

Toluene Standardization Fuel 99.8

Version 1.8

Revision Date 2021-08-12

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2015/830

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

1.1

Product information

Product Name : Toluene Standardization Fuel 99.8
 Material : 1024334, 1024333, 1024332, 1024331

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
Toluene	108-88-3 203-625-9 601-021-00-3	Chevron Phillips Chemicals International NV 01-2119471310-51-0116
n-Heptane	142-82-5 205-563-8 601-008-00-2	Chevron Phillips Chemicals International NV 01-2119457603-38-0002
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1 601-009-00-8	Chevron Phillips Chemicals International NV 01-2119457965-22-0002

1.2

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

Relevant Identified Uses Supported :
 Manufacture
 Distribution
 Formulation
 Use as a fuel - industrial
 Use as a laboratory agent – industrial

1.3

Details of the supplier of the safety data sheet

Company : Chevron Phillips Chemical Company LP
 Specialty Chemicals
 10001 Six Pines Drive
 The Woodlands, TX 77380

Local : Chevron Phillips Chemicals International N.V.
 Airport Plaza (Stockholm Building)
 Leonardo Da Vincilaan 19
 1831 Diegem

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Belgium

SDS Requests: (800) 852-5530
 Responsible Party: Product Safety Group
 Email:sds@cpchem.com

1.4**Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
 E-mail address : SDS@CPChem.com
 Website : www.CPChem.com

SECTION 2: Hazards identification**2.1****Classification of the substance or mixture
REGULATION (EC) No 1272/2008**

Flammable liquids, Category 2

H225:

Highly flammable liquid and vapor.

Skin irritation, Category 2

H315:

Causes skin irritation.

Reproductive toxicity, Category 2

H361d:

Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure, Category 3, Central nervous system

H336:

May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure, Category 2

H373:

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard, Category 1

H304:

May be fatal if swallowed and enters airways.

Short-term (acute) aquatic hazard, Category 1

H400:

Very toxic to aquatic life.

Long-term (chronic) aquatic hazard, Category 1

H410:

Very toxic to aquatic life with long lasting effects.

2.2**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :



Signal Word : Danger

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Hazard Statements : H225 Highly flammable liquid and vapor.
 H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H336 May cause drowsiness or dizziness.
 H361d Suspected of damaging the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
 P331 Do NOT induce vomiting.
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
 P391 Collect spillage.

Hazardous ingredients which must be listed on the label:

- 108-88-3 Toluene
- 142-82-5 n-Heptane
- 540-84-1 2,2,4-Trimethylpentane (Isooctane)

SECTION 3: Composition/information on ingredients**3.1 - 3.2****Substance or Mixture**

Molecular formula : Mixture

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
Toluene	108-88-3 203-625-9 601-021-00-3	Flam. Liq. 2; H225 Skin Irrit. 2; H315 Repr. 2; H361d STOT SE 3; H336 STOT RE 2; H373 Asp. Tox. 1; H304 Aquatic Chronic 3; H412	73 - 75
n-Heptane	142-82-5	Flam. Liq. 2; H225	15 - 17

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	205-563-8 601-008-00-2	Skin Irrit. 2; H315 STOT SE 3; H336 Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1 601-009-00-8	Flam. Liq. 2; H225 Skin Irrit. 2; H315 STOT SE 3; H336 Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	9 - 11

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures**4.1****Description of first-aid measures**

- General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.
- If inhaled : Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.
- In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
- In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

- Flash point : -12°C (10°F)
estimated
- Autoignition temperature : 204-480°C (399-896°F)
estimated

5.1**Extinguishing media**

- Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO₂). Dry chemical.
- Unsuitable extinguishing media : High volume water jet.

5.2**Special hazards arising from the substance or mixture**

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Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

5.3**Advice for firefighters**

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

Fire and explosion protection : Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures**6.1****Personal precautions, protective equipment and emergency procedures**

Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

6.2**Environmental precautions**

Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3**Methods and materials for containment and cleaning up**

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4**Reference to other sections**

For additional details, see the Exposure Scenario in the Annex portion

SECTION 7: Handling and storage**7.1****Precautions for safe handling
Handling**

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited

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in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

7.2**Conditions for safe storage, including any incompatibilities****Storage**

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters****SK**

Zložky	Podstata	Hodnota	Kontrolné parametre	Poznámka
Toluene	SK OEL	NPEL priemerný	50 ppm, 192 mg/m ³	K,
	SK OEL	NPEL krátkodobý	100 ppm, 384 mg/m ³	K,
n-heptane	SK OEL	NPEL priemerný	500 ppm, 2.085 mg/m ³	
2,2,4-Trimethylpentane (Isooctane)	SK OEL	NPEL krátkodobý	300 ppm, 1.400 mg/m ³	
	SK OEL	NPEL priemerný	200 ppm, 900 mg/m ³	

K Znamená, že faktor môže byť ľahko absorbovaný kožou. Niektoré faktory, ktoré ľahko prenikajú kožou, môžu spôsobovať až smrteľné otravy, často bez varovných príznakov (napr. anilín, nitrobenzén, nitroglykol, fenoly a pod.). Pri látkach s významným prienikom cez kožu, či už v podobe kvapalín alebo pár, je osobitne dôležité zabrániť kožnému kontaktu.

SI

Sestavine	Osnova	Vrednost	Parametri nadzora	Pripomba
Toluene	SI OEL	MV	50 ppm, 192 mg/m ³	RD-2, K,
	SI OEL	KTV	100 ppm, 384 mg/m ³	RD-2, K,
n-heptane	SI OEL	MV	500 ppm, 2.085 mg/m ³	
	SI OEL	KTV	500 ppm, 2.085 mg/m ³	
2,2,4-Trimethylpentane (Isooctane)	SI OEL	MV	500 ppm, 2.400 mg/m ³	
	SI OEL	KTV	1.000 ppm, 4.800 mg/m ³	

K Lastnosť ľahšie prechádza do krvi v organizme cez kožu
RD-2 Strupeno za rozmnožovanie - ľahko škoduje nerojenému dieťaťu - kategória 2

SE

Bestandsdelar	Grundval	Värde	Kontrollparametrar	Anmärkning
Toluene	SE AFS	NGV	50 ppm, 192 mg/m ³	H,
	SE AFS	KGV	100 ppm, 384 mg/m ³	H,
n-heptane	SE AFS	NGV	200 ppm, 800 mg/m ³	
	SE AFS	KGV	300 ppm, 1.200 mg/m ³	V,
2,2,4-Trimethylpentane (Isooctane)	SE AFS	NGV	200 ppm, 900 mg/m ³	
	SE AFS	KGV	300 ppm, 1.400 mg/m ³	V,

H Ämnet kan lätt upptas genom huden.

V Vägledande kortidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas

RS

Компоненты	Основа	Величина	Параметры контроля	Заметка
Толуол	RS OEL	GVI	50 ppm, 192 mg/m ³	K, EU**,
	RS OEL	KGVI	100 ppm, 384 mg/m ³	K, EU**,
н-гептан	RS OEL	GVI	500 ppm, 2.085 mg/m ³	EU*,

EU* Substance mentioned in indicative exposure limit values in Directive 2000/39 / EC (first list)

EU** Substance mentioned in indicative exposure limit values in Directive 2006/15 / EC (second list)

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K This chemical substance can adversely affect the skin.

RO

Componente	Sursă	Valoare	Parametri de control	Notă
Toluene	RO OEL	TWA	50 ppm, 192 mg/m3	R2, P,
	RO OEL	STEL	100 ppm, 384 mg/m3	R2, P,
n-heptane	RO OEL	TWA	500 ppm, 2.085 mg/m3	

P Substanțele cu indicativul P (piele) pot pătrunde în organism prin pielea sau mucoasele intacte. Indicativul P nu se referă la substanțele care au numai o acțiune locală de tip iritativ.
R2 susceptibil de a dăuna fertilității

PT

Componentes	Bases	Valor	Parâmetros de controlo	Nota
Toluene	PT OEL	VLE-MP	20 ppm,	P, A4,
	PT DL 305/2007	oito horas	50 ppm, 192 mg/m3	Cutânea,
	PT DL 305/2007	curta duração	100 ppm, 384 mg/m3	Cutânea,
n-heptane	PT DL 305/2007	oito horas	500 ppm, 2.085 mg/m3	
	PT OEL	VLE-MP	400 ppm,	
	PT OEL	VLE_CD	500 ppm,	

A4 Agente não classificável como carcinogénico no Homem.

Cutânea Uma notação cutânea atribuída ao valor limite de exposição profissional assinala a possibilidade de absorção significativa através de pele.

P Perigo de absorção cutânea

PL

Składniki	Podstawa	Wartość	Parametry dotyczące kontroli	Uwaga
Toluene	PL NDS	NDS	100 mg/m3	
	PL NDS	NDSch	200 mg/m3	
n-heptane	PL NDS	NDS	1.200 mg/m3	
	PL NDS	NDSch	2.000 mg/m3	

NO

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Toluene	FOR-2011-12-06-1358	GV	25 ppm, 94 mg/m3	H,
n-heptane	FOR-2011-12-06-1358	GV	200 ppm, 800 mg/m3	

H Kjemikalier som kan tas opp gjennom huden.

NL

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Toluene	NL WG	TGG-8 uur	150 mg/m3	
	NL WG	TGG-15 min	384 mg/m3	
n-heptane	NL WG	TGG-8 uur	1.200 mg/m3	
	NL WG	TGG-15 min	1.600 mg/m3	

MT

Components	Basis	Value	Control parameters	Note
Toluene	MT OEL	TWA	50 ppm, 192 mg/m3	Skin,
	MT OEL	STEL	100 ppm, 384 mg/m3	Skin,
n-Heptane	MT OEL	TWA	500 ppm, 2.085 mg/m3	

Skin A skin notation assigned to the OEL identifies the possibility of significant uptake through the skin.

MK

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Toluene	MK OEL	MV	50 ppm, 192 mg/m3	K,
n-heptane	MK OEL	MV	500 ppm, 2.085 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	MK OEL	MV	500 ppm, 2.400 mg/m3	

K The properties of easier transport of substances into organism through (via) the skin

LV

Sastāvdaļas	Bāze	Vērtība	Pārvaldības parametri	Piezīme
Toluene	LV OEL	AER 8 st	14 ppm, 50 mg/m3	Āda,
	LV OEL	AER īslaicīgā	40 ppm, 150 mg/m3	Āda,
n-heptane	LV OEL	AER 8 st	85 ppm, 350 mg/m3	
	LV OEL	AER īslaicīgā	500 ppm, 2.085 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	

Āda Āda

LU

Composants	Base	Valeur	Paramètres de contrôle	Note
Toluene	LU OEL	TWA	50 ppm, 192 mg/m3	Peau,

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	LU OEL	STEL	100 ppm, 384 mg/m3	Peau,
n-heptane	LU OEL	TWA	500 ppm, 2.085 mg/m3	

Peau Une pénétration cutanée s'ajoutant à l'inhalation réglementée est possible

LT

Komponentai	Šaltinis	Vertė	Kontrolės parametrai	Pastaba
Toluene	LT OEL	IPRD	50 ppm, 192 mg/m3	O,
	LT OEL	TPRD	100 ppm, 384 mg/m3	O,
n-heptane	LT OEL	IPRD	500 ppm, 2.085 mg/m3	
	LT OEL	TPRD	750 ppm, 3.128 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	LT OEL	IPRD	200 ppm, 900 mg/m3	
	LT OEL	TPRD	300 ppm, 1.400 mg/m3	

O pateikimas per nepažeistą odą

IT

Componenti	Base	Valore	Parametri di controllo	Nota
Toluene	IT VLEP	TWA	50 ppm, 192 mg/m3	Cute,
n-heptane	IT VLEP	TWA	500 ppm, 2.085 mg/m3	

Cute La notazione che riporta il termine 'cute' per un valore limite di esposizione professionale, indica la possibilità di un assorbimento significativo attraverso la cute.

IS

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Toluene	IS OEL	TWA	25 ppm, 94 mg/m3	H,
	IS OEL	STEL	50 ppm, 188 mg/m3	H,
n-heptane	IS OEL	TWA	200 ppm, 820 mg/m3	

H Skin notation

IE

Components	Basis	Value	Control parameters	Note
Toluene	IE OEL	OELV - 8 hrs (TWA)	50 ppm, 192 mg/m3	Sk,
	IE OEL	OELV - 15 min (STEL)	100 ppm, 384 mg/m3	Sk,
n-Heptane	IE OEL	OELV - 8 hrs (TWA)	500 ppm, 2.085 mg/m3	

Sk Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body

HU

Komponensek	Bázis	Érték	Ellenőrzési paraméterek	Megjegyzés
Toluene	HU OEL	AK-érték	190 mg/m3	R+T, b, EU2, i,
	HU OEL	CK-érték	380 mg/m3	R+T, b, EU2, i,
n-heptane	HU OEL	AK-érték	2.000 mg/m3	R, EU1,
2,2,4-Trimethylpentane (Isooctane)	HU OEL	AK-érték	2.350 mg/m3	R, i,
	HU OEL	CK-érték	4.700 mg/m3	R, i,

b Bőrön át is felszívódik. Az AK-értékek a veszélyes anyagoknak ezt a tulajdonságát, illetve az ebből származó expozíciót csak a levegőben megengedett koncentrációjuk mértékének megfelelően veszik figyelembe

EU1 2000/39/EK irányelvben közölt érték

EU2 2006/15/EK irányelvben közölt érték

i Ingerlő anyag (izgatja a bőrt, nyálkahártyát, szemet vagy mindhámat)

R Azok az anyagok, amelyek egészségkárosító hatása RÖVID expozíció hatására jelentkeznek. Korrigált ÁK = ÁK x 8/a napi óraszám

R+T Azok az anyagok, amelyek RÖVID és TARTÓS expozíciója is egészségkárosodást okoz. Korrigált ÁK = ÁK x 8/a napi óraszám; Korrigált ÁK = ÁK x 40/a heti óraszám. A két faktor közül a szigorúbb (kisebb) értéket kell alkalmazni

HR

Sastojci	Temelj	Vrijednost	Nadzorni parametri	Bilješka
Toluene	HR OEL	GVI	50 ppm, 192 mg/m3	koža,
	HR OEL	KGVI	100 ppm, 384 mg/m3	koža,
n-heptane	HR OEL	GVI	500 ppm, 2.085 mg/m3	koža,
	HR OEL		500 ppm, 2.000 mg/m3	

koža Razvrstana kao tvar koja nadražuje kožu (H315) ili je takva napomena navedena u direktivama

GR

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Toluene	GR OEL	TWA	50 ppm, 192 mg/m3	Δ,
	GR OEL	STEL	100 ppm, 384 mg/m3	Δ,
n-heptane	GR OEL	TWA	500 ppm, 2.000 mg/m3	
	GR OEL	STEL	500 ppm, 2.000 mg/m3	

Δ Η ένδειξη 'δέρμα' (Δ), η οποία επισημαίνει ορισμένους χημικούς παράγοντες του πίνακα της παρ. 1 του άρθρου 3, υπονοεί την πιθανή συμβολή στην συνολική έκθεση του εργαζόμενου και της ποσότητας αυτών των χημικών παραγόντων που απορροφάται διαμέσου του δέρματος κατά την άμεση επαφή μαζί τους.

GB

Components	Basis	Value	Control parameters	Note
Toluene	GB EH40	TWA	50 ppm, 191 mg/m3	Sk,
	GB EH40	STEL	100 ppm, 384 mg/m3	Sk,
n-Heptane	GB EH40	TWA	500 ppm, 2.085 mg/m3	

Sk Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.

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FR

Composants	Base	Valeur	Paramètres de contrôle	Note
Toluene	FR VLE	VME	20 ppm, 76,8 mg/m3	R2, Peau, VLR contraignantes,
	FR VLE	VLCT (VLE)	100 ppm, 384 mg/m3	R2, Peau, VLR contraignantes,
n-heptane	FR VLE	VME	400 ppm, 1.668 mg/m3	VLR contraignantes,
	FR VLE	VLCT (VLE)	500 ppm, 2.085 mg/m3	VLR contraignantes,
2,2,4-Trimethylpentane (Isooctane)	FR VLE	VME	1.000 mg/m3	Valeurs limites indicatives, Vapeur
	FR VLE	VLCT (VLE)	1.500 mg/m3	Valeurs limites indicatives, Vapeur

Peau Risque de pénétration percutanée
 R2 Substances préoccupantes en raison d'effets toxiques pour la reproduction possibles
 Valeurs limites indicatives Valeurs limites indicatives
 VLR Valeurs limites réglementaires contraignantes
 contraignantes

FI

Aineosat	Peruste	Arvo	Valvontaa koskevat muuttujat	Huomautus
Toluene	FI OEL	HTP-arvot 8h	25 ppm, 81 mg/m3	melu, iho,
	FI OEL	HTP-arvot 15 min	100 ppm, 380 mg/m3	melu, iho,
n-heptane	FI OEL	HTP-arvot 8h	300 ppm, 1.200 mg/m3	
	FI OEL	HTP-arvot 15 min	500 ppm, 2.100 mg/m3	
	FI OEL	HTP-arvot 8h	300 ppm, 1.200 mg/m3	
	FI OEL	HTP-arvot 15 min	500 ppm, 2.100 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	FI OEL	HTP-arvot 8h	300 ppm, 1.400 mg/m3	
	FI OEL	HTP-arvot 15 min	380 ppm, 1.800 mg/m3	

iho Ihon läpi imeytyvien aineiden elimistöön joutuvia määriä ja elimistöön joutuneesta aineesta aiheutuvaa vaaraa ei voida näin ollen arvioida pelkästään ilmapitoisuuksien avulla. Tämän vuoksi näiden aineiden HTP-arvojen yhteyteen on huomautussarakkeeseen otettu ihon läpi imeytymisen osoittamiseksi merkintä 'iho'. Monet aineet, varsinkin voimakkaat hapot tai emäkset, voivat aiheuttaa iholle jouduttuaan ihon ärsyyntymistä tai syöpymistä.
 melu Melu: aineille, joiden tiedetään voimistavan melun haitallisia kuulovaikutuksia.

ES

Componentes	Base	Valor	Parámetros de control	Nota
Toluene	ES VLA	VLA-ED	50 ppm, 192 mg/m3	via dérmica,
	ES VLA	VLA-EC	100 ppm, 384 mg/m3	via dérmica,
n-heptane	ES VLA	VLA-ED	500 ppm, 2.085 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	ES VLA	VLA-ED	300 ppm, 1.420 mg/m3	

via dérmica Via dérmica

EE

Komponendid, osad	Alused	Väärtus	Kontrolliparameetrid	Märkused
Toluene	EE OEL	Piirnorm	50 ppm, 192 mg/m3	A,
	EE OEL	Lühiajalise kokkupuute piirnorm	100 ppm, 384 mg/m3	A,
n-heptane	EE OEL	Piirnorm	500 ppm, 2.085 mg/m3	
2,2,4-Trimethylpentane (Isooctane)	EE OEL	Piirnorm	200 ppm, 900 mg/m3	
	EE OEL	Lühiajalise kokkupuute piirnorm	300 ppm, 1.400 mg/m3	

A Naha kaudu kergesti absorbeeruvad ained

DK

Komponenter	Basis	Værdi	Kontrolparametre	Note
Toluene	DK OEL	GV	25 ppm, 94 mg/m3	H,
n-heptane	DK OEL	GV	200 ppm, 820 mg/m3	

H Betyder, at stoffet kan optages gennem huden.

DE

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Toluene	DE TRGS 900	AGW	50 ppm, 190 mg/m3	H, Y,
n-heptane	DE TRGS 900	AGW	500 ppm, 2.100 mg/m3	

H Hautresorptiv
 Y Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden

CZ

Složky	Základ	Hodnota	Kontrolní parametry	Poznámka
Toluene	CZ OEL	PEL	192 mg/m3	I, D,
	CZ OEL	NPK-P	384 mg/m3	I, D,
n-heptane	CZ OEL	PEL	1.000 mg/m3	I,
	CZ OEL	NPK-P	2.000 mg/m3	I,

D Při expozici se významně uplatňuje pronikání faktoru kůží

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I dráždí sliznice (oči, dýchací cesty), respektive kůži

CY

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Toluene	CY OEL	TWA	50 ppm, 192 mg/m ³	
	CY OEL	STEL	100 ppm, 384 mg/m ³	
n-heptane	CY OEL	TWA	500 ppm, 2.085 mg/m ³	

CH

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Toluene	CH SUVA	MAK-Wert	50 ppm, 190 mg/m ³	OL, H, R2D, R2F, NIOSH, DFG, INRS, HSE, SSc.
	CH SUVA	KZGW	200 ppm, 760 mg/m ³	OL, H, R2D, R2F, NIOSH, DFG, INRS, HSE, SSc.
n-heptane	CH SUVA	KZGW	400 ppm, 1.600 mg/m ³	NIOSH,
	CH SUVA	MAK-Wert	400 ppm, 1.600 mg/m ³	NIOSH,
2,2,4-Trimethylpentane (Isooctane)	CH SUVA	MAK-Wert	300 ppm, 1.400 mg/m ³	NIOSH,
	CH SUVA	KZGW	600 ppm, 2.800 mg/m ³	NIOSH,
	CH SUVA	MAK-Wert	100 ppm, 470 mg/m ³	
	CH SUVA	KZGW	200 ppm, 940 mg/m ³	

DFG Deutsche Forschungsgemeinschaft

H Vergiftung durch Hautresorption möglich; Bei Stoffen, welche die Haut leicht zu durchdringen vermögen, kann durch die zusätzliche Hautresorption die innere Belastung wesentlich höher werden als bei alleiniger Aufnahme durch die Atemwege.

HSE Health and Safety Executive (Occupational Medicine and Hygiene Laboratory)

INRS Institut National de Recherche et de Sécurité pour la prévention des accidents du travail et des maladies professionnelles

NIOSH National Institute for Occupational Safety and Health

OL lärmverstärkende Ototoxizität

R2D Stoffe, die möglicherweise beim Menschen reproduktionstoxisch sind; die Beeinträchtigung bezieht sich auf die Entwicklung.

R2F Stoffe, die möglicherweise beim Menschen reproduktionstoxisch sind; die Beeinträchtigung bezieht sich auf die Fruchtbarkeit oder Sexualität.

SSc Eine Schädigung der Leibesfrucht braucht bei Einhaltung des MAK-Wertes nicht befürchtet zu werden.

BG

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Toluene	BG OEL	TWA	50 ppm, 192 mg/m ³	
	BG OEL	STEL	100 ppm, 384 mg/m ³	
n-heptane	BG OEL	TWA	1.600 mg/m ³	

BE

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Toluene	BE OEL	TGG 8 hr	20 ppm, 77 mg/m ³	D,
	BE OEL	TGG 15 min	100 ppm, 384 mg/m ³	D,
n-heptane	BE OEL	TGG 8 hr	400 ppm, 1.664 mg/m ³	
	BE OEL	TGG 15 min	500 ppm, 2.085 mg/m ³	

D Opname van het agens via de huid, de slijmvliezen of de ogen vormt een belangrijk deel van de totale blootstelling. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.

AT

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Toluene	AT OEL	MAK-TMW	50 ppm, 190 mg/m ³	H,
	AT OEL	MAK-KZW	100 ppm, 380 mg/m ³	H,
n-heptane	AT OEL	MAK-TMW	500 ppm, 2.000 mg/m ³	
	AT OEL	MAK-KZW	2.000 ppm, 8.000 mg/m ³	
2,2,4-Trimethylpentane (Isooctane)	AT OEL	MAK-TMW	300 ppm, 1.400 mg/m ³	
	AT OEL	MAK-KZW	1.200 ppm, 5.600 mg/m ³	

H Besondere Gefahr der Hautresorption

Biological exposure indices**SK**

Názov látky	Č. CAS	Kontrolné parametre	Doba odberu vzorky	Aktualizácia
Toluene	108-88-3	toluén: 600 µg/l (Krv)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18
		toluén: 6.517 µmol.l-1 (Krv)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18

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		kyselina hippurová: 2.401 mg/l (moč)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18
		kyselina hippurová: 13399 μ mol.l-1 (moč)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18
		kyselina hippurová: 1600 mg/g kreatinínu (moč)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18
		kyselina hippurová: 1010 μ mol/mmol kreatinínu (moč)	Koniec vystavenia alebo pracovnej zmeny	2016-01-18
		o-krezol: 14.3 μ mol.l-1 (moč)	Pri dlhodobej expozícii; po viacerých predchádzajúcich pracovných zmenáchKoniec vystavenia alebo pracovnej zmeny	2016-01-18
		o-krezol: 1.03 mg/g kreatinínu (moč)	Pri dlhodobej expozícii; po viacerých predchádzajúcich pracovných zmenáchKoniec vystavenia alebo pracovnej zmeny	2016-01-18
		o-krezol: 1.08 μ mol/mmol kreatinínu (moč)	Pri dlhodobej expozícii; po viacerých predchádzajúcich pracovných zmenáchKoniec vystavenia alebo pracovnej zmeny	2016-01-18
		o-krezol: 1,5 mg/l (moč)	Pri dlhodobej expozícii; po viacerých predchádzajúcich pracovných zmenáchKoniec vystavenia alebo pracovnej zmeny	2016-01-18

SI

Ime snovi	Št. CAS	Parametri nadzora	Čas vzorčenja	Sprememba
Toluene	108-88-3	toluen: 600 μ mol/l (Kri)	Ob koncu delovne izmene	2018-12-04
		o-krezol: 1,5 mg/l po hidrolizi (Urin)	pri dolgotrajni izpostavljenosti: ob koncu delovne izmene po več zaporednih delavnikihOb koncu delovne izmene	2018-12-04

RO

Numele substanței	Nr. CAS	Parametri de control	Timpe de prelevare a probei	Adus la zi
Toluene	108-88-3	o-cresol: 3 mg/l (Urină)	Sfârșit schimb	2018-08-17
		acid hipuric: 2 g/l (Urină)	Sfârșit schimb	2018-08-17

PT

Nome da substância	No. CAS	Parâmetros de controlo	Tempo de amostra	Atualizada em
Toluene	108-88-3	Tolueno: 0,02 mg/l (Sangue)	Antes do último turno da semana de trabalho	2014-11-14
		Tolueno: 0,03 mg/l (Urina)	Fim do turno	2014-11-14

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		o-Cresol: 0.3 mg/g creatinina Com hidrólise (Urina) Valor basal ()	Fim do turno	2014-11-14
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LV

Vielas nosaukums	CAS Nr.	Pārvaldības parametri	Parauga ņemšanas laiks	Precizējums
Toluene	108-88-3	toluolu: 0,05 mg/l (Asinis)	maiņas beigās nosaka	2007-05-18
		hipurskābi: 1.6 g/g kreatinīns (Urīns)	maiņas beigās nosaka	2007-05-18

IT

Denominazione della sostanza	N. CAS	Parametri di controllo	Tempo di campionamento	Aggiornamento
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HU

Az anyag megnevezése	CAS szám	Ellenőrzési paraméterek	Mintavétel időpontja	Aktualizálás
Toluene	108-88-3	o-krezol: 1 mg/g kreatinin (húgyhólyag)	A műszak végén	2020-02-06
		o-krezol: 1 μmol/mmol kreatinin (kerekített értékek) (húgyhólyag)	A műszak végén	2020-02-06

HR

Naziv tvari	CAS-br.	Nadzorni parametri	Vrijeme uzorkovanja	Ažurirati
Toluene	108-88-3	toluen: 10.85 μmol/l (Krv)	na kraju radne smjene	2018-10-12
		toluen: 1 mg/l (Krv)	na kraju radne smjene	2018-10-12
		toluen: 0.83 μmol/l (krajnje izdahnuti zrak)	za vrijeme izloženosti	2018-10-12
		toluen: 20 dijelova na milijun (krajnje izdahnuti zrak)	za vrijeme izloženosti	2018-10-12
		hipurna kiselina: 1.58 mol/mol kreatinina Računato na prosječnu vrijednost kreatinina od 1,2 g/L urina. Za sve rezultate koji se izražavaju na kreatinin, koncentracije kreatinina < 0,5 g/L i > 3,0 g/L ne mogu se uzeti u obzir. (Urin) hrana bogata voćem i povrćem te konzervirana Na-benzoatom povisuje nalaz ()	na kraju radne smjene	2018-10-12
		hipurna kiselina: 2.5 g/g kreatinin Računato na prosječnu vrijednost kreatinina od 1,2 g/L urina. Za sve rezultate koji se izražavaju na kreatinin, koncentracije kreatinina < 0,5 g/L i > 3,0 g/L ne mogu se uzeti u obzir. (Urin) hrana bogata voćem i povrćem te konzervirana Na-benzoatom povisuje nalaz ()	na kraju radne smjene	2018-10-12
		o-krezol: 1.05 mmol/mol kreatinina Računato na prosječnu vrijednost kreatinina od 1,2 g/L urina. Za sve rezultate koji se izražavaju na kreatinin, koncentracije kreatinina < 0,5 g/L i > 3,0 g/L ne mogu se uzeti u obzir. (Urin)	na kraju radne smjene	2018-10-12
		o-krezol: 1 mg/g kreatinina Računato na prosječnu vrijednost kreatinina od 1,2 g/L urina. Za sve rezultate koji se izražavaju na kreatinin, koncentracije kreatinina < 0,5 g/L i > 3,0 g/L ne mogu se uzeti u obzir. (Urin)	na kraju radne smjene	2018-10-12

FI

Aineen nimi	CAS-Nro.	Valvontaa koskevat muuttujat	Näytteenottoaika	Päivämäärä
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Toluene	108-88-3	tolueeni: 500 nmol/l (Veri)	Työpäivän jälkeinen aamu	2016-12-22
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ES

Nombre de la sustancia	No. CAS	Parámetros de control	Hora de muestreo	Puesto al día
Toluene	108-88-3	o-cresol: 0.6 mg/g creatinina Cuando el final de la exposición no coincide con el final de la jornada laboral, la muestra se tomará lo antes posible después de que cese la exposición real (Orina) Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB. ()	Final de la jornada laboral	2018-02-19
		tolueno: 0,05 mg/l Significa antes del comienzo de la quinta jornada consecutiva de exposición. (Sangre)	principio de la última jornada de la semana laboral	2018-02-19
		tolueno: 0,08 mg/l Cuando el final de la exposición no coincide con el final de la jornada laboral, la muestra se tomará lo antes posible después de que cese la exposición real (Orina)	Final de la jornada laboral	2018-02-19

DE

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeit punkt	Stand
Toluene	108-88-3	Toluol: 600 µg/l (Blut)	Schichtende	2019-03-29
		o-Kresol: 1,5 mg/l Nach Hydrolyse (Urin)	bei Langzeitexposition: nach mehreren vorangegangenen SchichtenExpositionsende, bzw. Schichtende	2019-03-29
		Toluol: 75 µg/l (Urin)	Expositionsende, bzw. Schichtende	2019-03-29

CZ

Název látky	Č. CAS	Kontrolní parametry	Doba odběru vzorku	Aktualizace
Toluene	108-88-3	Hippurová kyselina: 1600 mg/g kreatininu Je-li hodnota při nálezu kyseliny hippurové vyšší než 1600 mg/g, avšak nepřesahuje 2500 mg/g kreatininu, použije se ke zpřesnění expozice toluenu biologický expoziční test podle ukazatele o-Kresol. Je-li hodnota při nálezu kyseliny hippurové vyšší než 2500 mg/g, považuje se za hodnotu prokazující, že jde o pracovní expozici toluenu, jehož hodnota PEL je překračována a biologický expoziční test podle ukazatele o-Kresol se již neprovádí (moč)	Konec směny	2013-04-22

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		Hippurová kyselina: 1000 µmol/mmol kreatininu Je-li hodnota při nálezu kyseliny hippurové vyšší než 1600 mg/g, avšak nepřesahuje 2500 mg/g kreatininu, použije se ke zpřesnění expozice toluenu biologický expoziční test podle ukazatele o-Kresol. Je-li hodnota při nálezu kyseliny hippurové vyšší než 2500 mg/g, považuje se za hodnotu prokazující, že jde o pracovní expozici toluenu, jehož hodnota PEL je překračována a biologický expoziční test podle ukazatele o-Kresol se již neprovádí (moč)	Konec směny	2013-04-22
		o-Kresol: 1.5 mg/g kreatininu Po hydrolyse (moč)	Konec směny	2013-04-22
		o-Kresol: 1.6 µmol/mmol kreatininu Po hydrolyse (moč)	Konec směny	2013-04-22

CH

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeitpunkt	Stand
Toluene	108-88-3	o-Kresol: 0,5 mg/l Quantitative Interpretation schwierig; Bei den mit Q gekennzeichneten biologischen Parametern ist die exakte quantitative Interpretation schwierig. Als Screening-Test kann der biologische Parameter verwendet werden, ebenfalls als Zusatzuntersuchung nach der Bestimmung nicht spezifischer Parameter (N). (Urin)	Expositionsende, bzw. Schichtende bei Langzeitexposition: nach mehreren vorangegangenen Schichten	2018-01-18
		Hippursäure: 2 g/g Kreatinin Nicht spezifischer Parameter; Die mit N gekennzeichneten biologischen Parameter sind nicht für den aufgeführten Arbeitsstoff spezifisch, sondern können auch nach Expositionen gegenüber bestimmten anderen Arbeitsstoffen im biologischen Material gemessen werden. In der Praxis hat sich die Bestimmung dieser Stoffe jedoch bewährt. Bei speziellen Problemen empfiehlt sich zusätzlich die Bestimmung eines spezifischen Parameters. (Urin) Umwelteinflüsse; Die mit X gekennzeichneten biologischen Parameter werden auch in unterschiedlicher Quantität bei beruflich Nichtexponierten gemessen, da sie zusätzlich auf Umwelteinflüsse zurückgeführt werden können. Die Festsetzung des BAT-Wertes berücksichtigt bei diesen Parametern auch die Einflüsse von Umweltfaktoren. ()	Expositionsende, bzw. Schichtende bei Langzeitexposition: nach mehreren vorangegangenen Schichten	2018-01-18
		Toluol: 6.48 µmol/l (Blut)	Expositionsende, bzw. Schichtende	2018-01-18

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		Hippursäure: 1.26 mmol/mmol Kreatinin Nicht spezifischer Parameter; Die mit N gekennzeichneten biologischen Parameter sind nicht für den aufgeführten Arbeitsstoff spezifisch, sondern können auch nach Expositionen gegenüber bestimmten anderen Arbeitsstoffen im biologischen Material gemessen werden. In der Praxis hat sich die Bestimmung dieser Stoffe jedoch bewährt. Bei speziellen Problemen empfiehlt sich zusätzlich die Bestimmung eines spezifischen Parameters. (Urin) Umwelteinflüsse; Die mit X gekennzeichneten biologischen Parameter werden auch in unterschiedlicher Quantität bei beruflich Nichtexponierten gemessen, da sie zusätzlich auf Umwelteinflüsse zurückgeführt werden können. Die Festsetzung des BAT-Wertes berücksichtigt bei diesen Parametern auch die Einflüsse von Umweltfaktoren. ()	Expositionsende, bzw. Schichtende bei Langzeitexposition: nach mehreren vorangegangenen Schichten	2018-01-18
		o-Kresol: 4.62 µmol/l Quantitative Interpretation schwierig; Bei den mit Q gekennzeichneten biologischen Parametern ist die exakte quantitative Interpretation schwierig. Als Screening-Test kann der biologische Parameter verwendet werden, ebenfalls als Zusatzuntersuchung nach der Bestimmung nicht spezifischer Parameter (N). (Urin)	Expositionsende, bzw. Schichtende bei Langzeitexposition: nach mehreren vorangegangenen Schichten	2018-01-18
		Toluol: 600 µg/l (Blut)	Expositionsende, bzw. Schichtende	2018-01-18

BG

Наименование на веществото	CAS номер	Параметри на контрол	Време на взимане на пробата	Последна актуализация
Toluene	108-88-3	хипурова киселина: 1.6 mmol/mmol креатинин (Урина)	В края на експозицията или в края на работната смяна	2007-08-17

AT

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeitpunkt	Stand
Toluene	108-88-3	o-Cresol: 0,8 mg/l Bei wiederholt erhöhten o-Cresolwerten ist zusätzlich Toluol im Blut am Ende eines Arbeitstages zu bestimmen (der Zeitpunkt der Untersuchung ist anzugeben). (Urin)	Nach Ablauf einer Arbeitswoche/am Ende des Arbeitstages/am Schichtende	2014-02-18
		Toluol: 250 µg/l (Blut)	Am Ende eines Arbeitstages	2014-02-18

DNEL
n-Heptane :

8.2

**Exposure controls
Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

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Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

- Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.
- Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties**9.1****Information on basic physical and chemical properties****Appearance**

- Form : liquid
 Physical state : liquid
 Color : Clear
 Odor : Strong gasoline

Safety data

- Flash point : -12°C (10°F)
 estimated

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Lower explosion limit	: 0,95 %(V)
Upper explosion limit	: 7,1 %(V)
Oxidizing properties	: No
Autoignition temperature	: 204-480°C (399-896°F) estimated
Molecular formula	: Mixture
Molecular weight	: Not applicable
pH	: Not applicable
Freezing point	: No data available
Boiling point/boiling range	: 98-111°C (208-232°F) estimated
Vapor pressure	: No data available
Relative density	: 0,823 at 15,6 °C (60,1 °F)
Water solubility	: negligible
Partition coefficient: n- octanol/water	: No data available
Viscosity, kinematic	: No data available
Relative vapor density	: No data available
Evaporation rate	: No data available
Percent volatile	: > 99 % 0,03 %

SECTION 10: Stability and reactivity**10.1**

Reactivity : Stable under recommended storage conditions.

10.2

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3

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Possibility of hazardous reactions

Hazardous reactions : Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

10.4

Conditions to avoid : Heat, flames and sparks.

10.5

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

10.6

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information**11.1****Information on toxicological effects****Toluene Standardization Fuel 99.8**

Acute oral toxicity : Acute toxicity estimate: > 5.000 mg/kg
Species: Rat
Method: Calculation method

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Acute inhalation toxicity : Acute toxicity estimate: > 20 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: vapor
Method: Calculation method

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Acute dermal toxicity : Acute toxicity estimate: > 5.000 mg/kg
Species: Rabbit
Method: Calculation method

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Skin irritation : Skin irritation
largely based on animal evidence.

Toluene Standardization Fuel 99.8

Eye irritation : Vapors may cause irritation to the eyes, respiratory system and the skin.

Toluene Standardization Fuel 99.8

Sensitization : Does not cause skin sensitization.
largely based on animal evidence.

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Repeated dose toxicity

Toluene

: Species: Rat
 Application Route: Inhalation
 Dose: 0, 100, 625, 1250, 3000 ppm
 Exposure time: 15 wk
 Number of exposures: 6.5 h/d, 5 d/wk
 NOEL: 625 ppm

Species: Mouse
 Application Route: Inhalation
 Dose: 0, 100, 625, 1250, 3000 ppm
 Exposure time: 14 wk
 Number of exposures: 6.5 h/d, 5 d/wk
 NOEL: 100 ppm

n-Heptane

Species: Rat, male
 Sex: male
 Application Route: Inhalation
 Dose: 12.47 mg/l
 Exposure time: 16 wk
 Number of exposures: 12 h/d, 7 d/wk
 NOEL: 12,47 mg/l
 No adverse effect has been observed in chronic toxicity tests.

Species: Rat, Male and female
 Sex: Male and female
 Application Route: Inhalation
 Dose: 12.35 mg/l
 Exposure time: 26 wk
 Number of exposures: 6 h/d, 5 d/wk
 Method: OECD Test Guideline 413
 No adverse effect has been observed in chronic toxicity tests.

2,2,4-Trimethylpentane
(Isooctane)

Species: Rat, Male and female
 Sex: Male and female
 Application Route: Inhalation
 Dose: 0, 668, 2220, 6646 ppm
 Exposure time: 13 weeks
 Number of exposures: 6 hr/day 5 d/wk
 NOEL: 8,117 mg/l 2220 ppm
 Method: OECD Guideline 413
 Information given is based on data obtained from similar substances.

Genotoxicity in vitro

Toluene

: Test Type: Ames test
 Result: negative

Test Type: Sister Chromatid Exchange Assay
 Result: negative

Test Type: Mouse lymphoma assay
 Result: negative

Test Type: Cytogenetic assay
 Result: negative

n-Heptane

Test Type: Ames test

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	Method: Mutagenicity (Escherichia coli - reverse mutation assay) Result: negative
	Test Type: Mammalian cell gene mutation assay Method: OECD Guideline 476 Result: negative
	Test Type: Chromosome aberration test in vitro Method: OECD Guideline 473 Result: negative
	Test Type: Mitotic recombination Result: negative
2,2,4-Trimethylpentane (Isooctane)	Test Type: Ames test Method: Mutagenicity (Escherichia coli - reverse mutation assay) Result: negative
	Test Type: Mouse lymphoma assay Method: OECD Guideline 476 Result: negative
	Test Type: Sister Chromatid Exchange Assay Result: negative
	Test Type: Unscheduled DNA synthesis assay Result: negative

Genotoxicity in vivo

Toluene	: Test Type: Cytogenetic assay Result: negative
	Test Type: Mouse micronucleus assay Result: negative
2,2,4-Trimethylpentane (Isooctane)	Test Type: Unscheduled DNA synthesis assay Species: Mouse Dose: 500 mg/kg Result: negative
	Test Type: Unscheduled DNA synthesis assay Species: Rat Dose: 500 mg/kg Result: negative

Carcinogenicity

Toluene	: Species: Rat Dose: 0, 600, 1200 ppm Exposure time: 2 yrs Number of exposures: 6.5 h/d, 5 d/wk Remarks: No evidence of carcinogenicity
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Species: Mouse
 Dose: 0, 600, 1200 ppm
 Exposure time: 2 yrs
 Number of exposures: 6.5 h/d, 5 d/wk
 Remarks: No evidence of carcinogenicity

Reproductive toxicity

Toluene : Species: Rat
 Application Route: Inhalation
 Dose: 0, 100, 500, 2000 ppm
 Test period: 95 d
 NOAEL Parent: 2000 ppm

n-Heptane Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Number of exposures: 6 hr/d, 5 d/wk
 Test period: 13 wk
 Method: OECD Test Guideline 416
 NOAEL Parent: 9000 ppm
 NOAEL F1: 3000 ppm
 NOAEL F2: 3000 ppm
 Information given is based on data obtained from similar substances.

2,2,4-Trimethylpentane (Isooctane) Species: Rat
 Sex: male and female
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Number of exposures: 6 h/d 5 d/wk
 Method: OECD Test Guideline 416
 NOAEL Parent: 3000 ppm
 NOAEL F1: 3000 ppm
 NOAEL F2: 3000 ppm
 Information given is based on data obtained from similar substances.

Developmental Toxicity

Toluene : Species: Rat
 Application Route: Inhalation
 Dose: 0, 100, 500, 2000 ppm
 Test period: 95 d
 NOAEL Teratogenicity: 400-750 ppm

n-Heptane Species: Rat
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Exposure time: GD6-15
 Number of exposures: 6 hrs/d
 NOAEL Teratogenicity: 9000 ppm
 NOAEL Maternal: 3000 ppm

2,2,4-Trimethylpentane (Isooctane) Species: Rat
 Application Route: Inhalation
 Dose: 0, 400, 1200 ppm
 Number of exposures: 6h/d

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Test period: GD6-15
 NOAEL Teratogenicity: 1200 ppm
 NOAEL Maternal: 1200 ppm
 Information given is based on data obtained from similar substances.

Species: Rat
 Application Route: Inhalation
 Dose: 0, 900, 3000, 9000 ppm
 Number of exposures: 6h/d
 Test period: GD6-15
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 9000 ppm
 NOAEL Maternal: 3000 ppm
 Information given is based on data obtained from similar substances.

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Aspiration toxicity : May be fatal if swallowed and enters airways.

CMR effects

Toluene : Carcinogenicity: Not classifiable as a human carcinogen.
 Mutagenicity: Animal testing did not show any mutagenic effects.
 Teratogenicity: Some evidence of adverse effects on development, based on animal experiments.
 Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

n-Heptane : Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: No toxicity to reproduction

2,2,4-Trimethylpentane (Isooctane) : Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

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Further information : Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

SECTION 12: Ecological information**12.1****Toxicity****Toxicity to fish**

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Toluene	: LC50: 18 - 36 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow)
n-Heptane	LL50: 5,738 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) Method: QSAR modeled data
2,2,4-Trimethylpentane (Isooctane)	LC50: 0,11 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates

Toluene	: EC50: 3,78 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea)
n-Heptane	EC50: 1,5 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Toxic to aquatic organisms. LC50: 0,1 mg/l Exposure time: 96 h Species: Mysidopsis bahia (mysid shrimp) semi-static test Very toxic to aquatic organisms.
2,2,4-Trimethylpentane (Isooctane)	EC50: 0,4 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Information given is based on data obtained from similar substances.

Toxicity to algae

Toluene	: EC50: 134 mg/l Exposure time: 72 h Species: Chlamydomonas angulosa (Green algae)
n-Heptane	EL50: 4,338 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (microalgae) Method: QSAR
2,2,4-Trimethylpentane (Isooctane)	EL50: 2,943 mg/l Exposure time: 72 h Method: QSAR modeled data

Toxicity to fish (Chronic toxicity)

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n-Heptane : NOELR: 1,284 mg/l
 Exposure time: 28 d
 Species: Oncorhynchus mykiss (rainbow trout)
 Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2,2,4-Trimethylpentane (Isooctane) : NOEL: 0,17 mg/l
 Exposure time: 21 d
 Species: Daphnia magna (Water flea)
 Method: OECD Test Guideline 211
 Information given is based on data obtained from similar substances.

12.2**Persistence and degradability**

Biodegradability : Expected to be inherently biodegradable.

12.3**Bioaccumulative potential**

Elimination information (persistence and degradability)

Bioaccumulation

Toluene : This material is not expected to bioaccumulate.

n-Heptane : Bioconcentration factor (BCF): 552
 Method: QSAR modeled data
 This material is not expected to bioaccumulate.

2,2,4-Trimethylpentane (Isooctane) : Bioconcentration factor (BCF): 231
 Method: QSAR modeled data
 This material is not expected to bioaccumulate.

12.4**Mobility in soil**

Mobility

Toluene : Not expected to adsorb on soil.

n-Heptane : Medium: Air
 Method: Calculation, Mackay Level I Fugacity Model
 After release, disperses into the air.

2,2,4-Trimethylpentane (Isooctane) : Medium: Air
 Method: Calculation, Mackay Level I Fugacity Model
 After release, disperses into the air.

12.5**Results of PBT and vPvB assessment**

Results of PBT assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6**Other adverse effects**

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Additional ecological information : Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

Toluene : Toxic to aquatic life.

n-Heptane : Very toxic to aquatic life.

2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

Toluene : Harmful to aquatic life with long lasting effects.

n-Heptane : Very toxic to aquatic life with long lasting effects.

2,2,4-Trimethylpentane (Isooctane) : Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations**13.1****Waste treatment methods**

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 14: Transport information**14.1 - 14.7****Transport information**

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

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US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, MARINE POLLUTANT, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (-12°C), MARINE POLLUTANT, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (N-HEPTANE, 2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information**15.1****Safety, health and environmental regulations/legislation specific for the substance or mixture
National legislation**

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Water contaminating class : WGK 3 highly water endangering
(Germany)**15.2****Chemical Safety Assessment**

Components	: heptane	A Chemical Safety Assessment has been carried out for this substance.	205-563-8
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Chemical Safety Assessment

	2,2,4-trimethylpentane	A Chemical Safety Assessment has been carried out for this substance.	208-759-1
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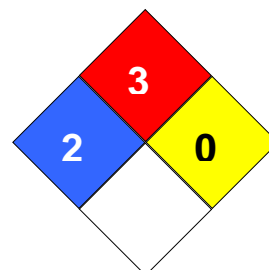
- Major Accident Hazard Legislation**
- : 96/82/EC Update: 2003
Highly flammable
7b
Quantity 1: 5.000 t
Quantity 2: 50.000 t
 - : 96/82/EC Update: 2003
Dangerous for the environment
9b
Quantity 1: 200 t
Quantity 2: 500 t
 - : ZEU_SEVES3 Update:
FLAMMABLE LIQUIDS
P5c
Quantity 1: 5.000 t
Quantity 2: 50.000 t
 - : ZEU_SEVES3 Update:
ENVIRONMENTAL HAZARDS
E1
Quantity 1: 100 t
Quantity 2: 200 t

Notification status

- Switzerland CH INV : On the inventory, or in compliance with the inventory
- United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory
- Canada DSL : All components of this product are on the Canadian DSL
- Other AIIIC : On the inventory, or in compliance with the inventory
- New Zealand NZIoC : Not in compliance with the inventory
- Korea KECI : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).
- Philippines PICCS : On the inventory, or in compliance with the inventory
- Taiwan TCSI : On the inventory, or in compliance with the inventory
- China IECSC : On the inventory, or in compliance with the inventory

SECTION 16: Other information

- NFPA Classification**
- : Health Hazard: 2
 - : Fire Hazard: 3
 - : Reactivity Hazard: 0



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Further information

Legacy SDS Number : 647600

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Full text of H-Statements referred to under sections 2 and 3.

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H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
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.

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Annex**1. Short title of Exposure Scenario: Manufacture**

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3, SU8, SU9: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental release category	: ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles
Further information	: Lead substance(s) EC-No. 208-759-1 EC-No. 205-563-8 Manufacture of the substance or use as an intermediate or process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics

SDS Number:100000014256

30/77

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Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance

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Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC15: Use in batch and other process (synthesis) where opportunity for exposure arises, Use as laboratory reagent**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

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Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

Maximum allowable site tonnage : 720.000
(MSafe) based on release
following total wastewater

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treatment removal (kg/d):(Msafe)

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
 Dilution Factor (River) : 10
 Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 100
 Emission or Release Factor: Air : 5 %
 Emission or Release Factor: Water : 0,03 %
 Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: 90 %)
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): (Effectiveness: 0 %)
 Remarks : Prevent discharge of undissolved substance to or recover from onsite wastewater.
 Water : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): (Effectiveness: 0 %)
 Remarks : Risk from environmental exposure is driven by freshwater sediment.
 Remarks : No wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant
 Flow rate of sewage treatment plant effluent : 2.000 m3/d
 Effectiveness (of a measure) : 96,2 %
 Percentage removed from waste water : 96,2 %

Conditions and measures related to external treatment of waste for disposal

Waste treatment : During manufacturing no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Recovery Methods : During manufacturing no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic

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standard of occupational hygiene is implemented.

Technical conditions and measures

Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC15: Use in batch and other process (synthesis) where opportunity for exposure arises, Use as laboratory reagent

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Product characteristics

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : Not applicable

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient

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temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1, ERC4	Hydrocarbon Block Method with Petrorisk		Air		0,0051 mg/m3	
			Freshwater		0,0015 mg/L	0,016
			Freshwater sediment		0,046 mg/kg	0,019
			Marine water		0,15 µg/L	0,0016
			Marine sediment		0,0046 mg/kg	0,0018
			Agricultural soil		0,036 µg/kg	0,000068

ERC1: Manufacture of substances

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	93,43 mg/m3	0,046
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,055
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000

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			term – systemic		
			Worker – long-term – systemic Combined routes		0,023
PROC8b, CS2, CS14, CS107, CS108	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,124
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,118
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,04 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,001
PROC2, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,024
PROC3, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	102,25 mg/m3	0,049
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,050
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	81,80 mg/m3	0,039
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,023
			Worker – long-term – systemic Combined routes		0,062
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,021
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,107
PROC8b, CS2, CS14, CS107, CS108	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,023
			Worker – long-term – systemic Combined routes		0,121

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS67: Storage

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PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS2: Process sampling

CS14: Bulk transfers

CS107: (closed systems)

CS108: (open systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS2: Process sampling

CS14: Bulk transfers

CS107: (closed systems)

CS108: (open systems)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Risk Management Measures are based on qualitative risk characterisation.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Risk Management Measures are based on qualitative risk characterisation.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).

1. Short title of Exposure Scenario: Distribution

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3: Industrial Manufacturing (all)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental release category	: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part

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of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

Further information : Lead substance(s)
EC-No. 208-759-1
EC-No. 205-563-8

Distribution of Substance: loading (including marine vessel/barge, rail/road car IBC loading), and repacking including drums and small packs of substance, including its distribution and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system.

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Transfer via enclosed lines.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Store substance within a closed system., Transfer via enclosed lines.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC9, PROC15: Use in closed batch process (synthesis or formulation), Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic

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standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8b: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic

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standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Apply vessel entry procedures including use of forced supplied air.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Wear suitable coveralls to prevent exposure to the skin., Wear rubber boots.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system., Transfer via enclosed lines.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Store substance within a closed system., Transfer via enclosed lines.

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2.2 Contributing scenario controlling worker exposure for: PROC3, PROC9, PROC15: Use in closed batch process (synthesis or formulation), Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

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Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Apply vessel entry procedures including use of forced supplied air.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable coveralls to prevent exposure to the skin., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	Hydrocarbon Block Method with Petrorisk		Air		0,0023 µg/m ³	
			Freshwater		0,0032 µg/L	0,000034
			Freshwater sediment		0,062 µg/kg	0,00002
			Marine water		0,082 ng/L	< 0,000088
			Marine sediment		0,0025 µg/kg	< 0,000099
			Agricultural soil		0,57 ng/kg	< 0,000006

ERC1: Manufacture of substances
ERC2: Formulation of preparations
ERC3: Formulation in materials

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ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
 ERC5: Industrial use resulting in inclusion into or onto a matrix
 ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
 ERC6b: Industrial use of reactive processing aids
 ERC6c: Industrial use of monomers for manufacture of thermoplastics
 ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
 ERC7: Industrial use of substances in closed systems

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS15, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC9, CS6	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/kg/d	0,115
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,124
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/kg/d	0,023
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,023
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	93,43 mg/m3	0,046
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,048
PROC8b, CS14, CS107, CS108	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,117
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term –		0,118

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			systemic Combined routes		
PROC1, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,04 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,001
PROC2, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,024
PROC3, CS2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	102,25 mg/m3	0,049
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,050
PROC9, CS6	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,023
			Worker – long-term – systemic Combined routes		0,0121
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,021
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	81,80 mg/m3	0,039
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,044
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,107
PROC8b, CS14, CS107, CS108	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,103

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

CS2: Process sampling

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PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

CS6: Drum and small package filling

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS14: Bulk transfers

CS107: (closed systems)

CS108: (open systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS2: Process sampling

CS15: General exposures (closed systems)

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

CS6: Drum and small package filling

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS14: Bulk transfers

CS107: (closed systems)

CS108: (open systems)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
 Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
 Risk Management Measures are based on qualitative risk characterisation.
 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).
 Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
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 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).

1. Short title of Exposure Scenario: Formulation

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting; PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;
Environmental release category	: ERC2: Formulation of preparations

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Further information : Lead substance(s)
EC-No. 208-759-1
EC-No. 205-563-8

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials, transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for:ERC2: Formulation of preparations**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure****Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system., Transfer via enclosed lines.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance

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Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Avoid dip sampling., Formulate in enclosed or ventilated mixing vessels., Provide enhanced general ventilation by mechanical means.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC15: Use in batch and other process (synthesis) where opportunity for exposure arises, Use as laboratory reagent**Product characteristics**Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa**Amount used**

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;**Product characteristics**Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

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Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Provide extraction ventilation at points where emissions occur., Use drum pumps or carefully pour from container.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at

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dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Provide extraction ventilation at points where emissions occur., Use drum pumps or carefully pour from container.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC9, PROC14: Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;**Product characteristics**

Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

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2.1 Contributing scenario controlling environmental exposure for:ERC2: Formulation of preparations**Amount used**

Annual site tonnage (tonnes/year): : 150
 Maximum daily site tonnage : 1500
 (kg/day):
 Maximum allowable site tonnage : 220.000
 (MSafe) based on release
 following total wastewater
 treatment removal (kg/d):(Msafe)

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
 Dilution Factor (River) : 10
 Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Continuous use/release
 Number of emission days per year : 100
 Emission or Release Factor: Air : 2,5 %
 Emission or Release Factor: Water : 0,02 %
 Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%) (Effectiveness: 0 %)
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%) (Effectiveness: 0 %)
 Remarks : Prevent discharge of undissolved substance to or recover from onsite wastewater.
 Water : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%) (Effectiveness: 0 %)
 Remarks : Risk from environmental exposure is driven by freshwater sediment.
 Remarks : No wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant
 Flow rate of sewage treatment plant effluent : 2.000 m3/d
 Effectiveness (of a measure) : 96,2 %
 Percentage removed from waste water : 96,2 %

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2: Use in closed process, no likelihood of exposure, Use in closed, continuous process with

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occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system., Transfer via enclosed lines.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Provide enhanced general ventilation by mechanical means., Formulate in enclosed or ventilated mixing vessels., Avoid dip sampling.

2.2 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

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Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC9, PROC14, PROC15: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;; Use as laboratory reagent

Product characteristics

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Provide extraction ventilation at points where emissions occur., Use drum pumps or carefully pour from container.

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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Provide extraction ventilation at points where emissions occur., Use drum pumps or carefully pour from container.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC2	Hydrocarbon Block Method with Petrorisk		Air		0,0029 mg/m3	
			Freshwater		0,57 µg/L	0,0061
			Freshwater sediment		0,017 mg/kg	0,0069
			Marine water		0,057 µg/L	0,00061
			Marine sediment		0,0017 mg/kg	0,00069
			Agricultural soil		0,02 µg/kg	0,000038

ERC2: Formulation of preparations

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined		0,000

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			routes		
PROC2, CS67, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long- term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long- term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC3, CS136	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	140,15 mg/m3	0,069
			Worker – dermal, long- term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,069
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	93,43 mg/m3	0,046
			Worker – dermal, long- term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,055
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long- term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,023
PROC5, CS30	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long- term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,118
PROC8a, CS34, CS22	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	23,36 mg/m3	0,011
			Worker – dermal, long- term – systemic	0,1371 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,012
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long- term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,118
PROC8b, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long- term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,117
PROC8b, CS8	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	7,01 mg/m3	0,003
			Worker – dermal, long- term – systemic	0,686 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,004
PROC9, CS6	ECETOC TRA		Worker – inhalation,	233,58 mg/m3	0,115

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	Modified		long-term – systemic		
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,124
PROC14, CS100	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	3,43 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,119
PROC1, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,04 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,001
PROC2, CS15, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,024
PROC3, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	102,25 mg/m3	0,049
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,050
PROC3, CS136	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	122,70 mg/m3	0,059
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,060
PROC5, CS30	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,107
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	81,80 mg/m3	0,039
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,023
			Worker – long-term – systemic Combined routes		0,062
PROC9, CS6	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	6,86 mg/kg/d	0,023
			Worker – long-term – systemic Combined routes		0,121
PROC14, CS100	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	3,43 mg/kg/d	0,011
			Worker – long-term – systemic Combined routes		0,110
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001

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			term – systemic		
			Worker – long-term – systemic Combined routes		0,021
PROC8a, CS34, CS22	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	20,45 mg/m3	0,010
			Worker – dermal, long-term – systemic	0,1371 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,010
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,107
PROC8b, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,005
			Worker – long-term – systemic Combined routes		0,103
PROC8b, CS8	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	6,13 mg/m3	0,003
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,005

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS67: Storage

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS2: Process sampling

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS136: Batch processes at elevated temperatures

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;

CS30: Mixing operations (open systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS34: Manual

CS22: Transfer from/pouring from containers

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

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PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS14: Bulk transfers

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS8: Drum/batch transfers

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

CS6: Drum and small package filling

PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;

CS100: Production or preparation or articles by tableting, compression, extrusion or pelletization

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

PROC3: Use in closed batch process (synthesis or formulation)

CS136: Batch processes at elevated temperatures

PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;

CS30: Mixing operations (open systems)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

CS16: General exposures (open systems)

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

CS6: Drum and small package filling

PROC14: Production of mixtures or articles by tableting, compression, extrusion, pelletization; Industrial setting;

CS100: Production or preparation or articles by tableting, compression, extrusion or pelletization

PROC15: Use as laboratory reagent

CS36: Laboratory activities

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS34: Manual

CS22: Transfer from/pouring from containers

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

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CS14: Bulk transfers

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS8: Drum/batch transfers

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).

1. Short title of Exposure Scenario: Use as a fuel - industrial

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: SU3: Industrial Manufacturing (all)
Process category	: PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to

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Environmental release category	: unburned product to be expected ERC7, ERC8b: Industrial use of substances in closed systems, Wide dispersive indoor use of reactive substances in open systems
Further information	: Lead substance(s) EC-No. 208-759-1 EC-No. 205-563-8 Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Physical Form (at time of use)	: Liquid substance
Vapor pressure	: 2,8 kPa

Amount used

Remarks	: No limit
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Frequency and duration of use

Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
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Other operational conditions affecting workers exposure

Remarks	: Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.
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Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use)	: Liquid substance
Vapor pressure	: 2,8 kPa

Amount used

Remarks	: No limit
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Frequency and duration of use

Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
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Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Transfer via enclosed lines., Store substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

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Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., Apply vessel entry procedures including use of forced supplied air.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable coveralls to prevent exposure to the skin., Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

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Product characteristics

Physical Form (at time of use) : Liquid substance
 Vapor pressure : 2,8 kPa

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

2.1 Contributing scenario controlling environmental exposure for:ERC7, ERC8b: Industrial use of substances in closed systems, Wide dispersive indoor use of reactive substances in open systems

Maximum allowable site tonnage : 4.300 tonnes/day
 (MSafe) based on release following total wastewater treatment removal (tonnes/day):
 (Msafe)

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
 Dilution Factor (River) : 10
 Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Continuous use/release
 Number of emission days per year : 20
 Emission or Release Factor: Air : 5 %
 Emission or Release Factor: Water : 0,001 %
 Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 95 %)
 Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): (Effectiveness: 0 %)
 Remarks : Risk from environmental exposure is driven by freshwater sediment.
 Water : If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):

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Remarks : (Effectiveness: 0 %)
 Remarks : No wastewater treatment required.
 Remarks : Common practices vary across sites thus conservative process release estimates used.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d
 Effectiveness (of a measure) : 96,2 %
 Percentage removed from waste water : 96,2 %

Conditions and measures related to external treatment of waste for disposal

Remarks : Combustion emissions considered in regional exposure assessment.
 Combustion emissions limited by required exhaust emission controls.

Conditions and measures related to external recovery of waste

Recovery Methods : This substance is consumed during use and no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system.

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is

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implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system., Store substance within a closed system., Transfer via enclosed lines.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Drain down and flush system prior to equipment opening or maintenance.

Organizational measures to prevent /limit releases, dispersion and exposure

Apply vessel entry procedures including use of forced supplied air.

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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374., Wear suitable coveralls to prevent exposure to the skin.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected**Product characteristics**

Physical Form (at time of use) : Liquid substance

Amount used

Remarks : No limit

Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures

Handle substance within a closed system.

3. Exposure estimation and reference to its source**Environment**

Contributing	Exposure Assessment	Specific	Compartment	Value type	Level of	Risk characterization
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Scenario	Method	conditions		Exposure	ratio
ERC7, ERC8b	Hydrocarbon Block Method with Petrorisk		Air	0,0086 µg/m3	
			Freshwater	0,0043 µg/L	0,000046
			Freshwater sediment	0,13 µg/kg	0,000052
			Marine water	0,0004 µg/L	0,000005
			Marine sediment	0,013 µg/kg	0,000005
			Agricultural soil	0,0006 µg/kg	< 0,000001

ERC7: Industrial use of substances in closed systems

ERC8b: Wide dispersive indoor use of reactive substances in open systems

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS37, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,05 mg/m3	0,000
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,000
PROC2, CS15, CS37, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC3, CS15, CS37, CS107	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,058
PROC8b, CS8, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,117
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	233,58 mg/m3	0,115
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,118
PROC8a, CS103	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	23,36 mg/m3	0,011
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,004
			Worker – long-term – systemic Combined routes		0,015
PROC16, CS15, CS107	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	23,36 mg/m3	0,011
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,000
			Worker – long-term – systemic Combined routes		0,012
PROC1, CS15, CS37, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,04 mg/m3	0,000

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			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,001
PROC2, CS15, CS37, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m3	0,020
			Worker – dermal, long-term – systemic	1,37 mg/kg	0,005
			Worker – long-term – systemic Combined routes		0,024
PROC3, CS15, CS37, CS107	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	102,25 mg/m3	0,049
			Worker – dermal, long-term – systemic	0,34 mg/kg	0,001
			Worker – long-term – systemic Combined routes		0,050
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	2,742 mg/kg/d	0,009
			Worker – long-term – systemic Combined routes		0,107
PROC8a, CS103	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	20,45 mg/m3	0,010
			Worker – long-term – systemic Combined routes	2,742 mg/kg	0,009
			Worker – dermal, long-term – systemic		0,019
PROC8b, CS8, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m3	0,098
			Worker – dermal, long-term – systemic	1,372 mg/kg	0,005
			Worker – long-term – systemic Combined routes		0,103
PROC16, CS15, CS107	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	20,45 mg/m3	0,010
			Worker – dermal, long-term – systemic	0,34 mg/kg	0,001
			Worker – long-term – systemic Combined routes		0,011

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS107: (closed systems)

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS8: Drum/batch transfers

CS14: Bulk transfers

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers

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at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS103: Vessel and container cleaning

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

CS15: General exposures (closed systems)

CS107: (closed systems)

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)

CS15: General exposures (closed systems)

CS37: Use in contained batch processes

CS107: (closed systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS39: Equipment cleaning and maintenance

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

CS103: Vessel and container cleaning

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

CS8: Drum/batch transfers

CS14: Bulk transfers

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

CS15: General exposures (closed systems)

CS107: (closed systems)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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.

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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>).
 Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
 Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
 Risk Management Measures are based on qualitative risk characterisation.
 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).

1. Short title of Exposure Scenario: Use as a laboratory agent – industrial

Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category	: PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Further information	: Lead substance(s) EC-No. 208-759-1 EC-No. 205-563-8

2.1 Contributing scenario controlling environmental exposure for:ERC2, ERC4: Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles

Maximum allowable site tonnage : 2.200
 (MSafe) based on release
 following total wastewater
 treatment removal (kg/d):(Msafe)

Environment factors not influenced by risk management

Flow rate	: 18.000 m ³ /d
Dilution Factor (River)	: 10
Dilution Factor (Coastal Areas)	: 100

Other given operational conditions affecting environmental exposure

Continuous use/release	
Number of emission days per year	: 20
Emission or Release Factor: Air	: 2,5 %
Emission or Release Factor: Water	: 2 %
Emission or Release Factor: Soil	: 0,01 %

Technical conditions and measures / Organizational measures

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Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)
Water	:	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): (Effectiveness: 17,4 %)
Remarks	:	Risk from environmental exposure is driven by freshwater sediment.
Water	:	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): (Effectiveness: 0 %)
Remarks	:	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	:	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Effectiveness (of a measure)	:	96,2 %
Percentage removed from waste water	:	96,2 %

Conditions and measures related to external treatment of waste for disposal

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

Recovery Methods	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling worker exposure for: PROC10: Roller application or brushing**Product characteristics**

Physical Form (at time of use)	:	Liquid substance
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Amount used

Remarks	:	No limit
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Frequency and duration of use

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently)
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Other operational conditions affecting workers exposure

Remarks	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.
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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent**Product characteristics**

Physical Form (at time of use)	:	Liquid substance
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Amount used

Remarks	:	No limit
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Frequency and duration of use

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks : Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Organizational measures to prevent /limit releases, dispersion and exposure

No specific measures identified.

3. Exposure estimation and reference to its source**Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC2, ERC4	Hydrocarbon Block Method with Petrorisk		Air		0,059 µg/m ³	
			Freshwater		0,0038 mg/L	0,041
			Freshwater sediment		0,12 mg/kg	0,046
			Marine water		0,38 µg/L	0,0041
			Marine sediment		0,012 mg/kg	0,0046
			Agricultural soil		0,67 ng/kg	< 0,000008

ERC2: Formulation of preparations

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC10, CS47	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	204,50 mg/m ³	0,098
			Worker – dermal, long-term – systemic	5,486 mg/kg/d	0,018
			Worker – long-term – systemic Combined routes		0,116
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	40,90 mg/m ³	0,020
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,001
			Worker – long-term – systemic Combined routes		0,021

PROC10: Roller application or brushing

CS47: Cleaning

PROC15: Use as laboratory reagent

CS36: Laboratory activities

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Risk Management Measures are based on qualitative risk characterisation.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. 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>).