AROMAX® HYDROGEN STREAM S-CHEM

Version 1.5 Revision Date 2021-09-21

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 : AROMAX® HYDROGEN STREAM S-CHEM

1.3

Details of the supplier of the safety data sheet

Company : Saudi Chevron Phillips Company
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
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 gases, Category 1A	H220: Extremely flammable gas.
Germ cell mutagenicity, Category 1B	H340: May cause genetic defects.
Carcinogenicity, Category 1A	H350: May cause cancer.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal Word : Danger

Hazard Statements :		
	H220	Extremely flammable gas.
	H340	May cause genetic defects.
	H350	May cause cancer.
	H373	May cause damage to organs through prolonged or repeated exposure.
	H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements :		
	Prevention:	
	P201	Obtain special instructions before use.
	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.
	P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
	Response:	
	P308 + P313	IF exposed or concerned: Get medical advice/ attention.
	P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
	P381	In case of leakage, eliminate all ignition sources.
	Storage:	
	P403	Store in a well-ventilated place.

Hazardous ingredients which must be listed on the label:

- 71-43-2 Benzene

Additional Labeling:

Restricted to professional users.

SECTION 3: Composition/information on ingredients

3.1 - 3.2
Substance or Mixture
Molecular formula : UVCB

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
Hydrogen	**1333-74-0** **215-605-7** 001-001-00-9	Flam. Gas 1; H220 Press. Gas H280 Press. Gas Compr. Gas; H280	0 - 50
Ethane	74-84-0 200-814-8 601-002-00-X	Flam. Gas 1; H220 Press. Gas Liquefied gas; H280 Press. Gas Liquefied gas; H280	0 - 25
Methane	74-82-8 200-812-7 601-001-00-4	Flam. Gas 1; H220 Press. Gas Compr. Gas; H280 Press. Gas Liquefied gas; H280	0 - 25
Propane	74-98-6 200-827-9 601-003-00-5	Flam. Gas 1; H220 Press. Gas Liquefied gas; H280	0 - 20
Hydrocarbons, C5 and Higher	68647-60-9 271-960-8	Asp. Tox. 1; H304	0 - 15
n-Butane	106-97-8 203-448-7 601-004-00-0	Flam. Gas 1; H220 Press. Gas Liquefied gas; H280 Press. Gas Compr. Gas; H280	0 - 10
Benzene	71-43-2 200-753-7 601-020-00-8	Flam. Liq. 2; H225 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Muta. 1B; H340 Carc. 1A; H350 Aquatic Chronic 3; H412 STOT RE 1; H372 Asp. Tox. 1; H304 Aquatic Chronic 3; H412	0 - 5
n-hexane	110-54-3 203-777-6 601-037-00-0	Flam. Liq. 2; H225 Skin Irrit. 2; H315 Repr. 2; H361f STOT SE 3; H336 STOT RE 2; H373 Asp. Tox. 1; H304	0 - 5

		Aquatic Chronic 2; H411	

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.
If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
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	:	Induce vomiting immediately and call a physician. Keep respiratory tract clear. Do not give milk or alcoholic beverages. 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 : <-73°C (<-99°F)

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

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.

6.4

Reference to other sections

SECTION 7: Handling and storage

7.1

Precautions for safe handling
Handling

Advice on safe handling	:	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 in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. 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	:	Prevent unauthorized access. No smoking. Keep in a 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
Benzene	SK OEL	TSH	1 ppm, 3,25 mg/m3	1B, 1A, K,
n-Hexane	SK OEL	NPEL priemerný	20 ppm, 72 mg/m3	
	SK OEL	NPEL krátkodobý	40 ppm, 140 mg/m3	

1A Kategória 1A - Dokázaný karcinogén pre ľudí
1B Kategória 1B - Mutagén cicavčích zárodočných buniek
K Prienik cez kožu

SI

Sestavine	Osnova	Vrednost	Parametri nadzora	Pripomba
Propane	SI OEL	MV	1.000 ppm, 1.800 mg/m3	
	SI OEL	KTV	4.000 ppm, 7.200 mg/m3	
n-Butane	SI OEL	MV	1.000 ppm, 2.400 mg/m3	
	SI OEL	KTV	4.000 ppm, 9.600 mg/m3	
n-Hexane	SI OEL	MV	20 ppm, 72 mg/m3	RD-2,
	SI OEL	KTV	160 ppm, 576 mg/m3	RD-2,

RD-2 Strupeno za razmnoževanje - lahko škoduje nerojenemu otroku - kategorija 2

SE

Beståndsdelar	Grundval	Värde	Kontrollparametrar	Anmärkning
Benzene	SE AFS	NGV	0,5 ppm, 1,5 mg/m3	H, C,
	SE AFS	KGV	3 ppm, 9 mg/m3	H, C,
n-Hexane	SE AFS	NGV	20 ppm, 72 mg/m3	
	SE AFS	KGV	50 ppm, 180 mg/m3	

C Ämnet är cancerframkallande.
H Ämnet kan lätt upptas genom huden.

RS

Компоненты	Основа	Величина	Параметры контроля	Заметка
Бензол	RS OEL	GVI	1 ppm, 3,25 mg/m3	
	RS OEL CM	TWA	1 ppm, 3,25 mg/m3	
н-гексан	RS OEL	GVI	20 ppm, 72 mg/m3	Repr. cat. 3, EU**,

EU** Substance mentioned in indicative exposure limit values in Directive 2006/15 / EC (second list)
Repr. cat. 3 chemical substances that are assumed to reduce reproductive capacity in humans and / or materials for which it is assumed that they can cause toxicity in the process of growth and development in humans.

RO

Componente	Sursă	Valoare	Parametri de control	Notă
Methane	RO OEL	TWA	1.834 ppm, 1.200 mg/m3	
	RO OEL	STEL	2.292 ppm, 1.500 mg/m3	
Propane	RO OEL	TWA	778 ppm, 1.400 mg/m3	
	RO OEL	STEL	1.000 ppm, 1.800 mg/m3	
Benzene	RO OEL	TWA	1 ppm, 3,25 mg/m3	C1A, M1B, P,
n-Hexane	RO OEL	TWA	20 ppm, 72 mg/m3	R2,

C1A poate provoca apariţia cancerului
M1B poate provoca anomalii genetice
P Substanţele cu indicativul P (piele) pot pătrunde în organism prin pielea sau mucoasele intacte. Indicativul P nu se referă la substanţele care au numai o acţiune locală de tip iritativ.
R2 susceptibil de a dăuna fertilităţii

PT

Componentes	Bases	Valor	Parâmetros de controlo	Nota
n-Butane	PT OEL	VLE_CD	1.000 ppm,	
Benzene	PT OEL	VLE-MP	0,5 ppm,	P, A1,
	PT OEL	VLE_CD	2,5 ppm,	P, A1,
	PT DL 88/2015	TWA	1 ppm, 3,25 mg/m3	
n-Hexane	PT OEL	VLE-MP	50 ppm,	P,
	PT DL 305/2007	oito horas	20 ppm, 72 mg/m3	

A1 Agente carcinogénico confirmado no Homem.
P Perigo de absorção cutânea

PL

Składniki	Podstawa	Wartość	Parametry dotyczące kontroli	Uwaga

Propane	PL NDS	NDS	1.800 mg/m3	
n-Butane	PL NDS	NDS	1.900 mg/m3	
	PL NDS	NDSch	3.000 mg/m3	
Benzene	PL NDS	NDS	1,6 mg/m3	
n-Hexane	PL NDS	NDS	72 mg/m3	

NO

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Propane	FOR-2011-12-06-1358	GV	500 ppm, 900 mg/m3	
n-Butane	FOR-2011-12-06-1358	GV	250 ppm, 600 mg/m3	
n-Hexane	FOR-2011-12-06-1358	GV	20 ppm, 72 mg/m3	R,

R Kjemikalier som skal betraktes som reproduksjonstoksiske.

NL

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Benzene	NL WG	TGG-8 uur	0,7 mg/m3	B1, H,
n-Hexane	NL WG	TGG-8 uur	72 mg/m3	
	NL WG	TGG-15 min	144 mg/m3	

B1 Kankerverwekkende stoffen, vastgesteld op basis van het drempelwaarde-effect
H Huidopname

MT

Components	Basis	Value	Control parameters	Note
n-hexane	MT OEL	TWA	20 ppm, 72 mg/m3	

MK

Съставки	Основа	Стойност	Параметри на контрол	Бележка
Propane	MK OEL	MV	1.000 ppm, 1.800 mg/m3	
n-Butane	MK OEL	MV	1.000 ppm, 2.400 mg/m3	
Benzene	MK OEL	MV	1 ppm, 3,25 mg/m3	R1, K,
n-Hexane	MK OEL	MV	20 ppm, 72 mg/m3	RF3,

K The properties of easier transport of substances into organism through (via) the skin
R1 Carcinogenic R1 - may cause cancer. Numbers 1, 2 and 3 indicate the class of carcinogenicity or mutagenicity according to the EU classification of carcinogenic or mutagenic substances. Carcinogenic or mutagenic substances are in EU classified in separate groups, according to the fulfilling of criteria, set in the EU directive 67/548/EEC.

RF3 Teratogenic RF3 - may be harmful for fertiliy. Numbers 1, 2 and 3 may the class of carcinogenicity or mutagenicity according to the EU classification of carcinogenic or mutagenic substances. Carcinogenic or mutagenic substances are in EU classified in separate groups, according to the fulfilling of criteria, set in the EU directive 67/548/EEC.

LV

Sastāvdaļas	Bāze	Vērtība	Pārvaldības parametri	Piezīme
Ethane	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	
Methane	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	
Propane	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	
	LV OEL	AER 8 st	1.000 ppm, 1.800 mg/m3	
HYDROCARBONS, C5 AND HIGHER	LV OEL	AER 8 st	100 mg/m3	
	LV OEL	AER īslaicīgā	300 mg/m3	
n-Butane	LV OEL	AER 8 st	300 mg/m3	
Benzene	LV OEL	AER 8 st	1 ppm, 3,25 mg/m3	Āda,
n-Hexane	LV OEL	AER 8 st	20 ppm, 72 mg/m3	

Āda Āda

LU

Composants	Base	Valeur	Paramètres de contrôle	Note
Benzene	LU OEL	TWA	1 ppm, 3,25 mg/m3	
n-Hexane	LU OEL	TWA	20 ppm, 72 mg/m3	

LT

Komponentai	Šaltinis	Vertė	Kontrolės parametrai	Pastaba
Benzene	LT OEL	IPRD	1 ppm, 3,25 mg/m3	O,
	LT OEL	TPRD	6 ppm, 19 mg/m3	O,
n-Hexane	LT OEL	IPRD	20 ppm, 72 mg/m3	

O patekimas per nepažeistą odą

IT

Componenti	Base	Valore	Parametri di controllo	Nota

Benzene	IT VLEP	TWA	0,5 ppm,	
	IT VLEP	TPRD	2,5 ppm,	
n-Hexane	IT VLEP	TWA	20 ppm, 72 mg/m3	

IS

Komponenter	Grunnlag	Verdi	Kontrollparametrer	Nota
Propane	IS OEL	TWA	1.000 ppm, 1.800 mg/m3	
n-Butane	IS OEL	TWA	500 ppm, 1.200 mg/m3	
Benzene	IS OEL	TWA	0,5 ppm, 1,6 mg/m3	H, K,
n-Hexane	IS OEL	TWA	20 ppm, 72 mg/m3	

H Skin notation
K Carcinogenic substances

IE

Components	Basis	Value	Control parameters	Note
n-Butane	IE OEL	OELV - 15 min (STEL)	1.000 ppm,	
Benzene	IE OEL	OELV - 8 hrs (TWA)	1 ppm, 3,25 mg/m3	Sk, Carc 1A, Muta 1B,
n-hexane	IE OEL	OELV - 8 hrs (TWA)	20 ppm, 72 mg/m3	Sk,

Carc 1A Carc 1A - Substances known to have carcinogenic potential for humans
Muta 1B Muta 1B - Substances which should be regarded as if they induce heritable mutations in the germ cells of humans
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
n-Butane	HU OEL	AK-érték	2.350 mg/m3	N,
	HU OEL	CK-érték	9.400 mg/m3	N,
Benzene	HU OEL	AK-érték	3,25 mg/m3	T, EU6, k(1A), b, i,
n-Hexane	HU OEL	AK-érték	72 mg/m3	T, b, EU2, i,

b Bőrön át is felszívódik. Az ÁK-értékek a veszélyes anyagoknak ezt a tulajdonságát, illetve az ebből származó expozíciót csak a levegőben megengedett koncentrációjuk mértékének megfelelően veszik figyelembe
EU2 2006/15/EK irányelvben közölt érték
EU6 2019/130 EU irányelvben közölt érték
i Ingerlő anyag (izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat)
k(1A) rákkeltő 1A
N Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok. Korrekció NEM szükséges.
T Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik. Korrigált ÁK = ÁK x 40/a heti óraszám

HR

Sastojci	Temelj	Vrijednost	Nadzorni parametri	Bilješka
Hydrogen	HR OEL	GVI	4.000 ppm,	IN-Z,
Propane	HR OEL	GVI	100 ppm, 400 mg/m3	
n-Butane	HR OEL	GVI	600 ppm, 1.450 mg/m3	
	HR OEL	KGVI	750 ppm, 1.810 mg/m3	
	HR OEL	GVI	10 ppm, 22 mg/m3	1, 2, T, F+,
Benzene	HR OEL	GVI	1 ppm, 3,25 mg/m3	koža, Karc 1A, Muta 1B,
n-Hexane	HR OEL	GVI	20 ppm, 72 mg/m3	koža,

1 Karc. kat. 1: tvari za koje je dokazano da su karcinogene za ljude
2 Muta. kat. 2: tvari koje su vjerojatno mutagene za ljude
F+ Vrlo lako zapaljivo
IN-Z inertni zagušljivac
Karc 1A Tvar koja je prema Uredbi (EZ) br. 1272/2008 razvrstana kao karcinogena 1.A kategorije
koža Razvrstana kao tvar koja nadražuje kožu (H315) ili je takva napomena navedena u direktivama
Muta 1B Tvar koja je prema Uredbi (EZ) br. 1272/2008 razvrstana kao mutagena 1.B kategorije
T Otrovno

GR

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
Propane	GR OEL	TWA	1.000 ppm, 1.800 mg/m3	
n-Butane	GR OEL	TWA	1.000 ppm, 2.350 mg/m3	
Benzene	GR OEL	TWA	1 ppm, 3,25 mg/m3	Δ,
n-Hexane	GR OEL	TWA	20 ppm, 72 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
n-Butane	GB EH40	TWA	600 ppm, 1.450 mg/m3	Carc,
	GB EH40	STEL	750 ppm, 1.810 mg/m3	Carc,
Benzene	GB EH40	TWA	1 ppm, 3,25 mg/m3	Sk, Carc,
n-hexane	GB EH40	TWA	20 ppm, 72 mg/m3	

Carc Capable of causing cancer and/or heritable genetic damage.
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.

FR

Composants	Base	Valeur	Paramètres de contrôle	Note
n-Butane	FR VLE	VME	800 ppm, 1.900 mg/m3	Valeurs limites indicatives,
Benzene	FR VLE	VME	1 ppm, 3,25 mg/m3	C1A, M1B, Peau, VLR contraignantes,
n-Hexane	FR VLE	VME	20 ppm, 72 mg/m3	R2, VLR contraignantes,

C1A Substances que l'on sait etre cancerogenes chez l'homme
M1B Substances devant etre assimilees a des substances pour l'homme
Peau Risque de pénétration percutanée
R2 Substances preoccupantes en raison d'effets toxiques pour la reproduction possibles
Valeurs limites indicatives Valeurs limites indicatives
VLR contraignantes Valeurs limites réglementaires contraignantes

FI

Aineosat	Peruste	Arvo	Valvontaa koskevat muuttujat	Huomautus
Ethane	FI OEL	HTP-arvot 8h	1.000 ppm,	Liite 4,
Methane	FI OEL	HTP-arvot 8h	1.000 ppm,	Liite 4,
Propane	FI OEL	HTP-arvot 8h	800 ppm, 1.500 mg/m3	Liite 4,
	FI OEL	HTP-arvot 15 min	1.100 ppm, 2.000 mg/m3	Liite 4,
n-Butane	FI OEL	HTP-arvot 8h	800 ppm, 1.900 mg/m3	Liite 4,
	FI OEL	HTP-arvot 15 min	1.000 ppm, 2.400 mg/m3	Liite 4,
Benzene	FI OEL CM	TWA	1 ppm, 3,25 mg/m3	
n-Hexane	FI OEL	HTP-arvot 8h	20 ppm, 72 mg/m3	iho,

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.
Liite 4 Happea syrjäyttämällä tukehduttavat kaasut

ES

Componentes	Base	Valor	Parámetros de control	Nota
Ethane	ES VLA	VLA-ED	1.000 ppm,	
Methane	ES VLA	VLA-ED	1.000 ppm,	
Propane	ES VLA	VLA-ED	1.000 ppm,	
n-Butane	ES VLA	VLA-ED	1.000 ppm,	gas
Benzene	ES VLA	VLA-ED	1 ppm, 3,25 mg/m3	M1B, vía dérmica, C1A,
n-Hexane	ES VLA	VLA-ED	20 ppm, 72 mg/m3	

C1A Carcinógenos para el hombre, en base a la existencia de pruebas en humanos.
M1B Sustancias de las que se considera que inducen mutaciones hereditarias en las células germinales humanas
vía dérmica Vía dérmica

EE

Komponendid, osad	Alused	Väärtus	Kontrolliparameetrid	Märkused
Propane	EE OEL	Piirnorm	1.000 ppm, 1.800 mg/m3	
n-Butane	EE OEL	Piirnorm	800 ppm, 1.500 mg/m3	
Benzene	EE OEL	Piirnorm	0,5 ppm, 1,5 mg/m3	A, C,
	EE OEL	Lühiajalise kokkupuute piirnorm	3 ppm, 9 mg/m3	A, C,
n-Hexane	EE OEL	Piirnorm	20 ppm, 72 mg/m3	

A Naha kaudu kergesti absorbeeruvad ained
C Kantserogeensed ained

DK

Komponenter	Basis	Værdi	Kontrolparametre	Note
Propane	DK OEL	GV	1.000 ppm, 1.800 mg/m3	
n-Butane	DK OEL	GV	500 ppm, 1.200 mg/m3	
Benzene	DK OEL	GV	0,5 ppm, 1,6 mg/m3	H, K,
n-Hexane	DK OEL	GV	20 ppm, 72 mg/m3	

H Betyder, at stoffet kan optages gennem huden.
K Betyder, at stoffet er optaget på listen over stoffer, der anses for at være kræftfremkaldende.

DE

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Propane	DE TRGS 900	AGW	1.000 ppm, 1.800 mg/m3	
n-Butane	DE TRGS 900	AGW	1.000 ppm, 2.400 mg/m3	
Benzene	DE TRGS 910	Akzeptanzkonzentration	0,06 ppm, 0,2 mg/m3	H,
	DE TRGS 910	Toleranzkonzentration	0,6 ppm, 1,9 mg/m3	H,
n-Hexane	DE TRGS 900	AGW	50 ppm, 180 mg/m3	Y,

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
Benzene	CZ OEL	PEL	3 mg/m3	I, K, M, D,
	CZ OEL	NPK-P	10 mg/m3	I, K, M, D,
n-Hexane	CZ OEL	PEL	70 mg/m3	I, D,
	CZ OEL	NPK-P	200 mg/m3	I, D,

D Při expozici se významně uplatňuje pronikání faktoru kůží
I dráždí sliznice (oči, dýchací cesty), respektive kůži
K karcinogen kategorie 1A a 1B (s větou H350, H350i)
M mutagen v zárodečných buňkách kategorie 1A a 1B (s větou H340)

CY

Συστατικά	Βάση	Τιμή	Παράμετροι ελέγχου	Σημείωση
n-Hexane	CY OEL	TWA	20 ppm, 72 mg/m3	

CH

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Ethane	CH SUVA	MAK-Wert	10.000 ppm, 12.500 mg/m3	
Methane	CH SUVA	MAK-Wert	10.000 ppm, 6.700 mg/m3	
Propane	CH SUVA	MAK-Wert	1.000 ppm, 1.800 mg/m3	NIOSH,
	CH SUVA	KZGW	4.000 ppm, 7.200 mg/m3	NIOSH,
n-Butane	CH SUVA	MAK-Wert	800 ppm, 1.900 mg/m3	
	CH SUVA	MAK-Wert	800 ppm, 1.900 mg/m3	
	CH SUVA	KZGW	3.200 ppm, 7.600 mg/m3	
Benzene	CH SUVA	MAK-Wert	0,5 ppm, 1,6 mg/m3	H, Carc.Cat.1, M1B, NIOSH, DFG, HSE, BG,
n-Hexane	CH SUVA	MAK-Wert	50 ppm, 180 mg/m3	H, R2F, NIOSH, SSc,
	CH SUVA	KZGW	400 ppm, 1.440 mg/m3	H, R2F, NIOSH, SSc,

BG BG
Carc.Cat.1 Krebserzeugende Stoffe Kategorie 1
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)
M1B Stoffe, die wahrscheinlich vererbbare Mutationen an menschlichen Keimzellen auslösen.
NIOSH National Institute for Occupational Safety and Health
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
Methane	BG OEL	TWA	500 mg/m3	
Propane	BG OEL	TWA	1.800 mg/m3	
n-Butane	BG OEL	TWA	1.900 mg/m3	
Benzene	BG OEL	TWA	1 ppm, 3,25 mg/m3	
n-Hexane	BG OEL	TWA	20 ppm, 72 mg/m3	

BE

Bestanddelen	Basis	Waarde	Controleparameters	Opmerking
Ethane	BE OEL	TGG 8 hr	1.000 ppm,	gas
Methane	BE OEL	TGG 8 hr	1.000 ppm,	gas
Propane	BE OEL	TGG 8 hr	1.000 ppm,	
	BE OEL	TGG 8 hr	1.000 ppm,	gas
n-Butane	BE OEL	TGG 8 hr	1.000 ppm,	
	BE OEL	TGG 15 min	980 ppm, 2.370 mg/m3	
Benzene	BE OEL	TGG 8 hr	1 ppm, 3,25 mg/m3	D, C,
n-Hexane	BE OEL	TGG 8 hr	20 ppm, 72 mg/m3	

C De betrokken stof valt onder het toepassingsgebied van het koninklijk besluit van 2 december 1993 betreffende de bescherming van de werknemers tegen de risico's van blootstelling aan kankerverwekkende en mutagene agentia op het werk.
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
Propane	AT OEL	MAK-TMW	1.000 ppm, 1.800 mg/m3	
	AT OEL	MAK-KZW	2.000 ppm, 3.600 mg/m3	
n-Butane	AT OEL	MAK-TMW	800 ppm, 1.900 mg/m3	
	AT OEL	MAK-KZW	1.600 ppm, 3.800 mg/m3	
Benzene	AT OEL	TRK-TMW	1 ppm, 3,2 mg/m3	H,
	AT OEL	TRK-KZW	4 ppm, 12,8 mg/m3	H,

n-Hexane	AT OEL	MAK-TMW	20 ppm, 72 mg/m3	
	AT OEL	MAK-KZW	80 ppm, 288 mg/m3	

H Besondere Gefahr der Hautresorption

Biological exposure indices

SK

Názov látky	Č. CAS	Kontrolné parametre	Doba odberu vzorky	Aktualizácia
n-Hexane	110-54-3	2,5-hexándión a 4,5-dihydroxy-2-hexanón: 5 mg/l (moč)	Koniec vystavenia alebo pracovnej zmeny	2011-11-23
		2,5-hexándión a 4,5-dihydroxy-2-hexanón: 20 µmol.l-1 (moč)	Koniec vystavenia alebo pracovnej zmeny	2011-11-23
		2,5-hexándión a 4,5-dihydroxy-2-hexanón: 3 mg/g kreatinínu (moč)	Koniec vystavenia alebo pracovnej zmeny	2011-11-23
		2,5-hexándión a 4,5-dihydroxy-2-hexanón: 1.4 µmol/mmol kreatinínu (moč)	Koniec vystavenia alebo pracovnej zmeny	2011-11-23

SI

Ime snovi	Št. CAS	Parametri nadzora	Čas vzorčenja	Sprememba
Benzene	71-43-2	fenol: 18 mmol/mol kreatinina Rezultati, ki so izraženi s kreatininom, se pri koncentraciji kreatinina < 0.5 g/l in > 3.0 g/l, ne upoštevajo. (Urin)	Ob koncu delovne izmene	2001-12-11
		benzen: 4.99 mmol/l (Zadnji izdihani zrak)	16 Ur po končanem delu	2001-12-11
		fenol: 15 mg/g kreatinina Rezultati, ki so izraženi s kreatininom, se pri koncentraciji kreatinina < 0.5 g/l in > 3.0 g/l, ne upoštevajo. (Urin)	Ob koncu delovne izmene	2001-12-11
		benzen: 0.12 Delov na milijon (Zadnji izdihani zrak)	16 Ur po končanem delu	2001-12-11
n-Hexane	110-54-3	2,5-heksandion in 4,5-dihidroksi-2-heksanon: 5 mg/l po hidrolizi (Urin)	Ob koncu delovne izmene	2018-12-04

RO

Numele substanţei	Nr. CAS	Parametri de control	Timp de prelevare a probei	Adus la zi
Benzene	71-43-2	fenoli totali: 50 mg/l (Urină)	Sfârşit schimb	2018-08-17
		acid S-fenil-mercapturic: 25 µg/g creatinină (Urină)	Sfârşit schimb	2018-08-17
		Acid t,t muconic: 500 µg/g creatinină (Urină)	Sfârşit schimb	2018-08-17
n-Hexane	110-54-3	2,5 hexandionă: 5 mg/g creatinină (Urină)	Sfârşit schimb	2002-11-25

PT

Nome da substância	No. CAS	Parâmetros de controlo	Tempo de amostra	Atualizada em
Benzene	71-43-2	Ácido s-fenilmercaptúrico: 25 µg/g creatinina Valor basal (Urina) Abrangido por legislação nacional específica ()	Fim do turno	2014-11-14
		Ácido t,t-mucónico: 500 µg/g creatinina Valor basal (Urina) Abrangido por legislação nacional específica ()	Fim do turno	2014-11-14
n-Hexane	110-54-3	2,5-Hexanodiona: 0,4 mg/l Sem hidrólise (Urina)	No final do turno e no final da semana de trabalho	2014-11-14

LV

Vielas nosaukums	CAS Nr.	Pārvaldības parametri	Parauga ņemšanas laiks	Precizējums
Benzene	71-43-2	fenolu: 25 µg/g kreatinīna (Urīns)	maiņas beigās nosaka	2007-05-18

IT

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

HU

Az anyag megnevezése	CAS szám	Ellenőrzési paraméterek	Mintavétel időpontja	Aktualizálás
Benzene	71-43-2	S-fenil-merkaptursav: 0.04 mg/g kreatinin (húgyhólyag)	A műszak végén	2020-02-06
		S-fenil-merkaptursav: 0.22 µmol/mmol kreatinin (kerekített értékek) (húgyhólyag)	A műszak végén	2020-02-06
n-Hexane	110-54-3	2,5-hexán-dion: 2 mg/l Hidrolízis után (húgyhólyag)	A műszak végén	2020-02-06
		2,5-hexán-dion: 18 µmol/l Hidrolízis után (húgyhólyag)	A műszak végén	2020-02-06

HR

Naziv tvari	CAS-br.	Nadzorni parametri	Vrijeme uzorkovanja	Ažurirati
Benzene	71-43-2	Benzen: 28 µg/l (Krv)	na kraju radne smjene	2018-10-12
		Benzen: 0.36 µmol/l (Krv)	na kraju radne smjene	2018-10-12
		S-fenilmerkapturna kiselina: 46 µg/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
		S-fenilmerkapturna kiselina: 21.7 µmol/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
n-Hexane	110-54-3	n-heksan: 1.74 µmol/l (Krv)	za vrijeme izloženosti	2018-10-12
		n-heksan: 150 µg/l (Krv)	za vrijeme izloženosti	2018-10-12
		n-heksan: 1.66 µmol/l (krajnje izdahnuti zrak)	za vrijeme izloženosti	2018-10-12
		n-heksan: 40 dijelova na milijun (krajnje izdahnuti zrak)	za vrijeme izloženosti	2018-10-12
		2-heksanol: 0.22 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) interferencija istodobne izloženosti metil etil-ketonu ()	na kraju radne smjene	2018-10-12

		2-heksanol: 0.2 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) interferencija istodobne izloženosti metil etil-ketonu ()	na kraju radne smjene	2018-10-12
		2,5-heksandion: 5.25 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) interferencija istodobne izloženosti metil etil-ketonu ()	na kraju radne smjene	2018-10-12
		2,5-heksandion: 5.3 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) interferencija istodobne izloženosti metil etil-ketonu ()	na kraju radne smjene	2018-10-12

ES

Nombre de la sustancia	No. CAS	Parámetros de control	Hora de muestreo	Puesto al día
Benzene	71-43-2	ácido t,t-mucónico: 2 mg/l Cuando el final de la exposición no coincida 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	2017-01-01
		ácido S-fenilmercaptúrico: 0.045 mg/g creatinina Cuando el final de la exposición no coincida 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	2017-01-01
n-Hexane	110-54-3	2,5-hexanodiona: 0,2 mg/l Significa 2,5-hexanodiona libre, es decir, sin conjugar. Esta sustancia es metabolito del n-hexano y de la metil-n-butilcetona. (Orina) Significa después de cuatro o cinco días consecutivos de trabajo con exposición, lo antes posible después del final de la última jornada, dado que los indicadores biológicos se eliminan con vidas medias superiores a las cinco horas. Estos indicadores se acumulan en el organismo durante la semana de trabajo, por lo tanto el momento de muestreo es crítico con relación a exposiciones anteriores. () Sin hidrólisis ()	Final de la semana laboral	2014-01-01

DE

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeitpunkt	Stand
Benzene	71-43-2	Benzol: 5 µg/l (Urin)	Äquivalenzwert zum Toleranz-konzentration: Expositionsende bzw. Schichtende	2019-03-29

		Benzol: 0,8 µg/l für Nichtraucher abgeleitet (Urin)	Äquivalenzwert zum Akzeptanz-konzentration: Expositionsende bzw. Schichtende	2019-03-29
		S-Phenylmerkaptursäure: 25 µg/g Kreatinin (Urin)	Äquivalenzwert zum Toleranz-konzentration: Expositionsende bzw. Schichtende	2019-03-29
		S-Phenylmerkaptursäure: 3 µg/g Kreatinin für Nichtraucher abgeleitet (Urin)	Äquivalenzwert zum Toleranz-konzentration: Expositionsende bzw. Schichtende	2019-03-29
		Trans, trans-Muconsäure: 500 µg/g Kreatinin (Urin)	Äquivalenzwert zum Toleranz-konzentration: Expositionsende bzw. Schichtende	2019-03-29
n-Hexane	110-54-3	2,5-Hexandion plus 4,5-Dihydroxy-2-hexanon: 5 mg/l Nach Hydrolyse (Urin)	Expositionsende, bzw. Schichtende	2013-09-19

CZ

Název látky	Č. CAS	Kontrolní parametry	Doba odběru vzorku	Aktualizace
Benzene	71-43-2	S- Fenylmerkapturová kyselina: 0.05 mg/g kreatininu (moč)	Konec směny	2013-04-22
		S- Fenylmerkapturová kyselina: 0.024 µmol/mmol kreatininu (moč)	Konec směny	2013-04-22
		t,t-mukonová kyselina: 1.5 mg/g kreatininu (moč)	Konec směny	2013-04-22
		t,t-mukonová kyselina: 1.2 µmol/mmol kreatininu (moč)	Konec směny	2013-04-22

CH

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeit punkt	Stand
Benzene	71-43-2	S-Phenylmerkaptursäure: 25 µg/g Kreatinin BAT-Werte von Arbeitsstoffen mit der Einstufung 'krebserzeugend' C1 und C2. (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	2016-01-01
		S-Phenylmerkaptursäure: 0.011 µmol/mmol Kreatinin BAT-Werte von Arbeitsstoffen mit der Einstufung 'krebserzeugend' C1 und C2. (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	2016-01-01

		t,t-Mukonsäure: 500 µg/g Kreatinin Provisorische Festlegung. Die BAT-Werte für diesen biologische Parameter sind aus verschiedenen Gründen noch nicht definitiv festgelegt. (Urin) BAT-Werte von Arbeitsstoffen mit der Einstufung 'krebserzeugend' C1 und C2. () 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	2016-01-01
		t,t-Mukonsäure: 0.398 µmol/mmol Kreatinin Provisorische Festlegung. Die BAT-Werte für diesen biologische Parameter sind aus verschiedenen Gründen noch nicht definitiv festgelegt. (Urin) BAT-Werte von Arbeitsstoffen mit der Einstufung 'krebserzeugend' C1 und C2. () 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	2016-01-01
n-Hexane	110-54-3	2,5-Hexandion plus 4,5-Dihydroxy-2-hexanon: 5 mg/l 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)	Expositionsende, bzw. Schichtende	2005-01-01

BG

Наименование на веществото	CAS номер	Параметри на контрол	Време на взимане на пробата	Последна актуализация
Benzene	71-43-2	Trans, trans -муконова киселина: 2 mg/l (Урина)	В края на експозицията или в края на работната смяна	2007-08-17
		S-фенилмеркаптурова киселина: 0.045 mg/g креатинин (Урина)	В края на експозицията или в края на работната смяна	2007-08-17

AT

Stoffname	CAS-Nr.	Zu überwachende Parameter	Probennahmezeitpunkt	Stand

Benzene	71-43-2	t,t-Muconsäure: 1,6 mg/l (Urin)	Nach Ablauf einer Arbeitswoche/am Ende des Arbeitstages/am Schichtende	2014-02-18

DMEL

Benzene : End Use: Workers
Routes of exposure: Skin contact
Potential health effects: Chronic effects, Systemic effects
Value: 234 mg/kg

End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Chronic effects, Systemic effects
Value: 3,25 mg/m3

End Use: Consumers
Routes of exposure: Skin contact
Potential health effects: Chronic effects, Systemic effects
Value: 0,234 mg/kg

End Use: Consumers
Routes of exposure: Inhalation
Potential health effects: Chronic effects, Systemic effects
Value: 0,00325 mg/m3
Derived minimal effect level
End Use: Consumer use
Routes of exposure: Ingestion
Potential health effects: Chronic effects, Systemic effects
Value: 0,00014 mg/kg
Derived minimal effect level

8.2

Exposure controls
Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. 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:. Self-contained breathing apparatus. 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. Safety glasses.

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.

SECTION 9: Physical and chemical properties

9.1

Information on basic physical and chemical properties

Appearance

Form	:	Gaseous
Physical state	:	Gaseous
Color	:	Colorless
Odor	:	Odorless

Safety data

Flash point	:	<-73°C (<-99°F)
Lower explosion limit	:	4,0 %(V)
Upper explosion limit	:	61,0 %(V)
Molecular formula	:	UVCB
pH	:	Not applicable
Melting point/range	:	Not applicable
Freezing point		Not applicable
Boiling point/boiling range	:	Not applicable
Vapor pressure	:	> 100,00 PSI
Relative density	:	0,2 estimated
Density	:	0,2 mg/m3
Water solubility	:	Insoluble
Relative vapor density	:	0,7

Percent volatile : 4,5 %

SECTION 10: Stability and reactivity

10.1

Reactivity : May react violently or explosively with halogens.

10.2

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

10.3

Possibility of hazardous reactions

Hazardous reactions : 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

AROMAX® HYDROGEN STREAM S-CHEM

Acute oral toxicity : Negligible or unlikely exposure pathways

Acute inhalation toxicity

Hydrogen : Substance is a simple asphyxiant that may create an atmosphere deficient in oxygen. Available oxygen in the range of 19.5 percent to 23 percent by volume must be present.

Ethane Substance is a simple asphyxiant that may create an atmosphere deficient in oxygen. Available oxygen in the range of 19.5 percent to 23 percent by volume must be present.

Methane	Substance is a simple asphyxiant that may create an atmosphere deficient in oxygen. Available oxygen in the range of 19.5 percent to 23 percent by volume must be present.
Propane	LC50: > 800000 ppm Exposure time: 15 min Species: Rat Test atmosphere: gas
n-Butane	LC50: 658 mg/l Exposure time: 4 h Species: Rat Test atmosphere: vapor
Benzene	LC50: 44,5 mg/l Exposure time: 4 h Species: Rat Sex: Not Specified Test atmosphere: vapor
n-hexane	LC50: 73860 ppm Exposure time: 4 h Species: Rat Sex: male Test atmosphere: vapor Method: OECD Test Guideline 403 Information given is based on data obtained from similar substances.

AROMAX® HYDROGEN STREAM S-CHEM
Acute dermal toxicity : Negligible or unlikely exposure pathways

AROMAX® HYDROGEN STREAM S-CHEM
Skin irritation : May irritate skin.

AROMAX® HYDROGEN STREAM S-CHEM
Eye irritation : Vapors may cause irritation to the eyes, respiratory system and the skin.

AROMAX® HYDROGEN STREAM S-CHEM
Sensitization : No adverse effects expected. Information refers to the main ingredient.

Repeated dose toxicity

Ethane	: Species: Rat, Male and female Sex: Male and female Application Route: Inhalation Dose: 0, 1600, 5000, 16000 ppm Exposure time: 6 weeks Number of exposures: 6 hours/day, 7 days/week NOEL: 16000 ppm Test substance: yes Method: OECD Guideline 422
Propane	Species: Monkey Application Route: Inhalation

	Dose: 0, 750 ppm Exposure time: 90 day Number of exposures: daily NOEL: > 750 ppm
n-Butane	Species: Rat, Male and female Sex: Male and female Application Route: Inhalation Dose: 0, 1017, 4489 ppm Exposure time: 90 day Number of exposures: 6 hr/d, 5 d/wk NOEL: 4489 ppm
Benzene	Species: Rat, female Sex: female Application Route: oral gavage Dose: 0, 25, 50, 100 mg/kg Exposure time: 103 wk Number of exposures: 5 d/wk NOEL: < 25 mg/kg Lowest observable effect level: 25 mg/kg
	Species: Rat, male Sex: male Application Route: oral gavage Dose: 0, 50, 100, 200 mg/kg Exposure time: 103 wk Number of exposures: 5 d/wk NOEL: < 50 mg/kg Lowest observable effect level: 50 mg/kg
	Species: Mouse Application Route: oral gavage Dose: 0, 25, 50,100 mg/kg Exposure time: 103 wk NOEL: < 25 mg/kg
n-hexane	Species: Rat, male Sex: male Application Route: Inhalation Dose: 3,000 ppm Exposure time: 16 wks Number of exposures: 12 h/d Lowest observable effect level: 3,000 ppm Target Organs: Peripheral nervous system

Species: Mouse, female
Sex: female
Application Route: Inhalation
Dose: 500, 1,000, 4,000, 10,000 ppm
Exposure time: 13 wks
Number of exposures: 6h or 22h (1,000 ppm)/ 5d/wk
Lowest observable effect level: 500 ppm
Target Organs: Nose

Species: Mouse, male
Sex: male
Application Route: Inhalation
Dose: 500, 1,000, 4000, 10,000 ppm
Exposure time: 13 wks
Number of exposures: 6h or 22h (1,000 ppm)/d, 5d/wk
NOEL: 500 ppm
Lowest observable effect level: 1,000 ppm
Target Organs: Nose

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 568, 1,135, 3,973 mg/kg bw/day
Exposure time: 90 or 120 days
Number of exposures: Daily or 5d/wk (120-d study)
NOEL: 568 mg/kg bw/day
Lowest observable effect level: 1135 mg/kg bw/day

Genotoxicity in vitro

Propane	:	Test Type: Ames test Result: negative
n-Butane		Test Type: Ames test Result: negative
Benzene		Test Type: Ames test Result: negative Test Type: Cytogenetic assay Result: positive Test Type: Mouse lymphoma assay Result: positive Test Type: Sister Chromatid Exchange Assay Result: negative
n-hexane		Test Type: Ames test Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: Positive results were obtained in some in vitro tests.

Genotoxicity in vivo

Benzene	:	Test Type: Mouse micronucleus assay Result: positive
n-hexane		Test Type: Dominant lethal assay Species: Mouse Dose: 100 and 400 ppm Result: negative Test Type: Cytogenetic assay Species: Rat Dose: 900, 3000, 9000 ppm Result: negative

Carcinogenicity

Benzene	:	Species: Rat Sex: female Dose: 0, 25, 50, 250 mg/kg Exposure time: 103 wks Number of exposures: daily, 5 days/week Test substance: yes Remarks: zymbal gland carcinomas, squamous cell papillomas Species: Rat Sex: male Dose: 0, 50, 100, 200 mg/kg Exposure time: 103 wks Number of exposures: daily, 5 days/week Test substance: yes Remarks: zymbal gland carcinomas, squamous cell papillomas Species: Mouse Sex: male and female Dose: 25, 50, 100 mg/kg Exposure time: 103 wks Number of exposures: daily, 5 days/week Test substance: yes Remarks: Clear evidence of multiple organ carcinogenicity.
n-hexane		Species: Rat Dose: 0.043, 900, 3,000, 9,016 ppm Exposure time: 2 yrs Number of exposures: 6 h/d, 5 d/wk Remarks: No evidence of carcinogenicity, Information given is based on data obtained from similar substances.

Species: Mouse
Sex: male and female
Dose: 0.039, 900, 3,000, 9,018 ppm
Exposure time: 2 yrs
Number of exposures: 6 h/d, 5 d/wk
Remarks: No evidence of carcinogenicity, Information given is based on data obtained from similar substances.

Reproductive toxicity

Ethane : Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 1600, 5000, 16000 ppm
Exposure time: 6 weeks
Number of exposures: 6 hours/day, 7 days/week
Test period: 6 weeks
Test substance: yes
Method: OECD Guideline 422
NOAEL Parent: 16000 ppm
NOAEL F1: 16000 ppm
no abnormalities observed

Propane Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 1200, 4000, 12000 ppm
Exposure time: 6 weeks
Number of exposures: 6 hours/day, 7 days/week
Test period: 6 weeks
Test substance: yes
Method: OECD Guideline 422
NOAEL Parent: 12000 ppm
NOAEL F1: 12000 ppm

n-hexane Species: Rat
Sex: male
Application Route: Inhalation
Dose: 5,000 ppm
Number of exposures: 16 hr/d, 6 d/wk
Test period: 6 wks
permanent testicular damage characterized by loss of germ-cell line

Developmental Toxicity

n-hexane : Species: Rat
Application Route: Inhalation
Dose: 200, 1,000, 5,000 ppm
Number of exposures: 20 hr/d, daily
Test period: GD 6-20
NOAEL Teratogenicity: 200 ppm
NOAEL Maternal: 200 ppm

Species: Mouse
Application Route: Inhalation
Dose: 200, 1,000, 5,000 ppm
Number of exposures: 20 hr/d, daily
Test period: GD 6-17
NOAEL Maternal: 1,000 ppm

AROMAX® HYDROGEN STREAM S-CHEM
Aspiration toxicity : No aspiration toxicity classification.

CMR effects

Ethane : Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: In vitro tests did not show mutagenic effects
Teratogenicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.
Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

Propane Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: In vitro tests did not show mutagenic effects
Teratogenicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.
Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

n-Butane Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: Weight of evidence does not support classification as a germ cell mutagen.
Teratogenicity: Not available
Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

Benzene Carcinogenicity: Human carcinogen.
Mutagenicity: In vivo tests showed mutagenic effects
Teratogenicity: Did not show teratogenic effects in animal experiments.
Reproductive toxicity: Animal testing did not show any effects on fertility.

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

AROMAX® HYDROGEN STREAM S-CHEM
Further information : No data available.

SECTION 12: Ecological information

12.1

Toxicity

Toxicity to fish

Benzene	:	LC50: 5,3 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) flow-through test Test substance: yes Method: OECD Test Guideline 203
n-hexane		LL50: 12,51 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates

Benzene	:	EC50: 10 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Test substance: yes Method: OECD Test Guideline 202
n-hexane		EL50: 21,85 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Method: QSAR modeled data

Toxicity to algae

Benzene	:	ErC50: 100 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae) Test substance: yes Method: OECD Test Guideline 201
n-hexane		EL50: 9,29 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae) Method: QSAR modeled data

12.2

Persistence and degradability

Biodegradability	:	No data available

12.3

Bioaccumulative potential

Elimination information (persistence and degradability)

Bioaccumulation	:	This material is not expected to bioaccumulate. Information refers to the main ingredient.

12.4

Mobility in soil

Mobility

Ethane	:	No data available
n-Butane	:	The product evaporates readily.
Benzene	:	No data available

12.5

Results of PBT and vPvB assessment

Results of PBT assessment	:	This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). 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

Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Harmful to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

Ethane	:	This material is not expected to be harmful to aquatic organisms.
Propane	:	This material is not expected to be harmful to aquatic organisms.
Benzene	:	Toxic to aquatic life.
n-hexane	:	Toxic to aquatic life.

Long-term (chronic) aquatic hazard

Ethane	:	This material is not expected to be harmful to aquatic organisms.
Propane	:	This material is not expected to be harmful to aquatic organisms.
Benzene	:	Harmful to aquatic life with long lasting effects.
n-hexane	:	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.

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.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE), 2.1, RQ (BENZENE)

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE), 2.1, (<-73°C), MARINE POLLUTANT, (N-HEXANE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE), 2.1

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

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE), 2.1, (B/D), ENVIRONMENTALLY HAZARDOUS, (N-HEXANE)

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

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE), 2.1, ENVIRONMENTALLY HAZARDOUS, (N-HEXANE)

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

UN1964, HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S., (HYDROGEN, ETHANE),

2.1, ENVIRONMENTALLY HAZARDOUS, (N-HEXANE)

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)

15.2

Major Accident Hazard Legislation : ZEU_SEVES3 Update:
FLAMMABLE GASES
P2
Quantity 1: 10 t
Quantity 2: 50 t

: ZEU_SEVES3 Update:
Hydrogen
15
Quantity 1: 5 t
Quantity 2: 50 t

: ZEU_SEVES3 Update:
Liquefied extremely flammable gases (including LPG) and natural gas
18
Quantity 1: 50 t
Quantity 2: 200 t

: ZEU_SEVES3 Update:
Petroleum products: (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams),(d) heavy fuel oils (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d)
34
Quantity 1: 2.500 t
Quantity 2: 25.000 t

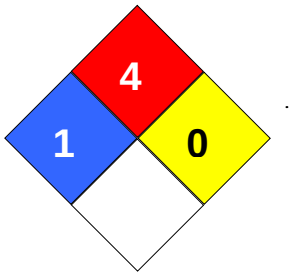
Notification status

Europe REACH	:	Not in compliance with the inventory
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 AIIC	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	Not in compliance with the inventory
Korea KECI	:	Not in compliance with the inventory
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: 1
Fire Hazard: 4
Reactivity Hazard: 0



Further information

Legacy SDS Number : 7126

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.

H220	Extremely flammable gas.
H225	Highly flammable liquid and vapor.
H280	Contains gas under pressure; may explode if heated.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361f	Suspected of damaging fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.