Substance Identity Card for TOPP	
The SIEF[1] of Turpentine Oil from Pulping Processes was a split from the pre-SIEF for Turpentine oil (CAS number 8006-64-2, EC number 232-350-7).	
Substance name	Turpentine oil from pulping processes
Synonyms	Crude sulfate turpentine (CST); Wood Turpentine (WT); Rohsulfat-Terpentin; Rohsulfatterpentinöl; Tärpätti, PTA; Essence de térébenthine; Essence résiduaire de térbenthine; Terpentin; Turpentine; Terebentina; Terebintina; Rå sulfatterpentin; Råterpentin; Sulphate turpentine; Crude Turpentine; Ejector oil
EC substance name	Turpentine, oil
EC number	232-350-7
CAS name	Turpentine oil
CAS number	8006-64-2
REACH substance name[2]	Turpentine Oil from Pulping Processes
Brief REACH description[3]	Turpentine Oil from Pulping Processes (TOPP) is a UVCB substance (Substance of Unknown or Variable composition, Complex reaction products or Biological materials) comprised of naturally-occurring compounds that are extracted from tree species during wood pulping. TOPP is a volatile oil extracted from various tree species. It consists of terpenes, mainly bicyclicmonoterpenes such as alpha- and beta-pinene, delta-3-carene and dipentene (limonene), and lower concentrations of monocyclic monoterpenes. TOPP is extracted from various wood chips by distillation. TOPP has typically 89% w/w terpenes with a range of 70-100%. About 90% of the total terpenes (range of 83-97% w/w) are accounted for by just three terpenes namely: α-pinene, β-pinene and δ-3-carene. • α-pinene and β-pinene are structural isomers that interconvert at about 60°C; combined they are typically 57 % with a range of 38-86% w/w. • α-pinene is typically about 49% w/w with a range of 10-85% w/w. • β-pinene is typically about 7% with a range of 0-40% w/w. • δ-3-carene is typically about 22% w/w with a range of 0-40% w/w. Total organic sulfur content is about 1.6% with a range of 0-12% w/w (or expressed in terms of elemental sulfur, typically 0-6% w/w). The high organic sulfur contents of a small number of samples can be attributed to the recovery from the foul condensate treatment system. Dimethyl sulfide (DMS) is typically 1% w/w with a range of 0-10% and dimethyl disulfide (DMDS) is typically 0.1% w/w with a range of 0-1% w/w. The term “turpentine” is a collective name that refers to several oleoresinous products which are obtained from conifers. Turpentine referred originally to the whole oleoresinous fraction that contains both volatile compounds (primarily monoterpenes) and a non-volatile portion of rosin acids. The term TOPP is used to differentiate it from gum turpentine (EC No. 932-349-8) which is subject to a separate registration in 2010 due to a SIEF split under REACH. TOPP keeps the EINECS Number 232-350-7. This chemical safety assessment (CSA) applies to Turpentine Oil from Pulping Processes (TOPP).

[1] Substance Information Exchange Forum according to regulation 1907/2006/EC named REACH
[2] IUCLID6 Section 1.1 Reference substance / IUPAC name
[3] IUCLID6 Section 1.1 Reference substance / Description

Type of substance[4]	UVCB; organic
General process[5]	- Identity of starting materials/source (and ratio): The source material for Turpentine Oil from Pulping Processes (TOPP) is chips of hardwood and softwood. Volatile constituents are recovered from the pulping of wood. - Reaction steps/mechanisms: TOPP is derived from the volatile organic compounds in softwoods and hardwoods as a by-product in the pulping industry. The wood chips are heated, and the terpenes are volatilised. TOPP is recovered from the terpene rich vapour through various streams of wood pulping process. These streams include the alkaline black liquor, vent gases, crude tall oil, and foul condensate streams. The detailed configuration of turpentine oil recovery varies: • In continuous cooking of kraft pulp, the wood chips and the cooking liquor are heated in a continuous digester and the terpenes are recovered from steam leaving the chip steaming vessel and/or the black liquor flash tanks. • In batch cooking, the terpenes are recovered from the digester degassing and from the blow steam condensers. In modern energy efficient batch cooking systems such as RDH or Super batch turpentine is recovered from the digester degassing and the vent gases from the hot black liquor accumulators • Turpentine oil is also recovered from the foul condensate stream in a continuous process and from the crude tall oil stream. - Relevant operating parameters (e.g. temperature and pressure): Atmospheric pressure and steam. Vacuum distillation could also be used. - Solvents/reagents used: None - Details on any extraction/isolation steps as appropriate: The terpenes fraction is vapourised by steam or vacuum distillation before being condensed. - Details on any clean-up/purification steps as appropriate: Steam distillation and subsequent enrichment and extraction by controlled condensation of the terpene rich vapour streams. The condensation is accomplished by a system of surface condensers. Turpentine oil is lighter than water and is separated from the condensates by means of a decanter. The condensation and decantation systems are principally the same regardless of pulping process. The important process parameters are the condensation temperatures in the primary and the secondary condensers. The non-condensable gases (NCG) from the condenser system contain high concentrations of malodorous gases and are drawn off and incinerated in the mills NCG-system. - Physical-chemical parameters (e.g. boiling point): The boiling point range is typically 150 – 175°C and the density 0.855 – 0.870 g/cm³ at 20°C.

[4] IUCLID6 Section 1.1 Type of substance

[5] IUCLID6 Section 1.2 Description

Boundary composition of TOPP				
Constituents	CAS number	EC number	Concentrations [w/w %]	
			Min.	Max.
α-pinene	80-56-8	201-291-9	10	85
β-pinene	127-91-3	204-872-5	0	40
δ-3-carene	13466-78-9	236-719-3	0	40
Dipentene	7705-14-8	231-732-0	0	20
Dimethyl sulfide	75-18-3	200-846-2	0	10
Dimethyl disulfide[6]	624-92-0	210-871-0	0	5
Total elemental sulphur content	multiple	multiple	0	6

[6] Turpentine oil from pulping processes has two different classifications depending on its concentration of the dimethyl disulfide impurity; no STOT SE classification if < 1.0 %, STOT SE 2 if 1.0-7.5 %. The substance is also either Flammable Liquid Category 2 or Category 3 depending on company specific flash-point value.