

### **Di-tert-Butyl Polysulfide (TBPS 454)**

### Version 1.17

Revision Date 2023-02-22

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2020/878

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

### 1.1 Product identifier

### **Product information**

Product Name Material	Di-tert-Butyl Polysulfide (TBPS 454) 1120381, 1072616, 1086440, 1086442, 1086441, 1024577,
	1024572, 1024785, 1024784, 1024573, 1024574, 1024576, 1024578, 1024575, 1105172

### **EC-No.Registration number**

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
Di-tert-butyl Polysulfide	68937-96-2 273-103-3	Chevron Phillips Chemicals International NV 01-2119540515-43-0001

### 1.2

	Relevant identified uses of the	e substance or mixture and uses advised against
	Relevant Identified Uses : Supported	Manufacture Use as an intermediate Formulation Lubricants - Industrial
1.3	Details of the supplier of the s	afety data sheet
	Company :	Chevron Phillips Chemical Company LP Specialty Chemicals 10001 Six Pines Drive The Woodlands, TX 77380
	Local :	Chevron Phillips Chemicals International N.V. Airport Plaza (Stockholm Building) Leonardo Da Vincilaan 19 1831 Diegem Belgium
		SDS Requests: (800) 852-5530
SDS	S Number:100000014136	1/37

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Responsible Party: Product Safety Group Email:sds@cpchem.com

#### 1.4

#### **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 (Giftlinien): +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) 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 SDS@CPChem.com E-mail address Website www.CPChem.com •

### **SECTION 2: Hazards identification**

#### 2.1

Classification of the substance or mixture

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### REGULATION (EC) No 1272/2008

Skin sensitization, Category 1

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

H317: May cause an allergic skin reaction. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long lasting effects.

# 2.2

Hazard pictograms	:		¥2
Signal Word	:	Warning	
Hazard Statements	:	H317 H410	May cause an allergic skin reaction. Very toxic to aquatic life with long lasting effects.
Precautionary Statements	:	Prevention: P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
		P273 P280 <b>Response:</b>	Avoid release to the environment. Wear protective gloves.
		P333 + P313	If skin irritation or rash occurs: Get medic advice/ attention.
		P362 + P364	Take off contaminated clothing and wash before reuse.
		P391	Collect spillage.

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2.3

Other hazards Results of PBT and vPvB assessment	: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1%
Endocrine disrupting	or higher. The substance/mixture does not contain components
properties	considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
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#### **SECTION 3: Composition/information on ingredients**

#### 3.1 - **3.2**

### Substance or Mixture

Synonyms	:	Tertiary-Butyl Polysulfide di-t-Butyl Polysulfide tert-Butyl Polysulfide Polysulfides, di-tert-Butyl CPChem TBPS 454	
Molecular formula	:	C8H18Sx (x = average of 4.0)	

#### **Hazardous ingredients**

Chemical name	CAS-No.	Classification	Concentration	Specific Conc.
	EC-No.	(REGULATION (EC)	[wt%]	Limits, M-factors
	Index No.	No 1272/2008)		and ATEs
Di-tert-butyl	68937-96-2	Skin Sens. 1B; H317	90 - 100	M [Acute]=1
Polysulfide	273-103-3	Aquatic Acute 1; H400		M [Chronic]=1
		Aquatic Chronic 1;		
		H410		

For the full text of the H-Statements mentioned in this Section, see Section 16.

### **SECTION 4: First aid measures**

#### 4.1

### **Description of first-aid measures** General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician. In case of skin contact : If on skin, rinse well with water. 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. 4.2 Most important symptoms and effects, both acute and delayed Notes to physician Symptoms : No data available. : No data available. Risks 4.3 Indication of any immediate medical attention and special treatment needed Treatment : No data available. **SECTION 5: Firefighting measures** Flash point : 103°C (217°F) Method: ASTM D 93 SDS Number:100000014136 4/37

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	Autoignition temperature	:	225°C (437°F) at 1.005,20 - 1.009,40 hPa Information given is based on data obtained from similar substances.
5.1	Extinguishing media		
	Unsuitable extinguishing media	:	High volume water jet.
5.2			
	Special hazards arising fro Specific hazards during fire fighting	m t :	
5.3	<b>Advice for firefighters</b> 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.
	Fire and explosion protection	:	Normal measures for preventive fire protection.
	Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.
SEC	CTION 6: Accidental release	me	asures
6.1	Personal precautions, prot	ecti	ive equipment and emergency procedures
6.2	Personal precautions	:	Use personal protective equipment.
0.2	Environmental precautions	i	
	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.
6.3			
	Methods and materials for Methods for cleaning up	con :	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.
6.4	<b>Reference to other section</b> For additional details, see the		posure Scenario in the Annex portion
SEC	CTION 7: Handling and stora	ge	
7.1			
SDS	S Number:100000014136		5/37

	tert-Butyl Polysulfic		
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<u>v 01</u>	Precautions for safe handli Handling	ing	
	Advice on safe handling	:	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. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
	Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
.2	Conditions for safe storage	ə, in	cluding any incompatibilities
	Storage		
	Requirements for storage areas and containers	:	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. Electrical installations / working materials must comply with the technological safety standards.
.3	Specific End Use		
	Use	:	For additional details, see the Exposure Scenario in the Annex portion
SEC	Use CTION 8: Exposure controls/	: /per	portion
SEC		: /per	portion
	Exposure controls Engineering measures Adequate ventilation to contro Consider the potential hazard activities, and other substand personal protective equipment exposure to harmful levels of recommended. The user sho	ol a ds o ces i nt. 1	portion
	Exposure controls Engineering measures Adequate ventilation to contro Consider the potential hazard activities, and other substand personal protective equipment exposure to harmful levels of recommended. The user sho	ol a ds o ces i nt. 1 this ould	sonal protection sonal protection irborned concentrations below the exposure guidelines/limits. f this material (see Section 2), applicable exposure limits, job in the work place when designing engineering controls and selecting f engineering controls or work practices are not adequate to prevent is material, the personal protective equipment listed below is read and understand all instructions and limitations supplied with is usually provided for a limited time or under certain circumstances.
	<b>Exposure controls</b> <b>Exposure controls</b> <b>Engineering measures</b> Adequate ventilation to contron Consider the potential hazard activities, and other substand personal protective equipment exposure to harmful levels of recommended. The user sho the equipment since protection	ol a ds o ces i nt. 1 this ould	sonal protection sonal protection irborned concentrations below the exposure guidelines/limits. f this material (see Section 2), applicable exposure limits, job in the work place when designing engineering controls and selecting f engineering controls or work practices are not adequate to prevent a material, the personal protective equipment listed below is read and understand all instructions and limitations supplied with a usually provided for a limited time or under certain circumstances.

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	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:. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.
Hygiene measures	: Wash hands before breaks and at the end of workday.
For additional details, see th	he Exposure Scenario in the Annex portion
CTION 9: Physical and cher	
· · · ·	
Information on basic physic Appearance Form	sical and chemical properties
Information on basic physic Appearance	sical and chemical properties
Information on basic phys Appearance Form Physical state Color	sical and chemical properties : liquid : liquid : Yellow
Information on basic phys Appearance Form Physical state Color Odor	sical and chemical properties : liquid : liquid : Yellow
Information on basic phys Appearance Form Physical state Color Odor Safety data	sical and chemical properties : liquid : liquid : Yellow : Mild, sweet : 103°C (217°F)
Information on basic phys Appearance Form Physical state Color Odor Safety data Flash point	sical and chemical properties : liquid : liquid : Yellow : Mild, sweet : 103°C (217°F) Method: ASTM D 93
Information on basic phys Appearance Form Physical state Color Odor Safety data Flash point Lower explosion limit	sical and chemical properties : liquid : liquid : Yellow : Mild, sweet : 103°C (217°F) Method: ASTM D 93 : No data available
Information on basic phys Appearance Form Physical state Color Odor Safety data Flash point Lower explosion limit Upper explosion limit	sical and chemical properties : liquid : liquid : Yellow : Mild, sweet : 103°C (217°F) Method: ASTM D 93 : No data available : No data available
Information on basic physical Appearance Form Physical state Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties	<ul> <li>sical and chemical properties</li> <li>iliquid</li> <li>Iliquid</li> <li>Yellow</li> <li>Mild, sweet</li> <li>103°C (217°F) Method: ASTM D 93</li> <li>No data available</li> <li>No data available</li> <li>No</li> <li>225°C (437°F) at 1.005,20 - 1.009,40 hPa Information given is based on data obtained from similar</li> </ul>
Information on basic phys Appearance Form Physical state Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties Autoignition temperature	<ul> <li>sical and chemical properties</li> <li>iliquid <ul> <li>liquid</li> <li>Yellow</li> <li>Mild, sweet</li> </ul> </li> <li>103°C (217°F) <ul> <li>Method: ASTM D 93</li> </ul> </li> <li>No data available</li> <li>No data available</li> <li>No data available</li> <li>No</li> </ul> <li>225°C (437°F) <ul> <li>at 1.005,20 - 1.009,40 hPa</li> <li>Information given is based on data obtained from similar substances.</li> </ul> </li>
Information on basic phys Appearance Form Physical state Color Odor Safety data Flash point Lower explosion limit Upper explosion limit Oxidizing properties Autoignition temperature Thermal decomposition	<ul> <li>sical and chemical properties</li> <li>ilquid <ul> <li>liquid</li> <li>Yellow</li> <li>Mild, sweet</li> </ul> </li> <li>103°C (217°F) <ul> <li>Method: ASTM D 93</li> </ul> </li> <li>No data available</li> <li>No data available</li> <li>No data available</li> <li>No</li> </ul> <li>225°C (437°F) <ul> <li>at 1.005,20 - 1.009,40 hPa</li> <li>Information given is based on data obtained from similar substances.</li> <li>144 °C</li> </ul> </li>

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	рН		Not applicable
	Melting point/range		-11°C (12°F) at 103,25 hPa Information given is based on data obtained from similar substances.
	Freezing point		No data available
	Boiling point/boiling range	:	172-180°C (342-356°F) (5%-50%), Decomposes
	Vapor pressure	:	15,60 Pa at 20°C (68°F) Information given is based on data obtained from similar substances.
	Density	:	1,0697 G/ML at 20°C (68°F)
	Water solubility	:	Insoluble
	Partition coefficient: n- octanol/water	:	log Pow: 5,6 Information given is based on data obtained from similar substances.
	Solubility in other solvents	:	Soluble in hexane and white spirits.
	Viscosity, dynamic	:	10 cP at 20°C (68°F)
	Relative vapor density	:	1 (Air = 1.0)
	Evaporation rate	:	Not applicable
	Percent volatile	:	> 99 %
9.2	Other information Conductivity		No data available
SEC	TION 10: Stability and reactiv	ity	
10.1 10.2	Reactivity	:	Stable under recommended storage conditions.
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	: This material is considered stable under normal ambient and
Chemical stability	anticipated storage and handling conditions of temperature and pressure.
0.3	
Possibility of hazardous rea	actions
Hazardous reactions	: Hazardous reactions: Hazardous polymerization does not occur.
	Further information: No decomposition if stored and applied as directed.
0.4 Conditions to avoid	: No data available.
Thermal decomposition	: 144 °C
0.6	
Hazardous decomposition products	: Carbon oxides Sulfur oxides
Other data	: No decomposition if stored and applied as directed.
ECTION 11: Toxicological infor	mation
1.1 Information on toxicologica	l effects
Acute oral toxicity	
_	: LD50: > 2.000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.
Acute oral toxicity	<ul> <li>LD50: &gt; 2.000 mg/kg</li> <li>Species: Rat</li> <li>Sex: male and female</li> <li>Method: OECD Test Guideline 401</li> <li>Information given is based on data obtained from similar</li> </ul>
Acute oral toxicity Di-tert-butyl Polysulfide	<ul> <li>LD50: &gt; 2.000 mg/kg</li> <li>Species: Rat</li> <li>Sex: male and female</li> <li>Method: OECD Test Guideline 401</li> <li>Information given is based on data obtained from similar</li> </ul>
Acute oral toxicity Di-tert-butyl Polysulfide Acute dermal toxicity	<ul> <li>LD50: &gt; 2.000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.</li> <li>LD50: &gt; 2.000 mg/kg Sex: male and female Method: OECD Test Guideline 402 Information given is based on data obtained from similar</li> </ul>
Acute oral toxicity Di-tert-butyl Polysulfide Acute dermal toxicity Di-tert-butyl Polysulfide	<ul> <li>LD50: &gt; 2.000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.</li> <li>LD50: &gt; 2.000 mg/kg Sex: male and female Method: OECD Test Guideline 402 Information given is based on data obtained from similar</li> </ul>
Acute oral toxicity Di-tert-butyl Polysulfide Acute dermal toxicity Di-tert-butyl Polysulfide Skin irritation	<ul> <li>LD50: &gt; 2.000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.</li> <li>LD50: &gt; 2.000 mg/kg Sex: male and female Method: OECD Test Guideline 402 Information given is based on data obtained from similar substances.</li> </ul>
Acute oral toxicity Di-tert-butyl Polysulfide Acute dermal toxicity Di-tert-butyl Polysulfide Skin irritation Di-tert-butyl Polysulfide Eye irritation	<ul> <li>LD50: &gt; 2.000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.</li> <li>LD50: &gt; 2.000 mg/kg Sex: male and female Method: OECD Test Guideline 402 Information given is based on data obtained from similar substances.</li> <li>Mild skin irritation</li> </ul>

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Sensitization	
Di-tert-butyl Polysulfide	: The product is a skin sensitizer, sub-category 1B.
Repeated dose toxicity	
Di-tert-butyl Polysulfide	<ul> <li>Species: Rat Application Route: Oral NOEL: 100 mg/kg Method: OECD Test Guideline 407 Target Organs: Blood Information given is based on data obtained from similar substances.</li> </ul>
Genotoxicity in vitro	
Di-tert-butyl Polysulfide	: Test Type: Ames test Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
	Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: positive
Genotoxicity in vivo	
Di-tert-butyl Polysulfide	<ul> <li>Test Type: In vivo micronucleus test Species: Mouse Cell type: Bone marrow Route of Application: Oral Exposure time: 2 d Dose: 2000 mg/kg/d Method: OECD Test Guideline 474 Result: negative</li> </ul>
Reproductive toxicity	
Di-tert-butyl Polysulfide	<ul> <li>Species: Rat Sex: male and female Application Route: Oral Method: OECD Guideline 421 Fertility and developmental toxicity tests did not reveal any effect on reproduction. Information given is based on data obtained from similar substances.</li> </ul>
Di-tert-Butyl Polysulfide (1 Aspiration toxicity	BPS 454) : No aspiration toxicity classification.
CMR effects	
Di-tert-butyl Polysulfide	<ul> <li>Carcinogenicity: Not available Teratogenicity: Animal testing did not show any effects on fetal development.</li> </ul>
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Reproductive toxicity: Animal testing did not show any effects on fertility.

### 11.2

Information on other hazards

### Di-tert-Butyl Polysulfide (TBPS 454)

Further information	: No data available.
Endocrine disrupting	: The substance/mixture does not contain components
properties	considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### **SECTION 12: Ecological information**

### 12.1

Toxicity

### Toxicity to fish

Di-tert-butyl Polysulfide	<ul> <li>LC50: &gt; 0,088 mg/l Exposure time: 96 h static test Analytical monitoring: yes Method: OECD Test Guideline 203 No toxicity at the limit of solubility. Information given is based on data obtained from similar substances.</li> </ul>
Toxicity to daphnia and o	other aquatic invertebrates
Di-tert-butyl Polysulfide	<ul> <li>EC50: 0,24 mg/l</li> <li>Exposure time: 48 h</li> <li>Species: Daphnia magna (Water flea)</li> <li>static test Analytical monitoring: yes</li> <li>Method: OECD Test Guideline 202</li> <li>Information given is based on data obtained from similar substances.</li> </ul>
Toxicity to algae	
Di-tert-butyl Polysulfide	<ul> <li>EC50: 0,838 mg/l</li> <li>Exposure time: 96 h</li> <li>Species: Pseudokirchneriella subcapitata (microalgae)</li> <li>static test Analytical monitoring: yes</li> <li>Method: OECD Test Guideline 201</li> <li>Information given is based on data obtained from similar substances.</li> </ul>
M-Factor	M Factor (Acute Acust Tax.)
Polysulfides, di-tert-Bu	: M-Factor (Acute Aquat. Tox.) 1
	M-Factor (Chron. Aquat. Tox.) 1
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Additional ecological information	: Very toxic to aquatic life with long lasting effects.
12.7 Other adverse effects	
Endocrine disrupting properties	: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
12.6 Endocrine disrupting prope	rties
12.5 Results of PBT and vPvB as Results of PBT assessment	<ul> <li>Sessment</li> <li>This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.</li> </ul>
Di-tert-butyl Polysulfide	: No data available
Mobility	
Mobility in soil	
12.4	Does not bioaccumulate.
Di-tert-butyl Polysulfide	<ul> <li>Species: Lepomis macrochirus (Bluegill sunfish) Exposure time: 14 d Temperature: 22 °C Bioconcentration factor (BCF): 188 Method: OECD Test Guideline 305</li> </ul>
Bioaccumulation	
12.3 Bioaccumulative potential	
	Testing period: 28 d Method: OECD Test Guideline 301B Information given is based on data obtained from similar substances.
Di-tert-butyl Polysulfide	: aerobic Result: Not readily biodegradable. 13 %
Biodegradability	
12.2 Persistence and degradabil	ity
Di-tert-butyl Polysulfide	: NOEC: 45,1 mg/l Respiration inhibition

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### 12.8

### Additional Information

#### **Ecotoxicology Assessment**

Short-term (acute) aquatic hazard Di-tert-butyl Polysulfide : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard Di-tert-butyl Polysulfide : Very toxic to aquatic life with long lasting effects.

### **SECTION 13: Disposal considerations**

### 13.1

### Waste treatment methods

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 dr courses or the soil. Do not contaminate pond ditches with chemical or used container. Sen waste management company.	s, waterways or
Contaminated packaging	Empty remaining contents. Dispose of as un Do not re-use empty containers.	used product.

For additional details, see the Exposure Scenario in the Annex portion

### **SECTION 14: Transport information**

#### 14.1 - 14.7

#### 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)**

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (DI-TERT-BUTYL POLYSULFIDE), 9, III

### IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (DI-TERT-BUTYL POLYSULFIDE), 9, III, (103 °C c.c.), MARINE POLLUTANT, (DI-TERT-BUTYL POLYSULFIDE)

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	AIR TRANSPORT ASSOCIATION) ENTALLY HAZARDOUS SUBSTANCE, LIQUID,	N.O.S., (DI-TERT-BUTYL
	DANGEROUS GOODS BY ROAD (EUROPE)) ENTALLY HAZARDOUS SUBSTANCE, LIQUID, E), 9, III, (-)	N.O.S., (DI-TERT-
DANGEROUS GOODS (E	IENTALLŸ HAZARDOUS SUBSTANCE, LIQUII	
OF DANGEROUS GOOD	EMENT CONCERNING THE INTERNATIONAL S BY INLAND WATERWAYS) ENTALLY HAZARDOUS SUBSTANCE, LIQUID,	
	Ilk according to IMO instruments	
SECTION 15: Regulatory info	prmation	
15.1 Safety, health and enviro National legislation	onmental regulations/legislation specific for	he substance or mixture
	EU) 2015/830 of 28 May 2015 amending Regula and of the Council on the Registration, Evaluatio REACH)	
Water hazard class (Germany)	: WGK 2 water endangering Classification according to appendix 3	
15.2		
Chemical Safety Assess	ment	
Components :	Polysulfides, di- tert-Bu	273-103-3
Major Accident Hazard Legislation	: 96/82/EC Update: 2003 Dangerous for the environment 9a Quantity 1: 100 t Quantity 2: 200 t	
	: ZEU_SEVES3 Update: ENVIRONMENTAL HAZARDS E1 Quantity 1: 100 t Quantity 2: 200 t	
SDS Number:100000014136	ENVIRONMENTAL HAZARDS E1	

Chemicals

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Notification stat Europe REACH Switzerland CH United States of TSCA Canada DSL Other AICS New Zealand NZ Japan ENCS Korea KECI	: Thi reg INV : On America (USA) : On TS : All DS : On 2loC : No : No : A s not by Imp per the am	ulation 1907/2006/EC the inventory, or in c or in compliance with CA inventory components of this p L the inventory, or in c in compliance with t ubstance(s) in this pr ified to be registered, CPChem according to portation or manufact mitted provided the k mselves notified the s	ompliance with the inventory in the active portion of the roduct are on the Canadian ompliance with the inventory he inventory roduct was not registered, or exempted from registration o K-REACH regulations. ure of this product is still Korean Importer of Record has substance or the exported d the minimum threshold
Philippines PICC China IECSC Taiwan TCSI	: On	the inventory, or in c	ompliance with the inventory ompliance with the inventory ompliance with the inventory
SECTION 16: Other i	information		
NFPA Classifica	Fire Hazard Reactivity H	: 1	2 0
Further informa	tion		
Legacy SDS Nur	nber : 627080		
Significant chang previous versions		highlighted in the m	argin. This version replaces all
The information i	n this SDS pertains only to t	he product as shippe	d.
information and b guidance for safe not to be conside specific material	e handling, use, processing, ared a warranty or quality sp	ation. The informatio storage, transportatio ecification. The inform valid for such materia	n given is designed only as a on, disposal and release and is
Kev	or legend to abbreviations a	nd acronyms used in	the safety data sheet
ACGIH	American Conference of	LD50	Lethal Dose 50%
AIIC	Government Industrial Hygienis Australian Inventory of Industria		Lowest Observed Adverse Effect

Level

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### Di-tert-Butyl Polysulfide (TBPS 454)

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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

### Full text of H-Statements referred to under sections 2 and 3.

H317	May cause an allergic skin reaction.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

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### Annex

1. Short title of Exposure Scenario: Ma	inu	facture
· · · · ·		
Main User Groups	•	SU 3: Industrial uses: Uses of substances as such or in
Process category	:	preparations at industrial sites <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/
		discharging) from/ to vessels/ large containers at dedicated facilities
Environmental release category	:	ERC1: Manufacture of substances
Further information	:	not determined
2.1 Contributing scenario contro substances	llin	g environmental exposure for:ERC1: Manufacture of
Amount used		
Annual amount per site	:	900 tonnes/year
Environment factors not influenced Flow rate		<b>risk management</b> 390.000 m3/d
Other given operational conditions a	affe	cting environmental exposure
Initial release factor		50
Number of emission days per year Emission or Release Factor: Air		53 0,0003 %
Emission or Release Factor: Water		
Final release factor		
Emission or Release Factor: Air	:	0,0003 %
		0.0000.0/
Emission or Release Factor: Water	÷	0,0003 %
Emission or Release Factor: Soil		0 %
	:	
Emission or Release Factor: Soil Local release rate: Water	:	0 % 0,051 kg/day There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate

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Local release rate: Soil Remarks : There is no direct exposure to soil. Technical conditions and measures / Organizational measures : Release fraction to air from incineration (Effectiveness: 0,01 Air %) : Release fraction to water from incineration (Effectiveness: Water 0,01 %) Conditions and measures related to municipal sewage treatment plant Type of Sewage Treatment Plant : Municipal sewage treatment plant : 1.000 m3/d Flow rate of sewage treatment plant effluent Effectiveness (of a measure) : 91,56 % Sludge Treatment : Agricultural soil, Not applicable Conditions and measures related to external treatment of waste for disposal Waste treatment : No Remarks : Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient. Conditions and measures related to external recovery of waste **Recovery Methods** : Releases to waste (Effectiveness: 3 %) 2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure Product characteristics : Liquid substance Physical Form (at time of use) : < 0,5 kPa Vapor pressure Process Temperature : <= 50 °C Frequency and duration of use Exposure duration : < 8 h Human factors not influenced by risk management Exposed skin area : One hand face only (240 cm2) Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor Remarks : Basic general ventilation (1-3 air changes per hour) Technical conditions and measures Closed system (minimal contact during routine operations) Local exhaust ventilation- inhalation:, No (Effectiveness: 0 %) Conditions and measures related to personal protection, hygiene and health evaluation Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %) 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure **Product characteristics** Physical Form (at time of use) : Liquid substance SDS Number:100000014136 18/37

Di-tert-Butyl Polysulfide	(TBPS 454)
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Vapor pressure Process Temperature	: < 0,5 kPa : <= 50 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by ri Exposed skin area	isk management : Palms of both hands (480 cm2)
Other operational conditions affect	ting workers exposure
Outdoor / Indoor Remarks	<ul><li>Indoor</li><li>Basic general ventilation (1-3 air changes per hour)</li></ul>
Technical conditions and measure Closed continuous process with occ Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	casional controlled exposure n:, Yes (Effectiveness: 90 %)
Conditions and measures related t	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear chem activity training. (Effectiveness: 95 %	nically resistant gloves (tested to EN374) in combination with specific %)
Respiratory Protection, No (Effective	reness: 0 %)
Product characteristics Physical Form (at time of use)	: Liquid substance
Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use	: < 0,5 kPa : <= 50 °C
Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration	: < 0,5 kPa : <= 50 °C : < 8 h
Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use	: < 0,5 kPa : <= 50 °C : < 8 h
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by ri Exposed skin area</li> <li>Other operational conditions affect</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: One hand face only (240 cm2)</li> <li>ting workers exposure</li> </ul>
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by rise Exposed skin area</li> </ul>	: < 0,5 kPa : <= 50 °C : < 8 h <b>isk management</b> : One hand face only (240 cm2)
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by ri Exposed skin area</li> <li>Other operational conditions affect Outdoor / Indoor</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: One hand face only (240 cm2)</li> <li>ting workers exposure</li> <li>: Indoor</li> <li>: Basic general ventilation (1-3 air changes per hour)</li> <li>es</li> <li>hal controlled exposure.</li> <li>h:, Yes (Effectiveness: 90 %)</li> </ul>
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by ri Exposed skin area</li> <li>Other operational conditions affect Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Closed batch process with occasior Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: One hand face only (240 cm2)</li> <li>ting workers exposure</li> <li>: Indoor</li> <li>: Basic general ventilation (1-3 air changes per hour)</li> <li>es</li> <li>hal controlled exposure.</li> <li>h:, Yes (Effectiveness: 90 %)</li> </ul>
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by ri Exposed skin area</li> <li>Other operational conditions affect Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Closed batch process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N</li> <li>Conditions and measures related t</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: One hand face only (240 cm2)</li> <li>ting workers exposure</li> <li>: Indoor</li> <li>: Basic general ventilation (1-3 air changes per hour)</li> <li>es</li> <li>hal controlled exposure.</li> <li>h:, Yes (Effectiveness: 90 %)</li> <li>No (Effectiveness: 0 %)</li> <li>to personal protection, hygiene and health evaluation</li> <li>nically resistant gloves (tested to EN374) in combination with specific</li> </ul>
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by rint Exposed skin area</li> <li>Other operational conditions affect Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Closed batch process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N</li> <li>Conditions and measures related to Dermal Protection, Yes, Wear chem</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management <ul> <li>: One hand face only (240 cm2)</li> </ul> </li> <li>ting workers exposure <ul> <li>: Indoor</li> <li>: Basic general ventilation (1-3 air changes per hour)</li> </ul> </li> <li>the personal protection, hygiene and health evaluation</li> <li>nically resistant gloves (tested to EN374) in combination with specific %)</li> </ul>
<ul> <li>Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by rint Exposed skin area</li> <li>Other operational conditions affect Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Closed batch process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N</li> <li>Conditions and measures related t Dermal Protection, Yes, Wear chema activity training. (Effectiveness: 95 %)</li> </ul>	<ul> <li>: &lt; 0,5 kPa</li> <li>: &lt;= 50 °C</li> <li>: &lt; 8 h</li> <li>isk management <ul> <li>: One hand face only (240 cm2)</li> </ul> </li> <li>ting workers exposure <ul> <li>: Indoor</li> <li>: Basic general ventilation (1-3 air changes per hour)</li> </ul> </li> <li>the personal protection, hygiene and health evaluation</li> <li>nically resistant gloves (tested to EN374) in combination with specific %)</li> </ul>

# Di-tert-Butyl Polysulfide (TBPS 454)

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	olling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at
Product characteristics Physical Form (at time of use) Vapor pressure	: Liquid substance : < 0,5 kPa
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by r Exposed skin area	isk management : Two hands (960 cm2)
Other operational conditions affec Outdoor / Indoor Remarks	ting workers exposure : Indoor : Good general ventilation (3-5 air changes per hour)
Technical conditions and measure Containment measures, No Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	n:, Yes (Effectiveness: 90 %)
Conditions and measures related t	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear chern activity training. (Effectiveness: 95	nically resistant gloves (tested to EN374) in combination with specific %)
Respiratory Protection, No (Effectiv	veness: 0 %)
substance or preparation (char dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure	<ul> <li>rolling worker exposure for: PROC8b: Transfer of ging/ discharging) from/ to vessels/ large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> </ul>
Process Temperature	: <= 40 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by r Exposed skin area	isk management : Two hands (960 cm2)
Other operational conditions affec Outdoor / Indoor Remarks	t <b>ing workers exposure</b> <ul> <li>Indoor</li> <li>Basic general ventilation (1-3 air changes per hour)</li> </ul>
Technical conditions and measure Semi-closed process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	al controlled exposure n:, Yes (Effectiveness: 95 %)
Conditions and measures related t	to personal protection, hygiene and health evaluation
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Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

Respiratory Protection, No (Effectiveness: 0 %)

### 3. Exposure estimation and reference to its source

### Environment

1			1			
Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
ERC1	EUSES		Freshwater		0,000011 mg/L	0,045
			Freshwater sediment		0,0041 mg/kg dry weight (d.w.)	0,0025
			Marine water		0,0000043 mg/L	0,18
			Marine sediment		0,0016 mg/kg dry weight (d.w.)	0,0097
			Agricultural soil		0,00004 mg/kg dry weight (d.w.)	0,022
			Sewage treatment plant		0,00043 mg/L	0,000095

ERC1: Manufacture of substances

### Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,114 mg/m3	< 0,01
			Worker – dermal, long- term – systemic	0,002 mg/kg bw/day	< 0,01
			Worker – long-term – systemic Combined routes		< 0,01
PROC2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,144 mg/m3	0,079
			Worker – dermal, long- term – systemic	0,068 mg/kg bw/day	0,021
			Worker – long-term – systemic Combined routes		0,099
PROC3, CS15, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,432 mg/m3	0,237
			Worker – dermal, long- term – systemic	0,034 mg/kg bw/day	0,01
			Worker – long-term – systemic Combined routes		0,247
PROC8a, CS22, CS63, CS82	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	8,007 mg/m3	0,552
			Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
			Worker – long-term – systemic Combined routes		0,758
PROC8b, CS22, CS63, CS81	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,86 mg/m3	0,197
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			i (GVISI	011 Date 2023-02-2
		Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
		Worker – long-term – systemic Combined routes		0,403
PROC1: Use in closed process, n CS15: General exposures (closed PROC2: Use in closed, continuous CS15: General exposures (closed PROC3: Use in closed batch proc CS15: General exposures (closed CS37: Use in contained batch pro PROC8a: Transfer of substance of at non-dedicated facilities CS22: Transfer from/pouring from CS63: Vessel / container CS82: Non-dedicated facility PROC8b: Transfer of substance of	I systems) s process I systems) eess (synth I systems) ocesses or preparation containers	d of exposure with occasional control esis or formulation) ion (charging/dischargi	ng) from/to vess	-
containers at dedicated facilities CS22: Transfer from/pouring from CS63: Vessel / container CS81: Dedicated facility	containers	5		
	ser to eva	luate whether he w	orks inside the	e boundaries se
y the Exposure Scenario	Use as ar	n intermediate		
by the Exposure Scenario	Use as ar : SU : prep : SU8	<b>n intermediate</b> 3: Industrial uses: Uses parations at industrial s 5, SU9: Manufacture of	s of substances a ites bulk, large scale	as such or in
y the Exposure Scenario . Short title of Exposure Scenario: Main User Groups	Use as ar prep : SU (incl : PRC PRC form PRC (cha non PRC	<b>a intermediate</b> <b>3:</b> Industrial uses: Uses barations at industrial s <b>3, SU9:</b> Manufacture of uding petroleum produce <b>0C1:</b> Use in closed pro- <b>0C2:</b> Use in closed, con- trolled exposure <b>0C3:</b> Use in closed bat nulation) <b>0C8a:</b> Transfer of subs- barging/discharging) from- dedicated facilities <b>0C8b:</b> Transfer of subs- harging) from/ to vesse	s of substances a ites bulk, large scale icts), Manufactur cess, no likelihoo ntinuous process ch process (synt tance or prepara n/to vessels/large	as such or in e chemicals e of fine chemicals od of exposure s with occasional hesis or ttion e containers at
y the Exposure Scenario . Short title of Exposure Scenario: I Main User Groups Sector of use	Use as ar SU prep SU (incl SU (incl PRC PRC cont PRC form PRC disc facil : ERC	<b>a intermediate</b> <b>3:</b> Industrial uses: Uses barations at industrial s <b>3, SU9:</b> Manufacture of uding petroleum produce <b>0C1:</b> Use in closed pro- <b>0C2:</b> Use in closed, con- trolled exposure <b>0C3:</b> Use in closed bat nulation) <b>0C8a:</b> Transfer of subs- barging/discharging) from- dedicated facilities <b>0C8b:</b> Transfer of subs- harging) from/ to vesse	s of substances a ites bulk, large scale icts), Manufactur cess, no likelihoo ntinuous process ch process (synt itance or prepara n/to vessels/large stance or prepara els/ large contain	as such or in e chemicals e of fine chemicals od of exposure s with occasional hesis or tion e containers at ation (charging/ ers at dedicated
Sector of use Process category	Use as ar SU prep SU (incl PRC conf PRC form PRC (cha non- PRC disc facil ERC subs	<b>a intermediate</b> <b>3:</b> Industrial uses: Uses barations at industrial s <b>5, SU9:</b> Manufacture of uding petroleum produ <b>DC1:</b> Use in closed pro <b>DC2:</b> Use in closed, con trolled exposure <b>DC3:</b> Use in closed bat hulation) <b>DC8a:</b> Transfer of subs arging/discharging) from- dedicated facilities <b>DC8b:</b> Transfer of subs harging) from/ to vesse ities <b>C6a:</b> Industrial use resu	s of substances a ites bulk, large scale icts), Manufactur cess, no likelihoo ntinuous process ch process (synt itance or prepara n/to vessels/large stance or prepara els/ large contain	as such or in e chemicals e of fine chemicals od of exposure s with occasional hesis or tion e containers at ation (charging/ ers at dedicated

# Di-tert-Butyl Polysulfide (TBPS 454)

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	lling environmental exposure for:ERC6a: Industrial use her substance (use of intermediates)
Amount used	
Annual amount per site	: 800 tonnes/year
Environment factors not influenced	
Flow rate	: 390.000 m3/d
Other given operational conditions a Initial release factor	affecting environmental exposure
Number of emission days per year	: 300
Emission or Release Factor: Air	: 0,0005 %
Emission or Release Factor: Water	: 0,0005 %
Final release factor	
Emission or Release Factor: Air	: 0,0005 %
Emission or Release Factor: Water Emission or Release Factor: Soil	: 0,0005 % : 0 %
Local release rate: Water	: 0,013 kg/day There is no direct release of the substance to waste water
Remarks	: There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate to the waste treatment process.
Local release rate: Air	: 0,013 kg/day
Remarks	<ul> <li>There is no direct release of the substance to air, as air emission abatement equipment such as an incinerator is used at the manufacturing site. Therefore, the release estimate and exposure calculations reported here only relate to/are treated as releases from the waste treated process.</li> </ul>
Local release rate: Soil Remarks	: There is no direct exposure to soil.
Technical conditions and measures	/ Organizational measures
Air	: Release fraction to air from incineration (Effectiveness: 0,01 %)
Water	: Release fraction to water from incineration (Effectiveness: 0,01 %)
Conditions and measures related to	municipal sewage treatment plant
Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Flow rate of sewage treatment	: 1.000 m3/d
plant effluent	
Effectiveness (of a measure)	: 91,56 %
Sludge Treatment	: Agricultural soil, Not applicable
Conditions and measures related to Waste treatment	external treatment of waste for disposal
Remarks	ERC based assessment demonstrating control of risk with
	default conditions.
	Low risk assumed for waste life stage.
	Waste disposal according to national/local legislation is
	sufficient.
Conditions and measures related to	
Recovery Methods	: Releases to waste (Effectiveness: 5 %)
SDS Number:100000011100	00/07
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2.2 Contributing scenario contriprocess, no likelihood of expos	rolling worker exposure for: PROC1: Use in closed sure
Product characteristics	
Physical Form (at time of use)	: Liquid substance : <0,5 kPa
Vapor pressure Process Temperature	. < 0.5  KPa : <= 40 °C
Process remperature	. <= 40 C
Frequency and duration of use	
Exposure duration	: <8h
	···
Human factors not influenced by r	
Exposed skin area	: One hand face only (240 cm2)
Other operational conditions affect	ting workers exposure
Outdoor / Indoor	: Indoor
Remarks	: Basic general ventilation (1-3 air changes per hour)
Technical conditions and measure	
Closed system (minimal contact du	
Local exhaust ventilation- inhalation	
Conditions and massauras related	to non-on-ol-protoction, buriano and baalth avaluation
Conditions and measures related	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear cher	nically resistant gloves (tested to EN374) in combination with specific
activity training. (Effectiveness: 90	
Respiratory Protection, No (Effectiv	
,	,
2.2 Contributing scenario contr	rolling worker exposure for: PROC2: Use in closed,
continuous process with occas	
Product characteristics	
Physical Form (at time of use)	: Liquid substance
Vapor pressure	: < 0,5 kPa
Process Temperature	: <= 40 °C
Frequency and duration of use	. 0.5
Exposure duration	: <8h
Human factors not influenced by r	isk management
Exposed skin area	: Palms of both hands (480 cm2)
Other operational conditions affect	ting workers exposure
Outdoor / Indoor	: Indoor
Remarks	: Basic general ventilation (1-3 air changes per hour)
Technical conditions and macoun	
Technical conditions and measure	
Closed continuous process with oc	
Local exhaust ventilation- inhalation	
Local exhaust ventilation-dermal:, N	NO (EITECTIVENESS: U %)
Conditions and measures related	to personal protection, hygiene and health evaluation
	nically resistant gloves (tested to EN374) in combination with specific
activity training. (Effectiveness: 90	
Respiratory Protection, No (Effective	/eness: U %)
SDS Number:10000001/1126	24/37
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process (synthesis or formulat	
Product characteristics	
Physical Form (at time of use)	: Liquid substance
Vapor pressure	: < 0,5 kPa
Process Temperature	: <= 40 °C
Frequency and duration of use	
Exposure duration	: < 8 h
Human factors not influenced by r	isk management
Exposed skin area	: One hand face only (240 cm2)
Other operational conditions affec	
Outdoor / Indoor	: Indoor
Remarks	: Basic general ventilation (1-3 air changes per hour)
Technical conditions and measure	
Closed continuous process with oc	
Local exhaust ventilation- inhalation	
Local exhaust ventilation-dermal:, N	No (Effectiveness: 0 %)
Conditions and measures related t	to personal protection, hygiene and health evaluation
Dermal Protection Veg. Wear abor	nicelly resistant days, (tested to EN274) in combination with an activ
activity training. (Effectiveness: 90	nically resistant gloves (tested to EN374) in combination with specific
Respiratory Protection, No (Effective	
Respiratory Frotection, No (Enectiv	
2 2 Contributing scenario contr	
	olling worker exposure for: PROC8a: Transfer of
substance or preparation (char	
substance or preparation (char	olling worker exposure for: PROC8a: Transfer of
substance or preparation (char non-dedicated facilities Product characteristics	olling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use)	rolling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure	<ul> <li>colling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>i Liquid substance</li> <li>i &lt; 0,5 kPa</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use)	rolling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use	<ul> <li>rolling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt;= 40 °C</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature	<ul> <li>colling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>i Liquid substance</li> <li>i &lt; 0,5 kPa</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area Other operational conditions affec	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> <li>ting workers exposure</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area Other operational conditions affec Outdoor / Indoor Remarks	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> <li>ting workers exposure</li> <li>Indoor</li> <li>Good general ventilation (3-5 air changes per hour)</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area Other operational conditions affec Outdoor / Indoor Remarks	<ul> <li>Folling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> <li>ting workers exposure</li> <li>Indoor</li> <li>Good general ventilation (3-5 air changes per hour)</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area Other operational conditions affec Outdoor / Indoor Remarks Technical conditions and measure Containment measures, None	<ul> <li>colling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>&lt; &lt; 8 h</li> <li>isk management</li> <li>Two hands (960 cm2)</li> <li>ting workers exposure</li> <li>Indoor</li> <li>Good general ventilation (3-5 air changes per hour)</li> </ul>
substance or preparation (char non-dedicated facilities Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature Frequency and duration of use Exposure duration Human factors not influenced by r Exposed skin area Other operational conditions affec Outdoor / Indoor Remarks	<ul> <li>colling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: Two hands (960 cm2)</li> <li>ting workers exposure</li> <li>: Indoor</li> <li>: Good general ventilation (3-5 air changes per hour)</li> <li>sn:, Yes (Effectiveness: 90 %)</li> </ul>
<ul> <li>substance or preparation (char non-dedicated facilities</li> <li>Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by r Exposed skin area</li> <li>Other operational conditions affec Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Containment measures, None Local exhaust ventilation- inhalatior Local exhaust ventilation-dermal:, N</li> </ul>	<ul> <li>colling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at</li> <li>Liquid substance</li> <li>&lt; 0,5 kPa</li> <li>&lt; = 40 °C</li> <li>: &lt; 8 h</li> <li>isk management</li> <li>: Two hands (960 cm2)</li> <li>ting workers exposure</li> <li>: Indoor</li> <li>: Good general ventilation (3-5 air changes per hour)</li> <li>sn:, Yes (Effectiveness: 90 %)</li> </ul>
<ul> <li>substance or preparation (char non-dedicated facilities</li> <li>Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature</li> <li>Frequency and duration of use Exposure duration</li> <li>Human factors not influenced by r Exposed skin area</li> <li>Other operational conditions affec Outdoor / Indoor Remarks</li> <li>Technical conditions and measure Containment measures, None Local exhaust ventilation- inhalatior Local exhaust ventilation-dermal:, N</li> </ul>	<pre>rolling worker exposure for: PROC8a: Transfer of ging/discharging) from/to vessels/large containers at      Liquid substance     &lt; &lt; 0,5 kPa     &lt; &lt; = 40 °C     </pre> <pre></pre>

SAFETY	DATA	SHEET
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### Di-tert-Butyl Polysulfide (TBPS 454) Version 1.17

Version 1.17					Revision	Date 2023-02-22
activity trainin	ction, Yes, Wear g. (Effectiveness: rotection, No (Eff	95 %)	<b>U</b>	ed to EN37	(4) in combina	ation with specific
2 2 Contribut	ing scenario c	ontrolling wo	rkor ovposura	for: DDO	Ceb. Trans	for of
	preparation (c					
dedicated fac	cilities				_	
Product charae	n (at time of use)	· Liquid	d substance			
Vapor pressu		: < 0,5				
		,				
	duration of use					
Exposure du	ration	: <8h				
Human factors	not influenced	by risk manag	ement			
Exposed skir	area	: Two I	nands (960 cm2	)		
Other operatio	nal conditions a	ffecting worke	re ovnoeuro			
Outdoor / Ind		: Indoc	-			
Remarks		: Basic	general ventilat	ion (1-3 air	changes per	hour)
<b>-</b>						
	ditions and mean process with occa		devocure			
	ventilation- inhal			5)		
	ventilation-derm			- )		
•						
Conditions and	d measures rela	ted to persona	I protection, hy	giene and	health evalu	ation
Dermal Protec	ction. Yes. Wear	chemically resis	tant gloves (test	ed to EN37	4) in combina	ation with specific
	g. (Effectiveness:				,	
Respiratory P	rotection, No (Eff	ectiveness: 0 %	.)			
3. Exposure e	estimation and	reference to	its source			
Environment						
Contributing	Exposure	Specific	Compartment	Value type	Level of	Risk
Scenario	Assessment	conditions			Exposure	characterization

Scenario	Assessment Method	conditions	Compartment	value type	Exposure	characterization ratio (PEC/PNEC):
ERC6a	EUSES		Freshwater		0,0000029 mg/L	0,012
			Freshwater sediment		0,0011 mg/kg dry weight (d.w.)	0,00066
			Marine water		0,0000011 mg/L	0,047
			Marine sediment		0,00043 mg/kg dry weight (d.w.)	0,0026
			Agricultural soil		0,000059 mg/kg dry weight (d.w.)	0,032
ERC6a: Indu	strial use resulting	g in manufactur	e of another sub	ostance (use	e of intermedi	ates)
Workers/Cons	umers					
SDS Number:1	00000014136			26/37		

### Di-tert-Butyl Polysulfide (TBPS 454)

Version 1.17

Revision Date 2023-02-22

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,114 mg/m3	< 0,01
			Worker – dermal, long- term – systemic	0,003 mg/kg bw/day	< 0,01
			Worker – long-term – systemic Combined routes		< 0,01
PROC2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,144 mg/m3	0,079
			Worker – dermal, long- term – systemic	0,137 mg/kg bw/day	0,041
			Worker – long-term – systemic Combined routes		0,12
PROC3, CS15, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,432 mg/m3	0,237
			Worker – dermal, long- term – systemic	0,069 mg/kg bw/day	0,021
			Worker – long-term – systemic Combined routes		0,257
PROC8a, CS22, CS63, CS82	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	8,007 mg/m3	0,552
			Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
			Worker – long-term – systemic Combined routes		0,758
PROC8b, CS22, CS63, CS81	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,86 mg/m3	0,197
			Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
			Worker – long-term – systemic Combined routes		0,403
CS15: Gener PROC2: Use	in closed process al exposures (clos in closed, continu al exposures (clos	sed systems) Ious process w	of exposure ith occasional contro	lled exposure	
CS15: Gener	in closed batch p al exposures (clos contained batch	sed systems)	sis or formulation)		

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities CS22: Transfer from/pouring from containers CS63: Vessel / container

CS82: Non-dedicated facility

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities CS22: Transfer from/pouring from containers CS63: Vessel / container CS81: Dedicated facility

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

SDS Number:100000014136

# Di-tert-Butyl Polysulfide (TBPS 454)

Version 1.17

Short title of Exposure Scenario: Fo	
Main User Groups	: SU 3: Industrial uses: Uses of substances as such or in
Sector of use	<ul> <li>preparations at industrial sites</li> <li>SU 10: Formulation [mixing] of preparations and/ or re-</li> </ul>
Sector of use	packaging (excluding alloys)
Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure
	<b>PROC2:</b> Use in closed, continuous process with occasional
	controlled exposure
	<b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises
	<b>PROC5:</b> Mixing or blending in batch processes for formulation
	of preparations and articles (multistage and/ or significant
	contact)
	PROC8b: Transfer of substance or preparation (charging/
	discharging) from/ to vessels/ large containers at dedicated
	facilities <b>PROC9:</b> Transfer of substance or preparation into small
	containers (dedicated filling line, including weighing)
Environmental release category	: ERC2: Formulation of preparations
Further information	: not determined
	not determined
2.1 Contributing scenario contro	lling environmental exposure for:ERC2: Formulation of
-	ining environmental exposure for Erroz. Formulation of
preparations	ining environmental exposure for.Erroz. Formulation of
Amount used	
Amount used Annual amount per site	: 20 tonnes/year
Amount used	
Amount used Annual amount per site (Msafe)	: 20 tonnes/year : 0,29 tonnes/day
Amount used Annual amount per site	: 20 tonnes/year : 0,29 tonnes/day
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul> affecting environmental exposure <ul> <li>100</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Dther given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul> affecting environmental exposure <ul> <li>100</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>1,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Water Emission or Release Factor: Air Emission or Release Factor: Air Emission or Release Factor: Air	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>1,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Water Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul> affecting environmental exposure <ul> <li>100</li> <li>0,1 %</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul> affecting environmental exposure <ul> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> </ul> There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate</li> </ul>
Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> </ul> by risk management <ul> <li>390.000 m3/d</li> </ul> affecting environmental exposure <ul> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> </ul> There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water Remarks	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate to the waste treatment process.</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Air Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate to the waste treatment process.</li> <li>0,2 kg/day</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water Remarks	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate to the waste treatment process.</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to air, as air</li> </ul>
Amount used Annual amount per site (Msafe) Environment factors not influenced Flow rate Other given operational conditions a Initial release factor Number of emission days per year Emission or Release Factor: Air Emission or Release Factor: Water Final release factor Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Water Emission or Release Factor: Soil Local release rate: Water Remarks	<ul> <li>20 tonnes/year</li> <li>0,29 tonnes/day</li> <li>by risk management</li> <li>390.000 m3/d</li> <li>affecting environmental exposure</li> <li>100</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,1 %</li> <li>0,2 kg/day</li> <li>There is no direct release of the substance to waste water. Equipment cleaning water containing the substance is collected as waste for incineration. Therefore, the release estimate and exposure calculations reported here only relate to the waste treatment process.</li> <li>0,2 kg/day</li> </ul>

	SAFETY DATA SHEET
Di-tert-Butyl Polysulfide (	(IBPS 454)
Version 1.17	Revision Date 2023-02-22
	exposure calculations reported here only relate to/are treated as releases from the waste treated process.
Local release rate: Soil Remarks	: There is no direct exposure to soil.
	<ul> <li>municipal sewage treatment plant</li> <li>Municipal sewage treatment plant</li> <li>1.000 m3/d</li> </ul>
plant effluent Effectiveness (of a measure) Sludge Treatment	: 91,56 % : Agricultural soil, Not applicable
Waste treatment	o external treatment of waste for disposal : No
Remarks	<ul> <li>ERC based assessment demonstrating control of risk with default conditions.</li> <li>Low risk assumed for waste life stage.</li> <li>Waste disposal according to national/local legislation is sufficient.</li> </ul>
2.2 Contributing scenario contro	olling worker exposure for: PROC1: Use in closed
process, no likelihood of exposi	
Product characteristics	
Physical Form (at time of use)	
Vapor pressure	: < 0,5 kPa
Process Temperature	: <= 40 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by ris Exposed skin area	sk management : One hand face only (240 cm2)
Other operational conditions affect	ing workers exposure
Outdoor / Indoor	: Indoor
Remarks	: Basic general ventilation (1-3 air changes per hour)
Technical conditions and measures Closed system (minimal contact duri Local exhaust ventilation- inhalation	ing routine operations)
Conditions and measures related to	o personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear chem activity training. (Effectiveness: 90 % Respiratory Protection, No (Effective	
2.2 Contributing scenario contro continuous process with occasi	olling worker exposure for: PROC2: Use in closed,
<b>Product characteristics</b> Physical Form (at time of use) Vapor pressure	: Liquid substance : < 0,5 kPa
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	20/01

Di-tert-Butyl Polysulfide	SAFETY DATA SHEET
Version 1.17	Revision Date 2023-02-22
Process Temperature	: <= 40 °C
Frequency and duration of use Exposure duration	: < 8 h
Human factors not influenced by Exposed skin area	risk management : Palms of both hands (480 cm2)
Other operational conditions affe Outdoor / Indoor Remarks	cting workers exposure : Indoor : Basic general ventilation (1-3 air changes per hour)
Technical conditions and measur Closed continuous process with or Local exhaust ventilation- inhalatio Local exhaust ventilation-dermal:,	es ccasional controlled exposure on:, Yes (Effectiveness: 90 %)
Conditions and measures related	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear che employee training. (Effectiveness: Respiratory Protection, No (Effecti	
other process (synthesis) whe Product characteristics	rolling worker exposure for: PROC4: Use in batch and re opportunity for exposure arises
Physical Form (at time of use) Vapor pressure Process Temperature	: Liquid substance : < 0,5 kPa : <= 40 °C
Frequency and duration of use Exposure duration	: < 8 h
Human factors not influenced by Exposed skin area	risk management : Palms of both hands (480 cm2)
Other operational conditions affect Outdoor / Indoor	: Indoor
Remarks <b>Technical conditions and measur</b> Semi-closed process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:,	nal controlled exposure on:, Yes (Effectiveness: 90 %)
	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear che employee training. (Effectiveness: Respiratory Protection, No (Effecti	
	rolling worker exposure for: PROC5: Mixing or blending in on of preparations and articles (multistage and/ or
SDS Number:100000014136	30/37

# Di-tert-Butyl Polysulfide (TBPS 454)

Version 1.17

Version 1.17	Revision Date 2023-02-22
Product characteristics Physical Form (at time of use) Vapor pressure Process Temperature	: Liquid substance : <0,5 kPa : <= 40 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by r Exposed skin area	risk management : Palms of both hands (480 cm2)
Other operational conditions affec Outdoor / Indoor Remarks	c <b>ting workers exposure</b> : Indoor : Basic general ventilation (1-3 air changes per hour)
Technical conditions and measure Containment measures, None Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	n:, Yes (Effectiveness: 90 %)
Conditions and measures related	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear cher employee training. (Effectiveness: 9 Respiratory Protection, No (Effectiv	
	rolling worker exposure for: PROC9: Transfer of small containers (dedicated filling line, including
<b>Product characteristics</b> Physical Form (at time of use) Vapor pressure Process Temperature	: Liquid substance : <0,5 kPa : <= 40 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by r Exposed skin area	risk management : Palms of both hands (480 cm2)
Other operational conditions affec Outdoor / Indoor Remarks	ting workers exposure : Indoor : Basic general ventilation (1-3 air changes per hour)
Technical conditions and measure Semi-closed process with occasion Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	es nal controlled exposure n:, Yes (Effectiveness: 90 %)
Conditions and measures related	to personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear cher employee training. (Effectiveness: 9 Respiratory Protection, No (Effectiv	
2.2 Contributing scenario contr	rolling worker exposure for: PROC8b: Transfer of
SDS Number:100000014136	31/37

## Di-tert-Butyl Polysulfide (TBPS 454)

Version 1.17

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substance or dedicated fac	preparation (c	harging/ dis	charging) fron	n/ to vesse	els/ large co	ontainers at
Product chara	cteristics					
Physical Form	m (at time of use)	: Liaui	id substance			
Vapor pressu		: < 0,5				
Process Tem		: <= 4				
11000331011	iperature	. <= +	00			
requency and	duration of use	9				
Exposure du		: <8h	ו			
luman factors	not influenced	by rick manag	noment			
				<b>`</b>		
Exposed skin	larea	: TWO	hands (960 cm2	)		
Other operatio	nal conditions a	ffecting work	ers exposure			
Outdoor / Ind		: Indo	-			
Remarks			c general ventilat	tion (1-3 air	changes per	hour)
Remarks		. Dasi	c general ventila		changes per	nour)
Local exhaust Local exhaust Conditions and Dermal Protect employee train Respiratory P	orocess with occa ventilation- inhal ventilation-derm d measures rela- ction, Yes, Wear of ning. (Effectivene rotection, No (Effectivene estimation and	ation:, Yes (Ef al:, No <b>ted to persona</b> chemically resi ss: 90 %) ectiveness: 0 %	fectiveness: 95 % al protection, hy stant gloves (test	giene and		
Contributing Scenario	Exposure	Specific conditions	Compartment	Value type	Level of	Risk
Scenario	Assessment Method	conditions			Exposure	characterization ratio (PEC/PNEC)
ERC2	EUSES		Freshwater		0,000042	0,7
					mg/L	
			Freshwater		0,016 mg/kg	0,0095
			sediment		dry weight	
			Marine water		(d.w.) 0,000017	0,7
			wanne water		0,000017 mg/L	0,7
			Marine sediment		0,0064 mg/kg	0,038
					dry weight	-,
					(d.w.)	
			Agricultural soil		0.00029	0.16

ERC2: Formulation of preparations

### Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):		
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,114 mg/m3	< 0,01		
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Agricultural soil

Sewage treatment plant 0,00029

mg/kg dry weight (d.w.)

0,0017 mg/L

0,16

0,000037

### Di-tert-Butyl Polysulfide (TBPS 454)

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		Worker – dermal, long- term – systemic	0,003 mg/kg bw/day	< 0,01
		Worker – long-term – systemic Combined routes		< 0,01
PROC2, CS15	ECETOC TRA Modified	Worker – inhalation, long-term – systemic	1,144 mg/m3	0,079
		Worker – dermal, long- term – systemic	0,137 mg/kg bw/day	0,041
		Worker – long-term – systemic Combined routes		0,12
PROC4, CS55	ECETOC TRA Modified	Worker – inhalation, long-term – systemic	5,719 mg/m3	0,394
		Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
		Worker – long-term – systemic Combined routes		0,6
PROC5, CS55	ECETOC TRA Modified	Worker – inhalation, long-term – systemic	5,719 mg/m3	0,394
		Worker – dermal, long- term – systemic	1,371 mg/kg bw/day	0,412
		Worker – long-term – systemic Combined routes		0,806
PROC9, CS22, CS63	ECETOC TRA Modified	Worker – inhalation, long-term – systemic	5,719 mg/m3	0,394
		Worker – dermal, long- term – systemic	0,686 mg/kg bw/day	0,206
		Worker – long-term – systemic Combined routes		0,6
PROC8b, CS22, CS63	ECETOC TRA Modified	Worker – inhalation, long-term – systemic	2,86 mg/m3	0,197
		Worker – dermal, long- term – systemic	1,371 mg/kg bw/day	0,412
		Worker – long-term – systemic Combined routes		0,609
	in closed process al exposures (clos	no likelihood of exposure ed systems)		
PROC2: Use		ous process with occasional control	ed exposure	
PROC4: Use CS55: Batch		process (synthesis) where opportu	nity for exposure	arises
	icant contact)	atch processes for formulation of pr	eparations and a	rticles (multistage
weighing)	fer from/pouring fr	or preparation into small containers om containers	(dedicated filling	line, including

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities CS22: Transfer from/pouring from containers CS63: Vessel / container

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set

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SAFETY DATA SHEET

### by the Exposure Scenario

1. Short title of Exposure Scenario: Lu	bricants - Industrial
Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU0:</b> Other
Process category	<ul> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> </ul>
Environmental release category	: ERC7: Industrial use of substances in closed systems
Further information	: not determined
2.1 Contributing scenario contro substances in closed systems	lling environmental exposure for:ERC7: Industrial use of
Amount used	
Annual amount per site	: 8 tonnes/year
(Msafe)	: 0,057 tonnes/day
Environment factors not influenced Flow rate	<b>by risk management</b> : 18.000 m3/d
Other given operational conditions a Initial release factor	affecting environmental exposure
Number of emission days per year	: 200
Emission or Release Factor: Air	
Emission or Release Factor: Water Final release factor	
Emission or Release Factor: Air	: 0,1 %
Emission or Release Factor: Water	: 0,1 %
Emission or Release Factor: Soil	: 0%
Local release rate: Water	: 0,04 kg/day
Remarks	: In the absence of specific information on the use of lubricants containing the substance, a generic release factor of 1E-03 is considered to be a reasonable estimate of release of the substance to water from industrial lubricants
Local release rate: Air	: 0,04 kg/day
Remarks	: In the absence of specific information on the use of lubricants containing the substance, a generic release factor of 1E-03 is considered to be a reasonable estimate of release of the substance to air from industrial lubricants.
Local release rate: Soil Remarks	: There is no direct exposure to soil
	: There is no direct exposure to soil.
Technical conditions and measures Air	<ul> <li>/ Organizational measures</li> <li>: Release fraction to air from incineration (Effectiveness: 0,01 %)</li> </ul>
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Di-tert-Butyl Polysulfide	SAFETY DATA SHEET (TBPS 454)
Version 1.17	Revision Date 2023-02-22
Water	: Release fraction to water from incineration (Effectiveness: 0,01 %)
<b>Conditions and measures related to</b> Type of Sewage Treatment Plant Flow rate of sewage treatment plant effluent Effectiveness (of a measure) Sludge Treatment	<ul> <li>o municipal sewage treatment plant</li> <li>Municipal sewage treatment plant</li> <li>1.000 m3/d</li> <li>91,56 %</li> <li>Agricultural soil, Not applicable</li> </ul>
	o external treatment of waste for disposal
Waste treatment Remarks	<ul> <li>No</li> <li>Low risk assumed for waste life stage.</li> <li>Waste disposal according to national/local legislation is sufficient.</li> </ul>
	olling worker exposure for: PROC8b: Transfer of ging/ discharging) from/ to vessels/ large containers at
<b>Product characteristics</b> Physical Form (at time of use) Vapor pressure Process Temperature	: Liquid substance : < 0,5 kPa : <= 40 °C
Frequency and duration of use Exposure duration	: <8h
Human factors not influenced by ris Exposed skin area	sk management : Two hands (960 cm2)
Other operational conditions affect Outdoor / Indoor Remarks	- Indeer
Technical conditions and measures Semi-closed process with occasiona Local exhaust ventilation- inhalation Local exhaust ventilation-dermal:, N	al controlled exposure i:, Yes (Effectiveness: 95 %)
Conditions and measures related to	o personal protection, hygiene and health evaluation
Dermal Protection, Yes, Wear chem employee training. (Effectiveness: 9 Respiratory Protection, No	nically resistant gloves (tested to EN374) in combination with 'basic' 0 %)
	olling worker exposure for: PROC9: Transfer of mall containers (dedicated filling line, including
<b>Product characteristics</b> Physical Form (at time of use) Vapor pressure Process Temperature	: Liquid substance : < 0,5 kPa : <= 40 °C
Frequency and duration of use Exposure duration	: < 8 h

### Di-tert-Butyl Polysulfide (TBPS 454)

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### Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm2)

#### Other operational conditions affecting workers exposure

Outdoor / Indoor Remarks

: Basic general ventilation (1-3 air changes per hour)

### Technical conditions and measures

Semi-closed process with occasional controlled exposure Local exhaust ventilation- inhalation:, Yes (Effectiveness: 90 %) Local exhaust ventilation-dermal:, No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation

: Indoor

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) Respiratory Protection, No

### 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
ERC7	EUSES		Freshwater		0,00017 mg/L	0,7
			Freshwater sediment		0,064 mg/kg dry weight (d.w.)	0,038
			Marine water		0,000017 mg/L	0,7
			Marine sediment		0,0064 mg/kg dry weight (d.w.)	0,038
			Agricultural soil		0,00012 mg/kg dry weight (d.w.)	0,065
			Sewage treatment plant		0,0017 mg/L	0,00037

ERC7: Industrial use of substances in closed systems

#### Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):	
PROC8b, CS22, CS63	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,716 mg/m3	0,118	
			Worker – dermal, long- term – systemic	0,823 mg/kg bw/day	0,247	
			Worker – long-term – systemic Combined routes		0,365	
PROC9, CS22, CS63	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,432 mg/m3	0,237	
			Worker – dermal, long- term – systemic	0,412 mg/kg bw/day	0,124	
			Worker – long-term – systemic Combined routes		0,36	
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large						
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### Di-tert-Butyl Polysulfide (TBPS 454)

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containers at dedicated facilities CS22: Transfer from/pouring from containers CS63: Vessel / container

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) CS22: Transfer from/pouring from containers CS63: Vessel / container

### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

SDS Number:100000014136