

**Jet RF (AMS 2629B Type 1)**

Version 1.3

Revision Date 2022-04-25

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

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

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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

Responsible Department : 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
 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.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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.
 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/ sparks/ open flames/ hot surfaces. No smoking.
 P233: Keep container tightly closed.
 P240: Ground/bond container and receiving equipment.
 P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
 P242: Use only non-sparking tools.
 P243: Take precautionary measures against static discharge.
 P260: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
 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/ shower.
 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.
 P362 + P364: Take off contaminated clothing and wash it before reuse.
 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.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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.

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.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

- 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 : Do not spray on a naked flame or any incandescent material.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

against fire and explosion

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.

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/m ³	
Toluene	JP OEL ISHL	ACL	20 ppm,	
	JP OEL JSOH	OEL-M	50 ppm, 188 mg/m ³	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 (Blood)	Within 2 h prior to end of shift at end of work week	2011-05-18
		Toluene: 0.06 mg/l (Urine)	Within 2 h prior to end of shift at end of work week	2011-05-18

Engineering measures

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

Personal protective equipment

Respiratory protection

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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)

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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 %

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. Further information: No decomposition if stored and applied as directed. 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	: Oxidizing solids. Oxidizing liquids. Hydrocarbons Carbon oxides
Other data	: No decomposition if stored and applied as directed.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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

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

tert-Butyl Disulfide LD50: 18,000 mg/kg
 Species: Rabbit

Skin irritation

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

Cyclohexane : May cause skin irritation in susceptible persons.
 2,2,4-Trimethylpentane : Skin irritation
 (Isooctane)
 Toluene : Skin irritation

tert-Butyl Disulfide : Mild skin irritation

Eye irritation

Cyclohexane : No eye irritation
 2,2,4-Trimethylpentane : No eye irritation
 (Isooctane)
 Toluene : slight irritation. Not classified due to data which are
 conclusive although insufficient for classification.
 tert-Butyl Disulfide : Mild eye irritation

Sensitization

Cyclohexane : Did not cause sensitization on laboratory animals.
 2,2,4-Trimethylpentane : Does not cause skin sensitization.
 (Isooctane)
 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 : Species: Rat, Male and female
 (Isooctane) : 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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

tert-Butyl Disulfide

Test Type: Sister Chromatid Exchange Assay
Result: negative

Test Type: Mouse lymphoma assay
Result: negative

Test Type: Cytogenetic assay
Result: negative

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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

**Jet RF (AMS 2629B Type 1)
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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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)

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

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 : cyclohexane(232)
 Notified Names Article 57-2
 (Enforcement Order Table 9) 2,2,4-trimethylpentane(115)
 toluene(407)

Enforcement Order of the : Inflammable Substance
 Industrial Safety and Health
 Law - Attached table 1
 (Dangerous Substances)

Harmful Substances Required : Not applicable
 Permission for Manufacture
 Hazardous Substances : cyclohexane (232)
 Subject to Labeling 2,2,4-trimethylpentane (115)
 Requirements Article 57 toluene (407)
 (Enforcement Order Article
 18)

Organic Solvents Class 2 :
 Ordinance on Prevention of : Not applicable
 Lead Poisoning
 Harmful Substances : Not applicable
 Prohibited from Manufacture
 Ordinance on Prevention of : Not applicable

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

**Hazards Due to Specified
Chemical Substances**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 : cyclohexane(96)
Substance 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 : toluene(300)
Substances**Other regulations**Fire Service Law : Flammable liquids
Type 1 petroleums
Hazardous rank II

Explosive Control Law : Not relevant

Vessel Safety Law : Flammable liquids (Article 2 and 3 of rules on shipping and
storage of dangerous goods and its Attached Table 1), Marine
pollutantsAviation Law : Flammable liquid (Article 194 of The Enforcement Rules of
Aviation Law and its Attached Table 1)**Notification status**Europe REACH : A substance or substances in this product is not
registered or notified to be registered. Importation or
manufacture of this product is still permitted provided
that it does not exceed the REACH minimum threshold
quantity of the non-regulated substances.

Switzerland CH INV : On the inventory, or in compliance with the inventory

United States of America (USA) : On or in compliance with the active portion of the
TSCA inventoryCanada NDSL : This product contains one or several components listed
in the Canadian NDSL.

Other 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

Korea KECI : A substance(s) in this product was not registered,
notified to be registered, or exempted from registration
by CPChem according to K-REACH regulations.

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).

Philippines PICCS : On the inventory, or in compliance with the inventory
 Taiwan TCSI : On the inventory, or in compliance with the inventory
 China IECSC : 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%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and	TSCA	Toxic Substance Control Act

Jet RF (AMS 2629B Type 1)

Version 1.3

Revision Date 2022-04-25

	New Chemical Substances		
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%		