

Substance Identity Card for crude tall oil	
The SIEF <sup>1</sup> of crude tall oil is split from the pre-SIEF for Tall oil (EINECS number 232-304-6). Crude tall oil is not keeping the EINECS number.	
Substance name	Crude tall oil
EINECS substance name	Not applicable
EC number	931-433-1
CAS RN	8002-26-4
CAS name	Tall oil
Synonyms	Crude Tall Oil (CTO), Tall oil, Tallojja, Tallöl, Bioharts
REACH substance name <sup>2</sup>	Crude tall oil is produced by acidification of tall oil soap with sulfuric acid or generator waste acid.
Brief REACH description <sup>3</sup>	<p>Crude tall oil is produced by acidification of tall oil soap from the wood pulping industry. Crude tall oil is a dark brown viscous liquid with a complex composition of fatty acids, rosin acid, sulfonated carboxylic acids and plant sterols. Its composition varies. The main groups of constituents are</p> <p>20-60 % w/w saturated and unsaturated C8 – C28 fatty acids  0-65 % w/w rosin acids  0-10 % w/w plant sterols  0-8 % w/w terpenes</p> <p>In addition, "Tall oil" has a CAS definition as a complex combination of tall oil rosin and fatty acids derived from acidification of tall oil soap and including that which is further refined. Contains at least 10 % rosin</p>
Type of substance <sup>4</sup>	UVCB; organic
Sourcing material <sup>5</sup>	Tall oil soap and sulphuric acid and/or other inorganic acids
Manufacturing process <sup>6</sup>	<ul style="list-style-type: none"> <li>- Identity of starting materials/source (and ratio): The source material is tall oil soap (EINECS 266-037-1, CAS 65997-01-5)</li> <li>- Reaction steps/mechanisms: crude tall oil is produced from the acidification of tall oil soap in a batch or continuous process. The main reaction is shown below:  <math display="block">2 \text{ R-COONa} + \text{H}_2\text{SO}_4 \rightarrow 2 \text{ R-COOH} + \text{Na}_2\text{SO}_4</math></li> <li>- Relevant operating parameters (e.g., temperature and pressure): The optimum conditions for the reactions are temperature of 95-100°C and pH 3 -3.5.</li> <li>- Solvents/reagents used: Inorganic acids such as sulfuric acid</li> <li>- Details on any extraction/isolation steps as appropriate: After the acidification, the crude tall oil is separated from the aqueous acid phase by gravity and/or centrifugation or ultrafiltration</li> </ul>

<sup>1</sup> Substance Information Exchange Forum according to the REACH regulation 1907/2006/EC

<sup>2</sup> IUCLID6 Section 1.1 Reference substance / IUPAC name field

<sup>3</sup> IUCLID6 Section 1.1 Reference substance / Description

<sup>4</sup> IUCLID6 Section 1.1 Type of substance

<sup>5</sup> Fill in company specific sourcing material in IUCLID section 1.2 under the headline "Description"

<sup>6</sup> Fill in the site-specific manufacturing process in IUCLID section 1.2 under the headline "Description"

	<p>- Details on any clean-up/purification steps as appropriate: It is possible for some side reactions to occur due to black liquor residue in the soap as shown below:</p> $\text{Na}_2\text{S} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{S}$
Major constituents	<p>4-25 % oleic acid, C18:1, EINECS 204-007-1, CAS 112-80-1 8-30 %, linoleic acid, C18:2 (c9, c12), EINECS 200-470-9, CAS 60-33-3 5-30 %, abietic acid, EINECS 208-178-3, CAS 514-10-3</p>

Boundary composition ranges of CTO				
Constituents grouped into blocks	EC number	CAS number	Concentration [w/w %]	
			Min.	Max.
Block A1 C8-C28 fatty acids	<i>Multiple, variable</i>	<i>Multiple, variable</i>	20	60
Block A2 rosin acids and rosin acid methyl esters	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	65
Block B1 water	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	5
Block C1 terpene alcohols	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	0.2
Block C2 rosin aldehydes	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	2
Block C3 rosin alcohols	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	4
Block C4 C20-C26 fatty alcohols	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	2
Block C5 plant sterols	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	10
Block C6 betulaprenols	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	7
Block D1 fatty acid sterol esters	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	12
Block D2 rosin acid sterol esters	<i>Multiple, variable</i>	<i>Multiple, variable</i>	1	6.5
Block E1 Terpenes	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	8
Block E2 sesquiterpenes	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	0.5
Block E3 rosin hydrocarbons	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	1
Block E4 stilbenes	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	0.3
Block E5 squalenes	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	3
Block F Oligomeric / polymeric material, like lignin, lignocellulose, oligomeric esters, organic disulfides, polysulfides, dimeric rosin acids	<i>Multiple, variable</i>	<i>Multiple, variable</i>	0	30