IMPIANTO DI RETE PER LA CONNESSIONE A 15 kV
DEGLI IMPIANTI DI PRODUZIONE DI ENERGIA ELETTRICA
DA FONTE SOLARE PER COMPLESSIVI 36 MW

UBICATI IN COMUNE DI SAN NICOLO' D'ARCIDANO (OR) SARDEGNA SUD
alle Contrade: Terra Ziringonis, Snc; Coddu Fagoni, Snc

PROGETTO DEFINITIVO

DOCUMENTAZIONE ELETTRICA CABINA PRIMARIA "CP ARCIDANO"

RELAZIONE TECNICA - D.P.R. n. 151/2011 - Attività 48.B

IDENTIFICAZIONE ELABORATO								
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GESTORE RETE ELETTRICA

e-distribuzione
Area Territoriale Rete Nord Ovest
Sviluppo Rete
Centro PL Cagliari

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Parere di conformità alla soluzione tecnica

COMUNE DI SAN NICOLO' D'ARCIDANO	PROVINCIA DI: ORISTANO
TIPO D'INSTALLAZIONE:	ALL'APERTO

Cabina Primaria di trasformazione AT/MT 150/15 kV

RELAZIONE TECNICA
ALLEGATA ALL'ISTANZA PER
RICHIESTA DI ESAME PROGETTO
DEI TRASFORMATORI E BOBINE DI PETERSEN DA INSTALLARE PRESSO LA NUOVA CP "ARCIDANO"
ALLE NORME DI PREVENZIONE INCENDI

Attività presenti elencate nel DPR n. 151/2011 al n. 48.B

RIFERIMENTO PRAT. VV.F. n. …

Sommario

1. PREMESSA

La presente relazione ha lo scopo di descrivere i criteri di progettazione, costruzione, installazione, esercizio e manutenzione delle macchine elettriche presenti nella realizzazione della futura cabina primaria (di seguito CP) "Arcidano" da autorizzare per la costruzione.

In particolare, si fa riferimento ad un modello unificato E-Distribuzione di CP di trasformazione, costituito da un impianto AT tradizionale in aria interasse 14 m e sezione MT con quadro bipiano in fabbricato. La coppia di stalli linea AT 150 kV connettono alla RTN due stalli trafo di potenza singola pari 40 MVA, con presenza di liquido isolante combustibile in quantità superiore a 1 m^3. La futura CP è raggiungibile percorrendo la SS.126 Sud Occidentale Sarda, direzione N-S all'altezza della kilometrica 104,70 vi è sulla sinistra (destra S-N) un incrocio, ove tramite una strada sterrata da percorrere per circa 400 m si arriva la cancello di ingresso. La CP è nel Comune di San Nicolò d'Arcidano, di cui E-distribuzione S.p.A. avrà pieno diritto d'uso.

Le future attività sono tutte individuate al punto 48.B dell'allegato I al D.P.R. 1° agosto 2011, n. 151: "..., macchine elettriche fisse con presenza di liquidi isolanti combustibili in quantitativi superiori a 1 m^3".

Nell'impianto non saranno presenti ulteriori attività da sottoporre a valutazione preventiva al controllo dei VV.F. ai sensi del D.P.R. 151/11.

Nella stesura della presente relazione si è tenuto conto delle seguenti norme:

- Decreto Ministeriale 15 luglio 2014 "Approvazione della regola tecnica di prevenzione incendi per la progettazione, l'installazione e l'esercizio delle macchine elettriche fisse con presenza di liquidi isolanti combustibili in quantità superiore ad 1 m^3." – (GU n.180 del 5/08/2014)
- Decreti 16 febbraio e 9 marzo 2007 per la resistenza al fuoco delle strutture;
- D.Lgs. n 81 del 9 aprile 2008, "Testo Unico sulla salute e sicurezza sul lavoro";
- Legge n. 186 del 01/03/1968 relativa agli impianti elettrici;
- Decreto 22 gennaio 2008, n. 37, relativo alla sicurezza degli impianti;
- Decreto 20 dicembre 2012, "Regola tecnica di prevenzione incendi per gli impianti di protezione attiva contro l'incendio installati nelle attività soggette ai controlli di prevenzione incendi";
- Decreto Ministeriale 10 Marzo 1998 per la gestione dell'emergenza nei luoghi di lavoro;
- CEI 99 – 2 "Impianti elettrici con tensione superiore a 1 kV in corrente alternata".

Ai fini della prevenzione incendi l'attività è da considerare nella sua fase di progettazione e trattasi di installazioni di macchine elettriche di futuro esercizio, da omologare alle disposizioni di cui al Titolo I ed al Titolo III dell'allegata Regola Tecnica (Decreto Ministeriale 15 Luglio 2014) entro i termini di cui all'art. 6 dell'allegato decreto (in corso di pubblicazione) di approvazione della stessa Regola Tecnica.

Dai dati di targa relativi alla macchina elettrica di cui sopra, ai sensi del Titolo III punto 2 della citata Regola Tecnica, si rileva che, ai fini antincendio, le stesse sono così classificate:

Macchina elettrica (identificativo)		**Classe**	**Installazione**	**Potenza della singola macchina**
Codice	**Descrizione**			
*T10+T12** *T11+T12**	*ASC1 sbarra MT Rossa*** *ASC2 sbarra MT Verde***	**EE0**	Area non urbanizzata	**≤1 MVA**
	~~*(Cod. AUI)*~~	~~**EE1**~~	~~Area urbanizzata~~	
T8	*TR1 linea Rossa (Uras)* *TR2 linea Verde (Pabillonis)*	**AE0**	Area non urbanizzata	**>1 MVA e ≤100 MVA**
	~~*(Cod. AUI)*~~	~~**AE1**~~	~~Area urbanizzata~~	

Si precisa inoltre che E-Distribuzione S.p.A., attua (per le attività di progettazione, realizzazione, sviluppo, conduzione e manutenzione delle reti AT, MT e BT e telecontrollo) un Sistema di Gestione Integrato (SGI) certificato conforme alle norme ISO 9001, ISO 14001, ISO 50001 e allo standard OHSAS 18001.

*** Codici cartelli da apporre sulle apparecchiature descritte**
****ASC (Arc Suppression Coil) TFN (T12) +Bobina di Petersen (T10/T11)**

2. GENERALITÀ

2.1 Definizioni

Macchina elettrica: macchina elettrica **fissa**, trasformatori di potenza e reattori, con presenza di liquido isolante combustibile in quantità superiore ad 1 m^3.

Installazione fissa: installazione di macchina elettrica collegata ad una rete elettrica o ad un impianto elettrico comprensiva dei sistemi accessori a corredo.

Installazione rimovibile: installazione non fissa di macchina elettrica, facilmente disinstallabile, utilizzata per collegamenti provvisori e/o di emergenza ad una rete elettrica o ad un impianto elettrico, comprensiva dei sistemi accessori a corredo.

Installazione mobile: installazione di macchina elettrica su carrello, autoveicolo o altro mezzo mobile collegata, per utilizzo temporaneo, ad una rete elettrica o ad un impianto elettrico, comprensiva dei sistemi accessori a corredo.

Installazione temporanea: tutte le installazioni rimovibili o mobili.

Installazione all'aperto: l'installazione di macchina elettrica su spazio scoperto.

Impianto: officine elettriche destinate alla produzione di energia elettrica, ovvero parte di un sistema elettrico di potenza, concentrato in un dato luogo, comprendente soprattutto terminali di linee di trasmissione o distribuzione, apparecchiature di interruzione e sezionamento, alloggiamenti ove possono essere installati anche macchine elettriche fisse.

Sistema di contenimento: sistema che impedisce la tracimazione e lo spandimento del liquido isolante contenuto all'interno della macchina elettrica.

Area urbanizzata: zona territoriale omogenea totalmente edificata, individuata come zona A nel piano regolatore generale o nel programma di fabbricazione ai sensi dell'articolo 2 del decreto ministeriale 2 aprile 1968, n. 1444, e nei comuni sprovvisti dei predetti strumenti urbanistici, all'interno del perimetro del centro abitato, delimitato a norma dell'articolo 17 della legge 6 agosto 1967, n. 765, quando, nell'uno e nell'altro caso, la densità della edificazione esistente, nel raggio di duecento metri dal perimetro dell'impianto risulti superiore a 3 m^3 per m^2; nelle zone di completamento e di espansione dell'aggregato urbano indicate nel piano regolatore generale o nel programma di fabbricazione, nelle quali sia previsto un indice di edificabilità superiore a tre metri cubi per metro quadrato; aree, ovunque ubicate, destinate a verde pubblico. La rispondenza dell'area dell'impianto alle caratteristiche urbanistiche deve essere attestata dal sindaco o comprovata da perizia giurata a firma di professionista, iscritto al relativo albo professionale.

Area non urbanizzata: quella che non si può definire urbanizzata o che afferisce al concetto di centrale di produzione di energia elettrica.

Locale esterno: locale ubicato su spazio scoperto, anche in adiacenza ad altro fabbricato, purché strutturalmente separato e privo di pareti verticali comuni. Sono considerati locali esterni anche quelli ubicati sulla copertura piana dei fabbricati, purché privi di pareti verticali comuni, le installazioni in caverna e quelle in cabine interrate al di fuori del volume degli edifici.

Locale fuori terra: locale il cui piano di calpestio è a quota non inferiore a quello del piano di riferimento.

Locale interrato: locale in cui l'intradosso del solaio di copertura è a quota non superiore a 0,6 m al di sopra del piano di riferimento.

Edifici a particolare rischio di incendio: fabbricati destinati, anche parzialmente a caserme, attività comprese nei punti 41, 58, 65, 66, 67, 68, 69, 71, 72, 77 (per edifici aventi altezza antincendio superiore a 54 m) dell'Allegato I al D.P.R. 1° agosto 2011, n. 151 o soggetti ad affollamento superiore a 0,4 persone per m^2.

2.2 Protezioni Elettriche

Gli impianti elettrici a cui è collegato il trasformatore sono realizzati secondo la regola dell'arte e dotati di adeguati dispositivi di protezione contro il sovraccarico, il cortocircuito ed i guasti verso terra, che consentono l'apertura in automatico del circuito di alimentazione.

2.3 Esercizio e manutenzione

L'esercizio e la manutenzione della macchina elettrica oggetto della presente relazione sono effettuati secondo quanto indicato dalla normativa tecnica applicabile, dai manuali di uso e manutenzione forniti dai costruttori della macchina, ovvero secondo quanto previsto nel piano dei controlli e delle manutenzioni dell'impianto secondo le procedure aziendali.
Le operazioni di controllo e gli interventi di manutenzione sono svolti da personale specializzato al fine di garantire il corretto e sicuro funzionamento; tali interventi sono opportunamente documentati (Registro dei controlli) in modo da poter essere messi a disposizione, se necessario, del competente Comando dei Vigili del Fuoco.

2.4 Messa in sicurezza

In caso di incendio, al fine di consentire ai soccorritori di intervenire in sicurezza, e-distribuzione S.p.A. rende reperibile h24, personale tecnico operativo che, con intervento in loco ovvero mediante intervento in remoto, provvede al sezionamento della porzione di rete a cui è connessa la macchina elettrica fissa.
Tale sezionamento si configura anche come sezionamento di emergenza.
Per motivi di sicurezza è previsto il sezionamento e la messa in sicurezza della porzione di impianto interessata dall'incendio o di eventuali porzioni interferenti.
Tenuto conto della presenza di impianti elettrici, che se non messi in sicurezza devono essere considerati in tensione, l'ingresso alle aree può avvenire solo in presenza di personale qualificato PES a sensi della norma CEI 11-27.

2.5 Segnaletica di sicurezza

L'area in cui è ubicata la macchina elettrica oggetto della presente relazione ed i relativi accessori, è segnalata con apposita cartellonistica conforme alla normativa vigente integrata con segnaletica conforme al titolo V del D.Lgs. 81/08.
Altresì vengono segnalati gli accessi all'area della macchina elettrica e le aree all'interno delle quali esiste il pericolo di elettrocuzione per i soccorritori. Apposita segnaletica indica le aree ove è vietato l'accesso anche ai mezzi ed alle squadre di soccorso.
I percorsi di esodo e le uscite sono adeguatamente segnalati.
Alcuni esempi di segnaletica antincendio:

Tabella 1

Direzione da seguire 	Attrezzatura antincendio 	Estintore portatile 	Estintore carrellato 
Idrante a muro 	Pericolo elettricità 		

La macchina elettrica in esame ha le seguenti caratteristiche: **MACCHINA ELETTRICA** (identificativo)		**POTENZA [MVA]**	**VOLUME OLIO [m³]**	**TOTALE VOLUME OLIO [m³]**
Codice	Descrizione			
T10+T12	ASC1 sbarra MT Rossa	$0,1 < P_n < 1$	1,35	41,78
T11+T12	ASC2 sbarra MT Verde	$0,1 < P_n < 1$	1,35	
T8	TR1 linea Rossa	40	19,54	
T8	TR2 linea Verde	40	19,54	

Le potenze nominali saranno riportate sulle targhe di identificazione, dichiarate dai fabbricanti, al momento in fase di definizione.

2.6 Olio isolante

Il riempimento è effettuato con olio minerale isolante.
Si riportano di seguito le principali caratteristiche chimico-fisiche dell'olio isolante utilizzato nei quantitativi di cui al punto precedente.

CARATTERISTICHE CHIMICOFISICHE		
	U.M.	Valore min
Punto di infiammabilità	*°C*	***>140***
PCB	*"Assente"*	

Tutte le altre caratteristiche del prodotto sono dettagliate nella scheda di sicurezza allegata.

Dal punto di vista della sicurezza antincendio i principali componenti interessati sono i trasformatori e le bobine di Petersen.
Per i TR AT/MT della CP si è evitato l'inserimento del muro parafiamma ricorrendo al rispetto delle distanze di sicurezza fra i trasformatori al fine di agevolare le manutenzioni permettendo l'uso di veicoli anche nella strada centrale previa valutazione degli ingombri e dei titoli autorizzativi posseduti.
Per le isole Petersen dal punto di vista della normativa antincendio e delle norme CEI-EN 61936, ogni installazione per semi-sbarra può essere costituita da 1 o più macchine elettriche a seconda se il quantitativo d'olio contenuto in ogni singola apparecchiatura superi o meno i 1.000 litri e a seconda delle reciproche distanze e della presenza di eventuali setti REI60.
Di conseguenza sono state rispettate le previste distanze di sicurezza interne, esterne e di protezione.
Ai fini della classificazione delle installazione di macchine elettriche, le stesse essendo inserite all'interno della stessa area elettrica chiusa (CP) costituiscono un unico centro di pericolo e pertanto i relativi quantitativi di liquido combustibile isolante vanno sommati.

3. SISTEMA DI CONTENIMENTO

Per ogni installazione, in caso di fuoriuscita del liquido isolante, è previsto un adeguato sistema di contenimento. Il sistema di contenimento è realizzato con vasca di raccolta.
La vasca di raccolta olio è un manufatto interrato in cemento armato, collegato alla tramoggia sita alla base di ogni macchina elettrica tramite un sistema di tubazioni fisse.
Le eventuali acque meteoriche raccolte dalla tramoggia in condizioni normali di esercizio sono regolarmente conferite a soggetti in possesso delle necessarie iscrizioni/autorizzazioni, previi controlli periodici al fine di assicurare, in ogni condizione, la capacità di cui sopra.

Sia i trasformatori AT/MT sia le Bobine di Petersen sono posizionati su vasche sigillate auto contenenti. Le vasche saranno equipaggiate con un sistema di controllo del livello di riempimento tramite galleggiante elettronico regolato in modo tale da inviare al Centro Operativo un segnale di allarme al superamento del livello che garantisce la non fuoriuscita dell'olio dalla vasca in caso di svuotamento dell'intero volume d'olio delle macchine. Le acque meteoriche accumulate nelle vasche sotto TR e Isola Petersen sono acque con potenziale presenza di olio isolante dielettrico e, in quanto tali, non possono essere scaricate per dispersione sul suolo o nel sottosuolo (subirrigazione).

Lo svuotamento delle acque meteoriche sarà eseguito mediante intervento di auto spurgo che dovrà certificare il corretto smaltimento.

Le vasche saranno impermeabilizzate attraverso guaine o pitturazioni idonee con garanzia di tenuta di almeno 20 anni. Inoltre, per assicurare una tenuta più duratura e scongiurare il pericolo di possibili rilasci nel terreno, si dovrà utilizzare un calcestruzzo a bassa permeabilità.

3.1 Volumetrie e impermeabilizzazione

Descrizione volumetrie vasca trasformatore	Volume [m^3]
Volume da fondo vasca a quota grigliato	49,80
Volume da fondo a sensore di livello superiore	15,30
Volume sensore di livello superiore a quota grigliato	34,50
Volume da fondo a sensore di livello intermedio	8,40
Volume da fondo a sensore di livello inferiore	3,0
Volume tra sensore di livello inferiore e intermedio	5,40

Bobina di Petersen	Volume [m^3]
Volumetria vasca	11,4

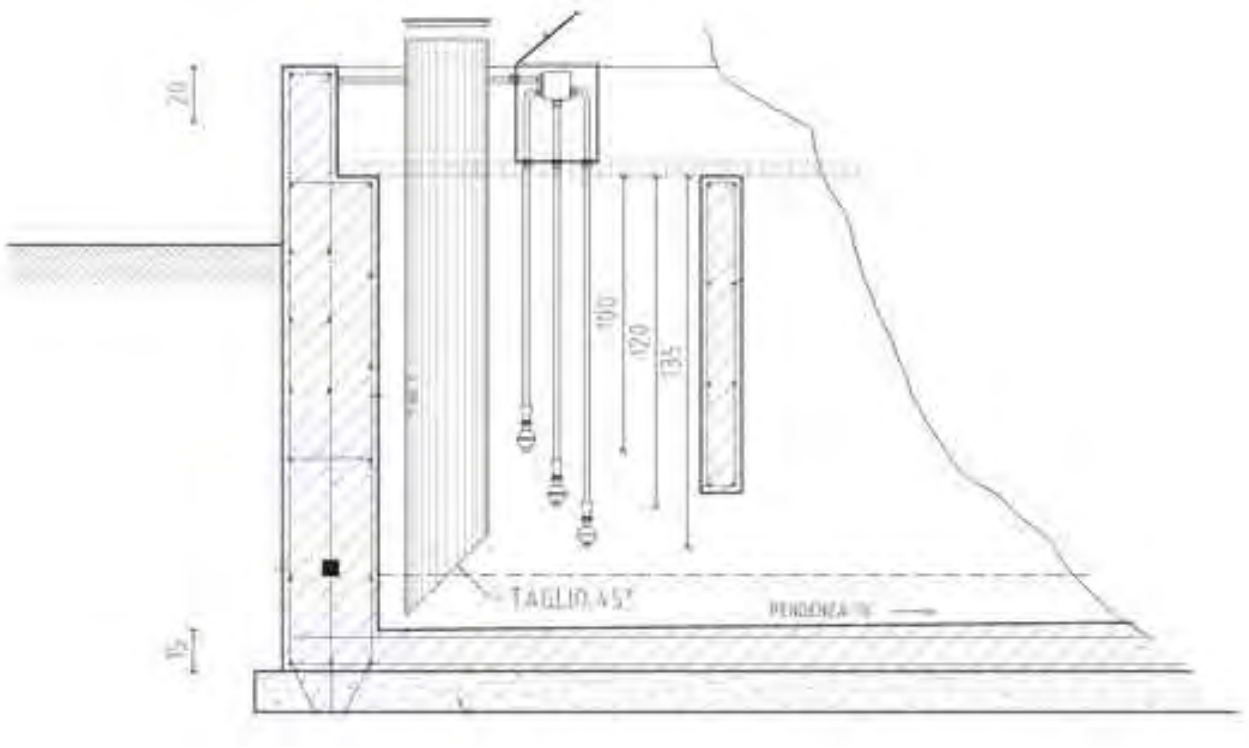

Figura 1 - particolare sensori di livello vasca trafo e B.P.

IMPERMEABILIZZAZIONE DELLA VASCA

- IL CALCESTRUZZO DOVRÀ ESSERE RESO IMPERMEABILE AGGIUNGENDO ADDITIVI SUPERFLUIDIFICANTI ESENTI DA CLORURI (TIPO RHEOBUILD, SIKAMENT O SIMILI)
- SIGILLARE LE RIPRESE DI GETTO CON GIUNTO BENTONITICO IDRORESPANSIVO TIPO "WATERSTOP"
- PER MIGLIORARE LA TENUTA UTILIZZARE DISTANZIATORI PER CASSEFORME PIEGATI AD ELICA
- SI DOVRÀ IMPERMEABILIZZARE L' INTERNO DELLA VASCA FINO AL CIGLIO, SONO ESCLUSI I SETTI AVENTI ENTRAMBE LE SUPERFICI INTERNE ALLA VASCA, CHE DEVONO ESSERE IMPERMEABILIZZATI SOLTANTO PER UNA STRISCIA DI 15 cm DI LARGHEZZA A PARTIRE DAGLI SPIGOLI CON LA PLATEA E LE PARETI.
- DOPO LA SCASSERATURA ESEGUIRE LA PULIZIA DELLE PARETI INTERNE CON IDROLAVAGGIO A 180-200 bar
- STUCCARE VESPAI, VAIOLATURE E RIPRESE DI GETTO (CON FORMAZIONE DI CUSSIE FRA PLATEA E MURI) MEDIANTE STUCCO PASTOSO EPOSSIDICO SENZA SOLVENTI AD INDURIMENTO NORMALE (TIPO "SIKATOP-122" O SIMILI)
- APPLICARE UNO STRATO DI FONDO EPOSSIDICO UNIVERSALE A SOLVENTE PER SUPERFICI CEMENTIZIE (TIPO "HALOVAN PRIMER FE", OPPURE "SIKA POXITAR F"
- APPLICARE DUE STRATI DI RIVESTIMENTO PROTETTIVO EPOSSICATRAMOSO DI FINITURA PER SUPPORTI CEMENTIZI RESISTENTE AGLI OLII A TEMPERATURE ELEVATE (TIPO "SIKA POXITAR F" O SIMILI)
- IN ALTERNATIVA SI PUÒ USARE UN RIVESTIMENTO FINALE COMPOSTO DA DUE MANI DI VERNICE EPOSSIDICA BICOMPONENTE CON RESISTENZA CERTIFICATA AD OLII E COMBUSTIBILI (ESEMPIO "MAPECOAT I 24")
- L'IMPRESA DOVRÀ SOTTOPORRE ALLA DIREZIONE LAVORI L'ELENCO DEI MATERIALI CHE INTENDE USARE PER LE DIVERSE FASI DELL'IMPERMEABILIZZAZIONE, PRODUCENDO LE SCHEDE TECNICHE E CERTIFICANDO LA COMPATIBILITÀ FRA I VARI MATERIALI SE PRODOTTI DA DIVERSE CASE PRODUTTRICI
- PRIMA DELLA POSA DEI CIOTTOLI ROMPIFIAMMA SI DEVE VERIFICARE LA TENUTA DELLA VASCA

MATERIALI

ACCIAIO	- PER RETI E FERRI DI ARMATURA	ACCIAIO B450C CONTROLLATO IN STABILIMENTO
	- PROFILATI, PIATTI, LAMIERA STIRATA	ACCIAIO S275JR
GRIGLIATI	- GRIGLIATO ELETTROSALDATO ZINCATO A CALDO CONFORME NORME UNI 11002-1/2/3, CLASSE DI PORTATA 2	
FINITURA SUPERFICIALE	- I METALLI ESPOSTI DEVONO ESSERE ZINCATI A CALDO SECONDO UNI 1461	
CALCESTRUZZO	- PER STRUTTURE	C 28/35 XO S4
	- PER SOTTOFONDI	C 16/20 XO S4

Figura 2 - procedura e materiali impermeabilizzazione vasca

4. CARATTERISTICHE NOMINALI

Frequenza nominale		Hz	50
Tensione nominale Vn		kV	20
Livelli di isolamento (isolamento uniforme)	Tensione massima Um (val. effic.) Tensione di tenuta di breve durata a f.i. (val. effic.) Tensione di tenuta ad impulso (val. cresta)	kV kV kV	24 50 125
Alimentazione simmetrica	Perdite nel ferro alla tensione nominale P_0 Corrente a vuoto alla tensione nominale I_0 Livello di potenza acustica	W mA dB(A)	1400 250 60
Alimentazione omopolare	Corrente nominale di neutro $I = 3I_0$ - in servizio di breve durata (10 min.) - in servizio permanente Impedenza omopolare $Z_0 = R_0+jX_0$	A A Ω/fase	500 50 0,9+j8

Tabella 2 - caratteristiche elettriche nominali TFN

Note	Principali caratteristiche nominali			Reti con V_n 20 kV
	Frequenza nominale		Hz	50
(1)	Tensione nominale $E_n = V_n / \sqrt{3}$		kV	11,547
	Corrente nominale I_n		A	300
(2)	Posizione nominale $X_n = E_n / I_n$		Ω	38,5
	Campo di regolazione della corrente			da 100% a 20% I_n
(3) (5) (6)	R_p (valore ohmico di R'_p riportato lato avv principale)		Ω	460 Variazione ammessa nel campo 430 Ω ÷ 610 Ω in tutto il range $X_{n,min} \div X_{n,max}$
(4) (5)	R_0 (valori comprensivi di resistenza dell' avvolgimento della bobina misurata in cc)	$R_0 = R_{avv} + R'_3$ con $R'_3 = R'_{31}$	Ω	1,4 Variazione ammessa nel campo 1,35 Ω ÷ 1,55 Ω in tutto il range $X_{n,min} \div X_{n,max}$
		$R_0 = R_{avv} + R'_3$ con $R'_3 = R'_{31} + R'_{32}$	Ω	3,8 Variazione ammessa nel campo 3,70 Ω ÷ 4,00 Ω in tutto il range $X_{n,min} \div X_{n,max}$
	Valore massimo nominale costante di tempo $T = L_{equiv-zero} / R_0$		ms	150 (max. tolleranza +20 ms)
Avvolgimenti del reattore	Avv. Principale (terminali 1U, 1N)			• U_m = 24 kV • Tenuta a freq ind =50 kV • Tenuta imp. atm.=125 kV
	Avv. Secondario di potenza per alimentare R'_p (terminali 2U, 2N) La variazione della tensione secondaria in tutto il campo di regolazione della bobina $X_{n,min}$-$X_{n,max}$ deve garantire il rispetto della variazione ammessa di R_p			• Tensione nom.: $E_{n,s}$ da fissare, a cura del Costruttore, fra 500V e 520V (tolleranza ± 10% in tutto il campo di regolazione della bobina $X_{n,min}$-$X_{n,max}$) • Potenza in servizio di breve durata (1 min) = 350 kVA • U_m = 1,1 kV; tenuta a f.i = 3 kV
	Avv. Secondario di misura per rilevare la tensione (terminali 3U(20), 3U(15), 3N) 3U(20)-3N da utilizzare con V_n=20 kV 3U(15)-3N da utilizzare con V_n=15 kV			• Tensione nominale = 100 V (tolleranza ± 10% in tutto il campo di regolazioni della bobina $X_{n,min}$-$X_{n,max}$) • Potenza continuativa = 300 VA • $U_m \leq$ 1,1 kV; tenuta a f.i. = 3 kV
Complesso in aria	Complesso resistori (terminali 2U', 2N', 1N', T)			• U_m = 1,1 kV • Tenuta a freq. ind. = 3 kV
	Trasformatore di corrente			• U_m = 0,72 kV • 300/5 A • 10 VA, 5 P 5

Tabella 3 - caratteristiche nominali impedenza di messa a terra con bobina mobile per reti MT

Trasformatore di potenza AT/MT

Dati nominali

costruttore	In fase di definizione
norme applicabili	IEC 60076 ECO DESIGN
tipo di servizio	continuo
temperatura ambiente	40°C
classe di isolamento	A
metodo di raffreddamento	ONAN
tipo d'olio	Nitro Libra Nynas
altezza d'installazione	≤ 1000 m
frequenza nominale	50 Hz
potenza nominale	40 MVA
tensioni nominali (a vuoto):	
AT	150 kV
MT	15,6/20,8 kV
regolazione sotto carico su AT	+/- 10 x 1.25 %
tipo di commutatore sotto carico	…
collegamento fasi	
avvolgimento AT	stella
avvolgimento MT	stella
gruppo di collegamento	Yyn0
classe d'isolamento:	
- lato AT	170 kV
- lato MT	24 kV
tensione di tenuta a frequenza industriale:	
- lato AT	275 kV
- lato MT	50 kV
tensione di tenuta ad impulso atmosferico	
- lato AT	650
- lato MT	125 kV
sovratemperature ammesse	
- olio	60 °C
- avvolgimenti	65 °C

5. RECINZIONE

Il perimetro esterno dovrà essere protetto mediante una recinzione di adeguata resistenza meccanica, realizzata con materiali durevoli, antisfondamento, non scalabili e di altezza tale da scoraggiare un eventuale tentativo di scavalcamento.

La soluzione unificata per la recinzione di CP è dovrà avere altezza totale di 270 cm dal piano di campagna; dovrà essere realizzata con pannelli prefabbricati monoblocco in c.a. con pali e lastre scomponibili e fondazione in c.a. a "T" rovescio continua.

6. DISTANZE DI SICUREZZA

La macchina elettrica è installata all'aperto ed è posizionata in modo tale che l'eventuale incendio non costituisca pericolo di incendio per le altre installazioni e/o fabbricati posti nelle vicinanze.
A tale scopo si precisa che le installazioni rispettano le distanze di sicurezza interne indicate nella tabella A, del Titolo III Capo I p.2 dell'allegata Regola Tecnica (Decreto Ministeriale 15 Luglio 2014), di seguito riportata.
Per le distanze di sicurezza esterna si sono applicati gli stessi valori previsti per quelle interne.

Tabella A

Potenza Nominale [MVA]della singola macchina	**Distanza [m]**
Oltre 1 fino a 10	3
Oltre 10 fino a 40	5
Oltre 40 fino a 200	10
Oltre 200	15

7. MEZZI DI ESTINZIONE (RIF. TAV. PD. T06)

Le installazioni sono dotate di mezzi e impianti per l'estinzione degli incendi come di seguito specificato.
Le apparecchiature e gli impianti di estinzione degli incendi sono realizzati, installati e manutenuti a regola d'arte, conformemente alle vigenti norme di buona tecnica ed a quanto di seguito indicato.

7.1 Mezzi (presidi) di estinzione

A seguito di apposita valutazione del rischio incendio in accordo a quanto stabilito dalla normativa vigente sono previsti presidi antincendio di estinzione opportunamente segnalati da cartelli/targhe all'interno dell'area di CP. La misura antincendio *di controllo e spegnimento adottata per la CP,* individua come presidi *antincendio per la protezione di base* e per la protezione finalizzata al controllo e *allo spegnimento la presenza di* **estintori d'incendio sia portatili sia carrellati,** ulteriori mezzi antincendio di estinzione, sono sempre a bordo degli automezzi di servizio ad uso del personale operativo, per lo svolgimento di lavori di manutenzione, manovre e controlli.

8. ORGANIZZAZIONE E GESTIONE DELLA SICUREZZA

8.1 Analisi del rischio d'incendio

Il sito in esame è un impianto tecnologico, non presidiato e nel quale il personale si reca occasionalmente per svolgere principalmente: lavori di manutenzione, manovre e controlli. La permanenza nell'impianto risulta estremamente bassa e con un numero limitato di persone. Tale ambiente non costituisce pertanto un luogo di lavoro permanente ai sensi del D. Lgs. 81/08. L'attività classificata a rischio medio D.P.R. 151/2011, è normata da specifica regola tecnica di prevenzione incendi (Decreto Ministeriale 15 Luglio 2014). Per tali impianti, il datore di lavoro dovrà adottare le misure finalizzate a:

- *Ridurre la probabilità di insorgenza di un incendio;*
- *Realizzare le misure per una rapida segnalazione dell'incendio al fine di garantire l'attivazione dei sistemi di allarme e delle procedure di intervento;*

- *Garantire l'efficienza dei sistemi di protezione antincendio;*
- *Fornire ai lavoratori una adeguata informazione e formazione sui rischi di incendio.*
- *Visto quanto specificato sopra non è necessario assicurare l'attivazione di sistemi per l'estinzione di un incendio.*

8.2 Piano di emergenza interno

In relazione al precedente paragrafo, E-Distribuzione nella figura di datore di lavoro applicherà le misure di emergenza descritte nella documentazione del proprio Sistema Gestione Integrato.
Per la specifica installazione, a cui la presente relazione tecnica fa riferimento, è stata predisposta apposita planimetria, dove sono rappresentate: la macchina elettrica installata, i centri di pericolo, il luogo sicuro, la disposizione delle vie di esodo e dei mezzi antincendio nonché gli spazi di manovra degli automezzi di soccorso.
Presso i Centri Operativi Rete (COR), sempre presidiati, faranno capo le segnalazioni di allarme e saranno rese disponibili le misure di emergenza e le planimetrie utili per le squadre di soccorso.

9. ALLEGATI

Elaborati grafici:

- *PA. T01 - Inquadramento generale CTR (1:10.000);*
- *PA. T12 - Planimetria inquadramento catastale (1:2000);*
- *PA. T13 - Estratto del Piano Regolatore Generale (PRG) (1:10.000);*
- *PD. T05 - Planimetria Generale dell'impianto (1:200);*
- *PD. T06 - Pianta con i percorsi di emergenza, dove sono riportate (1:200):*
- *gli impianti di estinzione incendi;*
- *vari ambienti di pertinenza con le relative destinazioni d'uso.*
- *Segnaletica di sicurezza.*

Segue scheda di sicurezza Olio.

IMPIANTO DI RETE PER LA CONNESSIONE A 15 kV
DEGLI IMPIANTI DI PRODUZIONE DI ENERGIA ELETTRICA
DA FONTE SOLARE PER COMPLESSIVI 36,0 MW

UBICATI IN COMUNE DI SAN NICOLO' D'ARCIDANO (OR) SARDEGNA SUD
alle Contrade: Terra Ziringonis, Snc; Coddu Fagoni, Snc

PROGETTO DEFINITIVO

DOCUMENTAZIONE ELETTRICA CABINA PRIMARIA "CP ARCIDANO"

SCHEDA SICUREZZA OLIO ISOLANTE PER TASFORMATORI E ASC DI CABINA
(Impianto AT tradizionale in aria interasse 14 m e sezione MT con quadro bipiano in fabbricato)

IDENTIFICAZIONE ELABORATO								
Livello prog.	Codice Rintracciabilità	Tipo documento	N° elaborato	N° foglio	Totale fogli	Nome File	Data	Scala
PD	T0736974 T0737400	Tavola	Allegato	0	20	010 011 BG005 ARCI	Luglio 2021	1:

REVISIONI					
Rev	Data	Descrizione	Eseguito	Verificato	Approvato
01	05.07.21	Prima emissione 25.06.21-0534931 Verifica progetto e-distribuzione AUT_2279216	Giovanni Barlotti	ADiG	

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GESTORE RETE ELETTRICA

e-distribuzione
Area Territoriale Rete Nord Ovest
Sviluppo Rete
Centro PL Cagliari

RICHIEDENTE

GREEN CITY
GC SNARC S.r.l.
Piazza Walther Von Vogelweide
8 - 39100 Bolzano

Parere di conformità alla soluzione tecnica

NYTRO® LIBRA

SAFETY DATA SHEET

Date of printing	2021-05-28
Date of issue/ Date of revision	2021-05-28
Date of previous issue	2021-05-28
Version	6.01

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

1.1 Product identifier

Product name	NYTRO® LIBRA
UFI	A280-50JQ-N00Q-TMSW
Product description	Insulating oil
Product type	Liquid.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Formulation and (re)packing of substances and mixtures - Industrial Use in functional fluids - Industrial Use in 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	Head office: 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
e-mail address of person responsible for this SDS	ProductHSE@nynas.com

1.4 Emergency telephone number

Telephone number	+44 (0) 1235 239 670
Hours of operation	24 hour service

National advisory body/Poison Centre

Telephone number 020 - 99 60 00 (Kemiakuten, 24h service)

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

SECTION 2: Hazards identification

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 doctor. Do NOT induce vomiting.
Storage	Not applicable.
Disposal	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	Distillate (petroleum), hydrotreated light naphthenic Distillates (petroleum), hydrotreated light paraffinic Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based
Supplemental label elements	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

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Other hazards which do not result in classification	Prolonged or repeated contact may dry skin and cause irritation.

SECTION 3: Composition/information on ingredients

3.2 Mixtures Mixture

Product/ingredient name	Identifiers	%	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	50 - 70	Asp. Tox. 1, H304	[1] [2]
Distillate (petroleum), hydrotreated light paraffinic	REACH #: 01-2119487077-29 EC: 265-158-7 CAS: 64742-55-8	0 - 50	Asp. Tox. 1, H304	[1] [2]
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	REACH #: 01-2119474878-16 EC: 276-737-9 CAS: 72623-86-0 Index: 649-482-00-X	0 - 50	Asp. Tox. 1, H304 **See Section 16 for the full text of the H statements declared above.**	[1] [2]

SECTION 3: Composition/information on ingredients

Regulation (EC) No. 1272/2008 [CLP] Annex VI 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, vPvBs or Substances of equivalent concern, 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
[6] Additional disclosure due to company policy

Occupational exposure limits, if available, are listed in Section 8.

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 skin thoroughly with soap and water or use recognised skin cleanser. 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.
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

Over-exposure signs/symptoms

Eye contact	Slight irritant
Inhalation	Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.
Skin contact	Adverse symptoms may include the following: irritation dryness cracking

SECTION 4: First aid measures

Ingestion	Adverse symptoms may include the following: Nausea or vomiting. diarrhoea

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Due to low viscosity there is a risk of aspiration if the product enters the lungs. Treat symptomatically.
Specific treatments	Always assume that aspiration has occurred.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	Use dry chemical, CO_2, 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.
Hazardous combustion products	Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H2S, SOx (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.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

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	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. Approach the release from upwind. Contaminated absorbent material may pose the same hazard as the spilt product.
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. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Use and store only outdoors or in a well-ventilated area. Hazard of slipping on spilt product. 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. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Prevent the risk of slipping. Take precautionary measures against static discharge. Avoid splash filling of bulk volumes when handling hot liquid product. Empty containers retain product residue and can be hazardous.

SECTION 7: Handling and storage

Nota : 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 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 Not available.

Industrial sector specific solutions Not available.

SECTION 8: Exposure controls/personal protection

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).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Distillate (petroleum), hydrotreated light naphthenic	**Work environment authority Regulation 2018:1 (Sweden, 2/2018).** TWA: 1 mg/m³ 8 hours. Form: mist and fume STEL: 3 mg/m³ 15 minutes. Form: mist and fume
Distillate (petroleum), hydrotreated light paraffinic	**Work environment authority Regulation 2018:1 (Sweden, 2/2018).** TWA: 1 mg/m³ 8 hours. Form: mist and fume STEL: 3 mg/m³ 15 minutes. Form: mist and fume
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	**Work environment authority Regulation 2018:1 (Sweden, 2/2018).** TWA: 1 mg/m³ 8 hours. Form: mist and fume STEL: 3 mg/m³ 15 minutes. Form: mist and fume
Oil mist	***[Air contaminant]*** **Work environment authority Regulation 2018:1 (Sweden, 2/2018).** TWA: 1 mg/m³ 8 hours. Form: mist and fume

SECTION 8: Exposure controls/personal protection

	STEL: 3 mg/m³ 15 minutes. Form: mist and fume

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 monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) 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	5,58 mg/m³	Workers	Local
Distillate (petroleum), hydrotreated light paraffinic	DNEL	Long term Inhalation	5,58 mg/m³	Workers	Local
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	DNEL	Long term Inhalation	5,58 mg/m³	Workers	Local

PNECs

No PNECs available

PNEC Summary: Hydrocarbon Block Method (Petrorisk)

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.

Eye/face protection: Recommended: Safety glasses with side shields.

Skin protection

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. 4 - 8 hours (breakthrough time): nitrile rubber

Body protection: Wear protective clothing if there is a risk of skin contact. Change contaminated clothes at the end of working shift.

Other skin protection: 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

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state	Liquid.
Colour	Light yellow
Odour	Odourless/Light petroleum.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	-51°C
Initial boiling point and boiling range	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	Not available.
Flash point	Closed cup: >140°C (>284°F) [Pensky-Martens]
Auto-ignition temperature	>200°C (>392°F)
Decomposition temperature	>280°C
Viscosity	Kinematic (40°C): 9,6 mm^2/s (9,6 cSt)
Solubility(ies)	Insoluble in water.
Solubility in water	Not available.
Partition coefficient: n-octanol/ water	Not applicable.
Vapour pressure (Calculated)	<0,01 kPa (<0,075 mm Hg)
Evaporation rate	Not available.
Relative density	Not available.
Density	0,88 g/cm^3 [15°C]
Explosive properties	Not available.
Oxidising properties	Not available.
DMSO extractable compounds for base oil substance(s) according to IP346	< 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	Keep away from extreme heat and oxidizing agents. Take precautionary measures against static discharge.
10.5 Incompatible materials	Oxidising agent.
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, SOx (sulfur 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	>5,53 mg/l	4 hours	EMBSI 1988 (similar material)
	LD50 Dermal	Rabbit	>5000 mg/kg	-	API 1982 (similar material)
	LD50 Oral	Rat	>5000 mg/kg	-	API 1982(similar material)
Distillate (petroleum), hydrotreated light paraffinic	LC50 Inhalation Dusts and mists	Rat	>5,53 mg/l	4 hours	EMBSI 1988 (similar material)
	LD50 Dermal	Rabbit	>5000 mg/kg	-	API 1982 (similar material)
	LD50 Oral	Rat	>5000 mg/kg	-	API 1982(similar material)
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5,53 mg/l	4 hours	EMBSI 1988 (similar material)
	LD50 Dermal	Rabbit	>5000 mg/kg	-	API 1982 (similar material)
	LD50 Oral	Rat	>5000 mg/kg	-	API 1982(similar material)

Conclusion/Summary: Based on available data, the classification criteria are not met.

Acute toxicity estimates

N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Observation	Remarks
Distillate (petroleum), hydrotreated light naphthenic	Skin - Non-irritant to skin.	Rabbit	0 to 1	24 to 72 hours	API 1982(similar material)
	Eyes - Non-irritating to the eyes.	Rabbit	0 to 0,11	24 to 72 hours	API 1982(similar material)
Distillate (petroleum), hydrotreated light paraffinic	Skin - Non-irritant to skin.	Rabbit	0 to 1	24 to 72 hours	API 1982(similar material)
	Eyes - Non-irritating to the eyes.	Rabbit	0 to 0,11	24 to 72 hours	API 1982(similar material)
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Skin - Non-irritant to skin.	Rabbit	0 to 1	24 to 72 hours	API 1982 (similar material)
	Eyes - Non-irritating to the eyes.	Rabbit	0 to 0,11	24 to 72 hours	API 1982(similar material)

Skin: Based on available data, the classification criteria are not met.

Eyes: Based on available data, the classification criteria are not met.

Respiratory: Based on available data, the classification criteria are not met.

Sensitisation

SECTION 11: Toxicological information

Product/ingredient name	Route of exposure	Species	Result	Remarks
Distillate (petroleum), hydrotreated light naphthenic	skin	Guinea pig	Not sensitizing	API 1982(similar material)
Distillate (petroleum), hydrotreated light paraffinic	skin	Guinea pig	Not sensitizing	API 1982(similar material)
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	skin	Guinea pig	Not sensitizing	UBTL 1984j,k,l (similar material)

Skin — Based on available data, the classification criteria are not met.

Respiratory — Based on available data, the classification criteria are not met.

Mutagenicity

Conclusion/Summary — Based on available data, the classification criteria are not met.

Carcinogenicity

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 — Based on available data, the classification criteria are not met.

Teratogenicity

Conclusion/Summary — Based on available data, the classification criteria are not met.

Aspiration hazard

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

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
Distillate (petroleum), hydrotreated light naphthenic	Sub-chronic LOAEL Oral	Rat	125 mg/kg	-
	Sub-chronic NOAEL Dermal	Rat	>2000 mg/kg	-
	Sub-acute NOEL Inhalation Dusts and mists	Rat	220 mg/m³	6 hours; 5 days per week
Distillate (petroleum), hydrotreated light paraffinic	Sub-chronic LOAEL Oral	Rat	125 mg/kg	-
	Sub-chronic NOAEL Dermal	Rat	>2000 mg/kg	-
	Sub-acute NOEL Inhalation Dusts and mists	Rat	220 mg/m³	6 hours; 5 days per week
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Sub-chronic LOAEL Oral	Rabbit	125 mg/kg	-
	Sub-chronic NOAEL Dermal	Rat	>2000 mg/kg	-
	Sub-chronic NOEL Inhalation Dusts and mists	Rat	220 mg/m³	6 hours; 5 days per week

Specific hazard

Aspiration hazard

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

Aspiration of hydrocarbon substances can result in 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

SECTION 11: Toxicological information

of reliable human evidence or on the basis of physical properties.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Distillate (petroleum), hydrotreated light naphthenic	Acute EL50 >10000 mg/l	Daphnia	48 hours
	Acute LL50 >100 mg/l	Fish	96 hours
	Acute NOEL >100 mg/l	Algae	72 hours
	Chronic NOEL 10 mg/l Fresh water	Daphnia	21 days
Distillate (petroleum), hydrotreated light paraffinic	Acute EL50 >10000 mg/l	Daphnia	48 hours
	Acute LL50 >100 mg/l	Fish	96 hours
	Acute NOEL >100 mg/l	Algae	72 hours
	Chronic NOEL 10 mg/l Fresh water	Daphnia	21 days
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	Acute EL50 >10000 mg/l	Daphnia	48 hours
	Acute LL50 >100 mg/l	Fish	96 hours
	Acute NOEL >100 mg/l	Algae	72 hours
	Chronic NOEL 10 mg/l Fresh water	Daphnia	21 days

Conclusion/Summary Based on available data, the classification criteria are not met.

12.2 Persistence and degradability

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

Conclusion/Summary Inherently biodegradable.

12.3 Bioaccumulative potential

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

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

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/IMDG 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.

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 IMO instruments: Not applicable.

MARPOL Annex 1: 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

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

Industrial emissions (integrated pollution prevention and control) - Air	Not listed
Industrial emissions (integrated pollution prevention and control) - Water	Not listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

National inventory

Australia	All components are listed or exempted.
Canada	All components are listed or exempted.
China	All components are listed or exempted.
Japan	**Japan inventory (CSCL)**: All components are listed or exempted. **Japan inventory (ISHL)**: All components are listed or exempted.
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.

SECTION 15: Regulatory information

United States	All components are active or exempted.
Thailand	All components are listed or exempted.
Turkey	All components are listed or exempted.
Viet Nam	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.

Abbreviations and acronyms:

ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

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

Classification	Justification
Asp. Tox. 1, H304	Calculation method

Sweden

Full text of abbreviated H statements	H304	May be fatal if swallowed and enters airways.
Full text of classifications [CLP/GHS]	Asp. Tox. 1	ASPIRATION HAZARD - Category 1
Date of printing	2021-05-28	
Date of issue/ Date of revision	2021-05-28	
Date of previous issue	2021-05-28	
Version	6.01	

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.
The information provided herein does not in any way constitute a product warranty, product specification, agreement on quality or similar.

Section 1 - Title

Short title of the exposure scenario	Formulation and (re)packing of substances and mixtures - Industrial
List of use descriptors	**Identified use name:** Formulation and (re)packing of substances and mixtures - Industrial **Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15, PROC28 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC02, ESVOC SpERC 2.2.v1
Environmental contributing scenarios	**Formulation into mixture -** ERC02
Health Contributing scenarios	**General exposures (open systems) -** PROC04 **General exposures (closed systems) -** PROC01, PROC02, PROC03 **Batch processes at elevated temperatures -** PROC03 **Laboratory activities -** PROC15 **Bulk transfers -** PROC08b **Mixing operations (open systems) -** PROC05 **Transfer from/pouring from containers -** PROC08a **Drum/batch transfers -** PROC08b **Tabletting, compression, extrusion or pelletisation -** PROC14 **Drum and small package filling -** PROC09 **Storage -** PROC01, PROC02 **Process sampling -** PROC09 **Equipment cleaning and maintenance -** PROC08a, PROC28
Industry Association	Concawe - 2020
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, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Section 2 - Exposure controls

2.1 Control of environmental exposure

Amounts used	Annual site tonnage (tonnes/year) 3900 Maximum daily site tonnage (kg/day) 12900
Frequency and duration of use	Continuous release Emission days (days per year) 300
Other conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM) 0.0025 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
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Risk management measures - Water	Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%) 93.7.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.

Section 2 - Exposure controls

Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.0. Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 95.0 Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/day): 62000 Assumed on-site sewage treatment plant flow (m^3/d): 2000

2.2 Control of worker exposure

General measures applicable to all activities

Concentration of substance in mixture or article	Covers percentage substance in the product up to 100 %.
Frequency and duration of use	Covers daily exposures up to 8 hours
Other conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented Assumes use at not more than 20°C above ambient temperature. 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.

Risk management measures (RMM)

General exposures (closed systems) - PROC 1, PROC 2, PROC 3
Sample via a closed loop or other system to avoid exposure.

Batch processes at elevated temperatures Use in contained systems - PROC 3
Handle substance within a closed system. Assumes process temperature up to 60.0 °C.

Bulk transfers Dedicated facility - PROC 8b
Handle substance within a closed system.

Manual Transfer from/pouring from containers Non-dedicated facility - PROC 8a
Use drum pumps.

Equipment cleaning and maintenance - PROC 8a, PROC 28
Drain down and flush system prior to equipment break-in or maintenance.

Storage - PROC 1, PROC 2
Store substance within a closed system.

Section 3 - Exposure estimation and reference to its source

3.1 Environment

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

3.2 Workers

Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Qualitative approach used to conclude safe use.
Exposure estimation and reference to its source	A DNEL (derived no effect levels) cannot be derived. 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 1 - Title

Short title of the exposure scenario	Use in functional fluids - Industrial
List of use descriptors	**Identified use name:** Use in functional fluids - Industrial **Process Category:** PROC01, PROC02, PROC04, PROC08a, PROC08b, PROC09, PROC28 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC07,
Environmental contributing scenarios	**Use of functional fluid at industrial site -** ERC07
Health Contributing scenarios	**General exposures (closed systems) -** PROC02 **Bulk transfers -** PROC01, PROC02 **Storage -** PROC01, PROC02 **Drum/batch transfers -** PROC08b **Filling of articles/equipment -** PROC09 **Filling of equipment from drums or containers -** PROC08a **General exposures (open systems) -** PROC04 **Remanufacture of reject articles -** PROC09 **Equipment cleaning and maintenance -** PROC08a, PROC28
Industry Association	Concawe - 2020
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.

Section 2 - Exposure controls

2.1 Control of environmental exposure

Amounts used	Annual site tonnage (tonnes/year) 10 Maximum daily site tonnage (kg/day) 500
Frequency and duration of use	Continuous release Emission days (days per year) 20
Other conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM) 0.0005 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
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Risk management measures - Water	Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%) 62.3.
Organisational measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.0 Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 95.0 Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/day) 3600 Assumed on-site sewage treatment plant flow (m^3/d) 2000

2.2 Control of worker exposure

General measures applicable to all activities

Section 2 - Exposure controls

Concentration of substance in mixture or article	Covers percentage substance in the product up to 100 %. unless stated differently
Frequency and duration of use	Covers daily exposures up to 8 hours
Other conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented Assumes use at not more than 20°C above ambient temperature. 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.

Risk management measures (RMM)

Bulk transfers Closed system - PROC 1, PROC 2
Handle substance within a closed system.

Filling of articles/equipment Closed system - PROC 9
Handle substance within a closed system.

Filling of equipment from drums or containers Non-dedicated facility - PROC 8a
Use drum pumps.

General exposures (closed systems) - PROC 2
Sample via a closed loop or other system to avoid exposure.

General exposures (open systems) Elevated temperature - PROC 4
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Assumes process temperature up to 80.0 °C.

Remanufacture of reject articles - PROC 9
Drain or remove substance from equipment prior to break-in or maintenance.

Equipment cleaning and maintenance - PROC 8a, PROC 28
Drain down and flush system prior to equipment break-in or maintenance.

Storage - PROC 1, PROC 2
Store substance within a closed system.

Section 3 - Exposure estimation and reference to its source

3.1 Environment

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

3.2 Workers

Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Qualitative approach used to conclude safe use.
Exposure estimation and reference to its source	A DNEL (derived no effect levels) cannot be derived. 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 1 - Title

Short title of the exposure scenario	Use in functional fluids - Professional
List of use descriptors	**Identified use name:** Use in functional fluids - Professional **Process Category:** PROC01, PROC02, PROC03, PROC08a, PROC09, PROC20, PROC28 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC09a, ERC09b, ESVOC SpERC 9.13b.v1
Environmental contributing scenarios	**Widespread use of functional fluid (outdoor) -** ERC09b **Widespread use of functional fluid (indoor) -** ERC09a
Health Contributing scenarios	**Drum/batch transfers -** PROC08a **Transfer from/pouring from containers -** PROC09 **Operation of equipment containing engine oils and similar -** PROC20 **Remanufacture of reject articles -** PROC09 **Equipment cleaning and maintenance -** PROC08a, PROC28 **Storage -** PROC01, PROC02 **Filling of equipment from drums or containers -** PROC09 **General exposures (closed systems) -** PROC01, PROC02, PROC03
Industry Association	Concawe - 2020
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.

Section 2 - Exposure controls

2.1 Control of environmental exposure

Amounts used	Annual site tonnage (tonnes/year) 0.015 Maximum daily site tonnage (kg/day) 0.041
Frequency and duration of use	Continuous release Emission days (days per year) 365
Other conditions affecting environmental exposure	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
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Risk management measures - Water	Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%) 70.5.
Conditions and measures related to sewage treatment plant	Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Estimated substance removal from wastewater via domestic sewage treatment (%): 95.0. Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 95.0. Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/day): 0.77 Assumed domestic sewage treatment plant flow (m3/d): 2000

2.2 Control of worker exposure

General measures applicable to all activities

Section 2 - Exposure controls

Concentration of substance in mixture or article	Covers percentage substance in the product up to 100 %.
Frequency and duration of use	Covers daily exposures up to 8 hours
Other conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented Assumes use at not more than 20°C above ambient temperature. 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.

Risk management measures (RMM)

Drum/batch transfers Non-dedicated facility - PROC 8a
Use drum pumps.

Transfer from/pouring from containers - PROC 9
Use drum pumps.

Filling of equipment from drums or containers - PROC 9
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

General exposures (closed systems) - PROC1, PROC 2, PROC 3
Sample via a closed loop or other system to avoid exposure.

Operation of equipment containing engine oils and similar Closed system - PROC 20
Handle substance within a closed system.

Operation of equipment containing engine oils and similar Closed system Elevated temperature - PROC 20
Assumes process temperature up to 80.0 °C.

Remanufacture of reject articles - PROC 9
Drain or remove substance from equipment prior to break-in or maintenance.

Equipment cleaning and maintenance - PROC 8a, PROC 28
Drain down and flush system prior to equipment break-in or maintenance.

Storage - PROC 1, PROC 2
Store substance within a closed system.

Section 3 - Exposure estimation and reference to its source

3.1 Environment

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

3.2 Workers

Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Qualitative approach used to conclude safe use.
Exposure estimation and reference to its source	A DNEL (derived no effect levels) cannot be derived. 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.