

SAFETY DATA SHEET

Turpentine Oil from Pulping Process – Item no. 60-028



Date: 29/04/2013

1.1 Product identifier

Trade name: Turpentine oil from pulping process (TOPP)

Other means of identification (alternative names, numbers, company product codes, or other unique identifiers):

Alternative names:	Turpentine oil from pulping processes
CAS number:	8006-64-2
EC number:	232-350-7

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

Identified use(s): Production of TOPP and its fractionation .

The following scenarios were addressed in the chemical safety report (CSR) for TOPP as prepared as part of the registration dossier required by the EU REACH Regulation:

- Scenario 1. Production of TOPP (and on-site uses)
- Scenario 2. Fractionation

1.3. Details of the supplier of the safety data sheet

(The supplier, whether it is the manufacturer, importer, only representative, downstream user or distributor, shall be identified).

Address:	UCY ENERGY GROUP UCY business services & trading GmbH Am Villepohl 4 D-53347 Alfter Western Germany
Telephone:	+49 228 2428 732
Facsimile:	+49 228 2428 731
Internet:	http://www.ucy-energy.com

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1.4. Emergency telephone number

Control Room UCY ENERGY: +49 228 2428 732

In case of intoxication (consultation in German and English)

Poisoning emergency number (Berlin) Tel. +49 (0) 30 30686 790

Emergency telephone number (consultation in German and English)

Poisoning emergency number (Berlin) Tel. +49 (0) 30 19240

Section 2. Hazards identification

2.1. Classification of the substance or mixture

According to 67/548/EC

F, Xn, N; R11, R20/21/22, R36/38, R43, R65, R51/53

According to 1272/2008/EC

Flam. Liq., 2; H225, Acute Tox., 4; H332, H312, H302, Eye Irrit., 2; H319, Skin Irrit., 2; H315, Skin Sens., 1; H317, Asp. Tox., 1; H304, Aquatic Chronic 2; H411

HEALTH

Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes and skin. May cause sensitisation (allergic eczema) by skin contact. May be fatal if swallowed and enters airways (aspiration hazard)

ENVIRONMENT

Toxic to aquatic life with long lasting effects.

FIRE

Highly flammable liquid and vapour.

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2.2. Label elements



Pictogram(s):

Signal word: **Danger**

Hazard statements:

H225, H302, H312, H332, H304, H315, H319, H317, H411

Highly flammable liquid and vapour. Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled. May be fatal if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. Toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention: P210, P233, P240, P241, P242, P243, P261, P264, P270, P271, P273, P280, P285

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/.../equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash ... thoroughly after handling.

Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
In case of inadequate ventilation wear respiratory protection.

Response: P301+P310, P302+P352, P303+P361+P353, P304+P340, P305+P351+P338, P321, P322, P330, P331, P333+P313, P337+P313, P363, P370+P378, P391

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IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

IF ON SKIN: Wash with plenty of soap and water.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Specific treatment (see... on this label)

Specific measures (see... on this label).

Rinse mouth.

Do NOT induce vomiting.

If skin irritation or rash occurs: Get medical advice/attention.

If eye irritation persists: Get medical advice/attention

Wash contaminated clothing before reuse.

In case of fire: Use powder, CO₂, foam or spray for extinction. Use water in large quantities for the cooling of the containers concerned by the fire.

Collect spillage.

Storage: P403+P235

Store in a well-ventilated place. Keep cool.

Disposal: P501

Dispose of contents/container as dangerous waste to an approved waste disposal plant.

Contains: Turpentine oil from pulping processes

Section 3. Composition/information on ingredients

TOPP is a UVCB substance, composed mainly of bicyclic terpene hydrocarbons (C₁₀H₁₆), with small proportions of other terpenes and, in the case of Crude Sulphate Turpentine, sulphur-containing species. See section 16 for TOPP constituent blocks.

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3.1. Substances

Classification of substances according to 67/548/EEC

Dangerous substances	Content, %	CAS No	EC No	Indication of danger	Risk phrases
Turpentine oil from pulping process	100	8006-64-2	232-350-7	F Xn Xi N	R11 R20/21/22, R65 R36/38, R43 R51/53

Risk phrases, full text; R11 = Highly flammable, R20/21/22 = Harmful by inhalation, in contact with skin and if swallowed, R36/38 = Irritating to eyes and skin, R43 = May cause sensitisation by skin contact, R51/53 = Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment, R65 = Harmful: may cause lung damage if swallowed.

Classification of substances according to CLP, 1272/2008/EC

Hazardous substances	Content, %	CAS No	EC No	Hazard class(es)/ Category code(s)	Hazard statements
Turpentine oil from pulping process	100	8006-64-2	232-350-7	Flam. Liq. 2 Acute Tox. 4 Acute Tox. 4 Acute Tox. 4 Asp. Tox. 1 Skin Irrit. 2 Eye Irrit. 2 Skin Sens. 1 Aquatic Chronic 2	H225 H302 H312 H332 H304 H315 H319 H317 H411

Hazard statements, full text; H225 = Highly flammable liquid and vapour, H302 = Harmful if swallowed, H304 = May be fatal if swallowed and enters airways, H312 = Harmful in contact with skin, H315 = Causes skin irritation, H319 = Causes serious eye irritation, H332 = Harmful if inhaled, H317 = May cause an allergic skin reaction, H411 = Toxic to aquatic life with long lasting effects.

Section 4. First aid measures

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air. Seek medical attention.

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Skin contact

Wash off immediately with plenty of soap and water. Remove contaminated clothing. Seek medical attention if irritation or symptoms persist.

Contact with eyes

Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Seek medical attention if irritation or symptoms persist.

Ingestion

DO NOT INDUCE VOMITING. If swallowed, seek medical advice immediately and show this container or label.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation

Harmful by inhalation. Inhalation may cause coughing, tightness of the chest and irritation of the respiratory system.

Skin contact

Irritating to skin.

Contact with eyes

Irritating to eyes.

Ingestion

Harmful if swallowed. Ingestion may cause nausea and vomiting. Ingestion is irritating to the respiratory tract and may cause damage to the central nervous system.

4.3 Indication of any immediate medical attention and special treatment needed

As a general rule, and in all cases of doubt or when symptoms persist, always seek medical attention. Never give anything by mouth to an unconscious person.

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Section 5. Fire-fighting measures

5.1. Extinguishing media

5.1.1. Suitable extinguishing media:

Use extinguishing media appropriate to the surrounding fire conditions.
Use as appropriate: carbon dioxide (CO₂), dry chemical, foam.

5.1.2. Unsuitable extinguishing media:

No specific recommendations.

5.2. Special hazards arising from the substance or mixture

Fire hazards: Flammable. Burning produces irritating, toxic and obnoxious fumes.

5.3. Advice for fire-fighters

Protective equipment: Wear suitable respiratory equipment when necessary.

Section 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation of the working area. Eliminate all sources of ignition. Wear suitable protective equipment (see section 8).

6.2. Environmental precautions

Do not allow product to enter drains. Prevent further spillage if safe.

6.3. Methods and material for containment and cleaning up

Clean up methods: Absorb with inert, absorbent material. Transfer to suitable, labelled containers for disposal. Clean spillage area thoroughly with plenty of water.

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Section 7. Handling and storage

7.1. Precautions for safe handling

Where respiratory protection is required, selection of appropriate equipment and provision of adequate worker training is the responsibility of individual companies.

7.1.1 Protective measures

Avoid contact with eyes and skin. Ensure adequate ventilation of the working area. Use explosion proof equipment. Keep away from heat. Keep away from sources of ignition - No smoking. Adopt best manual handling considerations when handling, carrying and dispensing.

7.1.2 Advice on general occupational hygiene

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

7.2. Conditions for safe storage, including any incompatibilities

Storage: Keep in a cool, dry, well ventilated area. Keep containers tightly closed. Store in correctly labelled containers. Avoid temperatures over 30°C.

7.3. Specific end use(s)

See exposure scenarios attached to this Safety Data Sheet.

Section 8. Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limit value

TLV not established.

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DN(M)ELs for workers

Exposure pattern	Route	Descriptors	DNEL/DMEL	Most sensitive endpoint
Acute - systemic effects	Dermal	DNEL	1.6 mg/kg/day	Repeat-dose toxicity
	Inhalation	DNEL	11.2 mg/m ³	Repeat-dose toxicity
Acute - local effects	Dermal	Not quantifiable	-	Sensitisation
	Inhalation	Not quantifiable	-	NA
Long-term - systemic effects	Dermal	DNEL	1.6 mg/kg/day	Repeat-dose toxicity
	Inhalation	DNEL	11.2 mg/m ³	Repeat-dose toxicity
Long-term – local effects	Dermal	Not quantifiable	-	Sensitisation
	Inhalation	DNEL	0.77 mg/m ³	Repeated-dose toxicity

DN(M)ELs for the general population

Exposure pattern	Route	Descriptors	DNEL/DMEL	Most sensitive endpoint
Acute - systemic effects	Dermal	NA	NA	NA
	Inhalation	NA	NA	NA
Acute - local effects	Dermal	NA	NA	NA
	Inhalation	NA	NA	NA
Long-term - systemic effects	Oral	DNEL	0.57 mg/kg/day	Repeat-dose toxicity
	Dermal	NA	NA	NA
	Inhalation	NA	NA	NA
Long-term – local effects	Dermal	NA	NA	NA
	Inhalation	NA	NA	NA

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Aquatic PNECs

As TOPP is a UVCB (Substance is of Unknown or Variable composition, Complex reaction product or Biological origin) derivation of a single, representative PNEC value for this substance using conventional methods is not possible. PNECs for the aquatic compartment should therefore be based on data for the blocks of constituents rather than on data for the whole substance.

Aquatic PNECs for TOPP constituent blocks (see section 16)

Block	PNEC for this assessment (mg/l)
1	0.013
2	0.0066
3	0.0042
4	0.0055
5	1.7
6	1.80
7	0.00037
8	0.080

8.2. Exposure controls

8.2.1. Appropriate engineering controls

The usual precautionary measures are to be adhered to when handling chemicals.
Immediately remove all soiled and contaminated clothing.
Avoid contact with the eyes and skin.
Do not inhale vapours.

8.2.2. Individual protection measures, such as personal protective equipment

a) Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or gases.

b) Skin protection

Protective clothing including chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

c) Respiratory protection

Suitable respiratory protective device complying with an approved standard recommended.

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8.2.3 Environmental exposure controls

See section 13.

Section 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid (at standard temperature and pressure) The substance is a UVCB, variations in the physical appearance (colour) of the substance may occur depending on the natural variation in composition of the substance
Colour	Colourless, amber or yellow
Odour	Sulphur compounds
Odour threshold	Not determined
pH	Not determined
Melting point / freezing point	-60 to -50°C (publicly obtained data source)
Boiling point / range	154 - 170°C (peer reviewed public domain source)
Flash point	5°C (at 1013 hPa) (EU method A.9)
Evaporation rate	Not determined
Flammability (solid, gas)	Highly flammable (but not expected to be pyrophoric nor release flammable gas in contact with water or air)
Explosion limits	Not applicable (no chemical groups associated with explosive properties present in the constituents of TOPP)
Vapour pressure	2600 Pa (obtained by prediction)
Vapour density	Not determined
Relative density	864 kg/m ³ (at 20°C) (ASTM D4052)
Solubility in water	0.351 g/L (at 20 °C, pH 6.4 - 6.5) (OECD TG 105)
Solubility in other solvents	Miscible with organic solvents (from SDS)
Partition coefficient: n-octanol/water	Not applicable to UVCB substances, predicted values for constituents used to obtain weighted average for constituent Blocks
Auto-ignition temperature	270°C (at 1013 hPa, 19–20°C) (EU method A.15)
Decomposition temperature	Not determined
Viscosity	2.03548 cP (at 50°F) ("appropriate test method")
Explosive properties	Not applicable (no chemical groups associated with explosive properties present in the constituents of TOPP)
Oxidising properties	Not applicable (based upon chemical structure of the constituents of TOPP, and experience in use and handling, the substance is considered non-oxidising)

9.2. Other information

Surface tension	54.8 mN/m (at 20°C) (OECD TG 115)
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Section 10. Stability and reactivity

10.1. Reactivity

The substance is not reactive under recommended storage and handling conditions (see section 7).

10.2. Chemical stability

The substance is stable under recommended storage and handling conditions (see section 7).

10.3. Possibility of hazardous reactions

The product can self-oxidize on contact with air and generate heat which may cause spontaneous ignition in enclosed areas. Materials such as rags, vessels, insulation when soaked with the product, can self-ignite in enclosed areas.

10.4. Conditions to avoid

Avoid sources of ignition.

10.5. Incompatible materials

May react violently with :

- oxidizing products, strong mineral acids and halogens (especially chlorine)
- $\text{Ca}(\text{OCl})_2$, CrO_3 , $\text{Cr}(\text{OCl})_2$, SnCl_4
- hexachloromelamine and trichloromelamine.

10.6. Hazardous decomposition products

In contact with air oxidation products with sensitizing properties may be formed. Contact with acid: sulphur compounds.

Section 11. Toxicological information

11.1. Information on toxicological effects

11.1.1. Substances

11.1.1.1. The relevant hazard classes, for which information shall be provided, are:

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a) Acute toxicity

TOPP is classified for acute toxicity (harmful by inhalation, in contact with skin and if swallowed) in CLP, Annex VI.

However the results of the available acute oral and dermal studies do not agree with the official classification:

Oral LD₅₀, rat: 4.6 ml/kg (equivalent to ca. 4000 mg/kg).

Dermal LD₅₀, rabbit: > 2000 mg/kg.

LC₅₀ (4 h), rat: 13.7 mg/L.

Clinical signs were slight ataxia and lethargy in the oral study. Local irritant effects were noted in the dermal study. Clinical signs reported from the inhalation study were convulsions and apnea; increase in respiratory rate and decrease in tidal volume.

b) Skin corrosion/irritation

TOPP is irritating to skin.

Recent, reliable *in vitro* skin irritation studies (EpiSkin) are available for three of the major constituents of TOPP, δ -pinene, β -pinene and δ -3-carene. In all three cases, the study results indicated that the relevant test substance met the criteria for classification as a skin irritant,

based on percentage cellular viability of <50%. The studies were conducted according to an appropriate test protocol (ECVAM).

c) Serious eye damage/irritation

TOPP is irritating to eyes.

Two major constituents of TOPP did not meet EU criteria for classification as eye irritants (OECD TG 405). Turpentine (unspecified composition) was reported to cause adverse ocular effects in a peer-reviewed publication.

d) Respiratory or skin sensitization

TOPP is a skin sensitizer.

Positive results for skin sensitisation were obtained in reliable *in vivo* studies with laboratory animals for turpentine (GPMT), β -pinene (LLNA) and δ -3-carene (GPMT).

In addition, turpentine was reported to be an extreme sensitizer when tested in humans.

Based on the weight of evidence for these test substances, it can be concluded that TOPP is a skin sensitizer.

e) Germ cell mutagenicity

TOPP is not genotoxic.

Information is available from reliable studies for all the required *in vitro* endpoints. The results of all the studies were in agreement.

Gene mutation (Bacterial reverse mutation assay / Ames test): negative with and without activation in all strains tested (OECD TG 471).

Cytogenicity in mammalian cells: negative in cultured human lymphocytes (OECD TG 473).

Mutagenicity in mammalian cells: negative in L5178Y cells (OECD TG 476).

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f) Carcinogenicity

No data are available for the carcinogenicity of TOPP. However, further testing is not considered necessary because:

The substance is not classified for mutagenicity; and

There is no evidence from the repeated dose studies that constituents of CTO are able to induce hyperplasia or pre-neoplastic lesions.

g) Reproductive toxicity

Not a reproductive toxicant.

Fertility/Developmental toxicity:

No reproductive toxicity studies are available for TOPP. Limited data are, however, available for an essential oil (oil of nutmeg, FDA 71 -28), which consists predominantly (80-90%) of bicyclic terpene $C_{10}H_{16}$ hydrocarbons { α -pinene (20-25%), β -pinene (15-18%) and sabinene (38-42%)}.

(Available acute toxicity data for the terpene constituents indicate that their toxicological profile is similar. It is therefore considered appropriate to use the existing data as representative of the terpene constituents of TOPP as a whole).

In a study on rats, mice and golden hamsters were dosed by gavage on gestation days 6 to 15.

There was no evidence of reproductive toxicity in any species up to and including the highest dose tested (260, 560 and 600 mg/kg/day respectively). The study pre-dates GLP and was not consistent with current guideline requirements for reproductive toxicity.

No teratogenic effects were reported in developmental toxicity studies on minor constituents of TOPP camphene (up to 2%) and dimethyl disulphide (typically 0.32%). Camphene is a structural isomer of α - and β -pinene.

NOAEL (fertility), oil of nutmeg: ≥ 260 mg/kg/day

NOAEL (developmental toxicity), camphene: ≥ 1000 mg/kg/day

h) STOT-single exposure

None of the constituents of CTO fulfil the criteria to be classified as STOT SE.

i) STOT-repeated exposure

TOPP does not fulfil the criteria to be classified as STOT RE.

Available toxicity data indicate that the toxicological profile for TOPP is similar to that of α -pinene.

In a sub-chronic inhalation toxicity study in rats (and mice) nephropathy is reported which is relevant only in male rats (alpha-2u-globulin nephropathy is a known male rat-specific effect).

LOAEC: 25 ppm (male rat). In humans, this LOAEC will not be relevant.

NOAEC: 200 ppm (female rats) (mortality and a lower body weight gain)

Overall NOAEC relevant for humans: 200 ppm.

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In a 90-day inhalation study (in accordance with OECD 413) for the constituent dimethyl disulfide, the NOAEC was 10 ppm (38.5 mg/m³) based on adverse local effects on the respiratory tract.

j) Aspiration hazard

TOPP is classified as presenting an aspiration hazard in CLP, Annex VI.

Section 12. Ecological information

12.1. Toxicity

LL50 (Lethal Level) and EL50 are similar to LC50 and EC50, but tests the water phase from incompletely miscible mixtures.

Reliable short-term have been determined in tests conducted with water-accommodated fractions (WAFs).

TOPP with sulphur content of 0.02%:

LL_{50/96h}, fish (*Danio rerio*): 29 mg/L

NOELr, fish (*Danio rerio*): 5 mg/L

EL_{50/48h}, Daphnia magna: 8.8 mg/L

NOELr, Daphnia magna: 2.5 mg/L

EL_{50/72h}, algae (*Desmodesmus subspicatus*): 17.1 mg/L

NOELr, algae (*Desmodesmus subspicatus*): 10 mg/L

TOPP with sulphur content of 3.6%:

LL_{50/96h}, fish (*Danio rerio*): 45.1 mg/L

NOELr, fish (*Danio rerio*): 5 mg/L

EL_{50/48h}, Daphnia magna: 6.4 mg/L

NOELr, Daphnia magna: 2.5 mg/L

EL_{50/72h}, algae (*Desmodesmus subspicatus*): 22.5 mg/L

NOELr, algae (*Desmodesmus subspicatus*): 5 mg/L

No measured data are available for long-term toxicity of TOPP to fish or aquatic invertebrates.

12.2. Persistence and degradability

Abiotic degradation:

On the basis of structural examination, none of the constituents of TOPP contain functional groups that are susceptible to hydrolysis under conditions relevant to the environment. This fate process will not contribute to a measurable degradative loss of these substances from the environment. The substance constituents can therefore be considered as stable under hydrolytic conditions.

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Biodegradation:

Although TOPP is readily biodegradable it cannot be stated with complete certainty that it does not contain non-readily-biodegradable constituents.

Two ready biodegradation studies are available for samples of TOPP. Ready biodegradation of 72% (measured as percentage of theoretical oxygen demand, TOD) was achieved in 28 days using a method consistent with OECD Guideline 301 F (manometric respirometer). The '10-day window' criterion was, however, not met.

12.3. Bioaccumulative potential

None of the constituents meet the bioaccumulation criteria.

12.4. Mobility in soil

The adsorption/desorption of TOPP as a whole substance is not scientifically necessary or meaningful for the purpose of environmental assessment.

Calculated values for the constituents of TOPP were obtained using KOCWIN.

The highest individual K_{oc} was calculated for block 7 (Sesquiterpenes); $2.36E+05$

12.5. Results of PBT and vPvB assessment

It is concluded that a typical TOPP composition substance should not be considered as a substance of very high concern (SVHC).

- There are no constituents of TOPP that meet the criteria for CMR category 1 or 2
- None of the constituents meet the criteria for PBT or vPvB.
- None of the constituents fall into the category of being equivalent to a SVHC on the grounds that they have potential endocrine disrupting properties.

12.6. Other adverse effects

No other adverse effects are observed.

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Section 13. Disposal considerations

13.1. Waste treatment methods

13.1.1 Product / Packaging disposal:

Product residues and uncleaned empty containers should be packaged, sealed, labelled, and disposed of or recycled according to relevant national and local regulations. Where large quantities are concerned, consult the supplier. When uncleaned empty containers are passed on, the recipient must be warned of any possible hazard that may be caused by residues. For disposal within the EC, the appropriate code according to the European Waste List (EWL) should be used. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste List (EWL).

13.1.2 Waste treatment options:

Scenario 1. Production of TOPP (and on-site uses)

Details of the treatment of aqueous waste vary at different production sites but as a minimum it is assumed that the effluent is treated off-site in a waste water treatment plant before discharge to waste water. Discharge to marine water without biological treatment cannot be ruled out, but for such sites the dilution must be in excess of 1000.

Scenario 2. Fractionation

Details of the treatment of aqueous waste vary at different fractionation sites but as a minimum it is assumed that the effluent is treated off-site in a waste water treatment plant.

14. Transport information

14.1. UN number: UN 1993

14.2. UN proper shipping name: Flammable liquid, n.o.s. (Turpentine oil from pulping process)

14.3. Transport hazard class(es): 3

14.4. Packing group: II

14.5. Environmental hazards: Marine Pollutant

14.6. Special precautions for user: Sea (EMS): F-E, S-E

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer – **not applicable TOPP**

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC – **not applicable to TOPP**

Regulation (EC) No 689/2008 of the European Parliament and of the Council of 17 June 2008 concerning the export and import of dangerous chemicals – **not applicable to TOPP**

15.2. Chemical Safety Assessment

The supplier has performed a Chemical Safety Assessment (CSA) for this substance as required under the EU REACH Regulation.

16. Other information

Key literature references and sources for data:
Chemical Safety Report (CSR) for TOPP (REACH)

TOPP constituent Blocks

Block number	Constituents
1	Pinene
2	δ-3-carene
3	Dipentene
4	β-phellandrene
5	Dimethyl sulfide
6	Methyl mercaptan
7	Sesquiterpenes
8	Terpene alcohols

Annexes to the Safety Data Sheet:

The exposure scenarios (ES) below were addressed in the chemical safety report (CSR) for TOPP as part of the registration dossier required by the EU REACH Regulation and are attached as Annexes:

Scenario 1. Production of TOPP (and on-site uses)

Scenario 2. Fractionation

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Further information:

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Annex

Exposure Scenario (taken from section 9 of the Chemical Safety Report (CSR) for TOPP)

9.1. Production of TOPP (and on-site uses)

9.1.1. Exposure scenario

1. Short title of Exposure Scenario	
Production of TOPP (and on-site uses)	
2. Description of activities/process(es) covered in the Exposure Scenario	
Sector of use	SU 3 (Industrial uses: uses of substances as such or in preparations at industrial sites)
Product category	SU 8 (Manufacture of bulk, large scale chemicals)
Process category	Not applicable
Article category	PROC 2 (Use in closed, continuous process with occasional controlled exposure (e.g. sampling))
Environmental release category	PROC 3 (Use in closed batch process (synthesis or formulation))
	PROC 8b (Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities)
	Not applicable
	ERC 1 (Manufacture of substances)
3. Operational conditions	
3.1 Duration and frequency of use for which the ES ensures control of risk	
Duration of exposure at workplace:	8 h/d (ECHA default)
Frequency of exposure at workplace:	Up to 240 d per year
Annual amount used per site	2000-6000 tonnes
Emission days per site:	100-300 days/year
4.1 Physical form of product in which the substance is contained	
Liquid. Volatile and highly flammable and needs to be handled accordingly.	
4.2 Concentration of substance in preparation or article	
Not applicable	
4.3 Amount used per time or per activity for which the RMMs, in combination with other operational conditions of use ensure control of risk (if applicable)	
Respiration volume under conditions of use:	10 m ³ /d
Area of skin contact with the substance under conditions of use	PROC 2 and PROC 8b: 480 cm ² PROC3: 240 cm ²
Body weight	70 kg
5. Other operational conditions determining exposure, e.g. temperature, capacity of receiving environment (water flow; room size x ventilation rate), emission or release factors to the relevant compartments	
See PFA. (2010f). Generic approach to exposure of the environment and workers to Turpentine Oil from Pulping Processes (TOPP) during production. Reference code: PFA. 204.110.001. Peter Fisk Associates.	
The reference referred to above is available from the supplier of this safety data sheet.	
6. Risk Management Measures that, in combination with the operational conditions of use, ensure control of risk related to the different target groups	

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6.1 Risk management Measures related to workers	
Technical measures Organisational measures	Where respiratory protection is required, selection of appropriate equipment and provision of adequate worker training is the responsibility of individual companies.
Respiratory protection	Suitable respiratory protective device complying with an approved standard is recommended.
Hand protection	Protective clothing including chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or gases.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
6.2 Environment related measures; type and efficiency of single options or combination of options on exposure to be quantified; options to be phrased as instructive guidance	
Organisational measures	
Abatement measures waste water	Standard size waste water treatment plant for highly industrial sites.
Abatement measures waste air	Substance has low volatility and so releases to air are expected to be minimal.
Soil	The spreading of sludge is assumed as a worst-case scenario.
7. Waste related measures needed to ensure control of risk at the different life cycle stages of the substances (including preparations or articles at the end of service life)	
Type of waste Disposal technique	Aqueous waste Details of the treatment of aqueous waste vary at different production sites but as a minimum it is assumed that the effluent is treated off-site in a waste water treatment plant before discharge to waste water. Discharge to marine water without biological treatment cannot be ruled out, but for such sites the dilution must be in excess of 1000.
Fraction released to environment during waste treatment	Release to external sewage system: 1.2×10^{-3} kg/kg Waste gas released: 1.2×10^{-3} kg/kg
8. Prediction of exposure resulting from the conditions described above (entries 3-6) and the substance properties	
Workers (oral) Workers (dermal)	No significant oral exposure. Estimated by the means of the ECETOC TRA model. Only values with LEV are shown.
PROC 2	0.14 mg/kg/day
PROC 3	0.034 mg/kg/day
PROC 8b	0.69 mg/kg/day
Workers (inhalation) Systemic / local effects	TOPP is assigned to the 'medium fugacity' category according to the ECETOC TRA definitions. Only values with LEV are shown.
PROC 2	5.68 mg/m ³ / 3.92 mg/m ³ Safe use: LEV should be used, exposure duration <15 minutes plus respiratory protection with at least 95% efficiency
PROC 3	14.2 mg/m ³ / 9.81 mg/m ³ Safe use: LEV should be used, exposure duration 1-4 hours plus respiratory protection with at least 95% efficiency

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PROC 8b	8.52 mg/m ³ / 5.89 mg/m ³ Safe use: LEV should be used, exposure duration <15 minutes plus respiratory protection with at least 90% efficiency
PROC 8b - outdoors (no LEV)	199 mg/m ³ / 137 mg/m ³ Safe use: Exposure duration <15 minutes plus respiratory protection with at least 95% efficiency
Environment	(EUSES 2.1.1)
Water (fresh-water)	1.63E-01 mg/kg w.w. (Block 7, maximum value)
Soil	6.48EE-02 mg/kg w.w. (Block 1, maximum value)
STP	1.93E-02 mg/l (Block 1, maximum value)
Humans via the environment	The total daily intake for humans (exposed via the environment), expressed as the sum of the blocks is 5.41×10^{-3} mg/kg bw/day.

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Exposure Scenario (taken from section 9 of the Chemical Safety Report (CSR) for TOPP)

9.2. Fractionation

9.2.1. Exposure scenario

1. Short title of Exposure Scenario	
Fractionation.	
2. Description of activities/process(es) covered in the Exposure Scenario	
Sector of use	SU 3 (Industrial uses: uses of substances as such or in preparations at industrial sites)
Product category	SU 8 (Manufacture of bulk, large scale chemicals)
Process category	Not applicable
Article category	PROC 1 (Use in closed process, no likelihood of exposure)
Environmental release category	PROC 2 (Use in closed, continuous process with occasional controlled exposure (e.g. sampling))
	PROC 3 (Use in closed batch process (synthesis or formulation))
	PROC 4 (Use in batch and other process (synthesis) where opportunity for exposure arises)
	PROC 8b (Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities)
	Not applicable
	ERC 1 (Manufacture of substances)
3. Operational conditions	
3.1 Duration and frequency of use for which the ES ensures control of risk	
Duration of exposure at workplace:	8 h/d (ECHA default)
Frequency of exposure at workplace:	Up to 240 d per year
Annual amount used per site	Up to 1000 tonnes
Emission days per site:	100 days/year
4.1 Physical form of product in which the substance is contained	
Liquid. No special measures known.	
4.2 Concentration of substance in preparation or article	
Not applicable	
4.3 Amount used per time or per activity for which the RMMs, in combination with other operational conditions of use ensure control of risk (if applicable)	
Respiration volume under conditions of use:	10 m ³ /d
Area of skin contact with the substance under conditions of use	PROC 2, 4 and PROC 8b: 480 cm ³
Body weight	PROC 1, 3: 240 cm ³
	70 kg
5. Other operational conditions determining exposure, e.g. temperature, capacity of receiving environment (water flow; room size x ventilation rate), emission or release factors to the relevant compartments	
Fraction of applied amount lost from process/use to waste gas	~0 kg/kg
Fraction of applied amount lost from process/use to waste water	2.5 × 10 ⁻⁵ kg/kg

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6. Risk Management Measures that, in combination with the operational conditions of use, ensure control of risk related to the different target groups	
6.1 Risk management Measures related to workers	
Technical measures Organisational measures	Where respiratory protection is required, selection of appropriate equipment and provision of adequate worker training is the responsibility of individual companies.
Respiratory protection	Suitable respiratory protective device complying with an approved standard recommended.
Hand protection	Protective clothing including chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or gases.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
6.2 Environment related measures; type and efficiency of single options or combination of options on exposure to be quantified; options to be phrased as instructive guidance	
Organisational measures Abatement measures waste water Abatement measures waste air Soil	Standard size waste water treatment plant for highly industrial sites. Substance has low volatility and so releases to air are expected to be minimal. The spreading of sludge is assumed as a worst-case scenario.
7. Waste related measures needed to ensure control of risk at the different life cycle stages of the substances (including preparations or articles at the end of service life)	
Type of waste Disposal technique	Aqueous waste Details of the treatment of aqueous waste vary at different fractionation sites but as a minimum it is assumed that the effluent is treated off-site in a waste water treatment plant.
Fraction released to environment during waste treatment	Release to external sewage system: 2.5×10^{-5} kg/kg Waste gas released: ~0 kg/kg
8. Prediction of exposure resulting from the conditions described above (entries 3-6) and the substance properties	
Workers (oral) Workers (dermal)	No significant oral exposure. Estimated by the means of the ECETOC TRA model. Only values with LEV are shown.
PROC 1	0.34 mg/kg/day
PROC 2	0.14 mg/kg/day
PROC 3	0.034 mg/kg/day
PROC 4	0.69 mg/kg/day
PROC 8b	0.69 mg/kg/day
Workers (inhalation) Systemic / local effects	TOPP is assigned to the 'medium fugacity' category according to the ECETOC TRA definitions. Only values with LEV are shown.
PROC 1	0.057 mg/m ³ / 0.04 mg/m ³
PROC 2	5.68 mg/m ³ / 3.92 mg/m ³
	Safe use: LEV should be used, exposure duration <15 minutes plus respiratory protection with at least 95% efficiency

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PROC 3	14.2 mg/m ³ / 9.81 mg/m ³ Safe use: LEV should be used, exposure duration 1-4 hours plus respiratory protection with at least 95% efficiency
PROC 4	11.4 mg/m ³ / 7.85 mg/m ³ Safe use: LEV should be used, exposure duration 1-4 hours plus respiratory protection with at least 90% efficiency or exposure duration >4 hours plus respiratory protection with at least 95% efficiency
PROC 8b	8.52 mg/m ³ / 5.89 mg/m ³ Safe use: LEV should be used, exposure duration <15 minutes plus respiratory protection with at least 90% efficiency
PROC 8b - outdoors (no LEV)	199 mg/m ³ / 137 mg/m ³ Safe use: Exposure duration <15 minutes plus respiratory protection with at least 95% efficiency
Environment	(EUSES 2.1.1)
Water (fresh-water)	5.11E-03 mg/kg w.w. (Block 7, maximum value)
Soil	2.91E-03 mg/kg w.w. (Block 1, maximum value)
STP	5.66E-04 mg/l (Block 1, maximum value)
Humans via the environment	The total daily intake for humans (exposed via the environment), expressed as the sum of the blocks is 0.010 mg/kg bw/day.