

ПРЕДЛОЖЕНИЕ

за изпълнение на обществената поръчка

ДО: „ЧЕЗ РАЗПРЕДЕЛЕНИЕ БЪЛГАРИЯ“ АД,

ОТ: АББ България ЕООД

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 Представявано от Екехарт Нойрайтер и Стефан Минчев – Управители
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УВАЖАЕМИ ГОСПОЖИ И ГОСПОДА,

Предоставяме на Вашето внимание предложението ни за изпълнение на обществена поръчка с предмет „Доставка на електрически апарати 110кV“, реф. № PPD 17-064.

Обособена позиция 3 – Доставка на напреженови измервателни трансформатори 110кV за монтаж на открито – 6бр.

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 за всички позиции от стоката по предмета на поръчката.

3. Декларирам, че предлаганото от нас оборудване отговаря на минималните технически изисквания на Възложителя, които не 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 мен 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 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, от датата на приемо – предавателен протокол за получаване на стоката от Възложителя.


8. Срок за доставка на предлаганите стоки – 90 (деветдесет) дни от датата на поръчка от Възложителя до Изпълнителя

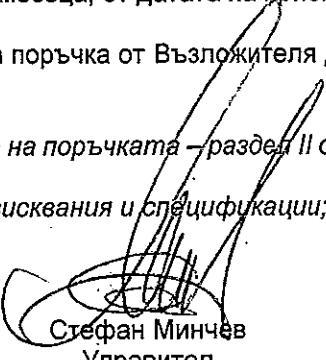
Приложения:

1. Приложение 1 - Технически изисквания и спецификации за изпълнение на поръчката – раздел II от документацията за участие – попълнени на съответните места;
2. Приложение 2 - Изисквани документи от приложение - Технически изисквания и спецификации;

Дата: 14.07.2017 г.
София

С уважение:


Екехарт Нойрайтер
Управител
АББ България ЕООД


Стефан Минчев
Управител
АББ България ЕООД

(

(

ИЗИСКВАНИЯ КЪМ ДОКУМЕНТАЦИЯТА И ИЗПИТВАНИЯТА ПО **ОБОСОБЕНА ПОЗИЦИЯ № 3**
„ДОСТАВКА НА НАПРЕЖЕНОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ 110 KV, ЗА МОНТАЖ НА ОТКРИТО“

№	Документи при участие	Приложение № (или текст)
1.	Точно обозначение на типа на напрежените измервателни трансформатори, производителя и страната на произход и последно издание на каталога на производителя	EMF-E123 ABB Sp. zo.o., Полша Приложение 1 - 161201ABB EMF-E_ENG (Dependable accuracy) HI-RES A4
2.	Удостоверение за одобряване на типа на напрежените измервателни трансформатори, издадено по реда и при условията на Закона за измерванията	Приложение 2 - Удостоверение за одобрен тип Напрежени Трансформатори тип EMF-E 123-145
3.	Техническо описание на напрежените измервателни трансформатори, гарантирани параметри и характеристики, тегло и др.	Приложение 3.1 - Технически параметри на HT EMF-E123 Приложение 3.2 - Чертеж на HT EMF-E123 Приложение 3.3 - Чертеж на клемната кутия на HT EMF-E123 Приложение 3.4 - Чертеж на табелата на HT EMF-E123 Приложение 3.5 - Ел. схема на HT EMF-E123 Приложение 3.6 - 170131 ABB 2129PL1496-w1-en. Edition 01.2017 Manual_Outdoor instrument transformers LO-RES Приложение 3.6 - EMF-E 123 Сертификат за съответствие Приложение 3.7 - Nytro_10XN_PO_EN_SDS Приложение 3.8 - Nytro_Libra_PO_EN_SDS
4.	Протоколи от типови изпитвания на напрежените измервателни трансформатори на английски или български език, проведени от независима изпитателна лаборатория с приложени резултати от изпитванията	Приложение 4 - Протоколи от типови изпитания на HT EMF-E123
5.	Сертификат/акредитация на независимата изпитателна лаборатория, провела типовите изпитвания – заверено копие	Приложение 5.1 - ISO 17025- ABB Przasnysz Приложение 5.2 - Сертификат за акредитация 117-323 324
6.	Информация за провежданите от производителя контролни (рутинни) изпитвания	Приложение 6 - Routine Test Plan for Voltage Transformer

ТАБЛИЦА 1

Стандарт на материала за напрежени измервателни трансформатори 110 kV, за монтаж на открито

Технически параметри на напрежени измервателни трансформатори 110 kV, за монтаж на открито, които се попълват от Участника в графа „Гарантирано предложение“:

Наименование на материала		Напрежен измервателен трансформатор 110:√3 / 0.1:√3 / 0.1:√3 / 0.1:√3 / 0.1:3 kV, за монтиране на открито	
Съкратено наименование на материала		НИТ 110:√3 / 0.1:√3 / 0.1:√3 / 0.1:√3 / 0.1:3 kV, OM	
№	Параметър	Изискване	Гарантирано предложение
1.	Тип/референтен номер съгласно каталога на производителя	Да се посочи	EMF-E123
2.	Производител	Да се посочи	ABB Sp. zo.o., Полша

Характеристика на материала:

Напрежени индуктивни измервателни трансформатори 110 kV, с изолаторно тяло от порцелан/полимер, и вътрешна изолационна среда - масло (без PCB), за монтиране на открито, с обявени коефициенти на трансформация (110 000:√3 / 100:√3 / 100:√3 / 100:√3 / 100:3) V, като вторичните намотки са както следва:

- две намотки за целите на измерването;
- две намотки за целите на защитата.

Напрежените измервателни трансформатори са от одобрен тип, преминали са през първоначална метрологична проверка и са маркирани със съответния знак по реда и при условията на „Наредба за

средствата за измерване, които подлежат на метрологичен контрол" по чл. 28, от Закона за измерванията.

Използване:

Напреженовите измервателни трансформатори са предназначени за захранване на напреженовите вериги на електромерите за търговско и контролно измерване на електрическа енергия, на релейните защиты и на контролно-измервателните апарати в електрическите разпределителни уредби.

Съответствие на предложеното изпълнение със стандартизационните документи:

Напреженовите измервателни трансформатори трябва да отговарят на:

- БДС EN 61869-3:2011 "Измервателни трансформатори. Част 3: Допълнителни изисквания за индуктивни напреженови трансформатори (IEC 61869-3:2011)" и на неговите валидни изменения и допълнения или еквивалентно/и.

Параметри на електрическата разпределителна мрежа

№	Параметър	Стойност
1.	Обявено напрежение	110 000 V
2.	Максимално работно напрежение	123 000 V
3.	Най-високо напрежение между фаза-земля при нормални условия	71 kV
4.	Обявена честота	50 Hz
5.	Заземяване на звездния център	Директно заземен

Характеристики на работната среда и място на монтиране

№	Характеристика/Място на монтиране	Стойност/описание
1.	Максимална околна температура	+ 40°C
2.	Минимална околна температура	Минус 25°C
3.	Относителна влажност	До 95 %
4.	Замърсяване с прах, пушек, агресивни газове и пари	Умерено
5.	Надморска височина	До 1 000 m
6.	Място на монтиране	В открити разпределителни уредби 110 kV

Конструктивни характеристики и др. данни за напреженови измервателни трансформатори 110 kV за монтаж на открито, за които Участникът декларира в техническото си предложение – Раздел V от настоящата документация, че предложеното от него оборудване отговаря на посочените минимални технически изисквания на Възложителя, посочени в таблицата по-долу:

№	Характеристика	Минимални технически изисквания
1.	Конструкция	а) Напреженовите измервателни трансформатори трябва да бъдат от подпорен тип с изолаторно тяло от порцелан/полимер и вътрешна изолираща среда от масло (без РСВ)
		б) Напреженовите измервателни трансформатори трябва да бъдат съоръжени с подходящи клеми с винтови съединения, за свързване на първичната намотка и клемен блок за свързване на вторичните вериги.
2.	Вторични намотки - брой и предназначение	а) две намотки за целите на измерването б) две намотки за целите на защитата
3.	Монтиране	Напреженовите измервателни трансформатори трябва да позволяват монтиране във вертикално положение.
4.	Клеми за свързване на първичната намотка	Клемите трябва да бъдат изработени от подходящ метал или метална сплав, недопускащи електрохимична корозия.
5.	Клемен блок за свързване на вторичните вериги	а) Клемният блок трябва да бъде поместен в защитна клемна кутия с IP44, с възможност за пломбиране
		б) Клемите на клемният блок трябва да бъдат изработени от месинг или друга подходяща некорозираща сплав.

№	Характеристика	Минимални технически изисквания
6.	Резбови и скрепителни съединения	Всички резбови и скрепителни съединения трябва да бъдат изработени от подходящи некорозиращи метали или метални сплави.
7.	Маркиране на обявените стойности	Напрежените измервателни трансформатори трябва да бъдат маркирани с информация за обявените стойности върху табелка съгласно изискванията БДС EN 61869-3 или еквивалентно/и.
8.	Маркиране на изводите	Изводите на напрежените измервателни трансформатори трябва да бъдат маркирани трайно и четливо съгласно изискванията на БДС EN 61869-3 или еквивалентно/и.
9.	Първоначална проверка и знаци за удостоверяване (съгласно разпоредбите на Закона за измерванията)	а) При доставка, напрежените измервателни трансформатори трябва да бъдат с извършена, валидна към момента първоначална метрологична проверка.
		б) Първоначалната метрологична проверка трябва да бъде удостоверена със знак за първоначална проверка и копието на протокола от проведените изпитвания.
10.	Транспортна опаковка	Напрежените измервателни трансформатори трябва да бъдат защитени посредством подходяща опаковка, предпазваща ги от повреди и въздействия на околната среда, подредени и закрепени на транспортни палети.
11.	Експлоатационна дълготрайност	≥ 25 години

Общи технически параметри, характеристики и др. данни за напрежени измервателни трансформатори 110 kV за монтаж на открито, за които Участникът декларира в техническото си предложение – Раздел V от настоящата документация, че предложеното от него оборудване отговаря на посочените минимални технически изисквания на Възложителя, посочени в таблицата по-долу:

№	Параметър	Минимални технически изисквания
1.	Обявено първично напрежение	110 000:√3 V
2.	Обявени вторични напрежения:	
-	за измервателните намотки	100:√3 V ; 100:√3 V
-	за намотките за защитите	100:√3 V ; 100:3 V
3.	Обявена честота	50 Hz
4.	Обявени коефициенти на трансформация:	
-	измервателни намотки	(110:√3 / 0,1:√3 / 0,1:√3) kV
-	защитни намотки	(110:√3 / 0,1:√3 / 0,1:3) kV
5.	Изолаторно тяло	Порцелан или полимер
6.	Класове на точност:	
-	измервателната намотка - търговско мерене	≤ 0,2
-	измервателна намотка - контролно мерене	≤ 0,2
-	2 бр. намотки за защитите: 1 бр. схема звезда; и 1 бр. схема отворен триъгълник за ЗС	≤ 3 P
7.	Номинална вторична мощност:	
-	измервателни намотки	≥ 15 VA
-	защитни намотки	≥ 30 VA
8.	Обявен коефициент на напрежение и обявено време на прилагане:	
-	измервателни намотки	≥ 1,2 продължително; и ≥ 1,5 за 30 S
-	защитни намотки	≥ 1,2 продължително; и ≥ 1,5 за 30 S
9.	Обявено издържано напрежение с промишлена честота за изолацията на първичната намотка	230 kV (ефективна стойност)
10.	Обявено издържано напрежение с мълниев импулс за изолацията на първичната намотка	550 kV (върхова стойност)
11.	Обявено издържано напрежение с промишлена честота на изолацията за вторичните намотки	3 kV (ефективна стойност)

№	Параметър	Минимални технически изисквания
12.	Най-високо напрежение за съоръженията, U_m	123 kV (ефективна стойност)
13.	Път на пропълзяване по повърхността на изолатора	≥ 31 mm/kV
14.	Сеизмична устойчивост	≥ 0.3 g

Дата: 14.07.2017 г.
София

С уважение:



Екехарт Нойрайтер
Управител
АББ България ЕООД



Стефан Минчев
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Certificate

Standard **ISO 9001:2015**

Certificate Registr. No. 01 100 1541808

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including the locations according to annex

Scope: Research and development as well as design, programming, manufacturing, sale, process and final testing, services and turnkey execution:

- distribution and power transformers, insulation kits as well as painting and welding works; dry transformers including also components for dry transformers, components for traction transformers
- low, medium and high voltage electrical apparatus and power systems;
- automation products including control and measurement equipment, motors, interlocks
- and protection, informative as well as automation systems for power facilities and industry;
- gas compressor and metering stations, gas compressor units and equipment, underground gas storages, gas pipelines and similar services for gas industry petroleum refineries and petrochemical industry;
- robots and industrial robotics stations;
- supercharging of diesel and gas engines;
- main host;
- production of low voltage motors;
- production of power electronics and medium voltage drives.
- Computer software production and implementation.

Technical training in scope of automatics, robotics and electrical power equipment and systems

Programs science and research in the fields of power and automation

Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

Validity:

The certificate is valid from 2016-11-29 until 2019-11-28.
First certification 2013

2016-11-24

Gregorz Guabka

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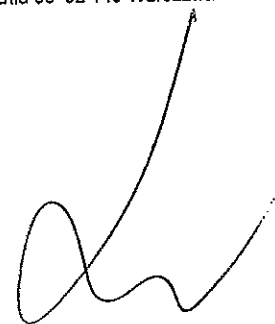
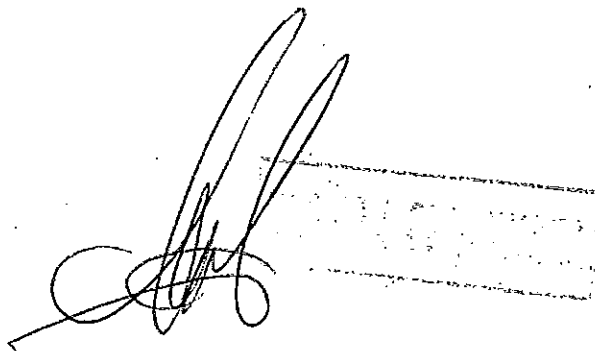
0198 113 00113 /08 **Oddział we Wrocławiu**
ABB Sp. z o.o.
ul. Graniczna 8B
54-610 Wrocław

0198 113 00113 /09 **Oddział we Wrocławiu**
ABB Sp. z o.o.
ul. Bacciarellego 54
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2016-11-24

Gregorz Guabka

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Стандарт **ISO 9001:2015**
Рег. Ном.: 01 100 1541808
Носител на сертификата: АББ Сп. з о.о.
ул. Зеганска 1
04-713 Варшава
включително локациите съгласно приложението

Обхват: Проучване и разработване, както и проектиране, програмиране, производство, продажба, процедиране и финално изпитване, сервизни услуги и цялостно изпълнение „под ключ“ на следното:

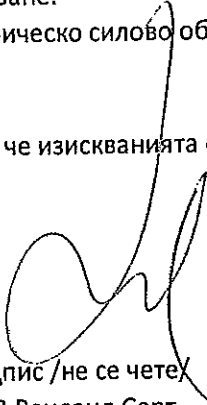
- Разпределителни и силови трансформатори, изолационни комплекти, както и работи по боядисване и заваряване; сухи трансформатори включително също компоненти за сухи трансформатори, компоненти за тягови трансформатори
- Електрически апарати за ниско, средно и високо напрежение и електрически системи
- Продукти за автоматизация включително апаратура за управление и измерване, двигатели и блокировки
- И защита, информативна както и система за автоматизация за енергийни обекти и индустрията
- Газ-компресорни и измервателни станции, газ-компресорни блокове и оборудване, подземни хранилища за газ, газопроводи и подобни услуги за газовата индустрия петролни рафинерии и нефтената химическа промишленост
- Главно хранилище
- Роботи и индустриални роботизирани станции
- Суперзареждане на дизелови и газ двигатели
- Производство на двигатели ниско напрежение
- Производство на силова електроника и задвижвания за двигатели средно напрежение
- Производство на компютърен програмен софтуер и внедряване.

Техническо обучение в обхват на автоматика, роботика и електрическо силово оборудване и системи.

Доказателства са представени, въз основа на проведения одит, че изискванията съгласно ISO 9001:2015 са изпълнени.

Валидност: Този сертификат е валиден от 29.11.2016г. до 28.11.2019 г.
Първа сертификация 2013 г.

24.11.2016 г.


Подпис /не се чете/
ТЮВ Реиланд Серт
Am Grauen Stein, 51105 Кьолн



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Приложение към СЕРТИФИКАТ

Стандарт **ISO 9001:2015**

Рег. Ном.: 01 100 1541808

№	Локация:	Обхват
0198 113 00113/01	АББ Сп. з о.о. ул. Зеганска 1 ПЛ 04-713 Варшава	както е в сертификата
0198 113 00113/02	Клон в Луч, АББ Сп. з о.о. ул. Александровска67/93, ПЛ-91-205 Луч	
0198 113 00113/03	Клон в Александровие Лучким, АББ Сп. з о.о. ул. Плачидовска 27 ПЛ-95-070 Александров Лучким	
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0198 113 00113/05	Клон в Краков, АББ Сп. з о.о. ул. Старовислна 13А ПЛ-31-038 Краков	
0198 113 00113/06	Клон в Елблагу, АББ Сп. з о.о. ул. Кролевиецка 11 ПЛ-82-300 Елблаг	

Приложение към СЕРТИФИКАТ

Стандарт **ISO 9001:2015**

Рег. Ном.: 01 100 1541808

0198 113 00113/07
Клон в Пшаснич,
АББ Сп. з о.о.
ул. Лесно 59
ПЛ-06-300 Пшаснич

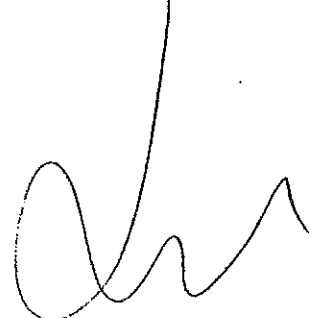
0198 113 00113/08
Клон в Вроцлав,
АББ Сп. з о.о.
ул. Гранична 8В
ПЛ-54-610 Вроцлав

0198 113 00113/09
Клон в Вроцлав,
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ул. Бачиарелего 54
ПЛ-51-649 Вроцлав

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ул. 17 Стижна 56 02-146 Варшава

Стр.2 от 2



Certificate

Standard **ISO 14001:2015**

Certificate Registr. No. 01 104 1541809

Certificate Holder: **ABB Sp. z o.o.**
ul. Żegańska 1
04-713 Warszawa

Scope: including the locations according to annex
Research and development as well as design, programming, manufacturing, sale, process and final testing, services and turnkey execution:

- distribution and power transformers, insulation kits as well as painting and welding works; dry transformers including also components for dry transformers, components for traction transformers
- low, medium and high voltage electrical apparatus and power systems;
- automation products including control and measurement equipment, motors, Interlocks
- and protection, informative as well as automation systems for power facilities and industry;
- gas compressor and metering stations, gas compressor units and equipment, underground gas storages, gas pipelines and similar services for gas industry petroleum refineries and petrochemical industry;
- robots and industrial robotics stations;
- supercharging of diesel and gas engines;
- main host;
- production of low voltage motors;
- production of power electronics and medium voltage drives.
- Computer software production and implementation.

Technical training in scope of automatics, robotics and electrical power equipment and systems
Programs science and research in the fields of power and automation

Proof has been furnished by means of an audit that the requirements of ISO 14001:2015 are met.

Validity:

The certificate is valid from 2016-11-29 until 2019-11-28.
First certification 2013

2016-11-24

Gregor Guabka

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

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Annex to certificate

Standard **ISO 14001:2015**

Certificate Registr. No. 01 100 1541809



No.	Location	Scope
0198 113 00113 /01	ABB Sp. z o.o. ul. Żegańska 1 04-713 Warszawa	As for certificate
0198 113 00113 /02	Oddział w Łodzi ABB Sp. z o.o. ul. Aleksandrowska 67/93 91-205 Łódź	
0198 113 00113 /03	Oddział w Aleksandrowie Łódzkim ABB Sp. z o.o. ul. Placydowska 27 95-070 Aleksandrów Łódzki	
0198 113 00113 /04	Oddział w Krakowie ABB Sp. z o.o. ul. Wadowicka 12 30-415 Kraków	
0198 113 00113 /05	Oddział w Krakowie ABB Sp. z o.o. ul. Starowiślna 13A 31-038 Kraków	
0198 113 00113 /06	Oddział w Elblągu ABB Sp. z o.o. ul. Królewiecka 11 82-300 Elbląg	

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Annex to certificate

Standard **ISO 14001:2015**

Certificate Registr. No. 01 100 1541809

- 0198 113 00113 /07 **Oddział w Przasnyszu**
ABB Sp. z o.o.
ul. Leszno 59
06-300 Przasnysz
- 0198 113 00113 /08 **Oddział we Wrocławiu**
ABB Sp. z o.o.
ul. Graniczna 8B
54-610 Wrocław
- 0198 113 00113 /09 **Oddział we Wrocławiu**
ABB Sp. z o.o.
ul. Bacciarellego 54
51-649 Wrocław

2016-11-24

Gregorz Guabka
TÜV Rheinland Polska Sp. z o.o.
ul. 17 Stycznia 56 02-146 Warszawa

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[Faint rectangular stamp]

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СЕРТИФИКАТ

/превод от английски език/

Стандарт **ISO 14001:2015**
Рег. Ном.: 01 104 1541809
Носител на сертификата: АББ Сп. з о.о.
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Валидност: Този сертификат е валиден от 29.11.2016г. до 28.11.2019 г.
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Am Grauen Stein, 51105 Кьолн

Приложение към СЕРТИФИКАТ

Стандарт	ISO 14001:2015	
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Приложение към СЕРТИФИКАТ

Стандарт **ISO 14001:2015**

Рег. Ном.: 01 104 1541809

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АББ Сп. з о.о.
ул. Лесно 59
ПЛ-06-300 Пшаснич

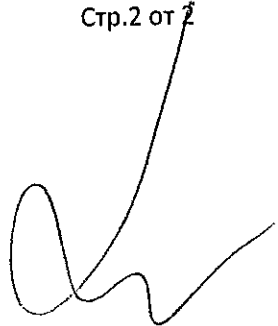
0198 113 00113/08 Клон в Вроцлав,
АББ Сп. з о.о.
ул. Гранична 8В
ПЛ-54-610 Вроцлав

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АББ Сп. з о.о.
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ПЛ-51-649 Вроцлав

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Стр.2 от 2



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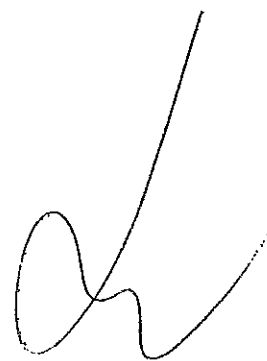
C

**„Доставка на електрически апарати
110кV“, реф. № PPD 17-064.**



**Обособена позиция 3 – Доставка на
напреженови измервателни
трансформатори 110кV за монтаж на
открито – 6бр.**

ПРИЛОЖЕНИЕ 1



C

C

Масло напълнени Измервателни трансформатори

Напреженос трансформатори тип EMF-E 52-145 kV

Надеждна точност

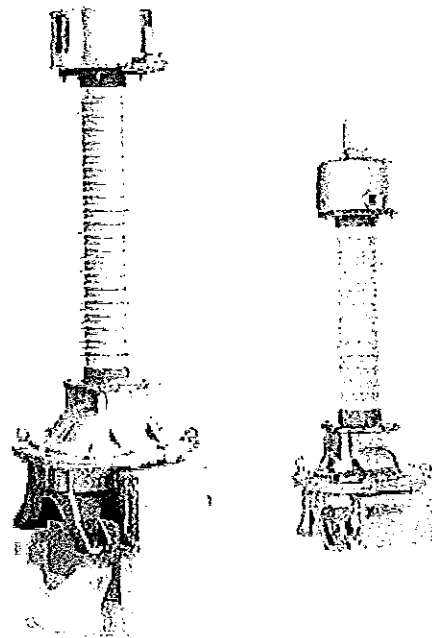
Индуктивен напреженос трансформатор тип EMF-E е с еднофазна конструкция, с ядро с разпределена-междина с ниски загуби, за стабилна работа. Трансформаторът има масло-изолирана, защитена конструкция, предназначен за монтаж на открито.

Features

- Разработени и изпитани в съответствие със стандарт IEC 61869-3
- Херметически затворен с газова възглавница или разширителен съд
- Ядро с ниска плътност на поток с 190% пренапрежение за 8 часа
- Висока точност и термична мощност
- Наличие на полимерни и порцеланови изолатори

Ползи

- Лесен монтаж и пускане в експлоатация
- Максимална надеждност и минимална поддръжка
- Подходящ за широк спектър от условия на околната среда, включително и силно замърсените райони
- Добри сеизмични показатели
- Отлична инженерингови решения за различни приложения



Технически данни

Тип		EMF-E072	EMF-E084	EMF-E123	EMF-E 145
Най-високо напрежение на оборудването Um	[kV] (r.m.s.)	72.5	84	126	145
Изпитвателно напрежение с промишлена честота	[kV] (r.m.s.)	140	150	230	275
Изпитвателно напрежение с импулсна вълна	[kV] (peak)	325	380	550	650
Номинална честота	[Hz]	50 или 60Hz			
Номинално вторично напрежение	[V]	100/√3; 100/3; 100; 110/√3; 110/3; 110; 115/√3; 115/3; 115; други по заявка			
Напреженос фактор		до 1.9x за 8 часа			
Клас на точност		0,1; 0,2; 0,5; 1,0; 3,0; 3P; 6P (IEC) други стандарти по заявка			
Обща номинална мощност	[VA]	До 2000	До 2000	До 4000	До 4000

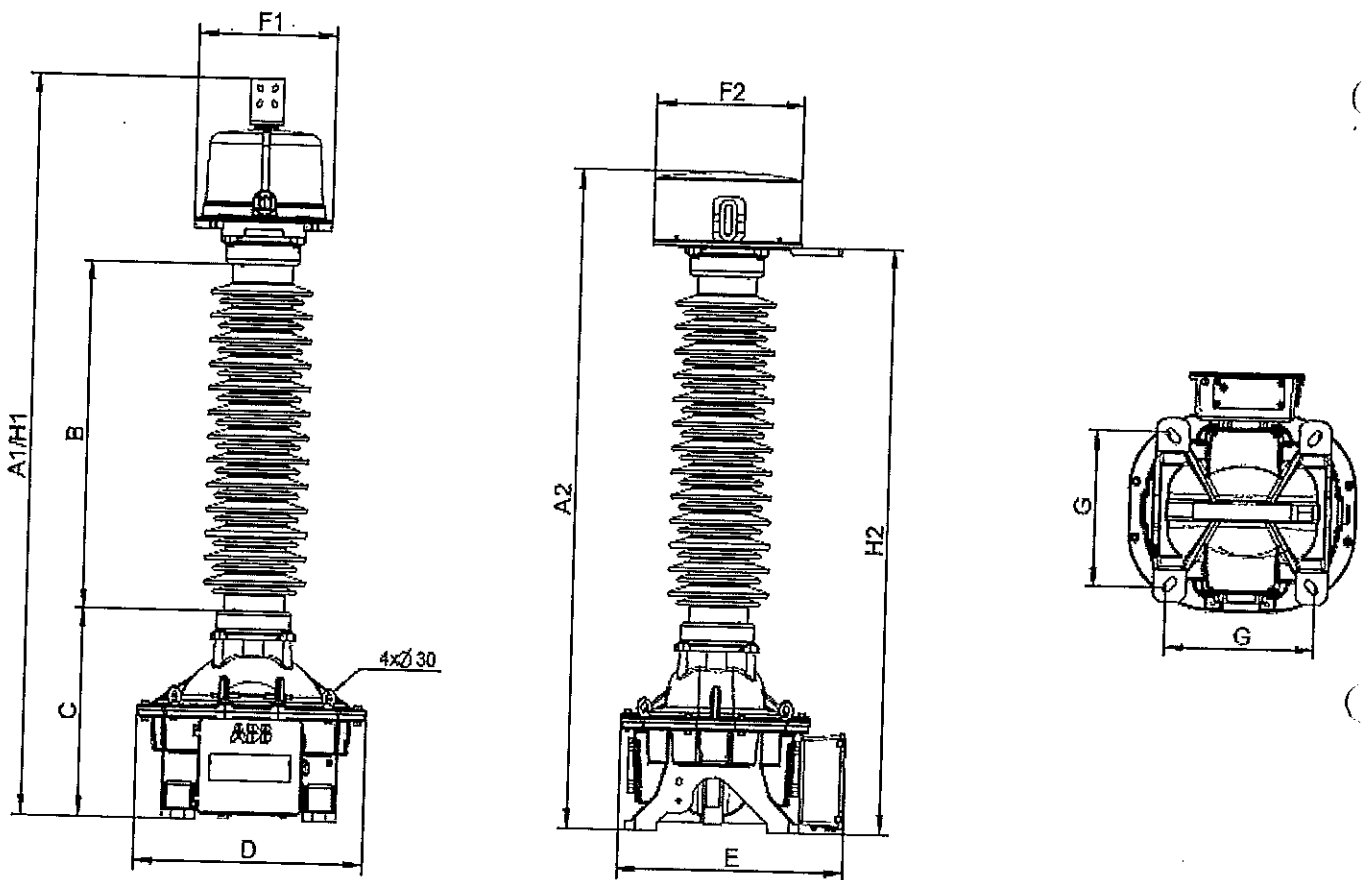
Стандартни параметри са показани по-горе. Свържете се с АББ, за каквито и да било изисквания, които не са показани.

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Размери и тегла

		EMF-E072	EMF-E084	EMF-E123	EMF-E 145
A (A1/A2) – Обща Височина	[mm]	1580/1450	1925/1795	2144/1907	2354/2117
B – Разстояние между линия и земя	[mm]	660	1005	1005	1215
C – Височина към най-ниската незаземена част	[mm]	491	491	602	602
D - Широчина	[mm]	535	535	693	693
E - Дълбочина	[mm]	618	618	691	691
F (F1/F2) – Диаметър на разширителния съд	[mm]	350/450	350/450	416/450	416/450
G – Монтажни размери	[mm]	310-350 x 310-350	310-350 x 310-350	410-450 x 410-450	410-450 x 410-450
H (H1/H2) – Височина на първичната клема	[mm]	1580/1239	1925/1584	21444/1695	2354/1905
Път на утечка	[mm]	1813	3075	3075	3650
Тегло	[kg]	185	210	300	315
Тегло на маслото	[kg]	35	40	60	62

Информацията по-горе е базирана на порцеланов изолатор, с път на утечка >25mm/kV и е идентичен за двата типа разширителни системи, с изключения на A1, F1, H1 за с газова възглавница и A2, F2, H2 за разширителен съд



За повече информация, моля свържете се с

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Oil-filled instrument transformers

Type EMF-E 52-145 kV voltage transformer

Dependable accuracy

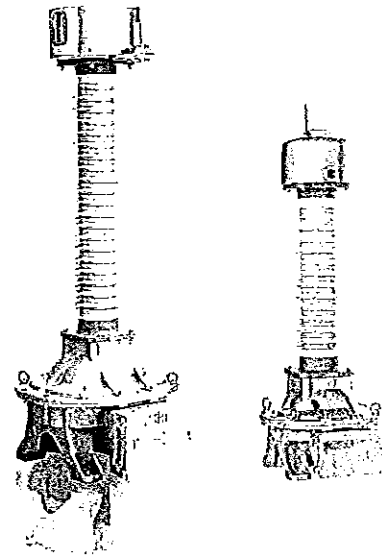
Inductive voltage transformer EMF-E is a single phase design with distributed-gap low-loss core design for stable performance. The transformer has oil insulated shield-graded construction intended for outdoor installations.

Features

- Designed and tested in accordance with latest IEC 61869-3
- Hermetically sealed with gas cushion or bellows expansion system
- Low core flux density with 190% overvoltage for 8 hours
- High accuracy and thermal burden
- Polymeric and porcelain insulators available

Benefits

- Easy installation and commissioning
- Maximum reliability and minimal maintenance
- Suitable for wide range of environmental conditions, including heavily polluted areas
- Good seismic performance
- Excellent application engineering support



Technical data

Type		EMF-E072	EMF-E084	EMF-E123	EMF-E145
Highest voltage for equipment U_m	[kV] (r.m.s.)	72.5	84	126	145
Rated power-frequency withstand voltage	[kV] (r.m.s.)	140	150	230	275
Rated lightning impulse withstand voltage	[kV] (peak)	325	380	550	650
Rated frequency	[Hz]	50 or 60Hz			
Rated secondary voltage	[V]	100/ $\sqrt{3}$; 100/3; 100; 110/ $\sqrt{3}$; 110/3; 110; 115/ $\sqrt{3}$; 115/3; 115; others on request			
Voltage factor		Up to 1.9x for 8 hours			
Accuracy class		0,1; 0,2; 0,5; 1,0; 3,0; 3P; 6P (IEC) other standards on request			
Rated thermal limiting output	[VA]	Up to 2000	Up to 2000	Up to 4000	Up to 4000

Standard ratings shown above. Contact ABB for any requirements not shown.

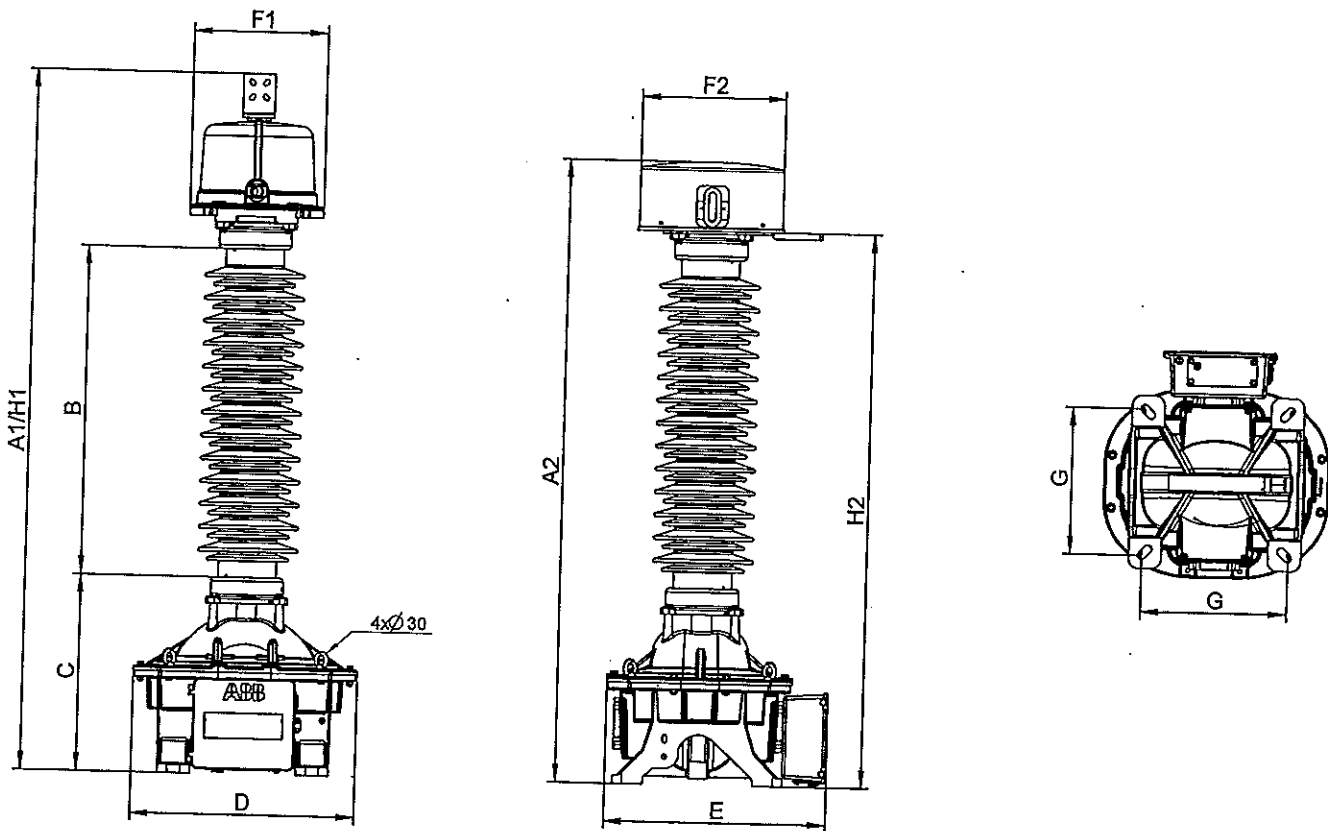


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Dimensions and weights

		EMF-E072	EMF-E084	EMF-E123	EMF-E145
A (A1/A2) – Overall height	[mm]	1580 / 1450	1925 / 1795	2144 / 1907	2354 / 2117
B – Arcing distance	[mm]	660	1005	1005	1215
C – Height to lowest ungrounded part	[mm]	491	491	602	602
D – Front-view dimension	[mm]	535	535	693	693
E – Side-view dimension	[mm]	618	618	691	691
F (F1/F2) – Expansion system diameter	[mm]	350 / 450	350 / 450	416 / 450	416 / 450
G – Mounting dimensions	[mm]	310-350 x 310-350	310-350 x 310-350	410-450 x 410-450	410-450 x 410-450
H (H1/H2) – Height to primary terminal	[mm]	1580 / 1239	1925 / 1584	2144 / 1695	2354 / 1905
Creepage distance	[mm]	1813	3075	3075	3650
Weight	[kg]	185	210	300	315
Oil volume	[kg]	35	40	60	62

All above information is based on porcelain insulator ≥ 25 mm/kV creepage distance and it is identical for both expansion systems, with exception of A1; F1; H1 for gas cushion expansion tank and A2; F2; H2 for bellows.



For more information please contact:

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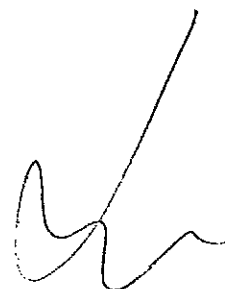
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**„Доставка на електрически апарати
110кV“, реф. № PPD 17-064.**

**Обособена позиция 3 – Доставка на
напреженови измервателни
трансформатори 110кV за монтаж на
открито – 6бр.**

ПРИЛОЖЕНИЕ 2



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РЕПУБЛИКА БЪЛГАРИЯ
Български институт по метрология
REPUBLIC OF BULGARIA
Bulgarian Institute of Metrology



Handwritten mark

**УДОСТОВЕРЕНИЕ
ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ**
Measuring Instrument Type-approval Certificate

№ 17.06.5121

Издадено на производител: ABB Sp. z o.o., ul. Leszno 59, 06-300 Przasnysz, Poland
Issued to manufacturer:

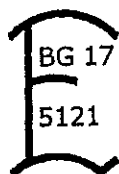
На основание на:
In Accordance with:

чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г., изм. бр. 88 от 05 г., изм. и доп. бр. 95 от 2005 г.)

Относно:
In Respect of:

измервателни напреженови трансформатори тип
EMF-E 123/EMF-E 145

Знак за одобрен тип:
Type Approval Mark:



**Технически и метрологични
характеристики:**
*Technical and metrological
characteristics:*

приложение, неразделна част от настоящото
удостоверение за одобрен тип средство за измерване

Срок на валидност:
Valid until:

07.06.2027 г.

**Вписва се в регистъра на
одобрените за използване
типове средства за
измерване под №:**
Reference №:

5121

**Дата на издаване на
удостоверението за
одобрен тип:**
Date:

07.06.2017 г.

И. Д. ПРЕДСЕДАТЕЛ:

Паун Илчев



страница 1 от 2

Приложение към удостоверение за одобрен тип № 17.06.5121

Издадено на производител: ABB Sp. z o.o., ul. Leszno 59, 06-300 Przasnysz, Poland

Относно: измервателни напреженови трансформатори тип EMF-E 123/EMF-E 145

1. Описание на типа:

Измервателни напреженови трансформатори тип EMF-E 123/EMF-E 145 се използват за измерване и защита на електрически мрежи с максимално допустимо работно напрежение до 126 kV и 145 kV.

Измервателни напреженови трансформатори тип EMF-E 123/EMF-E 145 са еднофазни трансформатори, проектирани са да работят в мрежи с ефективно заземена или изолирана неутрала, както и за компенсирани системи. Предназначени са за външен монтаж.

Активната част се намира в казан, който служи също и, като основа на трансформаторите и който трябва да бъде заземен. Измервателни напреженови трансформатори тип EMF-E 123/EMF-E 145 могат да имат до шест вторични намотки, които са изведени до клемната кутия. Заземеният казан се отделя от клемата високо напрежение с порцеланов или композитен изолатор. Вътрешната изолация на трансформаторите е изолационна хартия, импрегнирана с трансформаторно масло.

Първичната клемма се намира на плоча, която се намира на изолатора на трансформатора. Контактната повърхност на първичната клемма трябва да бъде равна и почистена от оксидните слоеве преди да се свърже. Към подготвената по този начин клемма, кабелните клеми трябва да се присъединят с болтове M12.

Вторичните намотки са свързани с клемните блокове, поставени в клемната кутия на дъното на трансформатора.

Две заземителни клеми са разположени диагонално на долния казан. Контактната повърхност трябва да бъде равна от слоеве оксиди, за да стане равна и гладка. Трябва да се нанесе тънък слой от проводяща смазка, за да се подобри контакта. Връзката за заземяване се реализира с болтове от неръждаема стомана.

2. Технически и метрологични характеристики:

Характеристики	Тип на трансформатора EMF-E 123/EMF-E 145
Максимално работно напрежение, kV	126; 145
Номинално първично напрежение, V	до 115/√3 до 145/√3
Номинално вторично напрежение, V	100/√3; 100/3; 100; 110/√3; 110/3; 110; 115/√3; 115/3; 115
Номинална честота, Hz	50
Коефициент на напрежение и време на прилагане	до 1,9/8h
Клас на точност: - измервателна намотка - защитна намотка	0,1; 0,2; 0,5; 1; 3; 3P; 6P
Мощност на вторичните намотки, VA	до 4000

3. Типово означение: EMF-E 123/EMF-E 145

4. Описание на местата, предназначени за поставяне на знаци от метрологичен контрол:

- Знакът за одобрен тип (марка за залепване) се поставя на табелката с техническите данни;
- Знакът за първоначална проверка (марка за залепване) се поставя над табелката с технически данни, под знака за одобрен тип.



**„Доставка на електрически апарати
110кV“, реф. № PPD 17-064.**



**Обособена позиция 3 – Доставка на
напреженови измервателни
трансформатори 110кV за монтаж на
открито – 6бр.**

ПРИЛОЖЕНИЕ 3



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Технически данни : Напреженов Трансформатор

Дата : 2017-06-20 Име : bozena.trajer@pl.abb.com
 CCP Number: - Ревизия : A
 Наш реф. : KU 597/17
 Проект : CEZ Bulgaria

Общи данни	6
Количество	EMF-E123
Тип	IEC 61869-3
Стандарт	Окрит
Монтаж	Масло / хартия херметичен
Изолация	ABB, Полша
Производител, страна	

Работни условия	kV r.m.s.	123
Highest voltage of a system (phase-to-phase) U_{sys}	Hz	50
Rated frequency f_R	°C	-40/ +40
Ambient air temperature (Temperature category)	°C ≤	35
Average ambient air temp. (period 24h)	m	1000
Altitude		AF5
Seismic activity acc. to IEC 62271-300		

Номинално изолационно ниво	kV r.m.s.	123
Най-високо напрежение за оборудването (фаза-фаза) U_m	kV peak	550
Обявено издържано напрежение с мълниев импулс 1,2/50 μ s	kV r.m.s.	230
Обявено издържано напрежение с промишлена честота, сухо	kV r.m.s.	230
Обявено издържано напрежение с промишлена честота, мокро		

Оношение на напрежението	V	110000 / $\sqrt{3}$
Номинална първично напрежение U_{pr}		1.2/продължително &
Ном. Напреженов фактор F_v / ном. време		1.5/30s

Класове на точност

Намотка №	Ном. Втор. напр. U_{sr}	Ном. мощност S_r	клас	Обща . мощност	Терм.	No. на кл. Кут.	Капак за пломб	ог g
					огр. мощност			
I (1a - 1n)	100 : $\sqrt{3}$ V	15 VA	0,2	60 VA	1000 VA	1	-	-
II (2a - 2n)	100 : $\sqrt{3}$ V	15 VA	0,2	60 VA	1000 VA	1	-	-
III (3a - 3n)	100 : $\sqrt{3}$ V	30 VA	1/3P	60 VA	1000 VA	1	-	-
IV (da - dn)	100 : 3 V	30 VA	3P	90 VA	450 VA	1	-	-

Данни за продукта

Оразмерителен чертеж	2GKV614917A0597;rev.A
Език на табелката	Български
Тип изолатор / цвят	Порцелан / кафяв
Мин. път на утечка	4495 mm
Мин. дъгово разстояние	1425 mm
Тип на първичните клеми	Al плоска шина 100x120 T=20 4xD=14/50x50mm 2x ϕ 14/28-60mm
Earthing terminals type	Phoenix rail клемни блокове;
Secondary terminal type	винтова връзка, тип UK 10 N
Cable glands – terminal box No. 1	Без кабелни уплътнения
Изпитано издържано FRнатоварване на първичните клеми	(Статично/дин)N 3600/5000

Боядисване (цвят)

- Корпус над изолятора		Не е боядисан
- Корпус под изолятора		Не е боядисан
Общо тегло	kg	350
Тегло на маслото	kg	65
Тип на изолационното масло		Nynas Nytro 10XN – inhibited mineral insulating oil acc. to IEC 60296
Опаковане		Вертикално-3-броя в дървена каса
Тегло на пратката	kg/Зброй	1121
Размери на пратката	cm x cm x cm/Зброй	231x91x261
Обем на пратката	m3/Зброй	5,4

ABB**Data Schedule : Inductive Voltage Transformer**

Date :	2017-06-20	Name :	bozena.trajer@pl.abb.com
CCP Number:	-	Revision :	A
Our ref :	KU 597/17		
Project :	CEZ Bulgaria		

General data	
Quantity	6
Type	EMF-E123
Standards	IEC 61869-3
Design	Outdoor
Insulation	Oil / paper hermetic
Manufacturer, country	ABB, Poland

Service conditions	
Highest voltage of a system (phase-to-phase) U_{sys}	kV r.m.s. 123
Rated frequency f_R	Hz 50
Ambient air temperature (Temperature category)	°C -40/ +40
Average ambient air temp. (period 24h)	°C ≤ 35
Altitude	m 1000
Seismic activity acc. to IEC 62271-300	AF5

Rated insulation level	
Highest voltage for equipment (phase-to-phase) U_m	kV r.m.s. 123
Rated lightning impulse withstand voltage 1,2/50 μs	kV peak 550
Rated power-frequency withstand voltage, dry	kV r.m.s. 230
Rated power-frequency withstand voltage, wet	kV r.m.s. 230

Voltage ratings	
Rated primary voltage U_{pr}	V 110000 / $\sqrt{3}$
Rated voltage factor F_V / Rated time	1.2/continuous & 1.5/30s

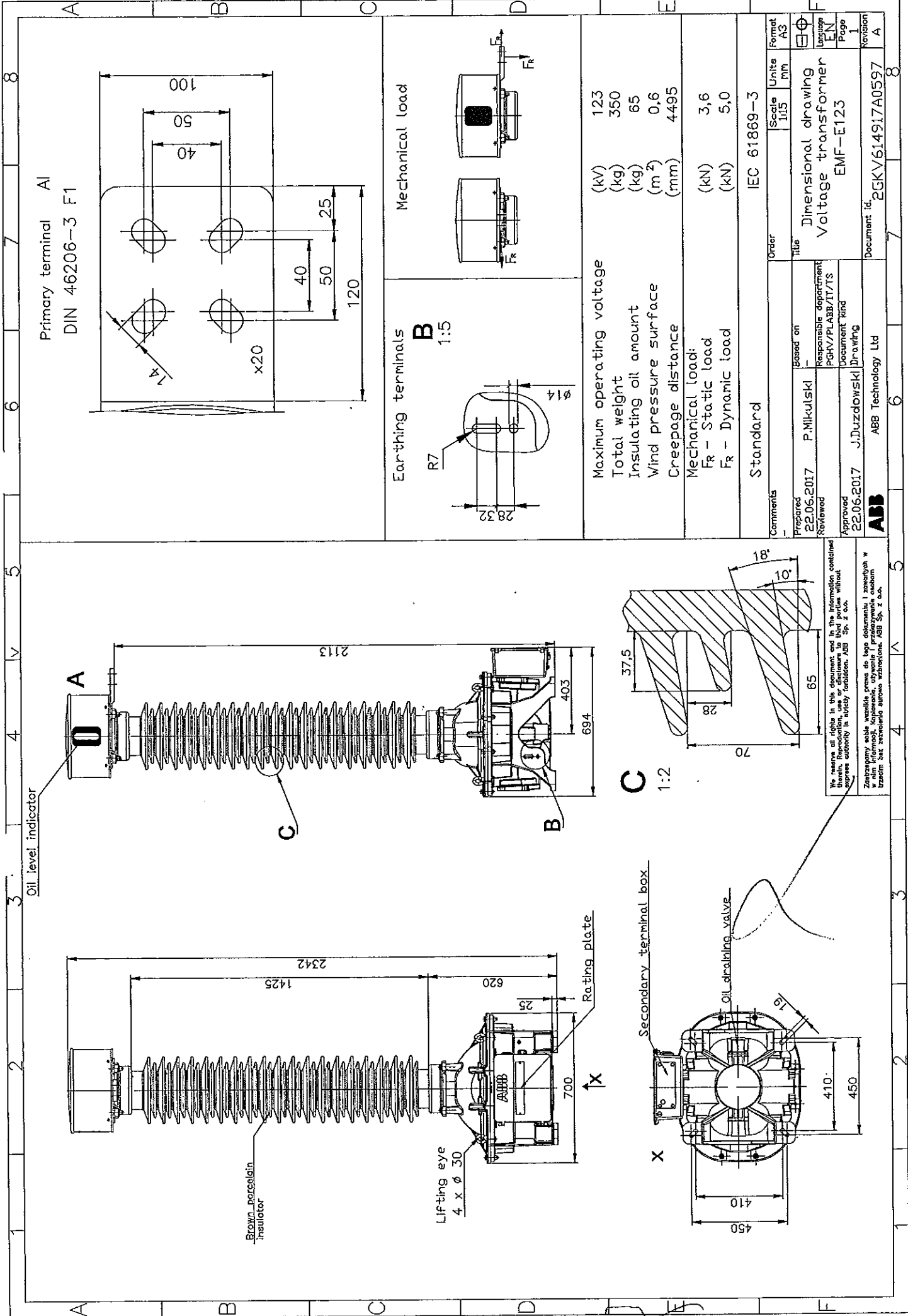
Accuracy ratings

Winding No.	Rated sec. voltage U_{sr}	Rated output S_r	Class	Total simult. output	Thermal limiting output	No. of terminal box	Cover for sealing
I (1a - 1n)	100 : $\sqrt{3}$ V	15 VA	0,2	60 VA	1000 VA	1	-
II (2a - 2n)	100 : $\sqrt{3}$ V	15 VA	0,2	60 VA	1000 VA	1	-
III (3a - 3n)	100 : $\sqrt{3}$ V	30 VA	1/3P	60 VA	1000 VA	1	-
IV (da - dn)	100 : 3 V	30 VA	3P	90 VA	450 VA	1	-

Product data

Dimension drawing	2GKV614917A0597;rev.A
Rating plate language	Bulgarian
Insulator type / colour	Porcelain / brown
Minimum creepage distance	mm 4495
Minimum arcing distance	mm 1425
Primary terminal type	Al flat pad 100x120 T=20 mm; 4xD=14/50x50mm
Earthing terminals type	2x ϕ 14/28-60mm
Secondary terminal type	Phoenix rail terminal blocks; screw connection, type UK 10 N without cable glands
Cable glands – terminal box No. 1	
Withstand test load on primary terminal FR	(Static/Dyn)N 3600/5000
Painting (colour)	Not painted
- Housing above insulator	

Housing below insulator		
Total weight	kg	Not painted 350
Weight of oil	kg	65
Insulating oil type		Nynas Nytro 10XN – inhibited mineral insulating oil acc. to IEC 60296
Packing		Vertical -3-pack wooden pallet
Shipping weight	kg/3unit	1121
Shipping dimensions	cm x cm x cm/3unit	231x91x261
Shipping volume	m3/3unit	5,4



Primary terminal AI
DIN 46206-3 F1

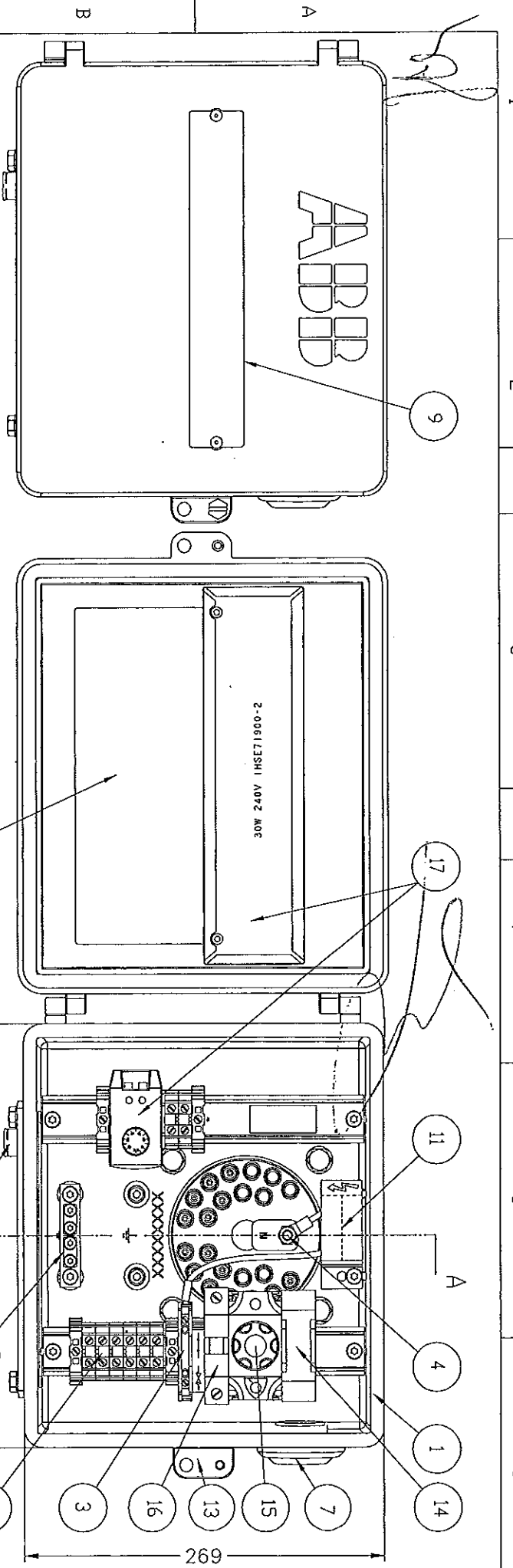
Earthing terminals

Mechanical load

Maximum operating voltage (kV) 123
 Total weight (kg) 350
 Insulating oil amount (kg) 65
 Wind pressure surface (m²) 0,6
 Creepage distance (mm) 4495
 Mechanical load:
 Fr - Static load (kN) 3,6
 Fr - Dynamic load (kN) 5,0

Standard IEC 61869-3

Comments	Order	Scale	Units	Format
Prepared 22.06.2017 P.Mikulski	Title	1:1.5	mm	AS
Reviewed	based on			
Approved 22.06.2017 J.Duzdowski	Responsible department			
	Document kind			
	Document id.			
	Document title			
	Language			
	Page			
	Revision			

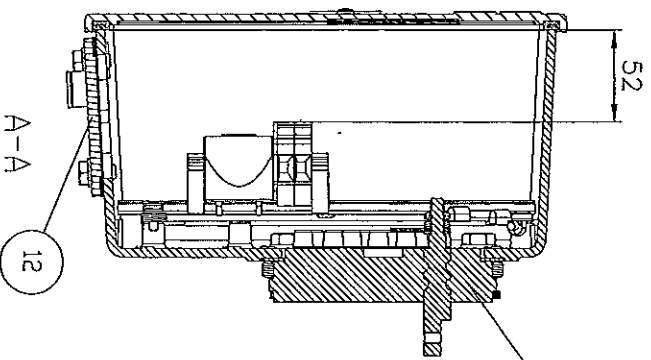
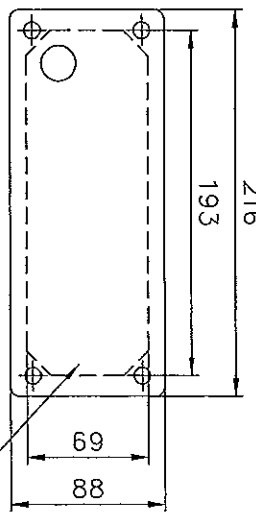


- STANDARD EQUIPMENT**
1. Terminal box
 2. Terminal blocks for secondary terminals
 3. Voltage coil screen terminal "E"/g4"
 4. Voltage coil primary winding terminal "N"
 5. Earthing bar
 6. Resin bushing
 7. Ventilation device
 8. Drain tube
 9. Rating plate
 10. Schematic diagram plate
 11. Warning plate
 12. Removable terminal flange
 13. Place for padlock

- OPTIONS**
14. Fuse Busmann type
 15. Fuse Diazed type
 16. MCB with or without auxiliary contacts
 17. Heating plate with thermostat 240V AC 30 W (required external power supply)

Number of secondary terminals	Type of secondary terminals	Cable ending according to DIN 46237
≤ 12	UK10N	10 mm ²
≤ 12	OTTA6	6 mm ²
≤ 12	USS16	6 mm ²

Note: The number of secondary circuits presented on the drawing is pictorial only. The actual number of circuits will be according to the order (and the offer)



Comments	Drawn	Scale	Units	Format
Proposed	2017-01-24	7:20	mm	A3
Reviewed	Z. Wesolowski			
Approved	2017-01-24			
2017-01-24	J. Bilzowski			
2017-01-24				

Responsible department	2GKVV/RS54	Document no.	Secondary terminal box of voltage instrument transformer EMF-E123
Document type	PGHV/PL/TC/DIT	Document no.	2GKVV615012
Approved	J. Bilzowski	Document no.	2GKVV615012
2017-01-24		Document no.	2GKVV615012

IP55



ABB Technology Ltd

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Revision

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ABB		Произведено ABB	
Напряженой трансформатор	Тип	EMF-E123	Production year
Серия №	Стандарт	2GGK Vnnnnnn	IEC 61869-3
Изоляционно ниво	Темп.	123/230/550 KV	-40/40° C
Номинальное первичное напряжение	Транспортиране	110000/13 V	Вертикално
Частота	Тезло	50 Hz	350 kg
ВНИМАНИЕ: Херметично устройство, не отбърквайте. Моля за проба с виеща съвласно инструкциите на производителя.			
		245	

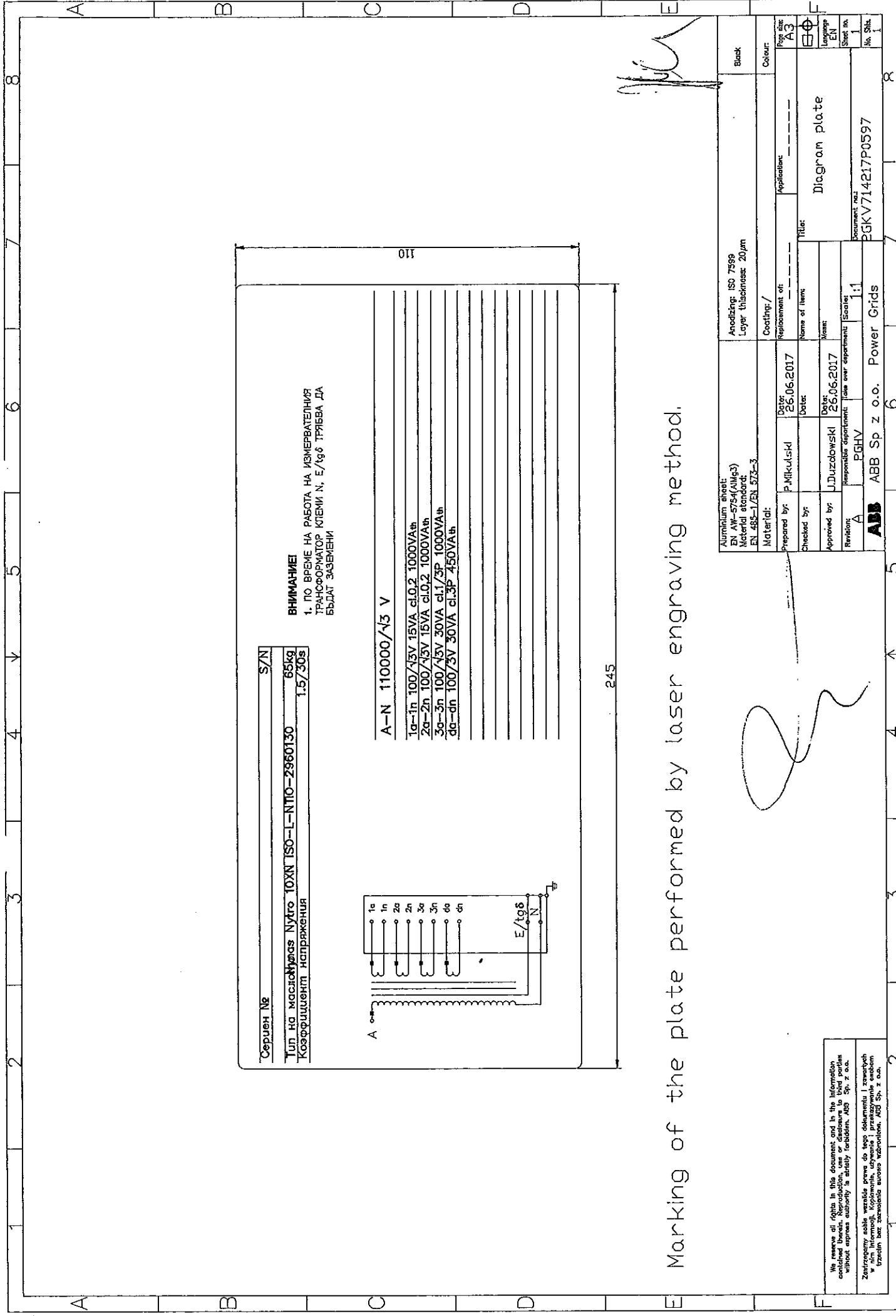
Serial number 2GGK Vnnnnnn

Production year yyyy = Actual year of production

Marking of the plate performed by laser engraving method.

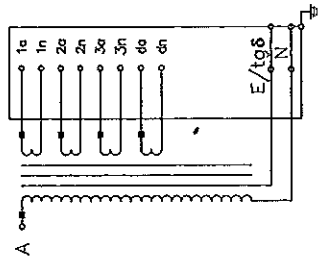
Aluminium sheet: EN AW-5754 (AlMg3) Material standard: EN 485-1/EN 573-3		Anodizing: ISO 7599 Layer thickness: 20µm		Block
Material:	Coating: /	Colour:		
Prepared by: P.MIKULSKI	Date: 26.06.2017	Replacement of:	Page size: A4	
Checked by:	Date:	Name of item:	Title: Rating plate	
Approved by: J.DUZDOWSKI	Date: 26.06.2017	Mass:	Language: EN	
Responsible department: A	Date over department: 1.1	Scenes:	Sheet no: 1	
ABB		ABB Sp z o.o. Power Grids		No. Shtk: 1
		Document no: 2GKV714117P0597		

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Сериен № S/N
 Тип на маслото Нутро 10ХН 150-L-NT10-2960130
 Коэффициент напряжения 1.5/30s
 65kg

ВНИМАНИЕ!
 1. ПО ВРЕМЕ НА РАБОТА НА ИЗМЕРВАТЕЛНИЯ
 ТРАНСФОРМАТОР КИТЕНИ N, E/Tgδ ТРЯБВА ДА
 БЪДАТ ЗАЗЕМЕНИ



A-N 110000/43 V
 1a-1n 100/43V 15VA cl.0.2 1000VAth
 2a-2n 100/43V 15VA cl.0.2 1000VAth
 3a-3n 100/43V 30VA cl.1/3P 1000VAth
 4a-4n 100/3V 30VA cl.3P 450VAth

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Marking of the plate performed by laser engraving method.

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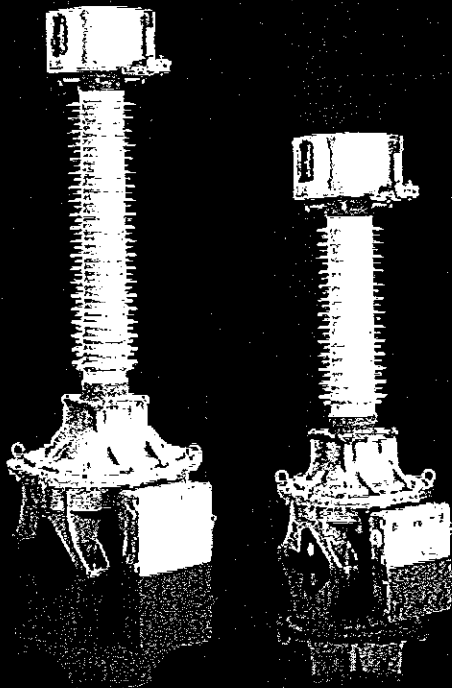
Aluminium sheet: EN AW-5754(A1Mg3) Material standard: EN 485-1/EN 575-3	Anodizing: ISO 7599 Layer thickness: 20µm	Back
Material:	Coating: /	Colour:
Prepared by: P. Mikulski	Date: 25.06.2017	Application: Diagram plate
Checked by:	Date:	Reproduction of:
Approved by: J. Duzdowski	Date: 25.06.2017	Name of item:
Revision: A	Responsible department: Power grids	Scale:
ABB		Document no.: BGKV714217P0597

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Manual
Outdoor instrument transformers
EMF-E type

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General information	Outdoor instrument transformers	3
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	Packaging, transport and storage	6
EMF-E 52-145 kV	Installation	8
	Maintenance	10
	Oil sampling	11
	Dielectric dissipation factor measurement (tg δ)	13
	Anti-condensation heater	14
Pre-/post-energizing	Disposal	15
	Troubleshooting	17
	Checklist	18

Outdoor instrument transformers

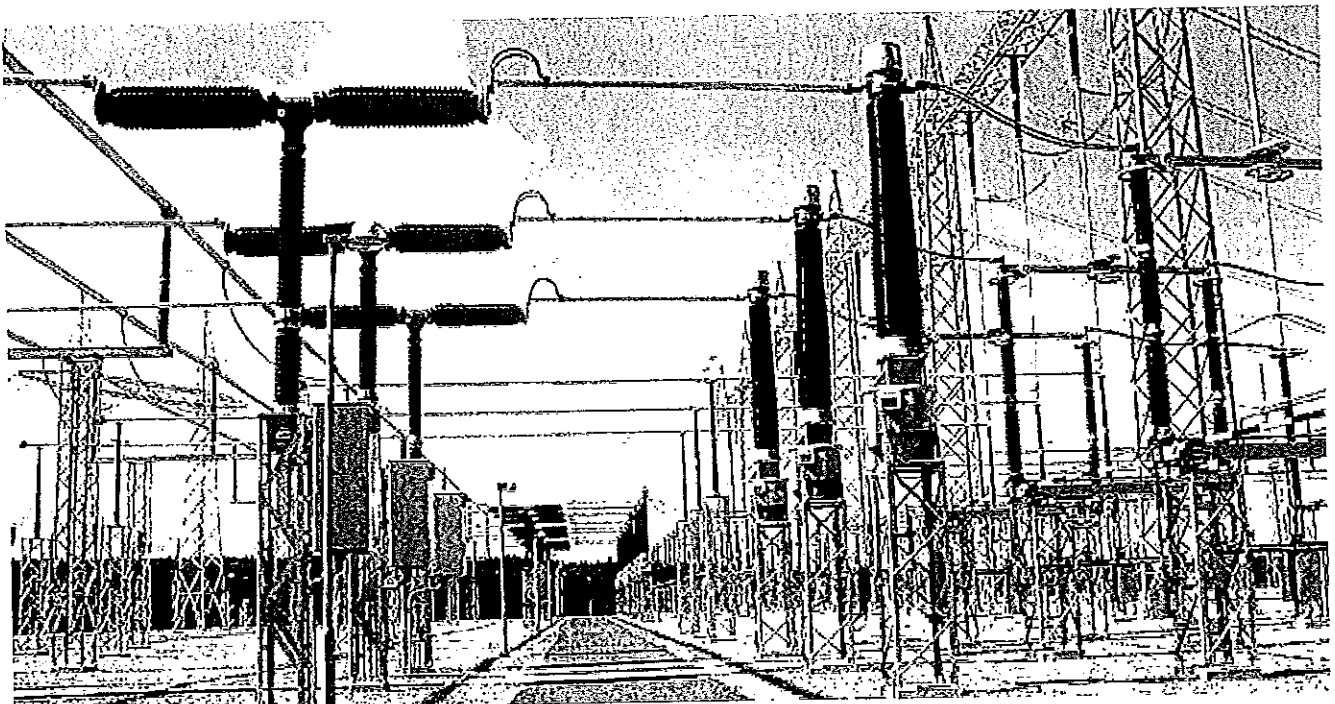
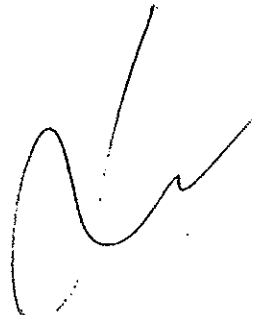
ABB has been producing instrument transformers for more than 60 years. Thousands of our products perform vital functions in electric power networks around the world – day after day, all year round. Their main applications include revenue metering, control, indication and relay protection.

All instrument transformers supplied by ABB are tailor-made to meet the needs of our customers. An instrument transformer must be capable of withstanding very high stresses in all climatic conditions. We design and manufacture our products for a service life of at least 30 years. Actually, most last even longer.

Thank you for purchasing an ABB outdoor instrument transformer. Please carefully read the applicable parts of this manual before installing and energizing the instrument transformer.

The manual should be saved for future reference for the entire service life of the instrument transformer. The figures in this manual are only intended for illustrative purposes.

Please contact your local ABB office if you have any questions.



Definitions

System voltage

The system voltage is the maximum voltage (phase to phase), expressed in kV RMS, of the system for which the equipment is intended. It is also known as maximum system voltage.

Rated insulation level

The combination of voltage values that characterize the insulation of an instrument transformer with regard to its capability to withstand dielectric stresses. The rated value given is valid for altitudes ≤ 1000 m above sea level. A correction factor is introduced for higher altitudes.

Lightning impulse test

The lightning impulse test is performed with a standardized wave shape – 1.2/50 μ s – for simulation of lightning overvoltage.

Rated power frequency withstand voltage

This test is to show that the apparatus can withstand the power frequency overvoltages that can occur. The rated power frequency withstand voltage indicates the required withstand voltage. The value is expressed in kV RMS.

Rated SIWL

For voltages ≥ 300 kV the power-frequency voltage test is partly replaced by the switching impulse test. The wave shape 250/2500 μ s simulates switching overvoltage. The rated switching impulse withstand level (SIWL) indicates the required withstand level phase-to-ground (phase-to-earth). The value is expressed in kV as a peak value.

Rated chopped wave impulse withstand voltage, phase-to-ground

The rated chopped wave impulse withstand level at 2 μ s and 3 μ s respectively, indicates the required withstand level phase-to-ground (phase-to-earth).

Installation altitude

If installed > 1000 m above sea level, the external dielectric strength is reduced due to the lower density of the air. Always specify the installation altitude and normal rated insulation levels. ABB will make the needed correction when an altitude higher than 1000 meters ASL is specified. Internal insulation is not affected by installation altitude, and dielectric routine tests will be performed at the rated insulation levels.

Creepage distance

The creepage distance is defined as the shortest distance along the surface of an insulator between high voltage and ground.

Rated frequency

The rated (power) frequency is the nominal frequency of the system expressed in Hz for which the instrument transformer is designed to operate. Standard frequencies are 50 Hz and 60 Hz. Other frequencies, such as 16 2/3 Hz and 25 Hz, might be applicable for some railway applications.

Ambient temperature

Average 24-hour ambient temperature above the standardized $+35^{\circ}\text{C}$ influences the thermal design of the transformer and must therefore be specified.

Pollution level

Environmental conditions with respect to pollution are sometimes categorized in pollution levels. Five pollution levels are described in IEC 60815-1.

Wind load

The specified wind load for an instrument transformer intended for outdoor normal conditions is based on a wind speed of 34 m/s.

RCT

The secondary winding resistance at 75°C

Simultaneous output (IEC)

Metering windings and protection windings not connected in broken delta are considered as under simultaneous load. A protection winding connected in broken delta is not considered as a simultaneous load.

Voltage factor (F_v)

It is important that the voltage transformer, for thermal and protection reasons, can withstand and reproduce the continuous-fault overvoltages that can occur in the grid. The overvoltage factor is abbreviated as F_v . The IEC standard specifies a voltage factor of 1.2 continuously and simultaneously 1.5/30 s. for systems with effective grounding with automatic fault tripping, and 1.9/8 h for systems with insulated neutral points without automatic ground fault systems.

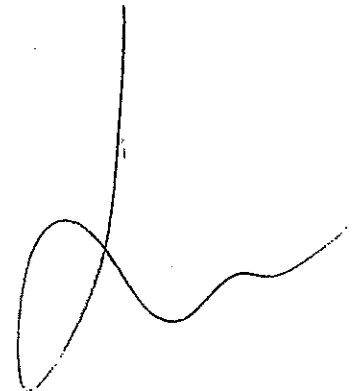
Accuracy, according to IEC, for measuring windings is fulfilled between 0.8 and 1.2 x rated voltage and for protection windings up to the voltage factor (1.5 or 1.9 x rated voltage).

Thermal Limiting Output

Thermal Limiting Output is the total power the transformer can supply without excessively high temperature rise. The transformer is engineered so that it can be loaded with the impedance corresponding to the load at rated voltage, multiplied by the square of the voltage factor. This means that at a voltage factor of 1.9/8 h, for example, the limit load = total rated load x 1.9². The transformer cannot be subjected to a higher limit load without exceeding the rated load. Consequently, because of load considerations, it is unnecessary to specify a higher thermal limit load.

Ferro resonance

Ferro resonance is a potential source of transient overvoltage. Three-phase and single-phase switching, blown fuses, and broken conductors can result in overvoltage when ferro resonance occurs between the magnetizing impedance of a transformer and the system capacitance of the isolated phase or phases. For example, the capacitance could be as simple as a length of cable connected to the ungrounded winding of a transformer. Another example of ferro resonance occurring is when an inductive voltage transformer is connected in parallel with a large grading capacitor across the gap of a circuit breaker. Ferro resonance is usually known as a series resonance.



Packaging, transport and storage

General information

As far as the height permits, instrument transformers are shipped vertically in packages of three or as single units; see Figure 1 on the next page. Single units can also be shipped in the horizontal position depending on the type of transformer.



Note!

Transformers delivered in horizontal crates shall always be transported, if transported horizontally, with the same side up as when delivered.

Special optional accessories, such as ground terminals, are kept in the terminal box or are secured inside the crate together with the primary terminals. Dampers, adapters, etc. are secured to the bottom of the crate or packed in a separate crate. The crate materials and packing methods for instrument transformer are specified in the following chapters of this document.

Crate markings

The following applies to crates:

- A packing list and unpacking instructions are stapled to the inside of the crate.
- All crates transported in the vertical position are marked with position tags that are stapled on opposite sides of the crate.
- The crate label is painted on all four sides. The gross weight is painted on two opposite sides of the crate.
- When transported horizontally, the goods label is stapled on two sides of the crate, both the long and the short side. For vertical transportation the goods label is stapled on the two short sides of the crate.

Crate disposal

The crates consist of a bottom frame, sides and cover made of wood. There are also a number of nails, screws and brackets. Furthermore, there are strips of felt or foam rubber to protect the paint (only applicable for painted units). These components can be recycled according to local regulations.

Heat treatment of crates

The wooden transport crates have been debarked and heat treated in conjunction with kiln drying.

Transportation

An instrument transformer is packed in an export crate, designed to withstand the stresses of transport and storage. However, the following have to be considered during transport:

- The instrument transformer must be handled with care to avoid mechanical damage.
- Lifting of the crate is preferably by forklift. If slings are used, make sure that the slings pass outside the crossbar at the bottom of the crate to avoid the risk of dropping the crate.
- Transformers packed vertically must not be tilted more than 45° during transport or storage.



Caution!

Transformers delivered in horizontal crates shall always be transported, if transported horizontally, with the same side up as when delivered.

Unpacking

Instructions for unpacking and lifting accompany each transformer. When unpacking, check the contents of the crate against the packing list attached inside each crate, and inform the nearest ABB representative if there is a discrepancy. Crate damage may be a sign of rough transport. Immediately register all claims regarding any visible damage to the crates or the contents, as well as any shortages, with the carrier and the appropriate insurance agent. In the event of damage, it is advisable to take photos with high resolution.



Caution!

Do not install or attempt to repair any transformer showing visible damages.

Be especially observant of signs of oil leakage and insulator damage, and that oil is visible in the oil level glass on the transformer. Leakage must be immediately localized.

Handwritten mark resembling a stylized 'S' or '3'.

Storage

The unit must be stored on a flat and stable surface with a suitable load capacity, and if possible, in its original packaging.



Caution!

Do not install or attempt to repair any transformer showing visible damages.



Caution!

Transformers delivered in horizontal crates shall always be stored with the same side up as when delivered.



Caution!

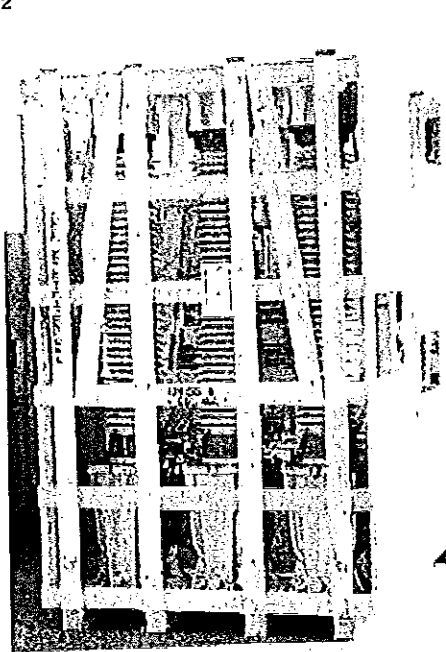
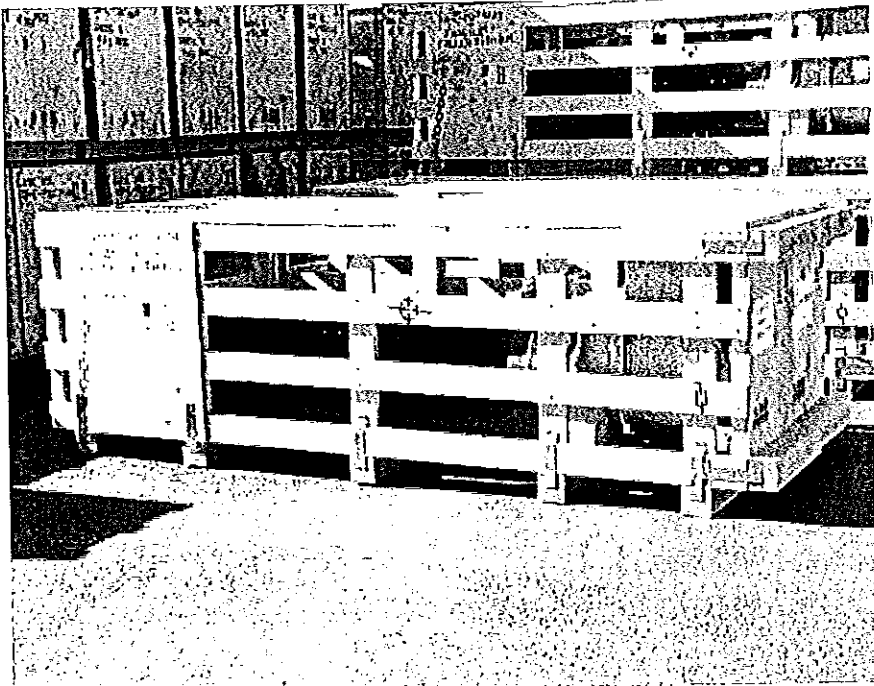
Horizontal crates can be stacked with maximum three crates.

For extended storage, the contact surfaces should be protected from corrosion. Before placing in service, ensure that all contact surfaces are thoroughly cleaned.

If the unit is stored horizontally under unfavorable climatic conditions, corrosion can occur on secondary terminals and accessories in the terminal box. This because drainage is optimized for the upright position only. When stored horizontally, the terminal box must be checked for condensation and penetrating moisture. Before long-term storage, appropriate measures must be taken, such as connecting any available heating elements, or placing silica gel or an equivalent drying agent in the terminal box. This applies for storage of up to two years. For longer storage of up to five years, the transformer must be stored indoors or under a roof. The maximum time for storage in the original crate without any protection is six months. If the transformer is stored protected, make sure the building is very well ventilated.

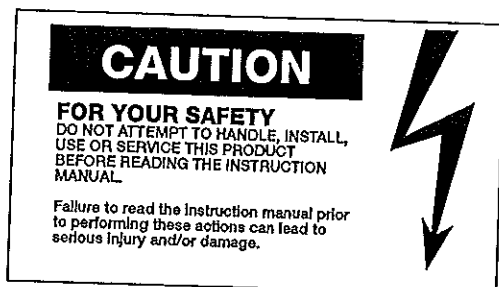
Handwritten signature or scribble.

1 Example of a single unit packed using a horizontal single package | 2 Example of three units packed using vertical three pack



Handwritten mark resembling a stylized 'S' or '3'.

EMF-E 52-145 kV Installation



Safety notice

This inductive voltage transformer should be installed within the design limitations as described on its rating plate and in these instructions. Follow your company's safety procedures. This product is intended to be operated and maintained by qualified persons who are thoroughly trained and who understand the hazards involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this device.

WARNING

DETAILED DESCRIPTIONS OF STANDARD REPAIR PROCEDURES, SAFETY PRINCIPLES AND SERVICE OPERATIONS ARE NOT INCLUDED. IT IS IMPORTANT TO NOTE THAT THIS DOCUMENT CONTAINS CERTAIN WARNINGS AND CAUTIONS REGARDING CERTAIN SPECIFIC SERVICE METHODS THAT COULD CAUSE PERSONAL INJURY TO SERVICE PERSONAL OR COULD DAMAGE EQUIPMENT OR RENDER IT UNSAFE. PLEASE UNDERSTAND THAT THESE WARNINGS CANNOT COVER ALL CONCEIVABLE WAYS IN WHICH SERVICE, WHETHER OR NOT RECOMMENDED BY ABB, MIGHT BE PERFORMED OR POSSIBLE HAZARDOUS CONSEQUENCES OF EACH CONCEIVABLE WAY, NOR COULD ABB INVESTIGATE ALL SUCH WAYS. ANYONE USING SERVICE PROCEDURES OR TOOLS, WHETHER OR NOT RECOMMENDED BY ABB, MUST THOROUGHLY ENSURE ONESELF THAT NEITHER PERSONAL NOR EQUIPMENT SAFETY WILL BE JEOPARDIZED BY THE SERVICE METHOD OR TOOLS SELECTED.

All information contained in this manual is based on the latest product information available at the time of printing. The right is reserved to make changes at any time without notice.

Delivery

Immediately check the inductive voltage transformer for any transport damage upon delivery. Damage to packaging may be a sign of rough handling. Note any damage (it is advisable to take pictures) and contact the appropriate insurance company. Check the transformer. Be especially observant of signs of oil leakage and insulator damage and that oil is visible in the oil level glass. Leakage must be immediately localized.

Lifting the instrument transformer

Each package is delivered with detailed lifting instructions that must be complied with when lifting. Any deviation from the instructions may harm the product. If the transformer is delivered in the vertical position, carefully read the instructions since tilting the product may be harmful.

The detailed lifting instructions can be sent separately if requested. Please contact your ABB representative for further information.



Caution!

The inductive voltage transformer must be placed in the vertical position at least 24 hours before energizing.

Assembly

Each transformer should be checked for possible oil leakage, porcelain damage and other damage caused by rough handling. Check that the oil level is correct according to the maintenance chapter. If not, carefully check for possible oil leakage and contact ABB for further instructions.

Prior to assembly, ensure that the support structure is flat and horizontal. The tolerance for flatness is 1.5 mm. Any gap between support structure and the mounting feet of the unit must be within 1 mm. If not, correct with washers. Deformation of the bottom tank may otherwise occur and possibly lead to oil leakage and/or insulator damage.

Connecting secondary terminals in the terminal box

The secondary terminals must be carefully connected. There are markings on the terminal block. There is a wiring diagram on the transformer's rating plate, inside the terminal box. Each unused secondary winding must be grounded at one point. Ground terminals are located in the secondary terminal box.



Caution!

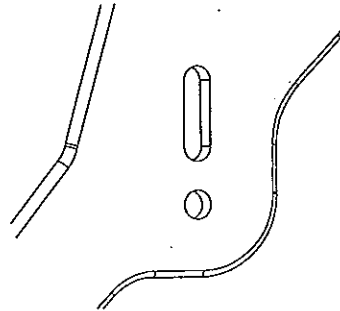
Never short circuit a secondary winding. Very high current will occur between the terminals, dangerous for both personnel and transformers.

Handwritten mark resembling a stylized '4' or '9'.

Ground terminals

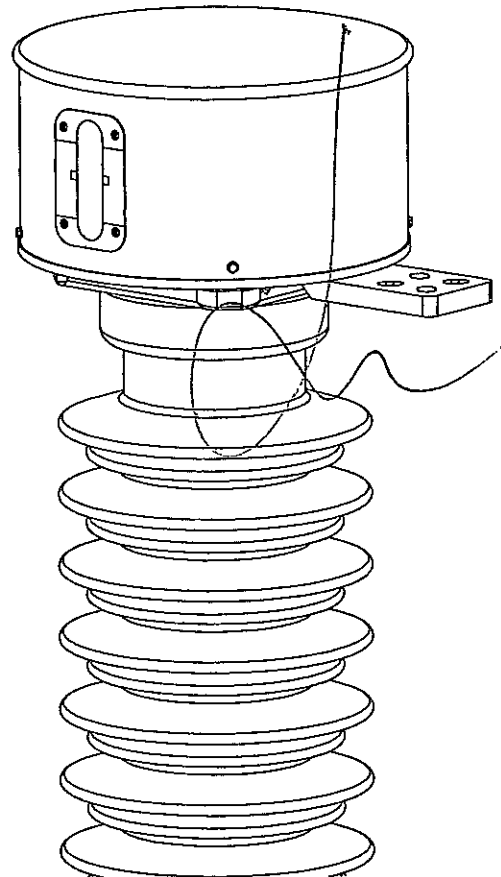
As standard the transformer is delivered without ground clamp, see standard ground terminal in Figure 1. Other additional clamps can be supplied upon request. If special, optional, ground bars are ordered, these are found inside the package. Make sure that the ground terminal, by means of a separate conductor, is securely connected to ground. Also make sure that the ground terminal is galvanically connected to the mounting pad of the apparatus, in particular if the oil tank's surface is painted or anodized. Note that the ground terminal can be attached on at least two feet.

1 Standard ground terminal (other types can be supplied upon request when an order is placed)



There are also ground terminals in the terminal box for connection of appropriate winding terminals and cable screens.

2 View of primary terminal



Neutral terminal

The transformer is equipped with an external, so-called neutral terminal (N-terminal) on the primary winding. Check that it is grounded to the grounding point in the terminal box.



Caution!
High voltages are present at the neutral terminal when the voltage transformer is in service.

Connection of E/tgð tap

The E terminal must be grounded to the terminal box when the voltage transformer is energized.



Caution!
High voltages are present at the E/tgð tap when the voltage transformer is in service.

Primary terminal

"The primary terminal is integrated part of the unit, located on top part with bellow plate, see Figure 2. Additional bolt or flat primary terminals on customer request.

The primary connection should be made so that the static mechanical load on the primary terminal is minimized. The maximum permitted static test load is according to the dimensional drawing for all directions, in compliance with IEC.

Handwritten mark resembling a stylized '8' or '9'.

EMF-E 52-145 kV

Maintenance

Minimal maintenance is required due to the transformer being hermetically sealed. Recommended is to follow the checklist at the back of the manual.

Check for oil leakage at the following positions:

- Oil level indicator and oil filling plug
- Seals at top and bottom flange of the insulator
- Seal between the oil tank and lid
- Secondary terminal box bushing
- Oil drain plug (if any)

Transformer damage

Metal, porcelain and epoxy components are checked. Porcelain components are cleaned as necessary.

Minor damage to insulator sheds can be repaired on site. Instructions for repair of porcelain and polymer insulators can be obtained from your ABB representative; see the contact information at the end of the document.

Oil filling

Filling of oil can be necessary when the oil level in the transformer suggest to be too low. If oil needs to be filled, ABB representative manufacturer for further instructions. Contact information can be found at the end of the document.

Oil level check

On the top of the transformer a stainless steel expansion below is placed, used for compensation of oil volume thermal changes in the transformer. The oil level indicator is located on the upper surface of the bellows, as shown in Figure 1. The bellows are placed in a metal cover equipped with a view-finder. Cover removal does not result unsealing of the transformer.

Changes of the position of the oil level indicator depend on oil temperature in the transformer. The position of the yellow indicator should be in the green field range, see Figure 2.



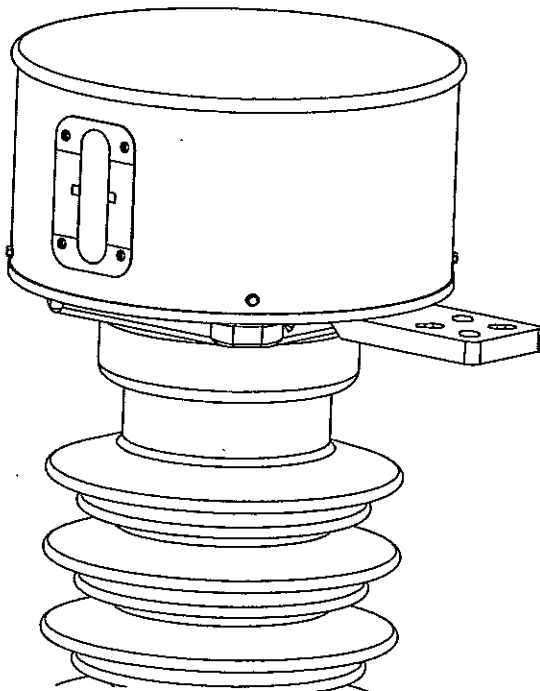
Notel

Shifting of the indicator to the upper or bottom red field points out of incorrect transformer operation. In such of case, the transformer should be take out of service and the ABB representative should be contacted.

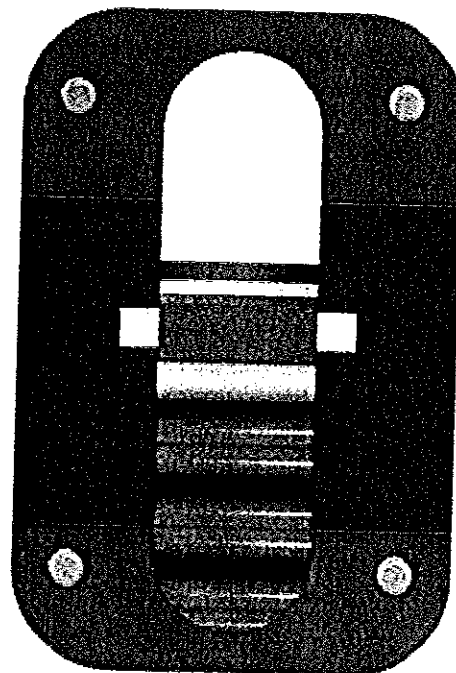
Oil sampling

After a longer period of service (15–20 years) or if damage is suspected after for example, a major operational disturbance, an oil sample can be extracted for testing of the oil's moisture and gas contents.

1 Oil level indicator location on an inductive voltage transformer



2 Oil level indicator in green field range



EMF-E 52-145kV

Oil sampling

General information

The instruction in this chapter describe oil sampling from high voltage transformers with oil-impregnated paper insulation. Provisions of IEC 60475 standard shall apply for areas not covered by the instruction. Oil samples must be taken under dry and windless conditions. The transformer shall be dry as well. Oil sampling is not recommended in ambient temperature below -20°C due to decreasing of the viscosity. Due to hydrostatic pressure, be careful to avoid oil spillage when opening the bottom valve. The valve in the bottom of the EMF-E is a male quick release coupling, protected with a protective hood. See Figure 2.



Attention!

Sampling of oil from live transformers is not permitted. Sampling of oil may be performed only in potential-free condition with properly grounded primary terminals of the transformer. Workplace shall be prepared in accordance with requirements of EN 50110 and local OHS regulations.



Note!

Before sampling, indication of oil level in the transformer shall be checked. Oil sampling shall not be performed when indication mark is in the lower red field, since there may still be pressure inside the transformer, which may lead to ingress of air inside the device.

Necessary parts

Before sampling of oil, the following parts (Figure 1) shall be prepared:

- A female quick release coupling in accordance with ISO 7241-1, series "A", 1/2", male-threaded, e.g. Stucchi IP12 L12 SCHOTT 30, cat. No 809410000, thread M18x1.5,
- Hose stub pipe $\varnothing 6$ mm,
- Transparent hose made of PVC or PUR,
- Transparent glass syringe fitted with a three-way valve,
- Container for oil being poured, with capacity > 200 ml.

Part a, b, c and d shall be properly washed (e.g. with extraction naphtha) and dried, so they did not contaminate the oil sample. Size of the syringe shall be adapted to requirements of the test to be performed.



Note!

Parts shown of Figure 1 are additional parts and should be treated as additional accessory for set of delivered transformers.

System preparation

- Assemble the set of parts as in Figure No 1.
- Loosen the two bolts (M8) and remove the protective hood, see Figure 2.
- Set the three-way valve in "C" position.
- Push the syringe piston as far as possible.
- Connect two parts of the quick release coupling (Figure 3).
- Hold the syringe close to vertical.



Attention!

Before connecting the system, make sure that the three-way valve is set in a position blocking outflow of oil from the transformer. Due to possible leaks of oil outside the system, use protective gloves

Figure 1 System of parts for oil sampling

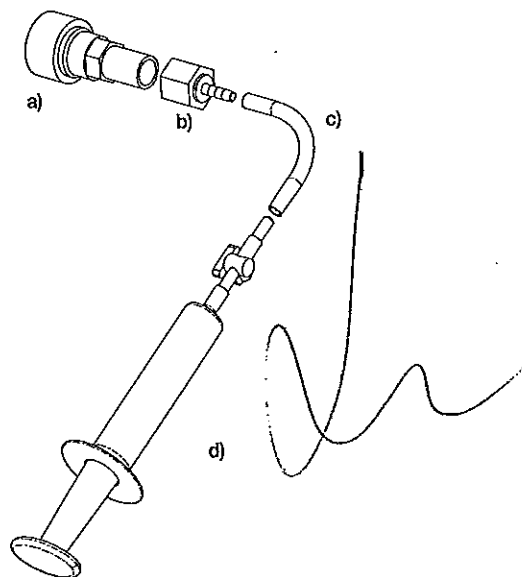
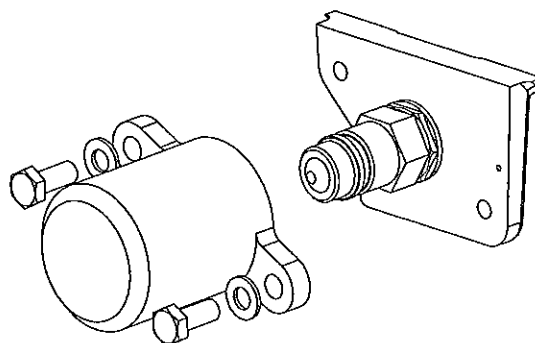
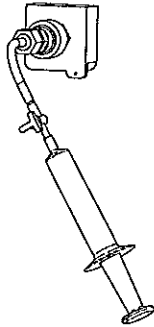


Figure 2 Disassembly of a protective plug



EMF-E 52-145kV

Oil sampling



Sampling (Figure 4)

1. Set the three-way valve in "A" position by blocking the syringe piston.
2. Release the air and ca. 50 ml of oil from the transformer, flushing the valve (place the oil container).
3. Set the valve in "B" position.
4. Allow the syringe to be slowly filled up with oil, slowing the piston's movement all the time. Do not pull the piston.
5. Set the valve in "C" position.
6. Release oil, pressing the syringe piston. During the final stage, direct the side outlet upwards. After releasing the oil, block the side outlet (pos. "C" + plug), still holding the piston.
7. Set the three-way valve in "B + plug" position, holding the syringe piston.
8. Allow the syringe to be slowly filled up with oil, as in item 4 — this will be the oil sample for tests. If necessary, flush the syringe once again — go back to item 5.
9. Set the valve in "A + plug" position.



Note!

The female quick release coupling and the stub pipe may be reused. However, prior to reuse, those need to be carefully washed with extraction naphtha and then dried.

If, despite safety measures taken, there will be air bubbles inside the syringe after sampling of oil, those need to be immediately removed by holding the syringe upright. This information shall be included in the attached sample description.

The maximum volume of oil that can be taken from the transformer without the necessity of refilling is 0.5 l. The amount of oil taken from individual transformers shall be recorded and, if necessary, refilled. In accordance with clause 5.3 of IEC 60296, oil used for refilling shall have the same classification (class, group, LCSET, types of additives) as oil in the transformer.

The collected samples shall be protected against sun rays and immediately transferred for testing.

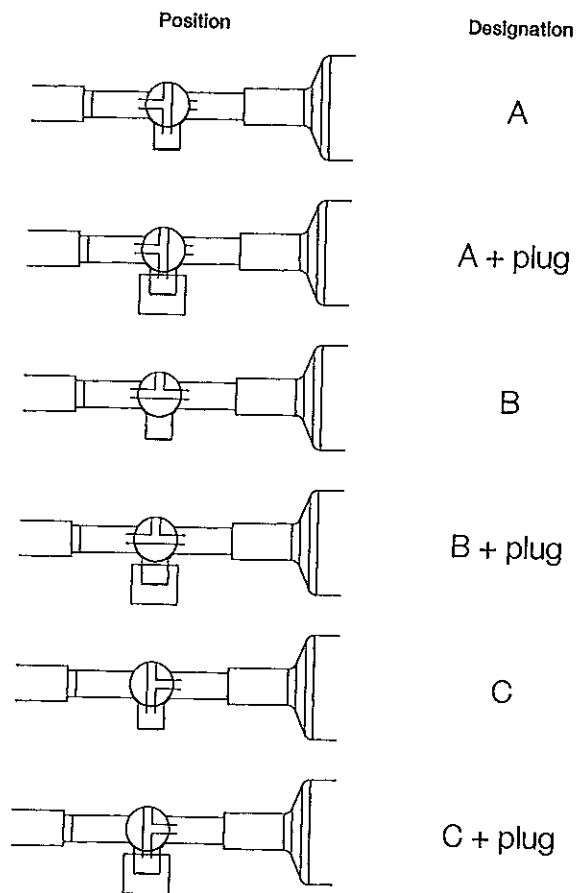
Disassembly of the system

Disconnect the quick release coupling. Small amount of oil may flow out during disconnection of the quick release coupling.

Protection of the drain valve

Clean up any oil spills and sealing surfaces. Check the o-ring and replace if damaged. Mount the protective hood and tighten the M8 bolts to a torque of 22,5 Nm.

Figure 4 Available positions of the three-way valve and the side drain plug



Refilling of oil in the transformer

Refilling of oil shall be conducted in a manner similar to oil sampling. Using the same connection set, inject the required amount of oil to the transformer. Before injecting oil, using the proper position of the three-way valve, release air closed in the quick-release coupling and the hose. In case one syringe is not sufficient, disconnect the syringe so as to leave the three-way valve on the hose. Each time make sure there is no air in the hose and in the syringe.

EMF-E 52-145kV

Dielectric dissipation factor measurement ($\text{tg}\delta$)

5

Before energizing, a $\text{tg}\delta$ measurement is recommended. This measurement should be kept as a reference. Measurement for maintenance measurements in the future. It's important that the same test equipment is used for each measurement.

1 Test setup when performing a $\text{tg}\delta$ measurement. Point 1 is the primary terminal, 2 is the ground terminal and 3 is the E/ $\text{tg}\delta$ terminal.

Conditions for measurements

Field measurements made at ambient air temperatures below 10°C have proven to produce inconsistent results. Measurements shall preferably be made at temperatures around 20°C.

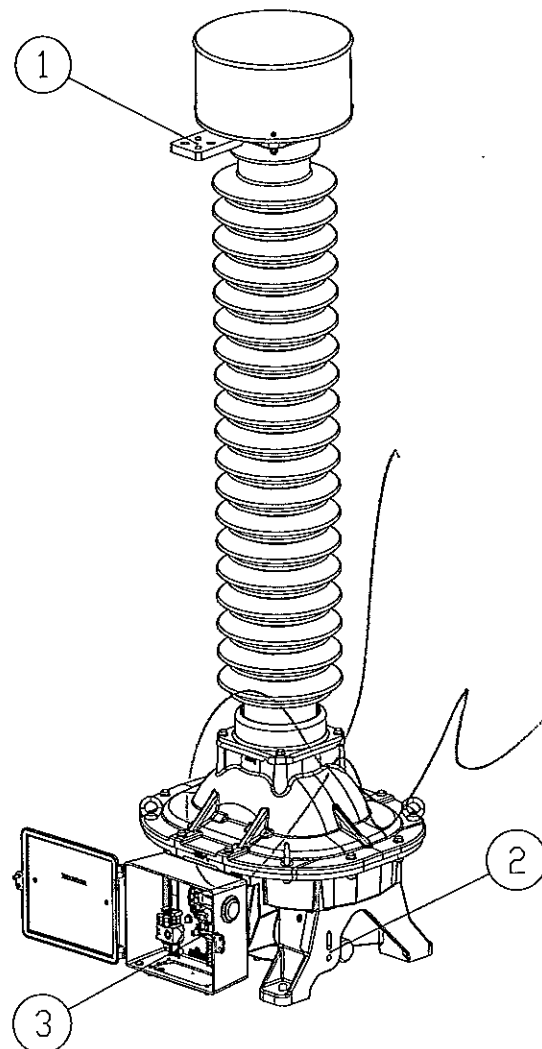
It is preferably to avoid field measurements at power line frequency, to eliminate electrostatic interference from measurement. (Test equipment, such as DOBLE M4000 that runs two tests at $\pm 5\%$ of power line frequency, is available on the market.)

When making field measurements it is important to try to estimate the temperature of the test object. One way is to let the voltage transformer be non-energized until the internal temperature drops to the ambient temperature (this can be expected to take about 6 hours.) Alternatively, if there is access to a resistance value, R_o , of a secondary winding at a known temperature, T_o , then the actual temperature, T_a , can be calculated on the basis of a measured winding resistance, R_a , as $T_a = (R_a/R_o)(235 + T_o) - 235$. Initial resistance measurement can be done before energizing, when it can be assumed that the internal temperature is equal to ambient temperature.

Measurement of main insulation between primary terminal and ground

- Disconnect the primary terminal from the transmission line.
- Disconnect the E terminal, located in secondary terminal box from the ground.
- Connect the $\text{tg}\delta$ bridge to the terminal marked with an E, terminal located in secondary terminal box.

One should remember to earth it after performing the measurement. The test voltage measurement shall equal 10kV RMS and it should be applied across transformer primary terminal and ground.



85

Optional accessories

Anti-condensation heater

Anti-condensation heater can, if ordered prior to manufacturing, be supplied on EMF-E inductive voltage transformer.

Anti-condensation heater is used to prevent condensation inside the terminal box. The supply voltage for the heater shall be in the range of 220 V to 240 V AC at 50 Hz or 60 Hz. The power of the heater is 30 W.

The temperature, which can be set in the range from 0°C to 60°C, on the thermostat needs to be adjusted during installation depending on the geographical location. The recommendation is to set the temperature slightly above the daily average temperature to achieve drying.



Caution!

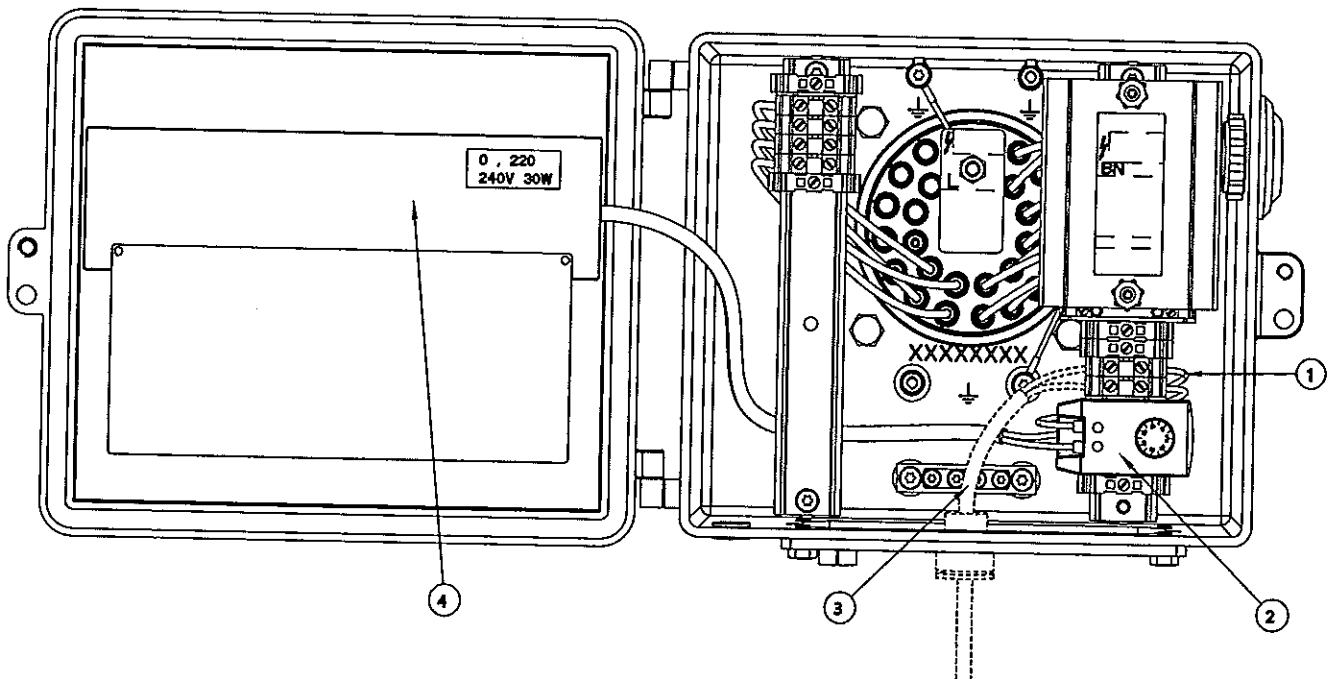
The surface of the heater element, see point four (4) in Figure 1, is very warm during operation. The surface of the heater is warmer than the set temperature at the thermostat.



Caution!

The heater works with full effect if the temperature inside the secondary terminal box drops below the specified temperature on the thermostat. This results in very hot surface.

1 Anti-condensation heater mounted inside the secondary terminal box. Point one (1) is the terminal where the auxiliary power supply is to be connected, according to the specification of the heater, point two (2) is the thermostat, point three (3) is the cable installed after manufacturing and point four (4) is the heater element.



Disposal

3

The environmental effects for ABB Sp. z o. o., High Voltage Products' instrument transformers have been evaluated according to methods for appraising environmental effects such as EPS, ET, ECO and TELLUS

After disassembling all components, as seen in Figures 1-4 on the next page, can be recycled as described below.

Disposal in general must be carried out in accordance with local legal provisions, laws and regulations.

1. Oil	8. Porcelain and polymeric
2. Paper	9. Iron
3. Copper	10. Hardening plastic
4. Aluminum	11. O-rings
5. Stainless steel	12. Oil level Indicator
6. Zinc-coated iron	13. Thermoplastic
7. Brass	

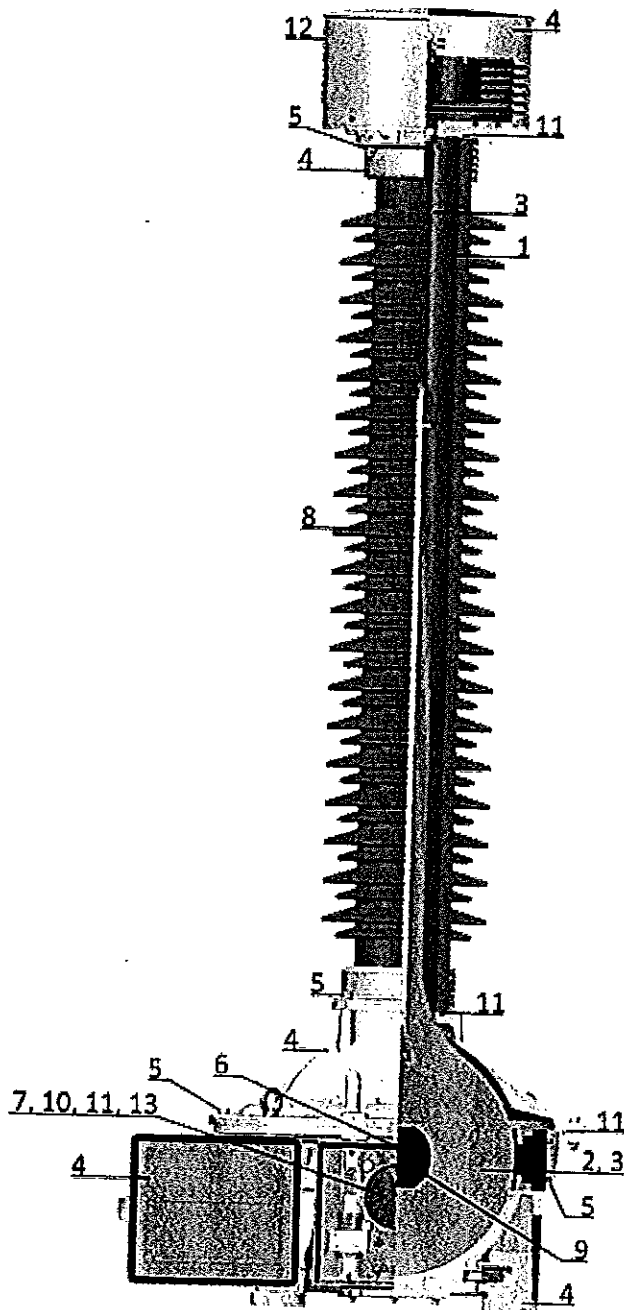


Note!
ABB Sp. z o. o., High Voltage Products, Instrument Transformers can be engaged to uninstall transformers. There is a charge for this service.

Component	Recommendations for reuse, recycling and incineration
Oil	Mineral oil according to IEC 61039: L-NTIO-296, is used as impregnating agents. This type of oil is free from PCB and other heavy toxic substances and has low environmental impact. In Germany, the oil is classified in water conversation class WGK1. The oil can be compared with fuel class 1 and used as fuel (due to the low sulfur content in the oil).
Paper and wood	Paper and wood and oil can be easily consumed in a waste incinerator with a very high temperature. The decomposition products are water, carbon dioxide and small amounts of nitrogen oxides.
Copper	Return to a recycling company
Aluminum	Return to a recycling company
Stainless steel	Return to a recycling company
Zinc-coated iron	Return to a recycling company
Brass	Return to a recycling company
Iron	Return to a recycling company
Porcelain	Crushed and used as filling material
Polymeric	Return to a recycling company
O-rings	Ground down and used as filling material
Oil indicator	Return to a recycling company
Thermoplastic	Return to a recycling company

Handwritten signature or scribble.

Cut-away view of an EMF-E inductive voltage transformer



Troubleshooting

Symptom	Possible cause	Corrective measure ¹
Insulation resistance of secondary terminals low (<50,000 ohm) megger <= 2 kV	1. Damaged insulation on secondary wires. Any winding.	1. Replace the damaged wires in terminal box. If not successful replace the unit.
Lower than normal voltage, more than -1.2%	1. Heavy load on secondary exceeding thermal load.	1. Reduce load

¹) Some measures require breaking warrant seals. During the warranty period, please obtain authorization from your ABB representative prior to taking corrective measures.

Checklist

Prior to energizing

What to check	When	Check for
External package damage	A	Broken bracing, signs of rough handling
Signs of oil leakage	A, B, C	Visible oil spillage
Transformer damage	B, C	Damage to insulator and terminals
Corrosion on primary and ground terminals	B	Corrosion on the contact surface. If present remove the same.
Oil level	B, C	Oil visible in level glass
Tan- δ measurement	C	On-site reference value

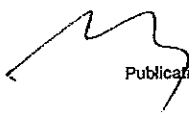
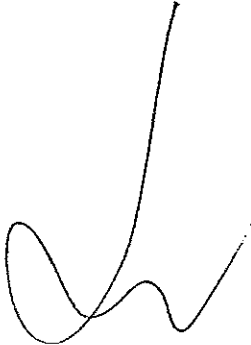
After energizing

What to check	When	Check for
Signs of oil leakage	D, E	Visible oil spillage
Transformer damage	D, E	Damage to insulator and terminals
Oil level	D, E	Oil indicator in range of green field
Tan- δ measurement	E	Trends and change of values. Values depend on age, voltage level, test method and temperature
Insulation test on secondary windings	E	Values depend on age, voltage level, test method and temperature
Oil sample and gas analysis	E	Content of critical gases indicating possible damage

Definitions

A	After arrival of the transformer at the destination
B	Upon unpacking
C	Immediately before energizing
D	During periodic routine checks according to established schedule for the S/S
E	After 15-20 years

Customer notes



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Тип:

EMF-E 123

Производител:

ABB Sp. z o.o. клон в Пшашниш АBB АВ, Пауър Продуктс
ул. Лешно 59 Валхалаваген 2
06-300 Пшашниш, Полша 771 31 Лудвика, Швеция

Параметри и приложение на продукта:

Съгласно Приложение
Индуктивен напрежен трансформатор, за открит монтаж, предназначен за монтаж в електрически мрежи с най-високо напрежение до 126 kV

Продуктът отговаря на изискванията на:

IEC 61869-1 изд. 1.0 (2007) и IEC 61869-3 изд. 1.0 (2011)

Според доклада, изработен от:

Институт по енергетика

Номер на доклада за оценка:

DZC/111с/Е/2015-2

Период на валидност:

от 01 Декември 2015 г. до 01 Декември 2018

Правото на използване на сертификата за съответствие, в рамките на срока на валидност, важи само:

- * за тези копия, които отговарят на изискванията, посочени по-горе и имат същите характеристики (параметри), като модела/продукта представен за изпитания,
- * притежателя на сертификата или негов упълномощен представител

Списъкът с доказани параметри, е включен в приложенията към сертификата за съответствие.

Брой приложения: 1

Системата на сертификация на продукти 1а (съгл. PN-ISO IEC 17067:2014-01)
(параметри на продукта, потвърдени от типовите изпитания)

Варшава, 01.12.2015 г.

Директор на Института по енергетика
др. инж. Томаш Галка

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AC.117...

ПРИЛОЖЕНИ КЪМ СЕРТИФИКАТ ЗА СЪОТВЕТСТВИЕ № 100/2015

Издание № 04 от 28.11.2016

СПИСЪК НА ДОКАЗАНИТЕ ПАРАМЕТРИ

Индуктивен напрежен трансформатор тип EMF-E123	
Номинално първично напрежение U_{Pr}	$\leq 115; \sqrt{3} \text{ kV}$
Макс. напрежение на комб. трансформатор U_m	$\leq 126 \text{ kV}$
Номинална честота f_R	50 Hz
Номинално изолационно ниво	AC 230 kV / LI 550 kV
Изпитание на издръжливост на статично натоварване F_R	3600 N
Външна изолация – път на утечка на изолятора ¹⁾	3150 mm ÷ 4495 mm ¹⁾
Степен на защита срещу механично въздействие на обвивката ²⁾	IK07
Степен на защита на вторичната клемна кутия	IP55
Номинален напрежен фактор F_V / време	$\leq 1.9/8h$
Номинално вторично напрежение U_{Sr}	$\leq 115 \text{ V}$
Клас на точност на намотките за мерене и защита	0.1; 0.2; 0.5; 1; 3; 3P; 6P
Номинална мощност на намотките за мерене и за защита S_r	$\leq 1000 \text{ VA}$
Номинално напрежение на остатъчна намотка $U_{Sr} (da-dn)$	$\leq 115 \text{ V}$
Клас на точност на остатъчна намотка	0.5; 1; 3; 3P; 6P
Номинална мощност остатъчна намотка S_r	$\leq 450 \text{ VA}$
Обща номинална мощност $S_{\Sigma Th}$	4000 VA

ЗАБЕЛЕЖКА:

- ¹⁾ Приложимо е композитни и за порцеланови изолятори
- ²⁾ Не е приложимо за порцеланови изолятори



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INSTYTUT ENERGETYKI

Research Institute

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fax. +48 22 836 63 63

instytut.energetyki@ien.com.pl

CERTIFICATE OF CONFORMITY

No. 100/2015

Issue No. 04 of 2016.11.28

Name and address of the Certificate Holder:

ABB Sp. z o.o.
1 Zegańska Str.
04-713 Warsaw
Poland

Name of the product:

Inductive voltage transformer

Type:

EMF-E123

Manufacturer:

ABB AB Power Products
Valhallavägen 2
771 31 Ludvika
Sweden

ABB Sp. z o.o., Branch Office in Przasnysz
59 Leszno Str.
06-300 Przasnysz
Poland

Parameters and application of the product:

According to appendix
Outdoor inductive voltage transformer designed for installing in electrical grids with highest voltage up to 126 kV

The product meets requirements of:

IEC 61869-1 ed. 1.0 (2007) and IEC 61869-3 ed. 1.0 (2011)

According to the evaluation report made by:

Instytut Energetyki

Number of the evaluation report:

DZC/111c/E/2015-2

Period of validity:

from 1st of December 2015 until 1st of December 2018

The right to use the certificate of conformity within its validity period applies only to:

- these copies that meet the requirements specified above and have the same characteristics (parameters) as the model / product samples submitted for testing,
- certificate owner or his authorized representative.

The list of evidenced parameters is included in the appendices to the certificate of conformity.

Number of appendices: 1

THE SYSTEM OF PRODUCT CERTIFICATION 1a (PN-EN ISO/IEC 17067:2014-01)
(product parameters confirmed by type test)

DIRECTOR OF
INSTYTUT ENERGETYKI

dr hab. inż. Tomasz Gałka, prof. IEn

Warsaw, 2015.12.01



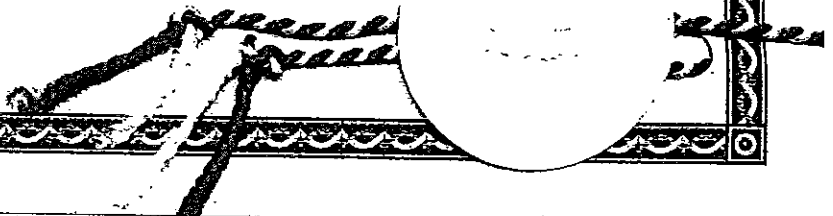
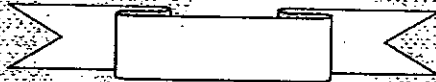
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APPENDIX TO THE CERTIFICATE OF CONFORMITY**No. 100/2015****Issue No. 04 of 2016.11.28****LIST OF EVIDENCED PARAMETERS**

Inductive voltage transformer type EMF-E123	
Rated primary voltage U_{Pr}	$\leq 115/\sqrt{3}$ kV
Highest voltage for equipment U_m	≤ 126 kV
Rated frequency f_R	50 Hz
Rated insulation level	AC 230 kV / LI 550 kV
Static withstand test load F_R	3600 N
External insulation – creepage distance of insulators ¹⁾	3150 mm + 4495 mm
Degree of protection against mechanical impact of enclosure ²⁾	IK07
Degree of protection of secondary terminals enclosure	IP55
Rated voltage factor F_V / time	$\leq 1,9 / 8$ h
Rated secondary voltage U_{S_r}	≤ 115 V
Accuracy class of measurements and protection windings	0.1; 0.2; 0.5; 1; 3; 3P; 6P
Rated output of measurement and protection windings S_r	≤ 1000 VA
Rated voltage of residual voltage winding $U_{S_r(da-dn)}$	≤ 115 V
Accuracy class of residual voltage winding	0.5; 1; 3; 3P; 6P
Rated output of residual voltage winding S_r	≤ 450 VA
Total thermal limiting output S_{Th}	4000 VA

REMARKS:

- 1) Applies to composite and porcelain insulators
- 2) Does not apply to porcelain insulators



Nytro 10 XN



SAFETY DATA SHEET

Date of printing	2015-09-11
Date of issue/ Date of revision	2015-09-11
Date of previous issue	No previous validation
Version	1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
 Product name Nytro 10 XN
 Product description Insulating oil
 Product type Liquid
 MAPOL Annex 1 Oils

1.2 Identified uses
Identified uses
 Use in formulations in lubricants- Industrial
 Use as lubricant in open and closed systems - Professional
 Distribution of substance - Industrial
 Formulation and (re)packing of substances and mixtures - Industrial
 Manufacture of substance - Industrial
 Functional Fluids - Industrial
 Functional Fluids - Professional

Uses advised against
 Reason
 This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet
 Supplier/Manufacturer Nynas AB
 Head office: P.O. Box 10700 SE-121 29 Stockholm SWEDEN
 +46 8 602 12 00 (Office hours 8 am - 4.30 pm (CET))
 www.nynas.com
 e-mail address of person responsible for this SDS ProductHSE@nynas.com

National contact
 Nynas sp. z o.o. ul. Kolberga 48D PL-44 100 Gliwice POLAND
 +48 32 232 74 10
 1.4 Emergency telephone number
 National advisory body/Poison Centre
 Telephone number +44 (0) 1235 239 670
 Hours of operation 24 hour service

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
 Mixture
 Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
 Asp. Tox. 1, H304
 Aquatic Chronic 3, H412
 The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
 See Section 16 for the full text of the H statements declared above.
 See Section 11 for more detailed information on health effects and symptoms.
 2.2 Label elements
 Hazard pictograms



Signal word **Danger**
 Hazard statements
 H304 - May be fatal if swallowed and enters airways.
 H412 - Harmful to aquatic life with long lasting effects.
 Precautionary statements
 Prevention
 P273 - Avoid release to the environment
 Response
 P301 - IF SWALLOWED:
 P310 - Immediately call a POISON CENTER or physician.
 P331 - Do NOT induce vomiting.
 Storage
 Not applicable.
 Disposal
 P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
 Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures Mixture

Product/ingredient name	Identifiers	%	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
Distillate (petroleum), hydrotreated light naphthenic	REACH #: 01-2119480375-34 EC: 265-156-6 CAS: 64742-53-6 Index: 649-466-00-2 REACH #:	>99	Asp. Tox. 1, H304	[1]
2,6-di-tert-butyl-p-cresol		<0.3	Aquatic Acute 1, H400	[1]

SECTION 3: Composition/information on ingredients

01-2119555270-46 EC: 204-881-4 CAS: 128-37-0	Aquatic Chronic 1, H410
See Section 16 for the full text of the H statements declared above.	

Annex I Nota L applies to the base oil(s) in this product. Nota L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3 % DIMSO extract as measured by IP 346. There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs or vPvBs or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact
 Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.
 If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If casualty is unconscious and: if not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention if adverse health effects persist or are severe. Maintain an open airway.

Skin contact
 Wash with soap and water. Remove contaminated clothing and shoes. Handle with care and dispose of in a safe manner. Seek medical attention if skin irritation, swelling or redness develops and persists.

Ingestion
 Accidental high pressure injection through the skin requires immediate medical attention. Do not wait for symptoms to develop.
 Always assume that aspiration has occurred. Do not induce vomiting. Can enter lungs and cause damage. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Seek professional medical attention or send the casualty to a hospital. Do not wait for symptoms to develop.

Protection of first-aiders

Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
 No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
 Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact
 Eye contact may cause redness and transient pain.

Inhalation
 Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.
 No known significant effects or critical hazards.
 May be fatal if swallowed and enters airways.

SECTION 4: First aid measures

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
 No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
 Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.
 Always assume that aspiration has occurred.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
 Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media

Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture
 In a fire or if heated, a pressure increase will occur and the container may burst. This substance will float and can be reignited on surface water. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H₂S, SO₂ (sulfur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

5.3 Advice for firefighters

Special precautions for fire-fighters
 Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
 Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
 Avoid breathing vapour or mist. Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency. Stop leak if safe to do so. Avoid direct contact with the product. Stay upwind/keep distance from source. In case of large spillages, alert occupants in downwind areas.
 Eliminate all ignition sources if safe to do so. Spillages of limited amounts of product, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which will presumably limit the exposure to dangerous concentrations.

Note : recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken.

SECTION 6: Accidental release measures

For emergency responders
Small spillages: normal antistatic working clothes are usually adequate.
Large spillages: full body suit of chemically resistant and thermal resistant material should be used. Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Note: gloves made of PVA are not water-resistant, and are not suitable for emergency use. Safety helmet, antistatic non-skid safety shoes or boots. Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated.

Respiratory protection: A half or full-face respirator with filter(s) for organic vapours (and when applicable for H2S) a Self Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

6.2 Environmental precautions
Water polluting material. May be harmful to the environment if released in large quantities. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Prevent product from entering sewers, rivers or other bodies of water. If necessary dike the product with dry earth, sand or similar non-combustible materials. In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.

In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents.

If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities.

6.3 Methods and material for containment and cleaning up
Small spill
Stop leak if without risk. Absorb spilled product with suitable non-combustible materials.

Large spill
Large spillages may be cautiously covered with foam, if available, to limit vapour cloud formation. Do not use water jet. When inside buildings or confined spaces, ensure adequate ventilation. Transfer collected product and other contaminated materials to suitable containers for recovery or safe disposal. Note: see Section 1 for emergency contact information and Section 13 for waste disposal. See Section 8 for information on appropriate personal protective equipment.

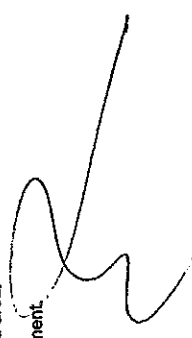
6.4 Reference to other sections
See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

General Information
Obtain special instructions before use. Hazard of slipping on spill product. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use and store only outdoors or in a well-ventilated area.

7.1 Precautions for safe handling
Avoid release to the environment.



SECTION 7: Handling and storage

Protective measures
Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with eyes, skin and clothing.

Prevent the risk of slipping. Take precautionary measures against static discharge. Avoid splash filling of bulk volumes when handling hot liquid product.

Avoid release to the environment.

Note: See Section 8 for information on appropriate personal protective equipment. See section 13 for waste disposal information.

Advice on general occupational hygiene
Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands thoroughly after handling. Change contaminated clothes at the end of working shift. See also Section 8 for additional information on hygiene measures.


7.2 Conditions for safe storage, including any incompatibilities

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Storage area layout, tank design, equipment and operating procedures must comply with the relevant regional, national or local legislation. Storage installations should be designed with adequate bunds in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

Store separately from oxidising agents.

Recommended materials for containers, or container linings use mild steel, stainless steel. Not suitable: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.

Keep only in the original container or in a suitable container for this kind of product. Keep container tightly closed and sealed until ready for use. Do not store in unlabelled containers. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Empty containers may contain harmful, flammable/combustible or explosive residue or vapours. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards. Store locked up. Protect from sunlight.



7.3 Specific end use(s)
Recommendations
Industrial sector specific solutions
Not available.
Not available.

SECTION 8: Exposure controls/personal protection

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters
Occupational exposure limits

Product/ingradient name	Exposure limit values
Oil mist	[Air contamination] Rozporadzenie Ministra Pracy i Polityki Społecznej (Dz.U. 2014 poz. 817) (Poland, 6/2014). TWA: 5 mg/m ³ 8 hours. Form: Inhalable fraction

SECTION 8: Exposure controls/personal protection

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELS

Product/ingredient name	Type	Exposure	Value	Population	Effects
Distillate (petroleum), hydrotreated light naphthenic	DNEL	Long term Inhalation	5.4 mg/m ³	Workers	Local

PNECs

No PNECs available

PNEC Summary

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

8.2 Exposure controls

Appropriate engineering controls

Mechanical ventilation and local exhaust will reduce exposure via the air. Use oil resistant material in construction of handling equipment. Store under recommended conditions and if heated, temperature control equipment should be used to avoid overheating.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Wash contaminated clothing before reuse.
Recommended: Safety glasses with side shields.

Eye/face protection

Skin protection

Hand protection

Body protection

Other skin protection

4 - 8 hours (breakthrough time): nitrile rubber

Wear protective clothing if there is a risk of skin contact. Change contaminated clothes at the end of working shift.
Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state

Colour

Odour

Odour threshold

pH

Melting point/freezing point

Initial boiling point and boiling range

Flash point

Liquid.
Light yellow
Odourless/Light petroleum.
Not applicable.
Not applicable.
-60°C
>250°C
Closed cup: >140°C [Pensky-Martens.]

Flash point

Closed cup: >140°C [Pensky-Martens.]

SECTION 9: Physical and chemical properties

Evaporation rate

Flammability (solid, gas)

Upper/lower flammability or explosive limits

Vapour pressure

Density

Solubility(ies)

Partition coefficient: n-octanol/water

Auto-ignition temperature

Decomposition temperature

Viscosity

Explosive properties

Oxidising properties

DMSO extractable compounds for base oil substance(s) according to IP346

>270°C

>280°C

Not available.

Not available.

< 3%

160 Pa @ 100 °C

0.88 g/cm³ [15°C]

Insoluble in water.

Not available.

>270°C

>280°C

Not available.

Not available.

< 3%

160 Pa @ 100 °C

0.88 g/cm³ [15°C]

Insoluble in water.

Not available.

>270°C

>280°C

Not available.

Not available.

< 3%

160 Pa @ 100 °C

0.88 g/cm³ [15°C]

Insoluble in water.

Not available.

>270°C

>280°C

Not available.

Not available.

< 3%

160 Pa @ 100 °C

0.88 g/cm³ [15°C]

Insoluble in water.

Not available.

>270°C

>280°C

Not available.

Not available.

< 3%

160 Pa @ 100 °C

0.88 g/cm³ [15°C]

Insoluble in water.

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Oxidising agent

10.5 Incompatible materials

Keep away from extreme heat and oxidizing agents.

10.6 Hazardous decomposition products

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H₂S, SO_x (sulphur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
Distillate (petroleum), hydrotreated light naphthenic	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.53 mg/l	4 hours	EMBSI 1988a (similar material)
	LD50 Dermal	Rabbit	>5000 mg/kg	-	API 1982 (similar material)
	LD50 Oral	Rat	>5000 mg/kg	-	API 1986a (similar material)
2,6-di-tert-butyl-p-cresol	LD50 Dermal	Rat	>5000 mg/kg	-	Supplier's information
	LD50 Oral	Rat	>5000 mg/kg	-	Supplier's information

Conclusion/Summary

No known significant effects or critical hazards.

Irritation/Corrosion

SECTION 11: Toxicological information

SECTION 11: Toxicological information

Conclusion/Summary
 No known significant effects or critical hazards.

Aspiration hazard

Product/ingredient name	Result
Distillate (petroleum), hydrotreated light naphthenic	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure
 Not available.

Potential acute health effects
 Eye contact may cause redness and transient pain.
 Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.

Eye contact
 No known significant effects or critical hazards.

Inhalation
 May be fatal if swallowed and enters airways.

Skin contact
 No known significant effects or critical hazards.

Ingestion
 No known significant effects or critical hazards.

Potential chronic health effects

Product/ingredient name	Species	Score	Observation	Remarks
Distillate (petroleum), hydrotreated light naphthenic	Rabbit	0 to 0.8	24 to 72 hours	UBTL 1984e (similar material)
2,6-di-tert-butyl-p-cresol	Rabbit	0.17 to 0.33	24 to 72 hours	UBTL 1984i (similar material)
	Rabbit	0.5	-	Supplier's information
	Rabbit	0	-	Supplier's information
	Rabbit	0.1	-	-

Skin
 No known significant effects or critical hazards.

Eyes
 No known significant effects or critical hazards.

Respiratory
 No known significant effects or critical hazards.

Sensitisation

Product/ingredient name	Result	Species	Dose	Exposure
2,6-Di-tert-butyl-p-cresol	Chronic NOAEL Oral	Rat	25 mg/kg	28 days; 7 days per week

General
 No known significant effects or critical hazards.

Carcinogenicity
 The base oil(s) in this product is based on an severely hydrotreated distillate. The product should not be regarded as a carcinogen.

Mutagenicity
 No known significant effects or critical hazards.

Teratogenicity
 No known significant effects or critical hazards.

Developmental effects
 No known significant effects or critical hazards.

Fertility effects
 No known significant effects or critical hazards.

Other information
 Not available.

Specific hazard

Product/ingredient name	Route of exposure	Species	Result	Remarks
Distillate (petroleum), hydrotreated light naphthenic	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)

Skin
 No known significant effects or critical hazards.

Respiratory
 No known significant effects or critical hazards.

Mutagenicity

SECTION 12: Ecological information

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Distillate (petroleum), hydrotreated light naphthenic	Acute LL50 >10000 mg/l	Aquatic invertebrates.	96 hours
	Acute LL50 >100 mg/l	Fish	96 hours
	Acute NOEL >100 mg/l	Algae	72 hours
	Chronic NOEL 10 mg/l	Aquatic Invertebrates.	21 days
2,6-Di-tert-butyl-p-cresol	Acute EC50 0.61 mg/l	Daphnia - Magna	48 hours
	Acute LC50 >0.4 mg/l	Algae - Desmodesmus Subspicatus	72 hours
	Chronic NOEC 0.316 mg/l	Daphnia - Magna	21 days

Conclusion/Summary
 Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Distillate (petroleum), hydrotreated light naphthenic	-	-	Inherent
2,6-Di-tert-butyl-p-cresol	-	-	Not readily

Conclusion/Summary
 Inherently biodegradable.

12.3 Bioaccumulative potential

Conclusion/Summary
 No known significant effects or critical hazards.

Aspiration hazard

Product/ingredient name	Result
Distillate (petroleum), hydrotreated light naphthenic	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure
 Not available.

Potential acute health effects
 Eye contact may cause redness and transient pain.
 Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.

Eye contact
 No known significant effects or critical hazards.

Inhalation
 May be fatal if swallowed and enters airways.

Skin contact
 No known significant effects or critical hazards.

Ingestion
 No known significant effects or critical hazards.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
Distillate (petroleum), hydrotreated light naphthenic	Negative - Dermal	Rat	0 to 2000 mg/kg mg/kg/day	-	(similar material)

Conclusion/Summary
 No known significant effects or critical hazards.

Reproductive toxicity
 No known significant effects or critical hazards.

Conclusion/Summary
 No known significant effects or critical hazards.

Teratogenicity

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SECTION 12: Ecological information

Product/ingredient name	LogP _{ow}	BCF	Potential
Distillate (petroleum), hydrotreated light naphthenic 2,6-Di-tert-butyl-p-cresol	2 to 6	<500	low
	5,1	>500	high

Conclusion/Summary
The product has a potential to bioaccumulate.

12.4 Mobility in soil
Mobility

High mobility in soil predicted, based on log Kow > 3.0.

12.5 Results of PBT and vPvB assessment

Not applicable.
Not applicable.

12.6 Other adverse effects

Insoluble in water. Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal

Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended. This substance can be burned or incinerated, subject to national/local authorizations, relevant contamination limits, safety regulations and air quality legislation. Contaminated or waste substance (not directly recyclable): Disposal can be carried out directly, or by delivery to qualified waste handlers. National legislation may identify a specific organization, and/or prescribe composition limits and methods for recovery or disposal.

Hazardous waste
Yes.

European waste catalogue (EWC)

Waste code	Waste designation
13 03 07*	Mineral-based non-chlorinated insulating and heat transmission oils

Packaging

Methods of disposal

The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

International transport regulations

	ADR/RID	ADN	IMO/MDG Classification	ICAO/IATA Classification
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-

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: No previous issue

Version : 1

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SECTION 14: Transport information

14.5 Environmental hazards	No.	No.	No.
Additional Information	-	-	-

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk

according to Annex I of MARPOL 73/78 and the IBC Code

Oils

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

Other EU regulations

Saveso Directive

This product is not controlled under the Seveso Directive.

International lists

National inventory

Australia

Canada

China

Japan

Malaysia

New Zealand

Philippines

Republic of Korea

Taiwan

United States

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

All components are listed or exempted.

Complete.

15.2 Chemical Safety Assessment

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Date of previous issue

: No previous validation

Version : 1

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SECTION 16: Other information

Revision comments

Not available.

- ✓ Indicates information that has changed from previously issued version.
- ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
- ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- CMR = Carcinogen, Mutagen or Reproductive toxicant
- CSA = Chemical Safety Assessment
- CO₂ = carbon dioxide
- DNEL = Derived No Effect Level
- EC50 = Half maximal effective concentration
- EUH statement = CLP-specific Hazard statement
- IATA = International Air Transport Association
- IC50 = Half maximal inhibitory concentration
- IMDG = International Maritime Dangerous Goods
- LC50 = Median lethal concentration
- LD50 = Median lethal dose
- PNEC = Predicted No Effect Concentration
- PBT = Persistent, Bioaccumulative and Toxic
- RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
- REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
- SCBA = Self-Contained Breathing Apparatus
- SVHC = Substances of Very High Concern

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Asp. Tox. 1, H304 Aquatic Chronic 3, H412	Calculation method Calculation method
Poland	
Full text of abbreviated H statements	H304 May be fatal if swallowed and enters airways. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.
Full text of classifications [CLP/GHS]	Aquatic Acute 1, H400 ACUTE AQUATIC HAZARD - Category 1 Aquatic Chronic 1, H410 LONG-TERM AQUATIC HAZARD - Category 1 Aquatic Chronic 3, H412 LONG-TERM AQUATIC HAZARD - Category 3 Asp. Tox. 1, H304 ASPIRATION HAZARD - Category 1
Date of printing	2015-09-11
Date of issue/ Date of revision	2015-09-11
Date of previous issue	No previous validation
Version	1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Identification of the substance or mixture

Product definition Mixture
Product name Nytro 10 XV

Section 1 - Title

Short title of the exposure scenario Use in formulations in lubricants- Industrial (2,6-di-tert-butyl-p-cresol)

List of use descriptors

Identified use name: Use in formulations in lubricants- Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09
Substance supplied to that use in form of: As such
Sector of end use: SUJ03, SU10
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02
Market sector by type of chemical product: PC17, PC24, PC25

Environmental contributing scenarios
Health, Contributing scenarios

Number of the ES	Not applicable.
Industry Association	Not applicable.
Generic exposure scenario	Not applicable.
Processes and activities covered by the exposure scenario	Covers the use of formulated lubricants within closed or contained systems including incidental exposures during material transfers, operation of machinery/engines and similar articles, equipment maintenance and disposal of wastes.
Additional information	Industrial

Section 2 - Exposure controls

Product characteristics	Solid Melting/Freezing Point (°C): 69.8
Concentration of substance in mixture or article	≤100%
Amounts used	Annual site tonnage 110 t/a Continuous release(d/a): 300
Frequency and duration of use	Local freshwater dilution factor 10 Receiving surface water flow is 18000 m³/d. Local marine water dilution factor 100
Environment factors not influenced by risk management	Not applicable.
Other given operational conditions affecting environmental exposure	
Technical conditions and measures at process level (source) to prevent release	% Release fraction to wastewater from process (initial release prior to RMM) 0.2 % Release fraction to air from process (initial release prior to RMM) 0.01 % Release fraction to soil from process (initial release prior to RMM) 0
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	On-site wastewater treatment required. Ensure all waste water is collected and treated via a waste water treatment plant. Floors should be impervious, resistant to liquids and easy to clean.
Organisational measures to prevent/limit release from site	Ensure operatives are trained to minimise exposures.

Section 2 - Exposure controls

Conditions and measures related to municipal sewage treatment plant
 Conditions and measures related to external treatment of waste for disposal
 Conditions and measures related to external recovery of waste

Size of industrial sewage treatment plant (m³/d): 2000, Removal Efficiency (total):94 %

No special measures are required. General information, See section 13 for waste disposal information.

See section 13 for waste disposal information.

Contributing scenario controlling worker exposure for 0:	
Product characteristics	Melting/Freezing Point (°C): 63.8
Concentration of substance in mixture or article	≤100%
Physical state	solid
Dust	Solid, medium dustiness
Frequency and duration of use	Exposure duration per day: 8 h (full shift) Exposure duration per year: 230 d
Human factors not influenced by risk management	Respiratory (m ³ /d): 10
Other given operational conditions affecting workers exposure	The product should be handled at room temperature.
Technical conditions and measures at process level (source) to prevent release	No special measures required.
Technical conditions and measures to control dispersion from source towards the worker	Handle only in a place with local exhaust ventilation (or other adequate ventilation).
Organisational measures to prevent/limit releases, dispersion and exposure	Ensure operatives are trained to minimise exposures.
Conditions and measures related to personal protection and hygiene	Wear protective clothing. See Section 8 of the safety data sheet (personal protective equipment).
Personal protection	

Section 3 - Exposure estimation and reference to its source

Website:	Not available.
Exposure estimation and reference to its source - Environment 2:	
Exposure assessment (environment):	Used EUSES model (v2.1).
Exposure estimation	Risk characterisation ratio (PEC/PNEC): <1
Exposure estimation and reference to its source - Workers: 1:	
Exposure assessment (human):	Used ECETOC TRA model (May 2010 release). (04/2010)
Exposure estimation	Risk characterisation ratio DNELs <1

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	Not available.
Health	Not available.
Environment	Not applicable.
Health	Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. See Section 8 for information on appropriate personal protective equipment.



Professional

Identification of the substance or mixture

Product definition: Mixture
 Product name: Nytro 10 XN

Section 1 - Title

Short title of the exposure scenario: Use as lubricant in open and closed systems- Professional (2,6-di-tert-butyl-p-creso)

List of use descriptors:

Identified use name: Use as lubricant in open and closed systems - Professional
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13
Substance supplied to that use in form of: As such
Sector of end use: SU22
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08a, ERC08d, ERC08e, ERC08f, ERC09b
Market sector by type of chemical product: PC17, PC24

Environmental contributing scenarios
 Health Contributing scenarios

Number of the ES: Not applicable.
 Industry Association: Not applicable.
 Generic exposure scenario: Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.
 covered by the exposure scenario: Professional
 Additional information:

Section 2 - Exposure controls

Product characteristics: solid
 Melting/freezing point: 69.8 °C
 Concentration of substance in mixture or article: 52%
 Amounts used: Annual site tonnage: 50.16 t/a (Closed system), 50.03 t/a open systems
 Continuous release(d/a): 300

Frequency and duration of use: Local freshwater dilution factor 10
 Receiving surface water flow is 18000 m³/d.
 Local marine water dilution factor 100
 Not applicable.

Environmental factors not influenced by risk management: % Release fraction to wastewater from process (Initial release prior to RMM) 0.2
 % Release fraction to air from process (Initial release prior to RMM) 0.01
 % Release fraction to soil from process (Initial release prior to RMM) 1
 Other given operational conditions affecting environmental exposure: On-site wastewater treatment required.
 Technical conditions and measures at process level (source) to prevent release: Ensure all waste water is collected and treated via a waste water treatment plant. Floors should be impervious, resistant to liquids and easy to clean.
 Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil: Ensure operatives are trained to minimise exposures.
 Organisational measures to prevent/limit release from site:

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Section 2 - Exposure controls

Conditions and measures related to municipal sewage treatment plant: Size of industrial sewage treatment plant (m3/d): 2000, Removal Efficiency (total): 94%

Conditions and measures related to external treatment of waste for disposal: No special measures are required. See section 13 for waste disposal information.
 Conditions and measures related to external recovery of waste: See section 13 for waste disposal information.

Contributing scenario controlling worker exposure for 0:

Product characteristics: Melting/freezing Point (°C): 69.8
 Concentration of substance in mixture or article: 52%
 Physical state: solid
 Dust: Solid, medium dustiness
 Frequency and duration of use: Exposure duration per year: 230 days, Exposure duration per day: 8 h (full shift), Respiratory m³/d: 10
 Human factors not influenced by risk management: The product should be handled at room temperature.
 Other given operational conditions affecting workers exposure: Lubricants (Closed system)
 Technical conditions and measures at process level (source) to prevent release: No special measures required.
 Technical conditions and measures to control dispersion from source towards the worker: Handle only in a place with local exhaust ventilation (or other adequate ventilation).
 Organisational measures to prevent/limit releases, dispersion and exposure: Ensure operatives are trained to minimise exposures.
 Conditions and measures related to personal protection and hygiene: Wear protective clothing. See Section 8 of the safety data sheet (personal protective equipment).
 Personal protection:

Section 3 - Exposure estimation and reference to its source

Website: Not available.

Exposure estimation and reference to its source - Environment: 2:

Exposure assessment (environment): Used EUSES model. (v2.1)

Exposure estimation: Risk characterisation ratio (PEC/PNEC): <1

Exposure estimation and reference to its source - Workers: 1:

Exposure assessment (human): Used ECETOC TRA model (May 2010 release).

Exposure estimation: Risk characterisation ratio DNELs <1

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

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Use as lubricant in open and closed systems - Professional (2,6-di-tert-butyl-p-cresol)

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment
Health

Not available.
Not available.

Environment
Health

Not available.
Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.
See Section 8 for information on appropriate personal protective equipment.

Nytro 10 XN

Annex to the extended Safety Data Sheet (eSDS)



Identification of the substance or mixture
Product definition: Mixture
Product name: Nytro 10 XN

Industrial

Section 1 - Title

Short title of the exposure scenario

Distribution of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)

List of use descriptors

Identified use name: Distribution of substance - Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15
Substance supplied to that use in form of: Substance
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ESVOC SpERC 1.1b.v1
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.

Environmental contributing scenarios

Distribution of substance

Health Contributing scenarios

Distribution of substance

Number of the ES
Industry Association

9.3.1b
Concawe
2012

Generic exposure scenario
Processes and activities covered by the exposure scenario
Additional information

01a
Bulk loading (including maine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.
Industrial

Section 2 - Exposure controls

Product characteristics
Amounts used

Substance is complex UVCS. Predominantly hydrophobic
Fraction of EU tonnage used in region 0.1
Regional use tonnage 8.5E+5
Fraction of Regional tonnage used locally 1
Maximum daily site tonnage 1.7E+4

Frequency and duration of use
Environment factors not influenced by risk management

Continuous release
Emission Days (days/year) 100
Local freshwater dilution factor 10
Local marine water dilution factor 100

Other given operational conditions affecting environmental exposure
Technical conditions and measures at process level (source) to prevent release
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk management measures - Air

Release fraction to air from process (initial release prior to RMM) 1.0E-4
Release fraction to wastewater from process (initial release prior to RMM) 1.0E-7
Release fraction to soil from process (initial release prior to RMM) 0.00001
Common practices vary across sites thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment if discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Treat air emission to provide a typical removal efficiency of 90

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<p>Mytro 10 XIV</p> <p style="text-align: right;"><i>Distribution of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</i></p>	<p>Section 2 - Exposure controls</p> <p>Drum and small package filling No other specific measures identified.</p> <p>Equipment cleaning and maintenance Drain down and flush system prior to equipment break-in or maintenance.</p> <p>Storage Store substance within a closed system.</p> <p>Conditions and measures related to personal protection and hygiene See Section 8 of the safety data sheet (general health and safety measures). See Section 8 of the safety data sheet (personal protective equipment).</p>
<p>Section 3 - Exposure estimation and reference to its source</p> <p>Website: Not applicable.</p> <p>Exposure estimation and reference to its source - Environment: 2: Distribution of substance Exposure assessment (environment): Not available.</p> <p>Exposure estimation The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrosisk model.</p> <p>Exposure estimation and reference to its source - Workers: 1: Distribution of substance Exposure assessment (human): Not available.</p> <p>Exposure estimation The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</p>	<p>Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES</p> <p>Environment</p> <p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.</p> <p>Health</p> <p>The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.</p> <p>A DNEL (derived no effect levels) cannot be derived.</p> <p>This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.</p> <p>However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.</p> <p>Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.</p> <p>There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.</p> <p>For any substance, classified as H304 (R65), these measures should be</p>

<p>Mytro 10 XIV</p> <p style="text-align: right;"><i>Distribution of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</i></p>	<p>Section 2 - Exposure controls</p> <p>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.4 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0</p> <p>Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.</p> <p>Estimated substance removal from wastewater via on-site sewage treatment^{94.7} Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs^{94.7} Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal^{1, 1E+5} Assumed on-site sewage treatment plant flow²⁰⁰⁰</p> <p>External treatment and disposal of waste should comply with applicable local and/or national regulations.</p> <p>External recovery and recycling of waste should comply with applicable local and/or national regulations.</p>	<p>Contributing scenario controlling worker exposure for 0: Distribution of substance</p> <p>Liquid, vapour pressure < 0.5 kPa at STP Covers percentage substance in the product up to 100% (unless stated differently).</p> <p>Liquid Covers daily exposures up to 8 hours (unless stated differently)</p> <p>Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented Aspiration hazard if swallowed. Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract. Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage. Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties. Do not induce vomiting as there is high risk of aspiration. IF SWALLOWED: Immediately call a POISON CENTER or physician.</p> <p>Contributing scenarios - Operational conditions and risk management measures</p> <p>General exposures (closed systems) No other specific measures identified.</p> <p>General exposures (open systems) No other specific measures identified.</p> <p>Process sampling No other specific measures identified.</p> <p>Laboratory activities No other specific measures identified.</p> <p>Bulk transfers closed systems No other specific measures identified.</p> <p>Bulk transfers open systems No other specific measures identified.</p>
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Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.

Annex to the extended Safety Data Sheet (eSDS)



Industrial

Identification of the substance or mixture

Product definition
Mixture
Product name
Nytrö 10 XN

Section 1 - Title

Short title of the exposure scenario

List of use descriptors

Formulation & (re)packing of substances and mixtures - Industrial (Other Lubricant Base Oils, IP346-3%)
Identified use name: Formulation and (re)packing of substances and mixtures - Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15
Substance supplied to that use in form of: Substance
Sector of end use: SU10
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ESVOG SpERC 2.2.V1
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.
Formulation and (re)packing of substances and mixtures

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES	9.4.1b
Industry Association	Concawe 2012
Generic exposure scenario	02
Processes and activities covered by the exposure scenario	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Additional information	Industrial

Formulation and (re)packing of substances and mixtures

Section 2 - Exposure controls

Product characteristics

Amounts used

Substance is complex UVCB.. Predominantly hydrophobic

Fraction of EU tonnage used in region 0.1

Regional use tonnage 8.5E+5

Fraction of Regional tonnage used locally 1

Annual site tonnage 3.0E+4

Maximum daily site tonnage 1.0E+5

Continuous release

Emission Days (days/year)300

Local freshwater dilution factor 10

Local marine water dilution factor 100

Frequency and duration of use

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure

Technical conditions and measures at process level (source) to prevent release

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil

Release fraction to air from process (initial release prior to RMM)2.5E-3
 Release fraction to wastewater from process (initial release prior to RMM)5.0E-6
 Release fraction to soil from process (initial release prior to RMM) 0.0001
 Common practices vary across sites thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

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^ (ES Revision date)

Section 2 - Exposure controls

Laboratory activities
 No other specific measures identified. Bulk transfers Dedicated facility

No other specific measures identified.

No other specific measures identified.

Mixing operations (open systems)
 No other specific measures identified.

Transfer from/pouring from containers Manual Non-dedicated facility
 No other specific measures identified.

Drum/batch transfers Dedicated facility
 No other specific measures identified.

No other specific measures identified.

Production of preparation or articles by tableting, compression, extrusion or pelletization
 No other specific measures identified.

Drum and small package filling
 No other specific measures identified.

Equipment cleaning and maintenance
 Drain down and flush system prior to equipment break-in or maintenance.

Storage
 Store substance within a closed system.

Conditions and measures related to personal protection and hygiene
 See Section 8 of the safety data sheet (general health and safety measures).
 Personal protection
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:
 Not applicable.

Exposure estimation and reference to its source - Environment 2: Formulation and (re)packing of substances and mixtures
 Not available.

Exposure assessment (environment):
 The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petronisk model.

Exposure estimation and reference to its source - Workers: 1: Formulation and (re)packing of substances and mixtures
 Not available.

Exposure assessment (human):
 The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment
 Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using on-site/off-site technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.

Date of issue/Date of revision ^ (ES Revision date) 26/39

Section 2 - Exposure controls

Treat air emission to provide a typical removal efficiency of 0

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 99.5
 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0

Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Not applicable as there is no release to wastewater.

Estimated substance removal from wastewater via on-site sewage treatment 94.7
 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs94.7
 Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 5.7E+5
 Assumed on-site sewage treatment plant flow 2000

External treatment and disposal of waste should comply with applicable local and/or national regulations.

External recovery and recycling of waste should comply with applicable local and/or national regulations.

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 0: Formulation and (re)packing of substances and mixtures

Product characteristics
 Liquid, vapour pressure < 0.5 kPa at STP
 Covers percentage substance in the product up to 100% (unless stated differently).

Concentration of substance in mixture or article
 Liquid
 Covers daily exposures up to 8 hours (unless stated differently)

Physical state
 Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented

Frequency and duration of use
 Aspiration hazard if swallowed.
 Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract.
 Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.
 This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.
 Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
 Do not induce vomiting as there is high risk of aspiration.
 IF SWALLOWED: Immediately call a POISON CENTER or physician.

Other given operational conditions affecting workers exposure
 Contributing scenarios - Operational conditions and risk management measures
 General exposures (closed systems)
 No other specific measures identified.

General exposures (open systems)
 No other specific measures identified.

Batch-processes at elevated temperatures
 No other specific measures identified.

Use in contained batch processes
 No other specific measures identified.

Process sampling
 No other specific measures identified.

Date of issue/Date of revision ^ (ES Revision date) 25/39

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Health

The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65; Harmful: may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL (derived no effect levels) cannot be derived.

This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.

Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern. There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.

For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.

Identification of the substance or mixture

Product definition: Mixture
Product name: Nytro 10 XN

Section 1 - Title

Short title of the exposure scenario: Manufacturer of substance- Industrial (Other Lubricant Base Oils, IP346<3%, H304)

List of use descriptors

Identified use name: Manufacture of substance - Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
Substance supplied to that use in form of: Substance
Sector of end use: SU03, SU08, SU09
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04, ESVOG SpERC 1.1.V1
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.
Manufacture of substance

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES	Industry Association	Generic exposure scenario	Processes and activities covered by the exposure scenario	Additional information
9.1.1b	Concawe 2012	01	Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	Industrial

Section 2 - Exposure controls

Product characteristics

Amounts used

Substance is complex UVCB. Predominantly hydrophobic
Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 8.5E+5
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 6.0E+5
Maximum daily site tonnage: 2.0E+6

Frequency and duration of use

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure

Technical conditions and measures at process level (source) to prevent release

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil

Continuous release
Emission Days (days/year): 300
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Release fraction to air from process (initial release prior to RMM): 1.0e-4
Release fraction to wastewater from process (initial release prior to RMM): 1.0e-5
Release fraction to soil from process (initial release prior to RMM): 0.0001
Common practices vary across sites thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

<p>Nytro 10 XV</p> <p>Manufacturer of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</p>	<p>Section 2 - Exposure controls</p> <p>No other specific measures identified.</p> <p>Equipment cleaning and maintenance Drain down and flush system prior to equipment break-in or maintenance.</p> <p>Bulk product storage Store substance within a closed system.</p> <p>Conditions and measures related to personal protection and hygiene See Section 8 of the safety data sheet (general health and safety measures). See Section 8 of the safety data sheet (personal protective equipment).</p> <p>Personal protection</p>
<p>Nytro 10 XV</p> <p>Manufacturer of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</p>	<p>Section 2 - Exposure controls</p> <p>Treat air emission to provide a typical removal efficiency of 90</p> <p>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 84.8 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0</p> <p>Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.</p> <p>Estimated substance removal from wastewater via on-site sewage treatment 94.7 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7 Maximum allowable site tonnage (Mis_{site}) based on release following total wastewater treatment removal 15.7E+6 Assumed on-site sewage treatment plant flow 10000 During manufacturing, no waste of the substance is generated.</p> <p>During manufacturing, no waste of the substance is generated.</p> <p>Conditions and measures related to external treatment of waste for disposal Conditions and measures related to external recovery of waste</p>
<p>Nytro 10 XV</p> <p>Manufacturer of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</p>	<p>Section 3 - Exposure estimation and reference to its source</p> <p>Not applicable.</p> <p>Exposure estimation and reference to its source - Environment 2: Manufacture of substance Not available.</p> <p>The Hydrocarbon Block Method has been used to calculate environmental exposure with the PetroRisk model.</p> <p>Exposure estimation and reference to its source - Workers: 1: Manufacture of substance Not available.</p> <p>The EGETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.</p>
<p>Nytro 10 XV</p> <p>Manufacturer of substance - Industrial (Other Lubricant Base Oils, IP346-3%, H304)</p>	<p>Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES</p> <p>Environment</p> <p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/em/reach-for-industries-libraries.html) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRO-RISK file - "Site-Specific Production" worksheet.</p> <p>The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.</p> <p>A DNIEL (derived no effect levels) cannot be derived.</p> <p>This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.</p> <p>However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.</p> <p>Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.</p> <p>There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.</p> <p>For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest.</p>
	<p>Health</p> <p>Contributing scenarios - Operational conditions and risk management measures</p> <p>General exposures (closed systems) No other specific measures identified.</p> <p>General exposures (open systems) No other specific measures identified.</p> <p>Process sampling No other specific measures identified.</p> <p>Laboratory activities No other specific measures identified.</p> <p>Bulk transfers (Closed system) No other specific measures identified.</p> <p>Bulk transfers open systems</p>

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Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

If swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.

Nytro 10 XN

Annex to the extended Safety Data Sheet (eSDS)



Industrial
 Identification of the substance or mixture
 Product definition Mixture
 Product name Nytro 10 XN

Section 1 - Title

Short title of the exposure scenario
 Uses in Functional fluids - Industrial (Other Lubricant Base Oils, IP346<3%, H304)

List of use descriptors
 Identified use name: Functional Fluids - Industrial
 Process Category: PROC01, PROC03, PROC08a, PROC08b, PROC02, PROC04, PROC09
 Substance supplied to that use in form of: Substance
 Sector of end use: SU03
 Subsequent service life relevant for that use: No.
 Environmental Release Category: ERC07,
 Market sector by type of chemical product: Not applicable.
 Article category related to subsequent service life: Not applicable.
 Functional Fluids

Environmental contributing scenarios

Health Contributing scenarios

Functional Fluids	Functional Fluids
Number of the ES	9.37.1b
Industry Association	Concawe 2012
Generic exposure scenario	13a
Processes and activities covered by the exposure scenario	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.
Additional Information	Industrial

Section 2 - Exposure controls

Product characteristics

Amounts used

Substance is complex UVCB. Predominantly hydrophobic
 Fraction of EU tonnage used in region 0.1
 Regional use tonnage 1.2E+3
 Fraction of Regional tonnage used locally 1
 Annual site tonnage 1.0E+1
 Maximum daily site tonnage 5.0E+2
 Continuous release
 Emission Days (days/year) 20
 Local freshwater dilution factor 10
 Local marine water dilution factor 100

Frequency and duration of use

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure
 Technical conditions and measures at process level (source) to prevent release
 Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil
 Risk management measures - Air
 Release fraction to air from process (initial release prior to RMM) 5.0E-4
 Release fraction to wastewater from process (initial release prior to RMM) 1.0E-6
 Release fraction to soil from process (initial release prior to RMM) 0.001 used.
 Common practices vary across sites thus conservative process release estimates
 Risk from environmental exposure is driven by freshwater sediment.
 Prevent discharge of undissolved substance to or recover from onsite wastewater.
 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
 Treat air emission to provide a typical removal efficiency of 0

Date of issue/Date of revision

^(ES Revision date)

Section 2 - Exposure controls

Remanufacture of reject articles
No other specific measures identified.

Equipment cleaning and maintenance
Drain down system prior to equipment break-in or maintenance.

Storage
Store substance within a closed system.

Conditions and measures related to personal protection and hygiene
See Section 8 of the safety data sheet (general health and safety measures).
Personal protection
See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:	Not applicable.
Exposure estimation and reference to its source - Environment 2: Functional Fluids	Not available.
Exposure assessment (environment):	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Exposure estimation	
Exposure estimation and reference to its source - Workers: 1: Functional Fluids	Not available.
Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
Exposure estimation	

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SPERC factsheet. (http://cofic.org/en/reach-for-industries-libraries.html) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.
Health	The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful: may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL (derived no effect levels) cannot be derived. This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern. There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.

Section 2 - Exposure controls

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 84.4.
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 70.

Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via on-site sewage treatment 84.7
Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 3.5E+3
Assumed on-site sewage treatment plant flow 2000

External treatment and disposal of waste should comply with applicable local and/or national regulations.

External recovery and recycling of waste should comply with applicable local and/or national regulations.

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 0: Functional Fluids	Liquid, vapour pressure < 0.5 kPa at STP Covers percentage substance in the product up to 100% (unless stated differently).
Product characteristics	
Concentration of substance in mixture or article	
Physical state	Liquid With potential for aerosol generation
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented Aspiration hazard if swallowed. Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract. Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage. Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties. Do not induce vomiting as there is high risk of aspiration. IF SWALLOWED: Immediately call a POISON CENTER or physician.
Contributing scenarios - Operational conditions and risk management measures	Contributing scenarios - Operational conditions and risk management measures Bulk transfers - Closed system No other specific measures identified.
Drum/batch transfers - Dedicated facility	Drum/batch transfers - Dedicated facility No other specific measures identified.
Filling of articles/equipment - closed systems	Filling of articles/equipment - closed systems No other specific measures identified.
Filling/preparation of equipment from drums or containers - Non-dedicated facility	Filling/preparation of equipment from drums or containers - Non-dedicated facility No other specific measures identified.
General exposures (closed systems)	General exposures (closed systems) No other specific measures identified.
General exposures (open systems) - Elevated temperature	General exposures (open systems) - Elevated temperature Restrict area of openings to equipment. Provide extract ventilation to emission points when contact with warm (>50°C) lubricant is likely.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

For any substance classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.

Nytro 10 XN

Annex to the extended Safety Data Sheet (eSDS)



Identification of the substance or mixture
 Product definition: Mixture
 Product name: Nytro 10 XN

Professional

Section 1 - Title

Short title of the exposure scenario: Uses in Functional fluids - Professional (Other Lubricant Base Oils, IP346-3%, H304)
 List of use descriptors: Identified use name: Functional Fluids - Professional
 Process Category: PROC01, PROC02, PROC03, PROC08a, PROC09, PROC20
 Substance supplied to that use in form of: Substance
 Sector of end use: SU22

Subsequent service life relevant for that use: No.
 Environmental Release Category: ERC09a, ERC09b, ESOVOC SpERC 9.13b.V1
 Market sector by type of chemical product: Not applicable.
 Article category related to subsequent service life: Not applicable.
 Functional Fluids

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES	Industry Association	Generic exposure scenario	Processes and activities covered by the exposure scenario	Additional information
9.38.1b	Concawe 2012	13b	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.	Professional

Section 2 - Exposure controls

Product characteristics
 Amounts used

Substance is complex UVCB. Predominantly hydrophobic
 Fraction of EU tonnage used in region: 0.1
 Regional use tonnage: 1.2E+3
 Fraction of Regional tonnage used locally: 1
 Annual site tonnage: 6.0E-1
 Maximum daily site tonnage: 1.6E+0
 Continuous release
 Emission Days (days/year): 365
 Local freshwater dilution factor: 10
 Local marine water dilution factor: 100

Frequency and duration of use
 Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure
 Technical conditions and measures at process level (source) to prevent release
 Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil
 Risk management measures - Air

Release fraction to air from process (initial release prior to RMM): 0.05
 Release fraction to wastewater from process (initial release prior to RMM): 0.025
 Release fraction to soil from process (initial release prior to RMM): 0.025
 Common practices vary across sites thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of N/A

Section 2 - Exposure controls

Risk management measures - Water
 Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.9
 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0
 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
 Estimated substance removal from wastewater via on-site sewage treatment 94.7
 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
 Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 1.1E+1
 Assumed on-site sewage treatment plant flow 2000
 External treatment and disposal of waste should comply with applicable local and/or national regulations.
 External recovery and recycling of waste should comply with applicable local and/or national regulations.

Organisational measures to prevent/limit release from site
 Conditions and measures related to municipal sewage treatment plant
 Conditions and measures related to external treatment of waste for disposal
 Conditions and measures related to external recovery of waste

Remanufacture of reject articles
 No other specific measures identified.
 Equipment cleaning and maintenance
 Drain down system prior to equipment break-in or maintenance.
 Storage
 Store substance within a closed system.
 Conditions and measures related to personal protection and hygiene
 See Section 8 of the safety data sheet (general health and safety measures).
 Personal protection
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website: Not applicable.

Exposure estimation and reference to its source - Environment: 2: Functional Fluids
 Exposure assessment (environment): Not available.
 Exposure estimation: The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrosisk model.

Exposure estimation and reference to its source - Workers: 1: Functional Fluids
 Exposure assessment (human): Not available.
 Exposure estimation: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment
 Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. (<http://cefic.org/reach-for-industries-libraries.html>) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.
 The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.
 A DNEL (derived no effect levels) cannot be derived.
 This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.
 However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.
 Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.
 There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.

Section 2 - Exposure controls

Risk management measures - Water
 Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.9
 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0
 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
 Estimated substance removal from wastewater via on-site sewage treatment 94.7
 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
 Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 1.1E+1
 Assumed on-site sewage treatment plant flow 2000
 External treatment and disposal of waste should comply with applicable local and/or national regulations.
 External recovery and recycling of waste should comply with applicable local and/or national regulations.

Organisational measures to prevent/limit release from site
 Conditions and measures related to municipal sewage treatment plant
 Conditions and measures related to external treatment of waste for disposal
 Conditions and measures related to external recovery of waste

Contributing scenario controlling worker exposure for 0: Functional Fluids
 Product characteristics
 Concentration of substance in mixture or article
 Physical state
 Frequency and duration of use
 Other given operational conditions affecting workers exposure

Liquid, vapour pressure < 0.5 kPa at STP
 Covers percentage substance in the product up to 100% (unless stated differently).
 Liquid With potential for aerosol generation
 Covers daily exposures up to 8 hours (unless stated differently)
 Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented
 Aspiration hazard if swallowed.
 Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract.
 Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.
 This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.
 Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
 Do not induce vomiting as there is high risk of aspiration.
 IF SWALLOWED: Immediately call a POISON CENTER or physician.
 Contributing scenarios - Operational conditions and risk management measures
 Bulk transfers - Closed system
 No other specific measures identified.
 Drum/batch transfers - Dedicated facility
 No other specific measures identified.
 Filling of articles/equipment - closed systems
 No other specific measures identified.
 Filling/preparation of equipment from drums or containers - Non-dedicated facility
 No other specific measures identified.
 General exposures (closed systems)
 No other specific measures identified.
 General exposures (open systems) - Elevated temperature
 Restrict area of openings to equipment. Provide extract ventilation to emission points when contact with warm (>50°C) lubricant is likely.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest if swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.



Nytro Libra

SAFETY DATA SHEET

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Date of previous validation	No previous validation
Version	1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier	Nytro Libra
Product name	Insulating oil
Product description	Liquid.
Product type	Oils
MARPOL Annex 1	
1.2 Identified uses	
Identified uses	Distribution of substance - Industrial Formulation and (re)packing of substances and mixtures - Industrial Manufacture of substance - Industrial Functional Fluids - Industrial Functional Fluids - Professional
Uses advised against	
Reason	
Uses advised against	This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet	Head offices: Nynas AB P.O. Box 10700 SE-121 29 Stockholm SWEDEN +46 8 602 12 00 (Office hours 8 am - 4.30 pm (CET)) www.nynas.com
Supplier/Manufacturer	ProductHSE@nynas.com
e-mail address of person responsible for this SDS	
National contact	Nynas sp. z o.o. ul. Kolberga 48D PL-44 100 Gliwice POLAND +48 32 232 74 10
1.4 Emergency telephone number	
National advisory body/Poison Centre	+44 (0) 1235 239 670
Telephone number	24 hour service
Hours of operation	
Date of issue/Date of revision	: 2015-09-17 Date of previous issue : No previous validation Version : 1
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition
Mixture
Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
Asp. Tox. 1, H304
The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
See Section 16 for the full text of the H statements declared above.
See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements



Hazard pictograms
Signal word
Danger
Hazard statements
H304 - May be fatal if swallowed and enters airways.
Precautionary statements
Prevention
Not applicable.
Response
P301 + P310 + P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
Storage
P405 - Store locked up.
Disposal
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles
Not applicable.

2.3 Other hazards
Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product/ingredient name	Identifiers	%	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
Distillate (petroleum), hydro-treated light naphthenic	REACH #: 01-2119480375-34 EC: 265-156-6 CAS: 64742-53-6 Index: 649-466-00-2	50 - 70	Asp. Tox. 1, H304	[1]
Distillate (petroleum), hydro-treated light paraffinic	REACH #: 01-2119487077-29 EC: 265-158-7	0 - 50	Asp. Tox. 1, H304	[1]

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SECTION 3: Composition/information on ingredients

Distillates (petroleum), hydrotreated heavy paraffinic	CAS: 64742-65-8 REACH #: 01-2119484627-25	0 - 50	Not classified.	[1]
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	EC: 265-157-1 CAS: 64742-54-7 Index: 649-467-00-8 REACH #: 01-2119474878-16	0 - 50	Asp. Tox. 1, H304	[1]
Distillates (petroleum), solvent-refined heavy naphthenic	EC: 276-737-9 CAS: 72623-86-0 Index: 648-482-00-X REACH #: 01-2119483621-38	0 - 5	Not classified.	
Distillates (petroleum), solvent-refined light naphthenic	EC: 265-097-6 CAS: 64741-96-4 Index: 649-457-00-3 REACH #: 01-2119480374-36	0 - 5	Asp. Tox. 1, H304	[1]
See Section 16 for the full text of the H statements declared above.				

Annex I Nota L applies to the base oil(s) in this product. Nota L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3 % DMSO extract as measured by IP 346. There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs or vPvBs or have been assigned a workplace exposure limit and hence require reporting in this section.

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- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

Inhalation
If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If casualty is unconscious and: if not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention if adverse health effects persist or are severe. Maintain an open airway.

Skin contact
Wash with soap and water. Remove contaminated clothing and shoes. Handle with care and dispose of in a safe manner. Seek medical attention if skin irritation, swelling or redness develops and persists.

Accidental high pressure injection through the skin requires immediate medical attention. Do not wait for symptoms to develop.

SECTION 4: First aid measures

Ingestion

Always assume that aspiration has occurred. Do not induce vomiting. Can enter lungs and cause damage. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Seek professional medical attention or send the casualty to a hospital. Do not wait for symptoms to develop.

Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

- Eye contact**
Irritation.
- Inhalation**
Eye contact may cause redness and transient pain. Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.
- Skin contact**
No known significant effects or critical hazards.
- Ingestion**
May be fatal if swallowed and enters airways.

4.3 Indication of any immediate medical attention and special treatment needed

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

Specific treatments

Always assume that aspiration has occurred.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media

Do not use direct water jets on the burning product, they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance
In a fire or if heated, a pressure increase will occur and the container may burst. This substance will float and can be reignited on surface water.

Hazardous thermal decomposition products
Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H₂S, SO_x (sulphur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

5.3 Advice for firefighters

Special precautions for fire-fighters
Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters
Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
 For non-emergency personnel
 Avoid breathing vapour or mist. Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency. Stop leak if safe to do so. Avoid direct contact with the product. Stay upwind/keep distance from source. In case of large spillages, alert occupants in downwind areas.

Eliminate all ignition sources if safe to do so. Spillages of limited amounts of product, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which will presumably limit the exposure to dangerous concentrations.

Note : recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken.

Small spillages: normal antistatic working clothes are usually adequate.
 Large spillages: full body suit of chemically resistant and thermal resistant material should be used. Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Note : gloves made of PVA are not water-resistant, and are not suitable for emergency use. Safety helmet, antistatic non-skid safety shoes or boots. Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated.

Respiratory protection : A half or full-face respirator with filter(s) for organic vapours (and when applicable for H2S), a Self Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

6.2 Environmental precautions
 Prevent product from entering sewers, rivers or other bodies of water. If necessary dilute the product with dry earth, sand or similar non-combustible materials. In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.

In case of small spillages in closed waters (i.e. ponds), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents.

If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities.

6.3 Methods and material for containment and cleaning up
 Small spill
 Stop leak if without risk. Absorb spilled product with suitable non-combustible materials.
 Large spill
 Large spillages may be cautiously covered with foam, if available, to limit vapour cloud formation. Do not use water jet. When inside buildings or confined spaces, ensure adequate ventilation. Transfer collected product and other contaminated materials to suitable containers for recovery or safe disposal. Note: see Section 1 for emergency contact information and Section 13 for waste disposal. See Section 8 for information on appropriate personal protective equipment.

6.4 Reference to other sections
 See Section 1 for emergency contact information.
 See Section 8 for information on appropriate personal protective equipment.
 See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

General information
 Obtain special instructions before use. Hazard of slipping on spill product. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use and store only outdoors or in a well-ventilated area.

Avoid release to the environment.

7.1 Precautions for safe handling
 Protective measures
 Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with eyes, skin and clothing.
 Prevent the risk of slipping. Take precautionary measures against static discharge.
 Avoid splash filling of bulk volumes when handling hot liquid product

Note : See Section 8 for information on appropriate personal protective equipment.
 See section 13 for waste disposal information.

Advice on general occupational hygiene
 Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands thoroughly after handling. Change contaminated clothes at the end of working shift. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities
 Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Storage area layout, tank design, equipment and operating procedures must comply with the relevant regional, national or local legislation. Storage installations should be designed with adequate bunds in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

Store separately from oxidising agents.

Recommended materials for containers, or container linings use mild steel, stainless steel. Not suitable : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.

Keep only in the original container or in a suitable container for this kind of product. Keep container tightly closed and sealed until ready for use. Do not store in unlabelled containers. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Empty containers may contain harmful, flammable/combustible or explosive residue or vapours. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards. Store locked up. Protect from sunlight.

7.3 Specific end use(s)
 Recommendations
 Industrial sector specific solutions
 Not available.
 Not available.

Note : See Section 8 for information on appropriate personal protective equipment.
 See section 13 for waste disposal information.

Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands thoroughly after handling. Change contaminated clothes at the end of working shift. See also Section 8 for additional information on hygiene measures.

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Storage area layout, tank design, equipment and operating procedures must comply with the relevant regional, national or local legislation. Storage installations should be designed with adequate bunds in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

SECTION 8: Exposure controls/personal protection

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Oil mist	[Air contaminant] Rozporządzenie Ministra Pracy i Polityki Społecznej (Dz.U. 2014 poz. 817) (Poland, 6/2014). TWA: 5 mg/m ³ 8 hours. Form: Inhalable fraction

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMEELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Distillate (petroleum), hydrotreated light naphthenic	DNEL	Long term Inhalation	5,4 mg/m ³	Workers	Local
Distillate (petroleum), hydrotreated light paraffinic	DNEL	Long term Inhalation	5,4	Workers	Local
Distillates (petroleum), solvent-refined light naphthenic	DNEL	Long term Inhalation	5,4 mg/m ³	Workers	Local

PNECs

No PNECs available

PNEC Summary

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

8.2 Exposure controls

Appropriate engineering controls

Mechanical ventilation and local exhaust will reduce exposure via the air. Use oil resistant material in construction of handling equipment. Store under recommended conditions and if heated, temperature control equipment should be used to avoid overheating.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Wash contaminated clothing before reuse.
Recommended: Safety glasses with side shields.

Eye/face protection

Skin protection

Hand protection

Body protection

Other skin protection

4 - 8 hours (breakthrough time); nitrile rubber
Wear protective clothing if there is a risk of skin contact. Change contaminated clothes at the end of working shift.
Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.

Respiratory protection

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state

Colour

Odour

Odour threshold

pH

Melting point/freezing point range

Flash point

Evaporation rate

Flammability (solid, gas)

Upper/lower flammability or explosive limits

Vapour pressure

Density

Solubility(ies)

Partition coefficient: n-octanol/water

Auto-ignition temperature

Decomposition temperature

Viscosity

Explosive properties

Oxidising properties

DMSO extractable compounds for base oil substance(s) according to IP346

Liquid.
Light yellow
Odourless/Light petroleum.
Not available.
Not applicable.
-51°C
>250°C
Closed cup: >140°C [Pensky-Martens.]
Not available.
Not available.
Not available.
160 Pa @ 100 °C
0.88 g/cm³ [15°C]
Insoluble in water.
Not available.
>270°C
>280°C
Kinematic (40°C): 0.096 cm²/s (9.6 cSt)
Not available.
Not available.
< 3%

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Oxidising agent

Keep away from extreme heat and oxidizing agents.

10.5 Incompatible materials

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H₂S, SO_x (sulfur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

10.6 Hazardous decomposition products

Acute toxicity

SECTION 11: Toxicological information

11.1 Information on toxicological effects

SECTION 11: Toxicological information

Product/ingredient name	Route of exposure	Species	Result	Remarks
Distillate (petroleum), hydro-treated light naphthenic	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)
Lubricating oils (petroleum), C15-30, hydro-treated neutral oil-based	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)
Distillate (petroleum), hydro-treated light paraffinic	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)
Distillates (petroleum), solvent-refined light naphthenic	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)

Skin
No known significant effects or critical hazards.
Respiratory
No known significant effects or critical hazards.
Mutagenicity

Product/ingredient name	Test	Experiment	Result	Remarks
Distillate (petroleum), hydro-treated light naphthenic	OECD 473 473 In vitro Mammalian Chromosomal Aberration Test	Experiment In vitro	Negative	
Lubricating oils (petroleum), C15-30, hydro-treated neutral oil-based	OECD 473 473 In vitro Mammalian Chromosomal Aberration Test	Subject: Mammalian-Animal Metabolic activation: with and without Experiment: In vitro	Negative	
Distillate (petroleum), hydro-treated light paraffinic	OECD 473 473 In vitro Mammalian Chromosomal Aberration Test	Subject: Mammalian-Animal Metabolic activation: with and without Experiment: In vitro	Negative	
Distillates (petroleum), solvent-refined light naphthenic	OECD 473 473 In vitro Mammalian Chromosomal Aberration Test	Subject: Mammalian-Animal Metabolic activation: with and without Experiment: In vitro	Negative	Reference report 1987 (similar material)

Conclusion/Summary
Carcinogenicity
No known significant effects or critical hazards.

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
Distillate (petroleum), hydro-treated light naphthenic	LC50 Inhalation Dusts and mists LD50 Dermal LD50 Oral	Rat - Male, Female Rabbit Rat	>5.53 mg/l >5000 mg/kg >5000 mg/kg	4 hours - -	EMBSI 1988a (similar material) API 1982 (similar material) API 1986a (similar material) EMBSI 1988a (similar material)
Lubricating oils (petroleum), C15-30, hydro-treated neutral oil-based	LC50 Inhalation Dusts and mists LD50 Dermal LD50 Oral	Rat - Male, Female Rabbit Rat	>5.53 mg/l >5000 mg/kg >5000 mg/kg	4 hours - -	API 1982 (similar material) API 1986a (similar material) EMBSI 1988a (similar material)
Distillate (petroleum), hydro-treated light paraffinic	LC50 Inhalation Dusts and mists LD50 Dermal LD50 Oral	Rat - Male, Female Rabbit Rat	>5.53 mg/l >5000 mg/kg >5000 mg/kg	4 hours - -	EMBSI 1988a (similar material) API 1982 (similar material) API 1986a (similar material)
Distillates (petroleum), solvent-refined light naphthenic	LC50 Inhalation Dusts and mists LD50 Dermal LD50 Oral	Rat - Male, Female Rabbit Rat	>5.53 mg/l >5000 mg/kg >5000 mg/kg	4 hours - -	EMBSI 1988a (similar material) API 1982 (similar material) API 1986a (similar material)

Conclusion/Summary
Initiation/Corrosion
No known significant effects or critical hazards.

Product/ingredient name	Result	Species	Score	Observation	Remarks
Distillate (petroleum), hydro-treated light naphthenic	Skin - Non-irritant to skin. Eyes - Non-irritating to the eyes. Eyes - Non-irritating to the eyes.	Rabbit Rabbit Rabbit	0 to 0.8 0.17 to 0.33 0.17 to 0.33	24 to 72 hours 24 to 72 hours 24 to 72 hours	UBTL 1984e (similar material) UBTL 1984i (similar material) UBTL 1984i (similar material)
Lubricating oils (petroleum), C15-30, hydro-treated neutral oil-based	Skin - Non-irritant to skin. Eyes - Non-irritating to the eyes. Skin - Non-irritant to skin.	Rabbit Rabbit Rabbit	0 to 0.8 0.17 to 0.33 0 to 0.8	24 to 72 hours 24 to 72 hours 24 to 72 hours	UBTL 1984e (similar material) UBTL 1984i (similar material) UBTL 1984e (similar material)
Distillates (petroleum), solvent-refined light naphthenic	Eyes - Non-irritating to the eyes. Skin - Non-irritant to skin. Eyes - Non-irritating to the eyes.	Rabbit Rabbit Rabbit	0.17 to 0.33 0 to 0.8 0.17 to 0.33	24 to 72 hours 24 to 72 hours 24 to 72 hours	UBTL 1984i (similar material) UBTL 1984e (similar material) UBTL 1984i (similar material)

Skin
Eyes
Respiratory
Sensitisation
No known significant effects or critical hazards.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

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SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
Distillate (petroleum), hydrotreated light naphthenic	Negative - Dermal	Mouse - Female	0.22 to 0.25 ml	78 weeks; Various	Doak, 1983, McKee, 1989 (similar material)
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Negative - Dermal	Mouse - Female	0.22 to 0.25 ml	78 weeks; Various	Doak, 1983, McKee, 1989 (similar material)
Distillate (petroleum), hydrotreated light paraffinic	Negative - Dermal	Mouse - Female	0.22 to 0.25 ml	78 weeks; Various	Doak, 1983, McKee, 1989 (similar material)
Distillates (petroleum), solvent-refined light naphthenic	Negative - Dermal	Mouse - Female	0.22 to 0.25 ml	78 weeks; Various	Doak, 1983, McKee, 1989 (similar material)

Conclusion/Summary
The base oil(s) in this product is based on an severely hydrotreated distillate. The product should not be regarded as a carcinogen.

Reproductive toxicity

Conclusion/Summary
No known significant effects or critical hazards.

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure	Remarks
Distillate (petroleum), hydrotreated light naphthenic	Negative - Dermal	Rat	0 to 2000 mg/kg mg/kg/day	-	(similar material)
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Negative - Dermal	Rat	0 to 2000 mg/kg mg/kg/day	-	-
Distillate (petroleum), hydrotreated light paraffinic	Negative - Dermal	Rat	0 to 2000 mg/kg mg/kg/day	-	-
Distillates (petroleum), solvent-refined light naphthenic	Negative - Dermal	Rat	0 to 2000 mg/kg mg/kg/day	-	1987 (similar material)

Conclusion/Summary
No known significant effects or critical hazards.

Aspiration hazard

Product/ingredient name	Result
Distillate (petroleum), hydrotreated light naphthenic	ASPIRATION HAZARD - Category 1
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	ASPIRATION HAZARD - Category 1
Distillate (petroleum), hydrotreated light paraffinic	ASPIRATION HAZARD - Category 1
Distillates (petroleum), solvent-refined light naphthenic	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure
Not available.

Potential acute health effects

Eye contact
Inhalation
Skin contact
Ingestion
Potential chronic health effects
General
Carcinogenicity
Eye contact may cause redness and transient pain.
Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.
No known significant effects or critical hazards.
May be fatal if swallowed and enters airways.

No known significant effects or critical hazards.
The base oil(s) in this product is based on an severely hydrotreated distillate. The product should not be regarded as a carcinogen.

SECTION 11: Toxicological information

Mutagenicity
No known significant effects or critical hazards.
Teratogenicity
No known significant effects or critical hazards.
Developmental effects
No known significant effects or critical hazards.
Fertility effects
No known significant effects or critical hazards.
Other information
Not available.
Specific hazard

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Distillate (petroleum), hydrotreated light naphthenic	Acute LL50 >10000 mg/l	Aquatic invertebrates.	96 hours
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Acute LL50 >100 mg/l Acute NOEL >100 mg/l Chronic NOEL 10 mg/l	Fish Algae Aquatic invertebrates.	96 hours 72 hours 21 days 96 hours
Distillates (petroleum), hydrotreated light paraffinic	Acute LL50 >100 mg/l Acute NOEL >100 mg/l Chronic NOEL 10 mg/l Acute IC50 >100 mg/l	Fish Algae Aquatic invertebrates.	96 hours 72 hours 21 days 48 hours
Distillates (petroleum), solvent-refined light naphthenic	Acute LC50 >100 mg/l Acute LL50 >10000 mg/l Acute NOEL >100 mg/l Chronic NOEL 10 mg/l	Fish Aquatic invertebrates. Fish Algae Aquatic invertebrates.	96 hours 96 hours 96 hours 72 hours 21 days 96 hours

Conclusion/Summary
No known significant effects or critical hazards.

12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Distillate (petroleum), hydrotreated light naphthenic	-	-	Inherent
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	-	-	Inherent
Distillates (petroleum), hydrotreated light paraffinic	-	-	Inherent
Distillates (petroleum), solvent-refined light naphthenic	-	-	Inherent

Conclusion/Summary
Inherently biodegradable.

12.3 Bioaccumulative potential

Conclusion/Summary
No known significant effects or critical hazards.

SECTION 12: Ecological information

Product/ingredient name	LogP _{ow}	BCF	Potential
Distillate (petroleum), hydrotreated light naphthenic	2 to 6	<500	low
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	2 to 6	<500	low
Distillates (petroleum), hydrotreated light paraffinic	2 to 6	<500	low
Distillates (petroleum), solvent-refined light naphthenic	2 to 6	<500	low

Conclusion/Summary
The product has a potential to bioaccumulate.

12.4 Mobility in soil
Mobility
High mobility in soil predicted, based on log Kow > 3.0.

12.5 Results of PBT and vPvB assessment
Not applicable.
Not applicable.

12.6 Other adverse effects
Insoluble in water. Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal
Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended. This substance can be burned or incinerated, subject to national/local authorizations, relevant contamination limits, safety regulations and air quality legislation. Contaminated or waste substance (not directly recyclable): Disposal can be carried out directly, or by delivery to qualified waste handlers. National legislation may identify a specific organization, and/or prescribe composition limits and methods for recovery or disposal.

Hazardous waste
Yes.

European waste catalogue (EMWC)

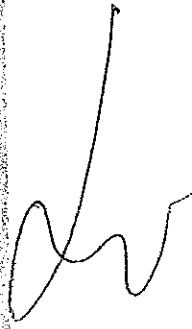
Waste code	Waste designation
13 03 07*	mineral-based non-chlorinated insulating and heat transmission oils

Packaging

Methods of disposal
The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

International transport regulations



SECTION 14: Transport information

14.1 UN number	ADR/RID	ADN	IMO/MDG Classification	ICAO/IATA Classification
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional Information	-	-	-	-

14.6 Special precautions for user
Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex I of MARPOL 73/78 and the IBC Code
Oils

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

Other EU regulations

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations

International lists

Product/ingredient name

List name

Name on list

Classification

Notes

Distillates (petroleum), hydrotreated light paraffinic

Poland Carcinogen, Mutagen chemicals

Destylaty lekkie parafinowe, obrabiane wodorem (ropa naftowa); olej bazowy - niespecyfikowany

Carc. cat.2

-

Date of issue/Date of revision

: 2015-09-17

Date of previous issue

: No previous validation

Version : 1

SECTION 15: Regulatory information

National Inventory

- Australia All components are listed or exempted.
- Canada All components are listed or exempted.
- China All components are listed or exempted.
- Japan All components are listed or exempted.
- Malaysia Not determined.
- New Zealand All components are listed or exempted.
- Philippines All components are listed or exempted.
- Republic of Korea All components are listed or exempted.
- Taiwan All components are listed or exempted.
- United States All components are listed or exempted.

15.2 Chemical Safety Assessment Complete.

SECTION 16: Other information

Revision comments Not available.

Indicates information that has changed from previously issued version.

- ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
- ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- CMR = Carcinogen, Mutagen or Reproductive toxicant
- CSA = Chemical Safety Assessment
- CO₂ = carbon dioxide
- DNEL = Derived No Effect Level
- EC50 = Half maximal effective concentration
- EUH statement = CLP-specific Hazard statement
- IATA = International Air Transport Association
- IC50 = Half maximal inhibitory concentration
- IMDG = International Maritime Dangerous Goods
- LC50 = Median lethal concentration
- LD50 = Median lethal dose
- PNEC = Predicted No Effect Concentration
- PBT = Persistent, Bioaccumulative and Toxic
- RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
- REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
- SCBA = Self-Contained Breathing Apparatus
- SVHC = Substances of Very High Concern

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Asp. Tox. 1, H304	Calculation method

Poland
Full text of abbreviated H statements H304 May be fatal if swallowed and enters airways.
Full text of classifications [CLP/GHS] Asp. Tox. 1, H304 ASPIRATION HAZARD - Category 1
Date of printing 2015-09-17
Date of issue/ Date of revision 2015-09-17

SECTION 16: Other information

Date of previous issue No previous validation
Version 1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Industrial

Identification of the substance or mixture

Product definition
Mixture
Product name
Nytro Libra

Section 1 - Title

Short title of the exposure scenario
Distribution of substance- Industrial (Other Lubricant Base Oils, IP346-3%, H304)

List of use descriptors
Identified use name: Distribution of substance - Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15
Substance supplied to that use in form of: Substance
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07, ESVOC SpERC 1.1b.v1
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES	Distribution of substance
9.3.1b	Concawe
Industry Association	2012
Generic exposure scenario	01a
Processes and activities covered by the exposure scenario	Bulk loading (including marine vessel/barge, railroad car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.
Additional information	Industrial

Section 2 - Exposure controls

Product characteristics

Amounts used
Substance is complex UVCB.. Predominantly hydrophobic
Fraction of EU tonnage used in region 0.1
Regional use tonnage 8.5E+5
Fraction of Regional tonnage used locally 1
Maximum daily site tonnage 1.7E+4

Frequency and duration of use

Continuous release
Emission Days (days/year) 100
Local freshwater dilution factor 10
Local marine water dilution factor 100

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure
Release fraction to air from process (initial release prior to RMM) 1.0E-4
Release fraction to wastewater from process (initial release prior to RMM) 1.0E-7
Release fraction to soil from process (initial release prior to RMM) 0.00001
Common practices vary across sites thus conservative process release estimates used.

Technical conditions and measures to prevent release (source) to prevent release

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Risk management measures - Air
Treat air emission to provide a typical removal efficiency of 90

Section 2 - Exposure controls

Risk management measures - Water
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Organisational measures to prevent/limit release from site
Conditions and measures related to municipal sewage treatment plant
Estimated substance removal from wastewater via on-site sewage treatment 94.7
Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMIS94.7
Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 1.1E+5
Assumed on-site sewage treatment plant flow 2000

Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 0: Distribution of substance

Product characteristics
Concentration of substance in mixture or article
Liquid
Covers percentage substance in the product up to 100% (unless stated differently).

Physical state

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure

Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented
Aspiration hazard if swallowed.
Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract
Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.
This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.
Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
Do not induce vomiting as there is high risk of aspiration.
IF SWALLOWED: Immediately call a POISON CENTER or physician.

Contributing scenarios - Operational conditions and risk management measures

General exposures (closed systems)
No other specific measures identified.

General exposures (open systems)
No other specific measures identified.

Process sampling
No other specific measures identified.

Laboratory activities
No other specific measures identified.

Bulk transfers closed systems
No other specific measures identified.

Bulk transfers open systems
No other specific measures identified.

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Section 2 - Exposure controls

Drum and small package filling
 No other specific measures identified.
 Equipment cleaning and maintenance
 Drain down and flush system prior to equipment break-in or maintenance.
 Storage
 Store substance within a closed system.
 Conditions and measures related to personal protection and hygiene
 Personal protection
 See Section 8 of the safety data sheet (general health and safety measures).
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:	Not applicable.
Exposure estimation and reference to its source - Environment 2: Distribution of substance (environment):	Not available.
Exposure estimation	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petronisk model.
Exposure estimation and reference to its source - Workers: 1: Distribution of substance	Not available.
Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	<p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using on-site/off-site technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.</p> <p>The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R68: Harmful: may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.</p> <p>A DNEL (derived no effect levels) cannot be derived.</p> <p>This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.</p> <p>However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.</p> <p>Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.</p> <p>There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.</p> <p>For any substance, classified as H304 (R65), these measures should be</p>
Health	

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.



Industrial

Identification of the substance or mixture
 Product definition: Mixture
 Product name: Nytro Libra

Section 1 - Title

Short title of the exposure scenario
 List of use descriptors
 Formulation & (re)packing of substances and mixtures - Base Oils, IP346<3%
 Identified use name: Formulation and (re)packing of substances and mixtures - Industrial
 Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15
 Substance supplied to that use in form of: Substance
 Sector of end use: SU10
 Subsequent service life relevant for that use: No.
 Environmental Release Category: ERC02, ESVOC SpERC 2.2.v1
 Market sector by type of chemical product: Not applicable.
 Article category related to subsequent service life: Not applicable.

Formulation and (re)packing of substances and mixtures

Formulation and (re)packing of substances and mixtures

Environmental contributing scenarios	9.4.1b
Health Contributing scenarios	Concawe 2012
Number of the ES	02
Industry Association	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, labelling, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Generic exposure scenario	Industrial
Processes and activities covered by the exposure scenario	
Additional information	

Section 2 - Exposure controls

Product characteristics
 Amounts used
 Substance is complex UVCB. Predominantly hydrophobic
 Fraction of EU tonnage used in region 0.1
 Regional use tonnage 8.5E+5
 Fraction of Regional tonnage used locally 1
 Annual site tonnage 3.0E+4
 Maximum daily site tonnage 1.0E+5
 Continuous release
 Emission Days (days/year) 300
 Local freshwater dilution factor 10
 Local marine water dilution factor 100
 Release fraction to air from process (initial release prior to RMM) 2.5E-3
 Release fraction to wastewater from process (initial release prior to RMM) 5.0E-6
 Release fraction to soil from process (initial release prior to RMM) 0.0001
 Common practices vary across sites thus conservative process release estimates used.
 Risk from environmental exposure is driven by freshwater sediment
 Prevent discharge of undissolved substance to or recover from on-site wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Date of issue/Date of revision: 21/37 (ES Revision date)

Section 2 - Exposure controls

Treat air emission to provide a typical removal efficiency of 0
 Risk management measures - Air
 Risk management measures - Water
 Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 69.5
 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0
 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
 Not applicable as there is no release to wastewater.
 Estimated substance removal from wastewater via on-site sewage treatment 94.7
 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
 Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removals: 7E+5
 Assumed on-site sewage treatment plant flow 2000
 External treatment and disposal of waste should comply with applicable local and/or national regulations.
 External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 0: Formulation and (re)packing of substances and mixtures	Liquid, vapour pressure < 0.5 kPa at STP
Product characteristics	Covers percentage substance in the product up to 100% (unless stated differently).
Concentration of substance in mixture or article	Liquid
Physical state	Covers daily exposures up to 8 hours (unless stated differently)
Frequency and duration of use	Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented
Other given operational conditions affecting workers exposure	Aspiration hazard if swallowed. Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract. Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death. This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage. Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties. Do not induce vomiting as there is high risk of aspiration. IF SWALLOWED: Immediately call a POISON CENTER or physician.
Contributing scenarios - Operational conditions and risk management measures	Contributing scenarios - Operational conditions and risk management measures General exposures (closed systems) No other specific measures identified. General exposures (open systems) No other specific measures identified. Batch processes at elevated temperatures No other specific measures identified. Use in contained batch processes No other specific measures identified. Process sampling No other specific measures identified.

Date of issue/Date of revision: (ES Revision date) 22/36

Section 2 - Exposure controls

Laboratory activities
 No other specific measures identified. Bulk transfers Dedicated facility
 No other specific measures identified.

Mixing operations (open systems)
 No other specific measures identified.

Transfer from/pouring from containers Manual Non-dedicated facility
 No other specific measures identified.

Drum/batch transfers Dedicated facility
 No other specific measures identified.

Production of preparation or articles by tableting, compression, extrusion or
 pelleting
 No other specific measures identified.

Drum and small package filling
 No other specific measures identified.

Equipment cleaning and maintenance
 Drain down and flush system prior to equipment break-in or maintenance.

Storage
 Store substance within a closed system.

Conditions and measures related to personal protection and hygiene
 See Section 8 of the safety data sheet (general health and safety measures).

Personal protection
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:	Not applicable.
Exposure estimation and reference to its source - Environment:	Environment: 2: Formulation and (re)packing of substances and mixtures
Exposure assessment (environment):	Not available.
Exposure estimation	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Exposure estimation and reference to its source - Workers:	Workers: 1: Formulation and (re)packing of substances and mixtures
Exposure assessment (human):	Not available.
Exposure estimation	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment
 Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using on-site/off-site technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Health

The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful: may cause lung damage if swallowed) relates to properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.
 A DNEL (derived no effect levels) cannot be derived.
 This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.
 However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.
 Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.
 There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.
 For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.



Industrial

Identification of the substance or mixture
 Product definition
 Mixture
 Product name
 Nytro Libra

Section 1 - Title

Short title of the exposure scenario
 Manufacturer of substance- Industrial (Other Lubricant Base Oils, IP246-3%, H304)

List of use descriptors
 Identified use name: Manufacture of substance - Industrial
 Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
 Substance supplied to that use in form of: Substance
 Sector of end use: SU03, SU08, SU09
 Subsequent service life relevant for that use: No.
 Environmental Release Category: ERC04, ESVOC SpERC 1.1.V1
 Market sector by type of chemical product: Not applicable.
 Article category related to subsequent service life: Not applicable.

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES

Industry Association

Generic exposure scenario
 Processes and activities covered by the exposure scenario

Additional Information

9.1.1b

Concawe 2012

01

Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Industrial

Section 2 - Exposure controls

Product characteristics
 Amounts used

Substance is complex UVCB... Predominantly hydrophobic

Fraction of EU tonnage used in region: 0.1

Regional use tonnage 8.5E+5

Fraction of Regional tonnage used locally 1

Annual site tonnage 6.0E+5

Maximum daily site tonnage 2.0E+6

Continuous release

Emission Days (days/year): 300

Local freshwater dilution factor 10

Local marine water dilution factor 100

Release fraction to air from process (initial release prior to RMM) 1.0e-4

Release fraction to wastewater from process (initial release prior to RMM) 1.0e-5

Release fraction to soil from process (initial release prior to RMM) 0.0001

Common practices vary across sites thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage/treatment plant, no onsite wastewater treatment required.

Section 2 - Exposure controls

Treat air emission to provide a typical removal efficiency of 90

Risk management measures - Air
 Risk management measures - Water

Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 84.8
 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0

Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via on-site sewage treatment 94.7
 Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
 Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment removal 5.7E+6
 Assumed on-site sewage treatment plant flow 10000

During manufacturing, no waste of the substance is generated.

During manufacturing, no waste of the substance is generated.

Organisational measures to prevent/limit release from site
 Conditions and measures related to municipal sewage treatment plant

Conditions and measures related to external treatment of waste for disposal
 Conditions and measures related to external recovery of waste

Contributing scenario controlling worker exposure for 0: Manufacture of substance

Product characteristics

Concentration of substance in mixture or article

Physical state
 Frequency and duration of use

Other given operational conditions affecting workers exposure

Liquid, vapour pressure < 0.5 kPa at STP
 Covers percentage substance in the product up to 100% (unless stated differently).

Liquid With potential for aerosol generation
 Covers daily exposures up to 8 hours (unless stated differently)

Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented

Aspiration hazard: if swallowed.
 Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract.

Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.

This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.

Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
 Do not induce vomiting as there is high risk of aspiration.
 IF SWALLOWED: Immediately call a POISON CENTER or physician.

Contributing scenarios - Operational conditions and risk management measures

General exposures (closed systems)
 No other specific measures identified.

General exposures (open systems)
 No other specific measures identified.

Process sampling
 No other specific measures identified.

Laboratory activities
 No other specific measures identified.

Bulk transfers (Closed system)
 No other specific measures identified.

Bulk transfers open systems

Section 2 - Exposure controls

No other specific measures identified.

Equipment cleaning and maintenance
 Drain down and flush system prior to equipment break-in or maintenance.

Bulk product storage
 Store substance within a closed system.
 Conditions and measures related to personal protection and hygiene
 Personal protection
 See Section 8 of the safety data sheet (general health and safety measures).
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:
 Not applicable.

Exposure estimation and reference to its source - Environment: 2: Manufacture of substance (environment):
 Not available.

Exposure estimation
 The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Exposure estimation and reference to its source - Workers: 1: Manufacture of substance (human):
 Not available.

Exposure estimation
 The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment
 Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using on-site/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.

Health
 The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.

A DNEL (derived no effect levels) cannot be derived.

This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.

However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.

Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.

There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.

For any substance, classifies as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

If swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.



Industrial

Identification of the substance or mixture

Product definition: Mixture
Product name: Nytro Libra

Section 1 - Title

Short title of the exposure scenario: Uses in Functional fluids - Industrial (Other Lubricant Base Oils, IP346-3%, H304)

List of use descriptors

Identified use name: Functional Fluids - Industrial
Process Category: PROC01, PROC03, PROC08a, PROC08b, PROC02, PROC04, PROC09
Substance supplied to that use in form of: Substance
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC07.
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.

Environmental contributing scenarios

Functional Fluids

Number of the ES	9.37.1b
Industry Association	Concawe 2012
Generic exposure scenario	13a
Processes and activities covered by the exposure scenario	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.
Additional information	Industrial

Section 2 - Exposure controls

Product characteristics
Amounts used

Substance is complex UVCB. Predominantly hydrophobic
Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 1.2E+3
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 1.0E+1
Maximum daily site tonnage: 5.0E+2
Continuous release
Emission Days (days/year): 20
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Frequency and duration of use

Environment factors not influenced by risk management

Release fraction to air from process (initial release prior to RMM): 5.0E-4
Release fraction to wastewater from process (initial release prior to RMM): 1.0E-6
Release fraction to soil from process (initial release prior to RMM): 0.001
Common practices vary across sites that conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Treat air emission to provide a typical removal efficiency of 0

Date of issue/Date of revision

^ (ES Revision date)

29/36

Nytro Libra

Uses in Functional fluids - Industrial (Other Lubricant Base Oils, IP346-3%, H304)

Section 2 - Exposure controls

Risk management measures - Water
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0

Organisational measures to prevent/limit release from site
Conditions and measures related to municipal sewage treatment plant

Do not apply industrial sludge to natural soils. Sludge should be incinerated.
Estimated substance removal from wastewater via on-site sewage treatment: 94.7
Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs: 94.7
Maximum allowable site tonnage (M_{site}): based on release following total wastewater treatment removal: 3.3E+3
Assumed on-site sewage treatment plant flow: 2000

External treatment and disposal of waste should comply with applicable local and/or national regulations.
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external treatment of waste for disposal
Conditions and measures related to external recovery of waste

Contributing scenario controlling worker exposure for 0: Functional Fluids
Product characteristics
Liquid, vapour pressure < 0.5 kPa at STP
Covers percentage substance in the product up to 100% (unless stated differently).

Concentration of substance in mixture or article

Physical state

Frequency and duration of use

Other given operational conditions affecting workers exposure

Liquid With potential for aerosol generation
Covers daily exposures up to 8 hours (unless stated differently)

Operation is carried out at elevated temperature (> 20°C above ambient temperature)
Assumes a good basic standard of occupational hygiene is implemented

Aspiration hazard if swallowed.
Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract.

Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.
This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.

Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
Do not induce vomiting as there is high risk of aspiration.
IF SWALLOWED: Immediately call a POISON CENTER or physician.

Contributing scenarios - Operational conditions and risk management measures

Bulk transfers - Closed system

No other specific measures identified.

Drum/batch transfers - Dedicated facility

No other specific measures identified.

Filling of articles/equipment - closed systems

No other specific measures identified.

Filling/preparation of equipment from drums or containers - Non-dedicated facility
No other specific measures identified.

General exposures (closed systems)

No other specific measures identified.

General exposures (open systems) - Elevated temperature

Restrict area of openings to equipment. Provide extract ventilation to emission points when contact with warm (>50°C) lubricant is likely.

^ (ES Revision date)

Date of issue/Date of revision

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Section 2 - Exposure controls

Remanufacture of reject articles
No other specific measures identified.

Equipment cleaning and maintenance
Drain down system prior to equipment break-in or maintenance.

Storage
Store substance within a closed system.
Personal protection and hygiene
See Section 8 of the safety data sheet (general health and safety measures).
See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:	Not applicable.
Exposure estimation and reference to its source - Environment 2: Functional Fluids (environment):	Not available.
Exposure estimation	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Exposure estimation and reference to its source - Workers: 1: Functional Fluids (human):	Not available.
Exposure estimation	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet. (http://cefic.org/en/reach-for-industries-libraries.html) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet. The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL (derived no effect levels) cannot be derived. This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance. However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance. Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern. There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to "specific risk."
Health	

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.



Identification of the substance or mixture

Product definition: Mixture
Product name: Nyro Libra

Section 1 - Title

Short title of the exposure scenario: Uses in Functional fluids - Professional (Other Lubricant Base Oils, IP346-3%, H304)

List of use descriptors

Identified use name: Functional Fluids - Professional
Process Category: PROC01, PROC02, PROC03, PROC08a, PROC09, PROC20
Substance supplied to that use in form of: Substance
Sector of end use: SU22
Subsequent service life relevant for that use: No
Environmental Release Category: ERC09a, ERC09b, ESVOC SPERC 9.13b.v1
Market sector by type of chemical product: Not applicable.
Article category related to subsequent service life: Not applicable.

Environmental contributing scenarios

Health Contributing scenarios

Number of the ES Industry Association	Functional Fluids
9.38.1b Concawe 2012	
13b	
Generic exposure scenario	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.
Processes and activities covered by the exposure scenario	
Additional information	Professional

Section 2 - Exposure controls

Product characteristics

Amounts used: Substance is complex UVCB. Predominantly hydrophobic
Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 1.2E+3
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 6.0E-1
Maximum daily site tonnage: 1.6E+0

Frequency and duration of use

Environment factors not influenced by risk management: Continuous release
Emission Days (days/year): 365
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other given operational conditions affecting environmental exposure

Technical conditions and measures at process level (source) to prevent release (source): Release fraction to air from process (initial release prior to RMM) 0.05
Release fraction to wastewater from process (initial release prior to RMM) 0.025
Release fraction to soil from process (initial release prior to RMM) 0.025
Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no on-site wastewater treatment required.
Risk management and releases to soil measures - Air: Treat air emission to provide a typical removal efficiency of N/A

Section 2 - Exposure controls

Risk management measures - Water: Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of 64.9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of 0

Organisational measures to prevent/limit release from site: Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant: Estimated substance removal from wastewater via on-site sewage treatment 94.7
Total efficiency of removal from wastewater after on-site and off-site (domestic treatment plant) RMMs 94.7
Maximum allowable site tonnage (M_{site}) based on release following total wastewater treatment allowed: 1E+1
Assumed on-site sewage treatment plant flow: 2000

Conditions and measures related to external treatment of waste for disposal: External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste: External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 0: Functional Fluids

Product characteristics: Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in mixture or article: Covers percentage substance in the product up to 100% (unless stated differently).
Physical state: Liquid
Frequency and duration of use: With potential for aerosol generation
Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure

Operation is carried out at elevated temperature (> 20°C above ambient temperature) Assumes a good basic standard of occupational hygiene is implemented
Aspiration hazard if swallowed.
Aspiration means the entry of a liquid substance directly into the trachea and lower respiratory tract.
Aspiration of hydrocarbon substances can result in severe acute effects such as chemical pneumonitis, varying degree of pulmonary injury or death.
This property relates to the potential for low viscosity material to spread quickly into the deep lung and cause severe pulmonary tissue damage.
Classification of a hydrocarbon substance for aspiration hazard is made on the basis of reliable human evidence or on the basis of physical properties.
Do not induce vomiting as there is high risk of aspiration.
IF SWALLOWED: Immediately call a POISON CENTER or physician.

Contributing scenarios - Operational conditions and risk management measures

Bulk transfers - Closed system
No other specific measures identified.
Drum/batch transfers - Dedicated facility
No other specific measures identified.
Filling of articles/equipment - closed systems
No other specific measures identified.
Filling/preparation of equipment from drums or containers - Non-dedicated facility
No other specific measures identified.
General exposures (closed systems)
No other specific measures identified.
General exposures (open systems) - Elevated temperature
Restrict area of openings to equipment. Provide extract ventilation to emission points when contact with warm (>50°C) lubricant is likely.

Section 2 - Exposure controls

Remanufacture of reject articles
 No other specific measures identified.
 Equipment cleaning and maintenance
 Drain down system prior to equipment break-in or maintenance.
 Storage
 Store substance within a closed system.
 Conditions and measures related to personal protection and hygiene
 See Section 8 of the safety data sheet (general health and safety measures).
 Personal protection
 See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website:	Not applicable.
Exposure estimation and reference to its source - Environment: 2: Functional Fluids (environment):	Not available.
Exposure estimation	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Exposure estimation and reference to its source - Workers: 1: Functional Fluids (human):	Not available.
Exposure estimation	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	<p>Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using on-site/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SPERC factsheet. (http://cefic.org/en/reach-for-industries-libraries.html) Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.</p> <p>The CLP hazard statement H304: May be fatal if swallowed and enters airways (the DPD risk phrase R65: Harmful; may cause lung damage if swallowed) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. kinematic viscosity) that can occur during ingestion and also if it is vomited following ingestion.</p> <p>A DNEL (derived no effect levels) cannot be derived.</p> <p>This general qualitative CSA (chemical safety assessment) approach aims to reduce/avoid contact or incidents with the substance.</p> <p>However, implementation of risk management measures (RMMs) and operational conditions (OCs) need to be proportional to the degree of concern for the health hazard presented by the substance.</p> <p>Exposures should be controlled to at least the levels that represent an acceptable level of risk such that the implementation of the chosen RMMs will ensure that the likelihood of an event occurring due to the substance hazard is negligible, and the risk is considered to be controlled to a level of no concern.</p> <p>There are no routine anticipated exposures by ingestion related to any supported uses of the substance. The risk arising from aspiration hazard is solely related to the physico-chemical properties of the substance. The risk can therefore be controlled by implementing risk management measures tailored to this specific risk.</p>
Health	

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

For any substance, classified as H304 (R65), these measures should be communicated via the safety data sheet by use of the following phrase: Do not ingest. If swallowed then seek immediate medical assistance.

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.

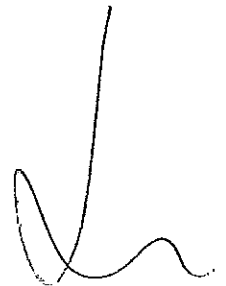
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk management measures are based on qualitative risk characterisation.

**„Доставка на електрически апарати
110кV“, реф. № РРД 17-064.**

**Обособена позиция 3 – Доставка на
напреженови измервателни
трансформатори 110кV за монтаж на
открито – 6бр.**

ПРИЛОЖЕНИЕ 4



Summary of type tests for Voltage Transformer

Type EMF-E123

Type tests performed	Tested acc. to	Report number	Test performed
Temperature rise test	IEC 61869-1; §.6.4.1; §.7.2.2 IEC 61869-3; §.6.4.1; §.7.2.2	EWP/52/E/2015-3 EWP/52/E/2015-4	2015 year
Short-circuit withstand capability test	IEC 61869-1; §.6.301; §.7.2.301 IEC 61869-3; §.6.301; §.7.2.301	8734/NZL/NBR/15	2015 year
Lightning impulse test	IEC 61869-1; §.7.2.3; IEC 61869-3; §.7.2.3	EWN/109/E/15-1	2015 year
Switching impulse voltage test	IEC 61869-1; §.7.2.3;	Not applicable	
Wet test for outdoor type transformers	IEC 61869-1; IEC 61869-3 IEC 60060-1: 2010 cl.4.4.1 and 4.4.2	RQ 15-78 RQ 15-79	2015 year
Determination of errors	IEC 61869-3; §.5.6	EMF-E123 1HSE8851774	2015 year
Measurement of the radio interference voltage (RIV)	IEC 61869-1; §.7.2.5.1; §.6.11.2 IEC 61869-3; §.7.2.5	EWN/109/E/15-4 EWN/109/E/15-5	2015 year
Chopped lightning impulse test on the primary winding	IEC 61869-1; §.7.2.3; §.7.4.1 IEC 61869-3; §.7.2.3	EWN/109/E/15-1	2015 year
Mechanical tests	IEC 61869-1:2007 §.7.4.5	EUR/44/E/16-4 EUR/44/E/16-5 EUR/44/E/16-6	2016 year
Transmitted overvoltage measurement	IEC 61869-1; §.7.4.4; §.6.11.4 IEC 61869-3; §.7.4.4; §.6.11.4	EWN/109/E/15-1	2015 year
Classification of degree of protection by enclosures – Mechanical impact test IK07	IEC 61869-1:2007; §.7.2.7.2	EWP/40/E/2015	2015 year


Sesmic test	IEEE Std 693TM-2005, PN-EN 60068-2-6, PN-EN 60068-3-3, PN-IEC 68-2-59	RS-2015/B-128/E	2015 year
Capacitor discharge		EWN/109/E/15-1	2015 year
Verification of the degree of protection IP55	IEC 60529: 1989+A1:1999	8604/NZL/NBR/15	2015 year

* Test performed on test object with porcelain insulator.

We hereby certify that the tests listed above verify guaranteed data for EMF-E123

ABB AB

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Summary of type tests for Voltage Transformer

Type EMF-E145

Type tests performed	Tested acc. to	Report number	Test performed
Temperature rise test	IEC 61869-1; §.6.4.1; §.7.2.2 IEC 61869-3; §.6.4.1; §.7.2.2	EWP/52/E/2015-3 EWP/52/E/2015-4	2015 year
Short-circuit withstand capability test	IEC 61869-1; §.6.301; §.7.2.301 IEC 61869-3; §.6.301; §.7.2.301	8734/NZL/NBR/15	2015 year
Lightning impulse test	IEC 61869-1; §.7.2.3; IEC 61869-3; §.7.2.3	EWN/134/E/15	2015 year
Switching impulse voltage test	IEC 61869-1; §.7.2.3;	Not applicable	
Wet test for outdoor type transformers	IEC 61869-1, IEC 61869-3 IEC 60060-1: 2010 cl.4.4.1 and 4.4.2	RQ 15-78 RQ 15-79	2015 year
Determination of errors	IEC 61869-3; §.5.6	EMF-E145 1HSE8851773	2015 year
Measurement of the radio interference voltage (RIV)	IEC 61869-1; §.7.2.5.1; §.6.11.2 IEC 61869-3; §.7.2.5	EWN/109/E/15-4 EWN/109/E/15-5	2015 year
Chopped lightning impulse test on the primary winding	IEC 61869-1; §.7.2.3; §.7.4.1 IEC 61869-3; §.7.2.3	EWN/134/E/15	2015 year
Mechanical tests	IEC 61869-1:2007 §.7.4.5	EUR/44/E/16-4 EUR/44/E/16-5 EUR/44/E/16-6	2016 year
Transmitted overvoltage measurement	IEC 61869-1; §.7.4.4; §.6.11.4 IEC 61869-3; §.7.4.4; §.6.11.4	EWN/109/E/15-4	2015 year
Classification of degree of protection by enclosures - Mechanical impact test IK07	IEC 61869-1:2007; §.7.2.7.2	EWP/40/E/2015	2015 year
Sesmic test	IEEE Std 693TM-2005; PN-EN 60068-2-6, PN-EN 60068-3-3, PN-IEC 68-2-59	RS-2015/B-128/E	2015 year
Verification of the degree of protection IP55	IEC 60529: 1989+A1:1999	8604/NZL/NBR/15	2015 year

* Test performed on test object with porcelain insulator.

We hereby certify that the tests listed above verify guaranteed data for EMF-E145

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Summary of type tests for Voltage Transformer

Type EMF-E084

Type tests performed

Tested acc. to	Report number	Test performed
IEC 61869-1; §.6.4.1; §.7.2.2 IEC 61869-3; §.6.4.1; §.7.2.2	EWP/52/E/2015-1	2015 year
IEC 61869-1; §.6.301; §.7.2.301 IEC 61869-3; §.6.301; §.7.2.301	8733/NZL/NBR/15	2015 year
IEC 61869-1; §.7.2.3; IEC 61869-3; §.7.2.3	EWN/106/E/16-2	2016 year
IEC 61869-1; §.7.2.3;	Not applicable	
IEC 61869-1, IEC 61869-3 IEC 60060-1: 2010 cl.4.4.1 and 4.4.2	RQ 15-74 RQ 15-75	2015 year
IEC 61869-3; §.5.6	EMF-E084 1HSE8851777 EMF-E084 1HSE8851778	2015 year
IEC 61869-1; §.7.2.5.1; §.6.11.2 IEC 61869-3; §.7.2.5	EWN/106/E/16-2	2016 year
IEC 61869-1; §.7.2.3; §.7.4.1 IEC 61869-3; §.7.2.3	EUR/44/E/16-1 EUR/44/E/16-2 EUR/44/E/16-3	2016 year
IEC 61869-1:2007 §.7.4.5	EWN/109/E/15-3	2015 year
IEC 61869-1; §.7.4.4; §.6.11.4 IEC 61869-3; §.7.4.4; §.6.11.4	EWP/40/E/2015	2015 year
IEC 61869-1:2007; §.7.2.7.2		
IEC 60529: 1989+A1:1999	8606/NZL/NBR/15	2015 year

We hereby certify that the tests listed above verify guaranteed data for EMF-E084

* Test performed on test object with porcelain insulator.

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Summary of type tests for Voltage Transformer

Type EMF-E072
Type tests performed

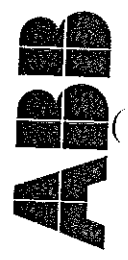
Tested acc. to	Report number	Test performed
Temperature rise test	EWP/52/E/2015-1	2015 year
Short-circuit withstand capability test	8733/NZL/NBR/15	2015 year
Lightning impulse test	EWN/106/E/16-1	2016 year
Switching impulse voltage test	Not applicable	
Wet test for outdoor type transformers	RQ 15-74	2015 year
Determination of errors	RQ 15-75	2015 year
Measurement of the radio interference voltage (RIV)	EMF-E145 1HSE8851776	2015 year
Chopped lightning impulse test on the primary winding	EWN/106/E/16-1	2016 year
Mechanical tests	EUR/44/E/16-1	2016 year
Transmitted overvoltage measurement	EUR/44/E/16-2	2016 year
Classification of degree of protection by enclosures - Mechanical impact test IK07	EUR/44/E/16-3	2015 year
	EWN/109/E/15-2	2015 year
	EWP/40/E/2015	2015 year

Verification of the degree of protection IP55 IEC 60529: 1989+A1:1999 8606/NZL/NBR/15 2015 year

* Test performed on test object with porcelain insulator. We hereby certify that the tests listed above verify guaranteed data for EMF-E072

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Summary of type tests for Voltage Transformer

Type PV145a

Type tests performed	Tested acc. to	Report number	Test performed
Temperature rise test	IEC 61869-1; §.6.4.1; §.7.2.2 IEC 61869-3; §.6.4.1; §.7.2.2	EWP/52/E/2015-3 EWP/52/E/2015-4	2015 year
Short-circuit withstand capability test	IEC 61869-1; §.6.301; §.7.2.301 IEC 61869-3; §.6.301; §.7.2.301	8734/NZL/NBR/15	2015 year
Lightning impulse test	IEC 61869-1; §.7.2.3; IEC 61869-3; §.7.2.3	EWN/45/E/16	2016 year
Switching impulse voltage test	IEC 61869-1; §.7.2.3;	Not applicable	
Wet test for outdoor type transformers	IEC 61869-1, IEC 61869-3 IEC 60060-1: 2010 cl.4.4.1 and 4.4.2	RQ 15-78 RQ 15-79	2015 year
Determination of errors	IEC 61869-3; §.5.6	EMF-E145 1HSE8851773	2015 year
Measurement of the radio interference voltage (RIV)	IEC 61869-1; §.7.2.5.1; §.6.11.2 IEC 61869-3; §.7.2.5	EWN/109/E/15-4 EWN/109/E/15-5	2015 year
Chopped lightning impulse test on the primary winding	IEC 61869-1; §.7.2.3; §.7.4.1 IEC 61869-3; §.7.2.3	EWN/45/E/16	2016 year
Mechanical tests	IEC 61869-1:2007 §.7.4.5	EUR/44/E/16-4 EUR/44/E/16-5 EUR/44/E/16-6	2016 year
Transmitted overvoltage measurement	IEC 61869-1; §.7.4.4; §.6.11.4 IEC 61869-3; §.7.4.4; §.6.11.4	EWN/109/E/15-4	2015 year
Classification of degree of protection by enclosures - Mechanical impact test IK07	IEC 61869-1:2007; §.7.2.7.2	EWP/40/E/2015	2015 year

Sismic test	IEEE Std 693TM-2005; PN-EN 60068-2-6, PN-EN 60068-3-3, PN-IEC 68-2-59	RS-2015/B-128/E	2015 year
Verification of the degree of protection IP55	IEC 60529: 1989+A1:1999	8604/NZL/NBR/15	2015 year

* Test performed on test object with porcelain insulator.

We hereby certify that the tests listed above verify guaranteed data for EMF-E145

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Summary of type tests for Voltage Transformer

Type PV123a

Type tests performed	Tested acc. to	Report number	Test performed
Temperature rise test	IEC 61869-1; §.6.4.1; §.7.2.2 IEC 61869-3; §.6.4.1; §.7.2.2	EWP/52/E/2015-3 EWP/52/E/2015-4	2015 year
Short-circuit withstand capability test	IEC 61869-1; §.6.301; §.7.2.301 IEC 61869-3; §.6.301; §.7.2.301	8734/NZL/NBR/15	2015 year
Lightning impulse test	IEC 61869-1; §.7.2.3; IEC 61869-3; §.7.2.3	EWN/45/E/16	2016 year
Switching impulse voltage test	IEC 61869-1; §.7.2.3;	Not applicable	
Wet test for outdoor type transformers	IEC 61869-1, IEC 61869-3	RQ 15-78 RQ 15-79	2015 year
Determination of errors	IEC 60060-1: 2010 cl.4.4.1 and 4.4.2	EMF-E123 1HSE8851774	2015 year
Measurement of the radio interference voltage (RIV)	IEC 61869-3; §.5.6	EWN/109/E/15-4	2015 year
Chopped lightning impulse test on the primary winding	IEC 61869-1; §.7.2.5.1; §.6.11.2 IEC 61869-3; §.7.2.5	EWN/109/E/15-5	2015 year
Mechanical tests	IEC 61869-1; §.7.2.3; §.7.4.1 IEC 61869-3; §.7.2.3	EWN/45/E/16	2016 year
Transmitted overvoltage measurement	IEC 61869-1:2007 §.7.4.5	EUR/44/E/16-4 EUR/44/E/16-5 EUR/44/E/16-6	2016 year
Classification of degree of protection by enclosures – Mechanical impact test IK07	IEC 61869-1; §.7.4.4; §.6.11.4 IEC 61869-3; §.7.4.4; §.6.11.4	EWN/109/E/15-1	2015 year
Sesmic test	IEC 61869-1:2007; § 7.2.7.2	EWP/40/E/2015	2015 year

Capacitor discharge	IEEE Std 693TM-2005, PN-EN 60068-2-6, PN-EN 60068-3-3, PN-IEC 68-2-59	RS-2015/B-128/E	2015 year
Verification of the degree of protection IP55	IEC 60529: 1989+A1:1999	EWN/109/E/15-1 8604/NZL/NBR/15	2015 year 2015 year

* Test performed on test object with porcelain insulator.

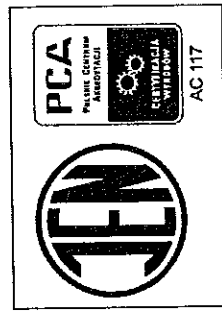
We hereby certify that the tests listed above verify guaranteed data for EMF-E123

ABB AB

This document is issued by means of a computerized system. A manual signature is not required.



Автор: Jan Tomaszewski M. Sc. Eng.



ИНСТИТУТ ПО ЕНЕРГЕТИКА
Отдел Сертификация

ДОКЛАД КАТАЛОГ ОЦЕНКА ДОКЛАД ЗА ОЦЕНКА НА ПРОДУКТ

No. DZC/111 с/Е/2015-2
реvisions 4
2016.12.30

Име на продукта и означение: **Индуктивни напрежени трансформатори типове EMF-E072, EMF-E084, EMF-E123, EMF-E145, PV123a и PV145a.**

Доставчик: **ABB Sp. z o. o.
1 Zeganska Str. 04-
713 Варшава
Полша**

Производител: **ABB AB Power Products
Valhallavagen 2 771
31 Јудвика
Швеция**

**ABB Sp. z o.o., Клон в Пшанини
59 Leszno Str.
06-300 Пшанини
Полша**

Варшава, Ноември 2016

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Приложение: Протоколи от типови изпитания, специални изпитания и рутинни изпитания (страниците не са номерирани), Изявления на Производителите

Несъответствията наблюдавани: Не са намерени

Общ резултат от оценката:

Положителен

Въз основа на анализа, направен, с настоящото кандидатствам за издаване на сертификат за съответствие за индуктивни трансформатори, тип EMF-E072, EMF-E084, EMF-E123 и EMF-E145, PV123a и PV145a, съгласно Обобщението.

Jan Tomaszewski

Име

подпис

2016.12.30

1. Въведение

Този доклад за оценка относно индуктивни трансформатори серия, тип EMF-E ... и PV ... а беше направен по време на процесите на сертификация, извършени от Отдела по сертификация на института по Енергетика, въз основа на заявлението от ABB Sp. Z Oo, Полша (за издаване на удостоверение на института по не DZC / 111c / E / 2015 г., разширение на EMF-E сертификат -- № DZC / 131c / E / 2016 г. и DZC / 187c / E / 2016 , издаване на удостоверение за PV ... а - №DZC / 189 / E / 2016 г.).

Напрежението трансформатори EMF-E и PV ... а са предназначени да захранват електрически вериги за измерване и защита в открити електрически мрежи с най-високите напрежения до 72.5 кВ (EMF-E072), 84 кВ (EMF-E084), 126 кВ (EMF-E123 и PV123a) и 145 кВ (EMF-E145 и PV145a) и честота 50 Hz.

Според документите, доставени от производителя (отчета за промени в протоколите за проектиране и изпитване), са въведени нови имена на едни и същи тип конструкции на напрежени трансформатори Трансформаторите тип PV123a и PV145a са идентични съответно с трансформаторите EMF-E123 и EMF-E145 от техническа гледна точка. Първите се произвеждат само в ABB Sp. Z o.o., клон в Пшашани, Полша, докато вторите, както и EMF-E072 и EMF-E084, както в ABB Sp. Z o.o., клон в Пшашани, Полша и в ABB AB в Лудвика, Швеция. Коректноста на сурово, асемблиране и пълнене масло е било потвърдено от подложките тестове, които са описани в глава 5 от настоящия доклад.

Въпросните индуктивни напрежени трансформатори имат еднопосонона конструкция. Активната част на HT се намира в казана, който служи също като основата на устройството и който трябва да бъде заземлен. HT може да има до шест вторични намотки, които са изведени до клемната кутия. Заземеният казан се отдели от клемата високо напрежение с порцеланов или композитен изолатор. Вътрешната изолацията на устройството е хартия-маслена.

Конструкцията на обвивката и видовете изолатор на EMF-E072 и EMF-E084 е идентичен. Същото важи и за EMF-E123, PV123a, EMF-E145 и PV145a.

Типовите и специалните изпитания на въпросните трансформатори са провеждани в Института по Енергетика (Варшава), Електротехнически Институт (Варшава) и в завода на производителите в Лудвика, Швеция (под надзора на SATS инспектор). Рутинните изпитания са извършени в лабораторията на производителя в Пшашани, Полша под наблюдението на представителите IEL.

Параметрите на цялата серия от HT бяха определени въз основа на извършените тестове. Резултатите от тестовете, потвърждаващи свойства на устройствата са дадени в протоколите от изпитанията, посочени в т. 2 на това проучване. Резултатите са сравнени с изискванията на следните стандарти:

- IEC 61869-1: 2007 (PN-EN 61869-1: 2009)

Измервателни трансформатори - Част 1: Общи изисквания

- IEC 61869-3: 2011 (PN-EN 61869-3: 2011)

Измервателни трансформатори - Част 3: Допълнителни изисквания за индуктивни трансформатори.

- IEC 60529: 1989 + AMD1: 1999 + AMD2: 2013 CSV (PN-EN 60529: 2003 / A2: 2014-07)

Степени на защита, осигурявани от корпусите (IP код)

- IEC 62262: 2002 (PN-EN 62262: 2003)

Степени на защита, осигурявани от корпусите на електрически съоръжения срещу външни механични въздействия (IK код)

ABB AB притежава сертификати, потвърждаващи качеството на техните системи за управление в обхвата на следните стандарти:

- SS-EN ISO 9001: 2008 (Сертификат № SE004225-1)

- SS-EN ISO 14001: 2004 (Сертификат № SE004224-1)

- OHSAS 18001: 2007 (сертификат №SE004226-1.), Издаден от Bureau Veritas Certification Sverige AB.

ABB Sp. z.o.o. всички свои представители притежава сертификат, който потвърждава качеството на техните системи за управление в обхвата на следните стандарти:

- ISO 9001: 2015 (сертификат №01 100 1541800.)

- ISO 14001: 2015 (сертификат № 01 104 1541809.)

- PN-N 18001: 2004 (сертификат № 0198 113 00 113.). Издаден от TUV Rheinland Cert GmbH.

2. Списък на използваните документи

След доклади, предоставени от Доставчика се използва за извършване на процеса на оценка на трансформатори на въпросна:

D1. Доклад № EWP / 52 / E / 2015-1; тест повишаване на температура; EMF-E084, SN. IHSE8851777; Висока Current Laboratory (EWP) на Instytut Energetyki; октомври 2015

D2. Доклад № EWP / 52 / E / 2015-3; тест повишаване на температура; EMF-E145, SN. IHSE8851772; Висока Current Laboratory (EWP) на Instytut Energetyki; септември 2015

D3. Доклад № EWP / 52 / E / 2015-4; тест повишаване на температура; EMF-E145, SN. IHSE8851773; Висока Current Laboratory (EWP) на Instytut Energetyki; септември 2015

D4. Доклад № EWN / 134 / E / 15; Impulse напрежение издържа теста на първичния терминал и напрежен импулс напрежение издържа теста на първичния терминал; EMF-E145, SN. IHSE8851773; High Voltage Laboratory (EWN) на Instytut Energetyki; ноември 2015

D5. Доклад № EWN / 109 / E / 15-1; Impulse напрежение издържа теста на първичния терминал, напрежен импулс напрежение издържа теста на първичния терминал, предава напрежение тест и тест звустване кондензатор; EMF-E123, SN. IHSE8851774; High Voltage Laboratory (EWN) на Instytut Energetyki; октомври 2015

D6. Доклад № EWN / 109 / E / 15-3; Impulse напрежение издържа теста на първичния терминал, напрежен импулс напрежение издържа теста на първичния терминал и се предава от пренапрежение тест; EMF-E084, SN. IHSE8851777; High Voltage Laboratory (EWN) на Instytut Energetyki; октомври 2015

D7. Доклад № EWN / 109 / E / 15-2; Impulse напрежение издържа теста на първичния терминал, напрежен импулс напрежение издържа теста на първичния терминал и се предава от пренапрежение тест; EMF-E072, SN. IHSE8851776; High Voltage Laboratory (EWN) на Instytut Energetyki; октомври 2015

D8. Доклад № EWN / 45 / E / 16; Impulse и напрежен импулсно напрежение издържа теста на първичния терминал; PV145a, SN. 2GKCP015V1188086; High Voltage Laboratory (EWN) на Instytut Energetyki; май 2016

D9. Доклад № EWN / 106 / E / 16-1; Impulse и напрежен импулсно напрежение издържа теста на първичния терминал; EMF-E072, SN. 2GGKV1190628; High Voltage Laboratory (EWN) на Instytut Energetyki; декември 2016

Z o.o., Przasnysz, ноември 2015
 D30. Рутинна доклад за тест след тест мълния импулс; EMF-E084, SN. 1HSE8851777; Лаборатория на ABB Sp. Z o.o., Przasnysz, ноември 2015
 D31. Рутинна доклад за тест след тест мълния импулс; EMF-E072, SN. 1HSE8851776; Лаборатория на ABB Sp. Z o.o., Przasnysz, ноември 2015
 D32. Рутинна доклад като съединение издържа теста способност; EMF-E145, SN. 1HSE8851778; Лаборатория на ABB Sp. Z o.o., Przasnysz, ноември 2015
 D33. Рутинна доклад за тест след като съединение издържа теста способност; EMF-E084, SN. 1HSE8851778; Лаборатория на ABB Sp. Z o.o., Przasnysz, ноември 2015
 D34. Доклад № EUR / 44 / E / 16-1; Механично изпитване; EMF- E072, SN. 2GGKV1190628; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, ноември 2016
 D35. Доклад № EUR / 44 / E / 16-2; Механично изпитване; EMF- E072, SN. 2GGKV1190629; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, ноември 2016
 D36. Доклад № EUR / 44 / E / 16-3; Механично изпитване; EMF- E072, SN. 2GGKV1190649; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, ноември 2016
 D37. Доклад № EUR / 44 / E / 16-4; Механично изпитване; EMF- E145, SN. 2GGKV1190669; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, декември 2016
 D38. Доклад № EUR / 44 / E / 16-5; Механично изпитване; EMF- E145, SN. 2GGKV1190668; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, декември 2016
 D39. Доклад № EUR / 44 / E / 16-6; Механично изпитване; EMF- E145, SN. 2GGKV1190670; Разпределение оборудване Лабораторно (EUR) на Instytut Energetyki, декември 2016

D10. Доклад №. EWN / 106 / E / 16-2; Импулс и нарязан импулсно напрежение издържа теста на първични терминал; PV145a, SN. 2GGKV1190678; High Voltage Laboratory (EWN) на Instytut Energetyki, декември 2016
 D11. Доклад № R Q 15-78; Wet test; EMF-E145, SN. 1HSE8851772; Лаборатория на ABB AB Power produkti, Ludvika, Швеция; октомври 2015
 D12. Доклад № R Q 15-79; Wet test; EMF-E145, SN. 1HSE8851773; Лаборатория на ABB AB Power produkti, Ludvika, Швеция; октомври 2015
 D13. Доклад № R Q 15-74; Wet test; EMF-E084, SN. 1HSE8851777; Лаборатория на ABB AB Power produkti, Ludvika, Швеция; септември 2015
 D14. Доклад № R Q 15-75; Wet test; EMF-E084, SN. 1HSE8851778; Лаборатория на ABB AB Power produkti, Ludvika, Швеция; септември 2015
 D15. Доклад №. EWN / 109 / E / 15-4; Предавани от преанапрежение тест и тест RIV; EMF-E145, SN. 1HSE8851772; High Voltage Laboratory (EWN) на Instytut Energetyki, ноември 2015
 D16. Доклад №. EWN / 109 / E / 15-5; RIV test; EMF-E145, SN. 1HSE8851772; High Voltage Laboratory (EWN) на Instytut Energetyki, ноември 2015
 D17. Доклад № 8604 / NZL / NBR / 15; Проверка на степеня на защита; Разпределителна кутия ZGHV042554; Табю Изпитвателна лаборатория на Instytut Elektrotechniki; април 2015
 D18. Доклад № 8606 / NZL / NBR / 15; Проверка на степеня на защита; Разпределителна кутия ZGHV042542; Табю Изпитвателна лаборатория на Instytut Elektrotechniki; април 2015
 D19. Доклад № EWP / 40 / E / 2015; Проверка на степеня на защита срещу механични въздействия; EMF-E072, SN. 2GKRP015V1188091, EMF-E072, SN. 2GKRP015V1188038, EMF-E145, SN. 1HSE8849700, EMF-E145, SN. 2GKRP015V1188093, EMF-E072, SN. 2GKRP015V1188092; Висока Current Laboratory (EWP) на Instytut Energetyki; октомври 2015
 D20. Доклад № 8734 / NZL / NBR / 15; Късо съединение издържа теста способност; EMF-E145, SN. 1HSE8851773; Табю Изпитвателна лаборатория на Instytut Elektrotechniki; ноември 2015
 D21. Доклад № 8733 / NZL / NBR / 15; Късо съединение издържа теста способност; EMF-E084, SN. 1HSE8851778; Табю Изпитвателна лаборатория на Instytut Elektrotechniki, ноември 2015
 D22. Рутинна доклад за тест преди изпитванията на типа; EMF-E145, SN. 1HSE8851772; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D23. Рутинна доклад за тест преди изпитванията на типа; EMF-E145, SN. 1HSE8851773; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D24. Рутинна доклад за тест преди изпитванията на типа; EMF-E123, SN. 1HSE8851774; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D25. Рутинна доклад за тест преди изпитванията на типа; EMF-E072, SN. 1HSE8851776; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D26. Рутинна доклад за тест преди изпитванията на типа; EMF-E084, SN. 1HSE8851777; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D27. Рутинна доклад за тест преди изпитванията на типа; EMF-E084, SN. 1HSE8851778; Лаборатория на ABB Sp. Z o.o., Przasnysz, октомври 2015
 D28. Рутинна доклад за тест след тест мълния импулс; EMF-E145, SN. 1HSE8851773; Лаборатория на ABB Sp. Z o.o., Przasnysz, ноември 2015
 D29. Рутинна доклад за тест след тест мълния импулс; EMF-E123, SN. 1HSE8851774; Лаборатория на ABB Sp.

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3. Компетенции на Изпитвателните лаборатории

Типови, специалните и рутинните изпитания на напреженинови трансформатори EMF-E са извършени в следния лаборатория:

- Лаборатория Witelkorabowe (High Current Laboratory), подразделение на Instytut Energetyki (Институт по енергетика) във Варшава, държейки РСА сертификата за акредитация на Research Laboratory PCA, бр на АВ 323

- Laboratorium Wysokich Napięć (High Voltage Laboratory), подразделение на Instytut Energetyki (Институт по енергетика) във Варшава, държейки РСА сертификата за акредитация на Research Laboratory PCA № АВ 272 на.

- АВВ АВ Лаборатория на Завода в Лудвика - тестове, извършени под надзора на представителите на SATS.

- АВВ Sp. Z o. o. Завод за производство на лаборатория в Пшашиц - ОКМ Варшава (областен клон по метрология) проверка на устройството, рутинни тестове, извършени под надзора на представителите на Instytut Energetyki.

- Laboratorium Badawcze Aparatury Rozdzielczej (ICPE Изпитвателна лаборатория), подразделение на Instytut Elektrotechniki (електротехническа Институт) във Варшава, държейки РСА сертификата за акредитация на Research Laboratory PCA № АВ 074.

- Laboratorium Utz Dziel Rozdzielczych (електросабдителни съоръжения Laboratory), подразделение на Instytut Energetyki (Институт по енергетика) във Варшава, държейки РСА сертификата за акредитация на Research Laboratory PCA № АВ 324.

4. Изпитвателни обекти

Производителът е подготвил тринадесет протокола ИТ, за да бъдат предложени на типови и специални изпитания. Основните параметри на протоколите са изброени в Таблица 1.

Таблица 1. Основни параметри на протоколите за изпитание

№	Тип	Ритмична voltage f_{cr}	Напреженос фактор μ	Обща термична мощност 4000 VA	Номинално изолационно напрежение (Um/AC/UL)	Изолатор, път на утвѐрда	Сериен номер
1.	EMF-E145	145/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	composite, 3150 mm	1HSE8851772
2.	EMF-E145	145/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	porcelain, 3075 mm	1HSE8851773
3.	EMF-E123	115/V3 KV	1.9xUL / 8h	4000 VA	123/230/550 KV	composite, 3150 mm	1HSE8851774
4.	EMF-E072	66/V3 KV	1.9xUL / 8h	2000 VA	72.5/140/325 KV	composite, 1813 mm	1HSE8851776
5.	EMF-E084	77/V3 KV	1.9xUL / 8h	2000 VA	84/150/380 KV	porcelain, 1813 mm	1HSE8851777
7.	EMF-E145	145/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	composite, 1813 mm	1HSE8851778
8.	EMF-E145	145/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	composite, 4300 mm	1HSE8849700
9.	EMF-E072	66/V3 KV	1.9xUL / 8h	750 VA	72.5/140/325 KV	porcelain, 4250 mm	2GKRP0131486306
10.	EMF-E072	66/V3 KV	1.9xUL / 8h	750 VA	72.5/140/325 KV	composite, 3150 mm	2GKRP0131188092
11.	EMF-E072	66/V3 KV	1.9xUL / 8h	750 VA	72.5/140/325 KV	porcelain, 3075 mm	2GKRP0131188093
12.	EMF-E072	66/V3 KV	1.9xUL / 8h	750 VA	72.5/140/325 KV	composite, 1813 mm	2GKRP0131188098
13.	PV1458	145/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	porcelain, 1813 mm	2GKRP0131188091
14.	EMF-E072	66/V3 KV	1.9xUL / 8h	4000 VA	145/275/650 KV	composite, 3150 mm	2GKRP0131188086
15.	EMF-E084	77/V3 KV	1.9xUL / 8h	2600 VA	72.5/140/325 KV	porcelain, 3150 mm	2GKRV1190628
16.	EMF-E072	66/V3 KV	1.9xUL / 3cs	2000 VA	84/150/380 KV	porcelain, 1813 mm	2GKRV1190678
17.	EMF-E072	66/V3 KV	1.9xUL / 8h	2600 VA	72.5/140/325 KV	composite, 3150 mm	2GKRV1190629
18.	EMF-E145	145/V3 KV	1.9xUL / 8h	2600 VA	145/275/650 KV	composite, 3150 mm	2GKRV1190669
19.	EMF-E145	145/V3 KV	1.9xUL / 8h	2600 VA	145/275/650 KV	composite, 4495 mm	2GKRV1190668
20.	EMF-E145	145/V3 KV	1.9xUL / 8h	2600 VA	145/275/650 KV	composite, 4495 mm	2GKRV1190670

Подробните чертежи и параметрите на протоколите могат да бъдат намерени в приложените протоколи от изпитания.

За да се провери, дали процесите на сушене, монтаж и пълнене масло се изпълняват правилно в завода на АВВ Sp. в Пшашиц, допълнителна са проведени изпитания на импулс от атмосферно преенапрежение и изпитания с насечени мълиени импулси, както и рутинни тестове преди и след изпитването с импулсите са извършени върху RV145a, EMF-E072 и EMF-E084 трансформатори. Беше договорено, че това ще бъде най-добрият източник на информация в този случай. Конструкцията на изолационна система на RV123a, както и производствения процес е идентичен с RV145a, като по този начин се счита, че допълнителните импулсни изпитания, извършени на трансформатор с по-висока номинална стойност на напрежението е достатъчно. Този тест също потвърждава правилността на монтажа процес на EMF-E072, EMF-E084, E123 EMF- и EMF-E145, извършена от АВВ Sp. Z o.o., клон в Pzszasz. EMF-E123 и E145 EMF- са идентични с трансформаторите RV123a и RV145a.

5. Резултати от изпитанията

Тестовите са проведени на избрани конструкции EMF-E... и RV... а напрежениви трансформатори. Достигащите резултати са валидни за цялата серия от устройства.

5.1. Типови изпитания

това изпитание. Тъй като изпитането с мълниво импулсно напрежение се отнася само за вътрешна изолация, това количество изпитвани обекти, се счита че ще да бъде достатъчно.

Три допълнителни трансформатори - Prototуре 13 (RV145a), Prototуре 14 (EMF-E072) и Prototуре 15 (EMF-E084) бяха допълнително тествани с мълнива импулс да се провери, ако процесите на сушене, монтаж и пълнене масло се изпълняват правилно в завода на ABB Sp. в Пиашинш. Тестване на RV123a се счита за неужно поради факта че конструкцията е идентична с тази на трансформатор RV145a, като същевременно номиналната стойност на напрежението е по-ниска. Този тест също потвърждава правилността на монтажа процес на EMF-E123 и EMF-E145, извършена от ABB Sp. Z o.o., клон в Rzymyszc, които са идентични с трансформаторите RV123a и RV145a.

Резултатите от теста и подробната процедура за изпитване са дадени съответно в докладите D4 - D7. Допълнителните доклади относно HT произведени в ABB Sp. са дадени в докладите D8 - D10. Определените параметри могат да бъдат намерени в резюмето.

5.1.3. Изпитания мокро - IEC 61869-3:2011, cl. 7.2.4

Мокрите тестове са проведени в лаборатория на ABB AB в Ludvika, Швеция под надзора на инспектори SATs. Четири трансформатори - Prototуре 1 (EMF-E145), Prototуре 2 (EMF-E145), Prototуре 5 (EMF-E084) и Prototуре 6 (EMF-E084) - са били подложени на този тест, поради по-високите стойности на изпитвателно напрежение от съответно EMF-E123 и EMF-E072, докато размерите остават същите. За всяко номинално напрежение, бяха изпитани трансформатори с порцеланов и с композиционен изолатор, с най-малък път на утечка. Трансформаторите RV123a и RV145a са идентични съответно с EMF-E123 и EMF-E145, като по този начин този тест се счита за неужен за тях. Тъй като изпитването при мокри условия се отнася само за външна изолация, тази бройка обекти за изпитване се счита, че ще бъде достатъчна.

Резултатите от теста и подробната процедура за изпитване са дадени в докладите D11 - D14. Определените параметри могат да бъдат намерени в резюмето.

5.1.4. RIV test - IEC 61869-3:2011, cl. 7.2.5.1

Тестът за RIV е извършено в High Voltage Laboratory (EWN) на Instytut Energetyki във Варшава. Този тест се отнася за измерителни трансформатори с $U_{m} > 123$ кV. Два трансформатора - Prototуре 1 (EMF-E145) и Prototуре 2 (EMF-E145) - бяха избрани за този тест, поради по-високите стойности на напрежението на изпитване от EMF-E123, докато размерите остават същите. Трансформаторите RV123a и RV145a са идентични съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужен за тях.

Резултатите от теста и подробно процедура за изпитване са дадени в докладите D15 и D16

5.1.1. Изпитания при нарастване на температурата - IEC 61869-3:2011, cl. 7.2.2

Тестът за повишаване на температурата се извършва в High Current Laboratory (EWF) на Instytut Energetyki във Варшава. Тестът се провежда на три трансформатори - Prototуре 1 (EMF-E145), Prototуре 2 (EMF-E145) и Prototуре 5 (EMF-E084). Тестване на EMF-E072 и EMF-E123 се счита за неужна поради същата конструкция като съответно EMF-E084 и E145 EMF-VTs докато номиналните стойности на напрежение са по-ниски, като по този начин по-малко топлина-изложени на риск. Единични RV123a и RV145a са идентични съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужна за тях.

Процедурата за изпитване е била разделена на три етапа, както е посочено в IEC 61869-3: 2011, т. 7.2.2:

- Първата стъпка е извършен с 120% от номиналното напрежение, класиран на тежестта, свързана с всяка вторична намотка, остатъчното напрежение намотка разтоварени.
- Втората стъпка се извършва с 190% от номиналното напрежение, класиран на тежестта, свързана с всяка вторична намотка, остатъчното напрежение намотка натоварени с бремено, съответстващи на неговата номинална топлинна ограничаване изход.
- Третият етап трябва да се извършва с 100% от номиналното напрежение, остатъчното напрежение намотка разтоварени, всеки от вторичните намотки, свързани с тежестта, съответстващ на номинална топлинна мощност, едни по един. Производителният обаче реши да зареди всички вторични намотки с тежест, съответстваща на тяхната номинална топлинна намаляване на продукцията с цел постигане на екстремни условия на изпитване.

Получените резултати за трансформатора на напрежение EMF-E084 и подробно процедура за изпитване. Резултатите са представени в доклад D1. Протогипът 5 бе успешно представен на грите етапа на изпитване. Получените резултати за напрежение трансформатори EMF-E145 и подробно процедура за изпитване. Резултатите са представени в докладите D2 и D3. Протогипът 1 се подлага на етап 1 и 2 на теста, докато протогип 2 се подлага на етап 3.

Проведените тестове потвърдиха, стойностите на фактор напрежение и обща топлинна намаляване на продукцията, обявена от производителите. Номиналната мощност по време на тестовете, е по-ниска, отколкото производителният дескриптор. Въпреки това, въз основа на преизчисляване на тежестта и напрежението на третия етап, че е възможно да се провери, че трансформаторите на напрежение също ще отговарят на изискванията, с максимална номинална мощност. Определените параметри могат да бъдат намерени в резюмето.

5.1.2. Изпитания с импулсно напрежение на първичните клеми - IEC 61869-3:2011, cl. 7.2.3

Изпитванията на импулсно напрежение са били проведени в High Voltage Laboratory (EWN) на Instytut Energetyki във Варшава. Четири трансформатори, един от всеки номинално напрежение - Prototуре 2 (EMF-E145), Prototуре 3 (EMF-E123), Prototуре 5 (EMF-E084) и Prototуре 4 (EMF-E072) - са били подложени на

5.1.5. Изпитания на класа на точност - IEC 61869-3:2011, cl. 7.2.6

Всички тестове за точност бяха проведени в лаборатория на ABB Sp. z o. o. в Pzgasuzs под наблюдението на представители на Instytut Energetyki. Всички протоколи бяха подложени на този тест преди изпитанията на тила и след теста на мълниев импулс и изпитанието на издръжливост на късо съединение, като проверка на резултата от теста. Измерените грешки са в съответствие с изискванията на стандарт IEC 61869-3:2011, CL. 5.6. Резултатите от теста са дадени в докладите D22 - D33. Допълнителните доклади относно HT произведени в ABB Sp. са прикрепени към протоколите за изпитване с импулсно напрежение и са дадени в докладите D8 - D10. Тестване на PV123a, EMF-E123 и EMF-E145 произведен от ABB Sp. Z o.o., клон в Pzgasuzs се счита за неужна, тъй като техните активни части са идентични на активната част на PV145a. От проверката на всички класове точност в комбинации с различни номинална мощност не би било икономически и технически обосновани, получените резултати бяха преизчислени, за да опише всички възможни комбинации. Определените параметри могат да бъдат намерени в резюмето.

5.1.6. Проверка на степента на защита - IEC 61869-3:2011, cl. 7.2.7

Тестовите, за да се потвърди обявената степен на защита IP55 са извършени в Изпитвателна лаборатория на Instytut Elektrotechniki във Варшава. Бяха тествани - два вида клемни кутии - ZGHV042554 и D18. Резултатите от теста и подробната процедура за изпитване са дадени в докладите D17 и D18.

Тестовите, които да потвърждават обявена степен IK07 защита срещу механични въздействия са извършени в High Current лаборатория на Instytut Energetyki във Варшава. Шест трансформатори - Prototype 7 (EMF-E145), Prototype 8 (EMF-E145), Prototype 9 (EMF-E072), Prototype 10 (EMF-E072), Prototype 11 (EMF-E072), Prototype 12 (EMF-E072) - бяха тествани. Трансформатори PV123a и PV145a са идентични съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужна за тях. Резултатите от теста и подробната процедура за изпитване са дадени в доклада D19. Определените параметри могат да бъдат намерени в резюмето.

5.1.7. Изпитания за издръжливост на късо съединение - IEC 61869-3:2011, cl. 7.2.301

Тези тестове са проведени в Изпитвателна лаборатория на Instytut Elektrotechniki във Варшава. Два трансформатора - Prototype 2 (EMF-E145) и Prototype 6 (EMF-E084) - са били подложени на този тест, поради по-високите стойности номинална напрежение, отколкото съответно EMF-E123 и EMF-E072. Трансформатори PV123a и PV145a са идентични съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужна за тях. Резултатите от теста и подробно процедурата за изпитване са дадени в докладите D20 и D21.

5.2. Рутинни изпитания

Рутинните тестове се провеждат на всички прототипи преди типовите изпитания. Те също бяха повторени за прототипите, които са били подложени на тестове с импулсните мълниев напрежения и издръжливост на късо съединение, за да потвърди, че тези тестове, не предизвиква някаква вътрешна повреда в изследваните HT. Рутинните изпитания са извършени в лабораторията на ABB Sp. Z o. o. в Пшаншип под наблюдението на представителите на Instytut Energetyki. Следните тестове бяха проведени в рамките на рутинните тестове:

- Изпитание на издръжливост на напрежение с промишлена честота на първични клемми - IEC 61869-3:2011, т. 7.3.1

Изпитание на издръжливост на напрежение с промишлена честота на първични клемми, след изпитанието за издръжливост на късо съединение се провежда с изпитателно напрежение намалено до 90% от номиналната стойност на издръжаното напрежение с промишлена честота. След изпитването с мълниев импулсно напрежение, напрежението с промишлена честота се намалява на 80% от номиналната стойност на издръжаното напрежение с промишлена честота издържа.

- Измерване на частичните разряди - IEC 61869-3:2011, т. 7.3.2

Нивото на частичните разряди измерени преди и след типовите изпитания на, не надвишава 0,6 pC в нито една от изследваните HT както за 1.2 * U_m и 1.2 * U_m /√3, докато допустимите нива са съответно 10 и 5 pC. Измерените стойности са приблизително равни на измереното ниво на фонония шум.

- Изпитание на издръжливост на напрежение с промишлена честота на вторичните клемми - IEC 61869-3:2011, т. 7.3.4

Изпитание на издръжливост на напрежение с промишлена честота на вторичните клемми се провежда с изпитателно напрежение 3 kV преди и след типовите изпитания.

- Изпитания за точността - IEC 61869-3:2011, т. 7.3.5

Вижте кл. 5.1.5.

- Проверка на маркировки - IEC 61869-3:2011, т. 7.3.6

- Проверка на корпуса за теглов при температура на околната среда - IEC 61869-3:2011, т. 7.3.7

Резултатите от теста са дадени в докладите D22 - D33. Допълнителните доклади относно HT произведени в ABB Sp. са прикрепени към докладите за изпитване с импулсно напрежение и са дадени в докладите D8 - D10.

5.3. Специални изпитания

5.3.1. Изпитване на издръжливост на насечено импулсно напрежение на първични клеми - IEC 61869-3:2011, cl. 7.4.1

Тези тестове са проведени в High Voltage Laboratory (EWN) на Instytut Energetyki във Варшава. Тестовите бокса проведени по време изпитанията на импулсно напрежение на първични клеми на всички HT тествани с пълна вълна импулсно напрежение. Пиковата стойност на напрежението на изпитване е равна на 115% от вълната пиковата стойност на вълната. Резултатите от теста и подробната процедура за изпитване са дадени в докладите D4 - D7. Допълнителните доклади относно HT произведени в ABB Sp са дадени в D8 - D10.

5.3.2. Измерване на капацитет и фактор на диелектрично разсейване - IEC 61869-3:2011, cl. 7.4.3

Този тест се третира от производителите като рутинен тест и се осъществява с други рутинни тестове в лаборатория на ABB Sp. Z. o. o. в Przysusz под наблюдението на представителите на Instytut Energetyki. Стойностите на напрежението на изпитване са 10 kV, $U_r / \sqrt{3}$ и $U_m / \sqrt{3}$. Капацитетът и фактора на диелектрично разсейване не се променят значително с нарастването на напрежението или след типовите изпитвания. Резултатите от теста са дадени в докладите D22 - D33. Допълнителните доклади относно HT произведени в ABB Sp. са прикрепени към протоколите за изпитване с импулсно напрежение и са дадени в докладите D8 - D10.

5.3.3. Изпитания на предаването прекапрежение - IEC 61869-3:2011, cl. 7.4.4

Тези тестове са проведени при High Voltage Laboratory (EWN) на Instytut Energetyki във Варшава. Четири трансформатори, един от всеки номинално напрежение - Prototype 1 (EMF-E145), Prototype 3 (EMF-E123), Prototype 5 (EMF-E084) и Prototype 4 (EMF-E072) - са били подложени на този тест. Трансформатори PV123a и PV145a са идентични със съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужен за тях. Резултатите от теста и подробната процедура за изпитване са дадени съответно в докладите D15, D5, D6 и D7.

5.3.4. Механични изпитания - IEC 61869-3:2011, cl. 7.4.5

Тестовите са проведени в Distribution Equipment Laboratory (EUR) на Instytut Energetyki във Варшава. Шест трансформатори - Prototype 14 (EMF-E072), Prototype 17 (EMF-E072), Prototype 18 (EMF-E072), Prototype 19 (EMF-E145), Prototype 20 (EMF-E145) и Prototype 21 (EMF-E145) - са били подложени на този тест, за да покрие целия спектър от порцеланови и композитни изолятори и първични клеми, използвани за напрежени трансформатори тип EMF-E ... Трансформатори PV123a и PV145a са идентични съответно EMF-E123 и EMF-E145, като по този начин този тест се счита за неужен за тях.

Статично изпитвателно натоварване беше 3600 N.

Резултатите от теста и подробната процедура за изпитване са дадени в докладите D34 - D39.

5.4. Допълнителни изпитания

5.4.1. Изпитване на разряд на кондензатора

Тестът за разряд кондензатор се провежда в High Voltage Laboratory (EWN) на Instytut Energetyki във Варшава. Prototype 3 (EMF-E123) се подлага на този тест. Процедурата за изпитване е била предоставена от ABB. А 6 nF кондензатор е свързан паралелно към тествания HT и се разреджа десет пъти в 2-минутни интервали. Целта на теста е да се провери влиянието на разреджането на кондензатор от температурата на намотката и целостта работа на напрежени трансформатора. Резултатите и подробната процедура за изпитване са дадени в доклад D5.

ВСИЧКИ ИЗПИТАНИЯ ДАДОХА ПОЗИТИВНИ РЕЗУЛТАТИ.

6. Обобщение

- Въз основа на анализирания резултати от изпитвания, заключението е, както следва:
- Напрежени трансформатори от серията EMF-E ... и PV ... а отговарят на изискванията на IEC 61869-3: 2011 стандарт в диапазона на типови и рутинни изпитания. Те също така са преминали няколко специални тестове и допълнителен тест по искане на производителя
- Проведените изпитания са достатъчни за пълна оценка на напрежени трансформатори тип EMF-E ... и PV ... а
- Производителите, които да бъдат посочени в сертификата са:
 - ABB AB Power Products, Vålhallavägen 2, 771 31 Ludvika, Швеция за продукти EMF-E072, EMF-E084, EMF-E123 и EMF-E145
 - ABB Sp. z o.o. клон в Плашини, ул. Leszno 59, 06-300 Przysusz, Полша за продукти EMF-E072, EMF-E084, EMF-E123, EMF-E145, PV123a и PV145a
- Списъкът на всички тестове с тестовите трансформатори е дадено в таблица 2.
- Списъкът с параметрите, определени за напрежени трансформатори на базата на анализирания резултати от тестове е дадено в таблица 3. (EMF-E072), Таблица 4. (EMF-E084), Таблица 5. (EMF-E123 и PV123a) и таблица 6. (EMF-E145 и PV145a).

Таблица 2. Списък на изпитванията и изпитваните напрежения трансформатори

Поз.	Изпитвания	Изпитвания	Протокол номер	Протоколи
ТИПОВИ ИЗПИТАНИЯ				
1	Изпитание на вярстване на температурата	IEC 61869-3:2011, cl. 7.2.2	EWP/52/E/2015-1 EWP/52/E/2015-3 EWP/52/E/2015-4	1, 2, 5
2	Изпитание с импулсно напрежение на първичните клеми	IEC 61869-3:2011, cl. 7.2.3	EWN/134/E/15 EWN/109/E/15-1 EWN/109/E/15-2 EWN/109/E/15-3 EWN/45/E/16 EWN/106/E/16-1 EWN/106/E/16-2	2, 3, 4, 5, 13, 14, 15
3	Изпитание мокро	IEC 61869-3:2011, cl. 7.2.4	IEC R Q 15-74 R Q 15-75 R Q 15-78 R Q 15-79	1, 2, 5, 6
4	RIV test	IEC 61869-3:2011, cl. 7.2.5.1	EWN/109/E/15-4 EWN/109/E/15-5	1, 2
5	Изпитания на класа на точност	IEC 61869-3:2011, cl. 7.2.6	Routine test reports from the Laboratory in ABB Sp. z o.o.	1, 2, 3, 4, 5, 6, 13, 14, 15
6	Проверка на Степен на защита	IEC 61869-3:2011, cl. 7.2.7	8604/NZL/NBR/15 8606/NZL/NBR/15 EWP/40/E/2015	7, 8, 9, 10, 11, 12 Terminal boxes: 2GHV042554 2GHV042542
7	Изпитание на устойчивост на късо съединение	IEC 61869-3:2011, cl. 7.2.301	8734/NZL/NBR/15 8733/NZL/NBR/15	2, 6
СИМВАЛНИ ИЗПИТАНИЯ				
8	Изпитание на издръжаност на импулсно напрежение на първични клеми	IEC 61869-3:2011, cl. 7.4.1	EWN/134/E/15 EWN/109/E/15-1 EWN/109/E/15-2 EWN/109/E/15-3 EWN/45/E/16 EWN/106/E/16-1 EWN/106/E/16-2	2, 3, 4, 5, 13, 14, 15
9	Измерване на капацитет и фактор на дисектречно разсейване	IEC 61869-3:2011, cl. 7.4.3	Routine test reports from the Laboratory in ABB Sp. z o.o.	1, 2, 3, 4, 5, 6, 13, 14, 15
10	Изпитание на пренесено пренапрежение	IEC 61869-3:2011, cl. 7.4.4	EWN/109/E/15-1 EWN/109/E/15-2 EWN/109/E/15-3 EWN/109/E/15-4	1, 3, 4, 5
11	Механични изпитания	IEC 61869-3:2011, cl. 7.4.5	EUR/44/E/16-1 EUR/44/E/16-2 EUR/44/E/16-3 EUR/44/E/16-4 EUR/44/E/16-5 EUR/44/E/16-6	14, 17, 18, 19, 20, 21
ДОПЪЛНИТЕЛНИ ИЗПИТАНИЯ				
12	Изпитание на разряд на АBB		EWN/109/E/15-1	3

ИНСТИТУТ ПО ЕНЕРГЕТИКА
Оддел по сертификација

ДОКЛАД
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Таблица 3. Списък на доказани параметри за EMF-E072

Индуктивен напрежен трансформатор тип EMF-E072	
Номинално първично напрежение U_{pr}	$\leq 69/\sqrt{3}$ kV
На-високо напрежение на оборудването U_{m}	≤ 72.5 kV
Номинална честота R	50 Hz
Номинално изоляционно ниво	AC 140 kV / LI 325 kV
Изпитание на издръжливост на статично нагоявяване R	3600 N
Вълшна изоляция – път на утечка на изолятора U	1813 mm \pm 3150 mm
Степен на защита срещу механично въздействие на вълната обвивка 2	IK07
Степен на защита на вторичната клемна кутия	IP55
Номинален фактор на напрежение R / време	$\leq 1.9/8$ h
Номинално вторично напрежение U_{sr}	≤ 115 V
Клас на точност на измервателните и защитни намотки	0.1; 0.2; 0.5; 1; 3; 3P; 6P
Ном. мощност на измервателните и защитни намотки S_r	≤ 500 VA
Номинално напрежение на остатъчната намотка $U_{sr} (da-dh)$	≤ 115 V
Клас на точност на остатъчната намотка S_r	0.5; 1; 3; 3P; 6P
Номинална мощност на остатъчната намотка S_r	≤ 150 VA
Обща мощност S_{gr}	2000 VA

Таблица 4. Списък на доказани параметри за EMF-E084

Индуктивен напрежен трансформатор тип EMF-E084	
Номинално първично напрежение U_{pr}	$\leq 77/\sqrt{3}$ kV
На-високо напрежение на оборудването U_{m}	≤ 84 kV
Номинална честота R	50 Hz
Номинално изоляционно ниво	AC 150 kV / LI 380 kV
Изпитание на издръжливост на статично нагоявяване R	3600 N
Вълшна изоляция – път на утечка на изолятора U	1813 mm \pm 3150 mm
Степен на защита срещу механично въздействие на вълната обвивка 2	IK07
Степен на защита на вторичната клемна кутия	IP55
Номинален фактор на напрежение R / време	$\leq 1.9/8$ h
Номинално вторично напрежение U_{sr}	≤ 115 V
Клас на точност на измервателните и защитни намотки	0.1; 0.2; 0.5; 1; 3; 3P; 6P
Ном. мощност на измервателните и защитни намотки S_r	≤ 500 VA
Номинално напрежение на остатъчната намотка $U_{sr} (da-dh)$	≤ 115 V
Клас на точност на остатъчната намотка S_r	0.5; 1; 3; 3P; 6P
Номинална мощност на остатъчната намотка S_r	≤ 150 VA
Обща мощност S_{gr}	2000 VA