Jet RF (AMS 2629B Type 1)

Version 1.4 Revision Date 2025-11-26

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

Product information

Product Name	:	Jet RF (AMS 2629B Type 1)
Material	:	1102078, 1024360, 1024363, 1024362, 1024361, 1105002
Use	:	Reference Fluid
Uses advised against	:	This material should not be used for purposes other than the identified uses in section 1 without expert advice.
Company	:	Chevron Phillips Chemical Company LP Specialty Chemicals 9500 Lakeside Blvd. The Woodlands, TX 77381
Local	:	See Company Address

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)
Belgium: 070 245 245 (24 hours/day, 7 days/week)
Bulgaria: +359 2 9154 233
Croatia: +3851 2348 342 (24 hours/day, 7 days/week)
Cyprus: 1401
Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402
Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212
Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Finland: 0800 147 111 09 471 977 (24 hours/day)
France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)
Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Greece: (0030) 2107793777 (24 hours/day, 7 days/week)
Hungary: +36-80-201-199 (24 hours/day, 7 days/week)
Iceland: 543 2222 (24 hours/day, 7 days/week)

Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Italy: POISON CENTER MILAN – Azienda Ospedaliera Niguarda Ca` Grande Tel. +39 02 66101029; POISON CENTER ROME – Policlinico “Agostino Gemelli”, Servizio di tossicologia clinica Tel. +39 06 3054343; POISON CENTER ROME – Ospedale Pediatrico Bambino Gesù Tel. +39 06 68593726;POISON CENTER ROME – Policlinico “Umberto I” Tel. +39 06 4997 8000; POISON CENTER FOGGIA – Azienda Ospedaliera Universitaria Riuniti Tel. +39 0881 732326; POISON CENTER NAPLES – Azienda Ospedaliera “Antonio Cardarelli” Tel. +39 081 7472870; POISON CENTER FLORENCE – Azienda Ospedaliera universitaria Careggi Tel. +39 055 7947819; POISON CENTER PAVIA – IRCCS Fondazione Salvatore Maugeri Tel. +39 0382 24444; POISON CENTER BERGAMO – Azienda Ospedaliera “Papa Giovanni XXIII” Tel. 800 883 300; POISON CENTER VERONA – Azienda Ospedaliera Universitaria integrata Tel. 800 011 858;
Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)
Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Lithuania: +370 (85) 2362052
Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)
Malta: +356 2395 2000
The Netherlands: NVIC: +31 (0)88 755 8000
Norway: 22 59 13 00 (24 hours/day, 7 days/week)
Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Portugal: CIAV phone number: +351 800 250 250
Romania: +40213183606
Slovakia: +421 2 5477 4166
Slovenia: Phone number: 112
Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)
Sweden: 112 – ask for Poisons Information

Organization that prepared the SDS	:	Product Safety and Toxicology Group
E-mail address	:	SDS@CPChem.com
Website	:	www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
GHS Classification and labelling according to JIS Z 7252-2019 and JIS Z 7253-2019 (GHS 2015)

Classification

: Flammable liquids, Category 2
Skin corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2
Reproductive toxicity, Category 1A
Effects on or via lactation
Specific target organ toxicity - single exposure, Category 1, Central nervous system
Specific target organ toxicity - single exposure, Category 2, Vasculature
Specific target organ toxicity - single exposure, Category 3, respiratory tract irritation, Narcotic effects
Specific target organ toxicity - repeated exposure, Category 1, Central nervous system, Kidney
Specific target organ toxicity - repeated exposure, Category 2, Inhalation, Auditory organs, color vision
Aspiration hazard, Category 1

Short-term (acute) aquatic hazard, Category 1
Long-term (chronic) aquatic hazard, Category 1

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements :
H225: Highly flammable liquid and vapor.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H336: May cause drowsiness or dizziness.
H360: May damage fertility or the unborn child.
H362: May cause harm to breast-fed children.
H370: Causes damage to organs (Central nervous system).
H371: May cause damage to organs (Vasculature).
H372: Causes damage to organs (Central nervous system, Kidney) through prolonged or repeated exposure.
H373: May cause damage to organs (Auditory organs, color vision) through prolonged or repeated exposure if inhaled.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements :
Prevention:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P260: Do not breathe mist or vapors.
P263: Avoid contact during pregnancy and while nursing.
P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
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/ doctor.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P311: IF exposed or concerned: Call a POISON

CENTER/ doctor.
P331: Do NOT induce vomiting.
P332 + P313: If skin irritation occurs: Get medical advice/ attention.
P337 + P313: If eye irritation persists: Get medical advice/ attention.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391: Collect spillage.
Storage:
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.
Disposal:
P501: Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: Composition/information on ingredients

Synonyms : Jet RF (AMS 2629B Type 1)

Molecular formula : Mixture

Chemical name	CAS-No.	Concentration	ENCS/ISHL number
Cyclohexane	110-82-7	30 % - 60%	3-2233
2,2,4-Trimethylpentane (Isooctane)	540-84-1	30 % - 60%	2-8
Toluene	108-88-3	25 % - 60%	3-2 3-60
tert-Butyl Disulfide	110-06-5	1 % - 5%	2-477 (2)-477

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

Notes to physician

Symptoms	:	No data available.
Risks	:	No data available.
Treatment	:	Treat symptomatically.

SECTION 5: Firefighting measures

Flash point	:	-17°C (1°F)
Autoignition temperature	:	No data available
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 firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Hydrocarbons. Carbon oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

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).

SECTION 7: Handling and storage

Handling

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

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

Storage

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

Uses advised against : This material should not be used for purposes other than the identified uses in section 1 without expert advice.

Use : Reference Fluid

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

JP

Components	Basis	Value	Control parameters	Note
Cyclohexane	JP OEL JSOH	OEL-M	150 ppm, 520 mg/m3	
Toluene	JP OEL ISHL	ACL	20 ppm,	
	JP OEL JSOH	OEL-M	50 ppm, 188 mg/m3	1, S,

1 Group 1: Substances known to cause reproductive toxicity in humans
S Skin absorption

Biological exposure indices

JP

Substance name	CAS-No.	Control parameters	Sampling time	Update

Toluene	108-88-3	Toluene: 0.6 mg/l In setting OEL-B, consideration is given to the relationship between biological monitoring values and OEL-Ms. (Blood)	Within 2 h prior to end of shift at end of work week	2023-09-25
		Toluene: 0.06 mg/l In setting OEL-B, consideration is given to the relationship between biological monitoring values and OEL-Ms. (Urine)	Within 2 h prior to end of shift at end of work week	2023-09-25

Engineering measures

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

Personal protective equipment

Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. Air-Purifying Respirator for Organic Vapors. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form : liquid

Physical state	:	liquid
Color	:	Colorless
Odor	:	gasoline-like

Safety data

Flash point	:	-17°C (1°F)
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Oxidizing properties	:	No
Autoignition temperature	:	No data available
Molecular formula	:	Mixture
Molecular weight	:	Not applicable
pH	:	No data available
Freezing point	:	No data available
Pour point		No data available
Boiling point/boiling range	:	82-138°C (180-280°F)
Vapor pressure	:	2.00 PSI at 38°C (100°F)
Relative density	:	0.77 at 15.6 °C (60.1 °F)
Water solubility	:	negligible
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Relative vapor density	:	1 (Air = 1.0)
Evaporation rate	:	No data available
Percent volatile	:	> 99 %
Conductivity	:	No data available

SECTION 10: Stability and reactivity

Reactivity	:	Stable under recommended storage conditions.

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

Possibility of hazardous reactions

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

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

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

Hazardous decomposition products : Hydrocarbons
Carbon oxides

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

SECTION 11: Toxicological information

Acute oral toxicity

Cyclohexane	: LD50: > 5,000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401
2,2,4-Trimethylpentane (Isooctane)	LD50: > 5,000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Symptoms: Salivation
Toluene	LD50: 6,500 mg/kg Species: Rat Sex: Not Specified
tert-Butyl Disulfide	LD50: > 5,000 mg/kg Species: Rat

Acute inhalation toxicity

Cyclohexane	: LC50: >32,880 mg/m3Exposure time: 4 h Species: Rat Sex: male and female Test atmosphere: vapor Method: OECD Test Guideline 403
2,2,4-Trimethylpentane (Isooctane)	LC50: > 33.52 mg/l Exposure time: 4 h Species: Rat

	Sex: male and female Test atmosphere: vapor Method: OECD Test Guideline 403
Toluene	LC50: 25.7 - 30 mg/l Exposure time: 4 h Species: Rat Test atmosphere: vapor
tert-Butyl Disulfide	LC50: 545 ppm Species: Rat Sex: male and female Test atmosphere: vapor An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

Acute dermal toxicity

2,2,4-Trimethylpentane (Isooctane)	:	LD50: > 2,000 mg/kg Species: Rabbit Sex: male and female Method: OECD Test Guideline 402
Toluene		LD50: 12,400 mg/kg Species: Rabbit Sex: Not Specified

Jet RF (AMS 2629B Type 1)
Skin irritation : May cause skin irritation in susceptible persons.

Jet RF (AMS 2629B Type 1)
Eye irritation : Vapors may cause irritation to the eyes, respiratory system and the skin.

Sensitization

Cyclohexane	:	Did not cause sensitization on laboratory animals.
2,2,4-Trimethylpentane (Isooctane)		Did not cause sensitization on laboratory animals.
Toluene		Did not cause sensitization on laboratory animals.

Repeated dose toxicity

Cyclohexane	:	Species: Rat Application Route: Inhalation Dose: 0, 500, 2000, 7000 ppm Exposure time: 90 day Number of exposures: 6 h/d, 5 d/wk NOEL: 2000 ppm

	Species: Rat, Male and female Sex: Male and female Application Route: Inhalation Dose: 0, 500, 2,000, 7000 ppm Exposure time: 13-14 wk Number of exposures: 6 hr/d, 5 d/wk NOEL: 7000 ppm Species: Mouse, Male and female Sex: Male and female Application Route: Inhalation Dose: 0, 500, 2000, 7000 ppm Exposure time: 13-14 wk Number of exposures: 6 hr/d, 5 d/wk NOEL: 2000 ppm Target Organs: Blood
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.
Toluene	Species: Rat Application Route: Inhalation Dose: 0, 100, 625, 1250, 3000 ppm Exposure time: 15 wk Number of exposures: 6.5 h/d, 5 d/wk NOEL: 625 ppm Species: Mouse Application Route: Inhalation Dose: 0, 100, 625, 1250, 3000 ppm Exposure time: 14 wk Number of exposures: 6.5 h/d, 5 d/wk NOEL: 100 ppm

Genotoxicity in vitro

Cyclohexane	:	Test Type: Ames test Metabolic activation: with and without metabolic activation Method: Mutagenicity (Escherichia coli - reverse mutation assay) Result: negative

	Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Result: negative
	Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Method: OECD Guideline 476 Result: negative
2,2,4-Trimethylpentane (Isooctane)	Test Type: Ames test Method: Mutagenicity (Escherichia coli - reverse mutation assay) Result: negative
	Test Type: Mouse lymphoma assay Method: OECD Guideline 476 Result: negative
	Test Type: Sister Chromatid Exchange Assay Result: negative
	Test Type: Unscheduled DNA synthesis assay Result: negative
Toluene	Test Type: Ames test Result: negative
	Test Type: Sister Chromatid Exchange Assay Result: negative
	Test Type: Mouse lymphoma assay Result: negative
	Test Type: Cytogenetic assay Result: negative
tert-Butyl Disulfide	Test Type: Ames test Result: negative
	Test Type: Mouse lymphoma assay Result: negative
	Test Type: Sister Chromatid Exchange Assay Result: negative

Genotoxicity in vivo

Cyclohexane	:	Test Type: Cytogenetic assay Species: Rat Cell type: Bone marrow Dose: 96.6, 307.2, 10141.6 ppm Result: negative
2,2,4-Trimethylpentane (Isooctane)		Test Type: Unscheduled DNA synthesis assay Species: Mouse Dose: 500 mg/kg Result: negative

	Test Type: Unscheduled DNA synthesis assay Species: Rat Dose: 500 mg/kg Result: negative
Toluene	Test Type: Cytogenetic assay Result: negative Test Type: Mouse micronucleus assay Result: negative

Carcinogenicity

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

Reproductive toxicity

Cyclohexane	:	Species: Rat Application Route: Inhalation Dose: 0, 500, 2000, 7000 ppm Number of exposures: 6 hr/d, 5 d/wk Method: OECD Test Guideline 416 NOAEL Parent: 500 ppm NOAEL F1: 7000 ppm NOAEL F2: 7000 ppm
2,2,4-Trimethylpentane (Isooctane)		Species: Rat Sex: male and female Application Route: Inhalation Dose: 0, 900, 3000, 9000 ppm Number of exposures: 6 h/d 5 d/wk Method: OECD Test Guideline 416 NOAEL Parent: 3000 ppm NOAEL F1: 3000 ppm NOAEL F2: 3000 ppm Information given is based on data obtained from similar substances.
Toluene		Species: Rat Application Route: Inhalation Dose: 0, 100, 500, 2000 ppm Test period: 95 d NOAEL Parent: 2000 ppm

Developmental Toxicity

Cyclohexane	:	Species: Rat Application Route: Inhalation

	Dose: 0, 500, 2,000, 7,000 PPM Number of exposures: 6 hr/d Test period: GD 6-15 Method: OECD Guideline 414 NOAEL Teratogenicity: 7,000 ppm NOAEL Maternal: 500 ppm Species: Rabbit Application Route: Inhalation Dose: 0, 500, 2,000, 7,000 PPM Number of exposures: 6 hr/d Test period: GD 6-18 Method: OECD Guideline 414 NOAEL Teratogenicity: 7,000 ppm NOAEL Maternal: 500 ppm
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 Information given is based on data obtained from similar substances. Species: Rat Application Route: Inhalation Dose: 0, 900, 3000, 9000 ppm Number of exposures: 6h/d Test period: GD6-15 Method: OECD Guideline 414 NOAEL Teratogenicity: 9000 ppm NOAEL Maternal: 3000 ppm Information given is based on data obtained from similar substances.
Toluene	Species: Rat Application Route: Inhalation Dose: 0, 100, 500, 2000 ppm Test period: 95 d NOAEL Teratogenicity: 400-750 ppm

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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

Cyclohexane : Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: Did not show mutagenic effects in animal experiments.
Teratogenicity: Did not show teratogenic effects in animal experiments.
Reproductive toxicity: No toxicity to reproduction

2,2,4-Trimethylpentane (Isooctane)	Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.
Toluene	Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Animal testing did not show any mutagenic effects. Teratogenicity: Some evidence of adverse effects on development, based on animal experiments. Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Jet RF (AMS 2629B Type 1)

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

SECTION 12: Ecological information

Toxicity to fish

Cyclohexane :	LC50: 4.53 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow) Method: OECD Test Guideline 203
2,2,4-Trimethylpentane (Isooctane)	LC50: 0.11 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances.
Toluene	LC50: 18 - 36 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow)
tert-Butyl Disulfide	1.3 mg/l Exposure time: 96 h Species: Fish

Toxicity to daphnia and other aquatic invertebrates

Cyclohexane :	EC50: 0.9 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Method: OECD Test Guideline 202
2,2,4-Trimethylpentane (Isooctane)	EC50: 0.4 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea)

static test Information given is based on data obtained from similar substances.

Toluene: EC50: 3.78 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Toxicity to algae

Cyclohexane : EbC50: 3.4 mg/l
Exposure time: 72 h
Species: Selenastrum capricornutum (algae)

NOEC: 0.925 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (microalgae)
Method: OECD Test Guideline 201

2,2,4-Trimethylpentane (Isooctane): EL50: 2.943 mg/l
Exposure time: 72 h
Method: QSAR modeled data

Toluene: EC50: 134 mg/l
Exposure time: 72 h
Species: Chlamydomonas angulosa (Green algae)

M-Factor

cyclohexane : M-Factor (Acute Aquat. Tox.) 1

M-Factor (Chron. Aquat. Tox.) 1

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2,2,4-Trimethylpentane (Isooctane) : NOEL: 0.17 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Information given is based on data obtained from similar substances.

Biodegradability : This material is not expected to be readily biodegradable.

Elimination information (persistence and degradability)

Bioaccumulation

Cyclohexane : Bioconcentration factor (BCF): 167
This material is not expected to bioaccumulate.

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

Toluene : This material is not expected to bioaccumulate.

Mobility

Cyclohexane	:	Not expected to adsorb on soil.
2,2,4-Trimethylpentane (Isooctane)	:	Medium: Air Method: Calculation, Mackay Level I Fugacity Model After release, disperses into the air.
Toluene	:	Not expected to adsorb on soil.

Results of PBT assessment

Cyclohexane	:	Non-classified PBT substance, Non-classified vPvB substance
2,2,4-Trimethylpentane (Isooctane)	:	Non-classified PBT substance, Non-classified vPvB substance
Toluene	:	Non-classified vPvB substance, Non-classified PBT substance
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.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

Cyclohexane	:	Very toxic to aquatic life.
2,2,4-Trimethylpentane (Isooctane)	:	Very toxic to aquatic life.
Toluene	:	Toxic to aquatic life.
tert-Butyl Disulfide	:	Toxic to aquatic life.

Long-term (chronic) aquatic hazard

Cyclohexane	:	Very toxic to aquatic life with long lasting effects.
2,2,4-Trimethylpentane (Isooctane)	:	Very toxic to aquatic life with long lasting effects.
Toluene	:	Harmful to aquatic life with long lasting effects.
tert-Butyl Disulfide	:	Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

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

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

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

waste management company.

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

SECTION 14: Transport information

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

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

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, MARINE POLLUTANT, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE))

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (-17 °C c.c.), MARINE POLLUTANT, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
33,UN1268,PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1268, PETROLEUM PRODUCTS, N.O.S., 3, II, ENVIRONMENTALLY HAZARDOUS, (2,2,4-TRIMETHYLPENTANE (ISOOCTANE), CYCLOHEXANE)

Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information

National legislation

Poisonous and Deleterious Substances Control Law

: Not applicable

Industrial Safety and Health Law

Substances Subject to be Notified Names Law Article 57-2 (Ministerial Order Article 34-2 Appended Table 2)	:	cyclohexane(232) 2,2,4-trimethylpentane(115) toluene(407)
Enforcement Order of the Industrial Safety and Health Law - Attached table 1 (Dangerous Substances)	:	Inflammable Substance
Harmful Substances Required Permission for Manufacture	:	Not applicable
Hazardous Substances Subject to Labeling Requirements Law Article 57 (Ministerial Order Article 30 Appended Table 2)	:	cyclohexane (232) 2,2,4-trimethylpentane (115) toluene (407)
Organic Solvents Class 2	:	
Ordinance on Prevention of Lead Poisoning	:	Not applicable
Harmful Substances Prohibited from Manufacture	:	Not applicable
Ordinance on Prevention of Hazards Due to Specified Chemical Substances	:	Not applicable
Ordinance on Prevention of Tetraalkyl Lead Poisoning	:	Not applicable
	:	Not applicable
	:	Not applicable
Substances Prevented From Impairment of Health	:	Not applicable Listed

Chemical Substance Control Law

Priority Assessment Chemical Substance	:	cyclohexane(96) toluene(46)

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

Class I Designated Chemical Substances	:	cyclohexane(629) toluene(300) (300)

Other regulations

Fire Service Law	:	Flammable liquids Type 1 petroleums Hazardous rank II
High Pressure Gas Safety Act	:	Not applicable
Explosive Control Law	:	Not applicable
Vessel Safety Law	:	Flammable liquids (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)
Aviation Law	:	Flammable liquid (Article 194 of The Enforcement Rules of Aviation Law and its Attached Table 1)

Notification status

Europe REACH	:	Not in compliance with the inventory
Switzerland CH INV	:	Not in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Canada DSL	:	This product contains one or several components listed in the Canadian NDSL.
Australia AIIC	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Japan ISHL	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	Not in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory
Other TECI	:	Not in compliance with the inventory

SECTION 16: Other information

Further information

Legacy SDS Number : 432570

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

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

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

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AIIC	Australian Inventory of Industrial Chemicals	LOAEL	Lowest Observed Adverse Effect Level

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