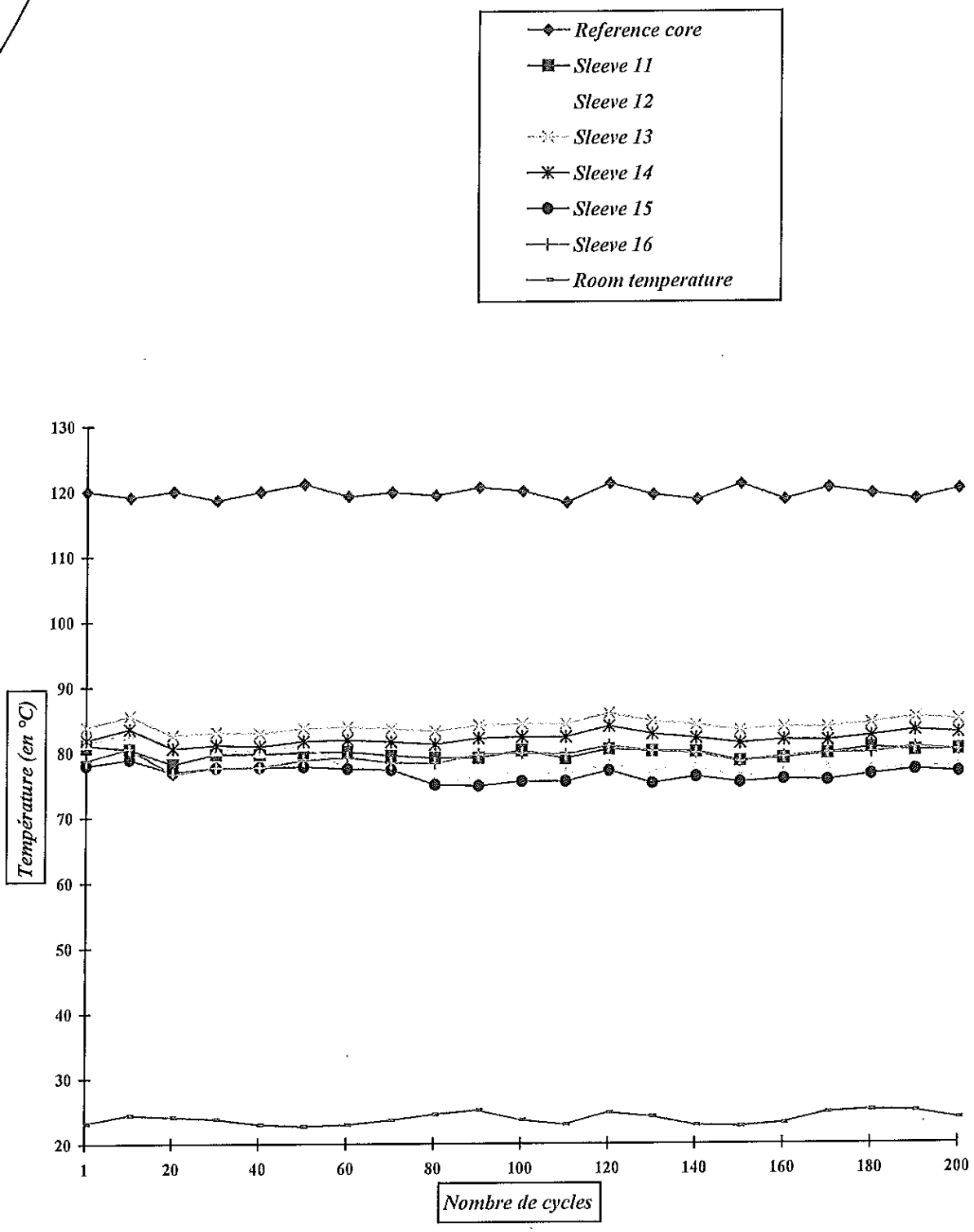
TEST RESULTS

TEMPERATURE RECORD (in °C)

Cycles	Reference core	Sleeves						Room temperature
		11	12	13	14	15	16	
1	120,0	81,1	81,6	83,9	81,9	78,0	78,8	23,2
10	119,1	80,5	82,9	85,6	83,6	78,9	80,6	24,4
20	120,0	78,2	80,4	82,6	80,6	76,9	76,7	24,1
30	118,6	79,7	80,5	83,1	81,1	77,6	77,7	23,8
40	119,9	79,7	80,2	82,9	80,9	77,7	77,7	23,0
50	121,1	80,0	81,2	83,7	81,7	77,8	78,8	22,7
60	119,2	80,1	77,5	83,9	81,9	77,5	79,2	22,9
70	119,8	79,5	77,4	83,6	81,6	77,3	78,4	23,6
80	119,3	79,1	75,2	83,2	81,2	75,0	78,3	24,5
90	120,5	79,1	76,3	84,1	82,1	74,8	79,6	25,1
100	119,9	80,2	76,8	84,3	82,3	75,5	79,8	23,6
110	118,2	79,0	76,7	84,3	82,3	75,5	79,6	22,9
120	121,1	80,4	77,9	85,9	83,9	77,1	80,9	24,7
130	119,4	80,1	77,2	84,7	82,7	75,2	80,1	24,1
140	118,6	80,0	77,6	84,1	82,1	76,2	79,8	22,8
150	121,0	78,6	76,1	83,3	81,3	75,3	78,5	22,6
160	118,6	79,0	76,7	83,8	81,8	75,8	79,2	23,1
170	120,4	79,7	77,3	83,7	81,7	75,6	79,8	24,7
180	119,5	80,6	77,1	84,4	82,4	76,5	79,8	25,1
190	118,6	80,1	77,7	85,2	83,2	77,2	80,6	24,9
200	120,1	80,2	77,4	84,8	82,8	76,8	80,1	23,8

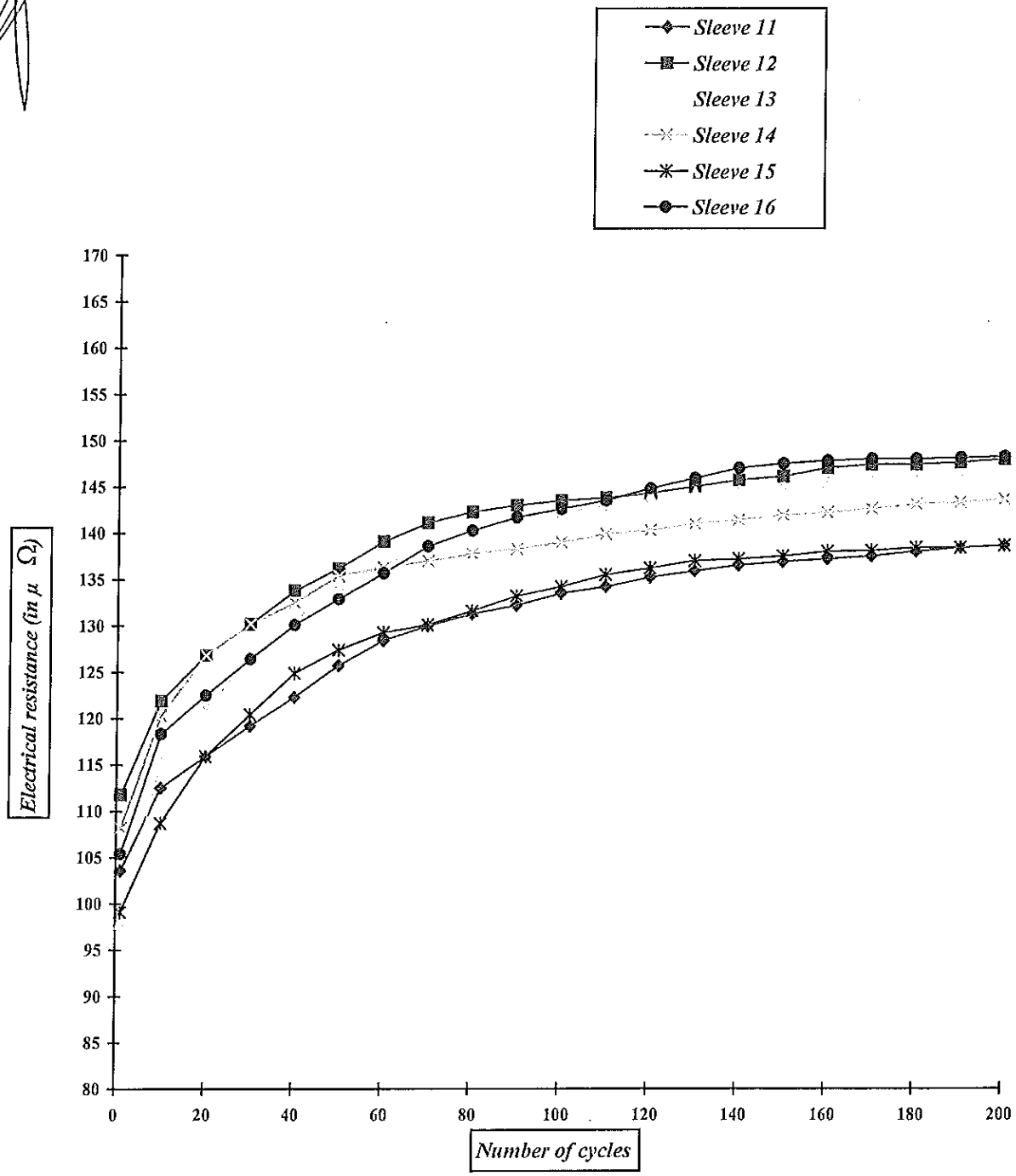
TEST DESCRIPTION : 2.8 Electric ageing test



Rj RESISTANCE RECORD (in μΩ)

Cycles	Sleeves					
	11	12	13	14	15	16
0	103,6	111,8	97,9	108,2	99,1	105,4
10	112,5	121,9	115,4	120,3	108,7	118,3
20	115,9	126,8	121,1	126,8	115,9	122,5
30	119,2	130,2	126,7	130,2	120,4	126,4
40	122,3	133,8	130,6	132,5	124,9	130,1
50	125,7	136,2	134,5	135,4	127,4	132,9
60	128,4	139,1	136,6	136,3	129,3	135,7
70	130,0	141,1	138,9	137,0	130,1	138,6
80	131,3	142,3	140,2	137,8	131,6	140,3
90	132,2	143,0	141,5	138,3	133,2	141,7
100	133,5	143,5	142,1	139,0	134,2	142,6
110	134,2	143,8	143,0	139,9	135,5	143,5
120	135,2	144,3	143,9	140,3	136,2	144,8
130	135,9	145,0	144,2	141,0	137,0	145,9
140	136,5	145,7	144,4	141,4	137,2	147,0
150	136,9	146,1	144,8	141,9	137,5	147,5
160	137,2	147,0	145,3	142,2	138,0	147,8
170	137,5	147,4	145,5	142,6	138,1	148,0
180	138,0	147,4	145,7	143,1	138,4	148,0
190	138,4	147,6	145,7	143,3	138,4	148,1
200	138,6	147,9	145,9	143,6	138,6	148,2

TEST DESCRIPTION : 2.8 **Electric ageing test** Page 6/



The results are the ones of § 5.4 of standard NF C 33-004 which defines the following acceptance criteria :

◊ *Relative initial scatter of resistances : : $\delta \leq 0,30$*

◊ *Stability of resistances R_j (on the 11th last measures) :* $\frac{\Delta R_j}{R_j} \leq 12\%$

◊ *Stability of temperatures θ_j (on the 11th last measures) :*

$d_j - 10 \leq d_j \leq d_j + 10$ with : * $d_j = \theta_R - \theta_j$

* θ_R : temperature of the warmest reference core

$\theta_j \leq Max\ \theta_R$

Equivalent to check : $Min\ d_j \geq 0$

1) Temperature

SAMPLE N°	TEMPERATURE STABILITY (IN K)			
	$\overline{d_j} - 10$	Min d_j	Max d_j	$\overline{d_j} + 10$
11	29,8	38,5	42,4	49,8
12	32,4	40,9	44,9	52,4
13	25,2	33,4	37,7	45,2
14	27,2	35,4	39,7	47,2
15	33,5	41,4	45,7	53,5
16	29,7	38,0	42,5	49,7

2) Resistance

SAMPLE N°	INITIAL SCATTER δ	RESISTANCE STABILITY (in %) $\frac{\Delta R_j}{R_j}$
11	0,084	3,7
12		3,0
13		2,6
14		3,2
15		3,2
16		3,8

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TEST DESCRIPTION : 2.9 **Endurance test under mechanical and thermal stresses**

DATE : FROM 23/01/2006 TO 27/02/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC. BERNARD

N° OF SAMPLES : 9 up to 12 for sleeves MJPB 16

TEST EQUIPMENTS

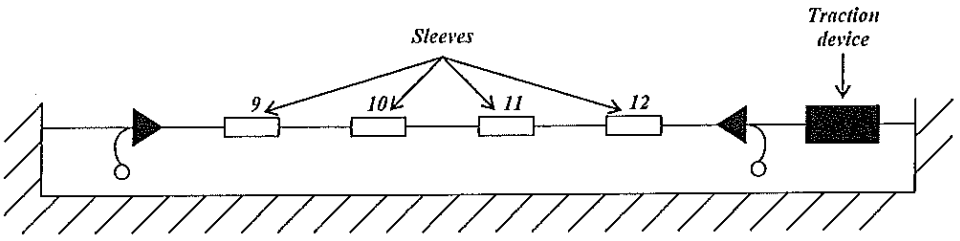
- Measure equipment for traction / compression
- Mechanical tensile strength and endurance bench
- Measure station SA 32

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.9 of standard NF C 33-021 dated June 1998.

1. **Assembly**

The four sleeves are fitted on a core according to the principle scheme hereafter :



The free length between each sleeve and between the end sleeves and the anchoring equipment is of 1m.

Thermocouples are installed in the middle of both sleeves placed at both extremities of the assembly, as well as in the middle of a 1 m long stripped reference core placed outside anchoring equipment.

2. **Installation period**

A tensile strength of 800N is applied in 1min on the core. This strength is regulated during 10min, temperature of the conductors core being regulated at the room temperature.

Then, while regulating the cores conductor at the room temperature, we leave the assembly stabilizing during 24 h.

3. **Cycles application**

After the previous stabilization period, 500 cycles of 90 min are applied on the assembly as follows :

- **Heating** :
  - for 45 min : Temperature of the conductors core maintained at (90 ± 3)°C,
  - for 45 min : Natural cooling of the conductors core down to (25 ± 3)°C and stabilization at this temperature.
- **Mechanical strength :**
  It is adjusted at 400N at the end of the first cycle then once per 24 h at the end of a cycle.

Temperature of the sleeves is measured every 25 cycles at the end of the heating period at 90°C.

ВЯРНО С ОРИГИНАЛА

4. Acceptance criteria

a) Temperature of the sleeves n° 9 and 12, at the end of the heating periods, must be under the temperature of the reference core.

b) Sleeves n° 10 and 11 must be tested accordingly :

- ***Dielectric strength test in the balls***

  The assembly, placed horizontally, is covered with lead balls over 1 up to 2cm. After at least 1 min, a dielectric test is performed on the assembly at a 6kV voltage at an industrial frequency for 1min, at a 1kV/s speed.
  No breakage shall occur.

- ***Dielectric strength test in water***

  A dielectric strength is then performed on the assembly under a 1kV voltage according to § 2.4 of this report.
  No breakage shall occur.

c) The four sleeves must be tested according to the mechanical test (§ 2.3.2 of this report).

TEST RESULTS

a) Temperature of sleeves n° 9 and 12

CYCLES	REFERENCE CORE	SLEEVES	
		9	12
1	89,2	62,6	63,1
25	88,6	61,4	62,5
50	91,4	61,8	63,4
75	90,2	62,3	61,3
100	89,5	63,2	62,7
125	91,3	62,1	63,2
150	89,7	63,0	63,6
175	89,5	63,4	62,9
200	91,4	62,8	63,3
225	90,3	61,5	64,0
250	88,8	62,3	63,2
275	90,9	63,9	62,8
300	91,0	61,7	62,8
325	89,5	62,4	63,6
350	90,7	63,2	64,1
375	90,2	62,0	62,7

CYCLES	REFERENCE CORE	SLEEVES	
		9	12
400	89,6	61,8	63,9
425	91,4	63,0	64,3
450	90,5	63,3	62,4
475	89,1	62,5	63,2
500	90,3	63,1	64,6

Temperature of each sleeve is always under the reference core temperature.

b) Dielectric test of sleeves n° 10 and 11

SAMPLE N°	COMMENTS AFTER 1min UNDER 6kV IN THE BALLS	COMMENTS AFTER 1min À 1kV IN WATER	FOLLOWING TEST
10	Satisfactory	Satisfactory	2.3.2
11	Satisfactory	Satisfactory	

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ ЗА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП К 032, К 035, К 039, К 042.

Съставил:

361

sicame

Laboratoire d'essais
Direction Etudes et Recherches

PRODUCT: Preinsulated junction sleeves

Test report	: Dielectric
Report number	: 9304220
Product brand	: SICAME
Product type	: MJPB 16-4
Project n°	: E 0900324
Batch number	: 2-92

Demander of the test: DER SICAME

Starting date ot the test : 21/09/1993

Report emission date : 06 SEP. 2000

According to standard : NF C 33-021 (January 1993)

This report contains : 3 Pages 0 Annex(es)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 16-4 conform to the NF C 33-021 standard of january 1993 sub-clause 2.4.1.

This is an english translation. The original french test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

B.P. N 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO STANDARD: NF C 33-021	SUP ER 1460 INDICE B

Test number : 9304220

Product brand : SICAME

Product type : MJPB 16-4

A - Computer equipment

IBM PS2 (Inv N°: 89 90 84) Hard disk 60 MB
Analog/Digital interface card
Digital/Analog interface card
RS232 on OS2

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric test equipment (Inv N°: 91 02 69) Bouchet 10 kV - 100 mA
3 settable thresholds
(10 mA, 100 mA delaye

C - General Equipment

Digital caliper (Inv N°: 92 00 91)

Calibrated Ruler (Inv N°: 93 00 83) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Electro-hydraulic compression tool ED50 (5 tons) N°UT: 91 01 29

Die E140 nominal width 5 mm

SICAME DER	DIELECTRIC TEST ACCORDING TO STANDARD: NF C 33-021	SUP ER 740 INDICE B

Test number : 9304220 Date:21/09/1993 Ambient Temperature :23.5°C

Manufacturer : SICAME Humidity : 42 %

Product : MJPB 16-4

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a water tank, the water level is 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subjected to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of ci. uit breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm²)
1	16 Alu / 4 Cu
2	16 Alu / 4 Cu

N° CONNECTOR	6kV/1mn After 30 min in water	Triggening value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

est

ЗЯРНОСОРТ-ПЛАМА

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sicame

Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Endurance test under mechanical and thermal stresses**
Test number	**: 00 11 311 indice 1**
Product brand	**: SICAME**
Product type	**: MJPB 16-4**

Demander of the test	: DER
Starting date of the test	: 06/11/2000
Report emission date	: 26 FEV. 2003
According to standard	: NF C 33-021 § 2.9 (june 98)
This report contains	: 5 page et 0 annex
Conclusion	: The preinsulated junction sleeves type MJPB 16-4 conform to the requirements of NF C 33-021 § 2.9 (june 98) standard.

This is an English translation. The original French test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email info@sicame.fr

1. Equipment used during test.

1.1 Equipment used :

N° U.T.	Designation	Characteristic
93 05 48	Crimping machine	50 kN
94 03 10	Traction bench 3 tons	Class 1
95 00 87	Electrical ageing machine n°9	/
92 04 55	Scanner	Accuracy ± 2°C
91 02 69	Dielectrimeter Bouchet	Accuracy 0,5 mA and 200V
92 02 82	Stop watch	Accuracy 1s
99 00 41	Conductimeter	Accuracy 30µS/cm
95 01 75	Calibrated ruler	Accuracy ± 1 mm

1.2 Cables :

Sections	16/4
Nature	Aluminium
From	Malaisia
Identification n°	9901
Conditioned on	01/07/1999 (1h00 at 120°C)

2. Product tested.

Désignation : MJPB 16-4

Number : 4

Project number : E 0900324

Identification : 1, 2, 3 and 4

Reception date at the laboratory : on the 06/11/2000

Visa
Supervisor
of the test

ВЯРНО СОРИГИНАЛА

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3. Test.

Preinsulated junction sleeves are tested according to NF C 33-021 § 2.9 (june 98) standard.

3.1 Test procedure.

The test is carried out on 4 joint sleeves.

The free length of core between two adjacent joint sleeves is (1,0 ± 0,1) m and the free length of core between the anchoring and the extremity joint sleeves is at least 1 m.

The test consists in performing heat cycles combined with the mechanical stresses on the conductors connected by a joint sleeve. These mechanical stresses are applied on the stripped cores extremity by an appropriate anchoring equipment. The number of cycles is 500.

Thermocouples are placed to the central conductive part of the two joint sleeves located at both ends of the test assembly.

The reference temperature is measured in the middle of a stripped of (1,0 ± 0,1) m located at the outer side of the anchoring equipments, not less than 1 m from any supporting or connecting components.

Thermal cycles of a duration of 90 min are applied to the test assembly.

For the first 45 minutes of the cycle, the temperature rise is created by current flowing. The reference temperature of the conductor is maintained at (90 ± 3)°C. This temperature is reached within 5 min to 15 min at the beginning of the cycle.

For the last 45 min, the test assembly is naturally cooled down to (25 +/- 3)°C. The temperature is then maintained at this value until the end of the cycle.

Once in 24 h, at the end of the 90°C heating period, the two temperatures reached by the two joint sleeves are recorded.

An increasing tensile strength is applied for about 1 min up to a value equal to 60 % of the minimum strength indicated in the standard.

This strength is then maintained for 10 min using a manual or automatic continuous control. The assembly is left to self stabilize mechanically for 24 h without any control.

After stabilization, thermal cycles are applied. At the end of the first cycle, the tensile strength is set at 33 % of the minimum strength indicated in the standard.

Then, at least once in 24 h, tensile strength is adjusted at 33 % of the minimum strength indicated in the standard.

Visa
Supervisor
of the test

ВЯРНО СОРИГИНАЛА

3.2 Preparation

A 9 mm wide dies for groove E140 is used.

4. Requirements and results.

- **Cycles :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 25°C Between 25 % et 75 % HR	22°C 39 %HR
Rate of the tensile (N/min)	720 in 1 min	720
Strength value maintained for 10 min (N)	720	720
After 24 h, the strength is set at 33 % of the minimum strength (N)	400	400
Thermal stress	45 min at 90°C	45 min at 90°C
Number of cycles	500	500

- **Temperature measurements :**

Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connecto temperature (°C)
06/11/2000	1	90,1	48,1	51,0
07/11/2000	14	90,1	48,2	51,3
08/11/2000	28	90,2	48,3	51,6
09/11/2000	42	89,9	47,9	51,8
10/11/2000	56	89,8	47,9	51,9
13/11/2000	100	90,0	48,3	51,8
14/11/2000	114	90,3	48,2	51,3
15/11/2000	128	90,2	48,5	51,7
16/11/2000	142	89,7	49,0	51,6
17/11/2000	156	89,9	49,3	51,2
20/11/2000	200	90,5	49,6	51,4
21/11/2000	214	90,2	49,5	51,0
22/11/2000	228	90,1	49,2	51,3
23/11/2000	242	90,4	49,4	51,6
24/11/2000	256	90,1	49,3	51,7
27/11/2000	300	89,7	49,6	51,9
28/11/2000	314	90,1	49,8	52,4
29/11/2000	328	90,4	49,5	52,1
30/11/2000	342	89,9	49,0	51,6
01/12/2000	356	90,0	49,5	51,9
04/12/2000	400	90,3	49,5	52,0

Visa
Supervisor
of the test

ВЯРНО С ОРИГИНАЛА

Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connector 4 temperature (°C)
05/12/2000	414	90,4	49,5	51,3
06/12/2000	428	89,6	49,6	51,8
07/12/2000	442	89,9	49,7	51,7
08/12/2000	456	90,5	49,3	51,4
11/12/2000	500	90,3	49,6	51,6

↳ Connectors temperatures are always lower than reference temperature.

- **Mechanical and flashover tests :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 35°C Between 25 % et 75 % HR	21°C 41 % HR
Water resistivity	< 200 Ωm	78,7 Ωm
6 kV during 1 min in metallic balls	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
1 kV during 1 min in water after 30 min in water	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
Rate of the tensile (N/min)	Between 1000 et 5000	Connector n°1 : 3000 Connector n°2 : 3000 Connector n°3 : 3000 Connector n°4 : 3000
Strength value maintained for 1 min (N)	600	Connector n°1 : 600 Connector n°2 : 600 Connector n°3 : 600 Connector n°4 : 600
Strength value applied without breakdown (N)	1200	Connector n°1 : 1200 Connector n°2 : 1200 Connector n°3 : 1200 Connector n°4 : 1200

↳ No flashover and no slippage are observed.

5. Conclusion

Tested connectors conform to the the requirements of NF C 33-021 § 2.9 (june 98) standard.

Visa
Supervisor
of the test

ВЯРНО СОРИГЕНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPB 16-4

1. **№ на тест 9304220** - Диелектричен тест;
2. **№ на тест 0011311** - Тест за издръжливост под механичен и топлинен натиск.

Съставил:

sicame
Laboratoire d'essais
Direction Etudes et Recherches

PRODUCT: Preinsulated junction sleeves

Test report	: Dielectric
Report number	: 9309320
Product brand	: SICAME
Product type	: MJPB 16-6
Project n°	: E 0900324
Batch number	: 2-92

Demander of the test: DER SICAME

Starting date ot the test : 21/09/1993

Report emission date : 06 SEP. 2000

According to standard : NF C 33-021 (January 1993)

This report contains : 3 Pages 0 Annex(es)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 16-6 conform to the NF C 33-021 standard of january 1993 sub-clause 2.4.1.

This is an english translation. The original french test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЕРНО С ОРИГИНАЛА

B.P. N 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO STANDARD: NF C 33-021	SUP ER 1160 INDICE B

Test number : 9309320

Product brand : SICAME

Product type : MJPB 16-6

A - Computer equipment

IBM PS2 (Inv N°: 89 90 84) Hard disk 60 MB
Analog/Digital interface card
Digital/Analog interface card
RS232 on OS2

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric test equipment (Inv N°: 91 02 69) Bouchet 10 kV - 100 mA
3 settable thresholds
(10 mA, 100 mA delaye

C - General Equipment

Digital caliper (Inv N°: 92 00 91)

Calibrated Ruler (Inv N°: 93 00 83) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Electro-hydraulic compression tool ED50 (5 tons) N°UT: 91 01 29

Die E140 nominal width 5 mm

Super

На основание чл. 2
от ЗЗЛД

SICAME DER	DIELECTRIC TEST ACCORDING TO STANDARD: NF C 33-021	SUP ER 720 INDICE B

Test number : 9309320 Date:21/09/1993 Ambient Temperature :23.5°C

Manufacturer : SICAME Humidity : 42 %

Product : MJPB 16-6

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a water tank, the water level is 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subjected to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of ci. .it breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm²)
1	16 Alu / 6 Cu
2	16 Alu / 6 Cu

N° CONNECTOR	6kV/1mn After 30 min in water	Triggening value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

На основание чл. 2
от ЗЗЛД

est

ВЯРНО СЪМ

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sicame
Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Endurance test under mechanical and thermal stresses**
Test number	**: 00 11 370 indice 1**
Product brand	**: SICAME**
Product type	**: MJPB 16-6**

Demander of the test	: DER
Starting date of the test	: 06/11/2000
Report emission date	: 26 FEV. 2003
According to standard	: NF C 33-021 § 2.9 (june 98)
This report contains	: 5 page et 0 annex
Conclusion	: The preinsulated junction sleeves type MJPB 16-6 conform to the requirements of NF C 33-021 § 2.9 (june 98) standard.

This is an English translation. The original French test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЕРНО С ОРИГИНАЛА

1. Equipment used during test.

1.1 Equipment used :

N° U.T.	Designation	Characteristic
93 05 48	Crimping machine	50 kN
94 03 10	Traction bench 3 tons	Class 1
95 00 87	Electrical ageing machine n°9	/
92 04 55	Scanner	Accuracy ± 2°C
91 02 69	Dielectrimeter Bouchet	Accuracy 0,5 mA and 200V
92 02 82	Stop watch	Accuracy 1s
99 00 41	Conductimeter	Accuracy 30µS/cm
95 01 75	Calibrated ruler	Accuracy ± 1 mm

1.2 Cables :

Sections	16/6
Nature	Aluminium
From	Malaisia
Identification n°	9901
Conditioned on	01/07/1999 (1h00 at 120°C)

2. Product tested.

Désignation : MJPB 16-6

Number : 4

Project number : E 0900324

Identification : 1, 2, 3 and 4

Reception date at the laboratory : on the 06/11/2000

Visa
Supervisor
of the test

ВЯРНО СОРЕГИНАЛА

3. Test.

Preinsulated junction sleeves are tested according to NF C 33-021 § 2.9 (june 98) standard.

3.1 Test procedure.

The test is carried out on 4 joint sleeves.

The free length of core between two adjacent joint sleeves is (1,0 ± 0,1) m and the free length of core between the anchoring and the extremity joint sleeves is at least 1 m.

The test consists in performing heat cycles combined with the mechanical stresses on the conductors connected by a joint sleeve. These mechanical stresses are applied on the stripped cores extremity by an appropriate anchoring equipment. The number of cycles is 500.

Thermocouples are placed to the central conductive part of the two joint sleeves located at both ends of the test assembly.

The reference temperature is measured in the middle of a stripped of (1,0 ± 0,1) m located at the outer side of the anchoring equipments, not less than 1 m from any supporting or connecting components.

Thermal cycles of a duration of 90 min are applied to the test assembly.

For the first 45 minutes of the cycle, the temperature rise is created by current flowing. The reference temperature of the conductor is maintained at (90 ± 3)°C. This temperature is reached within 5 min to 15 min at the beginning of the cycle.

For the last 45 min, the test assembly is naturally cooled down to (25 +/- 3)°C. The temperature is then maintained at this value until the end of the cycle.

Once in 24 h, at the end of the 90°C heating period, the two temperatures reached by the two joint sleeves are recorded.

An increasing tensile strength is applied for about 1 min up to a value equal to 60 % of the minimum strength indicated in the standard.

This strength is then maintained for 10 min using a manual or automatic continuous control. The assembly is left to self stabilize mechanically for 24 h without any control.

After stabilization, thermal cycles are applied. At the end of the first cycle, the tensile strength is set at 33 % of the minimum strength indicated in the standard.

Then, at least once in 24 h, tensile strength is adjusted at 33 % of the minimum strength indicated in the standard.

Visa
Supervisor
of the test

ВЕРНО СОРИГИНАЛА

3.2 Preparation

A 9 mm wide dies for groove E140 is used.

4. Requirements and results.

- **Cycles :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 25°C Between 25 % et 75 % HR	22°C 39 %HR
Rate of the tensile (N/min)	720 in 1 min	720
Strength value maintained for 10 min (N)	720	720
After 24 h, the strength is set at 33 % of the minimum strength (N)	400	400
Thermal stress	45 min at 90°C	45 min at 90°C
Number of cycles	500	500

- **Temperature measurements :**

Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connecto temperature (°C)
06/11/2000	1	90,1	48,1	51,0
07/11/2000	14	90,1	48,2	51,3
08/11/2000	28	90,2	48,3	51,6
09/11/2000	42	89,9	47,9	51,8
10/11/2000	56	89,8	47,9	51,9
13/11/2000	100	90,0	48,3	51,8
14/11/2000	114	90,3	48,2	51,3
15/11/2000	128	90,2	48,5	51,7
16/11/2000	142	89,7	49,0	51,6
17/11/2000	156	89,9	49,3	51,2
20/11/2000	200	90,5	49,6	51,4
21/11/2000	214	90,2	49,5	51,0
22/11/2000	228	90,1	49,2	51,3
23/11/2000	242	90,4	49,4	51,6
24/11/2000	256	90,1	49,3	51,7
27/11/2000	300	89,7	49,6	51,9
28/11/2000	314	90,1	49,8	52,4
29/11/2000	328	90,4	49,5	52,1
30/11/2000	342	89,9	49,0	51,6
01/12/2000	356	90,0	49,5	51,9
04/12/2000	400	90,3	49,5	52,0

Visa
Supervisor
of the test

ВЕРНО С ОРИГИНАЛА

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Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connector 4 temperature (°C)
05/12/2000	414	90,4	49,5	51,3
06/12/2000	428	89,6	49,6	51,8
07/12/2000	442	89,9	49,7	51,7
08/12/2000	456	90,5	49,3	51,4
11/12/2000	500	90,3	49,6	51,6

↳ Connectors temperatures are always lower than reference temperature.

- **Mechanical and flashover tests :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 35°C Between 25 % et 75 % HR	21°C 41 % HR
Water resistivity	< 200 Ωm	78,7 Ωm
6 kV during 1 min in metallic balls	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
1 kV during 1 min in water after 30 min in water	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
Rate of the tensile (N/min)	Between 1000 et 5000	Connector n°1 : 3000 Connector n°2 : 3000 Connector n°3 : 3000 Connector n°4 : 3000
Strength value maintained for 1 min (N)	600	Connector n°1 : 600 Connector n°2 : 600 Connector n°3 : 600 Connector n°4 : 600
Strength value applied without breakdown (N)	1200	Connector n°1 : 1200 Connector n°2 : 1200 Connector n°3 : 1200 Connector n°4 : 1200

↳ No flashover and no slippage are observed.

5. Conclusion

Tested connectors conform to the the requirements of NF C 33-021 § 2.9 (june 98) standard.

Visa
Supervisor
of the test

ВЯРНО С ОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPB 16-6

1. **№ на тест 9309320** - Диелектричен тест – тест;
2. **№ на тест 0011370** - Тест за издръжливост под механичен и топлинен натиск.

Съставил:

На основание чл. 2 от ЗЗЛД

sicame

Laboratoire d'essais
Direction Etudes et Recherches

PRODUCT: Preinsulated junction sleeves

Test report	: Dielectric
Report number	: 9101320
Product brand	: SICAME
Product type	: MJPB 16-10
Project n°	: E 0900324
Batch number	: 2-92

Demander of the test: DER SICAME

Starting date ot the test : 21/09/1993

Report emission date : 06 SEP. 2000

According to standard : NF C 33-021 (January 1993)

This report contains : 3 Pages 0 Annex(es)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 16-10 conform to the NF C 33-021 standard of january 1993 sub-clause 2.4.1.

This is an english translation. The original french test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЯРНО СОРЕГЕНАЛА

B.P. N 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO STANDARD: NF C 33-021	SUP ER 1200 INDICE B

Test number : 9101320

Product brand : SICAME

Product type : MJPB 16-10

A - Computer equipment

IBM PS2 (Inv N°: 89 90 84) Hard disk 60 MB
Analog/Digital interface card
Digital/Analog interface card
RS232 on OS2

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric test equipment (Inv N°: 91 02 69) Bouchet 10 kV - 100 mA
3 settable thresholds
(10 mA, 100 mA delaye

C - General Equipment

Digital caliper (Inv N°: 92 00 91)

Calibrated Ruler (Inv N°: 93 00 83) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Electro-hydraulic compression tool ED50 (5 tons) N°UT: 91 01 29

Die E140 nominal width 5 mm

ВЕРНО СОРЕГЕНИЛ

Visa
Supervisor of the test

SICAME DER	DIELECTRIC TEST ACCORDING TO STANDARD: NF C 33-021	SUP ER 720 INDICE B

Test number : 9101320 Date:21/09/1993 Ambient Temperature :23.5°C

Manufacturer : SICAME Humidity : 42 %

Product : MJPB 16-10

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a water tank, the water level is 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subjected to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of ci. uit breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm²)
1	16 Alu / 10 Cu
2	16 Alu / 10 Cu

N° CONNECTOR	6kV/1mn After 30 min in water	Triggening value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

Sup

На основание чл. 2 от ЗЗЛД

ВЯРНО С

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sicame
Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Endurance test under mechanical and thermal stresses**
Test number	**: 00 11 100 indice 1**
Product brand	**: SICAME**
Product type	**: MJPB 16-10**

Demander of the test	: DER
Starting date of the test	: 06/11/2000
Report emission date	: 26 FEV. 2003
According to standard	: NF C 33-021 § 2.9 (june 98)
This report contains	: 5 page et 0 annex
Conclusion	: The preinsulated junction sleeves type MJPB 16-10 conform to the requirements of NF C 33-021 § 2.9 (june 98) standard.

This is an English translation. The original French test report is the only reference version.

На основание чл. 2
от ЗЗЛД

ВЕРНО С ОРИГИНАЛА

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email info@sicame.fr

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1. Equipment used during test.

1.1 Equipment used :

N° U.T.	Designation	Characteristic
93 05 48	Crimping machine	50 kN
94 03 10	Traction bench 3 tons	Class 1
95 00 87	Electrical ageing machine n°9	/
92 04 55	Scanner	Accuracy ± 2°C
91 02 69	Dielectrimeter Bouchet	Accuracy 0,5 mA and 200V
92 02 82	Stop watch	Accuracy 1s
99 00 41	Conductimeter	Accuracy 30µS/cm
95 01 75	Calibrated ruler	Accuracy ± 1 mm

1.2 Cables :

Sections	16/10
Nature	Aluminium
From	Malaisia
Identification n°	9901
Conditioned on	01/07/1999 (1h00 at 120°C)

2. Product tested.

Désignation : MJPB 16-10

Number : 4

Project number : E 0900324

Identification : 1, 2, 3 and 4

Reception date at the laboratory : on the 06/11/2000

Visa
Supervisor
of the test

ВЯРНО С ОРИГИНАЛА

3. Test.

Preinsulated junction sleeves are tested according to NF C 33-021 § 2.9 (june 98) standard.

3.1 Test procedure.

The test is carried out on 4 joint sleeves.

The free length of core between two adjacent joint sleeves is (1,0 ± 0,1) m and the free length of core between the anchoring and the extremity joint sleeves is at least 1 m.

The test consists in performing heat cycles combined with the mechanical stresses on the conductors connected by a joint sleeve. These mechanical stresses are applied on the stripped cores extremity by an appropriate anchoring equipment. The number of cycles is 500.

Thermocouples are placed to the central conductive part of the two joint sleeves located at both ends of the test assembly.

The reference temperature is measured in the middle of a stripped of (1,0 ± 0,1) m located at the outer side of the anchoring equipments, not less than 1 m from any supporting or connecting components.

Thermal cycles of a duration of 90 min are applied to the test assembly.

For the first 45 minutes of the cycle, the temperature rise is created by current flowing. The reference temperature of the conductor is maintained at (90 ± 3)°C. This temperature is reached within 5 min to 15 min at the beginning of the cycle.

For the last 45 min, the test assembly is naturally cooled down to (25 +/- 3)°C. The temperature is then maintained at this value until the end of the cycle.

Once in 24 h, at the end of the 90°C heating period, the two temperatures reached by the two joint sleeves are recorded.

An increasing tensile strength is applied for about 1 min up to a value equal to 60 % of the minimum strength indicated in the standard.

This strength is then maintained for 10 min using a manual or automatic continuous control. The assembly is left to self stabilize mechanically for 24 h without any control.

After stabilization, thermal cycles are applied. At the end of the first cycle, the tensile strength is set at 33 % of the minimum strength indicated in the standard.

Then, at least once in 24 h, tensile strength is adjusted at 33 % of the minimum strength indicated in the standard.

Visa
Supervisor
of the test

ВЯРНО СОРИГИРАЛА

3.2 Preparation

A 9 mm wide dies for groove E140 is used.

4. Requirements and results.

- **Cycles :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 25°C Between 25 % et 75 % HR	22°C 39 %HR
Rate of the tensile (N/min)	720 in 1 min	720
Strength value maintained for 10 min (N)	720	720
After 24 h, the strength is set at 33 % of the minimum strength (N)	400	400
Thermal stress	45 min at 90°C	45 min at 90°C
Number of cycles	500	500

- **Temperature measurements :**

Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connecto temperature (°C)
06/11/2000	1	90,1	48,1	51,0
07/11/2000	14	90,1	48,2	51,3
08/11/2000	28	90,2	48,3	51,6
09/11/2000	42	89,9	47,9	51,8
10/11/2000	56	89,8	47,9	51,9
13/11/2000	100	90,0	48,3	51,8
14/11/2000	114	90,3	48,2	51,3
15/11/2000	128	90,2	48,5	51,7
16/11/2000	142	89,7	49,0	51,6
17/11/2000	156	89,9	49,3	51,2
20/11/2000	200	90,5	49,6	51,4
21/11/2000	214	90,2	49,5	51,0
22/11/2000	228	90,1	49,2	51,3
23/11/2000	242	90,4	49,4	51,6
24/11/2000	256	90,1	49,3	51,7
27/11/2000	300	89,7	49,6	51,9
28/11/2000	314	90,1	49,8	52,4
29/11/2000	328	90,4	49,5	52,1
30/11/2000	342	89,9	49,0	51,6
01/12/2000	356	90,0	49,5	51,9
04/12/2000	400	90,3	49,5	52,0

Visa
Supervisor
of the test

ВЯРНО С ОРИГИНАЛА

Date	Cycle	Reference temperature (°C)	Connector 2 temperature (°C)	Connector 4 temperature (°C)
05/12/2000	414	90,4	49,5	51,3
06/12/2000	428	89,6	49,6	51,8
07/12/2000	442	89,9	49,7	51,7
08/12/2000	456	90,5	49,3	51,4
11/12/2000	500	90,3	49,6	51,6

↳ Connectors temperatures are always lower than reference temperature.

- **Mechanical and flashover tests :**

	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 35°C Between 25 % et 75 % HR	21°C 41 % HR
Water resistivity	< 200 Ωm	78,7 Ωm
6 kV during 1 min in metallic balls	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
1 kV during 1 min in water after 30 min in water	No flashover	Connector n°1 : No flashover Connector n°3 : No flashover
Rate of the tensile (N/min)	Between 1000 et 5000	Connector n°1 : 3000 Connector n°2 : 3000 Connector n°3 : 3000 Connector n°4 : 3000
Strength value maintained for 1 min (N)	600	Connector n°1 : 600 Connector n°2 : 600 Connector n°3 : 600 Connector n°4 : 600
Strength value applied without breakdown (N)	1200	Connector n°1 : 1200 Connector n°2 : 1200 Connector n°3 : 1200 Connector n°4 : 1200

↳ No flashover and no slippage are observed.

5. Conclusion

Tested connectors conform to the the requirements of NF C 33-021 § 2.9 (june 98) standard.

Visa
Supervisor
of the test

ВЕРНО ОРИГИНАЛА

ЗАО "ИКОНТЕСТ"

38

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPB 16-10

1. **№ на тест 9101320** - Диелектричен тест;
2. **№ на тест 0011100** - Тест за издръжливост под механичен и топлинен натиск.

Съставил: На основание чл. 2 от ЗЗЛД

38

sicame

Laboratoire d'essais
Direction études et recherches

TEST REPORT : Dielectric test.

PRODUCT: Preinsulated junction sleeves.

Report number	: 2501222
Product brand	: SICAME
Product type	: MJPB 25-6
Project n°	: E 0900332
Batch number	: 98M708380

Demander of the test: SICAME D.E.R.

Starting date ot the test : 28/01/1999

Report emission date : 28/01/1999

According to standard : NF C 33-021 (june 1998)

This report contains : 3 Pages Annexe(s)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 25-6 comforms of standard NF C 33-021 (june 1998) ∫ 2.4.

На основание чл. 2
от ЗЗЛД

19230 POMPADOUR - FRANCE - Tél. (33) 55 73 89 00 - Fax (33) 55 75 63 12 - Télex 590 122 F

ВЯРНО С ОРИГИНАЛА

ИКОНОМАТИК

SICAME	DIELECTRIC TEST EQUIPMENT	SUP ER 1160
DER	ACCORDING TO SPECIFICATION: NF C 33-021	INDICE B

Test number : 2501222

Product brand : SICAME

Product type : MJPB 25-6

A - Computer equipment

IBM PS2 (Inv N°: 88 93 06) Hard disk 115 MB
Analog/Digital interface card
Digital/Analog interface card
Disk Operating System: DOS 6.1 IBM

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric unit (Inv N°: 91 02 69).

C - General Equipment

crimping machine (Inv N°: 93 05 48)

Calibrated Ruler (Inv N°: 95 01 75) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Visa
Supervisor of the test

ВЯРНО СОРИГИНАЛА

SICAME DER	DIELECTRIC TEST ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 720 INDICE B

Test number : 2501222 Date:28/01/1999 Ambient Temperature :22.9°C

Manufacturer : SICAME Humidity : 37 %

Product : MJPB 25-6

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a container of water, the water level must be 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subject to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of circuit breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm^2)
1	25 Alu / 6 Cu
2	25 Alu / 6 Cu

N° CONNECTOR	6kV/1mn After 30 min in water	Tripping value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

Visa
Supervisor of the test

ВЯРНО СОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП МЛРВ 25-6

1. **№ на тест: 2501422 -** Диелектричен тест.

Съставил:

На основание чл. 2
от ЗЗЛД

"ИКОН ДОСТАВКИ" ЕООД
СОФИЯ

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sicame

Laboratoire d'essais
Direction études et recherches

TEST REPORT : Dielectric test.

PRODUCT: Preinsulated junction sleeves.

Report number	: 2501425
Product brand	: SICAME
Product type	: MJPB 25-10
Project n°	: E 0900332
Batch number	: 98M708380

Demander of the test: SICAME D.E.R.

Starting date ot the test : 28/01/1999

Report emission date : 28/01/1999

According to standard : NF C 33-021 (june 1998)

This report contains : 3 Pages Annexe(s)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 25-10 comforms of standard NF C 33-021 (june 1998) ∫ 2.4.

На основание чл. 2
от ЗЗЛД

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ВЯРНО С ОРИГИНАЛА

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 1160 INDICE B

Test number : 2501425

Product brand : SICAME

Product type : MJPB 25-10

A - Computer equipment

IBM PS2 (Inv N°: 88 93 06) Hard disk 115 MB
Analog/Digital interface card
Digital/Analog interface card
Disk Operating System: DOS 6.1 IBM

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric unit (Inv N°: 91 02 69).

C - General Equipment

crimping machine (Inv N°: 93 05 48)

Calibrated Ruler (Inv N°: 95 01 75) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Visa
Supervisor of the test

ВЯРНОСОРЕГЕНАЛА

SICAME DER	DIELECTRIC TEST ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 720 INDICE B

Test number : 2501425 Date:28/01/1999 Ambient Temperature :22.9°C

Manufacturer : SICAME Humidity : 37 %

Product : MJPB 25-10

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a container of water, the water level must be 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subject to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of circuit breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm²)
1	25 Alu / 10 Cu
2	25 Alu / 10 Cu

N° CONNECTOR	6kV/1mn After 30 min in water	Tripping value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

Visa
Supervisor of the test

ВЯРНО СОРЕГНАЈА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPB 25-10

1. № на тест 2501425 - Диелектричен тест;

Съставил:

На основание чл. 2
от ЗЗЛД

SICAME

R & D DEPARTMENT

MECHANICAL TESTS

PRE-INSULATED JUNCTION SLEEVES

- MJPT 35 (CG) -> 9212290
- MJPT 50-25 (CG) -> 9212300
- MJPT 50-35 (CG) -> 9212310
- MJPT 50 (CG) -> 9212320
- MJPT 70-35 (CG) -> 9212330
- MJPT 70-50 (CG) -> 9212340
- [illegible]
- MJPT 150 (CG) -> 9212370
- MJPT 150-70 (CG) -> 9212380

PRE-INSULTAED LUGS

. BIMETALLIC LUGS

- CPTAU70A -> 9502080
- CPTAU150A -> 9502100

. ALUMINIUM LUGS

- CPTA70A -> 9502090

SUP ER 160
INDICE A

LABORATOIRE SICAME
ESSAI
FOLIO 1/10 VISA

ВЯРНО С ОРИГИНАЛА

EQUIPMENT USED DURING MECHANICAL TESTS

A - Computer

HP 9826 N°UT : 88 91 93

HP 3497A N°UT : 88 05 58 Data recording

HP 7470 N°UT : 88 91 90 Plotter

IBM PS2 N°UT : 88 93 06 Hard disk 112 Megabytes
Analog/digital card - Digital/analog card
DOS system used

IBM 4029 020 N°UT : 92 03 30 Laser printer

B - Electrical and thermal measurement equipment

HP 3456 N°UT : 88 05 17 Voltmeter

C - Equipment for mechanical tests

Traction bench (for junction sleeves) N°UT : 89 01 34
10 Tons HP 9826 driven
Load cell N°UT 920245 - FGP INSTRUMENTATION -

LHOMARGY DY 36 N° UT 92 04 23 (for pre insulated lugs)

Digital caliper N°UT : 93 06 07 - MITUTOYO -

Electronic torque wrench N°UT : 92 03 31 - POWELL DUFFRYN - Précision 1%

Standard ruler N°UT : 93 00 83 -ROCH-

Power supply FONTAINE N°UT : 92 02 79

Compression tool ED50 (5 tons) N°UT : 91 01 29

Pneumatic compression head U13 (13 tons) N°UT : 91 00 55

E215 die with 9 mm for 150 et 150-70 sleeves and lugs

E173 die with 9 mm for other sleeves and lugs

LABORATOIRE SICAME
ESSAI
FOLIO 2/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212290 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 35-35

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	1250	3820	wire breaking
2	1250	3960	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 92 12 290
FOLIO 3/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212300 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MUPT 50-25

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	900	3120	wire breaking
2	900	2940	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212300
FOLIO 4/10 VISA

ВЯРНО С ОРИГИНАЛА

400

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212310 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 50-35

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	1250	4410	wire breaking
2	1250	4300	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212310
FOLIO 5/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212320 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 50-50

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	1750	5860	wire breaking
2	1750	5960	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212320
FOLIO 6/10 VISA

402

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212330 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 70-35

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	1250	4250	wire breaking
2	1250	4350	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212330
FOLIO 7/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212340 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 70-50

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	1750	4950	wire breaking
2	1750	5400	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212340
FOLIO 8/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212350 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 70-70

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	2500	8570	wire breaking
2	2500	8620	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212350
FOLIO 9/10 VISA

SICAME DER	MECHANICAL TEST ACCORDING TO STANDARD : HN 33S66	SUP ER 730 INDEX A

Test number :9212370 Date:04/12/92 Ambient temperature : 22 °C

Product brand : CEGERS Humidity : 45 %

Product type : MJPT 150-150

A - SETTING OF THE TEST

A junction is set up with a core area adapted to the capacity of the sleeve.
A static load is applied on the conductive part of the cable.
It must be continuously increasing (the load increase must have a value between 1000 & 5000 N/mn) up to 50% of the minimum load value indicated in the standard.
The load is maintained during 1 minute.
Then, the load increase is repeated up to the breaking of the junction or the sliding of the conductor.

B - TEST RESULTS

N° of the sleeve	Value of the tensile strength required during 1 mn (N)	Breaking value (N)	Comments
1	5500	13560	wire breaking
2	5500	14010	wire breaking

General comments : Satisfactory

LABORATOIRE SICAME
ESSAI 9212370
FOLIO 10/10 VISA UB

SICAME

Laboratoire d'essais
de la Direction Etudes et Recherches

Rapport d'essai : Essai de montage à basse température
Test report : *Installation test at low temperature*

Rapport d'essai n°	: 12 04 124	*Test report n.*	*: 12 04 124*
Constructeur	: SICAME	*Product brand*	*: SICAME*
Référence produit	: MJPT 35	*Product type*	*: MJPT 35*
Demandeur de l'essai	: SICAME S.A.	*Test applied by*	*: SICAME S.A.*
Date d'essai	: Du 17 au 18 avril 2012	*Date of the test*	*: 17 to 18 April 2012*
Date d'émission du rapport	: 15 mai 2012	*Report emission date*	*: 15 May 2012*

Essais réalisés suivant : NF EN 50483-4 (07/2009), § 8.2.4
Tests carried out in accordance with

Ce rapport comprend : 9 pages
This report contains

Conclusion : Les manchons de jonction préisolés SICAME de type MJPT 35 soumis à essai satisfont aux exigences du § 8.2.4 de la norme NF EN 50483-4 (07/2009).
Pour déclarer la conformité, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

Conclusion : *The tested SICAME insulated splicing sleeves MJPT 35 comply with the requirements of clause 8.2.4 of NF EN 50483-4 (07/2009) standard.*
To give a ruling on the conformity, the uncertainty associated to the result is not implicitly involved

На основание чл. 2
от ЗЗЛД

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 69 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

ВЯРНО С ОРИГИНАЛА

1 Echantillons soumis à essai / *Samples under test*

Type : Manchon de jonction préisolé
Insulated splicing sleeve

Désignation / *Designation* : MJPT 35

Matière de la jupe / *over molding material* : KEPITAL

Fabricant / *Manufacturer* : SICAME

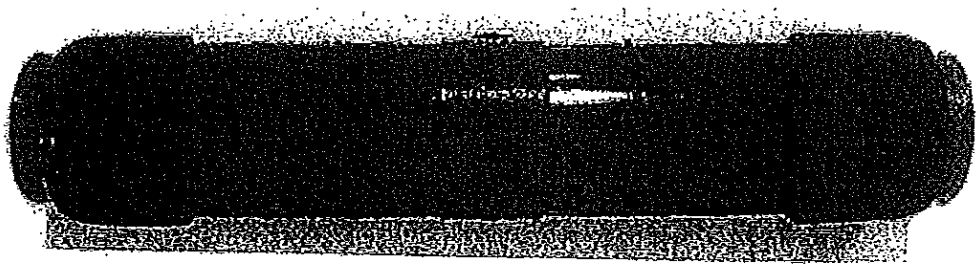
Numéro de lot / *Batch number* : Tête de série / *Head of series*
Echantillons suivant le plan E0700610
Samples in accordance with drawing n. E0700610

Classes du produit selon NF EN 50483-1 (§ 9.3) *Classes of product in accordance with NF EN 50483-1 (§ 9.3)*		
☑	Classe A *Class A*	: raccords soumis aux cycles de vieillissement électrique et aux essais de court-circuit *: connectors subjected to heat cycles and short-circuit current tests*
☐	Classe B *Class B*	: raccords soumis seulement aux cycles de vieillissement électrique *: connectors subjected to heat cycles only*
☑	Classe 1 *Class 1*	: raccords soumis à l'essai de tenue diélectrique dans l'eau *: connectors subjected to dielectric test in water*
☐	Classe 2 *Class 2*	: raccords soumis à l'essai de tenue diélectrique dans l'air *: connectors subjected to dielectric test in air*

Nombre d'échantillons / *Number of samples* : 2

Repérage / *Identification* : 1, 2

Date de réception au laboratoire : 3 avril 2012
Reception date at the laboratory : *03 April 2012*



Visa du responsable de l'essai
Visa supervisor of the test

2 Caractéristiques du matériel / *Equipment used during test*

2.1 Appareillage utilisé / *Equipment used*

N° U.T.	Désignation / *Designation*	Caractéristiques / *Characteristic*
93 05 48	Presse à sertir *Compression tool*	5 tonnes *5 tons*
/	Matrices *Dies*	E173 largeur 9 mm *E173 width 9 mm*
99 01 48	Thermomètre indicateur *Indicating thermometer*	Précision ± 2°C *Accuracy ± 2°C*
97 02 02	Réglet étalon *Calibrated ruler*	Précision 0,5 mm *Accuracy 0,5 mm*
10 03 21	Chambre froide *Low temperature chamber*	Précision 1°C *Accuracy 1°C*
99 00 41	Conductimètre *Conductimeter*	Précision 30 µS/cm *Accuracy 30µS/cm*
04 00 30	Thermomètre étanche *Watertight thermometer*	Précision 1°C *Accuracy 1°C*
03 02 56	Chronomètre *Stop watch*	Précision 1 s *Accuracy 1s*
94 03 09	Banc de traction 3 tonnes *Tensile test machine 3 tons*	Classe 1 *Class 1*
91 02 69	Diélectrimètre BOUCHET (10 kV) *Dielectrimeter BOUCHET (10 kV)*	Précision 0,5mA et 200V *Accuracy 0,5mA and 200V*

Visa du responsable de l'essai
Visa supervisor of the test

2.2 Câbles / *Cables*

N° Lot / *Identification*	08006					
Norme / *Standard*	NF C 33-209					
Provenance / *From*	France / *France*					
Section / *Cross section*	35 mm²					
Matériau de l'âme / *Conductor material*	☐	Cuivre / *Copper*	☑	Aluminium	☐	Alliage d'aluminium / *Aluminium alloy*
Type d'âme / *Conductor type*	☐	Massive / *Solid*	☑	Câblée / *Stranded*		
	☑	Rétreinte / *Compacted*	☐	Non rétreinte / *Non compacted*	☐	Souple / *Flexible*
Forme d'âme / *Conductor shape*	☑	Ronde / *Circular*	☐	Sectorale / *Sector-shaped*		
Nombre de brins / *Number of wires*	7					
Ø sur âme / *Ø on conductor*	7,05 mm					
Matériau de l'isolant / *Insulation material*	Polyéthylène réticulé type TIX-5 / *Cross-linked polyethylene, TIX-5 type*					
Ø sur isolant / *Ø on insulation*	10,45 mm					
Conditionnement / *Conditioned on*	1h00 à 120°C / *1h00 at 120°C*					
Référence du câble HD626 / *HD626 conductor reference*	6 E-1					
Charge de rupture minimale / *Minimum breaking load*	4 200 N					

3 Méthode / *Method*

Les essais sont effectués selon les prescriptions du paragraphe 8.2.4 de la norme NF EN 50483-4 (07/2009).

L'essai est effectué sur deux manchons pour chaque section.

Les raccords, le conducteur et les outillages sont au préalable pré-conditionnés jusqu'à la température d'essai (-10 ± 3) °C, ensuite ils sont assemblés à cette température dans la chambre froide.

Au moins 3h à température ambiante après la sortie de la chambre froide, les manchons sont soumis à :

- <u>l'essai de tenue diélectrique dans l'eau, conformément au § 8.2.3 :</u>

L'ensemble, raccord et conducteurs, est placé au fond d'un bac d'eau. Pendant le déplacement de l'ensemble, il peut être maintenu pour s'assurer qu'il n'y ait pas de courbure du conducteur ou de mouvement inutile des éléments. Le raccord est placé horizontalement. La profondeur de l'eau est mesurée à partir de la partie supérieure du raccord. Les conducteurs émergent suffisamment de l'eau pour éviter un claquage. Le courant de fuite maximum est égal à (10 ± 0,5) mA. La résistivité de l'eau est ≤ 200 Ωm. L'eau est à température ambiante. On effectue la montée progressive en tension à une vitesse d'environ 1 kV/s. Après une durée d'immersion de 30 min, une tension alternative de 6 kV est appliquée à l'échantillon pendant 60 s.

Visa du responsable de l'essai
Visa supervisor of the test

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- l'essai mécanique, conformément au § 8.2.2. :

L'ensemble est soumis à un effort de traction appliqué sur l'âme conformément à la figure 8 de la norme. Les efforts de traction sont appliqués sur les âmes, la montée en charge est conforme à la NF EN 50483-1, § 9.1.4. (vitesse entre 1000 N/min et 5000 N/min)
Un effort de traction est appliqué sur l'âme jusqu'à atteindre les valeurs exprimées en % de la CRM du Tableau 1 :

Tableau 1 – Efforts initiaux exigés pour le marquage

Système de torsade	*Sections*	*Efforts*	*Essai*
Système autoporté	4 mm² à 16 mm² Cuivre	10 % de la CRM pendant 60 s	☐
	16 mm² à 25 mm² Aluminium	20 % de la CRM pendant 60 s	☑
	35 mm² à 150 mm² Aluminium	**Pleine traction :** 20 % de la CRM pendant 60 s	☐
		Traction allégée : 5 % de la CRM pendant 60 s	☐
Système à neutre porteur	**Phases :** 16 mm² à 150 mm² Aluminium	30 % de la CRM pendant 60 s	☐
	Neutre : 25 mm² à 95 mm² alliage d'aluminium	60 % de la CRM pendant 60 s	☐

Un marquage est réalisé sur le câble à l'endroit où il sort du raccord.

Les efforts sont ensuite augmentés jusqu'aux valeurs exprimées en % de la CRM du Tableau 2 :

Tableau 2 – Efforts d'essai

Système de torsade	*Sections*	*Efforts*	*Essai*
Système autoporté	4 mm² à 16 mm² Cuivre	20 % de la CRM pendant 60 s	☐
	16 mm² à 25 mm² Aluminium	1 200 N ou 40 % de la CRM, la plus grande des deux valeurs pendant 60 s	☑
	35 mm² à 150 mm² Aluminium	**Pleine traction :** 85 % de la CRM pendant 60 s	☐
		Traction allégée : 10% de la CRM pendant 60 s	☐
Système à neutre porteur	**Phases :** 16 mm² à 150 mm² Aluminium	60 % de la CRM pendant 60 s	☐
	Neutre : 25 mm² à 95 mm² alliage d'aluminium	95 % de la CRM pendant 60 s	☐

Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

ЕЗК "ЕКОН ДОСТАВКА" СОФИЯ

Connectors are tested in accordance with NF EN 50483-4 (07/2009) §8.2.4 standard.
Two samples are tested of each equal cross section.
The connectors, conductor and tools are further pre-conditioned until they reach the test temperature of (-10 ± 3) °C before they are assembled. Assembly is made in the cold temperature chamber, at (-10 ± 3)°C.

At least 3 h after having been removed from the cold chamber, the sleeves are subjected to :

- *dielectrical voltage test in water, according to clause 8.2.3:*

The assembly, of connector and cores, is placed at the bottom of a water tank. During the movement of the assembly it may be supported to ensure no bending of the core or unnecessary movement of the component parts. The connector is placed horizontally. The depth of water is measured from the upper part of the connector. The cores are sufficiently above the water level to prevent flashover. The maximum leakage current is equal to (10 ± 0,5) mA. The resistivity of the water is ≤ 200 Ωm. The water is at ambient temperature. The a.c. voltage is applied to a rate of approximately 1 kV/s. After 30 min under water, the voltage test is applied to the sample with 6 kV a.c. for 60 s.

- *mechanical testing, according to clause 8.2.2:*

The assembly is subjected to a tensile load applied to the conductor in accordance with Figure 8 of the standard.
Tensile test loads are applied to conductors, the rate of increase is in accordance with § 9.1.4 of NF EN 50483-1. (speed between 1000 N/min and 5000 N/min)

A tensile test load is applied to the conductor until it reaches the values of Table 1:

Table 1 – Initial loads required for marking

Bundle System	*Cross sections*	*Loads*	*Test*
Self supporting system	*4 mm² to 16 mm² Copper*	*10 % of MBL for 60 s*	☐
	16 mm² to 25 mm² Aluminium	*20 % of MBL for 60 s*	☑
	35 mm² to 150 mm² Aluminium	***Full tension :*** *20 % of MBL for 60 s*	☐
		Partial tension : *5 % of MBL for 60 s*	☐
Neutral messenger system	***Phases :*** *16 mm² to 150 mm² Aluminium*	*30 % of MBL for 60 s*	☐
	Neutral : *25 mm² to 95 mm² Aluminium alloy*	*60 % of MBL for 60 s*	☐

The cable is marked at the point at wich it leaves the connector.

Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

ДЗЕ "МКОЕ ДОСТЕ" СОФИЯ

The load then is increased up to the values of Table 2:

Table 2 – Test loads

Bundle System	*Cross sections*	*Loads*	*Test*
Self supporting system	*4 mm² to 16 mm² Copper*	*20 % of MBL for 60 s*	☐
	16 mm² to 25 mm² Aluminium	*1200 N or 40 % of MBL whichever is the greater for 60 s*	☑
	35 mm² to 150 mm² Aluminium	***Full tension :*** *85 % of MBL for 60 s*	☐
		Partial tension : *10 % of MBL for 60 s*	☐
Neutral messenger system	***Phases :*** *16 mm² to 150 mm² Aluminium*	*60 % of MBL for 60 s*	☐
	Neutral : *25 mm² to 95 mm² Aluminium alloy*	*95 % of MBL for 60 s*	☐

3.1 Exigences supplémentaires du demandeur de l'essai
Additional requirements of the applicant for the test

Néant
None

3.2 Conditions ambiantes / *Ambient conditions*

Les conditions ambiantes relevées lors de l'essai sont les suivantes :
Ambient conditions when performing the test are as follows:

	Exigences *Requirements*	Relevés *Results*
Température ambiante et humidité *Ambient temperature and humidity conditions*	15 °C ≤ T° ≤ 35 °C 25 % ≤ HR ≤ 75 %	22 °C 30 %HR
Temps de conditionnement *Conditioning time*	-	1 h 23 min
Température de la chambre froide *Low temperature chamber*	(-10 ± 3)°C	-11,0 °C
Temps à température ambiante après la sortie de la chambre froide *Ambient temperature time after out of cold chamber*	> 3 h	3 h 21 min
Température de l'eau *Water temperature*	Température ambiante *Ambient temperature*	21,5 °C
Résistivité de l'eau *Water resistivity*	≤ 200 Ωm	34,01 Ωm
Temps d'immersion (minutes) *Immersion time (minutes)*	30	30
Vitesse de montée en tension *Voltage increase rate*	≈ 1 kV/s	≈ 1 kV/s

Visa du responsable de l'essai
Visa supervisor of the test

3.3 Configuration des échantillons / *Samples configuration*

Echantillon n° *Sample n.*	Section / *Cross section* (mm²)		Système de torsade *Bundle system*
1	35	35	Système autoporté *Self supporting system*
2			

4 Résultats / *Results*

Echantillon n° *Sample n.*	6 kV pendant 1 min *6 kV for 1 min*	
	Exigences *Requirements*	Résultats *Results*
1	Pas de claquage *No breakdown*	Pas de claquage *No breakdown*
2		Pas de claquage *No breakdown*

Echantillon n° *Sample n.*	Vitesse de montée programmée *Planned increase rate* (N/min)	
	Exigences *Requirements*	Résultats *Results*
1	$1000 \leq \ldots \leq 5000$	3000
2		3000

Echantillon n° *Sample n.*	Effort pour marquage pendant 1 minute *Strength for marking during 1 min* (N)		Effort pendant 1 minute *Strength during 1 min* (N)	
	Exigences *Requirements*	Résultats *Results*	Exigences *Requirements*	Résultats *Results*
1	20 % CRM *MBL* ⇔ 600	600	40 % CRM *MBL* ⇔ 1200	1200
2		600		1200

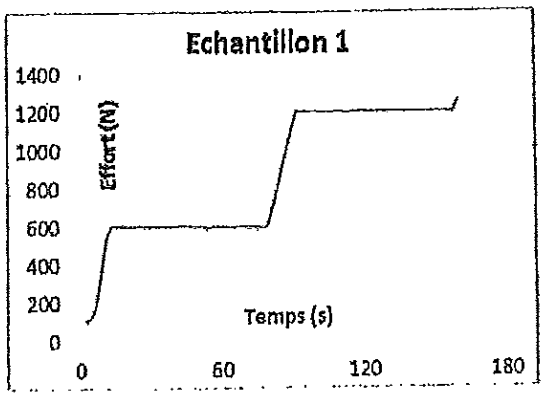
5 Conclusion / *Conclusion*

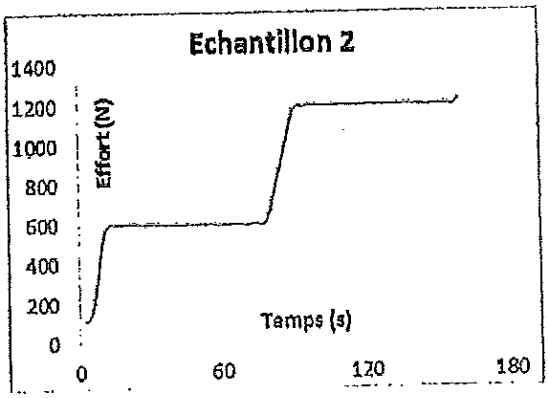
Aucun claquage ou contournement ne s'est produit (déclenchement du générateur de tension).
No breakdown or flashover occurred (tripping of voltage generator).

Aucun glissement ou rupture ne s'est produit.
No slippage or breakage occurred.

Visa du responsable de l'essai
Visa supervisor of the test

6 Courbes / *Curves*





FIN DU RAPPORT D'ESSAI / *END OF TEST REPORT*

Visa du responsable de l'essai
Visa supervisor of the test

ВЕРНО С ОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП МЈРТ 35

1. **№ на тест: 9212290** - Механичен тест;
2. **№ на тест: 1204124** - Тест за инсталиране при ниска температура.

Съставил:

На основание чл. 2 от ЗЗЛД

SICAME

Laboratoire d'essais
de la Direction Etudes et Recherches

Rapport d'essai : Essai de montage à basse température
Test report : *Installation test at low temperature*

Rapport d'essai n°	: 12 04 121	*Test report n.*	*: 12 04 121*
Constructeur	: SICAME	*Product brand*	*: SICAME*
Référence produit	: MJPT 50	*Product type*	*: MJPT 50*
Demandeur de l'essai	: SICAME S.A.	*Test applied by*	*: SICAME S.A.*
Date d'essai	: Du 17 au 18 avril 2012	*Date of the test*	*: 17 to 18 April 2012*
Date d'émission du rapport	: 15 mai 2012	*Report emission date*	*: 15 May 2012*

Essais réalisés suivant : NF EN 50483-4 (07/2009), § 8.2.4
Tests carried out in accordance with

Ce rapport comprend : 9 pages
This report contains

Conclusion : Les manchons de jonction préisolés SICAME de type MJPT 50 soumis à essai satisfont aux exigences du § 8.2.4 de la norme NF EN 50483-4 (07/2009).
Pour déclarer la conformité, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

Conclusion *: The tested SICAME insulated splicing sleeves MJPT 50 comply with the requirements of clause 8.2.4 of NF EN 50483-4 (07/2009) standard.*
To give a ruling on the conformity, the uncertainty associated to the result is not implicitly involved

На основание чл. 2
от ЗЗЛД

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : info@sicame.fr

ВЯРНО С ОРИГИНАЛА

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1 Echantillons soumis à essai / *Samples under test*

Type : Manchon de jonction préisolé
Insulated splicing sleeve

Désignation / *Designation* : MJPT 50

Matière de la jupe / *over molding material* : KEPITAL

Fabricant / *Manufacturer* : SICAME

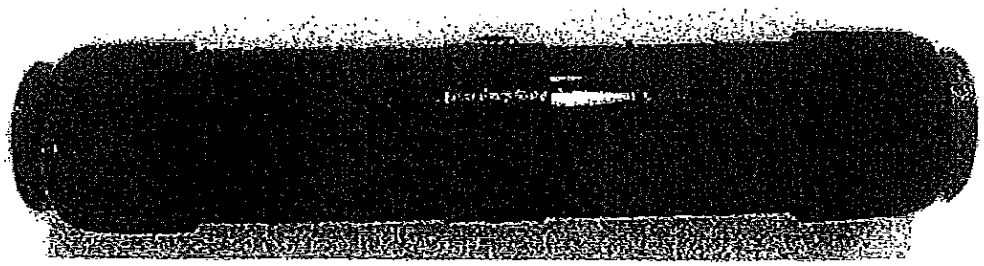
Numéro de lot / *Batch number* : Tête de série / *Head of series*
Echantillons suivant le plan E0700610
Samples in accordance with drawing n. E0700610

Classes du produit selon NF EN 50483-1 (§ 9.3) *Classes of product in accordance with NF EN 50483-1 (§ 9.3)*		
☑	Classe A *Class A*	: raccords soumis aux cycles de vieillissement électrique et aux essais de court-circuit *: connectors subjected to heat cycles and short-circuit current tests*
☐	Classe B *Class B*	: raccords soumis seulement aux cycles de vieillissement électrique *: connectors subjected to heat cycles only*
☑	Classe 1 *Class 1*	: raccords soumis à l'essai de tenue diélectrique dans l'eau *: connectors subjected to dielectric test in water*
☐	Classe 2 *Class 2*	: raccords soumis à l'essai de tenue diélectrique dans l'air *: connectors subjected to dielectric test in air*

Nombre d'échantillons / *Number of samples* : 2

Repérage / *Identification* : 1, 2

Date de réception au laboratoire : 3 avril 2012
Reception date at the laboratory : *03 April 2012*



Visa du responsable de l'essai
Visa supervisor of the test

ВЕРНО С ОРИГИНАЛА

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2 Caractéristiques du matériel / *Equipment used during test*

2.1 Appareillage utilisé / *Equipment used*

N° U.T.	Désignation / *Designation*	Caractéristiques / *Characteristic*
93 05 48	Presse à sertir *Compression tool*	5 tonnes *5 tons*
/	Matrices *Dies*	E173 largeur 9 mm *E173 width 9 mm*
99 01 48	Thermomètre indicateur *Indicating thermometer*	Précision ± 2°C *Accuracy ± 2°C*
97 02 02	Réglet étalon *Calibrated ruler*	Précision 0,5 mm *Accuracy 0,5 mm*
10 03 21	Chambre froide *Low temperature chamber*	Précision 1°C *Accuracy 1°C*
99 00 41	Conductimètre *Conductimeter*	Précision 30 µS/cm *Accuracy 30µS/cm*
04 00 30	Thermomètre étanche *Watertight thermometer*	Précision 1°C *Accuracy 1°C*
03 02 56	Chronomètre *Stop watch*	Précision 1 s *Accuracy 1s*
94 03 09	Banc de traction 3 tonnes *Tensile test machine 3 tons*	Classe 1 *Class 1*
91 02 69	Diélectrimètre BOUCHET (10 kV) *Dielectrimeter BOUCHET (10 kV)*	Précision 0,5mA et 200V *Accuracy 0,5mA and 200V*

2.2 Câbles / *Cables*

N° Lot / *Identification*	07021					
Norme / *Standard*	NF C 33-209					
Provenance / *From*	France / *France*					
Section / *Cross section*	50 mm²					
Matériau de l'âme / *Conductor material*	☐	Cuivre – *Copper*	☑	Aluminium	☐	Alliage d'aluminium *Aluminium alloy*
Type d'âme / *Conductor type*	☐	Massive *Solid*	☑	Câblée *Stranded*		
	☐	Rétreinte *Compacted*	☑	Non rétreinte *Non compacted*	☐	Souple *Flexible*
Forme d'âme / *Conductor shape*	☑	Ronde *Circular*	☐	Sectorale *Sector-shaped*		
Nombre de brins / *Number of wires*	7					
Ø sur âme / *Ø on conductor*	9,00 mm					
Matériau de l'isolant *Insulation material*	Polyéthylène réticulé type TIX-5 *Cross-linked polyethylene, TIX-5 type*					
Ø sur isolant / *Ø on insulation*	11,45 mm					
Conditionnement *Conditioned on*	1h00 à 120°C *1h00 at 120°C*					
Référence du câble HD626 *HD626 conductor reference*	4 E-1					
Charge de rupture minimale *Minimum breaking load*	3 000 N					

Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

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3 Méthode / *Method*

Les essais sont effectués selon les prescriptions du paragraphe 8.2.4 de la norme NF EN 50483-4 (07/2009).

L'essai est effectué sur deux manchons pour chaque section.

Les raccords, le conducteur et les outillages sont au préalable pré-conditionnés jusqu'à la température d'essai (-10 ± 3) °C, ensuite ils sont assemblés à cette température dans la chambre froide.

Au moins 3h à température ambiante après la sortie de la chambre froide, les manchons sont soumis à :

- l'essai de tenue diélectrique dans l'eau, conformément au § 8.2.3 :

L'ensemble, raccord et conducteurs, est placé au fond d'un bac d'eau. Pendant le déplacement de l'ensemble, il peut être maintenu pour s'assurer qu'il n'y ait pas de courbure du conducteur ou de mouvement inutile des éléments. Le raccord est placé horizontalement. La profondeur de l'eau est mesurée à partir de la partie supérieure du raccord. Les conducteurs émergent suffisamment de l'eau pour éviter un claquage. Le courant de fuite maximum est égal à (10 ± 0,5) mA. La résistivité de l'eau est ≤ 200 Ωm. L'eau est à température ambiante. On effectue la montée progressive en tension à une vitesse d'environ 1 kV/s. Après une durée d'immersion de 30 min, une tension alternative de 6 kV est appliquée à l'échantillon pendant 60 s.

Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

- l'essai mécanique, conformément au § 8.2.2. :

L'ensemble est soumis à un effort de traction appliqué sur l'âme conformément à la figure 8 de la norme. Les efforts de traction sont appliqués sur les âmes, la montée en charge est conforme à la NF EN 50483-1, § 9.1.4. (vitesse entre 1000 N/min et 5000 N/min)
Un effort de traction est appliqué sur l'âme jusqu'à atteindre les valeurs exprimées en % de la CRM du Tableau 1 :

Tableau 1 – Efforts initiaux exigés pour le marquage

Système de torsade	*Sections*	*Efforts*	*Essai*
Système autoporté	4 mm² à 16 mm² Cuivre	10 % de la CRM pendant 60 s	☐
	16 mm² à 25 mm² Aluminium	20 % de la CRM pendant 60 s	☑
	35 mm² à 150 mm² Aluminium	**Pleine traction :** 20 % de la CRM pendant 60 s	☐
		Traction allégée : 5 % de la CRM pendant 60 s	☐
Système à neutre porteur	**Phases :** 16 mm² à 150 mm² Aluminium	30 % de la CRM pendant 60 s	☐
	Neutre : 25 mm² à 95 mm² alliage d'aluminium	60 % de la CRM pendant 60 s	☐

Un marquage est réalisé sur le câble à l'endroit où il sort du raccord.

Les efforts sont ensuite augmentés jusqu'aux valeurs exprimées en % de la CRM du Tableau 2 :

Tableau 2 – Efforts d'essai

Système de torsade	*Sections*	*Efforts*	*Essai*
Système autoporté	4 mm² à 16 mm² Cuivre	20 % de la CRM pendant 60 s	☐
	16 mm² à 25 mm² Aluminium	1 200 N ou 40 % de la CRM, la plus grande des deux valeurs pendant 60 s	☑
	35 mm² à 150 mm² Aluminium	**Pleine traction :** 85 % de la CRM pendant 60 s	☐
		Traction allégée : 10% de la CRM pendant 60 s	☐
Système à neutre porteur	**Phases :** 16 mm² à 150 mm² Aluminium	60 % de la CRM pendant 60 s	☐
	Neutre : 25 mm² à 95 mm² alliage d'aluminium	95 % de la CRM pendant 60 s	☐

Visa du responsable de l'essai
Visa supervisor of the test

ВЕРНО С ОРИГИНАЛА

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Connectors are tested in accordance with NF EN 50483-4 (07/2009) §8.2.4 standard.
Two samples are tested of each equal cross section.
The connectors, conductor and tools are further pre-conditioned until they reach the test temperature of (-10 ± 3) °C before they are assembled. Assembly is made in the cold temperature chamber, at (-10 ± 3)°C.
At least 3 h after having been removed from the cold chamber, the sleeves are subjected to :

- *dielectrical voltage test in water, according to clause 8.2.3:*

The assembly, of connector and cores, is placed at the bottom of a water tank. During the movement of the assembly it may be supported to ensure no bending of the core or unnecessary movement of the component parts. The connector is placed horizontally. The depth of water is measured from the upper part of the connector. The cores are sufficiently above the water level to prevent flashover. The maximum leakage current is equal to (10 ± 0,5) mA. The resistivity of the water is ≤ 200 Ωm. The water is at ambient temperature. The a.c. voltage is applied to a rate of approximately 1 kV/s. After 30 min under water, the voltage test is applied to the sample with 6 kV a.c. for 60 s.

- *mechanical testing, according to clause 8.2.2:*

The assembly is subjected to a tensile load applied to the conductor in accordance with Figure 8 of the standard.
Tensile test loads are applied to conductors, the rate of increase is in accordance with § 9.1.4 of NF EN 50483-1. (speed between 1000 N/min and 5000 N/min)

A tensile test load is applied to the conductor until it reaches the values of Table 1:

Table 1 – Initial loads required for marking

Bundle System	*Cross sections*	*Loads*	*Test*
Self supporting system	*4 mm² to 16 mm² Copper*	*10 % of MBL for 60 s*	☐
	16 mm² to 25 mm² Aluminium	*20 % of MBL for 60 s*	☑
	35 mm² to 150 mm² Aluminium	***Full tension :*** *20 % of MBL for 60 s*	☐
		Partial tension : *5 % of MBL for 60 s*	☐
Neutral messenger system	***Phases :*** *16 mm² to 150 mm² Aluminium*	*30 % of MBL for 60 s*	☐
	Neutral : *25 mm² to 95 mm² Aluminium alloy*	*60 % of MBL for 60 s*	☐

The cable is marked at the point at wich it leaves the connector.

Visa du responsable de l'essai
Visa supervisor of the test

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The load then is increased up to the values of Table 2:

Table 2 – Test loads

Bundle System	*Cross sections*	*Loads*	*Test*
Self supporting system	*4 mm² to 16 mm² Copper*	*20 % of MBL for 60 s*	☐
	16 mm² to 25 mm² Aluminium	*1200 N or 40 % of MBL whichever is the greater for 60 s*	☑
	35 mm² to 150 mm² Aluminium	*Full tension : 85 % of MBL for 60 s*	☐
		Partial tension : 10 % of MBL for 60 s	☐
Neutral messenger system	*Phases : 16 mm² to 150 mm² Aluminium*	*60 % of MBL for 60 s*	☐
	Neutral : 25 mm² to 95 mm² Aluminium alloy	*95 % of MBL for 60 s*	☐

3.1 Exigences supplémentaires du demandeur de l'essai
Additional requirements of the applicant for the test

Néant
None

3.2 Conditions ambiantes / *Ambient conditions*

Les conditions ambiantes relevées lors de l'essai sont les suivantes :
Ambient conditions when performing the test are as follows:

	Exigences *Requirements*	**Relevés** *Results*
Température ambiante et humidité *Ambient temperature and humidity conditions*	15 °C ≤ T° ≤ 35 °C 25 % ≤ HR ≤ 75 %	22 °C 30 %HR
Temps de conditionnement *Conditioning time*	-	1 h 23 min
Température de la chambre froide *Low temperature chamber*	(-10 ± 3)°C	-11,0 °C
Temps à température ambiante après la sortie de la chambre froide *Ambient temperature time after out of cold chamber*	> 3 h	3 h 21 min
Température de l'eau *Water temperature*	Température ambiante *Ambient temperature*	21,5 °C
Résistivité de l'eau *Water resistivity*	≤ 200 Ωm	34,01 Ωm
Temps d'immersion (minutes) *Immersion time (minutes)*	30	30
Vitesse de montée en tension *Voltage increase rate*	≈ 1 kV/s	≈ 1 kV/s

Visa du responsable de l'essai
Visa supervisor of the test

3.3 Configuration des échantillons / *Samples configuration*

Echantillon n° *Sample n.*	Section / *Cross section* (mm²)		Système de torsade *Bundle system*
1	50	50	Système autoporté *Self supporting system*
2			

4 Résultats / *Results*

Echantillon n° *Sample n.*	6 kV pendant 1 min *6 kV for 1 min*	
	Exigences *Requirements*	Résultats *Results*
1	Pas de claquage *No breakdown*	Pas de claquage *No breakdown*
2		Pas de claquage *No breakdown*

Echantillon n° *Sample n.*	Vitesse de montée programmée *Planned increase rate* (N/min)	
	Exigences *Requirements*	Résultats *Results*
1	$1000 \leq \ldots \leq 5000$	3000
2		3000

Echantillon n° *Sample n.*	Effort pour marquage pendant 1 minute *Strength for marking during 1 min* (N)		Effort pendant 1 minute *Strength during 1 min* (N)	
	Exigences *Requirements*	Résultats *Results*	Exigences *Requirements*	Résultats *Results*
1	20 % CRM *MBL* ⇔ 600	600	40 % CRM *MBL* ⇔ 1200	1200
2		600		1200

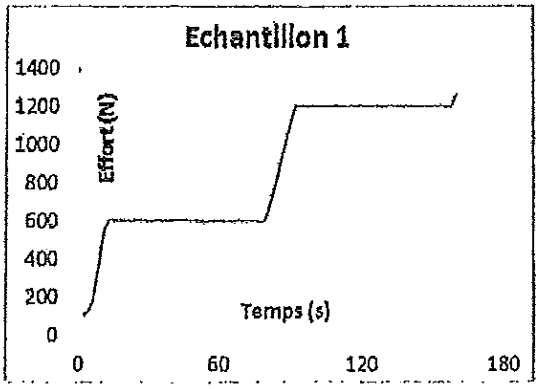
5 Conclusion / *Conclusion*

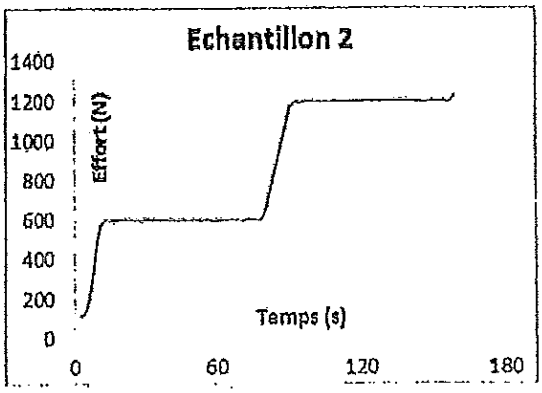
Aucun claquage ou contournement ne s'est produit (déclenchement du générateur de tension).
No breakdown or flashover occurred (tripping of voltage generator).

Aucun glissement ou rupture ne s'est produit.
No slippage or breakage occurred.

Visa du responsable de l'essai
Visa supervisor of the test

6 Courbes / *Curves*





FIN DU RAPPORT D'ESSAI / *END OF TEST REPORT*

Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

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СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП МЛРТ 50

1. **№ на тест: 9212320** – Механичен тест;
2. **№ на тест: 1204121** - Тест за инсталиране при ниска температура.

Съставил:

SICAME

Laboratoire d'essais
LABEP

Rapport d'essai : **Essai d'endurance sur conducteur de phase**
Test report : ***Endurance test on phase conductor***

Rapport d'essai n°	: 12 09 301	***Test report n.***	*: 12 09 301*
Constructeur	: SICAME	***Product manufacturer***	*: SICAME*
Référence produit	: MJPT70	***Product reference***	*: MJPT70*
Demandeur de l'essai	: SICAME S.A.	***Test applied by***	*: SICAME S.A.*
Date d'essai	: du 10 octobre au 13 novembre 2012	***Date of the test***	*: 10 October to 13 November 2012*
Date d'émission du rapport	: 15 novembre 2012	***Report issue date***	*: 15 November 2012*

Essais réalisés suivant : NF EN 50483-4 (07/2009), § 8.2.7
Tests carried out in accordance with

Ce rapport comprend : 9 pages
This report contains

Conclusion : Les manchons de jonction préisolés SICAME de type MJPT70 soumis à essai satisfont aux exigences du § 8.2.7 de la norme NF EN 50483-4 (07/2009).
Pour déclarer la conformité, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

Conclusion *: The tested SICAME insulated splicing sleeves MJPT70 comply with the requirements of clause 8.2.7 of NF EN 50483-4 (July 2009) standard.*
To give a ruling on the conformity, the uncertainty associated to the result is not implicitly involved

На основание чл. 2
от ЗЗЛД

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ВЯРНО С ОРИГИНАЛА

427

1 Echantillons soumis à essai / *Samples under test*

Type : Manchon de jonction préisolé
Insulated splicing sleeve

Désignation / *Designation* : MJPT70

Fabricant / *Manufacturer* : SICAME

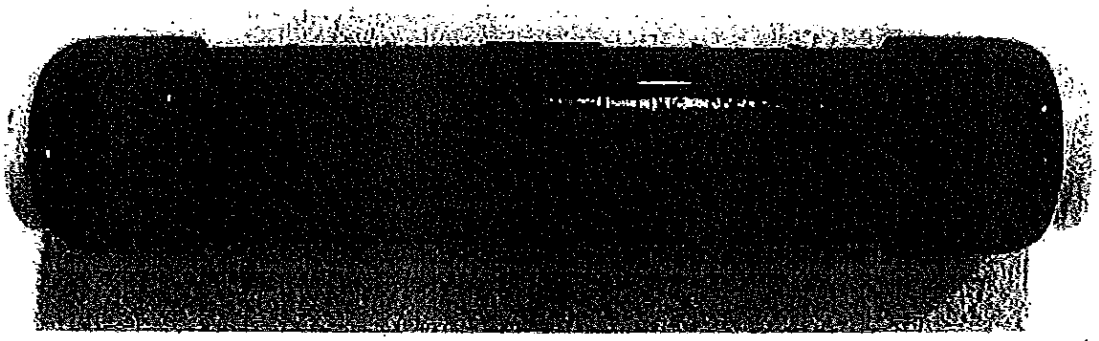
Numéro de lot / *Batch number* : Tête de série / *Head of series*
Echantillons suivant le plan E0700640
Samples in accordance with drawing n. E0700640

Classes du produit selon NF EN 50483-1 (§ 9.3) *Classes of product in accordance with NF EN 50483-1 (§ 9.3)*		
☑	Classe A *Class A*	: raccords soumis aux cycles de vieillissement électrique et aux essais de court-circuit *: connectors subjected to heat cycles and short-circuit current tests*
☐	Classe B *Class B*	: raccords soumis seulement aux cycles de vieillissement électrique *: connectors subjected to heat cycles only*
☑	Classe 1 *Class 1*	: raccords soumis à l'essai de tenue diélectrique dans l'eau *: connectors subjected to dielectric test in water*
☐	Classe 2 *Class 2*	: raccords soumis à l'essai de tenue diélectrique dans l'air *: connectors subjected to dielectric test in air*

Nombre d'échantillons / *Number of samples* : 4

Repérage / *Identification* : 1, 2, 3, 4

Date de réception au laboratoire : 25 septembre 2012
Reception date at the laboratory : *25 September 2012*



Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

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2 Caractéristiques du matériel / *Equipment used during test*

2.1 Appareillage utilisé / *Equipment used*

N° U.T.	Désignation / *Designation*	Caractéristiques / *Characteristic*
93 05 48	Presse à sertir avec matrices E173 *Compression tool with dies E173*	5 tonnes *5 tons*
02 01 76	Thermomètre indicateur *Indicating thermometer*	Précision ± 2°C *Accuracy ± 2°C*
97 02 02	Réglet étalon *Calibrated ruler*	Précision 0,5 mm *Accuracy 0,5 mm*
04 00 30	Thermomètre étanche *Watertight thermometer*	Précision 1°C *Accuracy 1°C*
12 03 03	Conductimètre *Conductimeter*	Précision 30 µS/cm *Accuracy 30µS/cm*
03 02 56	Chronomètre *Stop watch*	Précision 1 s *Accuracy 1s*
91 02 69	Diélectrimètre BOUCHET (10 kV) *Dielectrimeter BOUCHET (10 kV)*	Précision 0,5mA et 200V *Accuracy 0,5mA and 200V*
95 00 87	Armoire électrique n°9 *Electrical rack n°9*	Transformateur 1200A/7V commandé par unité thyristor au primaire et régulateur de température PID *Transformer 1200A/7V thyristor control unit used in the primary circuit and PID temperature controller*
05 00 34	Enregistreur Eurotherm *Eurotherm data recorder*	Mesure et enregistrement de température par thermocouple type T *Measurement and recording of temperatures by T-type thermocouples*
94 03 09	Banc de traction 3 tonnes *Tensile test machine 3 tons*	Classe 1 *Class 1*

Visa du responsable de l'essai
Visa supervisor of the test

2.2 Câbles / *Cables*

N° Lot / *Identification*	11029				
Norme / *Standard*	WT-92/K-396				
Provenance / *From*	Pologne / *Poland*				
Section / *Cross section*	70 mm²				
Matériau de l'âme *Conductor material*	☐	Cuivre *Copper*	☑	Aluminium	☐ Alliage d'aluminium *Aluminium alloy*
Type d'âme *Conductor type*	☐	Massive *Solid*	☑	Câblée *Stranded*	
	☑	Rétreinte *Compacted*	☐	Non rétreinte *Non compacted*	☐ Souple *Flexible*
Forme d'âme *Conductor shape*	☑	Ronde *Circular*	☐	Sectorale *Sector-shaped*	
Nombre de brins *Number of wires*	19				
Ø sur âme *Ø on conductor*	10,0 mm				
Matériau de l'isolant *Insulation material*	Polyéthylène réticulé *Cross-linked polyethylene*				
Ø sur isolant *Ø on insulation*	13,1 mm				
Conditionnement *Conditioned on*	1h00 à 110°C *1h00 at 110°C*				
Référence du câble HD626 *HD626 conductor reference*	/				
Charge de rupture minimale (CRM) / *Minimum Breaking Load (MBL)*	11242 N				

3 Méthode / *Method*

Les essais sont effectués selon les prescriptions du paragraphe 8.2.7 de la norme NF EN 50483-4 (07/2009).

L'essai est effectué sur quatre manchons pour chaque section.

La charge, pour le type de système approprié, doit être appliquée aux extrémités du conducteur et ajustée comme demandé durant l'essai.

Des cycles thermiques, d'une durée de 90 min, doivent être appliqués au montage d'essai.

500 cycles doivent être réalisés.

Pendant les 45 premières minutes de chaque cycle, le courant traversant l'ensemble doit créer l'élévation de température.

La température de référence du conducteur doit être maintenue à la température normale de service dans un intervalle de ± 3 K comme indiqué dans l'Annexe C de la EN 50483-1. Cette température est atteinte dans un temps de 5 min à 15 min en début de cycle.

Pendant les 45 dernières minutes, de chaque cycle, le montage en essai doit être refroidi à (25 ± 3) °C. La température doit ensuite être maintenue à cette valeur, jusqu'à la fin du cycle.

A intervalle de 24h, à la fin de la période de chauffage à la température normale de service, les températures atteintes par les deux manchons doivent être enregistrées.

Visa du responsable de l'essai
Visa supervisor of the test

Insulated splicing sleeves are tested in accordance with NF EN 50483-4 (07/2009) §8.2.7 standard.

The test is carried out on 4 Insulated splicing sleeves for each cross-section.

The load, for the appropriate type of system, shall be applied to the extremities of the core and varied as required throughout the test.

Thermal cycles, with duration of 90 min, shall be applied to the test assembly.

There shall be 500 cycles.

For the first 45 minutes of every cycle, current flowing through the assembly shall create the temperature rise.

The reference temperature of the conductor shall be maintained at the normal operating temperature within an interval of ± 3 °C a shown in Table B.1 of Annexe B. this temperature shall be reached within 5 min to 15 min at the beginning of the cycle.

For the last 45 min, of each cycle, the test assembly shall be cooled to (25 ± 3) °C. The temperature shall then be maintained, at this value, until the end of the cycle.

At 24 h intervals, at the end of the normal operating temperature heating period, the temperatures reached by the two sleeves shall be recorded.

La figure 1 décrit un exemple typique de dispositif d'essai. La configuration peut différer de ce montage du moment qu'elle rescpecte les longueurs du conducteur de phase

Figure 1 shows a typical test arrangement. The test configuration can differ from this arrangement as long as it complies with the phase conductor.

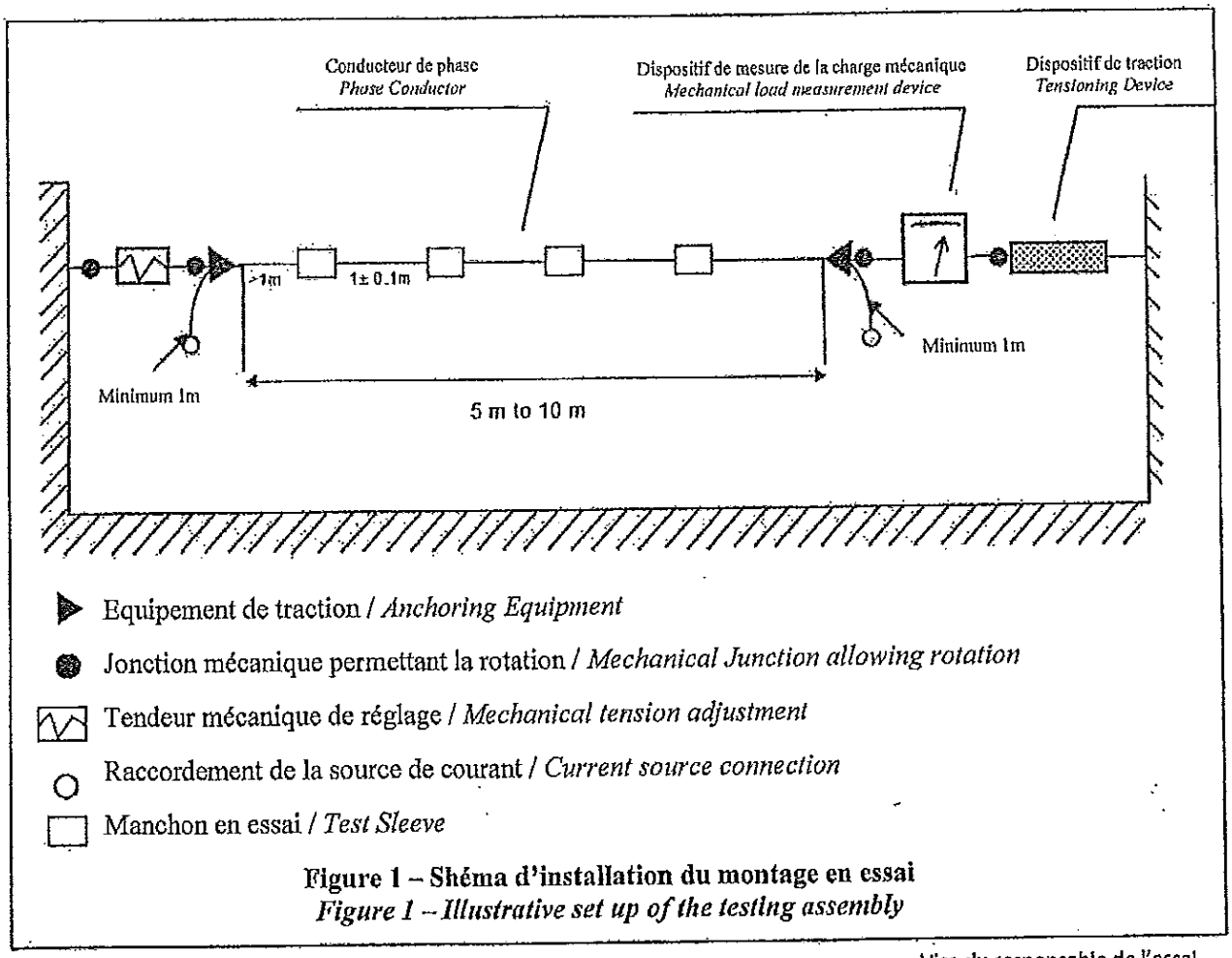


Figure 1 – Shéma d'installation du montage en essai
Figure 1 – Illustrative set up of the testing assembly

Visa du responsable de l'essai
Visa supervisor of the test

La variation de la charge mécanique et de la température est décrite sur le diagramme de la Figure 2.

Un effort de traction doit être appliqué jusqu'à une valeur égale à 35 % de la CRM du câble. Cette valeur doit être atteinte approximativement en 1 min.

La charge doit ensuite être maintenue pendant 10 min par un réglage permanent manuel ou automatique. On doit laisser l'ensemble se stabiliser mécaniquement pendant 24 h sans aucun réglage.

Une fois l'ensemble stabilisé les cycles thermiques doivent commencer. A la fin du premier cycle, l'effort de traction doit être réglé à 20 % de la CRM du câble.

Au moins une fois par 24 h, l'effort de traction doit être ajusté à 20 % de la CRM du câble.

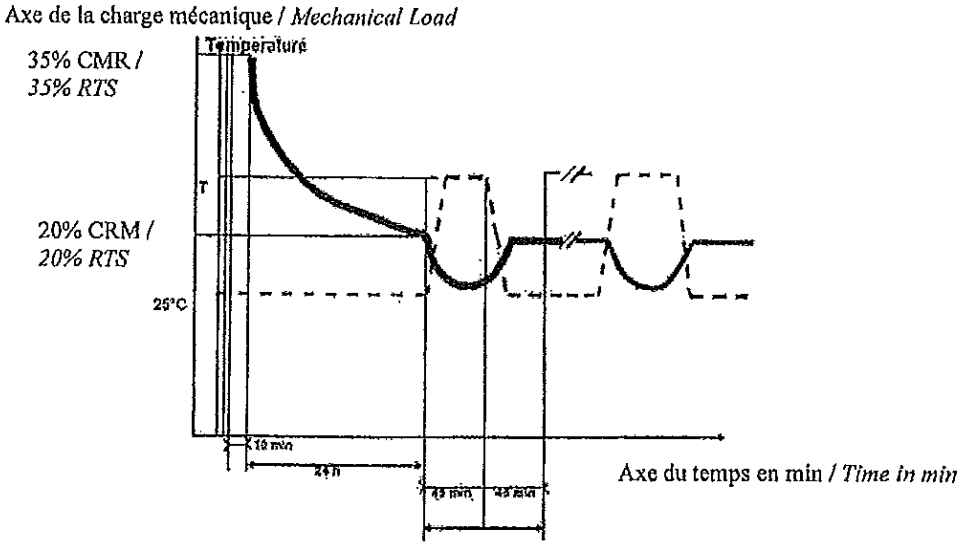
The variation in mechanical load and temperature is shown, diagrammatically, in Figure 2.

A tensile load shall be applied until a value equal to 35 % of the MBL is reached. This value shall be achieved in approximately 1 minute.

The load shall then be maintained for 10 min using a manual or automatic continuous adjustment. The assembly shall be left to self stabilize mechanically for 24 h without any adjustment.

Once the assembly has stabilized the thermal cycles shall be started. At the end of the first cycle, the tensile load shall be set at 20 % of MBL.

At least once every 24 h, the tensile load shall be adjusted to 20 % of the MBL.



Variation de la charge mécanique / *Mechanical Load Variation*

Température du conducteur / *Conductor temperature*

T Température normale de service / *Normal Operating Temperature*

Figure 2 – Diagramme des cycles thermiques et des contraintes mécaniques appliqués sur le conducteur de phase

Figure 2 – Diagram of thermal cycles and mechanical stresses applied on phase conductor

Visa du responsable de l'essai
Visa supervisor of the test

Tableau 1 – Effort de traction appliqué
Table 1 – Applied tensile load

20 % de la CRM du câble *20 % of MBL* 2248 N	35% de la CRM du câble *35 % of MBL* 3934 N

La température normale de service du câble est de 80° C.
The rated operating temperature of the cable is 80° C.

A la fin de la période de chauffage, la température des manchons doit être inférieure à la température du conducteur de référence.

Les manchons de Classe 1 et de Classe 2 doivent satisfaire aux exigences de l'essai de tenue diélectrique dans l'air, 8.2.3.1.3.2.

Pour les manchons de Classe 1, l'ensemble formé par le raccord et les conducteurs doit être ensuite retiré des billes métalliques, sans contrainte mécanique, et doit satisfaire aux exigences de l'essai de tenue diélectrique dans l'eau, comme indiqué au 8.2.3.1.3.1, mais avec une tension de 1 kV.

Les quatre manchons doivent satisfaire aux exigences de l'essai mécanique du § 8.2.2.

At the end of the heating period, the sleeves' temperatures shall be lower than the temperature of the reference core.

The Class 1 and the Class 2 sleeves shall meet the requirements of the Dielectrical Voltage Test in Air, Clause 8.2.3.1.3.2.

For Class 1 sleeves the assembly formed by the connector and the cores shall then taken out of the metallic balls, without any mechanical stress, and shall meet the requirements of the dielectrical voltage test in water, Clause 8.2.3.1.3.1 but with a voltage of 1 kV.

The four sleeves shall meet the requirements of the mechanical test Clause 8.2.2.

3.1 Conditions ambiantes / *Ambient conditions*

Les conditions ambiantes relevées lors de l'essai sont les suivantes :
Ambient conditions when performing the test are as follows:

	Exigences ***Requirements***	**Relevés** ***Results***
Température ambiante et humidité ***Ambient temperature and humidity conditions***	15 °C ≤ T° ≤ 35 °C 25 % ≤ HR ≤ 75 %	20 °C 39 %HR
Température de l'eau ***Water temperature***	-	20,2 °C
Résistivité de l'eau ***Water resistivity***	≤ 200 Ωm	39,9 Ωm
Temps d'immersion ***Immersion time***	≥ 30 min	31 min
Vitesse de montée en tension ***Voltage increase rate***	≈ 1 kV/s	≈ 1 kV/s

Visa du responsable de l'essai
Visa supervisor of the test

3.2 Configuration des échantillons / *Samples configuration*

Echantillon n° *Sample n.*	Section / *Cross section* (mm²)	
	Câble principal *Main cable*	Câble dérivé *Tap cable*
1	70	70
2		
3		
4		

4 Résultats / *Results*

4.1 Tenue diélectrique

Echantillon n° *Sample n.*	4 kV pendant 1 minute dans les billes métalliques *4 kV for 1 minute in metallic balls*	
	Résultats / *Results*	Exigences *Requirements*
1	Pas de claquage / *No breakdown*	Pas de claquage *No breakdown*
2	Pas de claquage / *No breakdown*	
3	Pas de claquage / *No breakdown*	
4	Pas de claquage / *No breakdown*	

Echantillon n° *Sample n.*	1 kV pendant 1 minute dans l'eau *1 kV for 1 minute in water*	
	Résultats / *Results*	Exigences *Requirements*
1	Pas de claquage / *No breakdown*	Pas de claquage *No breakdown*
2	Pas de claquage / *No breakdown*	
3	Pas de claquage / *No breakdown*	
4	Pas de claquage / *No breakdown*	

4.2 Essais mécaniques

Echantillon n° *Sample n.*	Vitesse de montée programmée *Planned increase rate* (N/min)	Exigences *Requirements* (N/min)
1	3000	1000 ≤...≤ 5000
2	3000	
3	3000	
4	3000	

Visa du responsable de l'essai
Visa supervisor of the test

Echantillon n° *Sample n.*	Effort pendant 1 minute *Strength during 1 min* (N)	Exigences *Requirements* (N)
1	2248	20 % CRM *MBL*
2	2248	
3	2248	
4	2248	

Echantillon n° *Sample n.*	Effort pendant 1 minute *Strength during 1 min* (N)	Exigences *Requirements* (N)
1	9555	85 % CRM *MBL*
2	9555	
3	9555	
4	9555	

5 Conclusion / *Conclusion*

Aucun claquage ou contournement ne s'est produit (déclenchement du générateur de tension).
No breakdown or flashover occurred (tripping of voltage generator).

Aucun glissement ou rupture ne s'est produit.
No slippage or breakage occurred.

FIN DU RAPPORT D'ESSAI / *END OF TEST REPORT*

Visa du responsable de l'essai
Visa supervisor of the test

sicame

Laboratoire d'essais
Direction Etudes et Recherches

Test report	**: Tensile test**
Test number	**: 07 01 081**
Product brand	**: SICAME**
Product type	**: MJPT 70**

Demander of the test	: SICAME Export
Starting date of the test	: 09/01/2007
Report emission date	: 16 JAN. 2007
According to standard	: NF C 33-021 § 2.3.2 (june 98)
This report contains	: 3 pages and 1 annex
Conclusion	: The tested preinsulated junction sleeves type MJPT 70 conform to the requirements of NF C 33-021 § 2.3.2 (june 98) with a 85% maximum load of the cable tensile instead of 60% required by the standard and with cables of Vietnam.

This is an English translation. The original French test report is the only reference version.

На основание чл. 2
от ЗЗЛД

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1. Equipment used during test.

1.1 Equipment used

N° U.T.	Designation	Characteristic
93 05 48	Crimping machine	50 kN
94 03 10	Traction bench 3 tons	Class 1

1.2 Cables :

Section (mm²)	70
Nature	Aluminium
Standard	/
From	Vietnam
Identification n°	06082

2. Product tested.

Désignation : MJPT 70

Number : 2

Batch number : sample 1 : embossed date : 09/2006 (06M621000)

Sample 2 : embossed date : 01/2004 (customer's one)

Marking : See annex 1

Identification : 1 and 2

Reception date at the laboratory : on the 08/01/2007 for the sample 1

and on the 14/12/2006 for the sample 2

На основание чл. 2
от ЗЗЛД

3. Test.

Preinsulated junction sleeves are tested according to NF C 33-021 § 2.3.2 (june 98) standard except that the stage of strength was of 65% of the minimum load during one hour instead of 50% of the minimum load during one minute and with a 85% maximum load of the cable tensile instead of 60% required for the garantee.

3.1 Test procedure.

Connection is carried out using 5 mm wide dies for groove E 140 and 9 mm wide dies for grooves E 173 and E 215. The minimum strength to be applied is given in the standard. The length of the cores used complies with the length indicated in the standard.

The assembly is submitted to a tensile strength applied to the conductor. The strength is increased at a rate between 1000 N/min and 5000 N/min up to 65% of the minimum load required. This strength is applied for 1 hour.

The strength is then increased up to 85% of the maximum load of the cable and released.

3.2 Preparation

A 9 mm wide dies for groove E173 is used.

4. Results.

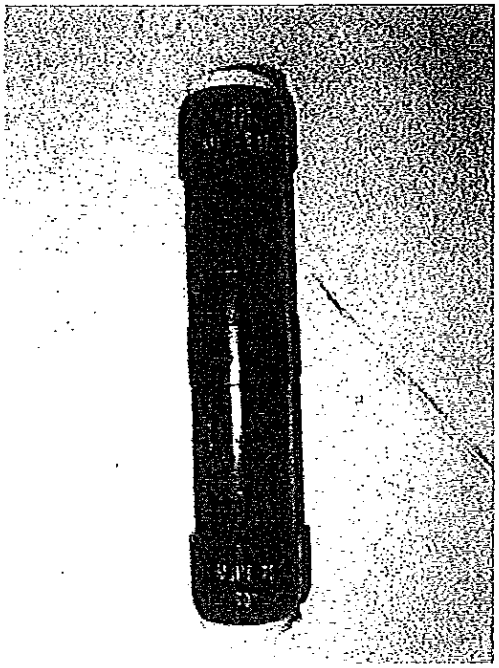
	Standard requirements	Results
Ambient temperature and humidity conditions	Between 15 et 35°C Between 25 % et 75 % HR	22°C 46 % HR
Rate of the tensile (N/min)	Between 1000 et 5000	3000
Strength value maintained for 1 hour (N)	5415	Sample 1 : ok Sample 2 : ok
Strength value applied without breakdown : 85% of the maximum load of the cable (N)	8330	Sample 1 : ok Sample 2 : ok

5. Requirement

No slippage is observed.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА



ВЯРНО С ОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPT 70

1. **№ на тест 9212350** – Механичен тест;
2. **№ на тест 1209301** – Тест за издражливост върху фазовия проводник;
3. **№ на тест 0701081** – Тест за якост на опън.

Състави

На основание чл. 2 от ЗЗЛД

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SICAME

Laboratoire d'essais
LABEP

Rapport d'essai : **Essai d'endurance sur conducteur de phase**
Test report : ***Endurance test on phase conductor***

Rapport d'essai n°	: 12 09 303	*Test report n.*	*: 12 09 303*
Constructeur	: SICAME	*Product manufacturer*	*: SICAME*
Référence produit	: MJPT95	*Product reference*	*: MJPT95*
Demandeur de l'essai	: SICAME S.A.	*Test applied by*	*: SICAME S.A.*
Date d'essai	: du 10 octobre au 13 novembre 2012	*Date of the test*	*: 10 October to 13 November 2012*
Date d'émission du rapport	: 15 novembre 2012	*Report issue date*	*: 15 November 2012*

Essais réalisés suivant : NF EN 50483-4 (07/2009), § 8.2.7
Tests carried out in accordance with

Ce rapport comprend : 9 pages
This report contains

Conclusion : Les manchons de jonction préisolés SICAME de type MJPT95 soumis à essai satisfont aux exigences du § 8.2.7 de la norme NF EN 50483-4 (07/2009).
Pour déclarer la conformité, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

Conclusion : *The tested SICAME insulated splicing sleeves MJPT95 comply with the requirements of clause 8.2.7 of NF EN 50483-4 (July 2009) standard.*
To give a ruling on the conformity, the uncertainty associated to the result is not implicitly involved

На основание чл. 2
от ЗЗЛД

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ВЕРНО С ОРИГИНАЛА

441

1 Echantillons soumis à essai / *Samples under test*

Type : Manchon de jonction préisolé
Insulated splicing sleeve

Désignation / *Designation* : MJPT95

Fabricant / *Manufacturer* : SICAME

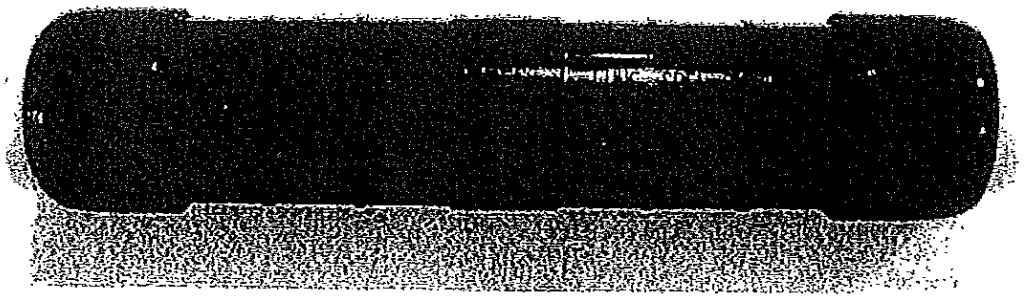
Numéro de lot / *Batch number* : Tête de série / *Head of series*
Echantillons suivant le plan E0700640
Samples in accordance with drawing n. E0700640

Classes du produit selon NF EN 50483-1 (§ 9.3) *Classes of product in accordance with NF EN 50483-1 (§ 9.3)*		
☑	Classe A *Class A*	: raccords soumis aux cycles de vieillissement électrique et aux essais de court-circuit *: connectors subjected to heat cycles and short-circuit current tests*
☐	Classe B *Class B*	: raccords soumis seulement aux cycles de vieillissement électrique *: connectors subjected to heat cycles only*
☑	Classe 1 *Class 1*	: raccords soumis à l'essai de tenue diélectrique dans l'eau *: connectors subjected to dielectric test in water*
☐	Classe 2 *Class 2*	: raccords soumis à l'essai de tenue diélectrique dans l'air *: connectors subjected to dielectric test in air*

Nombre d'échantillons / *Number of samples* : 4

Repérage / *Identification* : 1, 2, 3, 4

Date de réception au laboratoire : 25 septembre 2012
Reception date at the laboratory : *25 September 2012*



Visa du responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

2 Caractéristiques du matériel / *Equipment used during test*

2.1 Appareillage utilisé / *Equipment used*

N° U.T.	Désignation / *Designation*	Caractéristiques / *Characteristic*
93 05 48	Presse à sertir avec matrices E173 *Compression tool with dies E173*	5 tonnes *5 tons*
02 01 76	Thermomètre indicateur *Indicating thermometer*	Précision ± 2°C *Accuracy ± 2°C*
97 02 02	Réglet étalon *Calibrated ruler*	Précision 0,5 mm *Accuracy 0,5 mm*
04 00 30	Thermomètre étanche *Watertight thermometer*	Précision 1°C *Accuracy 1°C*
12 03 03	Conductimètre *Conductimeter*	Précision 30 µS/cm *Accuracy 30µS/cm*
03 02 56	Chronomètre *Stop watch*	Précision 1 s *Accuracy 1s*
91 02 69	Diélectrimètre BOUCHET (10 kV) *Dielectrimeter BOUCHET (10 kV)*	Précision 0,5mA et 200V *Accuracy 0,5mA and 200V*
95 00 87	Armoire électrique n°9 *Electrical rack n°9*	Transformateur 1200A/7V commandé par unité thyristor au primaire et régulateur de température PID *Transformer 1200A/7V thyristor control unit used in the primary circuit and PID temperature controller*
05 00 34	Enregistreur Eurotherm *Eurotherm data recorder*	Mesure et enregistrement de température par thermocouple type T *Measurement and recording of temperatures by T-type thermocouples*
94 03 09	Banc de traction 3 tonnes *Tensile test machine 3 tons*	Classe 1 *Class 1*

Visa du responsable de l'essai
Visa supervisor of the test

2.2 Câbles / *Cables*

N° Lot / ***Identification***	11029					
Norme / ***Standard***	WT-92/K-396					
Provenance / ***From***	Pologne / *Poland*					
Section / ***Cross section***	95 mm²					
Matériau de l'âme ***Conductor material***	☐	Cuivre *Copper*	☑	Aluminium	☐	Alliage d'aluminium *Aluminium alloy*
Type d'âme ***Conductor type***	☐	Massive *Solid*	☑	Câblée *Stranded*		
	☑	Rétreinte *Compacted*	☐	Non rétreinte *Non compacted*	☐	Souple *Flexible*
Forme d'âme ***Conductor shape***	☑	Ronde *Circular*	☐	Sectorale *Sector-shaped*		
Nombre de brins ***Number of wires***	19					
Ø sur âme ***Ø on conductor***	13,1 mm					
Matériau de l'isolant ***Insulation material***	Polyéthylène réticulé *Cross-linked polyethylene*					
Ø sur isolant ***Ø on insulation***	16,1 mm					
Conditionnement ***Conditioned on***	1h00 à 110°C *1h00 at 110°C*					
Référence du câble HD626 ***HD626 conductor reference***	/					
Charge de rupture minimale (CRM) / ***Minimum Breaking Load (MBL)***	11242 N					

3 Méthode / *Method*

Les essais sont effectués selon les prescriptions du paragraphe 8.2.7 de la norme NF EN 50483-4 (07/2009).

L'essai est effectué sur quatre manchons pour chaque section.

La charge, pour le type de système approprié, doit être appliquée aux extrémités du conducteur et ajustée comme demandé durant l'essai.

Des cycles thermiques, d'une durée de 90 min, doivent être appliqués au montage d'essai.

500 cycles doivent être réalisés.

Pendant les 45 premières minutes de chaque cycle, le courant traversant l'ensemble doit créer l'élévation de température.

La température de référence du conducteur doit être maintenue à la température normale de service dans un intervalle de ± 3 K comme indiqué dans l'Annexe C de la EN 50483-1. Cette température est atteinte dans un temps de 5 min à 15 min en début de cycle.

Pendant les 45 dernières minutes, de chaque cycle, le montage en essai doit être refroidi à (25 ± 3) °C. La température doit ensuite être maintenue à cette valeur, jusqu'à la fin du cycle.

A intervalle de 24h, à la fin de la période de chauffage à la température normale de service, les températures atteintes par les deux manchons doivent être enregistrées.

Visa du responsable de l'essai
Visa supervisor of the test

Insulated splicing sleeves are tested in accordance with NF EN 50483-4 (07/2009) §8.2.7 standard.

The test is carried out on 4 Insulated splicing sleeves for each cross-section.

The load, for the appropriate type of system, shall be applied to the extremities of the core and varied as required throughout the test.

Thermal cycles, with duration of 90 min, shall be applied to the test assembly.

There shall be 500 cycles.

For the first 45 minutes of every cycle, current flowing through the assembly shall create the temperature rise.

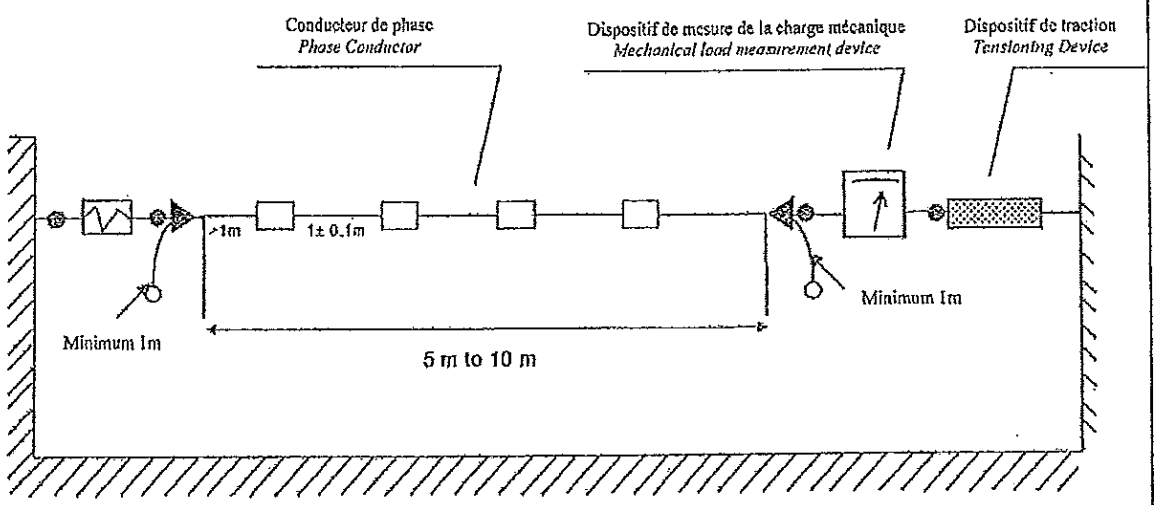
The reference temperature of the conductor shall be maintained at the normal operating temperature within an interval of ± 3 °C a shown in Table B.1 of Annexe B. this temperature shall be reached within 5 min to 15 min at the beginning of the cycle.

For the last 45 min, of each cycle, the test assembly shall be cooled to (25 ± 3) °C. The temperature shall then be maintained, at this value, until the end of the cycle.

At 24 h intervals, at the end of the normal operating temperature heating period, the temperatures reached by the two sleeves shall be recorded.

La figure 1 décrit un exemple typique de dispositif d'essai. La configuration peut différer de ce montage du moment qu'elle respecte les longueurs du conducteur de phase

Figure 1 shows a typical test arrangement. The test configuration can differ from this arrangement as long as it complies with the phase conductor.



Equipement de traction / *Anchoring Equipment*

Jonction mécanique permettant la rotation / *Mechanical Junction allowing rotation*

Tendeur mécanique de réglage / *Mechanical tension adjustment*

Raccordement de la source de courant / *Current source connection*

Manchon en essai / *Test Sleeve*

Figure 1 – Shéma d'installation du montage en essai
Figure 1 – Illustrative set up of the testing assembly

Visa du responsable de l'essai
Visa supervisor of the test

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La variation de la charge mécanique et de la température est décrite sur le diagramme de la Figure 2.

Un effort de traction doit être appliqué jusqu'à une valeur égale à 35 % de la CRM du câble. Cette valeur doit être atteinte approximativement en 1 min.

La charge doit ensuite être maintenue pendant 10 min par un réglage permanent manuel ou automatique. On doit laisser l'ensemble se stabiliser mécaniquement pendant 24 h sans aucun réglage.

Une fois l'ensemble stabilisé les cycles thermiques doivent commencer. A la fin du premier cycle, l'effort de traction doit être réglé à 20 % de la CRM du câble.

Au moins une fois par 24 h, l'effort de traction doit être ajusté à 20 % de la CRM du câble.

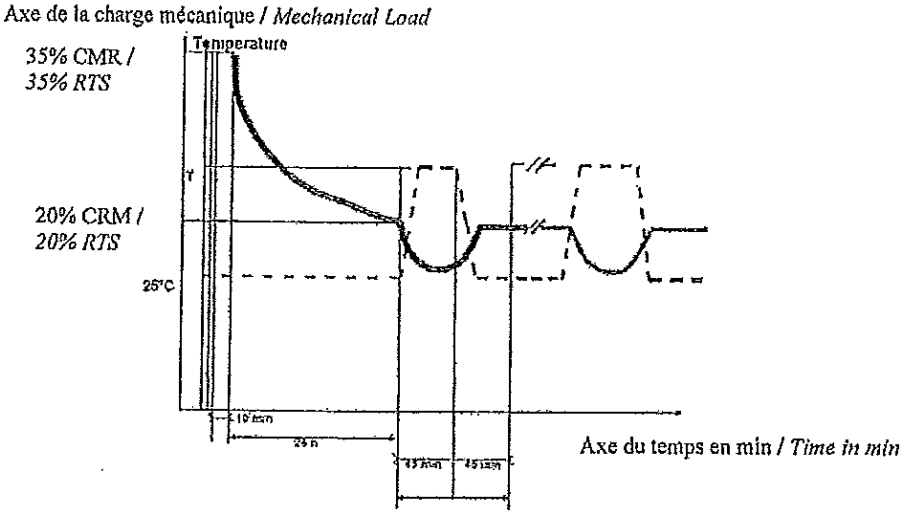
The variation in mechanical load and temperature is shown, diagrammatically, in Figure 2.

A tensile load shall be applied until a value equal to 35 % of the MBL is reached. This value shall be achieved in approximately 1 minute.

The load shall then be maintained for 10 min using a manual or automatic continuous adjustment. The assembly shall be left to self stabilize mechanically for 24 h without any adjustment.

Once the assembly has stabilized the thermal cycles shall be started. At the end of the first cycle, the tensile load shall be set at 20 % of MBL.

At least once every 24 h, the tensile load shall be adjusted to 20 % of the MBL.



Cycle de base/ *Basic cycle*
90 min

Variation de la charge mécanique / *Mechanical Load Variation*
Température du conducteur / *Conductor temperature*
T Température normale de service / *Normal Operating Temperature*

Figure 2 – Diagramme des cycles thermiques et des contraintes mécaniques appliqués sur le conducteur de phase

Figure 2 – Diagram of thermal cycles and mechanical stresses applied on phase conductor

Visa du responsable de l'essai
Visa supervisor of the test

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Tableau 1 – Effort de traction appliqué
Table 1 – Applied tensile load

20 % de la CRM du câble *20 % of MBL* 2248 N	35% de la CRM du câble *35 % of MBL* 3934 N

La température normale de service du câble est de 80° C.
The rated operating temperature of the cable is 80° C.

A la fin de la période de chauffage, la température des manchons doit être inférieure à la température du conducteur de référence.

Les manchons de Classe 1 et de Classe 2 doivent satisfaire aux exigences de l'essai de tenue diélectrique dans l'air, 8.2.3.1.3.2.

Pour les manchons de Classe 1, l'ensemble formé par le raccord et les conducteurs doit être ensuite retiré des billes métalliques, sans contrainte mécanique, et doit satisfaire aux exigences de l'essai de tenue diélectrique dans l'eau, comme indiqué au 8.2.3.1.3.1, mais avec une tension de 1 kV.

Les quatre manchons doivent satisfaire aux exigences de l'essai mécanique du § 8.2.2.

At the end of the heating period, the sleeves' temperatures shall be lower than the temperature of the reference core.

The Class 1 and the Class 2 sleeves shall meet the requirements of the Dielectrical Voltage Test in Air, Clause 8.2.3.1.3.2.

For Class 1 sleeves the assembly formed by the connector and the cores shall then taken out of the metallic balls, without any mechanical stress, and shall meet the requirements of the dielectrical voltage test in water, Clause 8.2.3.1.3.1 but with a voltage of 1 kV.

The four sleeves shall meet the requirements of the mechanical test Clause 8.2.2.

3.1 Conditions ambiantes / *Ambient conditions*

Les conditions ambiantes relevées lors de l'essai sont les suivantes :
Ambient conditions when performing the test are as follows:

	Exigences ***Requirements***	**Relevés** ***Results***
Température ambiante et humidité ***Ambient temperature and humidity conditions***	15 °C ≤ T° ≤ 35 °C 25 % ≤ HR ≤ 75 %	20 °C 39 %HR
Température de l'eau ***Water temperature***	-	20,2 °C
Résistivité de l'eau ***Water resistivity***	≤ 200 Ωm	39,9 Ωm
Temps d'immersion ***Immersion time***	≥ 30 min	31 min
Vitesse de montée en tension ***Voltage increase rate***	≈ 1 kV/s	≈ 1 kV/s

Visa du responsable de l'essai
Visa supervisor of the test

3.2 Configuration des échantillons / *Samples configuration*

Echantillon n° *Sample n.*	Section / *Cross section* (mm²)	
	Câble principal *Main cable*	Câble dérivé *Tap cable*
1	95	95
2		
3		
4		

4 Résultats / *Results*

4.1 Tenue diélectrique

Echantillon n° *Sample n.*	4 kV pendant 1 minute dans les billes métalliques *4 kV for 1 minute in metallic balls*	
	Résultats / *Results*	Exigences *Requirements*
1	Pas de claquage / *No breakdown*	Pas de claquage *No breakdown*
2	Pas de claquage / *No breakdown*	
3	Pas de claquage / *No breakdown*	
4	Pas de claquage / *No breakdown*	

Echantillon n° *Sample n.*	1 kV pendant 1 minute dans l'eau *1 kV for 1 minute in water*	
	Résultats / *Results*	Exigences *Requirements*
1	Pas de claquage / *No breakdown*	Pas de claquage *No breakdown*
2	Pas de claquage / *No breakdown*	
3	Pas de claquage / *No breakdown*	
4	Pas de claquage / *No breakdown*	

4.2 Essais mécaniques

Echantillon n° *Sample n.*	Vitesse de montée programmée *Planned increase rate* (N/min)	Exigences *Requirements* (N/min)
1	3000	1000 ≤...≤ 5000
2	3000	
3	3000	
4	3000	

Visa du responsable de l'essai
Visa supervisor of the test

Echantillon n° *Sample n.*	Effort pendant 1 minute *Strength during 1 min* (N)	Exigences *Requirements* (N)
1	2248	20 % CRM *MBL*
2	2248	
3	2248	
4	2248	

Echantillon n° *Sample n.*	Effort pendant 1 minute *Strength during 1 min* (N)	Exigences *Requirements* (N)
1	9555	85 % CRM *MBL*
2	9555	
3	9555	
4	9555	

5 Conclusion / *Conclusion*

Aucun claquage ou contournement ne s'est produit (déclenchement du générateur de tension).
No breakdown or flashover occurred (tripping of voltage generator).

Aucun glissement ou rupture ne s'est produit.
No slippage or breakage occurred.

FIN DU RAPPORT D'ESSAI / *END OF TEST REPORT*

Visa du responsable de l'essai
Visa supervisor of the test

ДИЗАЙН С ОРИГИНАЛА

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СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП МЈРТ 95

1. **№ на тест 1209303** - Тест за издръжливост върху фазовия проводник.

На основание чл. 2 от ЗЗЛД

Съставил

SICAME

Laboratoire d'essais
LABEP

Rapport d'essai : **Essai de vieillissement électrique**
Test report : ***Electrical ageing test***

Rapport d'essai n°	: 1201231	***Test report n.***	*: 1201231*
Constructeur	: SICAME	***Manufacturer***	*: SICAME*
Référence produit	: MJPT150	***Product reference***	*: MJPT150*
Demandeur de l'essai	: SICAME S.A.	***Test applied by***	*: SICAME S.A.*
Date d'essai	: Du 15 juin au 09 septembre 2012	***Date of the test***	*: 15th June to 09th September 2012*
Date d'émission du rapport	: 25 septembre 2012	***Report issue date***	*: 25th September 2012*

Essais réalisés suivant : NF EN 50483-5 (07/2009)
Tests carried out in accordance with

Ce rapport comprend : 11 pages
This report contains

Conclusion : Les manchons de jonction préisolés SICAME de type MJPT150 soumis à essai satisfont aux exigences de la norme NF EN 50483-5 (07/2009)
Pour déclarer la conformité, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

Conclusion *: The tested SICAME preinsulated splicing sleeves MJPT150 comply with the requirements of NF EN 50483-5 (July 2009) standard.*
To give a ruling on the conformity, the uncertainty associated to the result is not implicitly involved

На основание чл. 2
от ЗЗЛД

B.P. N° 1 - 19231 POMPADOUR - CEDEX - FRANCE - Tél (33) 05 55 73 89 00 - Fax (33) 05 55 73 63 12 - Email : Info@sicame.fr

ВЯРНО С ОРИГИНАЛА

1 Echantillons soumis à essai / *Samples under test*

Type : Manchons de jonction préisolés
Preinsulated splicing sleeves

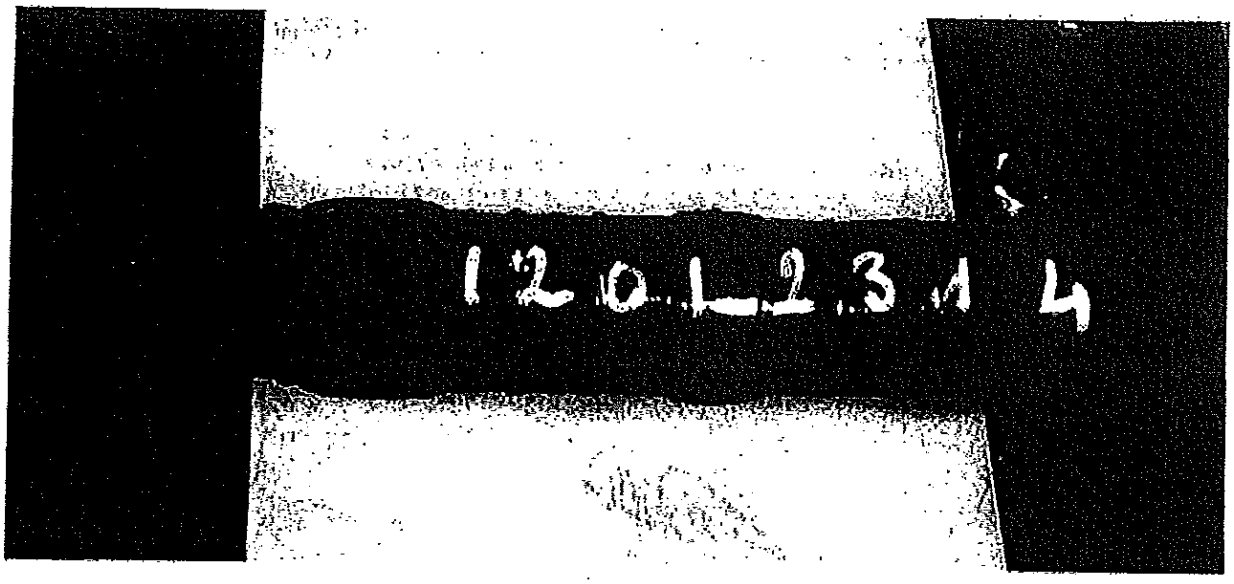
Désignation / *Designation* : MJPT150
Fabricant / *Manufacturer* : SICAME
Numéro de lot / *Batch number* : M327850

Plage de section / *Cross-section range* : 150 mm²

Classe du produit selon NF EN 50483-1 (§9.3) *Class of product in accordance with NF EN 50483-1 (§9.3)*		
☑	Classe A *Class A*	: raccords soumis aux cycles de vieillissement électrique et aux essais de court-circuit *: connectors subjected to heat cycles and short-circuit tests*
☐	Classe B *Class B*	: raccords soumis seulement aux cycles de vieillissement électrique *: connectors subjected to heat cycles only*
☑	Classe 1 *Class 1*	: raccords soumis à l'essai de tenue diélectrique dans l'eau *: connectors subjected to dielectric test in water*
☐	Classe 2 *Class 2*	: raccords soumis à l'essai de tenue diélectrique dans l'air *: connectors subjected to dielectric test in air*

Nombre d'échantillons / *Number of samples* : 6
Repérage / *Identification* : 1, 2, 3, 4, 5, 6

Date de réception au laboratoire : le 12 janvier 2012
Reception date at the laboratory : *on January, 12th 2012*



Visa responsable de l'essai
Visa supervisor of the test

2 Caractéristiques du matériel / *Equipment used during test*

2.1 Appareillage utilisé / *Equipment used*

N° U.T.	Désignation / *Designation*	Caractéristiques / *Characteristics*
100203	Centrale d'acquisition *Measurement acquisition*	Thermocouples type J *Type J thermocouples*
930548	Presse à sertir *Compression tool*	5 tonnes *5 tons*
/	Matrice *Die*	E215 largeur 9 mm *E215 width 9 mm*
970202	Réglet étalon *Calibrated ruler*	Précision 0,5 mm *Accuracy 0,5 mm*
980196	Pince ampèremétrique *Handheld clamp meter*	2000 A
090460	Banc électrique BC6 *Electrical bench BC6*	-
039221 790059	Banc de court-circuits *Short circuit bench*	-
#12	Thermomètre indicateur *Indicating thermometer*	-

2.2 Câbles utilisés / *Cables used*

N° Lot / *Identification*	09003					
Norme / *Standard*	NF C 33-209					
Provenance / *From*	France					
Section / *Cross section*	150 mm²					
Matériau de l'âme / *Conductor material*	☐	Cuivre *Copper*	☑	Aluminium	☐	Alliage d'aluminium *Aluminium alloy*
Type d'âme / *Conductor type*	☐	Massive *Solid*	☑	Câblée *Stranded*		
	☑	Rétreinte *Compacted*	☐	Non rétreinte *Non compacted*	☐	Souple *Flexible*
Forme d'âme / *Conductor shape*	☑	Ronde *Circular*	☐	Sectorale *Sector-shaped*		
Nb de brins / *N. of wires*	19					
Ø sur âme / *Ø conductor*	14,5 mm					
Matériau de l'isolant *Insulation material*	Polyéthylène réticulé type TIX-5 *Cross-linked polyethylene, TIX-5 type*					
Ø sur isolant / *Ø insulation*	18 mm					
Référence du câble HD626 / *HD626 conductor reference*	6 K-1					

Visa responsable de l'essai
Visa supervisor of the test

3 Méthode d'essai / *Test method*

Les modalités d'essai sont celles de la norme NF EN 50483-5 de juillet 2009.

Test procedures are in accordance with NF EN 50483-5 (July 2009) standard.

3.1 Conditions de montage des échantillons / *Conditions during installation of the samples*

Les conditions ambiantes relevées lors du montage des raccords sont les suivantes :
Ambient conditions when installing the connectors assembly are as follows :

	Exigences *Requirements*	**Relevés** *Results*
Température ambiante et humidité *Ambient temperature and humidity conditions*	20 °C ≤ T° ≤ 26 °C 25 % ≤ HR ≤ 75 %	22,0 °C 42 %HR

	Section/ *Cross section* (mm²)	
Echantillon n° *Sample n.*	Câble principal *Main cable*	Câble dérivé *Tap cable*
1	150	150
2		
3		
4		
5		
6		

3.2 Conditions d'essai / *Test conditions*

Le banc d'essai est situé dans le laboratoire, à l'abri des courants d'air éventuel.
La température climatisée du laboratoire est maintenue entre 20°C et 26°C.
Les parois verticales sont distantes de plus de 0,3 m de la boucle d'essai.
Les plans horizontaux sont éloignés de plus de 0,6 m du plan de la boucle d'essai.
Les égaliseurs sont soudés.

The testing bench is located in the laboratory, with the shelter of the possible draught.
Ambient temperature of the air-conditioned laboratory is maintained in the range 20-26°C.
Vertical walls are distant of more than 0,3 m of the test loop.
Horizontal planes are distant of more than 0,6 m of the plan of the test loop.
Equalizers are produced by welding.

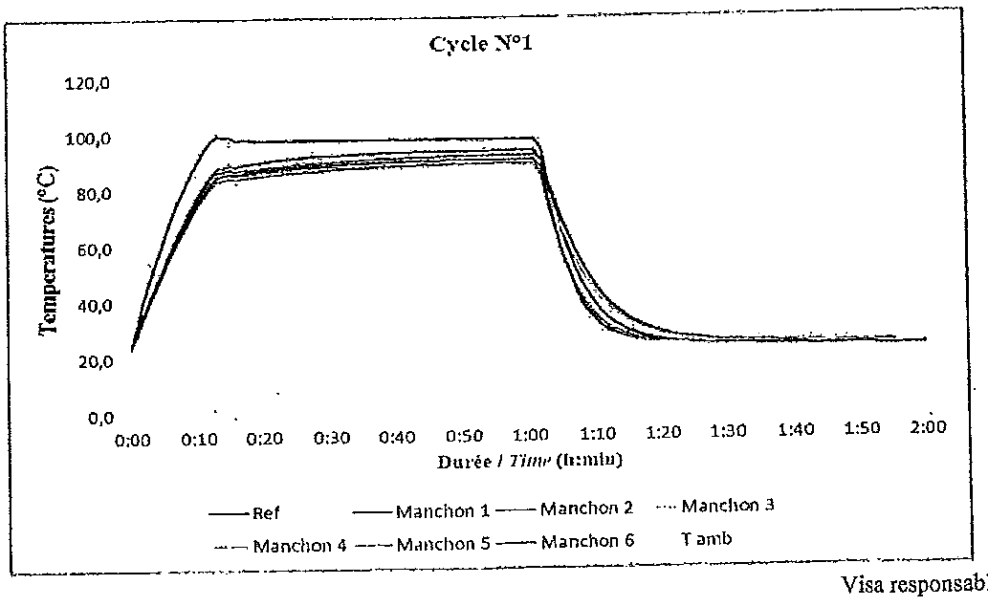
Visa responsable de l'essai
Visa supervisor of the test

3.3 Configuration de la boucle d'essai / *Test loop configuration*

Boucle d'essai selon NF EN 50483-5 / *Test loop in accordance with NF EN 50483-5*
☐ Boucle d'essai pour raccords de dérivation avec conducteur principal et dérivé ayant des sections et des résistances linéiques égales. *Test branch connectors with main and branch conductors having equal cross-sections and linear resistances.*
☐ Boucle d'essai pour raccords de dérivation avec conducteur principal et dérivé ayant des sections et des résistances linéiques inégales. *Test loop for branch connectors with main branch and branch conductors having unequal cross-sections and linear resistances.*
☑ Boucle d'essai pour raccords de jonction avec conducteurs ayant des sections et des résistances linéiques égales ou inégales. *Test loop for through connectors with conductors having equal or unequal cross-sections and linear resistances.*
☐ Boucle d'essai pour cosses pré-isolées. *Test loop for pre-insulated lugs.*

Paramètres de la boucle d'essai / *Test loop parameters*	
Section du câble principal / *Main cable cross section*	: 150 mm²
Longueur l_a / *Length* l_a	: 250 mm
Longueur l_b / *Length* l_b	: 250 mm
Longueur l_r / *Length* l_r	: 512 mm
Nombre de cycles / *Number of cycles*	: 1000
Consigne de temperature / *Temperature setting*	: 98,0 °C
Courant de chauffe / *Heating current*	: 446 A
Durée de chauffe / *Heating time*	: 60 min
Durée de refroidissement / *Cooling time*	: 40 min
Courant continu de mesure / *D.C measuring current*	: 19 A

3.4 Premier cycle thermique / *First heat cycle*



Visa responsable de l'essai
Visa supervisor of the test

3.5 Court-circuits / *Short circuits*

Raccord *Connector*	N°	Temps *Time* (s)	I_{rms} (A)	$I^2.t$ ($kA^2.s$)	Températures maximales / *Maximum temperatures* (°C)		
					Raccords / *Connectors*		Du câble (calculée) / *of cable (calculated)*
					N°1	N°2	
1, 2	1	1,109	16679	308,5	152,8	151,8	252,2
	2	1,120	16592	321,8	162,8	164,5	265,8
	3	1,108	16887	316,1	162,9	162,2	259,9
	4	1,108	16845	314,5	165,0	166,5	258,3
	5	1,110	16367	297,4	158,2	158,8	241,2
	6	1,119	16616	308,9	165,3	165,2	252,6
					N°3	N°4	
3, 4	1	1,160	15874	292,1	132,1	135,7	235,8
	2	1,077	16743	302,0	139,1	141,8	244,1
	3	1,110	16613	306,3	144,1	147,1	250,0
	4	1,136	16743	318,4	152,5	154,5	261,5
	5	1,130	16758	319,5	153,6	155,7	258,4
	6	1,145	16517	312,4	160,9	159,9	253,3
					N°5	N°6	
5, 6	1	1,140	16901	325,8	142,0	143,0	267,0
	2	1,100	16732	307,1	144,0	136,5	248,1
	3	1,129	16540	309,0	150,0	139,7	250,4
	4	1,156	16586	317,9	156,3	148,5	260,6
	5	1,150	16650	318,9	158,2	150,2	262,7
	6	1,128	16557	309,3	154,6	146,9	253,0

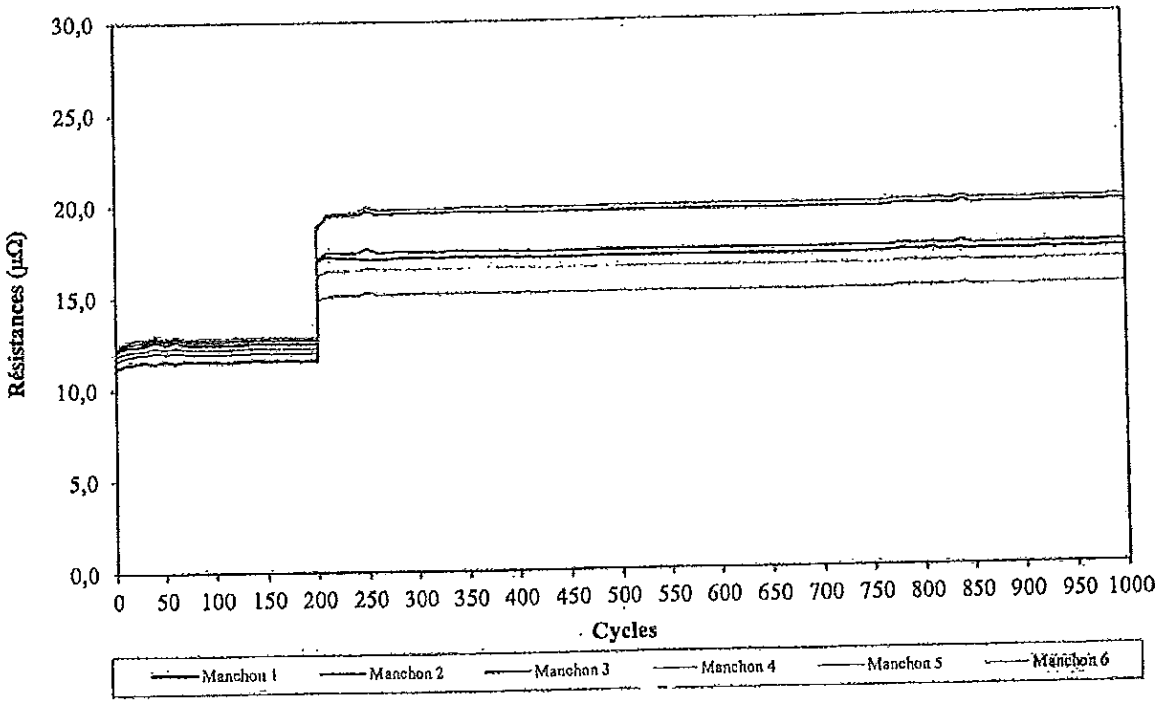
Visa responsable de l'essai
Visa supervisor of the test

4 Résultats / *Results*

4.1 Tableau des résistances / *Table of resistances*

Résistances R_j / R_j *resistances* (µΩ)						
Cycle	Raccord n° / *Connector n.*					
	1	2	3	4	5	6
0	11,2	12,2	12,2	12,4	11,6	11,9
200 av cc	11,6	12,5	12,7	12,9	12,0	12,3
200 ap cc	17,0	17,1	18,8	18,7	14,9	16,2
250	17,0	17,4	19,4	19,6	15,0	16,3
325	17,1	17,5	19,6	19,8	15,1	16,5
400	17,1	17,4	19,6	19,8	15,2	16,5
475	17,1	17,5	19,6	19,9	15,2	16,5
550	17,1	17,4	19,6	19,9	15,2	16,5
625	17,2	17,5	19,7	19,9	15,2	16,6
700	17,2	17,5	19,7	19,9	15,2	16,6
775	17,2	17,5	19,7	20,0	15,3	16,6
850	17,1	17,5	19,7	19,9	15,2	16,6
925	17,2	17,5	19,7	20,0	15,3	16,6
1000	17,2	17,5	19,7	20,0	15,2	16,6

Résistances Rj

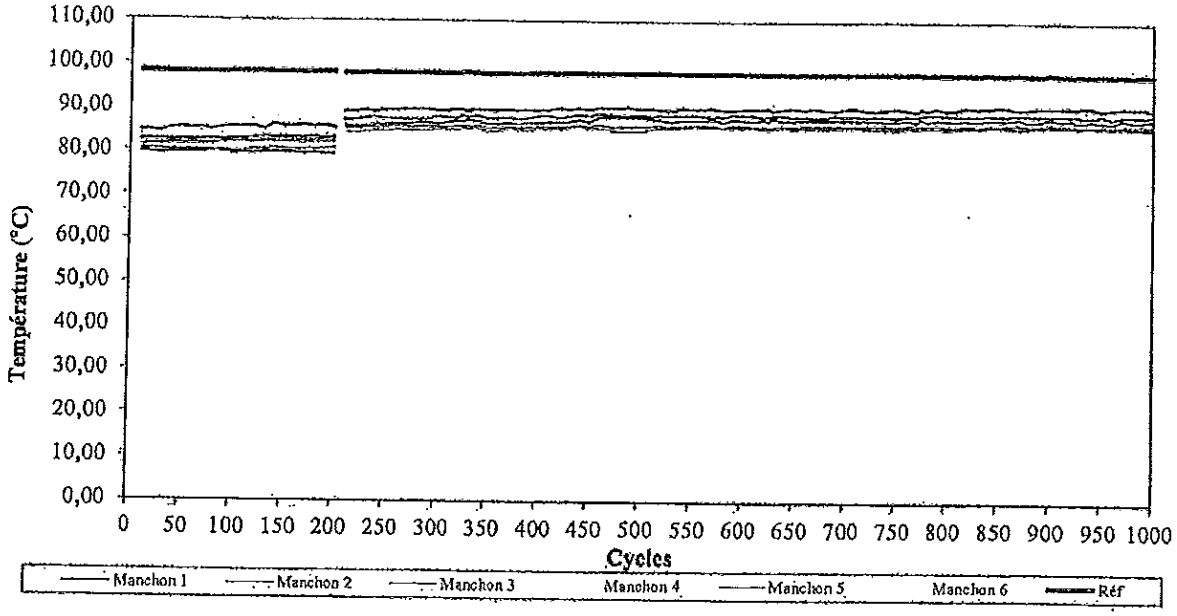


Visa responsable de l'essai
Visa supervisor of the test

4.2 Tableau des températures / *Table of temperatures* (°C)

Cycle	Températures maximales / *Maximum temperatures* (°C)						
	Raccord n° / *Connector n.*						Câble / *Cable* 150 mm²
	1	2	3	4	5	6	
0	-	-	-	-	-	-	-
200	85,5	83,4	79,5	82,8	80,9	82,2	98,2
200	-	-	-	-	-	-	-
250	89,6	87,5	86,2	85,9	85,8	84,8	98,1
325	89,6	88,5	87,0	86,0	86,1	85,5	98,1
400	89,6	88,4	86,8	86,1	85,9	85,6	98,2
475	90,4	88,7	88,3	86,0	86,0	85,0	98,2
550	90,1	88,6	87,5	86,2	86,4	86,1	98,2
625	90,3	88,4	87,4	86,1	86,1	85,5	98,0
700	90,3	88,4	87,7	86,5	86,3	85,8	98,1
775	90,3	88,8	88,2	86,5	86,5	85,9	98,2
850	90,8	88,7	87,8	86,6	86,5	86,3	98,1
925	90,5	88,9	87,4	86,5	86,4	86,0	98,0
1000	90,2	89,1	88,0	86,8	86,4	85,9	98,2

Températures à chaud



Visa responsable de l'essai
Visa supervisor of the test

5 Résultats statistiques / *Statistical results*

5.1 Calculs statistiques / *Statistical calculations*

		Exigences *Requirements*
$\overline{Rj}$	11,905	-
S_0	0,439	-
δ	0,06	$\leq 0,3$

	Raccord n° / *Connector n.*						Exigences *Requirements*
	1	2	3	4	5	6	
$\overline{R_j}$	17,14	17,47	19,64	19,89	15,19	16,53	-
$s(\overline{R_j})$	17,64						-
β	0,17						$\leq 0,3$

5.2 Evaluation de la stabilité de la résistance / *Assessment of resistance stability*

Raccord n° *Connector n.*	R_j (µΩ)			Stabilité *Stability*	Exigences *Requirements*
	Min.	Moy. / *Ave*	Max		
1	17,0	17,1	17,2	0,96%	≤ 15 %
2	17,4	17,5	17,5	1,07%	
3	19,4	19,6	19,7	1,65%	
4	19,6	19,9	20,0	1,96%	
5	15,0	15,2	15,3	1,95%	
6	16,3	16,5	16,6	1,85%	

5.3 Rapports de résistance / *Resistance factor ratios*

Cycles	λ_j					
	1	2	3	4	5	6
0	-	-	-	-	-	-
250	1,52	1,43	1,59	1,58	1,29	1,37
325	1,53	1,44	1,61	1,60	1,30	1,39
400	1,53	1,43	1,61	1,60	1,31	1,39
475	1,53	1,44	1,61	1,60	1,31	1,39
550	1,53	1,44	1,61	1,60	1,31	1,39
625	1,53	1,44	1,62	1,61	1,31	1,39
700	1,53	1,44	1,62	1,61	1,31	1,39
775	1,53	1,44	1,62	1,61	1,32	1,40
850	1,53	1,44	1,62	1,61	1,31	1,39
925	1,53	1,44	1,62	1,61	1,32	1,39
1000	1,53	1,44	1,62	1,61	1,31	1,39
Exigences *Requirements*	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2

Visa responsable de l'essai
Visa supervisor of the test

5.4 Stabilité de la température / *Temperature stability* ($\Delta\theta_j$)

Cycles	$\Delta\theta_j$ (°C)					
	1	2	3	4	5	6
0	-	-	-	-	-	-
250	8,46	10,56	11,86	12,16	12,26	13,26
325	8,48	9,58	11,08	12,08	11,98	12,58
400	8,56	9,76	11,36	12,06	12,26	12,56
475	7,78	9,48	9,88	12,18	12,18	13,18
550	8,14	9,64	10,74	12,04	11,84	12,14
625	7,71	9,61	10,61	11,91	11,91	12,51
700	7,83	9,73	10,43	11,63	11,83	12,33
775	7,93	9,43	10,03	11,73	11,73	12,33
850	7,27	9,37	10,27	11,47	11,57	11,77
925	7,53	9,13	10,63	11,53	11,63	12,03
1000	8,00	9,10	10,20	11,40	11,80	12,30

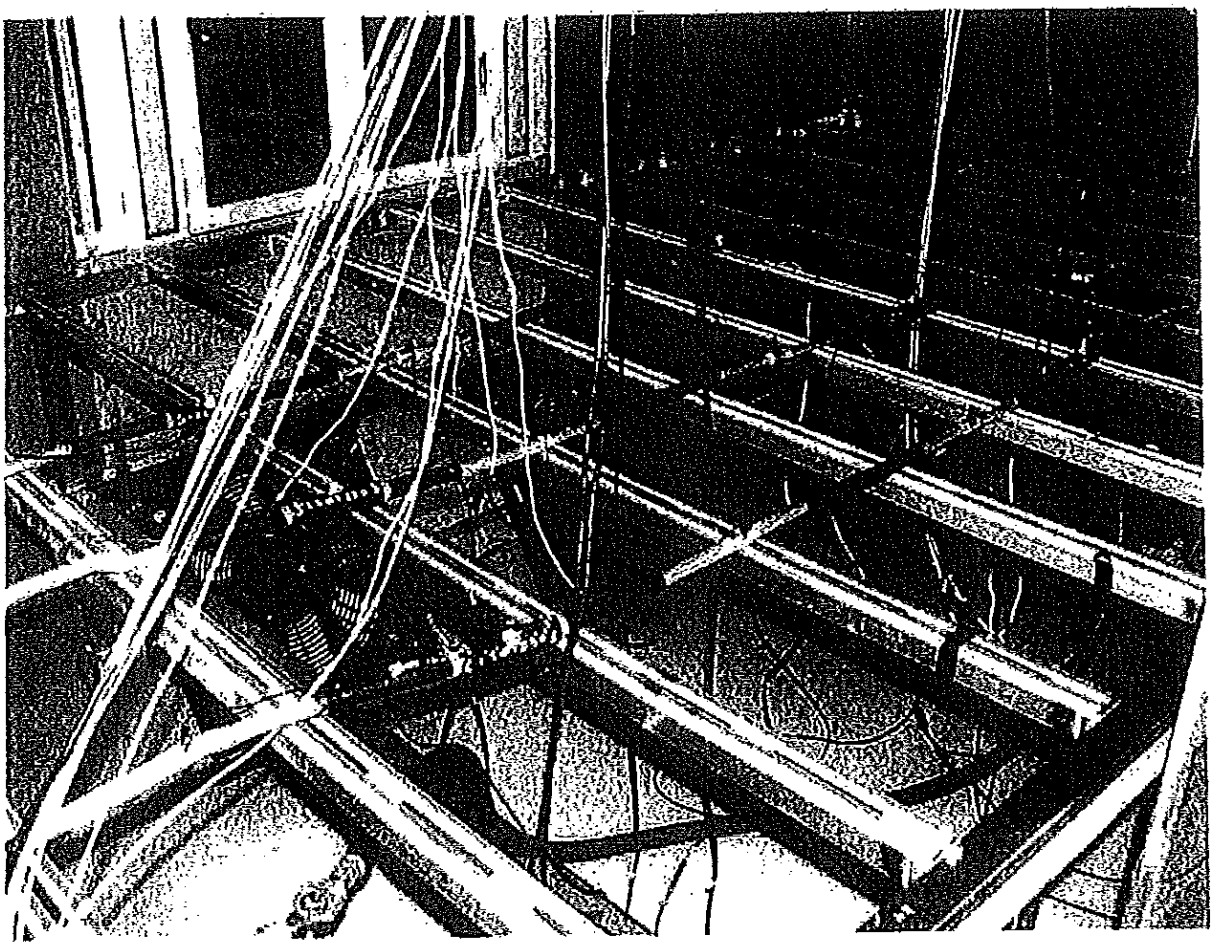
Raccord n° *Connector n.*	$\Delta\theta_j$ (°C)					Exigences / *Requirements*
	Moy. *Ave.*	$\overline{\Delta\theta_j} - 10$	Min.	Max.	$\overline{\Delta\theta_j} + 10$	$\overline{\Delta\theta_j} - 10 \le \Delta\theta_j \le \overline{\Delta\theta_j} + 10$
1	8,0	-2,0	7,3	8,6	18,0	Conforme / ***Compliant***
2	9,6	-0,4	9,1	10,6	19,6	
3	10,6	0,6	9,9	11,9	20,6	
4	11,8	1,8	11,4	12,2	21,8	
5	11,9	1,9	11,8	12,3	21,9	
6	12,5	2,5	11,8	13,3	22,5	

5.5 Température maximale θ_j de chaque raccord / *Maximum temperature θj of each connector.*

Raccord n° *Connector n.*	θ_j Max (°C)	θ_r (°C)	Exigences *Requirements*
1	90,8	98,2	θ_j Max $\le \theta_r$
2	89,1		
3	88,3		
4	86,8		
5	86,5		
6	86,3		

Visa responsable de l'essai
Visa supervisor of the test

6 Photo de la boucle d'essai / *Photo of the test loop*



FIN DU RAPPORT D'ESSAI / *END OF TEST REPORT*

Visa responsable de l'essai
Visa supervisor of the test

ВЯРНО С ОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП MJPT 150

1. **№ на тест: 9212370 -** Механичен тест.
2. **№ на тест: 1201231 -** Тест за стареене под въздействието на електричество.

На основание чл. 2
от ЗЗЛД

Съставил:

MICHAUD
MATERIEL ELECTRIQUE

BP 11 - Z.I. LE BLANCHON - 01160 PONT D'AIN - (FRANCE)

LABORATOIRE D'ESSAIS
TEST LABORATORY

RAPPORT D'ESSAIS
TEST REPORT

ESSAIS DE QUALIFICATION DES MANCHONS DE JONCTION MJPT (K101, K103, K106, K110, K121, K123, K115, K116,K117,K170 ET K175)
N°130-06-02-03

QUALIFICATION TESTS OF MJPT SLEEVES (K101, K103, K106, K110, K121, K123, K115, K116,K117,K170 AND K175)
N° 130-06-02-03

16/06/2006

DEMANDEUR : Bureau d'Etudes MICHAUD SA
REQUESTED BY : MICHAUD SA's Research Department

PRESENTATION : Ce document regroupe les essais de qualification des manchons de jonction MJPT (K101, K103, K106, K110, K121, K123, K115, K116,K117,K170 et K175). Les matériels testés sont de fabrication MICHAUD SA.
Les modalités d'essais retenues sont celles de la norme NF C 33-021 de Juin 1998.

INTRODUCTION : This document gathers the qualification tests of MJPT sleeves (K101, K103, K106, K110, K121, K123, K115, K116,K117, K170 and K175). Tested products are of MICHAUD's manufacture.
The test procedures are the ones of the standard NF C 33-021 dated June 1998.

На основание чл. 2
от ЗЗЛД

DIFFUSION : Le 16/06/2006 - 1 exemplaire original UR (LE)
Le 18/02/2011 - 1 exemplaire original COM (Classement Client)

ISSUANCE : On the 16/06/2006 - 1 original to UR (LE)
On the 18/02/2011 - 1 original to COM (Customer filing)

Ce document comporte 39 pages (y compris la présente page 1).
This document includes 39 pages (including this page 1).

ВЯРНО С ОРИГИНАЛА

46

CONTENTS

(*) The numbers of paragraph are given in the standard NF C 33-021 dated June 1998.

I) INTRODUCTION

1.1 Subject

This document gathers the qualification tests of MJPT sleeves (K101, K103, K106, K110, K121, K123, K115, K116, K170 and K175). Tested products are of MICHAUD's manufacture.

Test procedures are the ones of the standard NF C 33-021 dated June 1998.

For each test, there is a test sheet gathering procedures and results.

1.2 Tested products

Tested products are preinsulated sleeves for aerial conductors according to the technical file «MJPT». These products are coming from an industrial series and have been delivered to Test Laboratory on 09/01/2006.

DESIGNATION	REFERENCE	N° OF BATCH
PREINSULATED SLEEVE (173) MJPT 16	K 101	05 50 51
PREINSULATED SLEEVE (173) MJPT 25	K 103	05 47 49
PREINSULATED SLEEVE (173) MJPT 35	K 106	05 35 13
PREINSULATED SLEEVE (173) MJPT 50	K 110	05 47 50
PREINSULATED SLEEVE (173) MJPT 70	K 121	05 50 20
PREINSULATED SLEEVE (173) MJPT 95	K 123	05 50 07
PREINSULATED SLEEVE (173) MJPT 54	K 115	05 50 65
PREINSULATED SLEEVE (173) MJPT 70	K 116	05 50 66
PREINSULATED SLEEVE (215) MJPT 95	K 170	05 47 46
PREINSULATED SLEEVE (215) MJPT 150	K 175	05 50 01

1.3 Order of test

Tests are performed on 8 sleeves MJPT 16, MJPT 25, MJPT 35, MJPT 50, MJPT 70, MJPT 95 (215), MJPT 54N and on 20 sleeves MJPT 95 (173), MJPT 150 and MJPT 70N.

NUMBER OF SAMPLES		TESTS
MJPT 16, MJPT 25, MJPT 35, MJPT 50, MJPT 70, MJPT 95 (215) AND MJPT 54N	MJPT 95 (173), MJPT 150 AND MJPT 70N	
/	1 and 2	2.3.1 Mechanical tests – Crimping aptitude test
1 and 2	3 and 4	2.3.2 Mechanical tests – Tensile test
3 up to 6	5 up to 8	2.4 Dielectric and watertightness tests 2.6 Climatic ageing test
7 and 8	9 and 10	2.5 Low temperature assembly test 2.4 Dielectric and watertightness tests 2.3.2 Mechanical tests – Tensile test
/	11 up to 16	2.8 Electric ageing test
/	17 up to 20	2.9 Endurance test under mechanical and thermal stresses 2.3.2 Mechanical tests – Tensile test

II) STANDARD DOCUMENTS REFERRED TO IN THIS REPORT

- French standards

C 20-540 : June 2002,
«Environmental test - Test methods - Climatic ageing test of equipment and synthetic materials for outdoor use».

NF C 33-004 : June 1998,
«Insulated cables and their accessories for power systems - Connecting equipment for overhead distributions and services of rated voltage 0,6/1kV with at least one insulated core - Electrical ageing test».

NF C 33-021 : June 1998,
«Insulated cables and their accessories for power systems - Preinsulated compression type connecting equipment for overhead distributions and services of rated voltage 0,6/1kV with bundle assembled cores».

NF C 33-209 : July 1996,
«Insulated or shielded cables for power systems - Bundle assembled cores for overhead systems of rated voltage 0,6/1kV».

III) GENERAL CONDITIONS

- Temperature

Tests are carried out at the room temperature of the test laboratory between 20°C and 26°C.

- Cores used

STANDARD	NAME OF MANUFACTURER	NOMINAL CROSS-SECTIONAL AREA (in mm²)	NUMBER OF STRANDS AND COMPOSITION OF CORE	Ø OVER INSULANT (in mm)	Ø OVER CORE (in mm)
NF C 33-209	NEXANS	150	19 strands aluminium	17,5	13,9
		95	19 strands aluminium	15,0	11,2
		70	12 strands aluminium	13,6	10,1
		70N	7 strands aluminium alloy	13,3	10,2
		54,6N	7 strands aluminium alloy	12,5	9,4
		50	7 stands aluminium	11,2	8,3
		35	7 stands aluminium	10,6	7,1
		25	7 stands aluminium	9,0	6,0
		16	7 stands aluminium	7,4	4,8

Before tests, cores are conditioned, according to § 2.2.2 of the standard NF C 33-021 as follows : they are put in an enclosure during 1 h at 120°C, then the door of enclosure is opened so that conductors come back to room temperature.

IV) TESTS

On the following pages, sheets of each performed test can be found.

TEST DESCRIPTION : 2.3.1 Mechanical tests – Crimping aptitude test	Page 1/1

DATE : 22/02/2006
PLACE : MICHAUD test laboratory
OPERATOR : AC. BERNARD

N° OF SAMPLES : 1 and 2 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N

TEST EQUIPMENTS

- Measure equipment for traction / compression

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.3.1 of standard NF C 33-021 dated June 1998.

Samples are fitted on aluminium cores stripped over the length indicated on the sleeve.

Then, they are crimped with the measure equipment for traction / compression, according to the installation instructions. Crimping is performed with 9mm width dies type E173 for sleeves MJPT 95 and MJPT 70N and type E215 for sleeves MJPT 150.

The crimping strength applied is 5 000 daN.

At the end of the test, the two half-dies must be in contact : a 0,05 mm thick wedge does not go in.

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (In mm²)	COMMENTS AFTER CRIMPING	FOLLOWING TEST
MJPT 95 (173)	1	/	95mm² Al	Satisfactory : The 0,05 mm thick wedge does not go in	/
	2			Satisfactory : The 0,05 mm thick wedge does not go in	
MJPT 150	1	/	150mm² Al	Satisfactory : The 0,05 mm thick wedge does not go in	/
	2			Satisfactory : The 0,05 mm thick wedge does not go in	
MJPT 70N	1	/	70mm² Al alloy	Satisfactory : The 0,05 mm thick wedge does not go in	/
	2			Satisfactory : The 0,05 mm thick wedge does not go in	

TEST DESCRIPTION : 2.3.2 Mechanical tests – Tensile test — Page 1/3

DATE : 10/01/2006, 11/01/2006, 13/01/2006, 03/04/2006, 09/05/2006, 13/06/2006 — OPERATOR : AC. BERNARD

PLACE : MICHAUD test laboratory

N° OF SAMPLES : 3, 4, 9, 10 and 17 up to 20 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N
1, 2, 7 and 8 for the other type of sleeves

TEST EQUIPMENTS

- Measure equipment for traction / compression
- Mechanical tensile strength and endurance bench

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.3.2 of standard NF C 33-021 dated June 1998.

Samples are fitted on 30cm length cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

Then, the assembly sleeve - cores is installed between the clamping jaws of the tensile strength machine. Then, an increasing tensile strength is applied on the conductor core which progress is comprised between 1 000N/min and 5 000N/min up to the following F1 values and for the following duration :

- 600N for 1 minute for 16mm² Al conductor,
- 900N for 1 minute for 25mm² Al conductor,
- 1 300N for 1 minute for 35mm² Al conductor,
- 1 800N for 1 minute for 50mm² Al conductor,
- 2 500N for 1 minute for 70mm² Al conductor,
- 3 375N for 1 minute for 95mm² Al conductor,
- 5 300N for 1 minute for 150mm² Al conductor,
- 10 300N for 1 minute for 54,6mm² Al alloy conductor,
- 12 700N for 1 minute for 70mm² Al alloy conductor.

Then, the strength is raised until the following F2 values, then it is released :

- 1 200N for 16mm² Al conductor,
- 1 800N for 25mm² Al conductor,
- 2 500N for 35mm² Al conductor,
- 3 500N for 50mm² Al conductor,
- 5 000N for 70mm² Al conductor,
- 6 750N for 95mm² Al conductor,
- 10 500N for 150mm² Al conductor,
- 15 800N for 54,6mm² Al alloy conductor,
- 19 500N for 70mm² Al alloy conductor.

No slip shall be noticed.

TEST DESCRIPTION : 2.3.2 Mechanical tests – Tensile test

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	F1 STRENGTH APPLIED DURING THE STEP	F2 STRENGTH APPLIED (in N)	COMMENTS	FOLLOWING TEST
MJPT 16	1	/	16mm² Al	600	1 200	Satisfactory	/
	2		16mm² Al	600	1 200	Satisfactory	
	7	2.4	16mm² Al	600	1 200	Satisfactory	
	8		16mm² Al	600	1 200	Satisfactory	
MJPT 25	1	/	25mm² Al	900	1 800	Satisfactory	/
	2		25mm² Al	900	1 800	Satisfactory	
	7	2.4	25mm² Al	900	1 800	Satisfactory	
	8		25mm² Al	900	1 800	Satisfactory	
MJPT 35	1	/	35mm² Al	1 300	2 500	Satisfactory	/
	2		35mm² Al	1 300	2 500	Satisfactory	
	7	2.4	35mm² Al	1 300	2 500	Satisfactory	
	8		35mm² Al	1 300	2 500	Satisfactory	
MJPT 50	1	/	50mm² Al	1 800	3 500	Satisfactory	/
	2		50mm² Al	1 800	3 500	Satisfactory	
	7	2.4	50mm² Al	1 800	3 500	Satisfactory	
	8		50mm² Al	1 800	3 500	Satisfactory	
MJPT 70	1	/	70mm² Al	2 500	5 000	Satisfactory	/
	2		70mm² Al	2 500	5 000	Satisfactory	
	7	2.4	70mm² Al	2 500	5 000	Satisfactory	
	8		70mm² Al	2 500	5 000	Satisfactory	
MJPT 95 (215)	1	/	95mm² Al	3 375	6 750	Satisfactory	/
	2		95mm² Al	3 375	6 750	Satisfactory	
	7	2.4	95mm² Al	3 375	6 750	Satisfactory	
	8		95mm² Al	3 375	6 750	Satisfactory	
MJPT 54N	1	/	54,6N Al alloy	10 300	15 800	Satisfactory	/
	2		54,6N Al alloy	10 300	15 800	Satisfactory	
	7	2.4	54,6N Al alloy	10 300	15 800	Satisfactory	
	8		54,6N Al alloy	10 300	15 800	Satisfactory	

TEST DESCRIPTION : 2.3.2 Mechanical tests – Tensile test

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	F1 STRENGTH APPLIED DURING THE STEP	F2 STRENGTH APPLIED (in N)	COMMENTS	FOLLOWING TEST
MJPT 95 (173)	3	/	95mm² Al	3 375	6 750	Satisfactory	
	4		95mm² Al	3 375	6 750	Satisfactory	
	9	2.4	95mm² Al	3 375	6 750	Satisfactory	
	10		95mm² Al	3 375	6 750	Satisfactory	
	17	2.9	95mm² Al	3 375	6 750	Satisfactory	/
	18		95mm² Al	3 375	6 750	Satisfactory	
	19		95mm² Al	3 375	6 750	Satisfactory	
	20		95mm² Al	3 375	6 750	Satisfactory	
MJPT 150	3	/	150mm² Al	5 300	10 500	Satisfactory	/
	4		150mm² Al	5 300	10 500	Satisfactory	
	9	2.4	150mm² Al	5 300	10 500	Satisfactory	
	10		150mm² Al	5 300	10 500	Satisfactory	
	17	2.9	150mm² Al	5 300	10 500	Satisfactory	
	18		150mm² Al	5 300	10 500	Satisfactory	
	19		150mm² Al	5 300	10 500	Satisfactory	
	20		150mm² Al	5 300	10 500	Satisfactory	
MJPT 70N	3	/	70mm² Al alloy	12 700	19 500	Satisfactory	/
	4		70mm² Al alloy	12 700	19 500	Satisfactory	
	9	2.4	70mm² Al alloy	12 700	19 500	Satisfactory	
	10		70mm² Al alloy	12 700	19 500	Satisfactory	
	17	2.9	70mm² Al alloy	12 700	19 500	Satisfactory	
	18		70mm² Al alloy	12 700	19 500	Satisfactory	
	19		70mm² Al alloy	12 700	19 500	Satisfactory	
	20		70mm² Al alloy	12 700	19 500	Satisfactory	

TEST DESCRIPTION : 2.4 Dielectric and watertightness tests — Page 1/3

DATE : FROM 10/01/2006 TO 12/01/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC. BERNARD
JP. RAPY

N° OF SAMPLES : 5 up to 10 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N
3 up to 8 for the other type of sleeves.

TEST EQUIPMENTS

- Measure equipment for traction / compression
- Dielectric test equipment A 1105

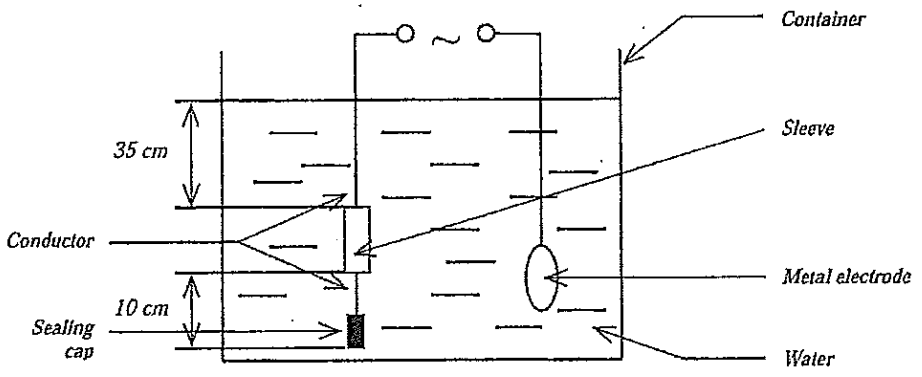
PROCEDURES

Procedures and acceptance criteria are the ones of § 2.4 of standard NF C 33-021 dated June 1998.

Samples are fitted on cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

After having put a sealing cap on one of the stripped extremities of the conductor, assemblies sleeve - cores are installed vertically in water, as shown below :



Voltage generator used is regulated to release under a 10 mA leakage current.
After 30 mln under water, a dielectric test is performed on the assembly under a 6 kV voltage at an industrial frequency for 1 min. The increase of voltage is performed at 1 kV/s speed.
No breakage (release of voltage source) shall occur.

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER 1 min UNDER 6kV	FOLLOWING TEST
MJPT 16	3	/	16mm² Al	Satisfactory	2.6
	4		16mm² Al	Satisfactory	
	5		16mm² Al	Satisfactory	
	6		16mm² Al	Satisfactory	

TEST DESCRIPTION : 2.4 Dielectric and watertightness tests

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER 1 min UNDER 6kV	FOLLOWING TEST
MJPT 16	7	2.5	16mm² Al	Satisfactory	2.3.2
	8		16mm² Al	Satisfactory	
MJPT 25	3	/	25mm² Al	Satisfactory	2.6
	4		25mm² Al	Satisfactory	
	5		25mm² Al	Satisfactory	
	6		25mm² Al	Satisfactory	
	7	2.5	25mm² Al	Satisfactory	2.3.2
	8		25mm² Al	Satisfactory	
MJPT 35	3	/	35mm² Al	Satisfactory	2.6
	4		35mm² Al	Satisfactory	
	5		35mm² Al	Satisfactory	
	6		35mm² Al	Satisfactory	
	7	2.5	35mm² Al	Satisfactory	2.3.2
	8		35mm² Al	Satisfactory	
MJPT 50	3	/	50mm² Al	Satisfactory	2.6
	4		50mm² Al	Satisfactory	
	5		50mm² Al	Satisfactory	
	6		50mm² Al	Satisfactory	
	7	2.5	50mm² Al	Satisfactory	2.3.2
	8		50mm² Al	Satisfactory	
MJPT 70	3	/	70mm² Al	Satisfactory	2.6
	4		70mm² Al	Satisfactory	
	5		70mm² Al	Satisfactory	
	6		70mm² Al	Satisfactory	
	7	2.5	70mm² Al	Satisfactory	2.3.2
	8		70mm² Al	Satisfactory	
MJPT 95 (215)	3	/	95mm² Al	Satisfactory	2.6
	4		95mm² Al	Satisfactory	
	5		95mm² Al	Satisfactory	
	6		95mm² Al	Satisfactory	
	7	2.5	95mm² Al	Satisfactory	2.3.2
	8		95mm² Al	Satisfactory	

TEST DESCRIPTION : 2.4 Dielectric and watertightness tests

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS AFTER 1 min UNDER 6kV	FOLLOWING TEST
MJPT 54N	3	/	54,6N Al alloy	Satisfactory	2.6
	4		54,6N Al alloy	Satisfactory	
	5		54,6N Al alloy	Satisfactory	
	6		54,6N Al alloy	Satisfactory	
	7	2.5	54,6N² Al alloy	Satisfactory	2.3.2
	8		54,6N² Al alloy	Satisfactory	
MJPT 95 (173)	5	/	95mm² Al	Satisfactory	2.6
	6		95mm² Al	Satisfactory	
	7		95mm² Al	Satisfactory	
	8		95mm² Al	Satisfactory	
	9	2.5	95mm² Al	Satisfactory	2.3.2
	10		95mm² Al	Satisfactory	
MJPT 150	5	/	150mm² Al	Satisfactory	2.6
	6		150mm² Al	Satisfactory	
	7		150mm² Al	Satisfactory	
	8		150mm² Al	Satisfactory	
	9	2.5	150mm² Al	Satisfactory	2.3.2
	10		150mm² Al	Satisfactory	
MJPT 70N	5	/	70N Al alloy	Satisfactory	2.6
	6		70N Al alloy	Satisfactory	
	7		70N Al alloy	Satisfactory	
	8		70N Al alloy	Satisfactory	
	9	2.5	70N Al alloy	Satisfactory	2.3.2
	10		70N Al alloy	Satisfactory	

TEST DESCRIPTION : 2.5 Low temperature assembly test — Page 1/2

DATE : 12/01/2006
PLACE : MICHAUD test laboratory — OPERATOR : AC. BERNARD

N° OF SAMPLES : 9 and 10 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N
3 and 8 for the other types of sleeves

TEST EQUIPMENTS

- Enclosure with regulated temperature - 25°C + 45°C
- Measure equipment for traction / compression

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.5 of standard NF C 33-021 dated June 1998.

Each sleeve as well as cores which are ready to be fitted, are installed in the enclosure with regulated temperature - 25°C + 45°C, at a temperature of - 11°C.

After one hour, the assembly being kept in the enclosure, the sleeve is crimped with a pneumatic jack and adapted dies.

So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.

3 h after its exit of the enclosure with regulated temperature - 25°C + 45°C, the sleeve being fitted is subjected to the dielectric and watertightness tests, then to the tensile test (respectively § 2.4 and 2.3.2 of this test report).

TEST RESULTS

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (In mm²)	COMMENTS DURING THE ASSEMBLY AT -11°C	FOLLOWING TEST
MJPT 16	7	/	16mm² Al	Satisfactory	2.4
	8		16mm² Al	Satisfactory	
MJPT 25	7	/	25mm² Al	Satisfactory	2.4
	8		25mm² Al	Satisfactory	
MJPT 35	7	/	35mm² Al	Satisfactory	2.4
	8		35mm² Al	Satisfactory	
MJPT 50	7	/	50mm² Al	Satisfactory	2.4
	8		50mm² Al	Satisfactory	
MJPT 70	7	/	70mm² Al	Satisfactory	2.4
	8		70mm² Al	Satisfactory	
MJPT 95 (215)	7	/	95mm² Al	Satisfactory	2.4
	8		95mm² Al	Satisfactory	
MJPT 54N	7	/	54,6N Al alloy	Satisfactory	2.4
	8		54,6N Al alloy	Satisfactory	

TEST DESCRIPTION : 2.5 Low temperature assembly test

TYPE OF SLEEVES	N° OF SAMPLE	PREVIOUS TEST	SECTION OF CONDUCTOR (in mm²)	COMMENTS DURING THE ASSEMBLY AT -11°C	FOLLOWING TEST
MJPT 95 (173)	9	/	95mm² Al	Satisfactory	2.4
	10		95mm² Al	Satisfactory	
MJPT 150	9	/	150mm² Al	Satisfactory	2.4
	10		150mm² Al	Satisfactory	
MJPT 70N	9	/	70N Al alloy	Satisfactory	2.4
	10		70N Al alloy	Satisfactory	

TEST DESCRIPTION : 2.6 Climatic ageing test — Page 1/5

DATE : FROM 13/01/2006 TO 28/02/2006
PLACE : MICHAUD laboratory test
OPERATORS : A. BERNARD, JP. RAPY

N° OF SAMPLES : 5 up to 8 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N
3 up to 6 for the other types of sleeves

TEST EQUIPMENTS

- Climatic ageing enclosure XR 35

PROCEDURES

Procedure and acceptance criteria are the ones of § 2.6 of standard NF C 33-021 dated June 1998.

CLIMATIC TEST

Procedures of this test are the ones of standard C 20-540 dated June 2002.

Samples support 6 weekly cycles, the enclosure temperature being 70 (± 2) °C for the conditionings A and C.

ACCEPTANCE CRITERIA

At the end of the climatic ageing cycles, the samples shall comply with the following tests, after being placed in the test laboratory atmosphere for at least 24 h without exceeding 72 h :

- ◊ Dielectric test :
  - * The assembly, placed horizontally, is covered with lead balls, over 1 to 2cm. After 1min, a dielectric test is performed on the assembly at a 6kV voltage at an industrial frequency during 1min. Increase of voltage is performed at a 1kV/s speed. No breakage shall occur.
  - * A dielectric test is performed on the assembly under a 1kV voltage, according to § 2.4 of this test report. No breakage shall occur.
- ◊ Visual control :
  - * At the end of the tests, marking of the pieces shall be legible when examined with normal or correction vision without magnification.

TEST RESULTS

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPT 16	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	

TEST DESCRIPTION : 2.6 Climatic ageing test

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPT 16	5	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 25	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 35	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 150	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/

TEST DESCRIPTION : 2.6 Climatic ageing test

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPT 150	4	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 70	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 95 (215)	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	

ВЯРНО С ОРИГИНАЛА

TEST DESCRIPTION : 2.6 Climatic ageing test

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPT 54N	3	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	4		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	5		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 95 (173)	5	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	7		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	8		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
MJPT 150	5	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	7		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	

TEST DESCRIPTION : 2.6 Climatic ageing test

TYPE OF SLEEVES	SAMPLE N°	PREVIOUS TEST	COMMENTS AFTER 6 WEEKS CLIMATIC AGEING TEST	DIELECTRIC TEST		LEGIBILITY IDENTIFICATION MARKING	FOLLOWING TEST
				6KV TEST IN LEAD	1KV TEST IN WATER		
MJPT 150	8	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
MJPT 70N	5	2.4	No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	/
	6		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	7		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	
	8		No visible damage (the body has slightly whitened and the cap has slightly faded on the side exposed to UV	No breakage	No breakage	Satisfactory	

TEST DESCRIPTION : 2.8 Electric ageing test — Page 1/17

DATE : FROM 02/02/2006 TO 03/03/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC, BERNARD
JP, RAPY

N° OF SAMPLES : 11 up to 16 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N

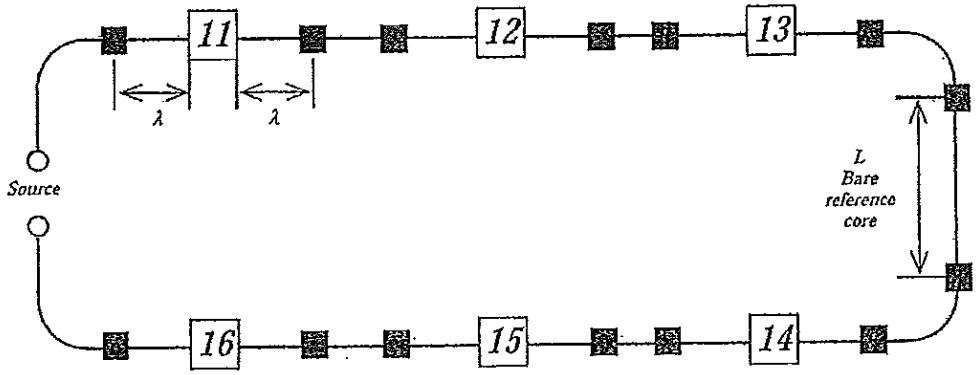
TEST EQUIPMENTS

- Measure equipment for traction / compression
- N° 1, 2 and 4 electric ageing benches
- Measure stations NI1, NI2 and SA 70 N1

PROCEDURES

Procedures and acceptance criteria are the ones of § 2.8 of standard NF C 33-021 dated June 1998 which refers to standard NF C 33-004 dated June 1998.

The test loop carried out according to standard NF C 33-004 is the loop "A" in "U" form :



LEGEND

- Sleeve
- Voltage measure point
- Core : 95mm² Al for the sleeve MJPT 95 (173)
  150mm² Al for the sleeve MJPT 150
  70mm² Al alloy for the sleeve MJPT 70N

1. Preparation of the loop

- Parameters of the loop are calculated :

TYPE OF SLEEVES	λ	L
MJPT 95 (173)	200mm	400mm
MJPT 150	250mm	500mm
MJPT 70N	200mm	400mm

- Voltage measure points are performed by means of equalizers (welding method : «TIG», metal filler : 1 050A aluminium). They are placed as shown on the previous schema.

- Conductors that come out of the sleeves, as well as the reference conductor, are equipped with terminal lugs.
- The reference core is stripped.

2. Assembly of the loop

- Samples are fitted on cores stripped over the length indicated on the sleeve. They are crimped with a pneumatic jack and adapted dies.
- So as to assure a good crimping of the preinsulated sleeves, we check that a 0,05 mm thick wedge does not go in.
- Conductors equipped with terminal lugs are linked between each other, to the electric ageing bench by means of bolts.
- Voltage measure points are installed.
- Temperature measure points are installed as follows :

	TYPE OF THERMOCOUPLE	PLACE OF FIXING	TYPE OF HOLD
Sleeve	- type «k», «sheathed» in a tube of inconel. - diameter 1 mm.	- at the middle of the sleeve, in a 1,2mm diameter hole.	- covered with «thermoconductor» grease - holding with a mastic type «polyurethane»
Reference core	- type «k», - diameter 0,5 mm.	- at the «middle» of the reference conductor core.	- holding through a splice (copper wire diameter 0,4mm) - covered with «thermoconductor» grease
Room temperature	- type «k», «sheathed» in a tube of inconel, - diameter 1 mm.	- at the middle of the loop in the horizontal level containing the sleeves.	/

3. Process of a cycle

		TYPE OF SLEEVES		
		MJPT 95 (173)	MJPT 150	MJPT 70N
Heating at 120°C of the reference core	Duration	5 min	5 min	4 min
	Intensity	~ 500A	~ 700A	~ 415A
Step at 120°C of the reference core	Duration	50 min	55 min	50 min
	Intensity	~ 355A	~ 490A	~ 275A
Temperature measure every 10 cycle				
Cooling	Duration	30min	35min	35min
Resistance measure every 10 cycle				
Total duration of a cycle	Duration	85min	95min	89min

TEST DESCRIPTION : 2.8 Electric ageing test	Page 3/17

4. Performing of the test - Measures

- Resistance measure is performed under a direct current of 25A for sleeve MJPT 70N, 30A for sleeve MJPT 95 (173) and 40A for sleeve MJPT 150, every 10 cycle.
- Rj resistance values of each sleeve are calculated according to § 5.3.3.4 of standard NF C 33-004 dated June 1998.
- The test is performed as follows :
  - 50 cycles of electrical ageing,
  - application of 4 overloads during 1 s with an intensity of 6 650A for sleeve MJPT 70N, 9 500A for sleeve MJPT 95 and 15 000A for sleeve MJPT 150,
  - 150 cycles of electrical ageing.

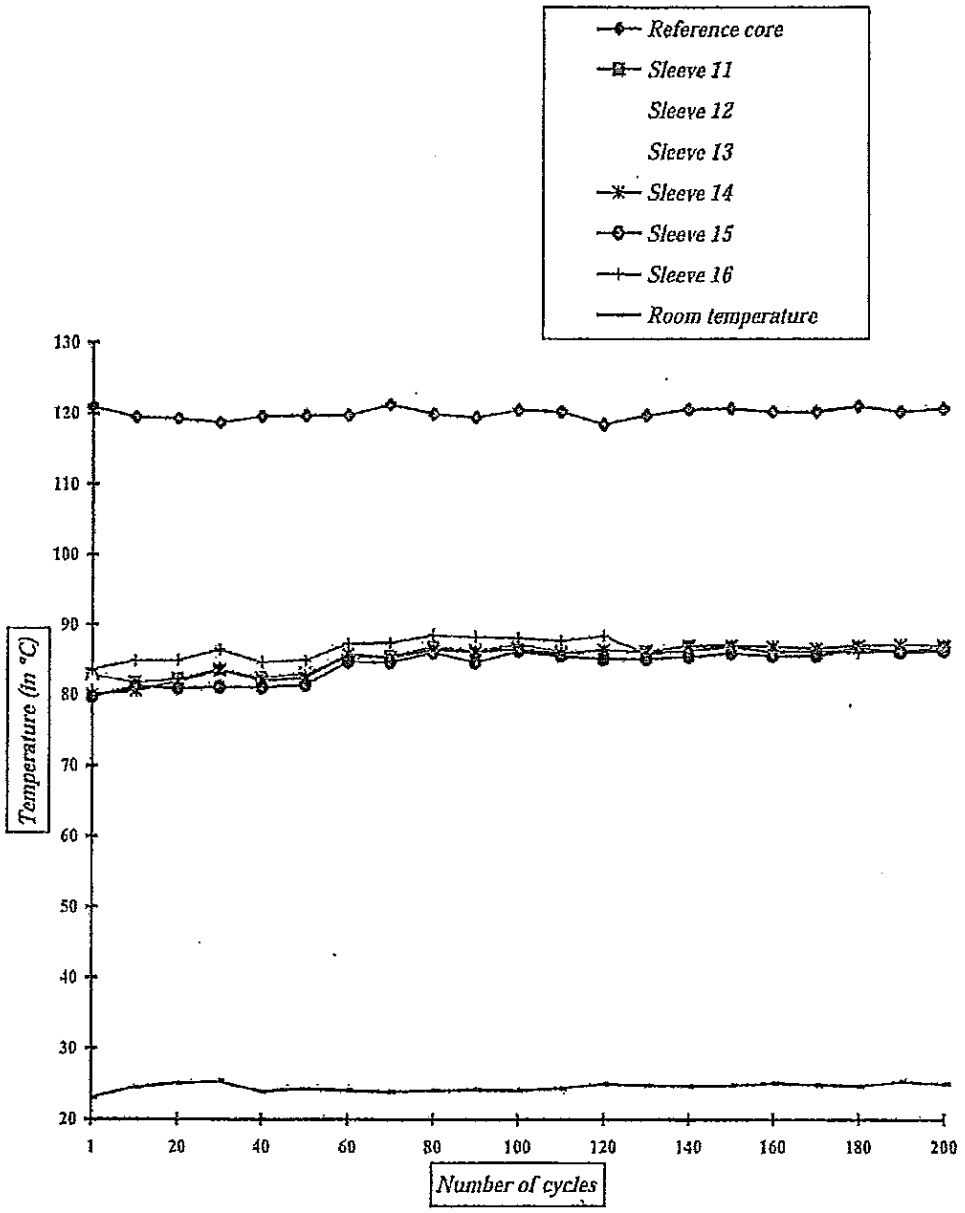
TEST RESULTS

Sleeve MJPT 95 (173)

TEMPERATURE RECORD (in °C)

Cycles	Reference core	Sleeves						Room temperature
		11	12	13	14	15	16	
1	120,9	82,8	82,4	84,1	80,0	79,7	83,6	23,1
10	119,5	81,7	81,0	85,3	80,6	81,2	84,8	24,5
20	119,3	82,2	81,3	84,2	81,9	80,9	84,9	25,1
30	118,7	83,6	81,9	85,0	83,5	81,1	86,4	25,3
40	119,6	82,4	81,1	84,0	82,0	81,0	84,6	23,9
50	119,7	83,0	81,6	84,0	82,4	81,4	84,9	24,3
60	119,8	85,2	84,1	86,7	85,8	84,7	87,3	24,1
70	121,3	85,5	84,3	87,3	85,3	84,6	87,4	23,9
80	120,0	86,8	85,7	88,5	86,4	86,0	88,5	24,1
90	119,5	86,3	85,5	87,4	86,1	84,6	88,3	24,2
100	120,5	87,1	86,2	88,3	86,5	86,2	88,1	24,1
110	120,3	86,2	85,3	87,0	85,9	85,5	87,7	24,4
120	118,5	85,3	85,7	87,7	86,4	85,1	88,4	25,0
130	119,8	86,2	85,7	85,4	86,1	85,1	85,9	24,8
140	120,6	86,9	86,3	85,8	87,0	85,4	86,3	24,7
150	120,8	86,8	85,8	86,0	87,0	85,9	86,9	24,8
160	120,3	86,5	85,9	85,5	86,9	85,5	86,0	25,1
170	120,3	86,0	85,4	85,4	86,6	85,5	86,2	24,9
180	121,1	86,7	86,6	85,6	87,0	86,7	86,0	24,7
190	120,3	86,2	86,4	85,3	87,1	86,0	86,3	25,3
200	120,7	86,8	86,2	85,9	87,0	86,3	86,6	25,0

TEST DESCRIPTION : 2.8 Electric ageing test



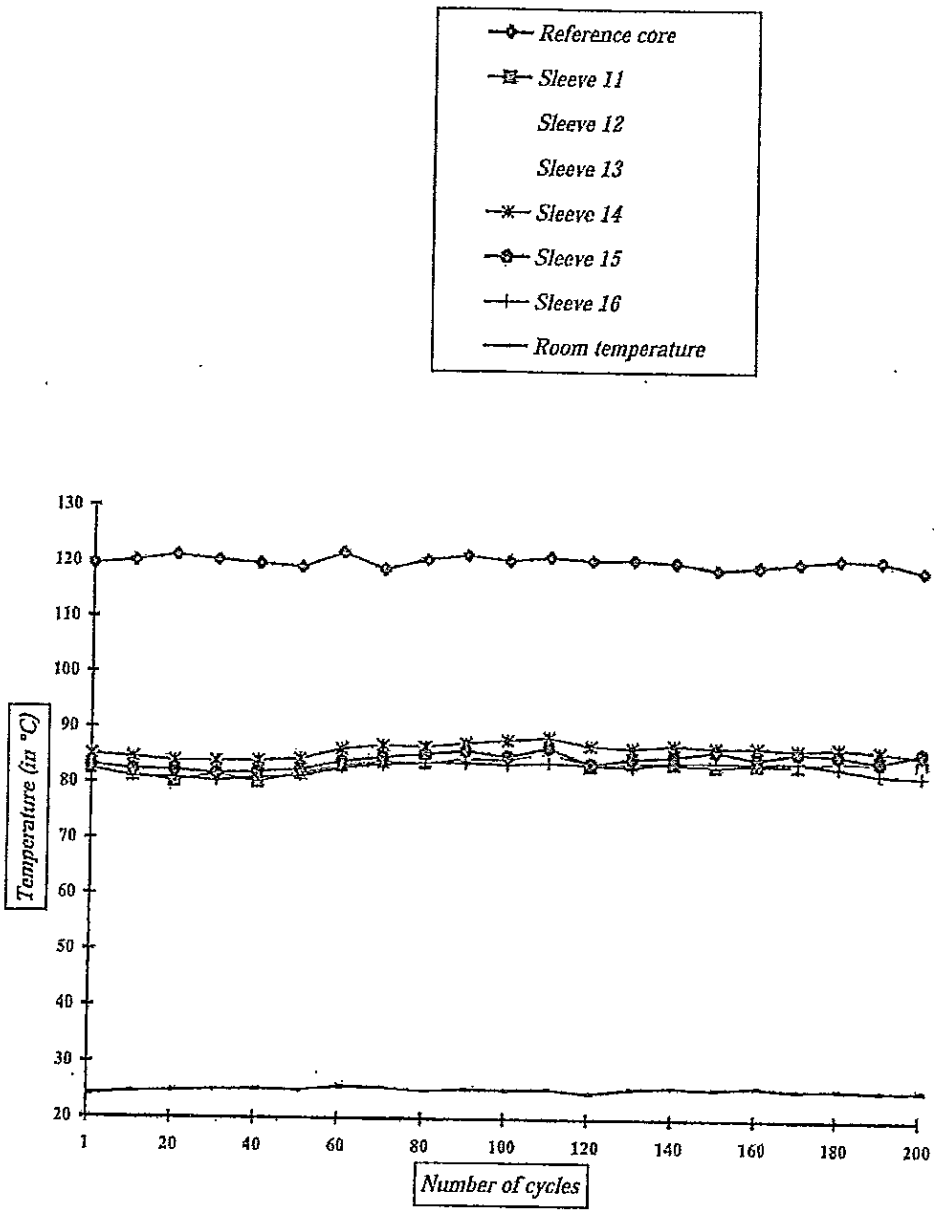
TEST DESCRIPTION : 2.8 Electric ageing test

Sleeve MJPT 150

TEMPERATURE RECORD (in °C)

Cycles	Reference core	Sleeves						Room temperature
		11	12	13	14	15	16	
1	119,5	82,5	83,3	84,4	85,1	83,1	82,4	24,1
10	120,1	81,2	81,8	84,8	84,6	82,4	81,0	24,6
20	121,2	80,3	82,0	83,6	84,0	82,3	80,9	24,8
30	120,3	81,6	81,9	83,5	84,0	81,7	80,4	25,0
40	119,7	80,2	82,3	83,5	84,1	82,0	81,0	25,2
50	119,1	81,8	82,3	84,0	84,4	82,5	81,3	25,0
60	121,8	83,3	85,1	84,6	86,3	84,0	82,9	25,7
70	118,8	84,0	84,6	86,3	87,0	84,9	83,5	25,6
80	120,6	83,8	84,8	86,1	86,8	85,4	83,9	25,0
90	121,5	84,7	85,7	86,4	87,5	86,1	83,9	25,3
100	120,5	84,5	85,1	85,7	88,0	85,1	83,6	25,2
110	121,2	86,1	85,9	86,8	88,6	86,7	84,0	25,4
120	120,6	83,4	84,6	84,5	87,1	83,8	83,6	24,7
130	120,8	84,0	84,5	85,0	86,7	84,8	83,3	25,5
140	120,3	83,9	85,8	85,8	87,3	85,3	84,3	25,8
150	119,1	83,5	84,9	85,1	86,9	86,2	84,2	25,5
160	119,6	83,8	85,7	85,1	86,9	84,9	84,1	25,9
170	120,3	83,7	84,8	84,1	86,5	86,0	84,3	25,4
180	121,0	84,4	85,0	86,2	86,9	85,6	83,3	25,6
190	120,8	84,5	84,5	87,4	86,4	84,5	82,2	25,3
200	119,0	83,8	83,7	85,6	85,5	86,1	81,8	25,4

TEST DESCRIPTION : 2.8 Electric ageing test

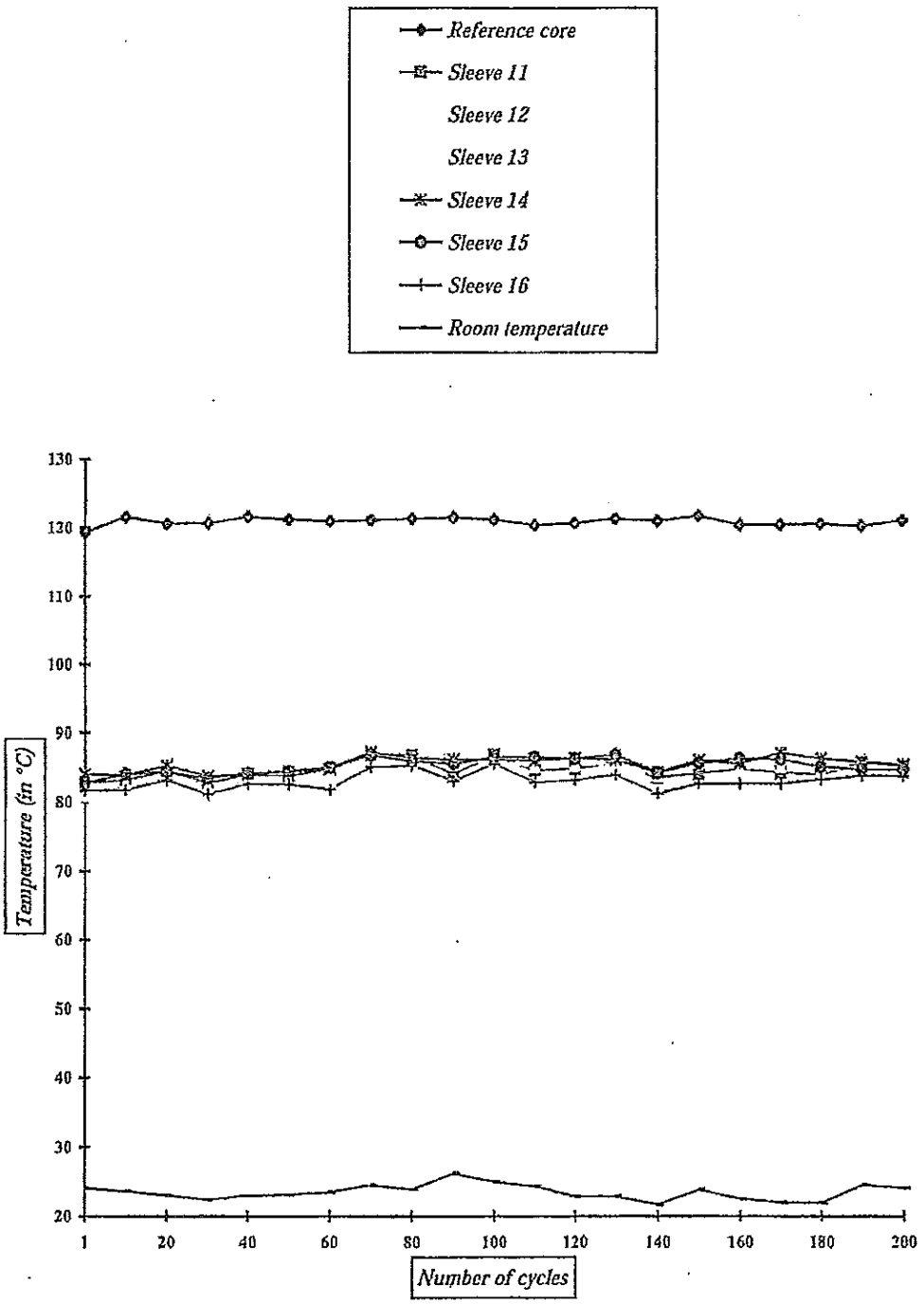


Sleeve MJPT 70N

TEMPERATURE RECORD (in °C)

Cycles	Reference core	Sleeves						Room temperature
		11	12	13	14	15	16	
1	119,3	82,8	80,9	80,6	84,0	82,7	81,6	24,1
10	121,6	83,1	82,6	80,3	83,8	84,0	81,7	23,6
20	120,6	84,4	84,0	81,2	85,2	84,3	83,1	23,0
30	120,7	82,8	82,1	79,5	83,7	83,4	81,1	22,4
40	121,6	83,9	83,4	80,4	84,1	84,1	82,6	23,0
50	121,2	83,8	82,9	80,9	84,4	84,4	82,5	23,1
60	121,0	84,7	84,5	81,6	84,8	85,0	81,8	23,5
70	121,1	86,9	86,0	83,5	87,2	86,8	85,0	24,5
80	121,3	86,7	85,8	82,7	86,3	85,9	85,3	23,9
90	121,5	84,0	85,5	82,5	86,1	85,5	83,0	26,2
100	121,2	86,8	85,9	83,1	86,1	86,4	85,5	25,0
110	120,4	84,5	85,1	82,3	86,0	86,5	82,8	24,3
120	120,7	84,8	85,3	82,7	86,3	86,2	83,1	22,9
130	121,3	85,7	85,5	82,6	86,1	86,8	83,9	22,9
140	121,0	83,5	83,7	80,8	84,2	84,2	81,2	21,7
150	121,7	84,1	85,7	82,3	86,0	85,6	82,6	23,8
160	120,4	84,7	84,8	82,1	85,5	86,2	82,6	22,5
170	120,4	84,2	85,1	82,1	87,0	86,1	82,6	22,0
180	120,5	83,9	84,4	82,1	86,2	85,0	83,1	21,9
190	120,2	85,6	85,1	82,6	85,7	84,6	83,7	24,5
200	121,0	85,0	84,3	81,5	85,3	84,6	83,6	24,1

TEST DESCRIPTION : 2.8 Electric ageing test

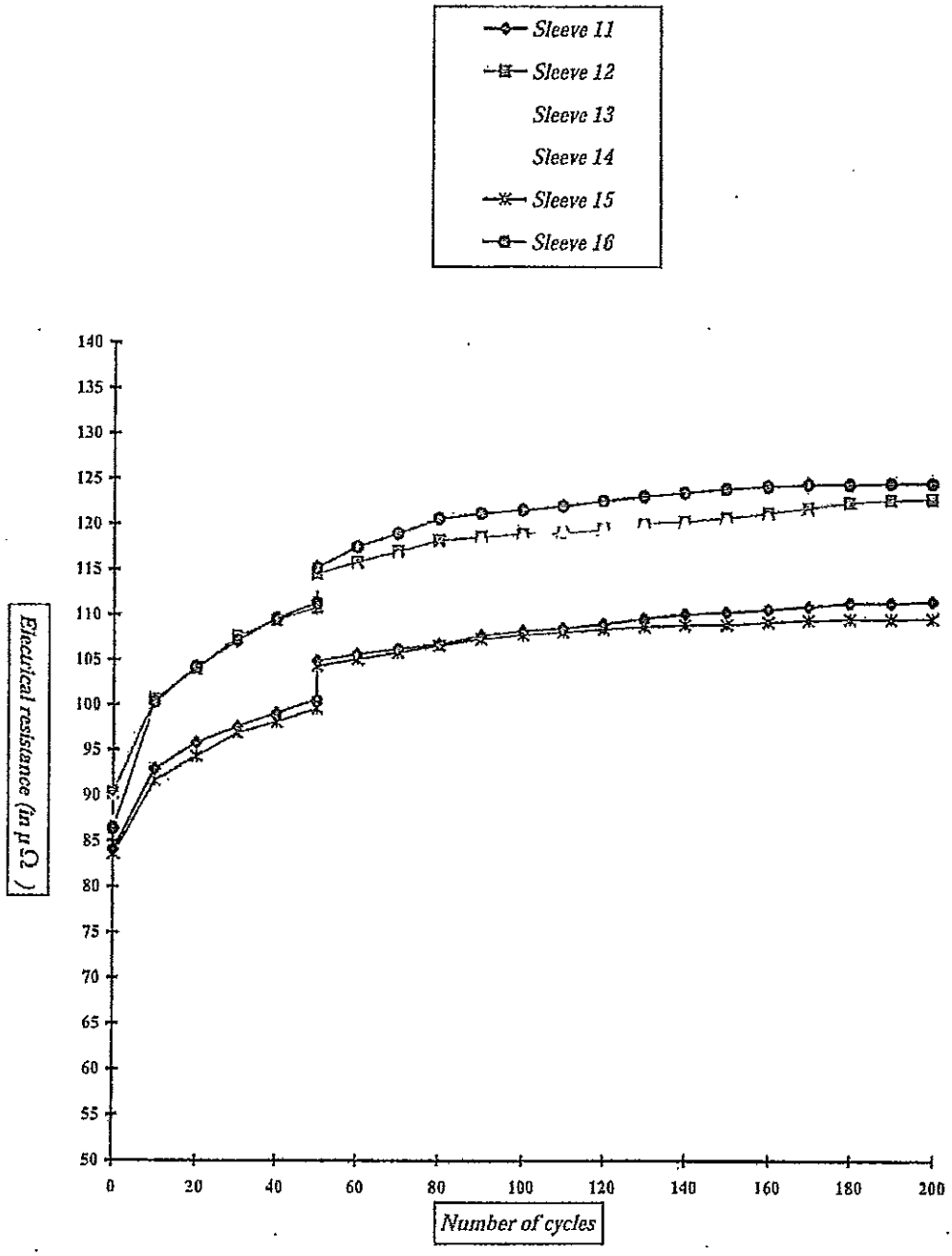


Sleeve MJPT 95 (173)

Rj RESISTANCE RECORD (in μΩ)

Cycles	Sleeves					
	11	12	13	14	15	16
0	84,1	90,3	87,2	89,5	83,6	86,4
10	92,9	100,6	99,0	97,4	91,6	100,3
20	95,8	104,0	102,7	100,3	94,3	104,2
30	97,6	107,6	104,8	102,6	96,9	107,1
40	99,1	109,4	106,7	104,2	98,1	109,6
50 before overloads	100,6	110,8	108,9	105,9	99,6	111,3
50 after overloads	104,9	114,5	113,3	111,5	104,3	115,2
60	105,6	115,8	115,0	113,0	105,1	117,5
70	106,2	117,0	116,4	114,6	105,8	119,0
80	106,7	118,2	117,1	115,8	106,6	120,6
90	107,7	118,6	118,3	116,5	107,3	121,2
100	108,2	118,9	118,7	117,4	107,8	121,6
110	108,5	119,1	119,3	118,0	108,1	122,0
120	109,0	119,5	119,6	118,5	108,4	122,6
130	109,6	120,0	119,9	118,9	108,7	123,1
140	110,1	120,3	120,1	119,3	108.9	123,5
150	110,3	120,7	120,4	119,6	108,9	123,9
160	110,6	121,2	120,7	119,8	109.2	124,2
170	110,9	121,8	120,9	120,2	109,4	124,4
180	111,3	122,4	121,1	120,5	109,5	124,4
190	111,3	122,7	121,3	120,6	109,5	124,5
200	111,5	122,8	121,4	120,8	109,6	124,5

TEST DESCRIPTION : 2.8 Electric ageing test

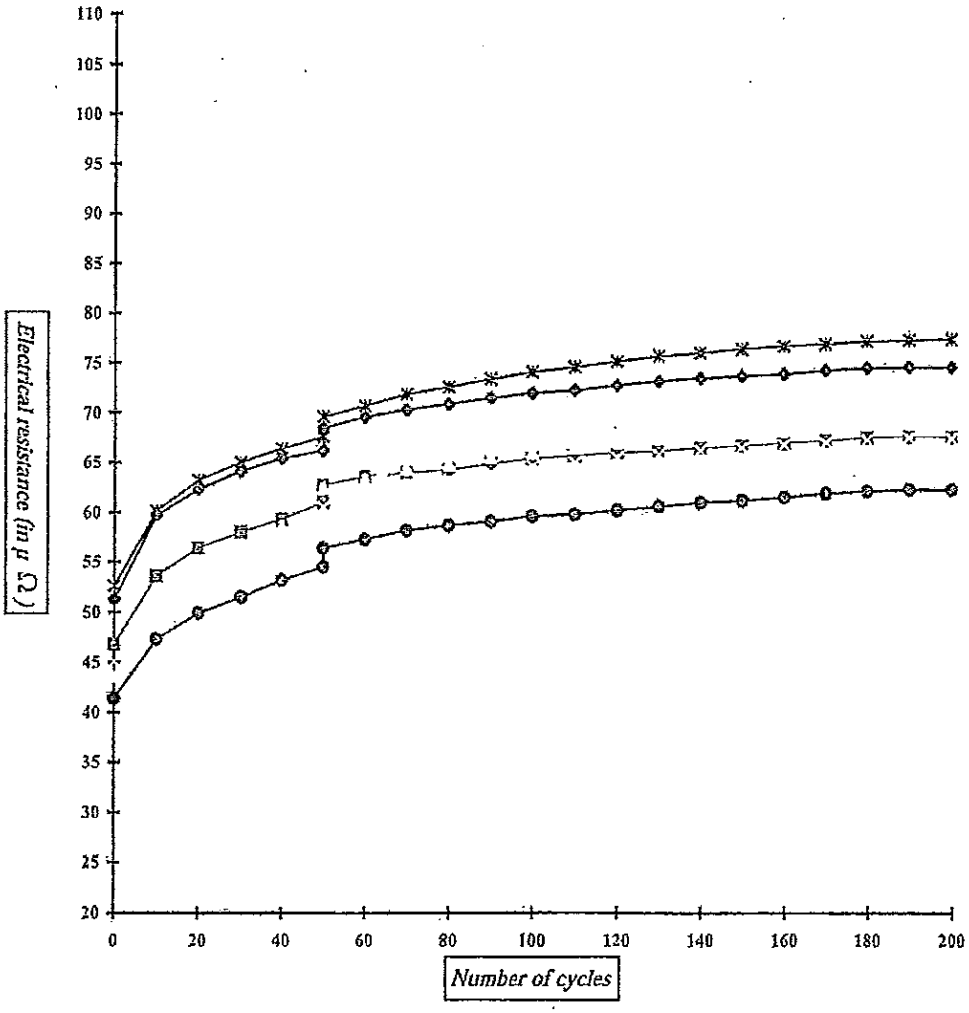


Sleeve MJPT 150

Rj RESISTANCE RECORD (in μΩ)

Cycles	Sleeves					
	11	12	13	14	15	16
0	51,3	46,8	43,6	45,1	52,6	41,4
10	59,7	53,6	50,7	51,0	60,1	47,3
20	62,3	56,4	54,1	53,4	63,2	49,9
30	64,1	58,0	56,4	55,6	65,0	51,5
40	65,4	59,3	58,6	57,0	66,4	53,2
50 before overloads	66,2	61,0	59,8	58,3	67,6	54,5
50 after overloads	68,5	62,7	62,4	60,5	69,6	56,4
60	69,6	63,6	63,3	61,4	70,7	57,3
70	70,3	64,0	64,4	62,3	71,9	58,2
80	70,9	64,3	64,9	63,2	72,6	58,7
90	71,5	64,9	65,6	63,9	73,4	59,1
100	72,0	65,4	66,0	64,6	74,1	59,6
110	72,3	65,7	66,6	65,0	74,6	59,8
120	72,8	66,0	67,1	65,5	75,2	60,2
130	73,2	66,2	67,5	65,8	75,7	60,6
140	73,5	66,5	67,9	66,2	76,0	61,0
150	73,7	66,7	68,4	66,5	76,4	61,2
160	73,9	66,9	68,6	66,8	76,7	61,5
170	74,3	67,2	68,9	67,0	76,9	61,9
180	74,5	67,5	69,2	67,3	77,2	62,1
190	74,6	67,6	69,3	67,5	77,3	62,3
200	74,6	67,6	69,6	67,4	77,4	62,3

TEST DESCRIPTION : 2.8 Electric ageing test

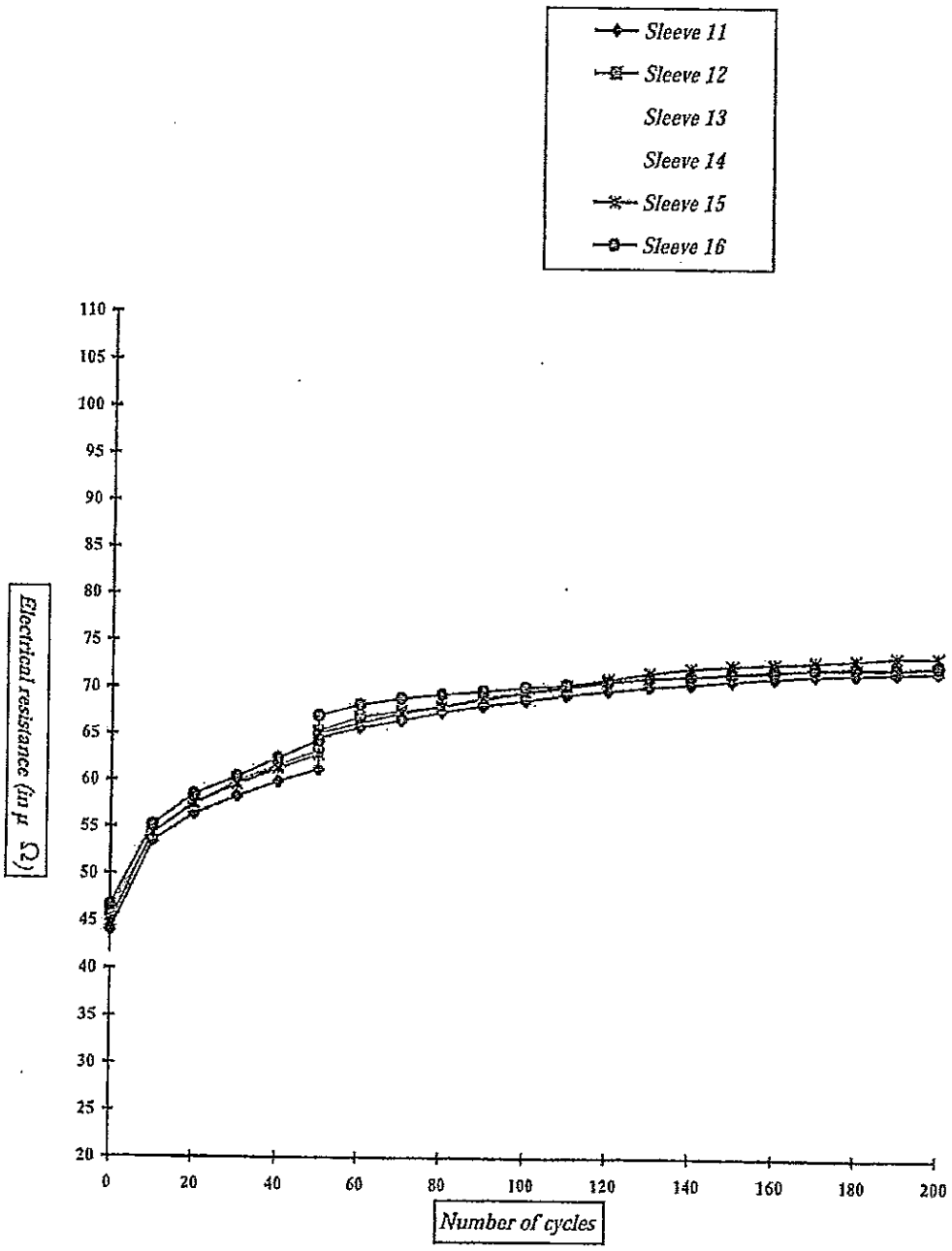


Sleeve MJPT 70N

Rj RESISTANCE RECORD (in μΩ)

Cycles	Sleeves					
	11	12	13	14	15	16
0	44,0	46,1	40,9	41,4	44,9	46,7
10	53,5	54,2	45,8	47,4	54,3	55,2
20	56,4	57,4	48,1	50,1	57,5	58,5
30	58,3	59,9	50,6	51,8	59,6	60,4
40	59,9	61,6	52,3	53,2	61,3	62,4
50 before overloads	61,2	63,2	53,9	54,8	62,8	64,3
50 after overloads	64,6	65,3	56,4	58,0	65,1	67,0
60	65,7	66,9	57,2	58,9	66,2	68,2
70	66,5	67,5	58,4	60,1	67,3	68,9
80	67,4	68,0	58,9	60.5	68,0	69,3
90	68,1	68,8	59,6	61,3	68,9	69,7
100	68,7	69,5	60,5	61,9	69,6	70,1
110	69,3	70,1	61,1	62,4	70,3	70,4
120	69,8	70,7	61,7	62,7	71,0	70,8
130	70,2	71,1	62,2	62,9	71,7	71,2
140	70,5	71,4	62,6	63,2	72,2	71,3
150	70,9	71,6	62,9	63,6	72,5	71,7
160	71,2	71,9	63,3	63,8	72,7	71,9
170	71,5	72,1	63,5	64,0	72,9	72,2
180	71.6	72,2	63,6	64,2	73,2	72.3
190	71,8	72,1	63,7	64,5	73,5	72,3
200	71,9	72,3	63,7	64,6	73,5	72,5

TEST DESCRIPTION : 2.8 Electric ageing test



TEST DESCRIPTION : 2.8 Electric ageing test — Page 16/17

The results are the ones of § 5.4 of standard NF C 33-004 which defines the following acceptance criteria :

◊ *Relative initial scatter of resistances : : $\delta \leq 0,30$*

◊ *Stability of resistances R_j (on the 11th last measures) :* $\frac{\Delta R_j}{R_j} \leq 12\%$

◊ *Stability of temperatures θj (on the 11th last measures) :*

$d_j - 10 \leq d_j \leq d_j + 10$ *with :* $* d_j = \theta_R - \theta_j$

$* \theta_R$ *: temperature of the warmest reference core*

$\theta_j \leq Max\ \theta_R$

Equivalent to check : Min $d_j \geq 0$

1) Temperature

TYPE OF SLEEVES	SAMPLE N°	TEMPERATURE STABILITY (IN K)			
		$\overline{d_j} - 10$	Min d_j	Max d_j	$\overline{d_j} + 10$
MJPT 95 (173)	11	23,9	33,2	34,4	43,9
	12	24,3	32,8	35,0	44,3
	13	24,1	30,8	35,5	44,1
	14	23,6	32,1	34,4	43,6
	15	24,5	33,4	35,2	44,5
	16	23,5	30,1	35,1	43,5
MJPT 150	11	26,1	35,1	37,2	46,1
	12	25,3	33,9	36,3	45,3
	13	24,7	33,4	36,2	44,7
	14	23,3	32,2	34,4	43,3
	15	24,9	32,9	36,8	44,9
	16	26,8	34,9	38,6	46,8
MJPT 70N	11	26,0	34,4	37,6	46,0
	12	25,8	35,1	37,3	45,8
	13	28,6	37,6	40,2	48,6
	14	24,9	33,4	36,8	44,9
	15	25,1	33,9	36,8	45,1
	16	27,6	35,7	39,8	47,6

TEST DESCRIPTION : 2.8 Electric ageing test

2) Resistance

TYPE OF SLEEVES	SAMPLE N°	INITIAL SCATTER δ	RESISTANCE STABILITY (in %) $\frac{\Delta R_j}{R_j}$
MJPT 95 (173)	11	0,052	3,0
	12		3,2
	13		2,2
	14		2,8
	15		1,7
	16		2,3
MJPT 150	11	0,155	3,5
	12		3,3
	13		5,3
	14		4,4
	15		4,3
	16		4,4
MJPT 70N	11	0,090	4,5
	12		3,9
	13		5,1
	14		4,3
	15		5,4
	16		3,4

TEST DESCRIPTION : 2.9 Endurance test under mechanical and thermal stresses	Page 1/4

DATE : FROM 27/02/2006 TO 13/06/2006
PLACE : MICHAUD test laboratory

OPERATORS : AC. BERNARD
JP. RAPY

N° OF SAMPLES : 17 up to 20 for sleeves MJPT 95 (173), MJPT 150 and MJPT 70N

TEST EQUIPMENTS

- Measure equipment for traction / compression
- Mechanical tensile strength and endurance bench
- Measure station SA 32

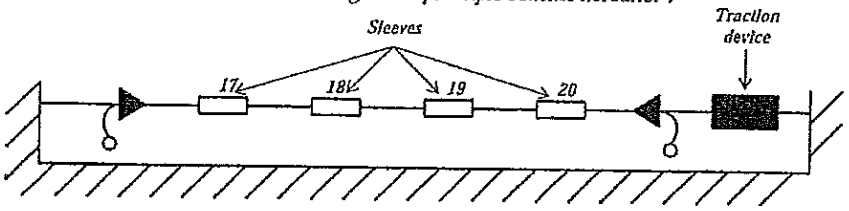
PROCEDURES

Procedures and acceptance criteria are the ones of § 2.9 of standard NF C 33-021 dated June 1998.

A) Sleeves MJPT 95 (173) et MJPT 150

1. Assembly

The four sleeves are fitted on a core according to the principle scheme hereafter :



The free length between each sleeve and between the end sleeves and the anchoring equipment is of 1m.

Thermocouples are installed in the middle of both sleeves placed at both extremities of the assembly, as well as in the middle of a 1 m long stripped reference core placed outside anchoring equipment.

2. Installation period

A tensile strength of 4 050N for sleeve MJPT 95 (173) and 6 300N for sleeve MJPT 150 is applied in 1min on the core. This strength is regulated during 10min, temperature of the conductors core being regulated at the room temperature.

Then, while regulating the cores conductor at the room temperature, we leave the assembly stabilizing during 24 h.

3. Cycles application

After the previous stabilization period, 500 cycles of 90 min are applied on the assembly as follows :

- Heating :
  - for 45 min : Temperature of the conductors core maintained at (90 ± 3) °C.
  - for 45 min : Natural cooling of the conductors core down to (25 ± 3) °C and stabilization at this temperature.
- Mechanical strength :
  It is adjusted at 2 230N for sleeve MJPT 95 (173) and 3 500N for sleeve MJPT 150 at the end of the first cycle then once per 24 h at the end of a cycle.

Temperature of the sleeves is measured every 25 cycles at the end of the heating period at 90°C.

4. Acceptance criteria

a) Temperature of the sleeves n° 17 and 20, at the end of the heating periods, must be under the temperature of the reference core.

b) Sleeves n° 18 and 19 must be tested accordingly :

- Dielectric strength test in the balls

  The assembly, placed horizontally, is covered with lead balls over 1 up to 2cm. After at least 1 min, a dielectric test is performed on the assembly at a 6kV voltage at an industrial frequency for 1min, at a 1kV/s speed
  No breakage shall occur.

- Dielectric strength test in water

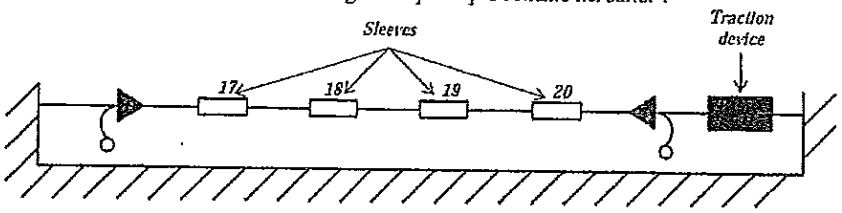
  A dielectric strength is then performed on the assembly under a 1kV voltage according to § 2.4 of this report.
  No breakage shall occur.

c) The four sleeves must be tested according to the mechanical test (§ 2.3.2 of this report).

B) Sleeve MJPT 70N

1. Assembly

The four sleeves are fitted on a core according to the principle scheme hereafter :



The free length between each sleeve and between the end sleeves and the anchoring equipment is of 1m.

Thermocouples are installed in the middle of both sleeves placed at both extremities of the assembly, as well as in the middle of a 1 m long stripped reference core placed outside anchoring equipment.

2. Cycles application

500 cycles of 90 min are applied on the assembly as follows :

- Heating :
  - for 45 min : Temperature of the conductors core maintained at (90 ± 3)°C,
  - for 45 min : Natural cooling of the conductors core down to (25 ± 3)°C and stabilization at this temperature.
- Mechanical strength :
  - for 75 min : a F1 tensile strength of 4 500N is applied on the assembly,
  - for 15 min : the tensile strength is adjusted at F2 equal to 10 000N.

F2 strength application shall be progressive and performed in 5 up to 60 s.

Temperature of the sleeves is measured every 25 cycles at the end of the heating period at 90°C.

TEST DESCRIPTION : 2.9 Endurance test under mechanical and thermal stresses

3. Acceptance criteria

a) Temperature of the sleeves n° 17 and 20, at the end of the heating periods, must be under the temperature of the reference core.

b) Sleeves n° 18 and 19 must be tested accordingly :

- Dielectric strength test in the balls

  The assembly, placed horizontally, is covered with lead balls over 1 up to 2cm. After at least 1 min, a dielectric test is performed on the assembly at a 6kV voltage at an industrial frequency for 1min, at a 1kV/s speed.
  No breakage shall occur.

- Dielectric strength test in water

  A dielectric strength is then performed on the assembly under a 1kV voltage according to § 2.4 of this report.
  No breakage shall occur.

c) The four sleeves must be tested according to the mechanical test (§ 2.3.2 of this report).

TEST RESULTS

a) Temperature of sleeves n° 17 et 20

CYCLES	TYPE OF SLEEVES								
	MJPT 95 (173)			MJPT 150			MJPT 70N		
	REFERENCE CORE	17	20	REFERENCE CORE	17	20	REFERENCE CORE	17	20
1	90,6	66,1	68,4	89,7	68,8	67,3	88,6	64,3	62,9
25	88,7	65,9	68,9	90,4	68,2	68,4	89,4	64,8	62,6
50	89,5	64,7	67,6	90.6	67,6	68,4	91,2	63,6	63,1
75	90,3	66,2	68,0	91,3	67,9	68,1	90,3	64,1	62,5
100	91,5	65,1	68,2	89,8	68,4	67,6	91,5	64,7	62,2
125	89,9	66,4	68,8	89,6	67,5	67,8	89,6	64,2	62,8
150	90,4	66,8	67,9	90,5	68,3	68,0	90,2	63,9	63,4
175	90,8	65,9	68,1	88,9	68,0	67,6	88,7	63,5	62,5
200	91,6	66,3	68,5	91,2	68,5	67,5	89,8	64,4	62,7
225	89,5	65,4	68,3	90,2	68,6	68,2	90,0	63,8	63,3
250	90,2	66,2	67,7	89,1	67,3	68,3	91,3	64,1	62,6
275	91,4	66,0	68,4	90,4	68,9	67,4	89,9	63,7	63,5
300	90,7	66,6	68,2	89,6	68,1	68,7	90,6	63,6	62,7
325	90,3	65,3	67,3	88,8	67,5	69,3	91,5	64,3	63,1
350	90,5	65,7	68,0	90,7	68,6	67,8	89,6	64,2	63,6
375	89,9	65,8	68,6	91,2	68,3	68,4	90,4	63,9	62,8

TEST DESCRIPTION : 2.9 Endurance test under mechanical and thermal stresses

CYCLES	TYPE OF SLEEVES								
	MJPT 95 (173)			MJPT 150			MJPT 70N		
	REFERENCE CORE	17	20	REFERENCE CORE	17	20	REFERENCE CORE	17	20
400	90,4	66,3	68,8	91,1	68,6	67,1	88,5	64,4	63,0
425	91,5	65,9	68,6	89,8	68,3	67,6	89,6	64,6	62,9
450	89,7	66,0	67,4	90,4	67,5	68,3	90,1	64,3	63,3
475	90,3	66,4	68,5	90,7	68,1	68,1	91,2	64,2	62,8
500	90,6	65,8	68,3	89,2	68,7	67,9	90,5	63,9	62,6

Temperature of each sleeve is always under the reference core temperature.

b) Dielectric test of sleeves n° 18 and 19

TYPE OF SLEEVES	SAMPLE N°	COMMENTS AFTER 1min UNDER 6kV IN THE BALLS	COMMENTS AFTER 1min A 1kV IN WATER	FOLLOWING TEST
MJPT 95 (173)	18	Satisfactory	Satisfactory	2.3.2
	19	Satisfactory	Satisfactory	
MJPT 150	18	Satisfactory	Satisfactory	2.3.2
	19	Satisfactory	Satisfactory	
MJPT 70N	18	Satisfactory	Satisfactory	2.3.2
	19	Satisfactory	Satisfactory	

ВЯРНО С ОРИГИНАЛА

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ ЗА МАНШОН МЛРТ - К 117, К 116, К 115

1. **№ на тест: 130-06-02-03**

Съставил:

На основание чл. 2 от ЗЗЛД

sicame

Laboratoire d'essais
Direction études et recherches

TEST REPORT : Dielectric test.

PRODUCT: Preinsulated junction sleeves.

Report number	: 6601465
Product brand	: SICAME
Product type	: MJPB 25-16
Project n°	: E 0900332
Batch number	: 98M708380

Demander of the test: SICAME D.E.R.

Starting date ot the test : 28/01/1999

Report emission date : 28/01/1999

According to standard : NF C 33-021 (june 1998)

This report contains : 3 Pages Annexe(s)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 25-16 comforms of standard NF C 33-021 (june 1998) § 2.4.

На основание чл. 2
от ЗЗЛД

19230 POMPADOUR - FRANCE - Tél. (33) 55 73 89.00 - Fax (33) 55 75 63 12 - Télex 590 122 F

ВЯРНО СЪС ОРИГИНАЛА

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 1160 INDICE B

Test number : 6601465

Product brand : SICAME

Product type : MJPB 25-16

A - Computer equipment

IBM PS2 (Inv N°: 88 93 06) Hard disk 115 MB
Analog/Digital interface card
Digital/Analog interface card
Disk Operating System: DOS 6.1 IBM

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric unit (Inv N°: 91 02 69).

C - General Equipment

crimping machine (Inv N°: 93 05 48)

Calibrated Ruler (Inv N°: 95 01 75) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Visa
Supervisor of the test

ВЯРНОСОРИГИНАЛА

ДЗЗД "ИКОН ДОСТ" СОФИЯ

SICAME DER	DIELECTRIC TEST ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 720 INDICE B

Test number : 6601465 Date:28/01/1999 Ambient Temperature :22.9°C

Manufacturer : SICAME Humidity : 37 %

Product : MJPB 25-16

A- Test Procedure

Two samples of the batch are crimped on appropriate cable and put in water.

The assembly is placed in a container of water, the water level must be 30 cm above the uppermost part of the connector.
After the assembly has been immersed for 30 minutes, the assembly is subject to the dielectric test. The potential difference applied between the water and the conductor being 6 kV - 50 Hz, for the duration of 1 minute.

The potential difference is applied at a rate of 1 kV/s.
The maximum leakage current for the interruption (triggering of circuit breaker) of the HT supply is 10 mA.

B- Results

CONNECTOR N°	Cable sizes used (mm²)
1	25 Alu / 16 Alu
2	25 Alu / 16 Alu

N° CONNECTOR	6kV/1mn After 30 min in water	Tripping value with I=10mA (KV)	OBSERVATIONS
1	OK	> 10	
2	OK	> 10	

Generals observations:

Visa
Supervisor of the test

ВЯРНО С ОРИГИНАЛА

АД "ИКОН ДОСТАВ" СОФИЯ

СПИСЪК НА ОТДЕЛНИТЕ ИЗПИТВАНИЯ НА ИЗОЛИРАН ПРЕСОВ СЪЕДИНИТЕЛ ТИП МЛРВ 25-16

1. **№ на тест: 6601465** - Диелектричен тест.

Съставил:

На основание чл. 2
от ЗЗЛД

ДЗЕД "ИКОН ДОСТАВКИ" СОФИЯ

sicame

Laboratoire d'essais
Direction études et recherches

TEST REPORT : Dielectric test.

PRODUCT: Preinsulated junction sleeves.

Report number	: 9901410
Product brand	: SICAME
Product type	: MJPB 35-25
Project n°	: E 0900332
Batch number	: 98M708380

Demander of the test: SICAME D.E.R.

Starting date ot the test : 28/01/1999

Report emission date : 28/01/1999

According to standard : NF C 33-021 (june 1998)

This report contains : 3 Pages Annexe(s)

Conclusion : The SICAME preinsulated junction sleeves type MJPB 35-25 comforms of standard NF C 33-021 (june 1998) ∫ 2.4.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

50

SICAME DER	DIELECTRIC TEST EQUIPMENT ACCORDING TO SPECIFICATION: NF C 33-021	SUP ER 1160 INDICE B

Test number : 9901410

Product brand : SICAME

Product type : MJPB 35-25

A - Computer equipment

IBM PS2 (Inv N°: 88 93 06) Hard disk 115 MB
Analog/Digital interface card
Digital/Analog interface card
Disk Operating System: DOS 6.1 IBM

IBM 4029 020 (Inv N°: 92 03 30) Laser printer

B - Equipment for Dielectric test

Dielectric unit (Inv N°: 91 02 69).

C - General Equipment

crimping machine (Inv N°: 93 05 48)

Calibrated Ruler (Inv N°: 95 01 75) ROCH

Stopwatch (Inv N°: 92 02 82) HANHART

Visa
Supervisor of the test

ВЯРНО СЪОТВЕТНАЛА

505