ENERGO – TEL Ltd.
www.energo-tel.bg
6 Akademik Georgi Bonchev str., Pavilion 3, 1113 Sofia, BULGARIA, tel./fax: +359 2 868 72 83, e-mail: office@energo-tel.bg
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VI. ТЕХНИЧЕСКО ПРЕДЛОЖЕНИЕ

поставя се в комплекта на техническото предложение, по отделно за всяка обособена позиция, за която се подава офертата

П Р Е Д Л О Ж Е Н И Е

за участие в „открита" по вид процедура за възлагане на обществена поръчка с предмет: Доставка на птицезащитни продукти", във връзка с реализацията на **Проект „LIFE FOR BIRDS ON POWER LINES", LIFE16NAT/BG/000612",**
реф. № PPD 20-019

ДО: „ЧЕЗ РАЗПРЕДЕЛЕНИЕ БЪЛГАРИЯ" АД,

ОТ: Енерго – Тел ООД
(участник)
адрес: 1407 гр.София бул. .Черни Връх , №. 43
тел.: 02/9620539, 02/9620540 факс: 02/8687283; e-mail: office@energo-tel.bg
Единен идентификационен код: BG 121286082,
Представлявано от Николай Йорданов Калев – Управител *(длъжност)*
Лице за контакти: Николай Йорданов Калев, тел.: 02/9620539, факс: 02/8687283, e-mail: office@energo-tel.bg

УВАЖАЕМИ ГОСПОЖИ И ГОСПОДА,

Предоставяме на Вашето внимание предложението ни за изпълнение на обществена поръчка с предмет:
„Доставка на птицезащитни продукти", във връзка с реализацията на **Проект „LIFE FOR BIRDS ON POWER LINES", LIFE16NAT/BG/000612",**
реф. № PPD 20-019

Обособена позиция 2 с предмет: "Доставка на птицезащитни изолационни маншети за въздушни електропроводни линии СрН по проект LIFE BIRDS ON POWER LINES, LIFE16 NAT/BG/000612".
(*записва се обособената позиция, за която се участва*)

1. В случай, че бъдем избрани за изпълнител, ще изпълним предмета на поръчката в пълно съответствие с изискванията на Възложителя, като се задължаваме да спазваме изискванията на нормативната уредба на Република България.
2. Представям техническите спецификации от раздел II на документацията с попълнени всички изисквани стойности и показатели за всички позиции от стоката по предмета на поръчката.
3. Декларирам, че предлаганите от нас стоки отговаря на минималните технически изисквания на Възложителя, които се съдържат графа „Гарантирано предложение" в таблиците на техническите спецификации на стоката, приложение към настоящото предложение за изпълнение на поръчката.

4. Представям всички изисквани данни и документи, посочени в Приложение 2 от настоящото техническо предложение. Запознат съм с изискването, че представените документи трябва да бъдат на български език или с превод на български език, придружени с оригиналните документи, с изключение на каталозите и протоколи от изпитания */в случай, че се изискват/* за материалите, които могат да се представят и само на английски език.

5. Запознат съм, че представените от нас технически документи са доказателство за декларираните от нас технически данни и параметри в техническите спецификации на стоката.

6. Потвърждавам, че представяните от нас стоки, описани в Техническото ни предложение, ще отговарят на посочените от възложителя стандарти или на еквивалентни. В случай, че даден материал отговаря на стандарт, еквивалентен на посочения в Техническата спецификация от документацията се задължаваме да го отразим в отделен документ и да представим доказателства за еквивалентността на двата стандарта.

7. Предлагам гаранционен срок за предлаганите стоки – 36 / тридесет и шест /. месеца */не по-малко от 36 месеца/*, от датата на приемо – предавателен протокол за получаване на стоката от Възложителя.

8. Приемам количества със срокове за доставка на стоката, съгласно Приложение 3 към настоящото Техническо предложение.

9. Информиран съм, че Възложителят (включително чрез неговия помощен орган, а именно назначената за провеждане на поръчката оценителна комисия) ще обработва и съхранява личните данни, посочени в настоящия документ, за целите на провеждане на обществената поръчка, като за целта ще предприеме всички необходими според действащата нормативна уредба мерки за защита на личните ми данни.

Приложения към настоящото техническо предложение:

1. Технически изисквания и спецификации за изпълнение на поръчката – раздел II от документацията за участие – попълнени на съответните места;

2. Изисквани документи от Технически изисквания и спецификации;

3. Срокове за доставка.

Забележки:

1. Настоящото предложение за изпълнение на поръчката е едно и също за всички обособени позиции.

2. В случай че участник участва за повече от една обособена позиция, то настоящото предложение за изпълнение на поръчката се попълва поотделно за всяка една от тях и се поставя в комплекта документи на техническо предложение за съответната обособена позиция.

на основание чл. 36а, ал. 3 от ЗОП

Дата 27.05.2020 г. ПОДПИС и ПЕЧАТ: Нико

(име

Управител

(длъжност на представляващия участника)

ОБОСОБЕНА ПОЗИЦИЯ 2: „Доставка на птицезащитни изолационни маншети за въздушни електропроводни линии СрН по проект LIFE BIRDS ON POWER LINES, LIFE16 NAT/BG/000612"

Наименование на материала: Птицезащитни изолационни маншети за въздушни електропроводни линии СрН

Съкратено наименование на материала: Птицезащитни изолационни маншети за ВЛ СрН

Област: В - Въздушни електропроводни линии СрН **Категория:** 04 – 00 Птицезащита

Мерна единица: m **Аварийни запаси:** Да

Характеристика на материала:

Птицезащитните изолационни маншети са изработени от полимерен, хидрофобен електроизолационен материал с червен цвят, устойчив на атмосферни въздействия и обледеняване, ултравиолетови лъчи и влиянието на озона в продължение на целия експлоатационен период.

В двата края по дължината на маншетите са интегрирани жлебове за монтаж върху неизолирани проводници и прилежащата към тях токопроводима арматура, които се използват при изпълнението на въздушни електропроводни линии СрН.

Използване:

Птицезащитните изолационни маншети са предназначени за първична изолация на тоководещи части с цел защита на птици от попадане под напрежение и предизвикване на повреди върху въздушните електропроводни линии СрН.

Съответствие на предлаганото изделие със стандартизационните документи:

Птицезащитните изолационни маншети трябва да отговарят на посочените по-долу стандарти или еквивалентно/и, включително на техните валидни изменения и допълнения:

- VDE-AR-N 4210-11:2011 Protection of birds on medium-voltage overhead lines; или
- DIN VDE 0212-490:2014 Fittings for overhead lines - Part 490: Components for the protection of birds - Requirements and tests, или еквивалентно/и.

Изисквания към документацията и изпитванията

№ по ред	Наименование	Приложение № (или текст)
1	Точно обозначение на типа, производителя и страната на произход (производство) и последно издание на каталога на производителя	CMVBP 18 M CANUSA – Германия Раздел А
2	Техническо описание, гарантирани параметри, чертежи с размери, тегло и др.	Раздел Б
3	Декларация за съответствие на предлаганото изпълнение с изискванията на параграф „Съответствие на предлаганото изделие със стандартизационните документи"	Раздел В
4	Протоколи от типови изпитвания на български или английски език, проведени от независима изпитвателна лаборатория – заверени копия, с приложен списък на отделните изпитвания на български език	Раздел Г
5	Сертификат/акредитация на независимата изпитвателна лаборатория, провела типовите изпитвания по т.4 – заверено копие	Раздел Д
6	Инструкция за монтаж и експлоатация	Раздел Е
7	Експлоатационна дълготрайност, год.	15 години

Забележка: Всички оригинални документи трябва да бъдат на български език или с превод на български език. Каталозите и изпитвателните протоколи могат да бъдат и само на английски език.

Технически данни

1. Характеристики на работната среда

№ по ред	Характеристика	Стойност
1.1	Място на монтиране	На открито
1.2	Максимална температура на околната среда	До + 40°C
1.3	Минимална температура на околната среда	Минус 30°C
1.4	Ветрово натоварване	min 780 N/m²
1.5	Относителна влажност	До 100 %

2. Параметри на електрическата разпределителна мрежа

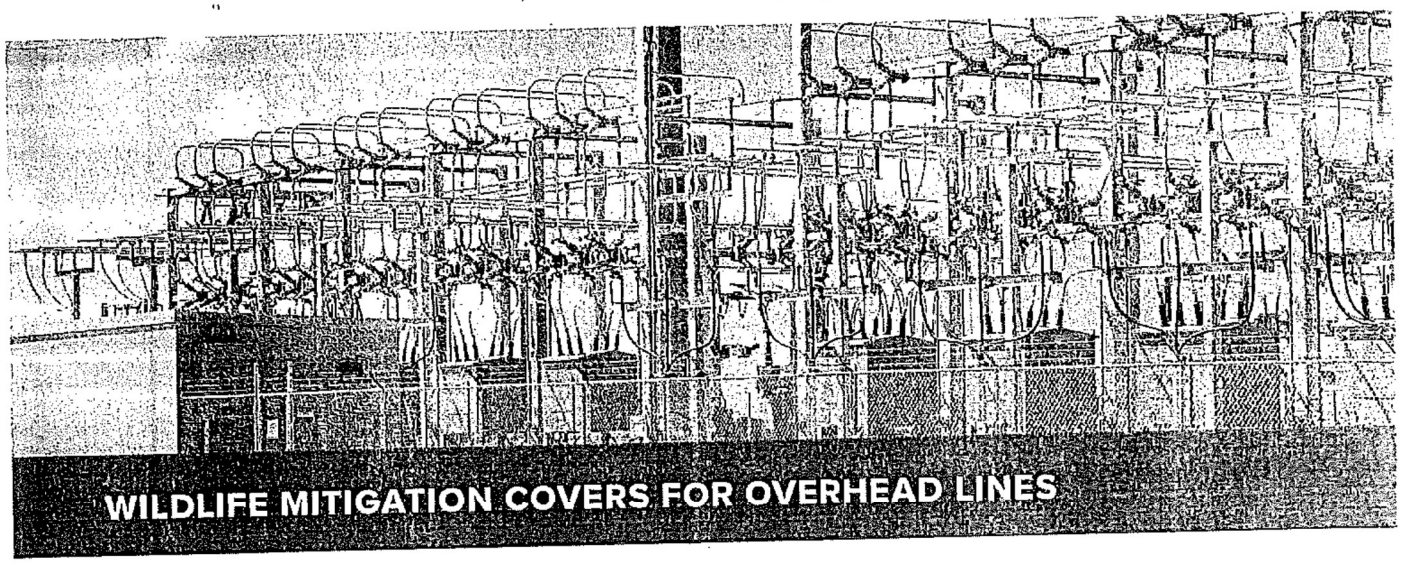
№ по ред	Параметър	Стойност
2.1	Номинално напрежение	20 kV
2.2	Максимално работно напрежение	24 kV
2.3	Номинална честота	50 Hz
2.4	Брой на фазите	3
2.5	Заземяване на звездния център	през активно съпротивление; през дъгогасителна бобина; или изолиран звезден център.

3. Технически параметри, характеристики и др. данни

№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
3.1	Едноминутно издържано напрежение с промишлена честота 50 Hz, изпитване в сухо състояние и под дъжд - (ефективна стойност)	min 25 kV	25 kV
3.2	Конструкция	а) Птицезащитните изолационни маншети са предвидени за монтаж върху неизолирани алуминиево-стоманени проводници с минимален външен диаметър 14 mm.	Птицезащитните изолационни маншети са предвидени за монтаж върху неизолирани алуминиево-стоманени проводници с минимален външен диаметър 14 mm.
		б) Конструкцията на маншетите трябва да позволява лесен многократен монтаж и демонтаж посредством жлебово заключване, като при необходимост поради спецификата на мястото на монтажа, тяхната дължина може да бъде редуцирана чрез срязване.	Конструкцията на маншетите позволява лесен многократен монтаж и демонтаж посредством жлебово заключване, като при необходимост поради спецификата на мястото на монтажа, тяхната дължина може да бъде редуцирана чрез срязване.

№ по ред	Параметър/характеристика	Изискване	Гарантирано предложение
		в) Формата на жлебовете дава възможност за съединяване на два или повече маншета с цел увеличаване на полезния обем при изолиране на токопроводима арматура за въздушни електропроводни линии СрН (токови клеми, кербови съединители и др.), като за постигане на по-голяма устойчивост на свръзката в жлеба има нанесен специален силикон или еквивалентно/и.	Формата на жлебовете дава възможност за съединяване на два или повече маншета с цел увеличаване на полезния обем при изолиране на токопроводима арматура за въздушни електропроводни линии СрН /токови клеми, кербови съединители и др./, като за постигане на по-голяма устойчивост на свръзката в жлеба има нанесен специален силикон .
3.3	Материали	а) Птицезащитните изолационни маншети трябва да бъдат изработени от подходящ полимерен електроизолационен материал с висока диелектрична якост.	Птицезащитните изолационни маншети са изработени от подходящ полимерен електроизолационен материал с висока диелектрична якост
		б) Полимерният материал трябва да бъде устойчив на външни атмосферни влияния и лъчения в ултравиолетовия диапазон.	Полимерният материал е устойчив на външни атмосферни влияния и лъчения в ултравиолетовия диапазон.
3.4	Ширина при доставка в отворено положение	min 70 mm (Да се посочи)	78 мм
3.5	Опаковка	а) Птицезащитните изолационни маншети трябва да се доставят опаковани на ролки, за лесно развиване.	Птицезащитните изолационни маншети се доставят опаковани на ролки, за лесно развиване
		б) Дължина на маншета – m / 1 бр. ролка: min 30 m (Да се посочи)	минимум 30 метра
3.6	Експлоатационна дълготрайност	min 15 години	15 години
3.7	Тегло, kg/m	Да се посочи	0,30кг./м

Забележка: Техническите изисквания за изпълнение на конкретната обособена позиция посочени в раздел II от документацията за участие и представляват приложение към договора, който ще бъде сключен с избрания изпълнител.



WILDLIFE MITIGATION COVERS FOR OVERHEAD LINES

Medium voltage protection covers for insulators, suspension clamps and conductors

The protective covers CTSC, CCTI, CASC and CMVBP are available in different designs and sizes. They offer an effective encapsulation against accidental phase-to-phase or phase-to-ground contact caused by fauna and flora.

≤36 kV
VOLTAGE RATING

UV RESISTANT

EXCELLENT ANTI-TRACKING MATERIAL CHARACTERISTIC

FEATURES AND BENEFITS

- Excellent anti-tracking material characteristic
- Voltage rating up to 36kV
- UV resistant
- Suitable for polymeric / ceramic / hybrid insulators and suspension clamps
- Designed to protect problem span areas
- Cost-effective and variable design on particular application situations
- Easy to install
- Plastic rivets included
- Additional rivets available on request
- Continuous operating Temperature: -40°C to 105°C

STANDARDS

- DIN VDE V 0212-490:2014
- VDE-AR-N 4210-11:2011-08
- IEC 60060-1:2010
- EN 60243-1

TYPICAL APPLICATIONS

- Protection of overhead lines
- Protection of pole-down installations

MARKETS:
Electrical Utility, Industrial

STANDARDS:

RoHS

ВЯРНО С ОРИГИНАЛА

CTSC / CCTI / CASC / CMVBP

ELECTRICAL PROPERTIES

TECHNICAL DATA	CURRENT VALUES	TEST METHODS
Dielectric strength	≤36 kV	EN 60243-1
AC withstand (dry) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC withstand (wet) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC long term withstand (dry) 4 hours	8,6 kV / 15 kV; no breakdown or flashover	DIN VDE V 0212-490

CTSC

DIMENSIONS OF T-SHAPED SUSPENSION CLAMP

ORDER NUMBER	WIDTH		HEIGHT		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CTSC 31/116	130	5.118	100	3.937	3
CTSC 116/180	190	7.480	150	5.906	3

CCTI

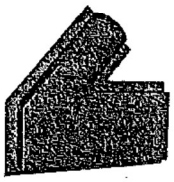
DIMENSIONS OF CONDUCTOR TO TENSION INSULATOR

ORDER NUMBER	WIDTH		HEIGHT		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CCTI 31/116	245	9.646	250	9.843	3
CCTI 116/180	280	11.024	330	12.992	3

CASC

DIMENSIONS OF ANGLED SUSPENSION CLAMP

ORDER NUMBER	WIDTH		HEIGHT		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CASC 1	350	13.780	160	6.299	3
CASC 2	330	12.992	80	3.150	3

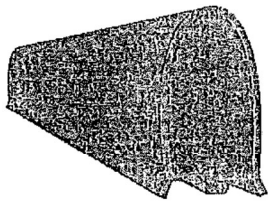


ВЯРНО С ОРИГИНАЛА

CMVBP

DIMENSIONS OF BARE CONDUCTOR COVER

ORDER NUMBER	CONDUCTOR SIZE			VOLTAGE RATING	DELIVERY LENGTH	
	Cross section	Maximum		Maximum	Bundle	
	MM²	MM	IN	KV	M	FT
CMVBP 18	up to 185	18	0.709	15	35	115
CMVBP 18 M	up to 185	18	0.709	25 (mastic lined closure)	35	115
CMVBP 38	up to 800	38	1.496	15	35	115
CMVBP 18 M	up to 800	38	1.496	25 (mastic lined closure)	35	115



ORDERING

Select options:

- Color: Red-brown (RD-BN)
- Dimensions: Customization to different accessories on request
- Please specify the product name, order number and options you require
- *Example:* CTSC 31/116, red-brown, 30 m, 4 sets of 3 (12 pieces)

Please contact your Customer Service Representative for information on custom colors, sizes, lengths and material data sheet.

FOR FURTHER INFORMATION, PLEASE CONTACT:
Americas: 800 422 6872 Canada: 800 845 6808 Asia Pacific: +86 512 82280099 Europe: +49 2226 9047 355

SHAWCOR

CTSC / CCTI / CASC / CMVBP

TECHNICAL DATA

TECHNICAL DATA	CURRENT VALUES	TEST METHODS
	Material	
Material	PE, modified; free of lead and cadmiun	n/a
Surface	smooth, glossy	n/a
Specific gravity	1.2 g/cm³ max.	ASTM-D 792, A-I
	Mechanical	
Tensile strength	10 MPa	IEC 60684-2
Elongation	400%	IEC 60684-2
	Thermal	
Tensile strength after thermal ageing (168 h at 160°C)	8 MPa	IEC 60684-2
Elongation after thermal ageing (168 h at 160°C)	400%	IEC 60684-2
Cold bend test	does not break at -40°C	IEC 60684-2
Combustion behaviour	passed	EN 60695-2-11
Storage temperature	40°C max.	IEC 60684-2
Continuous operating temperature	-40°C to 105°C	IEC 216
	Chemical	
Corrosive action	non-corrosive	ASTM-D 2671 Meth. A
Compatibility with copper	non-corrosive	ASTM-D 2671 Meth. B
Water absorption	0.20%	VDE 0473
	Electrical	
Dielectric strength	≤36 kV	EN 60243-1
AC withstand (dry) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC withstand (wet) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC long term withstand (dry) 4 hours	8,6 kV / 15 kV; no breakdown or flashover	DIN VDE V 0212-490
	Resistance to weather	
UV resistance	Pass to DIN VDE V 02012-490	ISO 4892-2

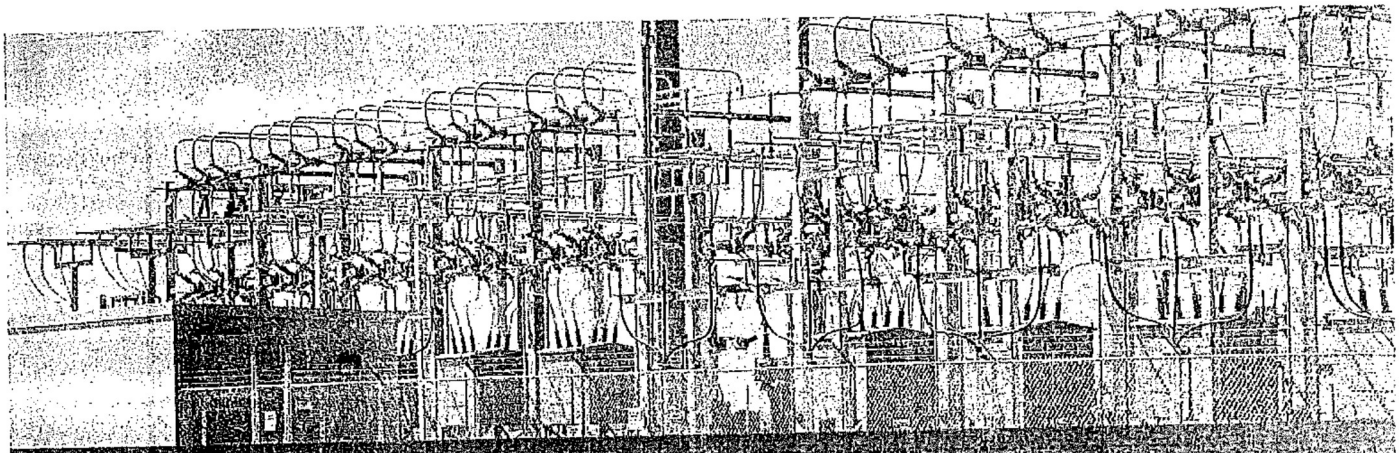
FOR FURTHER INFORMATION, PLEASE CONTACT:

Americas: 800 422 6872 Canada: 800 845 6808 Asia Pacific: +86 512 82280099 Europe: +49 2226 9047 355

DSG-CANUSA PRODUCTS dsg-canusa.com

Version: 05 2019/NOV/05

SHAWCOR



WILDLIFE MITIGATION COVERS FOR SUBSTATIONS

Medium voltage protective covers for insulators, bushings, surge arresters, cut-outs and clamps

The protective covers CCAPU, CFIN, CCONEC, CCOF, CCDE and CMVBP are available in different designs and sizes. They offer an effective encapsulation against accidental phase-to-phase or phase-to-ground fault caused by fauna and flora.

≤36 kV
VOLTAGE RATING

UV RESISTANT

EXCELLENT ANTI-TRACKING MATERIAL CHARACTERISTIC

FEATURES AND BENEFITS

- Excellent anti-tracking material characteristic
- Voltage rating up to 36kV
- UV resistant
- Suitable for polymeric / ceramic / hybrid insulators and suspension clamps
- Designed to protect problem span areas
- Cost-effective and variable design on particular application situations
- Easy to install
- Plastic rivets included
- Additional rivets available on request
- Continuous operating Temperature: -40 to 105°C

STANDARDS

- DIN VDE V 0212-490:2014
- VDE-AR-N 4210-11:2011-08
- IEC 60060-1:2010
- EN 60243-1

TYPICAL APPLICATIONS

- Protection of pole mounted substations
- Protection of air insulated substations

MARKETS:
Electrical Utility, Industrial

STANDARDS:

RoHS

ВЯРНО С ОРИГИНАЛА

SHAWCOR

Covers: CCAPU / CFIN / CCONEC / CCOF / CCDE / CMVBP

ELECTRICAL PROPERTIES

TECHNICAL DATA	CURRENT VALUES	TEST METHODS
Dielectric strength	≤36 kV	EN 60243-1
AC withstand (dry) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC withstand (wet) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC long term withstand (dry) 4 hours	8,6 kV / 15 kV; no breakdown or flashover	DIN VDE V 0212-490

CCAPU

DIMENSIONS OF BUSHING COVER

PRODUCT NUMBER	SHED DIAMETER		COVERAGE AREA		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CCAPU 10	105	4.134	180	7.087	3
CCAPU 12	120	4.724	150	5.906	3
CCAPU 15	150	5.906	225	8.858	3
CCAPU GR	140	5.512	200	7.874	3

CFIN

DIMENSIONS OF STANDOFF INSULATOR COVER

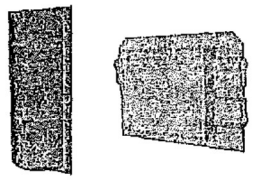
PRODUCT NUMBER	SHED DIAMETER		COVERAGE AREA		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CFIN 10	100	3.937	300	11.811	3

ВЯРНО С ОРИГИНАЛА

CCONEC

DIMENSIONS OF CONDUCTOR COVER

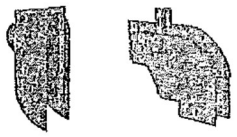
ORDER NUMBER	CABLE DIAMETER		COVERAGE AREA		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CCONEC 8	85	3.346	89	3.504	3
CCONEC 9	95	3.740	395	15.551	3
CCONEC 14	145	5.709	395	15.551	3
CCONEC 17	145	5.709	179	7.047	3



CCOF

DIMENSIONS OF CUT-OUT FUSE COVER

ORDER NUMBER	WIDTH		HEIGTH		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CCOF-P1	75	2.952	250 x 130	9.84 x 5.12	3
CCOF-P2	75	2.952	320 x 150	12.60 x 5.91	3
CCOF-C	110 / 160	4.33 x 6.30	140 x 400	12.60 x 5.91	3



CCDE

DIMENSIONS OF CONDUCTOR TO DEAD END COVER

ORDER NUMBER	WIDTH		HEIGH		DELIVERY UNITS
	Maximum		Maximum		Set of 3
	MM	IN	MM	IN	
CCDE-1 ex	53 / 61	2.09 / 2.40	135 x 95	5.31 x 3.74	3
CCDE-2 ex	53 / 61	2.09 / 2.40	135 x 95	5.31 x 3.74	3

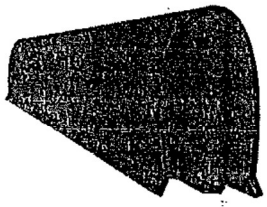
ВЯРНО С ОРИГИНАЛА

SHAWCOR

CMVBP

DIMENSIONS OF BARE CONDUCTOR COVER

ORDER NUMBER	CONDUCTOR SIZE			VOLTAGE RATING	DELIVERY UNITS	
	Cross section	Maximum		Maximum	Bundle	
	MM²	MM	IN	KV	M	FT
CMVBP 18	up to 185	18	0.709	15	35	115
CMVBP 18 M	up to 185	18	0.709	25 (mastic lined closure)	35	115
CMVBP 38	up to 800	38	1.496	15	35	115
CMVBP 18 M	up to 800	38	1.496	25 (mastic lined closure)	35	115



ORDERING

Select options:

- Color: Red-brown (RD-BN)
- Dimensions: Customization to different accessories on request

- Please specify the product name, order number and options you require
- *Example:* CCONEC 14, red-brown, 4 sets of 3 (12 pieces)

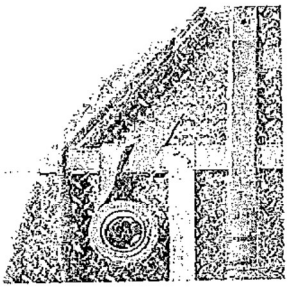
Please contact your Customer Service Representative for information on custom colors, sizes, lengths and material data sheet.

ВЯРНО С ОРИГИНАЛА

Additional Products: CMVBT, CMVIS, CBTM / CBTH

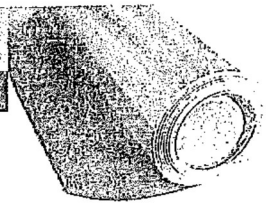
CMVBT: ANTITRACKING TAPE

ORDER NUMBER	WIDTH		WALL THICKNESS		DELIVERY UNITS
			Minimum		Spool
	MM	IN	MM	IN	M
CMVBT-1	25.4	1	1.06	0.042	7.62
CMVBT-2	50.8	2	1.06	0.042	7.62
CMVBT-4	101.6	4	1.06	0.042	7.62



CMVIS: SHRINKABLE INSULATION SHEET

ORDER NUMBER	ADHESIVE	WALL THICKNESS		DELIVERY UNITS
	Optional	Minimum		Spool
		MM	IN	M
CMVIS-660-10	without hotmelt	2	0.079	10
CMVIS-660-10-D	lined with hotmelt	2	0.079	10



CBTM / CBTH: ANTITRACKING HEATSHRINKABLE SLEEVE

ORDER NUMBER	DIAMETER		WALL THICKNESS		DELIVERY UNITS	
	Expanded		Minimum		Mini Spool	Spool
	MM	IN	MM	IN	M	M
CBTM	19.0 - 228.6	0.75 - 9	2.7 - 3.3	0.11 - 0.13	10 - 50	100 - 250
CBTH	27.9 - 167.6	1.1 - 65.9	3.9 - 4.2	0.15 - 0.17	10 - 50	75 - 150

ORDERING

Select options:

- Color: Red-brown (RD-BN)
- Please specify the product name, order number and options you require
- *Example:* CMVIS-660-10, without hotmelt, 10m

Please contact your Customer Service Representative for information on custom colors, sizes, lengths and material data sheet.

SHAWCOR

CCAPU / CFIN / CCONEC / CCOF / CCDE / CMVBP

TECHNICAL DATA

TECHNICAL DATA	CURRENT VALUES	TEST METHODS
	Material	
Material	PE, modified; free of lead and cadmiun	n/a
Surface	smooth, glossy	n/a
Specific gravity	1.2 g/cm³ max.	ASTM-D 792, A-I
	Mechanical	
Tensile strength	10 MPa	IEC 60684-2
Elongation	400%	IEC 60684-2
	Thermal	
Tensile strength after thermal ageing (168 h at 160°C)	8 MPa	IEC 60684-2
Elongation after thermal ageing (168 h at 160°C)	400%	IEC 60684-2
Cold bend test	does not break at -40°C (-40°F)	IEC 60684-2
Combustion behaviour	passed	EN 60695-2-11
Storage temperature	40°C max.	IEC 60684-2
Continuous operating temperature	-40°C to 105°C (-40°F to 221°F)	IEC 216
	Chemical	
Corrosive action	non-corrosive	ASTM-D 2671 Meth. A
Compatibility with copper	non-corrosive	ASTM-D 2671 Meth. B
Water absorption	0.20%	VDE 0473
	Electrical	
Dielectric strength	≤36 kV	EN 60243-1
AC withstand (dry) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC withstand (wet) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC long term withstand (dry) 4 hours	8,6 kV / 15 kV; no breakdown or flashover	DIN VDE V 0212-490
	Resistance to weather	
UV resistance	Pass to DIN VDE V 02012-490	ISO 4892-2

ВЯРНО С ОРИГИНАЛА

Additional Product: CMVBT

TECHNICAL DATA

TECHNICAL DATA	CURRENT VALUES	TEST METHOD
	Physical	
Tensile strength	8.3 MPa	ASTM D412, ISO 37
Elongation	370%	ASTM D412, ISO 37
Shrink ratio	1.7:1	ASTM D2671
Tensile strength after heat ageing (7 days at 175°C)	10 MPa	ASTM D2671
Elongation after heat ageing (7 days at 175°C)	200%	ASTM D2671
Heat shock (4 hr at 225°C)	no cracking or flowing	ASTM D2617
Low temperature flexibility (4 hr at -40°C)	no cracking	ASTM D2671
Combustion behaviour	passed	ANSI C37.20; ASTM D2671
	Chemical	
Corrosion	no corrosion	ASTM D2671
Water absorption	0.25%	ASTM D570
Fluid resistance	good to excellent	SAE-AMS-DTL-23053/15
	Electrical	
Dielectric strength	20 kV/mm at 2 mm	ASTM D149
Surface resistance	510×10^8 ohm	ASTM D257
Volume resistivity	1.9×10^{16} ohm-cm	ASTM D257
Dielectric constant	3.4	ASTM D150
Tracking resistance (2500 V, 300 min)	non-tracking	ANSI C37.20; ASTM D2303
Weathering	non-tracking after 6,000 hrs	ASTM G53
	Adhesive	
Adhesive softening point	100°C	ASTM E28
Low temperature flexibility	-25°C	STM C12
Lap sheer	1.7 MPa	STM C9
Peel strength to aluminum	42.5 N/25mm	STM C8
Tracking tests (2500 V, 300 min)	Non-tracking	ANSI 37.20; ASTM D2303

ВЯРНО С ОРИГИНАЛА

SHAWCOR

Additional Product: CBTH / CBTM

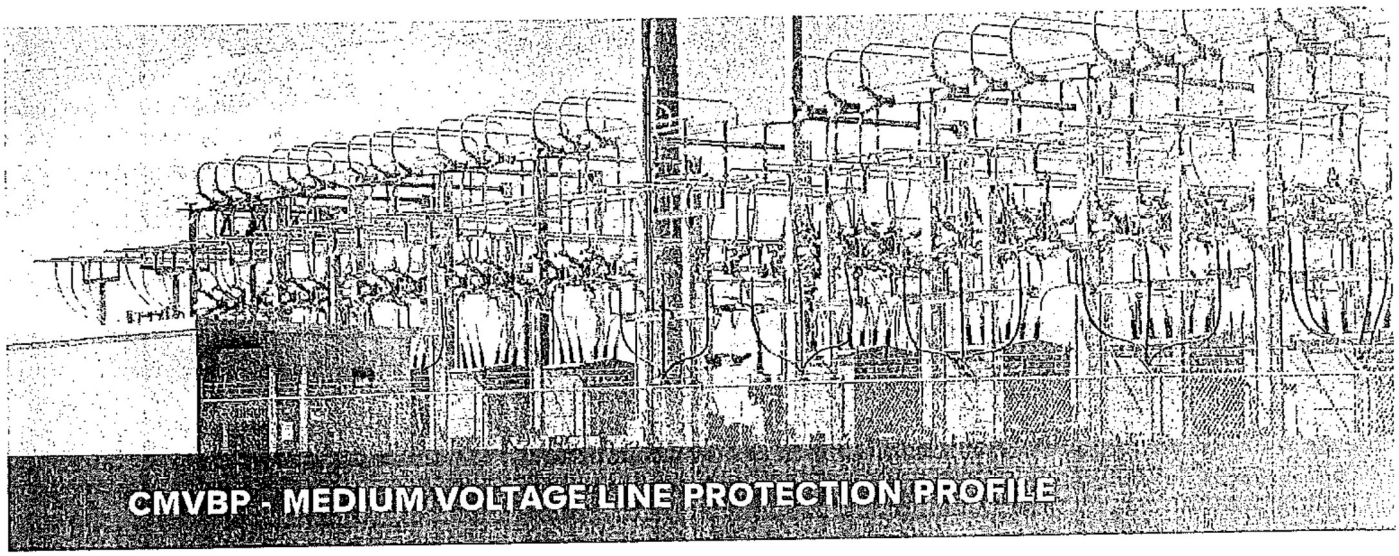
TECHNICAL DATA

TECHNICAL DATA	CURRENT VALUES	TEST METHODS
	Physical	
Tensile strength	8.3 MPa	ASTM D412, ISO 37
Elongation	370%	ASTM D412, ISO 37
Longitudinal change	-10% max. sizes 1100, 2000; -15% max. sizes 2700 to 6600	ASTM D2671
Tensile strength after heat ageing (7 days at 175°C)	10 MPa	ASTM D2671
Elongation after heat ageing (7 days at 175°C)	200%	ASTM D2671
Heat shock (4 hr at 225°C)	no cracking or flowing	ASTM D2617
Low temperature flexibility (4 hr at -40°C)	no cracking	ASTM D2671
Combustion behaviour	passed	ANSI C37.20; ASTM D2671
	Chemical	
Corrosion	no corrosion	ASTM D2671
Water absorption	0.25%	ASTM D570
Fluid resistance	good to excellent	SAE-AMS-DTL-23053/15
	Electrical	
Dielectric strength	20 kV/mm at 2 mm	ASTM D149
Surface resistance	510×10^9 ohm	ASTM D257
Volume resistivity	1.9×10^{16} ohm-cm	ASTM D257
Dielectric constant	3.4	ASTM D150
Tracking resistance (2500 V, 30 min)	non-tracking	ANSI C37.20; ASTM D2303
Weathering	non-tracking after 6,000 hrs	ASTM G53

FOR FURTHER INFORMATION, PLEASE CONTACT:

Americas: 800 422 6872 | Canada: 800 845 6808 | Asia Pacific: +86 512 82280099 | Europe: +49 2226 9047 355

ВЯРНО С ОРИГИНАЛА



CMVBP - MEDIUM VOLTAGE LINE PROTECTION PROFILE

Medium voltage line protection profile to insulate overhead lines to protect wildlife.

CMVBP line protection profile is available in different designs and sizes. It offers an effective encapsulation against accidental phase-to-phase or phase-to-ground fault caused by fauna and flora.

FEATURES AND BENEFITS

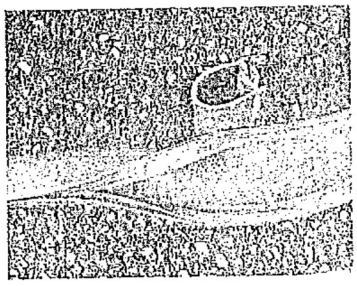
- Excellent anti-tracking material characteristic
- Voltage rating up to 36kV
- UV resistant
- Designed to protect problem span areas
- Cost-effective and variable design on particular application situations
- Easy to install
- Closing tool available for non-live installation
- Operating Temperature: -40 to 105°C

STANDARDS

- DIN VDE V 0212-490:2014
- VDE-AR-N 4210-11:2011-08
- IEC 60060-1:2010
- EN 60243-1

TYPICAL APPLICATIONS

- Protection of overhead lines
- Protection of pole-mounted installations



36 kV
VOLTAGE RATING

UV RESISTANT

EXCELLENT ANTI-TRACKING MATERIAL CHARACTERISTIC

MARKETS:
Electrical Utility, Industrial, Railway

STANDARDS:

SHAWCOR

ВЯРНО С ОРИГИНАЛА

Medium Voltage Line Protection Profile

ELECTRICAL PROPERTIES

Dielectric strength	>36 kV	EN 60243-1
AC withstand (dry) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC Withstand (wet) 1 minute	15 kV / 25 kV; no breakdown or flashover	DIN VDE V 0212-490
AC long term withstand (dry) 4 hours	8,6 kV / 15 kV; no breakdown or flashover	DIN VDE V 0212-490

DIMENSIONS

	Maximum		Maximum	Bundle	
	MM	IN	KV	M	FT
CMVBP 18	18	0.709	15	30	98
CMVBP 18 M	18	0.709	25 (mastic lined closure)	30	98

ORDERING

- Select options:
  - Color: Red
- Please specify the product name, order number and options you require
- *Example:* CMVBP 18, 15 kV, redbrown, bundle

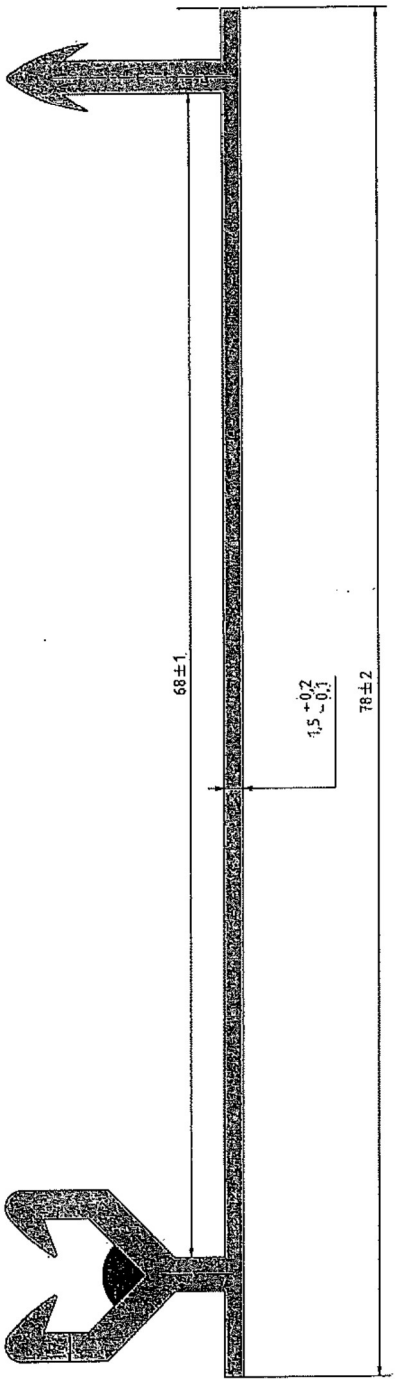
Please contact your Customer Service Representative for information on custom colors, sizes, lengths and material data sheet.

FOR FURTHER INFORMATION, PLEASE CONTACT:

Americas: 800 422 6872 Canada: 800 845 6808 Asia Pacific: +86 512 82280099 Europe: +49 2226 9047 355

SHAWCOR

ВЯРНО С ОРИГИНАЛА



ВЯРНО С ОРИГИНАЛА

ENERGO – TEL Ltd.
www.energo-tel.bg
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Д Е К Л А Р А Ц И Я

Долуподписаният **Николай Йорданов Калев,** на основание чл. 36а, ал. 3 от ЗОП

на основание чл. 36а, ал. 3 от ЗОП

на Управител на фирма

“ ЕНЕРГО – ТЕЛ “ ООД кандидат за участие в :

Процедура за :

„Доставка на птицезащитни продукти“, във връзка с реализацията на **Проект „LIFE FOR BIRDS ON POWER LINES“, LIFE16NAT/BG/000612“,**

реф. № PPD 20-019

Обособена позиция 2 с предмет: “Доставка на птицезащитни изолационни маншети за въздушни електропроводни линии СрН по проект LIFE BIRDS ON POWER LINES, LIFE16 NAT/BG/000612“.

ДЕКЛАРИРАМ, ЧЕ:

Предложените продукти напълно съответстват на изискванията на техническата спецификация на стандартите за материал, включително на параграфи ” Характеристика на материала „ и „ Съответствие на предложеното изпълнение със стандартизационните документи „

Производство на КАНУСА са преминали заводски контрол за качеството на технологичния цикъл. Продуктите притежават сертификати за качество, протоколи от изпитания и са технически одобрени.

Известно ми е, че при деклариране на неверни данни нося наказателна отговорност по чл. 313 от НК.

Декларатор: на основание чл. 36а, ал. 3 от ЗОП

/ Николай Калев /

гр. София
27.05.2020 год.

REFERENCE: TEST REPORT 2019/02/12A

PRODUCT: CMVPB MEDIUM VOLTAGE LINE PROTECTION PROFILE

PREPARED BY:

на основание чл. 36а, ал. 3 от ЗОП

PAUL SHERIDAN 20/3/2019

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Connection Systems.

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Boschstraße 17

53359 Rheinbach / Germany

Test Locations

FGH Engineering and Test GmbH Mannheim

Technische Universität Dresden.

Atlas Material Testing Linsengericht,

DSG Canusa GmbH Rheinbach

SUMMARY:

CMVBP medium voltage line protection profile is designed to insulate overhead lines and bare conductors to protect wildlife and encapsulate the line to prevent accidental phase-to-phase or phase-to-ground faults caused by fauna and flora.

This report details the physical, chemical, and accelerated aging tests to understand its ability to resist thermal aging, weathering, abrasion, and surface electrical activity.

SAMPLE PREPARATION: All tests were done on CMVBP 18 M profile or plaques pressed from CMVBP compound (ref KSF) according to the test standard requirement.

ВЯРНО С ОРИГИНАЛА DSG-CANUSA

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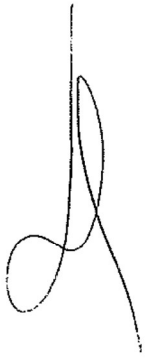


ВЯРНО С ОРИГИНАЛА

1. Test Procedures.

i. Tensile Strength, Elongation at Break and Secant Modulus.

Five dumb-bells were cut according to IEC 60684-2 clause 19.3. Tensile strength and elongation at break were tested according to clause 19.3 of the standard using a jaw separation rate of 100 mm/min. Secant modulus was tested according to clause 19.5.

ii. Bending at Low Temperature

Five strips were cut according to IEC 60684-2 clause 14.1. The strips were then conditioned and tested according to clause 14.2 of the standard.

iii. Heat Ageing.

Five dumb-bells were cut according to IEC 60684-2 clause 19.3. The samples were aged and tested according to clause 39.2 of the standard.

iv. Volume resistivity.

Five plaque samples prepared from CMVBP (KSF) compound were prepared ad tested according to clause 13 of IEC 62677 -2.

v. Tracking and Erosion Testing.

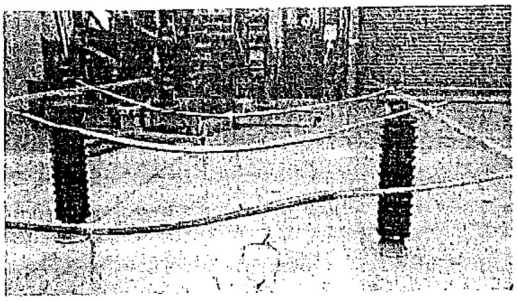
Five samples of plaque 50,8mm x 127mm were tested to the ASTM D 2303/IEC 60684-2 test procedure, to the requirement of IEC 60684-3-283.

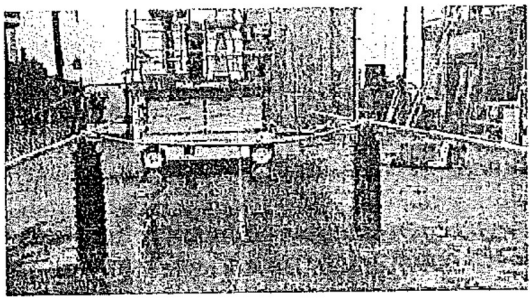
vi. Resistance to Bird Excrement

An artificial Guano solution was prepared by combining 50 grams of uric acid with 65 ml of distilled water. The test specimens were immersed in the solution for 168 hours at a temperature of 60°C. Test specimens were then removed from the test fluid, lightly wiped dry, and air dried for 45 minutes at room temperature prior to testing tensile strength and ultimate elongation according to IEC 60684-2 clause 19.

vii. Dielectric performance tests

Test A – Ramp to Failure: -
Three 1.5m samples were tested. An overhead line piece diameter 17 mm was inserted into the round section of the CMVBP profile. A mesh was wrapped around the sample to provide an earth to a length of 100mm and the voltage was supplied down the conductor, ramped to 36 kV at 500V/s and held for one minute, the voltage was then ramped to breakdown.
Test B – Dry Withstand Test: -
The set up was as test A but the voltage was held for 1 minute and 4 hours at the voltages shown in table 1.
Test C – Wet Withstand Test:-
Test set up was as test A. Rain was applied as per IEC 60060-1:2010 for the horizontal and vertical components as well as the water conductivity limits. Voltage was applied as shown in table 1.





ВЯРНО С ОРИГИНАЛА

viii. Weather resistance

Four plaque samples were exposed to UV/condensation according to IEC 60684-2, DIN EN ISO 4892-2A. Test criteria was according to VDE V 0212-490 (Components for the protection of birds - Requirements and tests) clause 5.3.2 with a 500-h-UV-Light test using Xenon-arc radiation.

ix. Fire performance.

Three plaque samples were tested to the glow-wire test in DIN EN 60695-2.

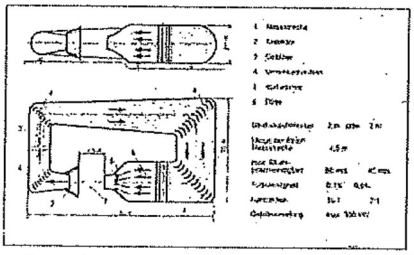
x. Wind Resistance

The aim of the wind tunnel testing was to check the mechanical stability of the CMVBP profile when impacted with a specified wind load. According to VDE 0212, clause 5-3-1, the samples are loaded with a dynamic pressure of 840 N/m ² for 15 min. These tests are valid as passed if no damage or permanent distortions are seen. Connections may not have loosened. The following test parameters are as specified in VDE 0212

- main flow velocity according to the dynamic pressure 840 N/m²
- time space of 15 min for 90°, -45° and 45°
- time space of 1 min for 20°

Each of the set of three samples is checked in four configurations (90°, -45°, 45° and 20°).

General view of wind tunnel at TU Dresden:



Test 05 – V5 45°:

Figure 77: Before / After Snapshot – V5S1 45°

xi. Ice accretion.

VDE 0212-490 clause 4.2.2 refers to a loading for zone E2 according to VDE 0210-2 (now IEC 50341-2-4). Clause 4.2.2 also refers to the reduction factor ke25 which is applied to the load required.

The requirement according to IEC 50341-2-4 clause 4.5.2 is therefore:

Ice Load (in N/m) g1 = 10 + (0.2 x d) x 0.75.

Where d = the diameter of the conductor in mm. For the testing in this report two conductor diameters were used:

120 sqmm: d = 14.4mm

70 sqmm: d = 10.7mm

Taking the worst-case requirement of 14.4mm,

g1 = 10 + (0.2 x 14.4) x 0.75 = 9.7N/m

The load sustained by the profile during wind resistance testing at TU Dresden was 840 Pa (840 N/m2) this can be converted to a N/m value by reference to the area exposed.

	Dimension exposed to wind load.			Force per CSA	Force per m
Product	length (L)/m	Width/m	Cross section/m²	(840 x CSA)	(F / L) N/m
CMVBP profile	1	0.03	0.030	25.200	25

2. Test Results.

The results of the above tests are shown in table 1. The requirement is taken from the relevant standard in column 2.

Table 1: Test Results.

Property	Standard	Requirement	Results
Tensile Strength, Elongation at Break Secant Modulus	IEC 60684-3-283.	8 MPa 400 % 160 MPa max.	12 Mpa 450% < 30 MPA Pass
Bending at Low Temperature	IEC 60684-3-283.	No cracking shall be visible at -40°C	Pass, no cracks.
Heat Ageing.	IEC 60684-3-283.	Heat at 150 °C Tensile: 5 MPa min. Elongation: 200% Min.	Aged at 160°C Tensile 8 MPa Elongation 400% Pass
Volume resistivity.	IEC 60684-3-283.	10^{13} Ω.cm Min.	10^{14} Ω.cm Pass
Tracking and Erosion Testing.	IEC 60684-3-283.	2,5 kV for 1 hour	> 1 hour at 2,5kV Pass
Resistance to Bird Excrement	Internal DSG Canusa	168 hours at a temperature of 60°C	Tensile > 10 MPa Elongation > 400% < 0.3% increase in mass. Pass
Dielectric performance tests	EN 60243-1 DIN VDE 0212-490	1 minute at 25kV 1 minute at 25kV WET 4 hours at 15kV Breakdown at 44.5kV	No breakdown or flashover on withstands Breakdown > 40kV Pass
Weather resistance	ISO 4892-2 DIN VDE 0212-490	8 MPa 400 %	Tensile > 10 MPa Elongation > 400% Pass
Fire performance.	DIN EN 60695-2.	> 700°C, 30s	750°C Pass
Wind Resistance	DIN VDE 0212-490	840 N/m² Pressure 4 configurations 90°, -45°, 45° and 20°	No loosening, moving, detachment from wire or permanent distortion. Pass
Ice accretion.	DIN VDE 0212-490	> 9.7N/m	Pass to 25 N/m

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3. Conclusions.

- The tensile strength and elongation at break values prove that the CMVBP profile is tough enough to withstand the physical requirements of the application.
- The cold bend and heat ageing results show the material will not crack when applied down to -40°C and will not become brittle when used continuously at 105°C
- The low Secant Modulus shows that the material is flexible enough to ease fitting, including over curved wires. The wind resistance testing proves that the closure is strong enough to withstand exceptional forces, and will also withstand the maximum ice accretion load as specified in DIN VDE 0212-490
- The dielectric withstand, tracking testing, volume resistivity and breakdown performance in excess of 36kV prove that the electrical performance is appropriate for the application. The fire performance test proves that even if exposed to flame, for example during arcing, then the CMVBP profile is self-extinguishing.
- The CMVBP is designed for continuous outdoor use in harsh environments the weather and bird excrement testing has been done to demonstrate that the profile will withstand this.

In summary the results in table 1 indicate the CMVBT material has suitable physical, UV, thermal, chemical, and electrical properties to insulate overhead lines and bare conductors to protect wildlife and encapsulate the line to prevent accidental phase-to-phase or phase-to-ground faults caused by fauna and flora.

DSG-Canusa GmbH Boschstraße 17, D-53359 Rheinbach • t +49 (0)2226 9047-0 f +49 (0)2226 9047-499 • Sitz der Gesellschaft: Rheinbach • Handelsregister: HRB Bonn 10551 • Geschäftsführer: Darrell Ewert, Stephen Michael Orr, Thomas Schmidt, Gaston Alfonso Tano • USt-IdNr.: DE201467428 • WEEE-Reg.-Nr.: DE 51136070

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ВЯРНО С ОРИГИНАЛА

DSG Canusa issue 1 20/3/2019

Test Report

No. H 18003 Duly signed copy 0E

Reference: HV-I-1716

Apparatus: Wildlife mitigation products: CMVBP 18 (52117431)
Type: Flexible conductor covers
Rated voltage: 25 kV
Rated frequency: 50/60 Hz

Manufacturer: DSG-Canusa GmbH
Boschstrasse 17, D-53359
Rheinbach, Germany

Customer: DSG-Canusa GmbH
Boschstrasse 17, D-53359
Rheinbach, Germany

Place and Date of Tests: FGH Engineering & Test GmbH, Mannheim, Germany
21st December 2017

Test Specification: Client's specification vide Order-No.: 42814 – APPD 2016_009

Test Performed:
1) 1 minute dry AC withstand voltage test at 25 kV
2) 4 hours dry AC withstand voltage test at 15 kV
3) 1 minute wet AC withstand voltage test at 25 kV

Test Results: No defacing or damages visible on any of the 3 test object samples. No flashover or breakdown occurred during the tests.

The above mentioned test objects have passed the tests performed in accordance with the applied test specifications.

FGH Engineering & Test GmbH

на основание чл. 36а, ал. 3 от ЗОП

Dr.-Ing. Heiko Jahn
FGH Engineering & Test GmbH

Pawan Jawale
Test Engineer

Mannheim, 23rd January 2018 Number of sheets: 11

This document may only be used complete and unabridged.

FGH Engineering & Test GmbH is a laboratory of the CESI group

Member Laboratory of the Short-Circuit Testing Liaison (STL)

ВЯРНО С ОРИГИНАЛА

Test documents issued by the FGH Engineering & Test GmbH

A Type Test Certificate
is issued for complete type tests according to valid standards taking into account valid STL guides.
Equipment to be tested must be clearly identifiable:
- Apparatus by a nameplate according to the relevant standard and by suitable drawings;
- Equipment for which the relevant standard does not require a nameplate, by suitable drawings and descriptions where necessary. In certain cases, a specification of details may be required.

The Type Test Certificate confirms that during all tests of the equipment according to the standard the specified pass criteria for its behaviour during the tests and its conditions after the tests have been fully met.

A Test Certificate
is issued for equipment having passed parts of the type tests specified in the relevant standards or fulfilling accepted specifications or recommendations.

Equipment to be tested must be clearly identifiable:
- Apparatus by a nameplate according to the relevant standard and by suitable drawings;
- Equipment for which the relevant standard does not require a nameplate, by suitable drawings and descriptions where necessary. In certain cases, a specification of details may be required.

The Test Certificate confirms that during the test of the equipment according to the standard the specified pass criteria for its behaviour during the tests and its conditions after the tests have been fully met.

A Test Report
is issued for all tests which do not meet the requirements of a Type Test Certificate or a Test certificate and have been performed according to specifications, standards and/or clients' instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were performed, also details relating to the behaviour of the test object and its condition after the tests.

An Investigation Report
is issued for investigations which have not the character of proving tests.

A Test Confirmation
is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.

Photographs and identification documents
Inserted photographs and identification documents (e. g. drawings, parts lists) must bear the FGH-stamp.
In case of electronic photographs the stamp can be omitted.

The customer confirmed by his signature that the test object corresponds to the submitted identification documents. FGH checked the accordance for essential details.

The original identification documents were stamped and signed by FGH. If this document contains electronic identification documents without FGH-stamp, the conformance with the checked, stamped and signed original documents has been verified by FGH.

With reference to ISO/IEC 17025 the FGH Engineering & Test GmbH states:

- The FGH Engineering & Test GmbH apply the PEHLA Procedure No. 12 for determining the uncertainties of measurement. As long as no explicit statements are made, the uncertainties required by the relevant standards have been complied with.
- The accreditation of the FGH Engineering & Test GmbH or its test documents by themselves in no way constitute or imply product approval by DAkkS or any other body.
- If a client refers to the accreditation of the FGH Engineering & Test GmbH, the reference shall include the accreditation body DAkkS, the relevant scope of the accreditation and the appropriate registration number.
- The test results included in the test documents as well as their evaluation relate exclusively to items tested.
- The test documents may not be reproduced, except in full contents, without written approval by the FGH Engineering & Test GmbH.

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1 Participants

Name	Date	Company
Mr. Bernd Henseler	21.12.2017	Shawcor (DSG-Canusa)
Mr. Pawan Jawale	21.12.2017	FGH Engineering & Test GmbH

ВЯРНО С ОРИГИНАЛА

2 Technical data of apparatus

Apparatus:	Wildlife mitigation products: CMVBP 18 (52117431)
Type:	Flexible conductor covers
Manufacturer:	DSG-Canusa GmbH
Year of manufacture:	2017
Rated voltage:	25 kV
Rated frequency:	50/60 Hz

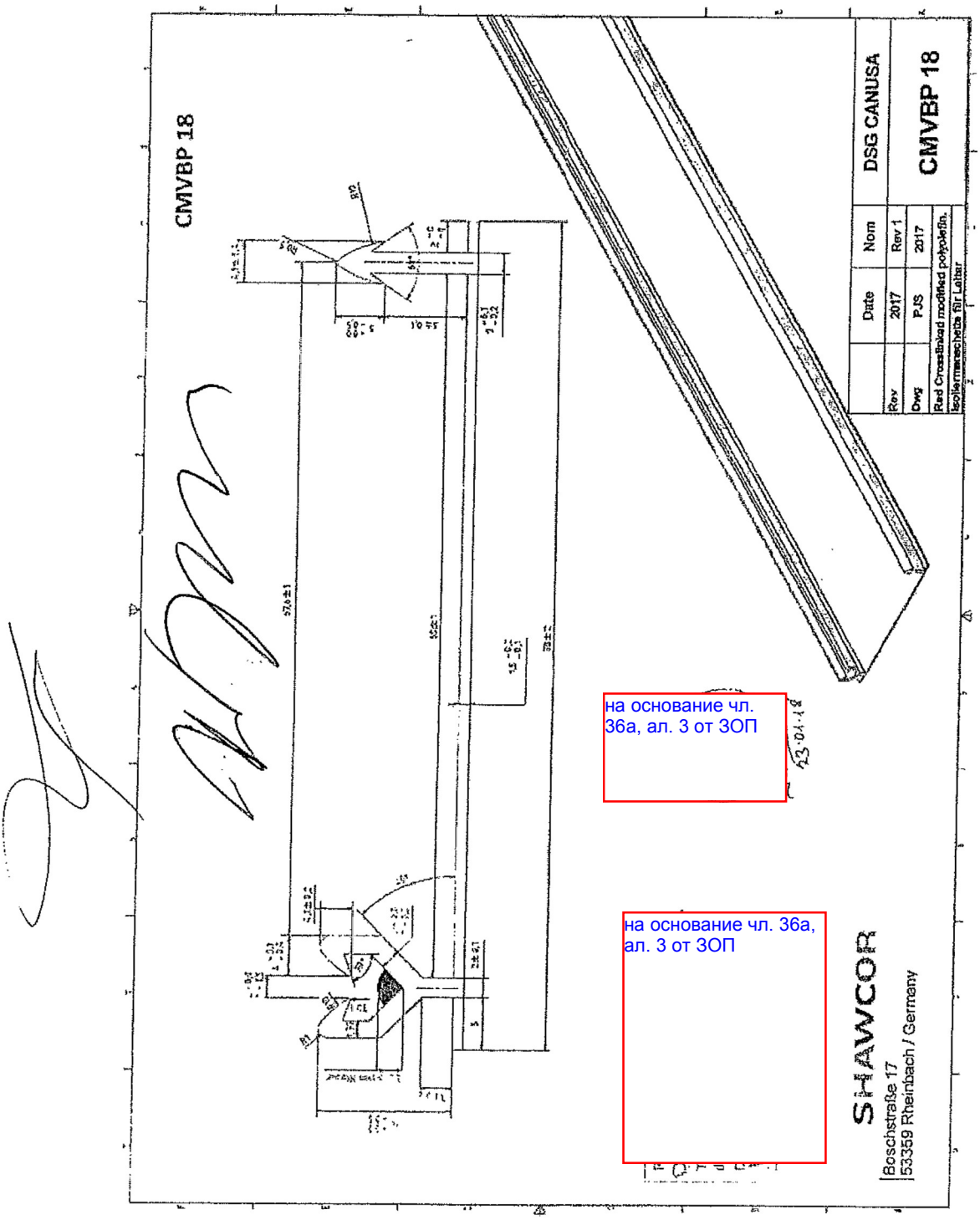
List of drawings submitted for identification:

Title	Drawing-no.	Date / Rev.	See Sheet
Red Crosslinked modified polyolefin Isoliermanschette für Leiter	CMVBP 18 Overview	2017 / 01	6

Identification documents not enclosed in this document are kept in the FGH/manufacturers/customers files.

ВЯРНО С ОРИГИНАЛА

3 Drawings



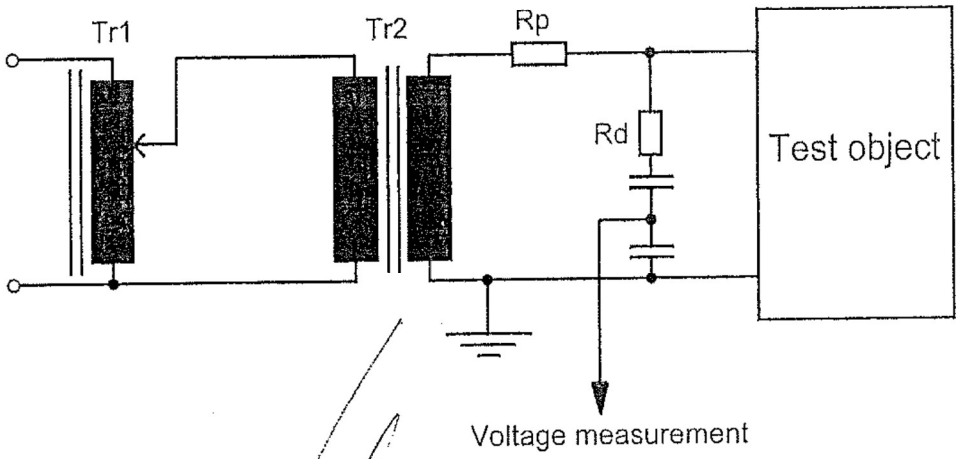
на основание чл. 36а, ал. 3 от ЗОП

на основание чл. 36а, ал. 3 от ЗОП

ВЯРНО С ОРИГИНАЛА

4 Technical data of test circuit

4.1 Dielectric test setup



Technical data

AC voltage system			
Regulation	I 211604	Primary voltage	220 V
Transformer Tr1		Secondary voltage	0...220 V
		Rated Power	19.8 kVA
Test	H 210604	Primary voltage	220 V
Transformer Tr2		Secondary voltage	125 kV
		Rated Power	20 kVA
Protective series resistance Rp			3 kΩ
Damping resistance Rd			3 kΩ
Measurement System			
AC voltage measurement	H 140609	MWB divider	100 kV
Temperature & Humidity	H 150610	Testo 635-1	
Air pressure	H 190602	GTD 1100	
Rain intensity measurement	H 150607		
Rain water conductivity & temperature measurement	I 116607	Knick 911 COND	

ВЯРНО С ОРИГИНАЛА

5 Test methodology

5.1 Dielectric AC withstand voltage tests

5.1.1 Electrode preparation

The test object is a moulded shape flexible cover for enclosing an exposed conductor. The test object lips are fixed together in the groove and sealed with an adhesive substance (mastic). The top electrode to be grounded is of meshed copper type and tightly wrapped around the flexible cover in such a way that its effective length is 10 cm as per the client instructions.

5.1.2 AC withstand voltage test – Dry (1 min)

The test is carried out on 3 test objects connected in parallel. Each of the test objects is a 1.5 m long line cover. An overhead line piece of 17 mm diameter is connected between Aluminium bars on both sides. This assembly is connected to the high voltage terminal of the transformer. The complete setup is kept at a height of about 1 m from ground via porcelain insulators. The photos of the entire test assembly are included in Chapter 6 below.

The metal electrodes are wound exactly in the middle of the test object and are earthed directly. The line cover surface is prepared by cleaning with Methylated spirit. The test circuit is applied with an AC voltage of 25 kV in incremental steps of 1 kV/s and maintained at 25 kV for 1 min.

Test summary:

Test performed:	AC dry withstand voltage test as per client instructions
Date of test:	21. December 2017
Test location:	HV Hall
Condition of test object:	New, Clean, Dry
Connections to test object:	Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air at ambient temperature.
Ambient conditions	Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	25 kV	60 sec	No breakdown, no flashover
Test object 2	25 kV	60 sec	No breakdown, no flashover
Test object 3	25 kV	60 sec	No breakdown, no flashover

All the three test objects have passed the test.

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5.1.3 AC withstand voltage test – Dry (4 hours)

The test setup is similar to the AC 1 min dry withstand test. The test summary is as under:

Test performed: AC dry withstand voltage test as per client instructions
Date of test: 21. December 2017
Test location: HV Hall
Condition of test object: Partly tested (after AC 1 min withstand voltage test), Dry
Connections to test object: Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air at ambient temperature.
Ambient conditions Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	15 kV	4 hours	No breakdown, no flashover
Test object 2	15 kV	4 hours	No breakdown, no flashover
Test object 3	15 kV	4 hours	No breakdown, no flashover

All the three test objects have **passed** the test.

5.1.4 AC withstand voltage test – Wet (1 min)

The test objects are tested one after the other. The test setup is similar to the dry tests in a manner that the overhead conductor is supported on the insulators. The AC voltage is applied at one end of the conductor and the metal electrode on the surface of the protective cover is earthed directly. The rain parameters are as per IEC 60060-1:2010 for the horizontal and vertical components as well as the water conductivity limits. The test summary is as under:

Test performed: AC wet withstand voltage test as per client instructions
Date of test: 21. December 2017
Test location: HV Hall
Condition of test object: Partly tested (after AC 4 hours withstand voltage test), Wet
Connections to test object: Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air and under standard rain conditions.
Rain water intensity: 1.8 mm/min (horizontal component), 1.5 mm/min (vertical component)
Water parameters: Conductivity: 98.1 µS/cm Temperature: 18.4 °C
Ambient conditions Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	25 kV	60 sec	No breakdown, no flashover
Test object 2	25 kV	60 sec	No breakdown, no flashover
Test object 3	25 kV	60 sec	No breakdown, no flashover

All the three test objects have **passed** the test.

ВЯРНО С ОРИГИНАЛА

6 Photographs

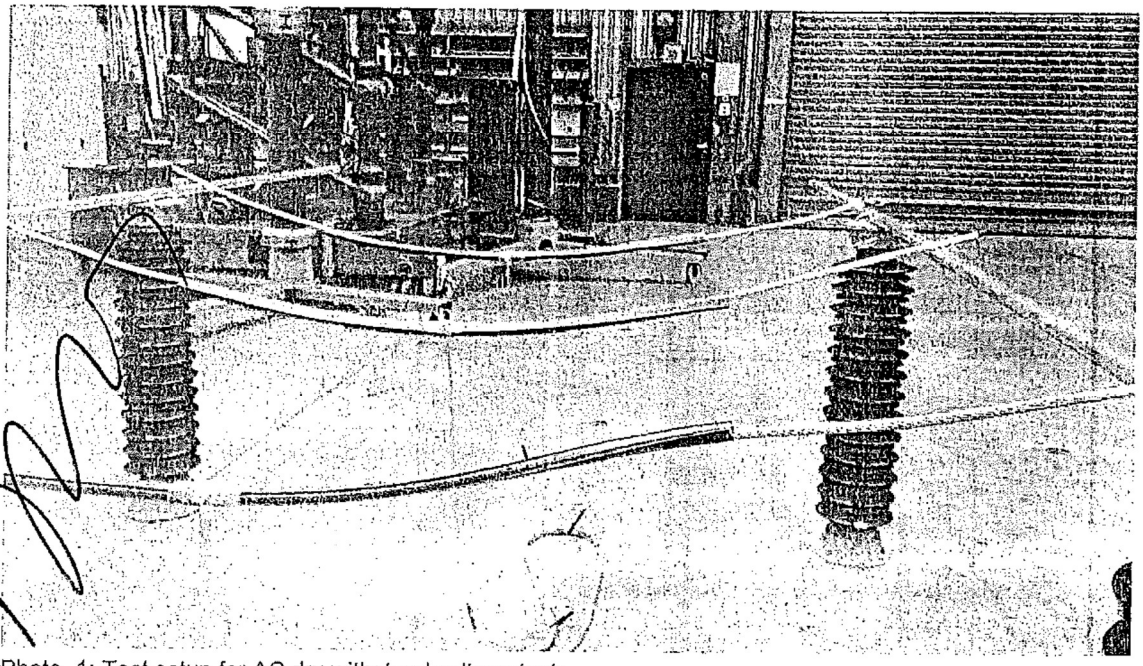

Photo. 1: Test setup for AC dry withstand voltage tests

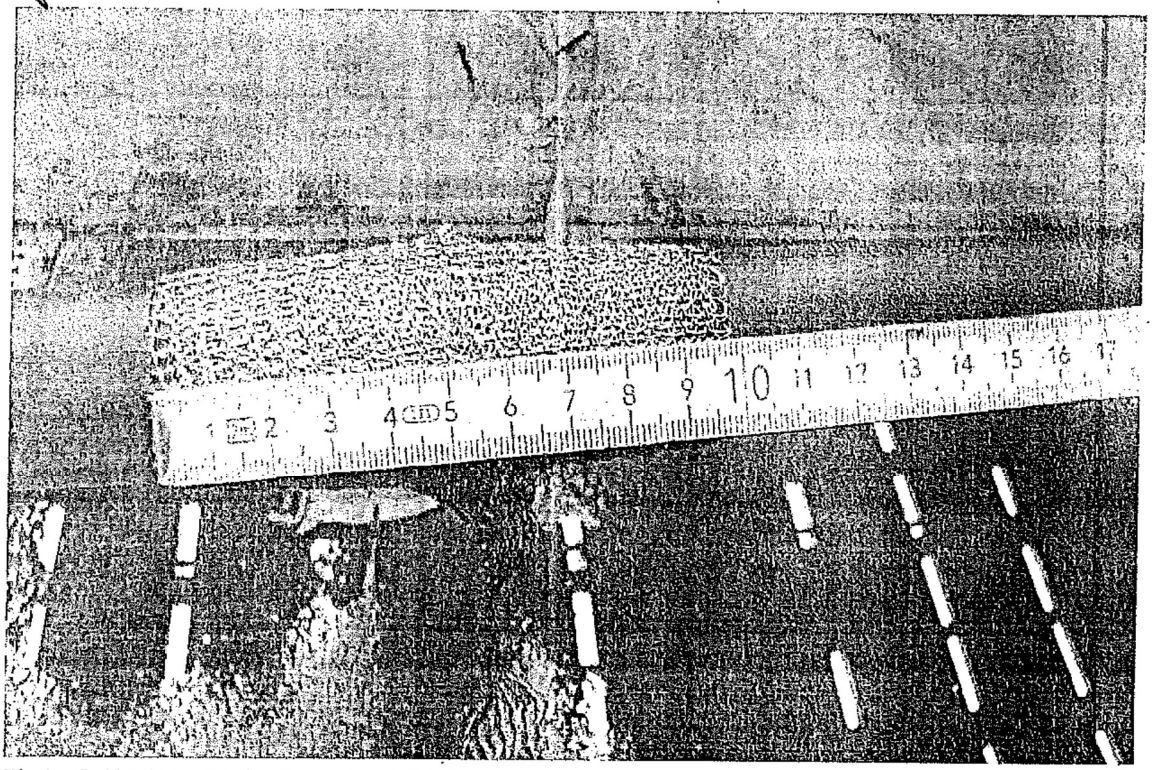

Photo. 2: Earth electrode dimensional details

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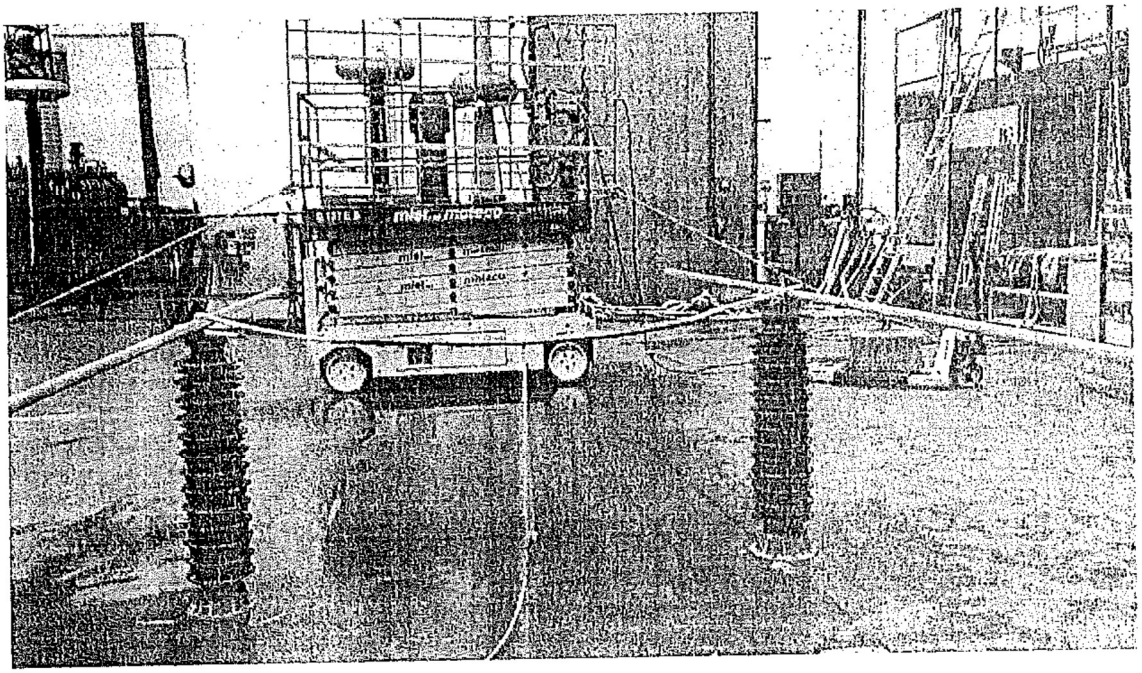

Photo. 3: Test setup for AC wet withstand voltage test

ВЯРНО С ОРИГИНАЛА

Type Test Certificate

Reference:	DSG Canusa 2018 C-1- Issue 1 – February 2018		
Products:	Wildlife Mitigation Covers DSG-Canusa Part — Description CCONEC7431 — Formteil für doppelte Seilklemmen und Abzweige CCAPU — Formteil für Endverschluss, Ableiter, Trafo, Seilklemmen und Abzweige CCAPUGR7433 — Formteil zur Isolierung Trafo MS Seite CFIN7434 — Formteil für Stützerabdeckung Seil CMVBP profile — Isoliermanschette für Leiter		
Place and date of Test:	FGH Engineering and Test GmbH Mannheim, 2017 Technische Universität Dresden, 2017 Atlas Material Testing Linsengericht, 2017 DSG Canusa GmbH Rheinbach, 2017		
Test Specification:	DIN VDE 0212-490, 2014		
VDE 0212 Table 1 Type Tests	Appendix	Test Report	Performance
5.2.1 Sizes and materials	A	Product Drawings	DSG Canusa product standards
5.3.1 Wind Load	B	TU report ILR – NWK VB 17 – 555	840 N/m² as detailed in 5.3.1
5.3.2 Weather resistance	C	Atlas DA 12938, RFT 2017-009	According to ISO 4892-1
5.4.1 Dielectric Strength (for 25kV operating voltage)	D	FGH H 17040, H 17041; H 18003	Material test to breakdown > 45kV Application test at 25kV. (Including wet withstand voltage tests)
5.4.2 Behaviour during Arcing	E	FGH L17021, L 17022	50A to 5.4.2
5.4.3 Leakage Current	E	FGH L17021, L 17022	< 2mA according to 4.3.3 of the standard.
VDE 0212 Additional General Requirements	Appendix	Test Report	Performance
4.1.4 Fire Performance	F	DSG Canusa KE -002	Pass to EN60695
4.1.5 Temperature Resistance	G	DSG Canusa TDS	
4.2.2 Ice accretion	H	DSG Canusa KE -003	Material will withstand > 25 N/m in accordance with EN 50341-2-4

The above-mentioned test objects passed all the tests required in accordance with VDE 0212-490, the Wildlife Mitigation Covers and Profile successfully completed the type testing.

на основание чл. 36а, ал. 3 от ЗОП

PAUL SHERIDAN — 7TH FEBRUARY 2018

Senior Applications Engineer, Connection Systems

SHAWCOR

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Summary of all tests and products covered

See appendices for full test details

			VDE 0212 Clause					
			4.1.4	5.3.1	5.3.2	5.4.1	5.4.2	5.4.3
			EN 60695-2-11	VDE 0212	DIN EN ISO 4892-2A	EN 60243-1	VDE 0212	IEC 60060-1
E.DIS part#	Description	DSG-Canusa description	Flame test - glow wire test	Wind Load	Weather resistance	Dielectric strength	ARC resistance	Leakage current
52117431	Formteil für doppelte Seilklemmen und Abzweige	CCONEC7431 (cf 7435)	Test on moulded plaque of material (150 x 150 x 2mm according to IEC 62677-2)	√	Test on moulded plaque of material (150 x 150 x 2mm according to IEC 62677-2)	Test on moulded plaque of material (150 x 150 x 2mm according to IEC 62677-2)	1 Minute at 25kV. 4 hours at 15kV + *wet withstand*	
52117432	Formteil für Endverschluss, Ableiter, Trafo, Seilklemmen und Abzweige	CCAPU		√			1 Minute at 25kV. 4 hours at 15kV + *wet withstand*	
52117433	Formteil zur Isolierung Trafo MS Seite	CCAPUGR4733		√			√	√
52117434	Formteil für Stützerabdeckung Seil	CFIN7434		√			√	√
52117435	Formteil für Isolatoren und Klemmen	CAMA7435		Covered by 52117431			Covered by 52117431	
52117437	Isoliermanschette für Leiter	CMVBP profile	Test on moulded plaque of material (150 x 150 x 2mm according to IEC 62677-2)	√	Test on moulded plaque of material (150 x 150 x 2mm according to IEC 62677-2)	1 Minute at 25kV. 4 hours at 15kV + wet withstand		

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ВЯРНО С ОРИГИНАЛА

5 Test methodology

5.1 Dielectric AC withstand voltage tests

5.1.1 Electrode preparation

The test object is a moulded shape flexible cover for enclosing an exposed conductor. The test object lips are fixed together in the groove and sealed with an adhesive substance (mastic). The top electrode to be grounded is of meshed copper type and tightly wrapped around the flexible cover in such a way that its effective length is 10 cm as per the client instructions.

5.1.2 AC withstand voltage test – Dry (1 min)

The test is carried out on 3 test objects connected in parallel. Each of the test objects is a 1.5 m long line cover. An overhead line piece of 17 mm diameter is connected between Aluminium bars on both sides. This assembly is connected to the high voltage terminal of the transformer. The complete setup is kept at a height of about 1 m from ground via porcelain insulators. The photos of the entire test assembly are included in Chapter 6 below.

The metal electrodes are wound exactly in the middle of the test object and are earthed directly. The line cover surface is prepared by cleaning with Methylated spirit. The test circuit is applied with an AC voltage of 25 kV in incremental steps of 1 kV/s and maintained at 25 kV for 1 min.

Test summary:

Test performed:	AC dry withstand voltage test as per client instructions
Date of test:	21. December 2017
Test location:	HV Hall
Condition of test object:	New, Clean, Dry
Connections to test object:	Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air at ambient temperature.
Ambient conditions	Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	25 kV	60 sec	No breakdown, no flashover
Test object 2	25 kV	60 sec	No breakdown, no flashover
Test object 3	25 kV	60 sec	No breakdown, no flashover

All the three test objects have **passed** the test.

ВЯРНО С ОРИГИНАЛА

5.1.3 AC withstand voltage test – Dry (4 hours)

The test setup is similar to the AC 1 min dry withstand test. The test summary is as under:

Test performed: AC dry withstand voltage test as per client instructions
Date of test: 21. December 2017
Test location: HV Hall
Condition of test object: Partly tested (after AC 1 min withstand voltage test), Dry
Connections to test object: Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air at ambient temperature.
Ambient conditions Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	15 kV	4 hours	No breakdown, no flashover
Test object 2	15 kV	4 hours	No breakdown, no flashover
Test object 3	15 kV	4 hours	No breakdown, no flashover

All the three test objects have **passed** the test.

5.1.4 AC withstand voltage test – Wet (1 min)

The test objects are tested one after the other. The test setup is similar to the dry tests in a manner that the overhead conductor is supported on the insulators. The AC voltage is applied at one end of the conductor and the metal electrode on the surface of the protective cover is earthed directly. The rain parameters are as per IEC 60060-1:2010 for the horizontal and vertical components as well as the water conductivity limits. The test summary is as under:

Test performed: AC wet withstand voltage test as per client instructions
Date of test: 21. December 2017
Test location: HV Hall
Condition of test object: Partly tested (after AC 4 hours withstand voltage test), Wet
Connections to test object: Overhead line is connected to the test circuit and surface metal electrode is directly earthed. Test setup is suspended in air and under standard rain conditions.
Rain water intensity: 1.8 mm/min (horizontal component), 1.5 mm/min (vertical component)
Water parameters: Conductivity: 95.1 µS/cm Temperature: 18.4 °C
Ambient conditions Air temperature t: 9.8 °C Air pressure b: 1023.6 hPa Humidity h: 58.9%

Test result:

Sample	Voltage applied	Duration	Remarks
Test object 1	25 kV	60 sec	No breakdown, no flashover
Test object 2	25 kV	60 sec	No breakdown, no flashover
Test object 3	25 kV	60 sec	No breakdown, no flashover

All the three test objects have **passed** the test.

ВЯРНО С ОРИГИНАЛА

6 Photographs

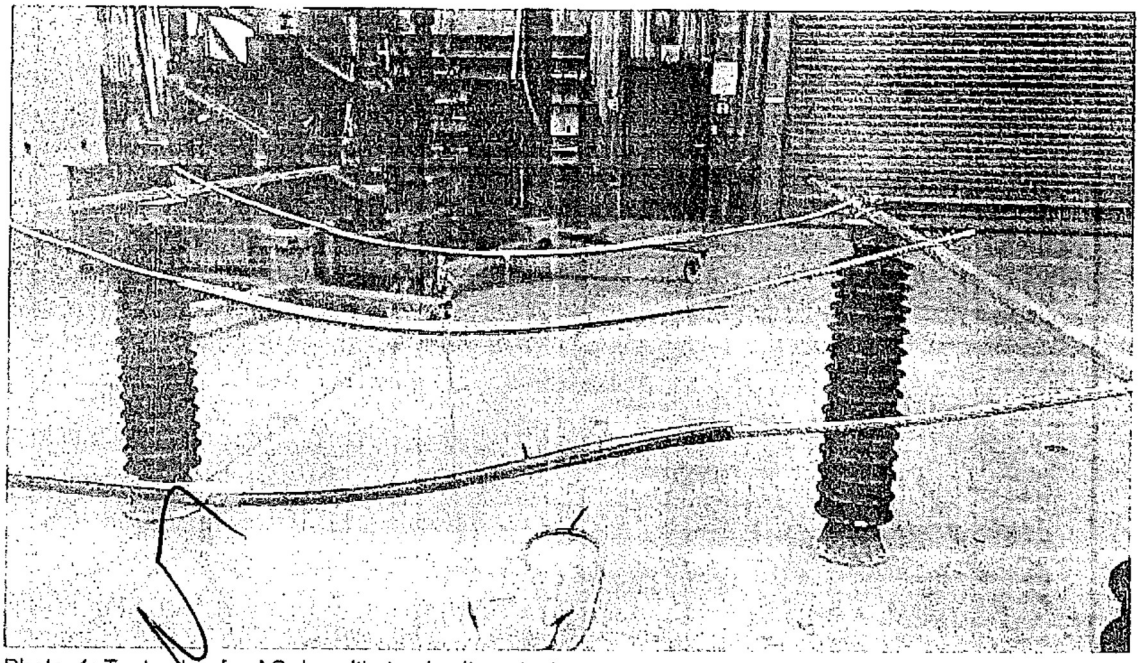

Photo. 1: Test setup for AC dry withstand voltage tests

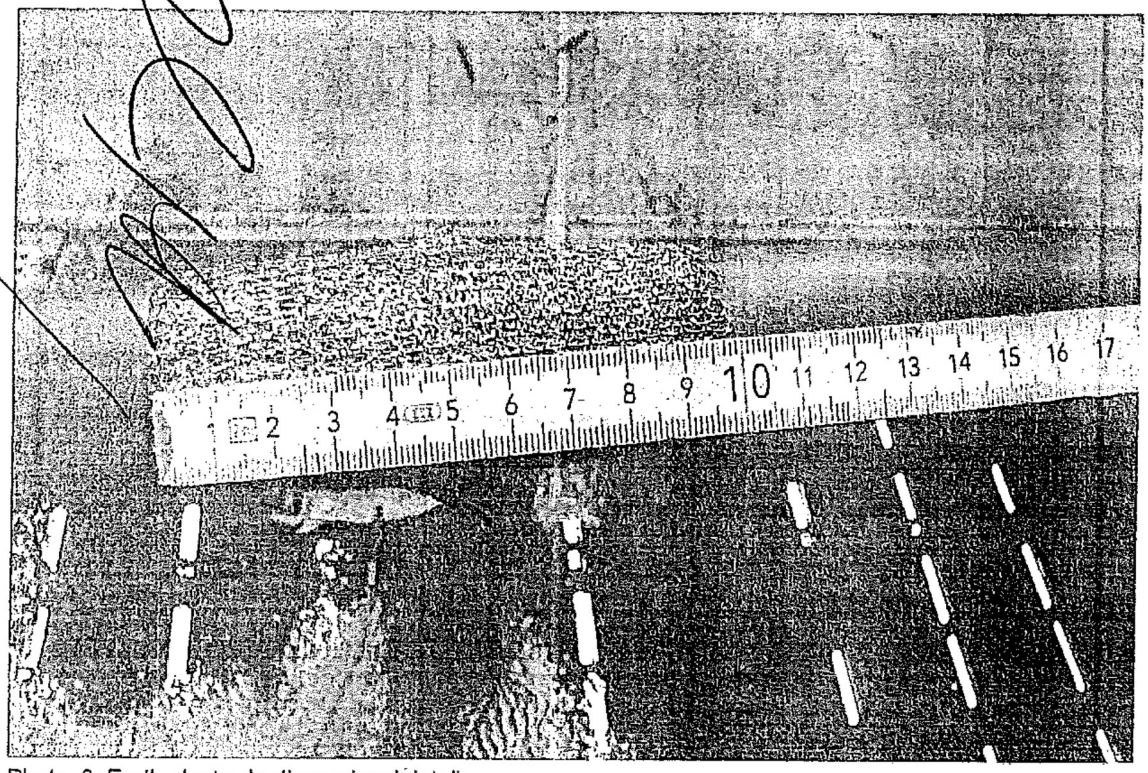

Photo. 2: Earth electrode dimensional details

ВЯРНО СЪОБРИЗНАЛА

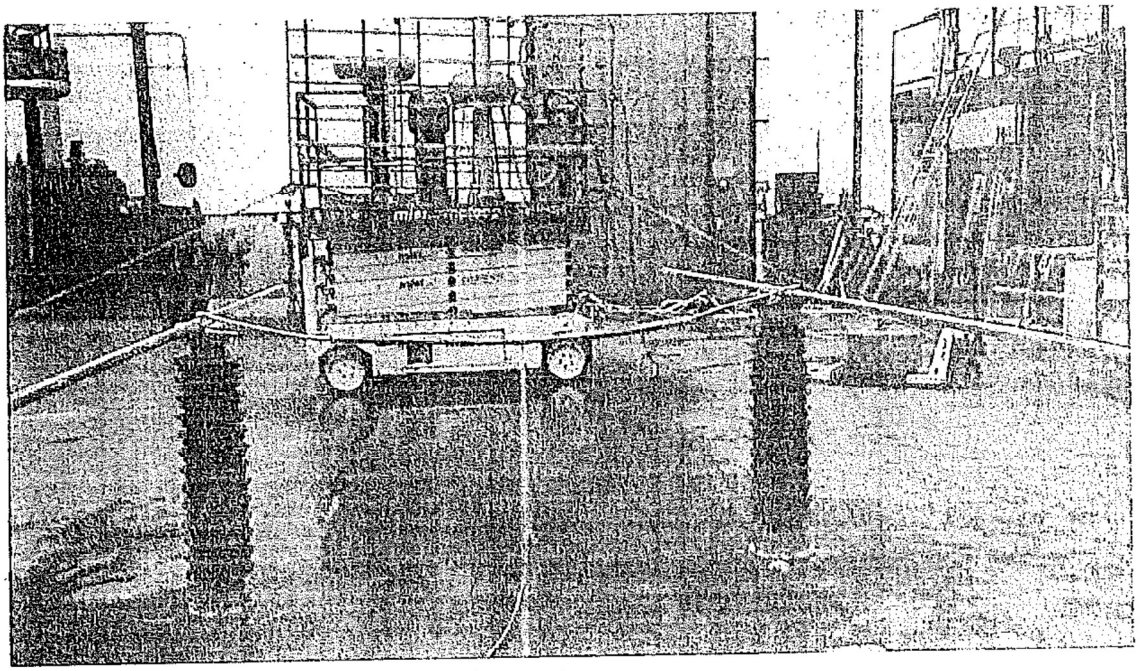

Photo. 3: Test setup for AC wet withstand voltage test

ВЯРНО С ОРИГИНАЛА