

Version 2.0

Revision Date 2011-03-03

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product information

 Trade name
 :
 PRF Isooctane

 Material
 :
 1020572, 1020570, 1020569, 1031133, 1020567, 1020571

EC-No.Registration number

Chemical Name	CAS-No. Index-No.	Registration number
2,2,4-Trimethylpentane (Isooctane)	540-84-1 601-009-00-8	01-2119457965-22-0002
Relevant Identified Uses Supported	Use a	ulation as a fuel - industrial as a fuel – professional
Company	Speci 1000	ron Phillips Chemical Company LP alty Chemicals 1 Six Pines Drive Voodlands, TX 77380
Local	Bruss	ron Phillips Chemicals International N.V. elsesteenweg 355 30 Overijse um
	Techi Resp	S Requests: (800) 852-5530 nical Information: (832) 813-4862 onsible Party: Product Safety Group :msds@cpchem.com
Emergency telephone:	1	
Health : 866.442.9628 (North 1.832.813.4984 (Inte		
Asia: +800 CHEMCA EUROPE: BIG +32.1 Chemcare Asia: Tel:	LL (+800 2436 4.584545 (pho +65 6848 9048	4.9300 or 703.527.3887 2255) China: 0532.8388.9090 ne) or +32.14583516 (telefax) 3 - Mob: +65 8382 9188 - Fax: +65 6848 razil: 0800.111.767 Outside Brazil: +55.19.3467.1600
		uct Safety and Toxicology Group
Responsible Departmen E-mail address Website		S@CPChem.com CPChem.com

Version 2.0

MATERIAL SAFETY DATA SHEET

Revision Date 2011-03-03

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 2 Skin irritation, Category 2 Specific target organ systemic toxicity single exposure, Category 3 Aspiration hazard, Category 1

Acute aquatic toxicity, Category 1 Chronic aquatic toxicity, Category 1

Classification (67/548/EEC, 1999/45/EC)

Highly flammable Harmful

Irritant Dangerous for the environment H225: Highly flammable liquid and vapor. H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H304: May be fatal if swallowed and enters airways. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long lasting effects.

R11: Highly flammable.
R65: Harmful: may cause lung damage if swallowed.
R38: Irritating to skin.
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R67: Vapors may cause drowsiness and dizziness.

Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms		
Signal Word	: Danger	• • •
Hazard Statements	: H225 H304	Highly flammable liquid and vapor. May be fatal if swallowed and enters airways.
	H315 H336 H410	Causes skin irritation. May cause drowsiness or dizziness. Very toxic to aquatic life with long lasting effects.
Precautionary Statements	: Prevention:	
	P210	Keep away from heat/sparks/open flames/hot surfaces No smoking.
	P233	Keep container tightly closed.
	P240	Ground/bond container and receiving equipment.
	P243	Take precautionary measures against stat discharge.
	P273	Avoid release to the environment.
	P280	Wear protective gloves/ protective clothing eye protection/ face protection.
	Response:	
	P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
	P303 + P361	
OS Number:100000068258		2/33

F Isooctane			MATERIAL SAF	EIY DATA SHE
rsion 2.0			Revisio	on Date 2011-03
	P331 Stora	+ P340 IF IN and I for b Do N ge: + P235 Store sal: Dispe	e skin with water/ showe IHALED: Remove victim keep at rest in a position reathing. IOT induce vomiting. e in a well-ventilated pla ose of contents/ contain oved waste disposal pla	to fresh air n comfortable ce. Keep cool. er to an
Hazardous ingredients v • 540-84-1	2,2,4-Trimethy	pentane (Isooctar	ne)	
OMPOSITION/INFORM	ATION ON ING	REDIENTS		
Synonyms	ASTM Isooct Isooct	ane (ASTM Grade		
Molecular formula	: C8H18	3		
Mixtures Hazardous ingredients	s			
Chemical Name	CAS-No. EINECS-No.	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1	F; R11 Xn; R65 Xi; R38 R67 N; R50-R53	Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Flam. Liq. 2; H225 Skin Irrit. 2; H315 STOT SE 3; H336	99 - 100
EC-No.Registration nu	umber			
Chemical Name	CAS-No. EINECS-No.		Registration number	
2,2,4-Trimethylpentane (Isooctane)	540-84-1 208-759-1	01-2119457965		
For the full text of the R For the full text of the H				
IRST AID MEASURES				
DS Number:1000000682	58		3/33	

RF Isooctane		MATERIAL SAFETY DATA SHEE
ersion 2.0		Revision Date 2011-03-0
General advice	:	Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Symptoms of poisoning may only appear several hours later. Do not leave the victim unattended.
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	:	Keep respiratory tract clear. Do NOT induce vomiting. 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.
FIRE-FIGHTING MEASURES		
Flash point	:	-12,22 °C (10,00 °F) estimated
Autoignition temperature	:	411 °C (772 °F)
Suitable extinguishing media	:	Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self contained breathing apparatus for fire fighting 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 an open flame or any other 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.
Hazardous decomposition products	:	Hydrocarbons. Carbon oxides.
SDS Number:100000068258		4/33

MATERIAL SAFETY DATA SHEET

Version 2.0

Revision Date 2011-03-03

A-Trimethylpentane (Isooctane) Manufacturer TWA 300 ppm, neosat Peruste Arvo Valvontaa koskevat muuttujat Nota	AL RELEASE MEASURES	
Personnel to safe areas. Beware of vapors accumulating tom explosive concentrations. Vapors can accumulate in tareas. Environmental precautions : Prevent product from entering drains. Prevent further leak or spillage if safe to do so. If the product contaminates rive and lakes or drains inform respective authorities. 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). HANDLING AND STORAGE		
or spillage if safe to do so. If the product contaminates rive and lakes or drains inform respective authorities. Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, verniculite) and place in container for disposal according to local / national regulations (see section 13). IANDLING AND STORAGE : Avoid formation of aerosol. Do not breathe vapors/dust. A contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibit in the application area. Take precautionary measures aga static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content m be under pressure. Dispose of rinse water in accordance local and national regulations. Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). only explosion-proof equipment. Keep away from open flam to surfaces and sources of ignition. Storage : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety stand EXPOSURE CONTROLS/PERSONAL PROTECTION Ingredients with workplace control parameters word Phillips Chemical Company LP Manufacturer 104/2 recesat Peruste Arvo Valvontaa koskevat N	personi form ex	nel to safe areas. Beware of vapors accumulating to
absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). ANDLING AND STORAGE Handling Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. A contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibi in the application area. Take precautionary measures aga static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content m be under pressure. Dispose of rinse water in accordance a local and national regulations. Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors), only explosion-proof equipment. Keep away from open flam hot surfaces and sources of ignition. Storage : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety stander control surfaces control parameters Vron Phillips Chemical Company LP red redients Basis Value Control parameters variational Walvontaa koskevat Nota	or spilla	age if safe to do so. If the product contaminates rivers
Handling Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. A contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibit in the application area. Take precautionary measures aga static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content m be under pressure. Dispose of rinse water in accordance to local and national regulations. Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). only explosion-proof equipment. Keep away from open flate ot surfaces and sources of ignition. Storage : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standed to be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standed to be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standed to be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standed to be predicted to be accomply with the technological safety standed to be accomply with th	absorbe	ent material, (e.g. sand, earth, diatomaceous earth, ulite) and place in container for disposal according to
Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. A contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibit in the application area. Take precautionary measures aga static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content m be under pressure. Dispose of rinse water in accordance to local and national regulations. Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). only explosion-proof equipment. Keep away from open flam to surfaces and sources of ignition. Storage : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standed to technological safety standed to the technological safety standed	AND STORAGE	
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against fire and explosion material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). only explosion-proof equipment. Keep away from open fla hot surfaces and sources of ignition. Storage Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standard the technological safety	contact section in the a static d exhaus be unde	with skin and eyes. For personal protection see 8. Smoking, eating and drinking should be prohibited pplication area. Take precautionary measures against ischarges. Provide sufficient air exchange and/or t in work rooms. Open drum carefully as content may er pressure. Dispose of rinse water in accordance with
Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and we ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / workin materials must comply with the technological safety standares EXPOSURE CONTROLS/PERSONAL PROTECTION Ingredients with workplace control parameters vron Phillips Chemical Company LP redients Basis (4-Trimethylpentane (Isooctane) Manufacturer TWA 300 ppm.	e and explosion materia dischar only ex	I. Take necessary action to avoid static electricity ge (which might cause ignition of organic vapors). Use plosion-proof equipment. Keep away from open flames,
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Ingredients with workplace control parameters vron Phillips Chemical Company LP gredients Basis Value Control parameters Note 2,4-Trimethylpentane (Isooctane) Manufacturer TWA 300 ppm, Image: Control parameters Note neosat Peruste Arvo Valvontaa koskevat muuttujat Nota	CONTROL S/DEDSONAL DD	OTECTION
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2,4-Trimethylpentane (Isooctane) Manufacturer TWA 300 ppm, neosat Peruste Arvo Valvontaa koskevat Nota muuttujat		Value Control parameters Note
muuttujat		
muuttujat		
	Peruste	
		HTP-arvot 8h 300 ppm, 1.400 mg/m3
FI OEL HTP-arvot 15 min 380 ppm, 1.800 mg/m3	FIOEL	HTP-arvot 15 min 380 ppm, 1.800 mg/m3
DS Number:10000068258 5/33	10000000000	E/00

F Isooctane	
sion 2.0	Revision Date 2011-03
DNEL	: End Use: Workers Routes of exposure: Skin contact Potential health effects: Chronic effects, Systemic effects Value: 773 mg/kg
DNEL	 End Use: Workers Routes of exposure: Inhalation Potential health effects: Chronic effects, Systemic effects Value: 2035 mg/m3
Personal protective equip	ment
Hand protection	: The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	: Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	: Impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.
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	he Exposure Scenario in the Annex portion
HYSICAL AND CHEMICAL	PROPERTIES
Information on basic phys	sical and chemical properties
Appearance	
Form	: Liquid
Physical state Color Odor	: Liquid : Colorless : Mild
Color	: Colorless
Color Odor	: Colorless
Color Odor Safety data	: Colorless : Mild : -12,22 °C (10,00 °F)
Color Odor Safety data Flash point	 Colorless Mild -12,22 °C (10,00 °F) estimated
Color Odor Safety data Flash point Lower explosion limit	 : Colorless : Mild : -12,22 °C (10,00 °F) estimated : 1 %(V)
Color Odor Safety data Flash point Lower explosion limit Upper explosion limit	 : Colorless : Mild : -12,22 °C (10,00 °F) estimated : 1 %(V) : 7 %(V)
Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties	 Colorless Mild -12,22 °C (10,00 °F) estimated 1 %(V) 7 %(V) No
Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties Autoignition temperature	 Colorless Mild -12,22 °C (10,00 °F) estimated 1 %(V) 7 %(V) 7 %(V) No 411 °C (772 °F)
Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties Autoignition temperature Molecular formula	 Colorless Mild -12,22 °C (10,00 °F) estimated 1 %(V) 7 %(V) 7 %(V) No 411 °C (772 °F) C8H18

	MATERIAL SAFETY DATA SHE
F Isooctane	Revision Date 2011-03
Pour point	: No data available
Boiling point/boiling range	: 99 °C (210 °F)
Vapor pressure	: 1,70 PSI at 37,8 °C (100,0 °F)
Water solubility	: Negligible
Partition coefficient: n- octanol/water	: No data available
Viscosity, kinematic	: 0,503 cSt at 20 °C (68 °F)
Relative vapor density	: 1 (Air = 1.0)
Evaporation rate	: 1
Percent volatile	: > 99 %
STABILITY AND REACTIVIT	V
STADILITY AND REACTIVITY	T
Possibility of hazardous rea	ctions
Conditions to avoid	: Heat, sparks, fire, and oxidizing agents.
Materials to avoid	: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Other data	 This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. No decomposition if stored and applied as directed.
TOXICOLOGICAL INFORMA	TION
I UNICOLOGICAL INFORMA	
Acute oral toxicity	
Acute oral toxicity 2.2.4-Trimethylpentane	: LD50: > 5.000 ma/ka
Acute oral toxicity 2,2,4-Trimethylpentane (Isooctane)	: LD50: > 5.000 mg/kg Species: rat
2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401
2,2,4-Trimethylpentane	Species: rat Sex: male and female
2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity 2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation : LC50: > 33,52 mg/l Exposure time: 4 HR
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity 2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation : LC50: > 33,52 mg/l Exposure time: 4 HR Species: rat Sex: male and female
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity 2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation : LC50: > 33,52 mg/l Exposure time: 4 HR Species: rat
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity 2,2,4-Trimethylpentane	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation : LC50: > 33,52 mg/l Exposure time: 4 HR Species: rat Sex: male and female
2,2,4-Trimethylpentane (Isooctane) Acute inhalation toxicity 2,2,4-Trimethylpentane (Isooctane)	Species: rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation : LC50: > 33,52 mg/l Exposure time: 4 HR Species: rat Sex: male and female

RF Isooctane	MATERIAL SAFETY DATA SHEE
/ersion 2.0	Revision Date 2011-03-03
(Isooctane)	Species: rabbit Sex: male and female Method: OECD Test Guideline 402
PRF Isooctane Skin irritation	: Irritating to skin.
PRF Isooctane Eye irritation	: No eye irritation
Sensitization	
2,2,4-Trimethylpentane (Isooctane)	: Does not cause skin sensitization.
Repeated dose toxicity	
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.
Reproductive toxicity	
2,2,4-Trimethylpentane (Isooctane)	: Species: rat 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
Teratogenicity	
2,2,4-Trimethylpentane (Isooctane)	: Species: rat Application Route: Inhalation Dose: 0, 400, 1200 ppm Number of exposures: 6h/d Test period: GD6-15 NOAEL Teratogenicity: 1200 ppm NOAEL Maternal: 1200 ppm
SDS Number:100000068258	8/33

RF Isooctane	
rsion 2.0	Revision Date 2011-03-0
	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
PRF Isooctane Aspiration toxicity	: May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.
CMR effects	
2,2,4-Trimethylpentane (Isooctane)	 Carcinogenicity: Not available 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.
PRF Isooctane Further information	: Solvents may degrease the skin.
Further information	
Further information ECOLOGICAL INFORMATIO	
Further information ECOLOGICAL INFORMATIO Toxicity to fish 2,2,4-Trimethylpentane	N : LC50: 0,11 mg/l Exposure time: 96 HR Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances.
Further information ECOLOGICAL INFORMATIO Toxicity to fish 2,2,4-Trimethylpentane (Isooctane)	N : LC50: 0,11 mg/l Exposure time: 96 HR Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances.
Further information ECOLOGICAL INFORMATIO Toxicity to fish 2,2,4-Trimethylpentane (Isooctane) Toxicity to daphnia and oth 2,2,4-Trimethylpentane	 N : LC50: 0,11 mg/l Exposure time: 96 HR Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances. informatic invertebrates. : EC50: 0,4 mg/l Exposure time: 48 HR Species: Daphnia magna (Water flea) static test Information given is based on data obtained from
Further information ECOLOGICAL INFORMATIO Toxicity to fish 2,2,4-Trimethylpentane (Isooctane) Toxicity to daphnia and oth 2,2,4-Trimethylpentane (Isooctane)	 N : LC50: 0,11 mg/l Exposure time: 96 HR Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances. informatic invertebrates. : EC50: 0,4 mg/l Exposure time: 48 HR Species: Daphnia magna (Water flea) static test Information given is based on data obtained from

PRF Isooctane	MATERIAL SAFETY DATA SHEE	
Version 2.0	Revision Date 2011-03-0	
	er aquatic invertebrates. (Chronic toxicity)	
2,2,4-Trimethylpentane (Isooctane)	: NOEC: 0,17 mg/l Exposure time: 21 D Species: Daphnia magna (Water flea)	
Bioaccumulation		
2,2,4-Trimethylpentane (Isooctane)	: Bioconcentration factor (BCF): 231 Method: Estimated based on individual component values.	
Biodegradability		
2,2,4-Trimethylpentane (Isooctane)	 Result: Not readily biodegradable. Method: OECD Test Guideline 301 Expected to be inherently biodegradable. Information given is based on data obtained from similar substances. 	
Further information on ecol	logy	
Results of PBT assessment	t	
2,2,4-Trimethylpentane	: Non-classified PBT substance, Non-classified vPvB substance	
(Isooctane) Additional ecological information	 An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects. 	
3. DISPOSAL CONSIDERATION	١S	
The information in this MSDS	pertains only to the product as shipped.	
may meet the criteria of a haz other State and local regulation regulated components may be	purpose or recycle if possible. This material, if it must be discarded, zardous waste as defined by US EPA under RCRA (40 CFR 261) or ons. Measurement of certain physical properties and analysis for e necessary to make a correct determination. If this material is ste, federal law requires disposal at a licensed hazardous waste	
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	
4. TRANSPORT INFORMATION	I	
	shown here are for bulk shipments only, and may not apply to kages (see regulatory definition).	
shipments in non-bulk pack	ages (see regulatory demittor).	

MATERIAL SAFETY DATA SHEET

Version 2.0

Revision Date 2011-03-03

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 MSDS and the bill of lading.

USDOT

UN1262, OCTANES, 3, II, RQ (2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IMO / IMDG

UN1262, OCTANES, 3, II, MP (2,2,4-TRIMETHYLPENTANE (ISOOCTANE)), RQ (2,2,4-TRIMETHYLPENTANE (ISOOCTANE)), (-12,22 °C)

ΙΑΤΑ

UN1262, OCTANES, 3, II

ADR

UN1262, OCTANES, 3, II

RID

UN1262, OCTANES, 3, II

15. REGULATORY INFORMATION

National legislation

Chemical Safety Assessment

2,2,4- trimethylpentane	A Chemical Safety Assessment has been carried out for this substance.	208-759-1
9a Quantity 1: 1	00 t	
7b Quantity 1: 5	.000 t	
US.TSCA : On the : On the	e inventory, or in compliance with the inventory, or in compliance with the	ne inventory ne inventory ne inventory ne inventory ne inventory ne inventory ne inventory
	11/33	
	trimethylpentane : 96/82/EC Dangerous fo 9a Quantity 1: 1 Quantity 2: 2 : 96/82/EC Highly flamm 7b Quantity 1: 5 Quantity 1: 5 Quantity 2: 5 US.TSCA : On the : On the	trimethylpentane has been carried out for this substance. : 96/82/EC Update: 2003 Dangerous for the environment 9a Quantity 1: 100 t Quantity 2: 200 t : 96/82/EC Update: 2003 Highly flammable 7b Quantity 1: 5.000 t Quantity 2: 50.000 t : On the inventory, or in compliance with th : On the inventory, or in compliance with th

Version 2.0

MATERIAL SAFETY DATA SHEET

Revision Date 2011-03-03

16. OTHER INFORMATION

NFPA Classification	: Health Hazard: 2 Fire Hazard: 3 Reactivity Hazard: 0
Further information Legacy MSDS Number	: 26040
Significant changes since previous versions.	the last version are highlighted in the margin. This version replaces all
The information in this MS	SDS pertains only to the product as shipped.
	based on the data of which we are aware and is believed to be correct this information may be applied under conditions beyond our control

as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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

MATERIAL SAFETY DATA SHEET

Version 2.0

Revision Date 2011-03-03

Revision Date 2011-03-0	3
Information System	ī
Lethal Dose 50%	1
of R-phrases referred to under sections 2 and 3	
Highly flammable.	
Irritating to skin.	
Very toxic to aquatic organisms.	
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.	
May cause long-term adverse effects in the aquatic environment.	
of H-Statements referred to under sections 2 and 3.	
Highly flammable liquid and vapor.	
May be fatal if swallowed and enters airways.	
Causes skin irritation.	
May cause drowsiness or dizziness.	
Very toxic to aquatic life.	
	Lethal Dose 50% Information System of R-phrases referred to under sections 2 and 3 Highly flammable. Irritating to skin. Very toxic to aquatic organisms. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause long-term adverse effects in the aquatic environment. of H-Statements referred to under sections 2 and 3. Highly flammable liquid and vapor. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause drowsiness or dizziness.

H410 Very toxic to aquatic life with long lasting effects.

MSDS Number:100000068258

Version 2.0

MATERIAL SAFETY DATA SHEET

Revision Date 2011-03-03

Annex	
I. Short title of Exposure Scenario: Fo	rmulation
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 PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting; PROC15: Use as laboratory reagent
Environmental release category Further information	 ERC2: Formulation of preparations Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
preparations	ERC2: Formulation of
Product characteristics Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 100 % (unless stated differently)
(Msafe)	: 900 tonnes/day
Environment factors not influenced Flow rate	by risk management : 18.000 m3/d
Dilution Factor (River) Dilution Factor (Coastal Areas)	: 10 : 100
Other given operational conditions Continuous use/release	affecting environmental exposure : 300
Number of emission days per year Emission or Release Factor: Air	: 300 : 2,5 %
MSDS Number:100000068258	14/33

PRF Isooctane	
Version 2.0	Revision Date 2011-03-0
Emission or Release Factor: Water Emission or Release Factor: Soil	: 0,002 % : 0,01 %
Technical conditions and measures	
Air	 Treat air emission to provide the required removal efficiency of (%): (Effectiveness: 0 %)
Water	 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 61,8 %)
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 ≥ (%): (Effectiveness: 0 %)
Remarks	: If discharging to domestic sewage treatment plant, no onsite
Remarks	wastewater treatment required.Prevent discharge of undissolved substance to or recover
	from wastewater.
Remarks	: Do not apply industrial sludge to natural soils.
Remarks	: Sludge should be incinerated, contained or reclaimed.
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	: 2.000 m3/d
plant effluent	
	: 96,3 %
Percentage removed from waste water	: 96,3 %
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations.
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with
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water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with Covers percentage substance in the product up to 100 % (unless stated differently)
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water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance
water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Illing worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa
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water Conditions and measures related to Waste treatment Conditions and measures related to Recovery Methods 2.2 Contributing scenario contro closed process, no likelihood of occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Frequency and duration of use Remarks	 external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations. Iling worker exposure for: PROC1, PROC2: Use in exposure, Use in closed, continuous process with Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa No limit Covers daily exposures up to 8 hours (unless stated differently)
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MATERIAL SAFETY DATA SHEET

Version 2.0

Revision Date 2011-03-03

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 Concentration of the Substance in : Covers percentage substance in the product up to 100 % (unless stated differently) Mixture/Article : Liquid substance Physical Form (at time of use) Vapor pressure : 2,8 kPa Amount used : No limit Remarks 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., 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 Concentration of the Substance in : Covers percentage substance in the product up to 100 % (unless stated differently) Mixture/Article Physical Form (at time of use) : Liquid substance Vapor pressure : 2,8 kPa Amount used : No limit Remarks Frequency and duration of use Remarks : Covers daily exposures up to 8 hours (unless stated MSDS Number:10000068258 16/33

PRF Isooctane	MATERIAL SAFETY DATA SHEET
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Version 2.0	Revision Date 2011-03-03
	differently)
Other operational conditions affecti Remarks	 ing workers exposure Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.
No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they	t /limit releases, dispersion and exposure bid direct skin contact with product. Identify potential areas for rested to EN374) if hand contact with substance likely. Clean up occur. Wash off any skin contamination immediately. Provide basic ise exposures and to report any skin problems that may develop.
	olling worker exposure for: : PROC 5: Mixing or blending on of preparations and articles (multistage and/or
Product characteristics	
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 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 affecti Remarks	 ing workers exposure Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.
No specific measures identified., Aver indirect skin contact. Wear gloves (t contamination/spills as soon as they employee training to prevent / minim Conditions and measures related to	t /limit releases, dispersion and exposure bid direct skin contact with product. Identify potential areas for rested to EN374) if hand contact with substance likely. Clean up occur. Wash off any skin contamination immediately. Provide basic rise exposures and to report any skin problems that may develop.
Wear suitable gloves tested to EN37	'4 .
	olling worker exposure for: : PROC8b: Transfer of ing/discharging) from/to vessels/large containers at
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa
Amount used	
Remarks	: No limit

	MATERIAL SAFETY DATA SHEET
PRF Isooctane Version 2.0	Revision Date 2011-03-03
Version 2.0	
Frequency and duration of use Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affect Remarks	 ting workers exposure 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 Use drum pumps or carefully pour fr emissions occur.	s rom container., Provide extraction ventilation at points where
Avoid direct skin contact with produc (tested to EN374) if hand contact wi	At /limit releases, dispersion and exposure ct. Identify potential areas for indirect skin contact. Wear gloves ith substance likely. Clean up contamination/spills as soon as they tion immediately. Provide basic employee training to prevent / ny skin problems that may develop.
Conditions and measures related to Wear suitable gloves tested to EN37	o personal protection, hygiene and health evaluation 74.
substance or preparation (charge dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article	 olling worker exposure for: PROC8b: Transfer of ging/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently)
Physical Form (at time of use) Vapor pressure Amount used	: Liquid substance : 2,8 kPa
Remarks	: No limit
Frequency and duration of use Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affect Remarks	 ting workers exposure 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 Use drum pumps or carefully pour fr emissions occur.	standard of occupational hygiene is implemented.
Use drum pumps or carefully pour fr emissions occur. Organizational measures to preven Avoid direct skin contact with produc (tested to EN374) if hand contact wi	standard of occupational hygiene is implemented. s rom container., Provide extraction ventilation at points where ht /limit releases, dispersion and exposure ct. Identify potential areas for indirect skin contact. Wear gloves ith substance likely. Clean up contamination/spills as soon as they tion immediately. Provide basic employee training to prevent /
Use drum pumps or carefully pour fr emissions occur. Organizational measures to preven Avoid direct skin contact with produc (tested to EN374) if hand contact wi occur. Wash off any skin contaminat minimise exposures and to report ar	standard of occupational hygiene is implemented. s rom container., Provide extraction ventilation at points where ht /limit releases, dispersion and exposure ct. Identify potential areas for indirect skin contact. Wear gloves ith substance likely. Clean up contamination/spills as soon as they tion immediately. Provide basic employee training to prevent / ny skin problems that may develop. o personal protection, hygiene and health evaluation

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Version 2.0

PROC3, CS136

MSDS Number:100000068258

ECETOC TRA

Revision Date 2011-03-03

0,058

0,069

MATERIAL SAFETY DATA SHEET

substance or weighing), Pr	preparation int	o small cont tures or arti	rker exposure for: ainers (dedicated cles by tabletting,	filling line, inc	luding
Mixture/Articl	n of the Substance le m (at time of use)	(unle:	rs percentage substa ss stated differently) d substance Pa	nce in the produc	ct up to 100 %
Amount used Remarks		: No lir	nit		
Frequency and Remarks	d duration of use	: Cove differ	rs daily exposures up ently)	to 8 hours (unle	ss stated
Other operatio Remarks	nal conditions af	: Assur temp	ers exposure mes use at not more erature, unless stated ard of occupational h	d differently., Ass	umes a good basic
indirect skin c contamination employee trai	ontact. Wear glov	es (tested to E they occur. Wa inimise expos	skin contact with proc N374) if hand contac ash off any skin conta ures and to report an its source	t with substance	likely. Clean up ately. Provide basic
Workers					
Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15,	ECETOC TRA		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	ECETOC TRA		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		Worker – inhalation, long-term – systemic	116,79 mg/m3	0,057
			Worker – dermal, long- term – systemic	0,34 mg/kg/d	0,000

term – systemic Worker – long-term –

systemic Combined routes

Worker - inhalation,

long-term – systemic

19/33

140,15 mg/m3

PRF Isooctane

Version 2.0

Revision Date 2011-03-03

Iong-term – systemic Iong-term – systemic Worker – dermal, long- term – systemic 6,86 mg/kg/d 0,009 Worker – long-term – systemic Combined routes 0,055 PROC15, CS36 ECETOC TRA Worker – inhalation, long-term – systemic 46,72 mg/m3 0,023 Worker – dermal, long- term – systemic 0,34 mg/kg/d 0,000 0,000 Vorker – long-term – systemic 0,023 0,023 Worker – long-term – systemic 0,023 0,023 PROC8b, CS14 ECETOC TRA Worker – inhalation, long-term – systemic 233,58 mg/m3 0,115 PROC8b, CS14 ECETOC TRA Worker – dermal, long- term – systemic 1,372 mg/kg/d 0,002 Worker – long-term – systemic systemic Combined routes 0,117 0,117	version 2.0			Revisio	1 Date 2011-03-03
Worker - long-term - systemic Combined routes 0.069 PROC4, CS16 ECETOC TRA Worker - implation, long-term - systemic 0.046 Worker - demail, long 0.86 mg/kg/d 0.099 Worker - long-term 0.86 mg/kg/d 0.0055 PROC15, CS38 ECETOC TRA Worker - long-term 0.023 Worker - long-term 0.34 mg/kg/d 0.000 1000 PROC15, CS38 ECETOC TRA Worker - long-term 0.34 mg/kg/d 0.002 PROC38, CS14 ECETOC TRA Worker - long-term 0.023 0.023 PROC38, CS14 ECETOC TRA Worker - long-term 0.023 0.023 PROC38, CS14 ECETOC TRA Worker - long-term 0.031 0.016 Worker - long-term - systemic 1.372 mg/kg/d 0.002 0.023 PROC38, CS14 ECETOC TRA Worker - long-term 0.033 0.017 PROC4, CS8 ECETOC TRA Worker - long-term 0.031 0.001 Err Systemic Combined 0.117 0.033 0.033 0.033				0,34 mg/kg/d	0,000
PROC4. CS16 ECETOC TRA Worker - Imalation, Imageterm - systemic 93.43 mg/m3 0.046 Worker - dermal, long- term - systemic 0.055 0.009 0.055 PROC15, CS36 ECETOC TRA Worker - dermal, long- mathematics 0.88 mg/kg/d 0.000 PROC15, CS36 ECETOC TRA Worker - dermal, long- mathematics 0.34 mg/kg/d 0.000 PROC15, CS36 ECETOC TRA Worker - dermal, long- mathematics 0.34 mg/kg/d 0.000 Worker - dermal, long- mathematics 0.34 mg/kg/d 0.000 0.002 PROC8b, CS14 ECETOC TRA Worker - dermal, long- mathematics 0.115 PROC8b, CS14 ECETOC TRA Worker - dermal, long- mathematics 0.002 PROC8b, CS8 ECETOC TRA Worker - malation, Ing-term - systemic 0.117 Worker - malation, Ing-term - systemic 0.117 0.003 0.001 PROC8b, CS8 ECETOC TRA Worker - dermal, long- Worker - malation, Ing-term - systemic 0.004 PROC21: Use in closed process, no likelihood texposure 0.686 mg/kg/d 0.001 Worker - malation, Ing-term - systemic 0.004			Worker – long-term – systemic Combined		0,069
Worker - dermal, long- term - systemic 6.86 mg/kg/d 0.003 PROC15, CS36 ECETOC TRA Worker - long-term - systemic 0.055 PROC15, CS36 ECETOC TRA Worker - long-term - systemic 0.34 mg/kg/d 0.003 Image: the systemic combined routes 0.34 mg/kg/d 0.000 0.023 0.023 PROC8b, CS14 ECETOC TRA Worker - inhalation, routes 1.372 mg/kg/d 0.002 PROC8b, CS14 ECETOC TRA Worker - inhalation, routes 1.372 mg/kg/d 0.002 PROC8b, CS14 ECETOC TRA Worker - inhalation, routes 1.372 mg/kg/d 0.001 PROC8b, CS8 ECETOC TRA Worker - inhalation, routes 7.01 mg/m3 0.003 PROC2b, CS8 ECETOC TRA Worker - inhalation, routes 7.01 mg/m3 0.004 PROC2b, CS8 ECETOC TRA Worker - inhalation, routes 0.004 0.001 PROC2b, CS8 ECETOC TRA Worker - inhalation, routes 0.004 0.004 PROC21; Use in closed process, no likelihood of exposure Storage 0.004 0.004 0.004 Storage <td< td=""><td>PROC4, CS16</td><td>ECETOC TRA</td><td>Worker – inhalation,</td><td>93,43 mg/m3</td><td>0,046</td></td<>	PROC4, CS16	ECETOC TRA	Worker – inhalation,	93,43 mg/m3	0,046
PROC15, CS36 ECETOC TRA Worker - long-term - systemic 0.34 mg/kg/d 0.000 PROC15, CS36 ECETOC TRA Worker - inhalation, Worker - admail, long-term - systemic 0.34 mg/kg/d 0.000 PROC36, CS14 ECETOC TRA Worker - inhalation, systemic Costuned 0.34 mg/kg/d 0.000 PROC36, CS14 ECETOC TRA Worker - inhalation, systemic Costuned 0.34 mg/kg/d 0.002 PROC36, CS14 ECETOC TRA Worker - inhalation, worker - inhalation, term - systemic 1.372 mg/kg/d 0.002 PROC36, CS14 ECETOC TRA Worker - inhalation, worker - inhalation, 7.01 mg/m3 0.003 PROC36, CS8 ECETOC TRA Worker - inhalation, worker - long-term - systemic Combined routes 0.004 PROC48, CS8 ECETOC TRA Worker - inhalation, torm - systemic 0.004 PROC515: General exposures (closed systems) 5.002 0.004 Storage PROC21: Use in closed patch process (synthesis or formulation) CS21 Forcess sampling CS15: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS216: General exposures (closed systems) PROC4: Use in back hand other processes for formulation) CS216: General exposures (close			Worker – dermal, long-	6,86 mg/kg/d	0,009
PROC15_CS36 ECETOC TRA Worker - Inhalation, long-term - systemic 46.72 mg/m3 0.023 PROC35_CS36 ECETOC TRA Worker - Iong-term - systemic 0.024 0.000 PROC35_CS14 ECETOC TRA Worker - Iong-term - systemic 0.023 PROC35_CS14 ECETOC TRA Worker - Inhalation, Iong-term - systemic 0.021 PROC35_CS14 ECETOC TRA Worker - Inhalation, Iong-term - systemic 1.372 mg/kg/d 0.002 PROC35_CS8 ECETOC TRA Worker - Inhalation, Iong-term - systemic 1.372 mg/kg/d 0.003 PROC45_CS8 ECETOC TRA Worker - Iong-term - systemic Combined routes 0.011 1 PROC25_CS8 ECETOC TRA Worker - Iong-term - systemic Combined routes 0.003 PROC26_CS8 ECETOC TRA Worker - Iong-term - systemic Combined routes 0.004 PROC21_Use in closed process, no likelihood of exposure cS15: General exposures (closed systems) PROC22 Use in closed batch process (synthesis or formulation) CS21: Forcess sampling CS15: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS136: Eatch processes at elevated temperatures PROC4: Use in batch and other process (synthesis) where opportun			Worker – long-term – systemic Combined		0,055
Worker - demail, long- term - systemic 0.34 mg/kg/d 0.000 PROC8b, CS14 ECETOC TRA Worker - insplainton, long-term - systemic 0.115 PROC8b, CS14 ECETOC TRA Worker - insplainton, long-term - systemic 0.323, 58 mg/m3 0.115 PROC8b, CS14 ECETOC TRA Worker - insplainton, long-term - systemic 0.002 1.372 mg/kg/d 0.002 PROC8b, CS8 ECETOC TRA Worker - insplainton, routes 0.117 0.117 PROC8b, CS8 ECETOC TRA Worker - insplainton, routes 7.01 mg/m3 0.003 PROC11: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0.004 systemic Combined routes 0.004 PROC2: Use in closed, continuous process with occasional controlled exposure 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 blosed batch process (synthesis) where opportunity for exposure arises CS16: General exposures (closed systems) PROC15: Use as laboratory reagent CS36: Laboratory activities : PROC4: Use in blosed batch processes for formulation of preparations and articles (multistage and/or significant conta	PROC15, CS36	ECETOC TRA	Worker – inhalation,	46,72 mg/m3	0,023
Worker - long-term - systemic Combined rottes 0.023 PROC8b, CS14 ECETOC TRA Worker - inhalation, long-term - systemic 233.58 mg/m3 0.115 Image: Combined received and the systemic combined rottes 0.002 0.002 0.002 PROC8b, CS14 ECETOC TRA Worker - inhalation, rottes 7.01 mg/m3 0.003 PROC8b, CS8 ECETOC TRA Worker - inhalation, rottes 7.01 mg/m3 0.003 PROC8b, CS8 ECETOC TRA Worker - inhalation, rottes 7.01 mg/m3 0.003 PROC7: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0.686 mg/kg/d 0.004 PROC2: Use in closed, continuous process with occasional controlled exposure : Storage CS15: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS15: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS16: 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: Eaboratory activities : PROC45: Wing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) CS30: Mixing operations			Worker – dermal, long-	0,34 mg/kg/d	0,000
PROC8b, CS14 ECETOC TRA Worker - inhalation, ing-term - systemic 233,58 mg/m3 0,115 Worker - dermal, long- term - systemic 1,372 mg/kg/d 0,002 PROC8b, CS8 ECETOC TRA Worker - inhalation, ing-term - systemic 1,372 mg/kg/d 0,003 PROC8b, CS8 ECETOC TRA Worker - inhalation, ing-term - systemic 0,886 mg/kg/d 0,001 PROC11: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0,886 mg/kg/d 0,004 PROC2: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0,004 systemic Combined routes 0,004 PROC2: Use in closed, continuous process with occasional controlled exposure 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) CS16: 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 : PROC4: Use in batch and other processes for formulation of preparations and articles (multistage and/or significant contact) CS36: Laboratory activities :			Worker – long-term – systemic Combined		0,023
Worker - demail, long: 1,372 mg/kg/d 0,002 PROC8b, CS8 ECETOC TRA Worker - long-term - systemic Combined routes 0,117 PROC8b, CS8 ECETOC TRA Worker - long-term - systemic 0,686 mg/kg/d 0,003 Image: Ima	PROC8b, CS14	ECETOC TRA	Worker – inhalation,	233,58 mg/m3	0,115
Worker - long-term - long-term - long-term - systemic 0,117 PROC8b, CS8 ECETOC TRA Worker - long-term, - systemic 7,01 mg/m3 0,003 Image:			Worker – dermal, long-	1,372 mg/kg/d	0,002
PROC8b, CS8 ECETOC TRA Worker - inhatation, long-term - systemic 7.01 mg/m3 0.003 Worker - dermal, long- term - systemic 0.686 mg/kg/d 0.001 0.004 PROC1: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0.004 0.004 Storage PROC2: Use in closed, continuous process with occasional controlled exposure 0.004 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) CS15: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS16: General exposures (closed systems) PROC3: Use in closed batch process (synthesis or formulation) CS16: 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 CS30: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) CS30: Mixing operations (open systems) : PROC45: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS32: Transfer of substance or preparation (charging/discharging) from/to vessels/larg			Worker – long-term – systemic Combined		0,117
Worker - dermal, long- term - systemic 0,686 mg/kg/d 0,001 PROC1: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) 0,004 PROC2: Use in closed, continuous process with occasional controlled exposure : Storage 9 PROC2: Use in closed, continuous process with occasional controlled exposure : Storage 9 PROC2: Use in closed, continuous process with occasional controlled exposure : Storage 9 PROC3: Use in closed batch process (synthesis or formulation) CS2: Process sampling CS15: General exposures (closed systems) 9 PROC3: Use in closed batch process (synthesis or formulation) CS136: Batch processes at elevated temperatures 9 PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises CS16: General exposures (closed systems) 9 PROC15: Use as laboratory reagent CS36: Laboratory activities 9 9 PROC15: Use as laboratory reagent CS30: Mixing operations (open systems) 9 9 PROC4: Use in blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) 9 CS30: Mixing operations (open systems) 9 9 9 : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities 9 9 <t< td=""><td>PROC8b, CS8</td><td>ECETOC TRA</td><td>Worker – inhalation,</td><td>7,01 mg/m3</td><td>0,003</td></t<>	PROC8b, CS8	ECETOC TRA	Worker – inhalation,	7,01 mg/m3	0,003
Worker - long-term - systemic Combined routes 0,004 PROC1: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) : Storage PROC2: Use in closed, continuous process with occasional controlled exposure : 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) 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 : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) CS30: Mixing operations (open systems) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS34: Manual CS22: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS39: Equipment cleaning and maintenance			Worker – dermal, long-	0,686 mg/kg/d	0,001
PROC1: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) : Storage PROC2: Use in closed, continuous process with occasional controlled exposure : 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) 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 : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) CS30: Mixing operations (open systems) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS34: Manual CS22: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS39: Equipment cleaning and maintenance <td></td> <td></td> <td>Worker – long-term – systemic Combined</td> <td></td> <td>0,004</td>			Worker – long-term – systemic Combined		0,004
: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS39: Equipment cleaning and maintenance	CS2: Process CS15: Gener PROC3: Use CS136: Batcl PROC4: Use CS16: Gener PROC15: Us CS36: Labora : PROC 5: Mi (multistage a CS30: Mixing : PROC8b: T containers at CS34: Manua	s sampling al exposures (closed in closed batch pro- h processes at eleva in batch and other p al exposures (open e as laboratory reag atory activities ixing or blending in t nd/or significant con g operations (open s ransfer of substance dedicated facilities al	systems) ess (synthesis or formulation) ed temperatures ocess (synthesis) where opportu ystems) nt atch processes for formulation of act) stems) or preparation (charging/discharg	preparations and a	articles
	containers at	dedicated facilities		ging) from/to vesse	els/large
				33	

PRF Isooctane

Version 2.0

Revision Date 2011-03-03

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

: 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 tabletting, compression, extrusion, pelletization; Industrial setting;

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

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).

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

Main User Groups Sector of use Process category	 SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites SU3: Industrial Manufacturing (all) 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) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
Environmental release category	: ERC7, ERC8b: Industrial use of substances in closed systems, Wide dispersive indoor use of reactive substances in
MSDS Number:100000068258	21/33

PRF Isooctane	MATERIAL SAFETY DATA SHEE
Version 2.0	Revision Date 2011-03-03
Further information	 open systems Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
of substances in closed systems	ERC7: Industrial use
-	
Product characteristics Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 100 % (unless stated differently)
(Msafe)	: 1.800 tonnes/day
Environment factors not influenced	
Flow rate	: 18.000 m3/d
Dilution Factor (River) Dilution Factor (Coastal Areas)	: 10 : 100
Other given operational conditions	affecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 5%
Emission or Release Factor: Water Emission or Release Factor: Soil	: 0,001 %
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 ≥ (%):
Remarks	 (Effectiveness: 23,4 %) 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 ≥ (%): (Effectiveness: 0 %)
Remarks	: Do not apply industrial sludge to natural soils.
Remarks	: Sludge should be incinerated, contained or reclaimed.
Remarks	 Common practices vary across sites thus conservative process release estimates used.
Remarks	 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Conditions and measures related to	
Flow rate of sewage treatment plant effluent	: 2.000 m3/d
Effectiveness (of a measure)	: 96,3 %
Percentage removed from waste water	: 96,3 %
Conditions and measures related to Remarks	external treatment of waste for disposal : Combustion emissions limited by required exhaust emission
Komuno	controls. Combustion emissions considered in regional exposure
Conditions and measures related to	assessment. external recovery of waste
Recovery Methods	: This substance is consumed during use and no waste of the
MSDS Number:100000068258	22/33

Version 2.0

MATERIAL SAFETY DATA SHEET

Revision Date 2011-03-03

substance is generated.

Mixture/Article (unless stated differently) Physical Form (at time of use) : Liquid substance Vapor pressure : 2,8 kPa Amount used Remarks Remarks : No limit Frequency and duration of use Remarks Remarks : Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Remarks : Assumes a good basic star implemented., Assumes us ambient temperature, unles Technical conditions and measures Handle substance within a closed system., Store substance within a Organizational measures to prevent /limit releases, dispersion an Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up cor occur. Wash off any skin contamination immediately. Provide basic eminimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: continuous process with occasional controlled exposure Product characteristics Covers percentage substance Concentration of the Substance in Mixture/Article : Covers percentage substar Vapor pressure : 2,8 kPa Amount used : No limit Frequency and duration of use : No limit Frequency and duration of use	
Product characteristics Concentration of the Substance in : Covers percentage substar (unless stated differently) 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 differently) Other operational conditions affecting workers exposure Remarks : Assumes a good basic star implemented., Assumes us ambient temperature, unlest temperature, un	PROC1: Use in closed
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Remarks Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Concentration of use Remarks Concentration and measures Handle substance within a closed system., Store substance within a Organizational measures to prevent /limit releases, dispersion an Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up cor occur. Wash off any skin contamination immediately. Provide basic e minimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: concentration of the Substance in Mixture/Article Vapor pressure Concentration of the Substance in Concentration of use Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Concentration of use Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Covers daily exposures up differently)	
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Remarks : Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Remarks : Assumes a good basic star implemented., Assumes us ambient temperature, unless Technical conditions and measures Handle substance within a closed system., Store substance within a Organizational measures to prevent /limit releases, dispersion an Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up con occur. Wash off any skin contamination immediately. Provide basic eminimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: continuous process with occasional controlled exposure Product characteristics Concentration of the Substance in : Covers percentage substar (unless stated differently) Physical Form (at time of use) : Liquid substance Vapor pressure : 2,8 kPa Amount used : No limit Frequency and duration of use : Covers daily exposures up differently) Other operational conditions affecting workers exposure : Covers daily exposures up differently) Other operational conditions affecting workers exposure : Assumes a good basic star	
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Remarks Assumes a good basic star implemented., Assumes us ambient temperature, unlest ambient temperature, unlest ambient temperature, unlest ambient temperature, unlest temperature within a closed system., Store substance within a Technical conditions and measures Handle substance within a closed system., Store substance within a Organizational measures to prevent /limit releases, dispersion an Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up con occur. Wash off any skin contamination immediately. Provide basic eminimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: Concentration of the Substance in Mixture/Article Mixture/Article Vapor pressure Vapor pressure Xamount used Remarks Remarks Substance Substance Substance Substance Substance Handle substance Substance Remarks Substance Substance Substance Substance Substance Substance Substance Substance <th></th>	
 Handle substance within a closed system., Store substance within a Organizational measures to prevent /limit releases, dispersion an Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up con occur. Wash off any skin contamination immediately. Provide basic e- minimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: continuous process with occasional controlled exposure Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Liquid substance Yapor pressure 2,8 kPa Amount used Remarks Kon limit Frequency and duration of use Remarks Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks Assumes a good basic star 	ndard of occupational hygiene is e at not more than 20°C above ss stated differently.
Avoid direct skin contact with product. Identify potential areas for ind (tested to EN374) if hand contact with substance likely. Clean up con occur. Wash off any skin contamination immediately. Provide basic eminimise exposures and to report any skin problems that may develor 2.2 Contributing scenario controlling worker exposure for: continuous process with occasional controlled exposure Product characteristics Concentration of the Substance in : Covers percentage substare (unless stated differently) Physical Form (at time of use) : Liquid substance Vapor pressure : 2,8 kPa Amount used : No limit Frequency and duration of use : Covers daily exposures up differently) Other operational conditions affecting workers exposure : Assumes a good basic stare	closed system.
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Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure: Covers percentage substance (unless stated differently) : Liquid substance 2,8 kPaAmount used Remarks: No limitFrequency and duration of use Remarks: Covers daily exposures up differently)Other operational conditions affecting Remarks: Assumes a good basic star	
Remarks : No limit Frequency and duration of use	nce in the product up to 100 %
Remarks : Covers daily exposures up differently) Other operational conditions affecting workers exposure Remarks : Assumes a good basic star	
Remarks : Assumes a good basic star	to 8 hours (unless stated
ambient temperature, unles	ndard of occupational hygiene is e at not more than 20°C above ss stated differently.
Technical conditions and measures Handle substance within a closed system., Transfer via enclosed line system.	es., Store substance within a closed
MCD0 Number 10000000000 00000 0000000000000000000	0
MSDS Number:100000068258 23/3	5

PRF Isooctane

Version 2.0	
	Revision Date 2011-03-02
Avoid direct skin contact with product (tested to EN374) if hand contact with	t /limit releases, dispersion and exposure ct. Identify potential areas for indirect skin contact. Wear gloves th substance likely. Clean up contamination/spills as soon as they tion immediately. Provide basic employee training to prevent / ny skin problems that may develop.
2.2 Contributing scenario contro process (synthesis or formulation	olling worker exposure for: PROC3: Use in closed batch on)
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 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 affect Remarks	 ing workers exposure 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 sy Organizational measures to preven No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they	rstem. t /limit releases, dispersion and exposure oid direct skin contact with product. Identify potential areas for tested to EN374) if hand contact with substance likely. Clean up
Handle substance within a closed sy Organizational measures to preven No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they employee training to prevent / minim 2.2 Contributing scenario contro substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	 t /limit releases, dispersion and exposure oid direct skin contact with product. Identify potential areas for tested to EN374) if hand contact with substance likely. Clean up occur. Wash off any skin contamination immediately. Provide basis ise exposures and to report any skin problems that may develop. blling worker exposure for: : PROC8b: Transfer of ging/discharging) from/to vessels/large containers at : Covers percentage substance in the product up to 100 % (unless stated differently) : Liquid substance
Handle substance within a closed sy Organizational measures to preven No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they employee training to prevent / minim 2.2 Contributing scenario contro substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 t /limit releases, dispersion and exposure oid direct skin contact with product. Identify potential areas for tested to EN374) if hand contact with substance likely. Clean up occur. Wash off any skin contamination immediately. Provide basis is exposures and to report any skin problems that may develop. billing worker exposure for: : PROC8b: Transfer of ging/discharging) from/to vessels/large containers at : Covers percentage substance in the product up to 100 % (unless stated differently)
Handle substance within a closed sy Organizational measures to preven No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they employee training to prevent / minim 2.2 Contributing scenario contro substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks	 t /limit releases, dispersion and exposure oid direct skin contact with product. Identify potential areas for tested to EN374) if hand contact with substance likely. Clean up o occur. Wash off any skin contamination immediately. Provide basi ise exposures and to report any skin problems that may develop. blling worker exposure for: : PROC8b: Transfer of ging/discharging) from/to vessels/large containers at : Covers percentage substance in the product up to 100 % (unless stated differently) : Liquid substance : 2,8 kPa
Handle substance within a closed sy Organizational measures to preven No specific measures identified., Ave indirect skin contact. Wear gloves (t contamination/spills as soon as they employee training to prevent / minim 2.2 Contributing scenario contro substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Frequency and duration of use	 t /limit releases, dispersion and exposure oid direct skin contact with product. Identify potential areas for tested to EN374) if hand contact with substance likely. Clean up occur. Wash off any skin contamination immediately. Provide basi bise exposures and to report any skin problems that may develop. Diling worker exposure for: : PROC8b: Transfer of ging/discharging) from/to vessels/large containers at : Covers percentage substance in the product up to 100 % (unless stated differently) : Liquid substance : 2,8 kPa : No limit : Covers daily exposures up to 8 hours (unless stated differently)

PRF Isooctane

Version 2.0

Revision Date 2011-03-03

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

Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 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 affecti Remarks	 ng workers exposure 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 sy					
Avoid direct skin contact with produc (tested to EN374) if hand contact wit	t /limit releases, dispersion and exposure t. Identify potential areas for indirect skin contact. Wear gloves h substance likely. Clean up contamination/spills as soon as they ion immediately. Provide basic employee training to prevent / y skin problems that may develop.				
Conditions and measures related to Wear suitable gloves tested to EN37	personal protection, hygiene and health evaluation 4.				
2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected					
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 				
MSDS Number:100000068258	25/33				

	MATERIAL SAFETY DATA SHEET
PRF Isooctane	
Version 2.0	Revision Date 2011-03-03
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 a	ffecting 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 meas Handle substance within a close	
Avoid direct skin contact with pr (tested to EN374) if hand conta occur. Wash off any skin contar	event /limit releases, dispersion and exposure roduct. Identify potential areas for indirect skin contact. Wear gloves ct with substance likely. Clean up contamination/spills as soon as they nination immediately. Provide basic employee training to prevent / ort any skin problems that may develop.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15, CS37,	ECETOC TRA		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,	ECETOC TRA		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		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, ECETOC TRA CS14		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
PROC16, CS15, ECETOC TRA CS107		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 –		0,012
MSDS Number:	100000068258		26/3	33	

PRF Isooctane			MATERIAL SAFETY DATA SHEET			
Version 2.0			Revision Date 2011-03-03			
		systemic Combined routes				
PROC1: Use in closed process, no likelihood of exposure CS15: General exposures (closed systems) CS37: Use in contained batch processes : Storage						
PROC2: Use in closed, continuc CS15: General exposures (close CS37: Use in contained batch p : Storage	ed systems)	h occasional contro	lled exposure			
PROC3: Use in closed batch pro CS15: General exposures (close CS37: Use in contained batch p CS107: (closed systems)	ed systems)	s or formulation)				
: PROC8b: Transfer of substanc containers at dedicated facilities CS39: Equipment cleaning and		n (charging/dischar	ging) from/to vessels/large			
: PROC8b: Transfer of substanc containers at dedicated facilities CS103: Vessel and container cle		n (charging/dischar	ging) from/to vessels/large			
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 L by the Exposure Scenario	Jser to evalu	ate whether he w	orks inside the boundaries set			
ensure that risks are manage	ions outlined in enable the deri are based on q nt Measures/O d to at least eq ay not be applie	Section 2 are imple vation of a DNEL fo ualitative risk chara perational Conditior uivalent levels.Guid cable to all sites; thu	emented. r dermal irritant effects. cterisation. ns are adopted, then users should			
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 fu	el – professional				
Main User Groups			Public domain (administration, services, craftsmen)			
MSDS Number:100000068258		27/3	•			

Version 2.0	Revision Date 2011-03-0
Sector of use	: SU 22: Professional uses: Public domain (administration,
Process category	 education, entertainment, services, craftsmen) 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) : PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at 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 unburned product to be expected
Environmental release category	: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances ir closed systems
Further information	: Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Product characteristics Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 100 % (unless stated differently)
(Msafe)	: 240 tonnes/day
	·
	·
Environment factors not influenced Flow rate Dilution Factor (River)	by risk management : 18.000 m3/d : 10
Environment factors not influenced Flow rate	by risk management : 18.000 m3/d : 10
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas)	by risk management : 18.000 m3/d : 10 : 100
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year	by risk management : 18.000 m3/d : 10 : 100 affecting environmental exposure : 365
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air	by risk management : 18.000 m3/d : 10 : 100 affecting environmental exposure : 365 : 0,1 %
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year	by risk management : 18.000 m3/d : 10 : 100 affecting environmental exposure : 365 : 0,1 % : 0,001 %
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	by risk management : 18.000 m3/d : 10 : 100 affecting environmental exposure : 365 : 0,1 % : 0,001 % : 0,001 %
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	by risk management 18.000 m3/d 10 100 affecting environmental exposure 365 0,1 % 0,001 % 0,001 % / Organizational measures
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil	 by risk management 18.000 m3/d 10 100 affecting environmental exposure 365 0,1 % 0,001 % /Organizational measures Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 0 %) Risk from environmental exposure is driven by freshwater. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Water Remarks	 by risk management 18.000 m3/d 10 100 affecting environmental exposure 365 0,1 % 0,001 % /Organizational measures Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 0 %) Risk from environmental exposure is driven by freshwater. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): (Effectiveness: 0 %) Common practices vary across sites thus conservative
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Water Remarks Water	 by risk management 18.000 m3/d 10 100 affecting environmental exposure 365 0,1 % 0,001 % / Organizational measures Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 0 %) Risk from environmental exposure is driven by freshwater. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): (Effectiveness: 0 %)
Environment factors not influenced Flow rate Dilution Factor (River) Dilution Factor (Coastal Areas) Other given operational conditions a Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Technical conditions and measures Water Remarks Water Remarks	 by risk management 18.000 m3/d 10 ffecting environmental exposure 365 0,1 % 0,001 % 0,001 % / Organizational measures Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 0 %) Risk from environmental exposure is driven by freshwater. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): (Effectiveness: 0 %) Common practices vary across sites thus conservative process release estimates used. No wastewater treatment required.

PRF Isooctane Version 2.0 Flow rate of sewage treatment	Revision Date 2011-03-03
Flow rate of sewage treatment	Revision Date 2011-03-03
plant effluent Effectiveness (of a measure) Percentage removed from waste water	: 96,3 %
Conditions and measures related to Remarks	 external treatment of waste for disposal Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
Conditions and measures related to Recovery Methods	
2.2 Contributing scenario control process, no likelihood of exposu	lling worker exposure for: PROC1: Use in closed re
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 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 affectir Remarks	 ng workers exposure Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Fechnical conditions and measures Handle substance within a closed sys	stem., Store substance within a closed system.
Avoid direct skin contact with product (tested to EN374) if hand contact with	/limit releases, dispersion and exposure . Identify potential areas for indirect skin contact. Wear gloves in substance likely. Clean up contamination/spills as soon as they on immediately. Provide basic employee training to prevent / y skin problems that may develop.
2.2 Contributing scenario control control control continuous process with occasio	lling worker exposure for: PROC2: Use in closed, onal controlled exposure
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa
Amount used Remarks	: No limit
MSDS Number:100000068258	29/33

PRF Isooctane	MATERIAL SAFETY DATA SHEE
Version 2.0	Revision Date 2011-03-0
Frequency and duration of use Remarks	: Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affect Remarks	 ing workers exposure 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 sy	
Avoid direct skin contact with product (tested to EN374) if hand contact with	t /limit releases, dispersion and exposure et. Identify potential areas for indirect skin contact. Wear gloves th substance likely. Clean up contamination/spills as soon as they ion immediately. Provide basic employee training to prevent / by skin problems that may develop.
	olling worker exposure for: PROC3, PROC16: Use in sor formulation), Using material as fuel sources, limited o be expected
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure	 Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 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 affect Remarks	 ing workers exposure 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 sy	
Avoid direct skin contact with product (tested to EN374) if hand contact with	t /limit releases, dispersion and exposure et. Identify potential areas for indirect skin contact. Wear gloves th substance likely. Clean up contamination/spills as soon as they ion immediately. Provide basic employee training to prevent / by skin problems that may develop.
	olling worker exposure for: : PROC8b: Transfer of jing/discharging) from/to vessels/large containers at
Product characteristics Concentration of the Substance in Mixture/Article	: Covers percentage substance in the product up to 100 % (unless stated differently)

PRF Isooctane	
Version 2.0	Revision Date 2011-03-03
Physical Form (at time of use) Vapor pressure	: Liquid substance : 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 affecti Remarks	 ing workers exposure 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 system prior to equipme	
Avoid direct skin contact with product (tested to EN374) if hand contact with occur. Wash off any skin contaminat	t /limit releases, dispersion and exposure et. Identify potential areas for indirect skin contact. Wear gloves th substance likely. Clean up contamination/spills as soon as they tion immediately. Provide basic employee training to prevent / by skin problems that may develop., Apply vessel entry procedures
	b personal protection, hygiene and health evaluation 74., Wear suitable coveralls to prevent exposure to the skin.
substance or preparation (charg	blling worker exposure for: PROC8b: Transfer of jing/ discharging) from/ to vessels/ large containers at
	olling worker exposure for: PROC8b: Transfer of
substance or preparation (charg dedicated facilities	olling worker exposure for: PROC8b: Transfer of
substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	 billing worker exposure for: PROC8b: Transfer of ging/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance
substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used	 billing worker exposure for: PROC8b: Transfer of jing/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa
substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Frequency and duration of use	 Dlling worker exposure for: PROC8b: Transfer of fing/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa No limit Covers daily exposures up to 8 hours (unless stated differently)
substance or preparation (charg dedicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Frequency and duration of use Remarks Other operational conditions affection Remarks Technical conditions and measures Handle substance within a closed sy	 Dlling worker exposure for: PROC8b: Transfer of fing/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa No limit Covers daily exposures up to 8 hours (unless stated differently) ing workers exposure Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.
substance or preparation (chargededicated facilities Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapor pressure Amount used Remarks Frequency and duration of use Remarks Other operational conditions affection Remarks Technical conditions and measures Handle substance within a closed sy operation is undertaken outdoors., C Organizational measures to prevent Avoid direct skin contact with produce (tested to EN374) if hand contact with	 Diling worker exposure for: PROC8b: Transfer of fing/ discharging) from/ to vessels/ large containers at Covers percentage substance in the product up to 100 % (unless stated differently) Liquid substance 2,8 kPa No limit Covers daily exposures up to 8 hours (unless stated differently) ing workers exposure Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Version 2.0

Revision Date 2011-03-03

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.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15, ECETOC TRA		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 ECETOC TRA		Worker – inhalation, long-term – systemic	93,43 mg/m3	0,046	
		Worker – dermal, long- term – systemic	1,37 mg/kg/d	0,002	
			Worker – long-term – systemic Combined routes		0,048
PROC3, CS15, CS107			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
PROC16, CS15, CS107			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
PROC8b, CS1, CS8			Worker – inhalation, long-term – systemic	46,72 mg/m3	0,023
			Worker – dermal, long- term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,025
PROC8b, CS14	PROC8b, CS14		Worker – inhalation, long-term – systemic	163,51 mg/m3	0,080
			Worker – dermal, long- term – systemic	1,372 mg/kg/d	0,002
			Worker – long-term – systemic Combined routes		0,082
CS15: Gener : Storage PROC2: Use CS15: Gener PROC3: Use	al exposures (clos in closed batch p al exposures (clos	sed systems) nous process w sed systems) rocess (synthes	of exposure ith occasional contro sis or formulation)	lled exposure	
MSDS Number	:100000068258		32/3	33	

PRF Isooctane

Version 2.0

Revision Date 2011-03-03

PROC16: Using material as fuel sources, limited exposure to unburned product to be expected CS15: General exposures (closed systems) CS107: (closed systems)

: PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities CS39: Equipment cleaning and maintenance CS103: Vessel and container cleaning

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities CS1: General exposures CS8: Drum/batch transfers

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities CS14: Bulk 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 gualitative 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).

MSDS Number:100000068258