

# SAFETY DATA SHEET

According to REACH Regulation (EC) No 1907/2006, as amended by  
UK REACH Regulations SI 2019/758



## VULKANOX BKF

Version	Revision Date:	SDS Number:	Date of last issue: 24.02.2022
2.1	10.06.2022	203000000196	Country / Language: GB / 6N (EN)

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

#### 1.1 Product identifier

Trade name : VULKANOX BKF

Product code : 000000000000074772

REACH Registration Number (EU) : 01-2119496065-33-0000

Substance name : 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol

EC-No. : 204-327-1

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

Use of the Substance/Mixture : Antioxidant agent  
A tabular overview of all uses for which an exposure scenario is provided can be found at the beginning of the annex to this safety data sheet.

Recommended restrictions on use : Uses advised against:

Widespread use by professional workers:  
- Non-industrial (professional) spraying (PROC 11) of adhesives, sealants, inks and toners, lubricants and similar products (PC1, PC17, PC18, PC24, PC25)

Consumer uses:  
- Spraying of adhesives (PC1) - All lubricant uses (PC24) except filling a vehicle engine with a lubricant (Concawe\_SCED\_24\_1)

Article service life - Consumer:  
- Rubber and plastic articles with daily contact and a skin contact area equivalent to the inside and outside of two hands or more (e.g. flooring, furniture (such as plastic chairs), gloves and footwear) (AC10a, AC10e, AC10f, AC10g, AC13a, AC13e, AC13f, AC13g) - Rubber and plastic articles with daily contact and a skin contact area equivalent to the inside of two hands (e.g. rubber handles and steering wheels) and the concentration in the article exceeds 1% (AC10g, AC13g) - Rubber and plastic articles with daily contact and a skin contact area equivalent to the inside of one hand (e.g. shoe soles and belts) and the concentration in the article exceeds 3% (AC10g, AC13g) - Rubber and plastic articles used as toys or childcare articles (AC10b, AC13b) - Rubber and plastic arti-

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cles used as food contact materials (AC10d, AC13d)

### 1.3 Details of the supplier of the safety data sheet

Company : LANXESS Limited  
Tenax Road, Trafford Park  
M17 1WT, Manchester  
Great Britain

Responsible Department : +49 221 8885 2288  
infosds@lanxess.com

### 1.4 Emergency telephone number

Emergency telephone number : For 24/7 multilingual emergency please call  
CHEMTREC EMEA: +44 20 3885 0382 and mention CCN  
1001748.

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## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK  
SI 2019/720, and UK SI 2020/1567)**

Reproductive toxicity, Category 1B                      H360: May damage fertility or the unborn child.

### 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI  
2019/720, and UK SI 2020/1567)**

Hazard pictograms :



Signal word : Danger

Hazard statements : H360 May damage fertility or the unborn child.

Precautionary statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been  
read and understood.

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P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

**Response:**

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

### 2.3 Other hazards

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.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

#### Components

Chemical name	CAS-No. EC-No.	Classification	Concentration (% w/w)
6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	119-47-1 204-327-1	Repr. 1B; H360F	>= 90 - <= 100

For explanation of abbreviations see section 16.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

- General advice : Move out of dangerous area.  
Show this safety data sheet to the doctor in attendance.  
Do not leave the victim unattended.
- If inhaled : Move the victim to fresh air.  
If unconscious, place in recovery position and seek medical advice.  
If symptoms persist, call a physician.
- In case of skin contact : Wash off with plenty of water.  
Get medical attention if symptoms occur.
- In case of eye contact : Flush eyes with water as a precaution.  
Remove contact lenses.

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Protect unharmed eye.  
Keep eye wide open while rinsing.  
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.  
Do not induce vomiting without medical advice.  
Never give anything by mouth to an unconscious person.  
Rinse mouth with water.  
If symptoms persist, call a physician.

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

Risks : May damage fertility.

### 4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media : In case of fire, use water spray (fog), foam, dry chemical or CO<sub>2</sub>.

Unsuitable extinguishing media : None known.

### 5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide

### 5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires.  
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Avoid dust formation.  
No action shall be taken involving any personal risk or without suitable training.  
Keep unnecessary and unprotected personnel from entering.

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Do not touch or walk through spilt material.

### 6.2 Environmental precautions

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 material for containment and cleaning up

Methods for cleaning up : Move containers from spill area.  
Avoid dust formation.  
Contain spillage, pick up with an electrically protected vacuum  
cleaner or by wet-brushing and transfer to a container for dis-  
posal according to local regulations (see section 13).

### 6.4 Reference to other sections

For personal protection see section 8., For disposal considerations see section 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of respirable particles.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the ap-  
plication area.  
Dispose of rinse water in accordance with local and national  
regulations.

Advice on protection against fire and explosion : Dust can form an explosive mixture in air. Provide appropriate  
exhaust ventilation at places where dust is formed. Take pre-  
cautionary measures against electrostatic discharges.

Hygiene measures : Wash hands before breaks and at the end of workday.

Dust explosion class : St3

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : To dissipate static electricity during transfer, earth drum and  
connect to receiving container with bonding strap. Use only  
non-sparking tools. All equipment handling the product, where  
there is a risk of decomposition, should be provided with ade-  
quate unrestricted venting area to ensure that internal pres-  
sure cannot build up. Keep container tightly closed in a dry  
and well-ventilated place. Observe label precautions. Electri-  
cal installations / working materials must comply with the

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technological safety standards.

Recommended storage temperature : < 40 °C

Further information on storage stability : No decomposition if stored and applied as directed.

### 7.3 Specific end use(s)

Specific use(s) : Antioxidant agent

## SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

#### Derived No Effect Level (DNEL):

Substance name	End Use	Exposure routes	Potential health effects	Value
6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	Workers	Inhalation	Systemic effects, Long-term exposure	1.25 mg/m <sup>3</sup>
	Workers	Inhalation	Systemic effects, Short-term exposure	6.25 mg/m <sup>3</sup>
	Workers	Dermal	Long-term exposure, Systemic effects	0.36 mg/kg bw/day
	Workers	Dermal	Systemic effects, Short-term exposure	1.8 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	0.22 mg/m <sup>3</sup>
	Consumers	Inhalation	Systemic effects, Short-term exposure	1.1 mg/m <sup>3</sup>
	Consumers	Dermal	Systemic effects, Long-term exposure	0.13 mg/kg bw/day
	Consumers	Dermal	Systemic effects, Short-term exposure	0.65 mg/kg bw/day
	Consumers	Oral	Systemic effects, Long-term exposure	0.13 mg/kg bw/day
	Consumers	Oral	Systemic effects, Short-term exposure	0.65 mg/kg bw/day

#### Predicted No Effect Concentration (PNEC):

Substance name	Environmental Compartment	Value
6,6'-di-tert-butyl-2,2'-	Secondary Poisoning	10 mg/kg food

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methylenedi-p-cresol		
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### 8.2 Exposure controls

#### Engineering measures

Use only with adequate ventilation.

If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Use explosion-proof ventilating equipment.

#### Personal protective equipment

Eye protection : Tightly fitting safety goggles

Hand protection

Material : Fluorinated rubber - FKM

Break through time :  $\geq 8$  h

Glove thickness :  $\geq 0.4$  mm

Wearing time :  $< 60$  min

Remarks : Source GESTIS <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index.jsp> After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : Dust impervious protective suit

Respiratory protection : In the case of dust or aerosol formation use respirator with an approved filter.

Wear breathing apparatus with separate air supply (compressed air respirator, tube apparatus) at higher concentrations.

Filter type : P3 filter

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance : powder

Physical state : solid

Colour : White to yellowish.

Odour : slight

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Odour Threshold	:	No data available
Melting point/range	:	> 124 °C
Boiling point/boiling range	:	185 - 187 °C (0.07 hPa)
Flammability	:	May form explosive dust-air mixture.
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	185 °C Method: closed cup
Ignition temperature	:	> 170 °C
Decomposition temperature	:	> 128 °C
pH	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Solubility(ies)		
Water solubility	:	0.007 mg/l insoluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: 6.25 (20 °C) Method: OECD Test Guideline 117 GLP: no
Vapour pressure	:	< 0.01 hPa (20 °C)
Relative density	:	No data available
Density	:	1.04 g/cm <sup>3</sup> (20 °C)
Bulk density	:	320 kg/m <sup>3</sup>
Particle characteristics		
Assessment	:	No data available
Particle size	:	No data available

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### 9.2 Other information

Explosives	:	No data available
Oxidizing properties	:	No data available
Flammable solids	:	
Burning number	:	No data available
Self-ignition	:	No data available
Dust explosion class	:	St3
Evaporation rate	:	No data available
Miscibility with water	:	No data available
Minimum ignition energy	:	< 1 mJ

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

### 10.2 Chemical stability

This product is stable.

### 10.3 Possibility of hazardous reactions

Hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
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### 10.4 Conditions to avoid

Conditions to avoid	:	Fine powder forms flammable and explosive mixtures in air. minimum ignition energy: <1 mJ Prevent dust accumulation. Avoid sources of ignition.
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### 10.5 Incompatible materials

Materials to avoid	:	Oxidizing agents
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### 10.6 Hazardous decomposition products

No hazardous decomposition products are known.

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### SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects

##### Acute toxicity

Not classified based on available information.

##### Components:

##### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

Acute oral toxicity                      : LD50 (Rat): > 5,000 mg/kg  
GLP: no

Acute dermal toxicity                    : LD50 (Rat): > 10,000 mg/kg  
GLP: no

##### Skin corrosion/irritation

Not classified based on available information.

##### Components:

##### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

Species                                    : Rabbit  
Exposure time                            : 4 h  
Method                                    : OECD Test Guideline 404  
Result                                     : No skin irritation  
GLP                                         : yes

##### Serious eye damage/eye irritation

Not classified based on available information.

##### Components:

##### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

Species                                    : Rabbit  
Method                                    : OECD Test Guideline 405  
Result                                     : No eye irritation  
GLP                                         : yes

##### Respiratory or skin sensitisation

##### Skin sensitisation

Not classified based on available information.

##### Respiratory sensitisation

Not classified based on available information.

##### Components:

##### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

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Exposure routes                   : Skin contact  
Species                             : Mouse  
Method                             : OECD Test Guideline 429  
Result                              : Did not cause sensitisation on laboratory animals.  
GLP                                 : yes

### Germ cell mutagenicity

Not classified based on available information.

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

Genotoxicity in vitro           : Test Type: Ames test  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
GLP: yes

Test Type: Ames test  
Test system: Escherichia coli  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
GLP: yes

Test Type: Chromosome aberration test in vitro  
Test system: Chinese hamster lung cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative  
GLP: yes

Test Type: In vitro mammalian cell gene mutation test  
Test system: Chinese hamster fibroblasts  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative  
GLP: yes

### Carcinogenicity

Not classified based on available information.

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

Species                             : Rat, male  
Application Route               : Oral  
Exposure time                   : 18 month(s)

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NOAEL : 12.7 mg/kg bw/day

### Reproductive toxicity

May damage fertility or the unborn child.

### Components:

#### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

Effects on fertility : Species: Rat, male  
Application Route: Oral  
General Toxicity - Parent: NOAEL: 12.5 mg/kg body weight  
General Toxicity F1: NOAEL: 12.5 mg/kg body weight  
Symptoms: Testicular damage in animals.  
Method: OECD Test Guideline 421  
GLP: yes

Species: Rat, female  
Application Route: Oral  
General Toxicity F1: NOAEL: 50 mg/kg body weight  
Method: OECD Test Guideline 421  
GLP: yes

Effects on foetal development : Species: Rat  
Application Route: Oral  
Dose: 200 milligram per kilogram  
General Toxicity Maternal: NOAEL: 50 mg/kg body weight  
Embryo-foetal toxicity: 50 mg/kg body weight  
Method: OECD Test Guideline 421

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

### STOT - single exposure

Not classified based on available information.

### STOT - repeated exposure

Not classified based on available information.

### Repeated dose toxicity

### Components:

#### 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:

Species : Rat, male  
NOAEL : 12.7 mg/kg  
Application Route : Oral  
Exposure time : 1.5 yr  
Number of exposures : daily  
GLP : no  
Remarks : Chronic toxicity

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### Aspiration toxicity

Not classified based on available information.

### Further information

#### Product:

Remarks : No data available

## SECTION 12: Ecological information

### 12.1 Toxicity

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

- Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 5 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
GLP: yes  
Remarks: Dosage caused no mortality
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 4.8 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
GLP: yes  
Remarks: No toxicity at the limit of solubility
- Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (microalgae)): > 5 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
GLP: yes  
  
NOEC (Pseudokirchneriella subcapitata (microalgae)): 1.3 mg/l  
End point: Growth rate  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
GLP: yes
- Toxicity to microorganisms : EC50 (activated sludge): > 10,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
GLP: no
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0.34 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Method: OECD Test Guideline 202

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GLP: yes

### Ecotoxicology Assessment

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

### 12.2 Persistence and degradability

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

Biodegradability : Inoculum: activated sludge  
Result: Not readily biodegradable.  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C  
GLP: yes

### 12.3 Bioaccumulative potential

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 840  
Method: OECD Test Guideline 305  
GLP: yes

Partition coefficient: n-octanol/water : log Pow: 6.25 (20 °C)  
Method: OECD Test Guideline 117  
GLP: no

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

#### Product:

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% or higher.

#### Components:

##### **6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol:**

Assessment : This substance is not considered to be very persistent and very bioaccumulating (vPvB).. This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

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### 12.6 Other adverse effects

**Product:**

Additional ecological information : In the range of solubility in water non-toxic under conditions of test.

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### SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

#### 13.1 Waste treatment methods

Product : Do not dispose of waste into sewer.  
Do not contaminate ponds, waterways or ditches with chemical or used container.  
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

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### SECTION 14: Transport information

#### 14.1 UN number

Not regulated as a dangerous good

#### 14.2 UN proper shipping name

Not regulated as a dangerous good

#### 14.3 Transport hazard class(es)

Not regulated as a dangerous good

#### 14.4 Packing group

Not regulated as a dangerous good

#### 14.5 Environmental hazards

Not regulated as a dangerous good

#### 14.6 Special precautions for user

Hazard and Handling Notes. : Not dangerous cargo.  
Keep dry.  
Keep away from foodstuffs, acids and alkalis.

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### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

Relevant EU provisions transposed through retained EU law

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Banned and/or restricted
International Chemical Weapons Convention (CWC) Schedules of Toxic Chemicals and Precursors	:	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Council Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors.	:	Neither banned nor restricted
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable
GB Export and import of hazardous chemicals - Prior Informed Consent (PIC) Regulation	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.		Not applicable

### 15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Full text of H-Statements

H360F : May damage fertility.

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### Full text of other abbreviations

Repr. : Reproductive toxicity

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECL - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The data contained in this Safety Data Sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered to be a guidance for processing and does not contain any warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is the responsibility of the recipient of the product to ensure that any proprietary rights and existing laws and legislation are observed.

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### Annex

#### Exposure Scenario (ES)

Number	Title
ES1	Formulation into mixture, Adhesives, inks, Industrial (ERC2; PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PROC9; PC1; PC18)  <u>Structured Short Title:</u> Formulation or re-packing; Various products (PC1, PC18).
ES2	Formulation into mixture, Production of tyres, Industrial (ERC2; PROC3; PROC5; PROC8b; PROC21; PC32)  <u>Structured Short Title:</u> Formulation or re-packing; Polymer preparations and compounds (PC32).
ES3	Liquid formulation of rubber and non-rubber plastic preparations, (excluding tyres), Industrial (ERC2; PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PC32)  <u>Structured Short Title:</u> Formulation or re-packing; Polymer preparations and compounds (PC32).
ES4	Formulation into solid matrix, Industrial (ERC3; PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PROC9; PROC14; PROC21; PC1; PC24)  <u>Structured Short Title:</u> Formulation or re-packing; Various products (PC1, PC24).
ES5	Formulation into solid matrix, rubber for tyres, Industrial (ERC3; PROC3; PROC5; PROC8b; PROC21; PC32)  <u>Structured Short Title:</u> Formulation or re-packing; Polymer preparations and compounds (PC32); Tyres.
ES6	Formulation into solid matrix, Manufacture of plastic materials, (excluding tyres), Industrial (ERC3; PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PROC9; PROC14; PROC21; PC32)  <u>Structured Short Title:</u> Formulation or re-packing; Polymer preparations and compounds (PC32); Plastic articles.
ES7	Use in adhesives and sealants, inks, Industrial (ERC5; PROC1; PROC2; PROC3; PROC4; PROC5; PROC7; PROC8a; PROC8b; PROC9; PROC10; PROC13; PROC15; PC1)  <u>Structured Short Title:</u> Use at industrial sites; Adhesives, sealants (PC1).
ES8	Production of tyres, Industrial (ERC5; PROC14; PROC21; SU11; SU12)

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	<u>Structured Short Title:</u> Use at industrial sites; Various sectors (SU11, SU12).
<b>ES9</b>	Use of tyres, Industrial (; PROC21)  <u>Structured Short Title:</u> Service life - workers; Tyres; Industrial.
<b>ES10</b>	Use of tyres, Professional (; PROC21)  <u>Structured Short Title:</u> Service life - workers; Tyres; Professional.
<b>ES11</b>	Use of tyres, Consumer (ERC10a; AC10)  <u>Structured Short Title:</u> Service life - consumers; Rubber articles (AC10); Tyres.
<b>ES12</b>	Use in rubber and non-rubber polymers., Industrial (ERC5; PROC2; PROC3; PROC5; PROC8b; PROC9; PROC10; PROC13; PROC14; PROC15; PROC21; PC32; SU11; SU12)  <u>Structured Short Title:</u> Use at industrial sites; Polymer preparations and compounds (PC32); Various sectors (SU11, SU12).
<b>ES13</b>	Service life of plastic articles, Industrial (; PROC21)  <u>Structured Short Title:</u> Service life - workers; Plastic articles; Industrial.
<b>ES14</b>	Service life of plastic articles, Professional (; PROC21)  <u>Structured Short Title:</u> Service life - workers; Plastic articles; Professional.
<b>ES15</b>	Service life of plastic articles, Consumer (ERC10a; ERC11a; AC10; AC13)  <u>Structured Short Title:</u> Service life - consumers; Various articles (AC10, AC13).
<b>ES16</b>	Use in adhesives and sealants, inks, Professional (ERC8f; PROC1; PROC2; PROC3; PROC4; PROC5; PROC8a; PROC8b; PROC9; PROC10; PROC13; PROC14; PROC15; PROC21; PC1; SU5; SU6a; SU6b; SU17; SU18; SU19)  <u>Structured Short Title:</u> Widespread use by professional workers; Adhesives, sealants (PC1).
<b>ES17</b>	Use in rubber and non-rubber polymers., Professional (ERC8f; PROC8a; PROC8b; PROC14; PROC15; PROC21; PC32; SU11; SU12)  <u>Structured Short Title:</u> Widespread use by professional workers; Polymer preparations and compounds (PC32); Various sectors (SU11, SU12).

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<b>ES18</b>	Use in adhesives and sealants, Consumer (ERC8f; PC1)  <u>Structured Short Title:</u> Consumer use; Adhesives, sealants (PC1).
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### ES1: Formulation into mixture, Adhesives, inks, Industrial

#### 1.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Various products (PC1, PC18).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC2:</b> Formulation into mixture
<b>Process category(ies)</b>	: <b>PROC1:</b> Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4:</b> Chemical production where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8a:</b> Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9:</b> Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
<b>Product (sub) category(ies)</b>	: <b>PC1:</b> Adhesives, sealants <b>PC18:</b> Ink and toners

Contributing Scenario (CS) Environment		
<b>CS1</b>	<b>Formulation into mixture; Adhesives; inks</b>	ERC2

Contributing Scenario (CS) Worker		
<b>CS2</b>	<b>Unloading</b>	PROC8a, PROC8b

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<b>CS3</b>	<b>Use in closed process</b>	PROC1
<b>CS4</b>	<b>Continuous process; Closed systems</b>	PROC2
<b>CS5</b>	<b>Batch process; Closed systems</b>	PROC3
<b>CS6</b>	<b>Use in semi-closed process with opportunity for exposure</b>	PROC4
<b>CS7</b>	<b>Mixing operations</b>	PROC5
<b>CS8</b>	<b>Material transfers; Dedicated facility</b>	PROC8b
<b>CS9</b>	<b>Small package filling; Small scale weighing</b>	PROC9

### 1.2. Conditions of use affecting exposure

#### 1.2.1. Control of environmental exposure: Formulation into mixture; Adhesives; inks (ERC2)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Annual amount per site	: 100 t
Daily amount per site	: 5 t
Emission days per year	: 20

<b>Conditions and measures related to sewage treatment plant</b>	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m3/d

<b>Conditions and measures related to treatment of waste (including article waste)</b>	
Waste disposal methods	: For general information on waste disposal see section 13.

<b>Other conditions affecting environmental exposure</b>	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

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### 1.2.2. Control of worker exposure: Unloading (PROC8a, PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Near field	: Covers exposure up to 4 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer / Falling of powders, granules or pelletized material
Application rate	: < 100 kg/min
Handling type	: Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner
drop height	: > 0.5 m

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %	

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Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m3
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.3. Control of worker exposure: Use in closed process (PROC1)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

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Wear suitable protective clothing.  
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.4. Control of worker exposure: Continuous process; Closed systems (PROC2)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %  
Physical form of product : Solid, high dustiness  
Vapour pressure : 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

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Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.5. Control of worker exposure: Batch process; Closed systems (PROC3)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation

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Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.6. Control of worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Solid in solution  
medium viscosity

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class : Activities with open liquid surfaces or open reservoirs -  
activity with agitated surfaces

Open surface :  $\leq 1 \text{ m}^2$

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Room size : 300 m<sup>3</sup>

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.7. Control of worker exposure: Mixing operations (PROC5)

#### Product (article) characteristics

Concentration of substance in prod- : Covers concentrations up to 5 %

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uct	
Physical form of product	: Solid in solution low viscosity

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Activity class	: Activities with open liquid surfaces or open reservoirs - activity with agitated surfaces
Open surface	: $\leq 3 \text{ m}^2$

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

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### 1.2.8. Control of worker exposure: Material transfers; Dedicated facility (PROC8b)

<b>Product (article) characteristics</b>	
Concentration of substance in product	: Covers concentrations up to 5 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h
<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %	
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air

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changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 1.2.9. Control of worker exposure: Small package filling; Small scale weighing (PROC9)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 5 %

Physical form of product : Solid, high dustiness

Vapour pressure : 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

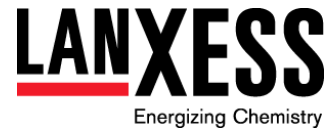
Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

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Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

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

#### 1.3.1. Environmental release and exposure: Formulation into mixture; Adhesives; inks (ERC2)

Release route	Release	Release estimation method
Water	0 %	SpERC FEICA 2.1c.v2
Air	3.6 %	SpERC FEICA 2.1c.v2
Soil	0 %	SpERC FEICA 2.1c.v2

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.046 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.797 mg/kg wet weight (Chesar 3.5)	0.18
Man via environment - Inhalation	0.00274 mg/m <sup>3</sup> (Chesar 3.5)	0.012
Man via environment - Oral	0.022 mg/kg bw/day (Chesar 3.5)	0.172

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### 1.3.2. Worker exposure: Unloading (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC8a, inhalation	systemic	long-term	0.055 mg/m <sup>3</sup> (ART v1.5)	0.044
PROC8a, inhalation	systemic	short-term	0.22 mg/m <sup>3</sup> (ART v1.5)	0.035
PROC8b, inhalation	systemic	long-term	0.053 mg/m <sup>3</sup> (ART v1.5)	0.042
PROC8b, inhalation	systemic	short-term	0.212 mg/m <sup>3</sup> (ART v1.5)	0.034
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 1.3.3. Worker exposure: Use in closed process (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.01 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.094
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

### 1.3.4. Worker exposure: Continuous process; Closed systems (PROC2)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 1.3.5. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 1.3.6. Worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.18 mg/m <sup>3</sup> (ART v1.5)	0.144
Inhalation	systemic	short-term	0.72 mg/m <sup>3</sup> (ART v1.5)	0.115

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dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 1.3.7. Worker exposure: Mixing operations (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.16 mg/m <sup>3</sup> (ART v1.5)	0.128
Inhalation	systemic	short-term	0.64 mg/m <sup>3</sup> (ART v1.5)	0.102
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 1.3.8. Worker exposure: Material transfers; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.25 mg/m <sup>3</sup> (Chesar 3.5)	0.2
Inhalation	systemic	short-term	1 mg/m <sup>3</sup> (Chesar 3.5)	0.16
dermal	systemic	long-term	0.055 mg/kg bw/day (Chesar 3.5)	0.153
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.031

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### 1.3.9. Worker exposure: Small package filling; Small scale weighing (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.32
Inhalation	systemic	short-term	1.6 mg/m <sup>3</sup> (Chesar 3.5)	0.256
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES2: Formulation into mixture, Production of tyres, Industrial

#### 2.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Polymer preparations and compounds (PC32).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC2:</b> Formulation into mixture
<b>Process category(ies)</b>	: <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC32:</b> Polymer preparations and compounds

Contributing Scenario (CS) Environment		
CS1	Formulation into mixture; Production of tyres	ERC2

Contributing Scenario (CS) Worker		
CS2	Unloading; Dedicated facility	PROC8b
CS3	Material transfers; Dedicated facility	PROC8b
CS4	Batch process; Closed systems	PROC3
CS5	Mixing operations (open systems)	PROC5
CS6	Material transfers; polymer	PROC21

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### 2.2. Conditions of use affecting exposure

#### 2.2.1. Control of environmental exposure: Formulation into mixture; Production of tyres (ERC2)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 500 t
Daily amount per site	: 5 t
Emission days per year	: 220

Technical and organisational conditions and measures
Provide onsite wastewater treatment. Sedimentation of solids by filtration Oil-water separation Water - minimum efficiency of 90 %

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m <sup>3</sup> /d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: No waste from process

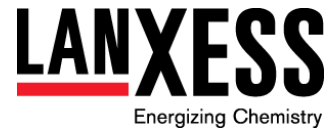
Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m <sup>3</sup> /d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

#### 2.2.2. Control of worker exposure: Unloading; Dedicated facility (PROC8b)

Product (article) characteristics
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Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness

Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers exposure up to 8 h
Near field	:	Covers exposure up to 4 h

Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Use in contained systems Inhalation - minimum efficiency of 90 %		
Activity class	:	Transfer / Falling of powders, granules or pelletized material
Application rate	:	< 100 kg/min
Handling type	:	Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner
drop height	:	> 0.5 m

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable protective clothing. Use suitable eye protection.		
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %		
Wear suitable respiratory protection. Inhalation - minimum efficiency of 90 %		
For further specification, refer to section 8 of the SDS.		

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Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 2.2.3. Control of worker exposure: Material transfers; Dedicated facility (PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 25 %
Physical form of product	: Solid in solution medium viscosity

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Use in contained systems Inhalation - minimum efficiency of 99 %	
Activity class	: Transfer of liquid products - falling liquids
Application rate	: > 1,000 L/min

Conditions and measures related to personal protection, hygiene and health evaluation
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Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m <sup>3</sup>
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 2.2.4. Control of worker exposure: Batch process; Closed systems (PROC3)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 4 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	100 hPa (60 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 60 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 2.2.5. Control of worker exposure: Mixing operations (open systems) (PROC5)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 2 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	100 hPa (60 °C)

#### Amount used, frequency and duration of use (or from service life)

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Duration : Covers exposure up to 8 h

### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 60 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 2.2.6. Control of worker exposure: Material transfers; polymer (PROC21)

### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 2 %

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Physical form of product	: Solid, medium dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

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

#### 2.3.1. Environmental release and exposure: Formulation into mixture; Production of tyres (ERC2)

Release route	Release	Release estimation method
Water, before on-site RMM	8 E-03 %	ETRMA SpERC 3/6d. 2.v1
Water, after RMM	8 E-04 %	-
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1
Soil	0 %	ETRMA SpERC 3/6d. 2.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.051 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00886 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00848 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.739 mg/kg wet weight (Chesar 3.5)	0.174
Man via environment - Inhalation	0.000191 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00604 mg/kg bw/day (Chesar 3.5)	0.046

#### 2.3.2. Worker exposure: Unloading; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.053 mg/m <sup>3</sup> (ART v1.5)	0.042
Inhalation	systemic	short-term	0.212 mg/m <sup>3</sup> (ART v1.5)	0.034
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg	0.152

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			bw/day (ECETOC TRA 3.1)	
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### 2.3.3. Worker exposure: Material transfers; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.007 mg/m <sup>3</sup> (ART v1.5)	< 0.01
Inhalation	systemic	short-term	0.03 mg/m <sup>3</sup> (ART v1.5)	< 0.01
dermal	systemic	long-term	0.165 mg/kg bw/day (ECETOC TRA 3.1)	0.458
dermal	systemic	short-term	0.165 mg/kg bw/day (ECETOC TRA 3.1)	0.092

### 2.3.4. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.12
dermal	systemic	long-term	0.007 mg/kg bw/day (Chesar 3.5)	0.01
dermal	systemic	short-term	0.007 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01

### 2.3.5. Worker exposure: Mixing operations (open systems) (PROC5)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar 3.5)	0.4
Inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.15
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.03

### 2.3.6. Worker exposure: Material transfers; polymer (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
Inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
dermal	systemic	long-term	0.028 mg/kg bw/day (Chesar 3.5)	0.079
dermal	systemic	short-term	0.028 mg/kg bw/day (ECETOC TRA 3.1)	0.016

### 2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES3: Liquid formulation of rubber and non-rubber plastic preparations, (excluding tyres), Industrial

#### 3.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Polymer preparations and compounds (PC32).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC2:</b> Formulation into mixture
<b>Process category(ies)</b>	: <b>PROC1:</b> Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4:</b> Chemical production where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8a:</b> Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities
<b>Product (sub) category(ies)</b>	: <b>PC32:</b> Polymer preparations and compounds

Contributing Scenario (CS) Environment		
CS1	Liquid formulation of rubber and non-rubber plastic preparations; (excluding tyres)	ERC2

Contributing Scenario (CS) Worker		
CS2	Unloading	PROC8a, PROC8b

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<b>CS3</b>	<b>Use in closed process</b>	PROC1
<b>CS4</b>	<b>Use in semi-closed process with opportunity for exposure</b>	PROC4
<b>CS5</b>	<b>Continuous process; Closed systems</b>	PROC2
<b>CS6</b>	<b>Batch process; Closed systems</b>	PROC3
<b>CS7</b>	<b>Mixing operations (open systems)</b>	PROC5
<b>CS8</b>	<b>Material transfers; Dedicated facility</b>	PROC8b

### 3.2. Conditions of use affecting exposure

#### 3.2.1. Control of environmental exposure: Liquid formulation of rubber and non-rubber plastic preparations; (excluding tyres) (ERC2)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 100 t
Daily amount per site	: 1 t
Emission days per year	: 220

Technical and organisational conditions and measures
Provide onsite wastewater treatment. Sedimentation of solids by filtration Oil-water separation Water - minimum efficiency of 90 %

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP effluent	: 2,000 m <sup>3</sup> /d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: No waste from process

Other conditions affecting environmental exposure
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Receiving surface water flow	:	18,000 m3/d
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

### 3.2.2. Control of worker exposure: Unloading (PROC8a, PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Near field	: Covers exposure up to 4 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer / Falling of powders, granules or pelletized material
Application rate	: < 100 kg/min
Handling type	: Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner
drop height	: > 0.5 m

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.

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Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m3
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 3.2.3. Control of worker exposure: Use in closed process (PROC1)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained

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personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 3.2.4. Control of worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid in solution medium viscosity

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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Demonstrable and effective housekeeping practices are in place.	
Activity class	: Activities with open liquid surfaces or open reservoirs - activity with agitated surfaces
Open surface	: <= 1 m <sup>2</sup>

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 3.2.5. Control of worker exposure: Continuous process; Closed systems (PROC2)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

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### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 3.2.6. Control of worker exposure: Batch process; Closed systems (PROC3)

### Product (article) characteristics

Concentration of substance in prod- : Covers concentrations up to 100 %

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uct	
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

### 3.2.7. Control of worker exposure: Mixing operations (open systems) (PROC5)

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Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 100 hPa (60 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation	Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %	
For further specification, refer to section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 60 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth-	

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ing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 3.2.8. Control of worker exposure: Material transfers; Dedicated facility (PROC8b)

<b>Product (article) characteristics</b>	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, medium dustiness
Vapour pressure	: 0.000867 mPa (40 °C)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h
<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

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

#### 3.3.1. Environmental release and exposure: Liquid formulation of rubber and non-rubber plastic preparations; (excluding tyres) (ERC2)

Release route	Release	Release estimation method
Water, before on-site RMM	8 E-03 %	ETRMA SpERC 3/6d. 2.v1
Water, after RMM	8 E-04 %	-
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1
Soil	0 %	ETRMA SpERC 3/6d. 2.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.046 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.797 mg/kg wet weight (Chesar 3.5)	0.18
Man via environment - Inhalation	0.00274 mg/m <sup>3</sup> (Chesar 3.5)	0.012
Man via environment - Oral	0.022 mg/kg bw/day (Chesar 3.5)	0.172

#### 3.3.2. Worker exposure: Unloading (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC8a, inhala-	systemic	long-term	0.055 mg/m <sup>3</sup> (ART)	0.044

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tion			v1.5)	
PROC8a, inhalation	systemic	short-term	0.22 mg/m <sup>3</sup> (ART v1.5)	0.035
PROC8b, inhalation	systemic	long-term	0.053 mg/m <sup>3</sup> (ART v1.5)	0.042
PROC8b, inhalation	systemic	short-term	0.212 mg/m <sup>3</sup> (ART v1.5)	0.034
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 3.3.3. Worker exposure: Use in closed process (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.01 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.094
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

### 3.3.4. Worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.18 mg/m <sup>3</sup> (ART v1.5)	0.144
Inhalation	systemic	short-term	0.72 mg/m <sup>3</sup> (ART v1.5)	0.115

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dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 3.3.5. Worker exposure: Continuous process; Closed systems (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 3.3.6. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

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### 3.3.7. Worker exposure: Mixing operations (open systems) (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar 3.5)	0.4
Inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.15
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.03

### 3.3.8. Worker exposure: Material transfers; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an

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exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES4: Formulation into solid matrix, Industrial

#### 4.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Various products (PC1, PC24).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylene-di-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC3:</b> Formulation into solid matrix
<b>Process category(ies)</b>	: <b>PROC1:</b> Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4:</b> Chemical production where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8a:</b> Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9:</b> Transfer of substance or mixture into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Tableting, compression, extrusion, pelettisation, granulation <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC1:</b> Adhesives, sealants <b>PC24:</b> Lubricants, greases, release products

Contributing Scenario (CS) Environment		
CS1	Formulation into solid matrix	ERC3

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Contributing Scenario (CS) Worker		
CS2	Unloading	PROC8a, PROC8b
CS3	Use in closed process	PROC1
CS4	Continuous process; Closed systems	PROC2
CS5	Batch process; Closed systems	PROC3
CS6	Use in semi-closed process with opportunity for exposure	PROC4
CS7	Mixing operations (open systems)	PROC5
CS8	Small package filling; Small scale weighing	PROC9
CS9	Tabletting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC14, PROC21

### 4.2. Conditions of use affecting exposure

#### 4.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 100 t
Daily amount per site	: 1 t
Emission days per year	: 100

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

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Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m <sup>3</sup> /d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

### 4.2.2. Control of worker exposure: Unloading (PROC8a, PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Near field	: Covers exposure up to 4 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer / Falling of powders, granules or pelletized material
Application rate	: < 100 kg/min
Handling type	: Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner
drop height	: > 0.5 m

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Room size : 300 m<sup>3</sup>

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 4.2.3. Control of worker exposure: Use in closed process (PROC1)

### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Solid, high dustiness

Vapour pressure : 0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 4.2.4. Control of worker exposure: Continuous process; Closed systems (PROC2)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 4.2.5. Control of worker exposure: Batch process; Closed systems (PROC3)

### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %  
Physical form of product : Solid, high dustiness  
Vapour pressure : 0.000867 mPa (40 °C)

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### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 4.2.6. Control of worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

### Product (article) characteristics

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Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness

Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers exposure up to 8 h
Near field	:	Covers exposure up to 4 h

Technical and organisational conditions and measures		
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Use in contained systems Inhalation - minimum efficiency of 99 %		
Activity class	:	Movement and agitation of powders, granules or pelletised material <= 1,000 kg

Conditions and measures related to personal protection, hygiene and health evaluation		
Wear suitable protective clothing. Use suitable eye protection.		
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %		
For further specification, refer to section 8 of the SDS.		

Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Room size	:	300 m <sup>3</sup>
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 4.2.7. Control of worker exposure: Mixing operations (open systems) (PROC5)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 5 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

For further specification, refer to section 8 of the SDS.

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Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 4.2.8. Control of worker exposure: Small package filling; Small scale weighing (PROC9)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 5 %
Physical form of product	: Solid, medium dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

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For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 4.2.9. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC14, PROC21)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 5 %
Physical form of product	:	Solid, medium dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

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Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

## 4.3. Exposure estimation and reference to its source

### 4.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

Release route	Release	Release estimation method
Water	0.005 %	FEICA SPERC 2.1a.v2
Air	1 %	FEICA SPERC 2.1a.v2
Soil	0 %	FEICA SPERC 2.1a.v2

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.052 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00898 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.0085 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.812 mg/kg wet weight (Chesar 3.5)	0.181

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Man via environment - Inhalation	0.000762 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.01 mg/kg bw/day (Chesar 3.5)	0.08

### 4.3.2. Worker exposure: Unloading (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC8a, inhalation	systemic	long-term	0.055 mg/m <sup>3</sup> (ART v1.5)	0.044
PROC8a, inhalation	systemic	short-term	0.22 mg/m <sup>3</sup> (ART v1.5)	0.035
PROC8b, inhalation	systemic	long-term	0.053 mg/m <sup>3</sup> (ART v1.5)	0.042
PROC8b, inhalation	systemic	short-term	0.212 mg/m <sup>3</sup> (ART v1.5)	0.034
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 4.3.3. Worker exposure: Use in closed process (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.01 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.094
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

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### 4.3.4. Worker exposure: Continuous process; Closed systems (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 4.3.5. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 4.3.6. Worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.4 mg/m <sup>3</sup> (ART v1.5)	0.32

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Inhalation	systemic	short-term	1.6 mg/m <sup>3</sup> (ART v1.5)	0.256
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 4.3.7. Worker exposure: Mixing operations (open systems) (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar 3.5)	0.4
Inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
dermal	systemic	long-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.15
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.03

### 4.3.8. Worker exposure: Small package filling; Small scale weighing (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

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### 4.3.9. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC14, PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC14, inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
PROC14, inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
PROC14, dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.095
PROC14, dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019
PROC21, inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
PROC21, inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
PROC21, dermal	systemic	long-term	0.028 mg/kg bw/day (Chesar 3.5)	0.079
PROC21, dermal	systemic	short-term	0.028 mg/kg bw/day (ECETOC TRA 3.1)	0.016

### 4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES5: Formulation into solid matrix, rubber for tyres, Industrial

#### 5.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Polymer preparations and compounds (PC32); Tyres.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC3:</b> Formulation into solid matrix
<b>Process category(ies)</b>	: <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC32:</b> Polymer preparations and compounds

Contributing Scenario (CS) Environment		
CS1	Formulation into solid matrix; Production of tyres	ERC3

Contributing Scenario (CS) Worker		
CS2	Bulk weighing; Material transfers; Dedicated facility	PROC8b
CS3	Batch process; Closed systems	PROC3
CS4	Mixing operations	PROC5
CS5	Material transfers; polymer	PROC21

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### 5.2. Conditions of use affecting exposure

#### 5.2.1. Control of environmental exposure: Formulation into solid matrix; Production of tyres (ERC3)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 250 t
Daily amount per site	: 1.136 t
Emission days per year	: 220

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: External treatment and disposal of waste should comply with applicable local and/or national regulations.

Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m3/d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

#### 5.2.2. Control of worker exposure: Bulk weighing; Material transfers; Dedicated facility (PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness

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### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

Activity class : Transfer / Falling of powders, granules or pelletized material

Application rate : < 1 kg/min

Handling type : Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner

drop height : > 0.5 m

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Room size : 300 m<sup>3</sup>

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 5.2.3. Control of worker exposure: Batch process; Closed systems (PROC3)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 2 %

Physical form of product : Solid, medium dustiness

Vapour pressure : 19.4 Pa (180 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

#### Other conditions affecting workers exposure

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Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 180 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 5.2.4. Control of worker exposure: Mixing operations (PROC5)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 2 %
Physical form of product	: Solid, medium dustiness
Vapour pressure	: 19.4 Pa (180 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 4 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

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For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 180 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 5.2.5. Control of worker exposure: Material transfers; polymer (PROC21)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 2 %
Physical form of product	: Solid, medium dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should

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also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 5.3. Exposure estimation and reference to its source

### 5.3.1. Environmental release and exposure: Formulation into solid matrix; Production of tyres (ERC3)

Release route	Release	Release estimation method
Water	0.008 %	ETRMA SpERC 3/6d. 2.v1
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1
Soil	0 %	ETRMA SpERC 3/6d. 2.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.07 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.011 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00886 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.894 mg/kg wet weight (Chesar 3.5)	0.189

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Man via environment - Inhalation	0.000096 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00717 mg/kg bw/day (Chesar 3.5)	0.055

### 5.3.2. Worker exposure: Bulk weighing; Material transfers; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.058 mg/m <sup>3</sup> (ART v1.5)	0.046
Inhalation	systemic	short-term	0.232 mg/m <sup>3</sup> (ART v1.5)	0.037
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 5.3.3. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.851 mg/m <sup>3</sup> (Chesar 3.5)	0.681
Inhalation	systemic	short-term	3.405 mg/m <sup>3</sup> (Chesar 3.5)	0.545
dermal	systemic	long-term	0.007 mg/kg bw/day (Chesar 3.5)	0.019
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

### 5.3.4. Worker exposure: Mixing operations (PROC5)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.851 mg/m <sup>3</sup> (Chesar 3.5)	0.681
Inhalation	systemic	short-term	5.675 mg/m <sup>3</sup> (Chesar 3.5)	0.908
dermal	systemic	long-term	0.055 mg/kg bw/day (Chesar 3.5)	0.153
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.031

### 5.3.5. Worker exposure: Material transfers; polymer (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
Inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
dermal	systemic	long-term	0.028 mg/kg bw/day (Chesar 3.5)	0.079
dermal	systemic	short-term	0.028 mg/kg bw/day (ECETOC TRA 3.1)	0.016

### 5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES6: Formulation into solid matrix, Manufacture of plastic materials, (excluding tyres), Industrial

#### 6.1. Title section

<b>Structured Short Title</b>	: Formulation or re-packing; Polymer preparations and compounds (PC32); Plastic articles.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC3:</b> Formulation into solid matrix
<b>Process category(ies)</b>	: <b>PROC1:</b> Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4:</b> Chemical production where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8a:</b> Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9:</b> Transfer of substance or mixture into small containers (dedicated filling line, including weighing) <b>PROC14:</b> Tableting, compression, extrusion, pelettisation, granulation <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC32:</b> Polymer preparations and compounds

Contributing Scenario (CS) Environment		
CS1	Formulation into solid matrix; Production of plastic articles	ERC3

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Contributing Scenario (CS) Worker		
CS2	Unloading	PROC8a, PROC8b
CS3	Use in closed process	PROC1
CS4	Continuous process; Closed systems	PROC2
CS5	Batch process; Closed systems	PROC3
CS6	Use in semi-closed process with opportunity for exposure	PROC4
CS7	Mixing operations	PROC5
CS8	Small package filling; Small scale weighing	PROC9
CS9	Tabletting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC14, PROC21

### 6.2. Conditions of use affecting exposure

#### 6.2.1. Control of environmental exposure: Formulation into solid matrix; Production of plastic articles (ERC3)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 100 t
Daily amount per site	: 1 t
Emission days per year	: 220

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: External treatment and disposal of waste should comply with applicable local and/or national regulations.

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Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m <sup>3</sup> /d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

### 6.2.2. Control of worker exposure: Unloading (PROC8a, PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 100 %
Physical form of product	: Solid, high dustiness

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Near field	: Covers exposure up to 4 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer / Falling of powders, granules or pelletized material
Application rate	: < 100 kg/min
Handling type	: Careful handling, involves workers showing attention to potential danger, error or harm and carrying out the activity in a very exact and thorough (or cautious) manner
drop height	: > 0.5 m

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

Wear suitable respiratory protection.  
Inhalation - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Room size : 300 m<sup>3</sup>

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.3. Control of worker exposure: Use in closed process (PROC1)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %

Physical form of product : Solid, high dustiness

Vapour pressure : 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 6.2.4. Control of worker exposure: Continuous process; Closed systems (PROC2)

### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 100 %  
Physical form of product : Solid, medium dustiness  
Vapour pressure : 0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.5. Control of worker exposure: Batch process; Closed systems (PROC3)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %  
Physical form of product : Solid, high dustiness  
Vapour pressure : 4.4 Pa (160 °C)

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### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 160 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.6. Control of worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

### Product (article) characteristics

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Concentration of substance in product	:	Covers concentrations up to 100 %
Physical form of product	:	Solid, high dustiness

Amount used, frequency and duration of use (or from service life)		
Duration	:	Covers exposure up to 8 h
Near field	:	Covers exposure up to 4 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Use in contained systems Inhalation - minimum efficiency of 99 %	
Activity class	: Movement and agitation of powders, granules or pelletised material <= 1,000 kg

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 98 %	
For further specification, refer to section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m3
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.7. Control of worker exposure: Mixing operations (PROC5)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 4.4 Pa (160 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 4 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 98 %

For further specification, refer to section 8 of the SDS.

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Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 160 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.8. Control of worker exposure: Small package filling; Small scale weighing (PROC9)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 5 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

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For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 6.2.9. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC14, PROC21)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Solid, medium dustiness
Vapour pressure	:	100 hPa (120 °C)

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

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Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 120 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).
PROC21	:	Assumes process temperature up to 40 °C

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 6.3. Exposure estimation and reference to its source

### 6.3.1. Environmental release and exposure: Formulation into solid matrix; Production of plastic articles (ERC3)

Release route	Release	Release estimation method
Water	0.008 %	ETRMA SpERC 3/6d. 2.v1
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1
Soil	0 %	ETRMA SpERC 3/6d. 2.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.056 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00934 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00857 mg/kg wet weight (Chesar 3.5)	< 0.01

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Predator's prey (terrestrial)	1.855 mg/kg wet weight (Chesar 3.5)	0.186
Man via environment - Inhalation	0.0000389 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00635 mg/kg bw/day (Chesar 3.5)	0.049

### 6.3.2. Worker exposure: Unloading (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC8a, inhalation	systemic	long-term	0.055 mg/m <sup>3</sup> (ART v1.5)	0.044
PROC8a, inhalation	systemic	short-term	0.22 mg/m <sup>3</sup> (ART v1.5)	0.035
PROC8b, inhalation	systemic	long-term	0.053 mg/m <sup>3</sup> (ART v1.5)	0.042
PROC8b, inhalation	systemic	short-term	0.212 mg/m <sup>3</sup> (ART v1.5)	0.034
dermal	systemic	long-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.761
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 6.3.3. Worker exposure: Use in closed process (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.01 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.094
dermal	systemic	short-term	0.034 mg/kg	0.019

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			bw/day (ECETOC TRA 3.1)	
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### 6.3.4. Worker exposure: Continuous process; Closed systems (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.05 mg/m <sup>3</sup> (Chesar 3.5)	0.04
Inhalation	systemic	short-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.032
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 6.3.5. Worker exposure: Batch process; Closed systems (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.851 mg/m <sup>3</sup> (Chesar 3.5)	0.681
Inhalation	systemic	short-term	3.405 mg/m <sup>3</sup> (Chesar 3.5)	0.545
dermal	systemic	long-term	0.015 mg/kg bw/day (Chesar 3.5)	0.038
dermal	systemic	short-term	0.014 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01

### 6.3.6. Worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.4 mg/m <sup>3</sup> (ART v1.5)	0.32
Inhalation	systemic	short-term	1.6 mg/m <sup>3</sup> (ART v1.5)	0.256
dermal	systemic	long-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 6.3.7. Worker exposure: Mixing operations (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.851 mg/m <sup>3</sup> (Chesar 3.5)	0.681
Inhalation	systemic	short-term	5.675 mg/m <sup>3</sup> (Chesar 3.5)	0.908
dermal	systemic	long-term	0.055 mg/kg bw/day (Chesar 3.5)	0.153
dermal	systemic	short-term	0.055 mg/kg bw/day (ECETOC TRA 3.1)	0.031

### 6.3.8. Worker exposure: Small package filling; Small scale weighing (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.32
Inhalation	systemic	short-term	1.6 mg/m <sup>3</sup> (Chesar 3.5)	0.256

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dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 6.3.9. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC14, PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC14, inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
PROC14, inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
PROC14, dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.095
PROC14, dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019
PROC21, inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
PROC21, inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
PROC21, dermal	systemic	long-term	0.028 mg/kg bw/day (Chesar 3.5)	0.079
PROC21, dermal	systemic	short-term	0.028 mg/kg bw/day (ECETOC TRA 3.1)	0.016

### 6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

<b>Guidance to Downstream Users</b>
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries

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set by this exposure scenario.  
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES7: Use in adhesives and sealants, inks, Industrial

#### 7.1. Title section

<b>Structured Short Title</b>	: Use at industrial sites; Adhesives, sealants (PC1).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC5:</b> Use at industrial site leading to inclusion into/onto article
<b>Process category(ies)</b>	: <b>PROC1:</b> Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4:</b> Chemical production where opportunity for exposure arises <b>PROC5:</b> Mixing or blending in batch processes <b>PROC7:</b> Industrial spraying <b>PROC8a:</b> Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9:</b> Transfer of substance or mixture into small containers (dedicated filling line, including weighing) <b>PROC10:</b> Roller application or brushing <b>PROC13:</b> Treatment of articles by dipping and pouring <b>PROC15:</b> Use as laboratory reagent
<b>Product (sub) category(ies)</b>	: <b>PC1:</b> Adhesives, sealants

Contributing Scenario (CS) Environment		
CS1	Use in adhesives and sealants; inks	ERC5

Contributing Scenario (CS) Worker		
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CS2	Material transfers; Formulation	PROC8b
CS3	Use in closed process; Batch process	PROC1, PROC3
CS4	Continuous process; Closed systems	PROC2
CS5	Use in semi-closed process with opportunity for exposure	PROC4
CS6	Mixing operations	PROC5
CS7	Spraying; FEICA SWED IS_7_i-b	PROC7
CS8	Material transfers; Small package filling; Small scale weighing	PROC8a, PROC8b, PROC9
CS9	Rolling, Brushing	PROC10
CS10	Dipping, immersion and pouring	PROC13
CS11	Laboratory activities	PROC15

### 7.2. Conditions of use affecting exposure

#### 7.2.1. Control of environmental exposure: Use in adhesives and sealants; inks (ERC5)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 100 t
Daily amount per site	: 5 t
Emission days per year	: 20

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 2,000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

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Other conditions affecting environmental exposure	
Receiving surface water flow	: 18,000 m <sup>3</sup> /d
Local freshwater dilution factor	: 10
Local marine water dilution factor	: 100

### 7.2.2. Control of worker exposure: Material transfers; Formulation (PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 5 %
Physical form of product	: Solid in solution medium viscosity

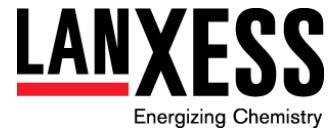
Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Activity class	: Transfer of liquid products - falling liquids
Application rate	: > 1,000 L/min
Handling type	: Splash loading

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	

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Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 7.2.3. Control of worker exposure: Use in closed process; Batch process (PROC1, PROC3)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

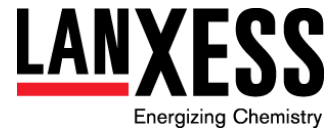
Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.
For further specification, refer to section 8 of the SDS.

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### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 7.2.4. Control of worker exposure: Continuous process; Closed systems (PROC2)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 1 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

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For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 7.2.5. Control of worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 1 %
Physical form of product	:	Solid in solution low viscosity

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class	:	Activities with open liquid surfaces or open reservoirs - activity with agitated surfaces
Open surface	:	< 1 m <sup>2</sup>

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m3
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 7.2.6. Control of worker exposure: Mixing operations (PROC5)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 1 %
Physical form of product	:	Solid in solution medium viscosity

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
Exposure duration	:	ECETOC TRA worker v3

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class : Activities with open liquid surfaces or open reservoirs -  
activity with agitated surfaces

Open surface : < 3 m<sup>2</sup>

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

Dermal exposure : ECETOC TRA worker v3

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Room size : 300 m<sup>3</sup>

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Process Temperature : ECETOC TRA worker v3

Dispersion in agitating mill. Mixing in open mill : ART v1.5

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

#### 7.2.7. Control of worker exposure: Spraying; FEICA SWED IS\_7\_i-b (PROC7)

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Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Liquid
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h
Exposure duration	: ECETOC TRA worker v3

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Ensure that a spraying booth is used.	
Local exhaust ventilation Inhalation - minimum efficiency of 95 %	

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	
Dermal exposure	: ECETOC TRA worker v3

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Process Temperature	: ECETOC TRA worker v3
Dispersion in agitating mill. Mixing in	: ECETOC TRA worker v3

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open mill

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.  
Consult the technical guidelines for the use of this substance/mixture.  
FEICA SWED IS\_7\_i-b

### 7.2.8. Control of worker exposure: Material transfers; Small package filling; Small scale weighing (PROC8a, PROC8b, PROC9)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 1 %
Physical form of product	:	Solid in solution low viscosity
Vapour pressure	:	0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class	:	Transfer of liquid products - falling liquids
Application rate	:	> 1,000 L/min
Handling type	:	Splash loading

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 7.2.9. Control of worker exposure: Rolling, Brushing (PROC10)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid in solution low viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class	: Spreading of liquid products
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Spreading of liquids at surfaces or work pieces : > 3 m<sup>2</sup>/h

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 7.2.10. Control of worker exposure: Dipping, immersion and pouring (PROC13)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 1 %

Physical form of product : Solid in solution  
low viscosity

Vapour pressure : 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Activity class	: Handling of contaminated objects.
Surface area	: <= 1 m <sup>2</sup>
Surface contamination	: <= 90 %

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

### 7.2.11. Control of worker exposure: Laboratory activities (PROC15)

<b>Product (article) characteristics</b>	
Concentration of substance in prod-	: Covers concentrations up to 1 %

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uct	
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

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

#### 7.3.1. Environmental release and exposure: Use in adhesives and sealants; inks (ERC5)

Release route	Release	Release estimation method
Water	0 %	FEICA SPERC 5.1a.v1
Air	0.9 %	FEICA SPERC 5.1a.v1
Soil	0 %	FEICA SPERC 5.1a.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.046 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.647 mg/kg wet weight (Chesar 3.5)	0.165
Man via environment - Inhalation	0.000686 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.0081 mg/kg bw/day (Chesar 3.5)	0.062

#### 7.3.2. Worker exposure: Material transfers; Formulation (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.3 mg/m <sup>3</sup> (ART v1.5)	0.24
Inhalation	systemic	short-term	1.2 mg/m <sup>3</sup> (ART v1.5)	0.192
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

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### 7.3.3. Worker exposure: Use in closed process; Batch process (PROC1, PROC3)

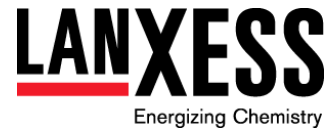
Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC1, inhalation	systemic	long-term	0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
PROC1, inhalation	systemic	short-term	0.004 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
PROC3, inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
PROC3, inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
PROC1, dermal	systemic	long-term	0.003 mg/kg bw/day (Chesar 3.5)	< 0.01
PROC1, dermal	systemic	short-term	0.003 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
PROC3, dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.038
PROC3, dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.272

### 7.3.4. Worker exposure: Continuous process; Closed systems (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.007 mg/kg bw/day (Chesar 3.5)	0.019

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dermal	systemic	short-term	0.007 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
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### 7.3.5. Worker exposure: Use in semi-closed process with opportunity for exposure (PROC4)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.01
Inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (ART v1.5)	< 0.01
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.4)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 7.3.6. Worker exposure: Mixing operations (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.033 mg/m <sup>3</sup> (ART v1.5)	0.026
Inhalation	systemic	short-term	0.132 mg/m <sup>3</sup> (ART v1.5)	0.021
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.19
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 7.3.7. Worker exposure: Spraying; FEICA SWED IS\_7\_i-b (PROC7)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.35 mg/m <sup>3</sup> (Chesar 3.5)	0.28
Inhalation	systemic	short-term	1.4 mg/m <sup>3</sup> (Chesar 3.5)	0.224
dermal	systemic	long-term	0.214 mg/kg bw/day (Chesar 3.5)	0.595
dermal	systemic	short-term	0.214 mg/kg bw/day (ECETOC TRA 3.1)	0.119

### 7.3.8. Worker exposure: Material transfers; Small package filling; Small scale weighing (PROC8a, PROC8b, PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.098 mg/m <sup>3</sup> (ART v1.5)	0.078
Inhalation	systemic	short-term	0.392 mg/m <sup>3</sup> (ART v1.5)	0.063
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076
PROC9, inhalation	systemic	long-term	0.099 mg/m <sup>3</sup> (ART v1.5)	0.079
PROC9, inhalation	systemic	short-term	0.396 mg/m <sup>3</sup> (ART v1.5)	0.063
PROC9, dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
PROC9, dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

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### 7.3.9. Worker exposure: Rolling, Brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.033 mg/m <sup>3</sup> (ART v1.5)	0.026
Inhalation	systemic	short-term	0.132 mg/m <sup>3</sup> (ART v1.5)	0.021
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 7.3.10. Worker exposure: Dipping, immersion and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 7.3.11. Worker exposure: Laboratory activities (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar)	0.4

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			3.5)	
Inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
dermal	systemic	long-term	0.003 mg/kg bw/day (Chesar 3.5)	< 0.01
dermal	systemic	short-term	0.003 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01

### 7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES8: Production of tyres, Industrial

#### 8.1. Title section

<b>Structured Short Title</b>	: Use at industrial sites; Various sectors (SU11, SU12).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC5:</b> Use at industrial site leading to inclusion into/onto article
<b>Process category(ies)</b>	: <b>PROC14:</b> Tableting, compression, extrusion, pelettisation, granulation <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Sector(s) of use</b>	: <b>SU11:</b> Manufacture of rubber products <b>SU12:</b> Manufacture of plastics products, including compounding and conversion

Contributing Scenario (CS) Environment		
CS1	Use at industrial site leading to inclusion into/onto article	ERC5

Contributing Scenario (CS) Worker		
CS2	Material transfers; Rubber products; Production of tyres	PROC21
CS3	Tableting, compression, extrusion or pelletisation	PROC14
CS4	Vulcanisation	PROC14

#### 8.2. Conditions of use affecting exposure

##### 8.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 750 t

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Daily amount per site	:	37.5 t
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### Conditions and measures related to sewage treatment plant

STP type	:	Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	:	Controlled application of sewage sludge to agricultural soil
STP effluent	:	10,000 m3/d

### Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods	:	For general information on waste disposal see section 13.
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### Other conditions affecting environmental exposure

Receiving surface water flow	:	400,000 m3/d
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## 8.2.2. Control of worker exposure: Material transfers; Rubber products; Production of tyres (PROC21)

### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 2 %
Physical form of product	:	Solid, medium dustiness
Vapour pressure	:	0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

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Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 8.2.3. Control of worker exposure: Tableting, compression, extrusion or pelletisation (PROC14)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 2 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	100 hPa (100 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation

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Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 100 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

PROC21 : Assumes process temperature up to 40 °C

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 8.2.4. Control of worker exposure: Vulcanisation (PROC14)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 1 %

Physical form of product : Solid, high dustiness

Vapour pressure : 73.2 Pa (200 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Containment in place  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 200 °C  
Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 8.3. Exposure estimation and reference to its source

### 8.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

Release route	Release	Release estimation method
Water	0.008 %	ETRMA SpERC 3/6d. 2.v1
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1

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Soil	0 %	ETRMA SpERC 3/6d. 2.v1
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Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.05 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00982 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00867 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	3.532 mg/kg wet weight (Chesar 3.5)	0.353
Man via environment - Inhalation	0.000286 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.026 mg/kg bw/day (Chesar 3.5)	0.198

### 8.3.2. Worker exposure: Material transfers; Rubber products; Production of tyres (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
Inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
dermal	systemic	long-term	0.028 mg/kg bw/day (Chesar 3.5)	0.079
dermal	systemic	short-term	0.028 mg/kg bw/day (ECETOC TRA 3.1)	0.016

### 8.3.3. Worker exposure: Tableting, compression, extrusion or pelletisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16

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Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 8.3.4. Worker exposure: Vulcanisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.497 mg/m <sup>3</sup> (Chesar 3.5)	0.397
Inhalation	systemic	short-term	1.986 mg/m <sup>3</sup> (Chesar 3.5)	0.318
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.095
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

### 8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES9: Use of tyres, Industrial

#### 9.1. Title section

<b>Structured Short Title</b>	: Service life - workers; Tyres; Industrial.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Process category(ies)</b>	: <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
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Contributing Scenario (CS) Worker		
CS1	Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC21

#### 9.2. Conditions of use affecting exposure

##### 9.2.1. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid, low dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained	

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personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear suitable gloves tested to EN374.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 80 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 40 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 9.3. Exposure estimation and reference to its source

### 9.3.1. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar)	0.157

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			3.5)	
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

### 9.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES10: Use of tyres, Professional

#### 10.1. Title section

<b>Structured Short Title</b>	: Service life - workers; Tyres; Professional.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Process category(ies)</b>	: <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
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Contributing Scenario (CS) Worker		
<b>CS1</b>	<b>Low energy manipulation and handling of substances bound in/on materials and/or articles; Indoor use</b>	PROC21
<b>CS2</b>	<b>Low energy manipulation and handling of substances bound in/on materials and/or articles; Outdoor use</b>	PROC21

#### 10.2. Conditions of use affecting exposure

##### 10.2.1. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles; Indoor use (PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid, low dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear suitable gloves tested to EN374.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 80 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 10.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles; Outdoor use (PROC21)

### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 1 %

Physical form of product : Solid, low dustiness

Vapour pressure : 0.000867 mPa (40 °C)

### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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

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Wear suitable protective clothing.  
Use suitable eye protection.

Wear suitable gloves tested to EN374.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 80 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Outdoor use

Temperature : Assumes process temperature up to 40 °C

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 10.3. Exposure estimation and reference to its source

### 10.3.1. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles; Indoor use (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.3 mg/m <sup>3</sup> (Chesar 3.5)	0.24
Inhalation	systemic	short-term	1.2 mg/m <sup>3</sup> (Chesar 3.5)	0.192
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar 3.5)	0.157
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

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### 10.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles; Outdoor use (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.21 mg/m <sup>3</sup> (Chesar 3.5)	0.168
Inhalation	systemic	short-term	0.84 mg/m <sup>3</sup> (Chesar 3.5)	0.134
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar 3.5)	0.157
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

### 10.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES11: Use of tyres, Consumer

#### 11.1. Title section

<b>Structured Short Title</b>	: Service life - consumers; Rubber articles (AC10); Tyres.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC10a:</b> Widespread use of articles with low release (outdoor)
<b>Article (sub) category(ies)</b>	: <b>AC10:</b> Rubber articles

Contributing Scenario (CS) Environment		
<b>CS1</b>	<b>Widespread use of articles with low release (outdoor)</b>	ERC10a

Contributing Scenario (CS) Consumer		
<b>CS2</b>	<b>Use of tyres</b>	AC10g
<b>CS3</b>	<b>sport pitches</b>	AC10

#### 11.2. Conditions of use affecting exposure

##### 11.2.1. Control of environmental exposure: Widespread use of articles with low release (outdoor) (ERC10a)

Amount used, frequency and duration of use (or from service life)	
Daily amount for wide dispersive uses	: 0.412 kg
Emission days per year	: 365

Conditions and measures related to sewage treatment plant
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STP type	:	Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
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<b>Conditions and measures related to treatment of waste (including article waste)</b>		
Waste disposal methods	:	For general information on waste disposal see section 13.

### 11.2.2. Control of consumer exposure: Use of tyres ( AC10g)

**Remarks:**

*In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a mixture is less than 1%.*

<b>Product (article) characteristics</b>		
Concentration of substance in product	:	Covers concentrations up to 1 %
Physical form of product	:	Solid

<b>Amount used, frequency and duration of use (or from service life)</b>		
Amount per use	:	40 kg
Duration	:	Covers exposure up to: 4 h
Use frequency	:	1 events per day

<b>Other conditions affecting consumers exposure</b>		
Body parts exposed	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
adult	:	

### 11.2.3. Control of consumer exposure: sport pitches ( AC10)

**Remarks:**

*In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation does not need to be performed if the substance in a mixture is less than 1%.*

<b>Product (article) characteristics</b>		
Concentration of substance in prod-	:	Covers concentrations up to 1 %

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uct	
Physical form of product	: Solid
children, goalkeeper	: Dermal transfer factor 0.008 %
children, goalkeeper	: oral transfer factor 18 %
children	: Dermal transfer factor 0.012 %
children	: oral transfer factor 19.5 %
children, bystanders	: Dermal transfer factor 0.013 %
children, bystanders	: oral transfer factor 88.4 %
adult	: Dermal transfer factor 0.036 %
adult	: oral transfer factor 56.3 %
Inhalation exposure	: Covers exposure up to 0.454 µg/m <sup>3</sup>
Inhalation exposure	: ECETOC TRA 3.1
Dermal exposure	: Migration rate 0.05 µg/cm <sup>2</sup>
Dermal exposure	: Tier 2
Oral exposure	: Tier 2

<b>Amount used, frequency and duration of use (or from service life)</b>	
Amount per use	: 1000 kg
For each use event, assumes swallowed amount of	: 0.05 cm <sup>3</sup>
Duration	: Covers exposure up to: 1.5 h
Use frequency	: 1 events per day
adult	: For each use event, assumes swallowed amount of 0.01 cm <sup>3</sup>
adult	: Covers exposure up to 4 h

<b>Other conditions affecting consumers exposure</b>	
Body parts exposed	: whole body

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

#### 11.3.1. Environmental release and exposure: Widespread use of articles with low release (out-door) (ERC10a)

Release route	Release	Release estimation method
Water	3.2 %	ERC based
Air	0.05 %	ERC based
Soil	3.2 %	ERC based

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.052 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00896 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.0085 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.639 mg/kg wet weight (Chesar 3.5)	0.164
Man via environment - Inhalation	0.0000008 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00381 mg/kg bw/day (Chesar 3.5)	0.029

#### 11.3.2. Consumer exposure: Use of tyres ( AC10g)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.003 mg/kg bw/day (ECETOC TRA Consumer v3.1)	0.109

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dermal	systemic	short-term	0.071 mg/kg bw/day (Chesar 3.5)	< 0.01
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### Additional information on exposure estimation

Oral exposure is considered to be not relevant.

### 11.3.3. Consumer exposure: sport pitches ( AC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.002 mg/kg bw/day (Other consideration (non-standard tool))	0.014
dermal	systemic	short-term	0.006 mg/kg bw/day (Other consideration (non-standard tool))	< 0.01
oral	systemic	long-term	0.01 mg/kg bw/day (Other consideration (non-standard tool))	0.075

### Additional information on exposure estimation

Worst case assumption  
children

### 11.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

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### Guidance to Downstream Users

Not applicable

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### ES12: Use in rubber and non-rubber polymers., Industrial

#### 12.1. Title section

<b>Structured Short Title</b>	: Use at industrial sites; Polymer preparations and compounds (PC32); Various sectors (SU11, SU12).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC5:</b> Use at industrial site leading to inclusion into/onto article
<b>Process category(ies)</b>	: <b>PROC2:</b> Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3:</b> Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC5:</b> Mixing or blending in batch processes <b>PROC8b:</b> Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9:</b> Transfer of substance or mixture into small containers (dedicated filling line, including weighing) <b>PROC10:</b> Roller application or brushing <b>PROC13:</b> Treatment of articles by dipping and pouring <b>PROC14:</b> Tableting, compression, extrusion, pelettisation, granulation <b>PROC15:</b> Use as laboratory reagent <b>PROC21:</b> Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC32:</b> Polymer preparations and compounds
<b>Sector(s) of use</b>	: <b>SU11:</b> Manufacture of rubber products <b>SU12:</b> Manufacture of plastics products, including compounding and conversion

Contributing Scenario (CS) Environment		
CS1	Use in rubber and non-rubber polymers.	ERC5

Contributing Scenario (CS) Worker		
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CS2	Material transfers; Formulation	PROC8b
CS3	Continuous process; Batch process; Closed systems	PROC2, PROC3
CS4	Mixing operations	PROC5
CS5	Material transfers; Dedicated facility	PROC8b
CS6	Small package filling; Small scale weighing	PROC9
CS7	Rolling, Brushing	PROC10
CS8	Dipping, immersion and pouring	PROC13
CS9	Tabletting, compression, extrusion, pelettisation, granulation	PROC14
CS10	Vulcanisation	PROC14
CS11	Laboratory activities	PROC15
CS12	Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC21

### 12.2. Conditions of use affecting exposure

#### 12.2.1. Control of environmental exposure: Use in rubber and non-rubber polymers. (ERC5)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	: 200 t
Daily amount per site	: 10 t

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %
STP sludge treatment	: Controlled application of sewage sludge to agricultural soil
STP effluent	: 10,000 m <sup>3</sup> /d

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

Other conditions affecting environmental exposure	
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Receiving surface water flow	:	400,000 m3/d
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### 12.2.2. Control of worker exposure: Material transfers; Formulation (PROC8b)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
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Physical form of product	:	Solid, medium dustiness
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Vapour pressure	:	0.000867 mPa (40 °C)
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#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

#### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
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Temperature	:	Assumes process temperature up to 40 °C
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Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).
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**Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply**

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On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.3. Control of worker exposure: Continuous process; Batch process; Closed systems (PROC2, PROC3)

<b>Product (article) characteristics</b>	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)
<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h
<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	
<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.4. Control of worker exposure: Mixing operations (PROC5)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Solid in solution  
medium viscosity

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class : Activities with open liquid surfaces or open reservoirs -  
activity with agitated surfaces

Open surface : < 3 m<sup>2</sup>

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

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### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m <sup>3</sup>
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.5. Control of worker exposure: Material transfers; Dedicated facility (PROC8b)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Solid in solution medium viscosity

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  
Demonstrable and effective housekeeping practices are in place.

Activity class	:	Transfer of liquid products - falling liquids
Application rate	:	> 1,000 L/min
Handling type	:	Splash loading

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

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Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Room size	:	300 m <sup>3</sup>
Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.6. Control of worker exposure: Small package filling; Small scale weighing (PROC9)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	10000 Pa (100 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

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Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 100 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.7. Control of worker exposure: Rolling, Brushing (PROC10)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 3 %

Physical form of product : Solid in solution  
medium viscosity

Vapour pressure : 0.000867 mPa (40 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. Demonstrable and effective housekeeping practices are in place.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	
Activity class	: Application of liquids in high speed processes (e.g. rotating tools)

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

### 12.2.8. Control of worker exposure: Dipping, immersion and pouring (PROC13)

<b>Product (article) characteristics</b>	
Concentration of substance in product	: Covers concentrations up to 3 %

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Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 95 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

<b>Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply</b>	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

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### 12.2.9. Control of worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

<b>Product (article) characteristics</b>	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 100 hPa (100 °C)

<b>Amount used, frequency and duration of use (or from service life)</b>	
Duration	: Covers exposure up to 8 h

<b>Technical and organisational conditions and measures</b>	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	

<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

<b>Other conditions affecting workers exposure</b>	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 100 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).
PROC21	: Assumes process temperature up to 40 °C

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### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.10. Control of worker exposure: Vulcanisation (PROC14)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 73.2 Pa (200 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	: Covers exposure up to 4 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Containment in place  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 95 %

For further specification, refer to section 8 of the SDS.

#### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
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Temperature	:	Assumes process temperature up to 200 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 12.2.11. Control of worker exposure: Laboratory activities (PROC15)

#### Product (article) characteristics

Concentration of substance in product	:	Covers concentrations up to 3 %
Physical form of product	:	Solid, high dustiness
Vapour pressure	:	73.2 Pa (200 °C)

#### Amount used, frequency and duration of use (or from service life)

Duration	:	Covers exposure up to 8 h
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#### Technical and organisational conditions and measures

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Local exhaust ventilation  
Inhalation - minimum efficiency of 90 %

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

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Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 200 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply	
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.	

### 12.2.12. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 10000 Pa (60 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.	
Local exhaust ventilation Inhalation - minimum efficiency of 90 %	

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 60 °C
Ventilation rate	:	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

## 12.3. Exposure estimation and reference to its source

### 12.3.1. Environmental release and exposure: Use in rubber and non-rubber polymers. (ERC5)

Release route	Release	Release estimation method
Water	0.008 %	ETRMA SpERC 3/6d. 2.v1
Air	0.05 %	ETRMA SpERC 3/6d. 2.v1
Soil	0 %	ETRMA SpERC 3/6d. 2.v1

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.047 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00877 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00846 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	2.113 mg/kg wet weight (Chesar 3.5)	0.211

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Man via environment - Inhalation	0.0000769 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.0093 mg/kg bw/day (Chesar 3.5)	0.072

### 12.3.2. Worker exposure: Material transfers; Formulation (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 12.3.3. Worker exposure: Continuous process; Batch process; Closed systems (PROC2, PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
PROC2, dermal	systemic	long-term	0.027 mg/kg bw/day (Chesar 3.5)	0.076
PROC2, dermal	systemic	short-term	0.027 mg/kg bw/day (ECETOC TRA 3.1)	0.015
PROC3, dermal	systemic	long-term	0.014 mg/kg bw/day (Chesar 3.5)	0.038

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PROC3, dermal	systemic	short-term	0.014 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
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### 12.3.4. Worker exposure: Mixing operations (PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.03 mg/m <sup>3</sup> (ART v1.5)	0.024
Inhalation	systemic	short-term	0.12 mg/m <sup>3</sup> (ART v1.5)	0.019
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 12.3.5. Worker exposure: Material transfers; Dedicated facility (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.089 mg/m <sup>3</sup> (ART v1.5)	0.071
Inhalation	systemic	short-term	0.356 mg/m <sup>3</sup> (ART v1.5)	0.057
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 12.3.6. Worker exposure: Small package filling; Small scale weighing (PROC9)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.32
Inhalation	systemic	short-term	1.60 mg/m <sup>3</sup> (Chesar 3.5)	0.256
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 12.3.7. Worker exposure: Rolling, Brushing (PROC10)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.03 mg/m <sup>3</sup> (ART v1.5)	0.024
Inhalation	systemic	short-term	0.12 mg/m <sup>3</sup> (ART v1.5)	0.019
dermal	systemic	long-term	0.274 mg/kg bw/day (Chesar 3.5)	0.762
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 12.3.8. Worker exposure: Dipping, immersion and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064

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dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 12.3.9. Worker exposure: Tableting, compression, extrusion, pelettisation, granulation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 12.3.10. Worker exposure: Vulcanisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.851 mg/m <sup>3</sup> (Chesar 3.5)	0.681
Inhalation	systemic	short-term	5.675 mg/m <sup>3</sup> (Chesar 3.5)	0.908
dermal	systemic	long-term	0.034 mg/kg bw/day (Chesar 3.5)	0.095
dermal	systemic	short-term	0.034 mg/kg bw/day (ECETOC TRA 3.1)	0.019

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### 12.3.11. Worker exposure: Laboratory activities (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.993 mg/m <sup>3</sup> (Chesar 3.5)	0.794
Inhalation	systemic	short-term	3.972 mg/m <sup>3</sup> (Chesar 3.5)	0.636
dermal	systemic	long-term	0.007 mg/kg bw/day (Chesar 3.5)	0.019
dermal	systemic	short-term	0.007 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01

### 12.3.12. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (Chesar 3.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (Chesar 3.5)	0.064
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar 3.5)	0.157
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

### 12.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries

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set by this exposure scenario.  
Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES13: Service life of plastic articles, Industrial

#### 13.1. Title section

<b>Structured Short Title</b>	: Service life - workers; Plastic articles; Industrial.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Process category(ies)</b>	: <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
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Contributing Scenario (CS) Worker		
CS1	Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC21

#### 13.2. Conditions of use affecting exposure

##### 13.2.1. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, low dustiness
Vapour pressure	: 10000 Pa (60 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate and well maintained equipment by trained	

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personnel operating under supervision.

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 60 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 13.3. Exposure estimation and reference to its source

### 13.3.1. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.2 mg/m <sup>3</sup> (Chesar 3.5)	0.16
Inhalation	systemic	short-term	0.8 mg/m <sup>3</sup> (Chesar 3.5)	0.128
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar)	0.157

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			3.5)	
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

### 13.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

<b>Guidance to Downstream Users</b>
Not applicable

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### ES14: Service life of plastic articles, Professional

#### 14.1. Title section

<b>Structured Short Title</b>	: Service life - workers; Plastic articles; Professional.
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Process category(ies)</b>	: <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
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Contributing Scenario (CS) Worker		
CS1	Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC21

#### 14.2. Conditions of use affecting exposure

##### 14.2.1. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, low dustiness
Vapour pressure	: 10000 Pa (60 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing.	

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Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use  
Temperature : Assumes process temperature up to 60 °C  
Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 14.3. Exposure estimation and reference to its source

### 14.3.1. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.6 mg/m <sup>3</sup> (Chesar 3.5)	0.48
Inhalation	systemic	short-term	2.4 mg/m <sup>3</sup> (Chesar 3.5)	0.384
dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar 3.5)	0.157
dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

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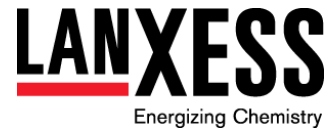
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### 14.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Not applicable

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### ES15: Service life of plastic articles, Consumer

#### 15.1. Title section

<b>Structured Short Title</b>	: Service life - consumers; Various articles (AC10, AC13).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1
<b>Environmental release category(ies)</b>	: <b>ERC10a</b> : Widespread use of articles with low release (out-door) <b>ERC11a</b> : Widespread use of articles with low release (in-door)
<b>Article (sub) category(ies)</b>	: <b>AC10</b> : Rubber articles <b>AC13</b> : Plastic articles

Contributing Scenario (CS) Environment		
<b>CS1</b>	<b>Service life of plastic articles and rubber articles</b>	ERC10a, ERC11a

Contributing Scenario (CS) Consumer		
<b>CS2</b>	<b>Plastic articles: Articles intended for food contact</b>	AC13d
<b>CS3</b>	<b>Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; infrequently</b>	AC10g
<b>CS4</b>	<b>Other rubber articles; Palm of one hand; daily</b>	AC10g
<b>CS5</b>	<b>Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; daily</b>	AC10g
<b>CS6</b>	<b>Plastic articles; Small scale</b>	AC13

#### 15.2. Conditions of use affecting exposure

##### 15.2.1. Control of environmental exposure: Service life of plastic articles and rubber articles (ERC10a, ERC11a)

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Amount used, frequency and duration of use (or from service life)	
Daily amount for wide dispersive uses	: 0.11 kg
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

### 15.2.2. Control of consumer exposure: Plastic articles: Articles intended for food contact ( AC13d)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 7.5 E-06 %
Physical form of product	: Solid, high dustiness

Amount used, frequency and duration of use (or from service life)	
For each use event, assumes swallowed amount of	: 2 l
Use frequency	: 1 events per day

Other conditions affecting consumers exposure	
Body parts exposed	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
adult	:

### 15.2.3. Control of consumer exposure: Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; infrequently ( AC10g)

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Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid

Amount used, frequency and duration of use (or from service life)	
Amount per use	: 40 kg
Duration	: Covers exposure up to: 4 h
Use frequency	: 0.2 events per day

Other conditions affecting consumers exposure	
Body parts exposed	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
adult	:

### 15.2.4. Control of consumer exposure: Other rubber articles; Palm of one hand; daily ( AC10g)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid

Amount used, frequency and duration of use (or from service life)	
Amount per use	: 40 kg
Duration	: Covers exposure up to: 4 h
Use frequency	: 1 events per day

Other conditions affecting consumers exposure	
Body parts exposed	: Palm of one hand
adult	:

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### 15.2.5. Control of consumer exposure: Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; daily ( AC10g)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid

Amount used, frequency and duration of use (or from service life)	
Amount per use	: 40 kg
Duration	: Covers exposure up to: 4 h
Use frequency	: 1 events per day

Other conditions affecting consumers exposure	
Body parts exposed	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
adult	:

### 15.2.6. Control of consumer exposure: Plastic articles; Small scale ( AC13)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid

Amount used, frequency and duration of use (or from service life)	
Amount per use	: 75 g
For each use event, assumes swallowed amount of	: 0.1 cm <sup>3</sup>
Duration	: Covers exposure up to: 8 h
Use frequency	: 1 events per day

Other conditions affecting consumers exposure	
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Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
adult	:	

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

#### 15.3.1. Environmental release and exposure: Service life of plastic articles and rubber articles (ERC10a, ERC11a)

Release route	Release	Release estimation method
Water	3.2 %	ERC based
Air	0.05 %	ERC based
Soil	3.2 %	ERC based

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.048 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00853 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00841 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.609 mg/kg wet weight (Chesar 3.5)	0.161
Man via environment - Inhalation	0.0000008 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00346 mg/kg bw/day (Chesar 3.5)	0.027

#### 15.3.2. Consumer exposure: Plastic articles: Articles intended for food contact ( AC13d)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
oral	systemic	long-term	0.003 mg/kg bw/day (Chesar 3.5)	0.019

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### Additional information on exposure estimation

Inhalation exposure is considered to be not relevant.  
Dermal exposure is considered to be not relevant.

### 15.3.3. Consumer exposure: Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; infrequently ( AC10g)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.043 mg/kg bw/day (ECETOC TRA Consumer v3.1)	0.329
dermal	systemic	short-term	0.214 mg/kg bw/day (ECETOC TRA Consumer v3.1)	< 0.01

### Additional information on exposure estimation

Oral exposure is considered to be not relevant.

### 15.3.4. Consumer exposure: Other rubber articles; Palm of one hand; daily ( AC10g)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.105 mg/kg	0.808

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			bw/day (ECETOC TRA Consumer v3.1)	
dermal	systemic	short-term	0.105 mg/kg bw/day (ECETOC TRA Consumer v3.1)	0.162

### Additional information on exposure estimation

Oral exposure is considered to be not relevant.

### 15.3.5. Consumer exposure: Other rubber articles; Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.; daily ( AC10g)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.071 mg/kg bw/day (ECETOC TRA Consumer v3.1)	0.55
dermal	systemic	short-term	0.071 mg/kg bw/day (ECETOC TRA Consumer v3.1)	0.109

### Additional information on exposure estimation

Oral exposure is considered to be not relevant.

### 15.3.6. Consumer exposure: Plastic articles; Small scale ( AC13)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
dermal	systemic	long-term	0.018 mg/kg bw/day (Chesar 3.5)	0.137
oral	systemic	long-term	0.05 mg/kg bw/day (Chesar 3.5)	0.385

### 15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Not applicable

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### ES16: Use in adhesives and sealants, inks, Professional

#### 16.1. Title section

<b>Structured Short Title</b>	: Widespread use by professional workers; Adhesives, sealants (PC1).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC8f</b> : Widespread use leading to inclusion into/onto article (outdoor)
<b>Process category(ies)</b>	: <b>PROC1</b> : Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions <b>PROC2</b> : Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions <b>PROC3</b> : Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition <b>PROC4</b> : Chemical production where opportunity for exposure arises <b>PROC5</b> : Mixing or blending in batch processes <b>PROC8a</b> : Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b</b> : Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC9</b> : Transfer of substance or mixture into small containers (dedicated filling line, including weighing) <b>PROC10</b> : Roller application or brushing <b>PROC13</b> : Treatment of articles by dipping and pouring <b>PROC14</b> : Tableting, compression, extrusion, pelettisation, granulation <b>PROC15</b> : Use as laboratory reagent <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC1</b> : Adhesives, sealants
<b>Sector(s) of use</b>	: <b>SU5</b> : Manufacture of textiles, leather, fur <b>SU6a</b> : Manufacture of wood and wood products <b>SU6b</b> : Manufacture of pulp, paper and paper products <b>SU17</b> : General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment <b>SU18</b> : Manufacture of furniture <b>SU19</b> : Building and construction work

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Contributing Scenario (CS) Environment		
CS1	Use in adhesives and sealants	ERC8f

Contributing Scenario (CS) Worker		
CS2	Use in closed process; Batch process	PROC1, PROC3
CS3	Continuous process; Closed systems; Laboratory activities	PROC2, PROC15
CS4	Use in semi-closed process with opportunity for exposure; Mixing operations	PROC4, PROC5
CS5	Material transfers	PROC8a, PROC8b
CS6	Small package filling; Small scale weighing	PROC9
CS7	Rolling, Brushing	PROC10
CS8	Dipping, immersion and pouring	PROC13

### 16.2. Conditions of use affecting exposure

#### 16.2.1. Control of environmental exposure: Use in adhesives and sealants (ERC8f)

Amount used, frequency and duration of use (or from service life)	
Daily amount for wide dispersive uses	: 0.055 kg
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %

Conditions and measures related to treatment of waste (including article waste)	
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Waste disposal methods : For general information on waste disposal see section 13.

### 16.2.2. Control of worker exposure: Use in closed process; Batch process (PROC1, PROC3)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 1 %

Physical form of product : Solid, high dustiness

Vapour pressure : 0.000867 mPa (40 °C)

#### Remarks:

Unloading  
< 5%  
Covered by  
Industrial use

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

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

Wear suitable protective clothing.  
Use suitable eye protection.

For further specification, refer to section 8 of the SDS.

#### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

#### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth-

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ing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 16.2.3. Control of worker exposure: Continuous process; Closed systems; Laboratory activities (PROC2, PROC15)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

#### Remarks:

Unloading  
< 5%  
Covered by  
Industrial use

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air

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changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 16.2.4. Control of worker exposure: Use in semi-closed process with opportunity for exposure; Mixing operations (PROC4, PROC5)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 1 %

Physical form of product : Solid in solution  
low viscosity

#### Remarks:

Unloading  
< 5%  
Covered by  
Industrial use

#### Amount used, frequency and duration of use (or from service life)

Duration : Covers exposure up to 8 h

#### Technical and organisational conditions and measures

Activity class : Activities with open liquid surfaces or open reservoirs -  
activity with agitated surfaces

Open surface : < 3 m<sup>2</sup>

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

Wear suitable protective clothing.  
Use suitable eye protection.

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Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 16.2.5. Control of worker exposure: Material transfers (PROC8a, PROC8b)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid in solution medium viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

#### Remarks:

Unloading  
< 5%  
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#### Amount used, frequency and duration of use (or from service life)

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Duration	: Covers exposure up to 8 h
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Technical and organisational conditions and measures	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer of liquid products - falling liquids
Application rate	: > 1,000 L/min
Handling type	: Splash loading
drop height	: > 0.5 m

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 16.2.6. Control of worker exposure: Small package filling; Small scale weighing (PROC9)

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Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid in solution medium viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

### Remarks:

Unloading  
< 5%  
Covered by  
Industrial use

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Activity class	: Transfer of liquid products - falling liquids
Application rate	: > 1,000 L/min
Handling type	: Splash loading

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Use suitable eye protection.	
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %	
For further specification, refer to section 8 of the SDS.	

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>

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Temperature	:	Assumes process temperature up to 40 °C
Ventilation rate	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 16.2.7. Control of worker exposure: Rolling, Brushing (PROC10)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid in solution low viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

#### Remarks:

Unloading  
< 5%  
Covered by  
Industrial use

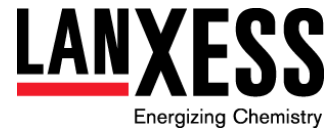
Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Activity class	: Spreading of liquid products
Application rate	: > 3 m <sup>2</sup> /h

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing.	

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Use suitable eye protection.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 16.2.8. Control of worker exposure: Dipping, immersion and pouring (PROC13)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 1 %
Physical form of product	: Solid in solution low viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Activity class	: Handling of contaminated objects.
Surface area	: > 3 m <sup>2</sup>

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Surface contamination : <= 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use
Temperature : Assumes process temperature up to 40 °C
Ventilation rate : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

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

#### 16.3.1. Environmental release and exposure: Use in adhesives and sealants (ERC8f)

Release route	Release	Release estimation method
Water	5 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC based

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.047 mg/kg wet weight (Chesar 3.5)	< 0.01

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Predator's prey (marine water)	0.0085 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.0084 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.606 mg/kg wet weight (Chesar 3.5)	0.161
Man via environment - Inhalation	0.0000008 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00344 mg/kg bw/day (Chesar 3.5)	0.026

### 16.3.2. Worker exposure: Use in closed process; Batch process (PROC1, PROC3)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
PROC1, inhalation	systemic	long-term	0.01 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
PROC1, inhalation	systemic	short-term	0.04 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
PROC3, inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar 3.5)	0.4
PROC3, inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
PROC1, dermal	systemic	long-term	0.003 mg/kg bw/day (Chesar 3.5)	< 0.01
PROC1, dermal	systemic	short-term	0.003 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
PROC3, dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.192
PROC3, dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 16.3.3. Worker exposure: Continuous process; Closed systems; Laboratory activities (PROC2, PROC15)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.5 mg/m <sup>3</sup> (Chesar 3.5)	0.4
Inhalation	systemic	short-term	2 mg/m <sup>3</sup> (Chesar 3.5)	0.32
PROC2, dermal	systemic	long-term	0.014 mg/kg bw/day (Chesar 3.5)	0.038
PROC2, dermal	systemic	short-term	0.014 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
PROC15, dermal	systemic	long-term	0.003 mg/kg bw/day (Chesar 3.5)	< 0.01
PROC15, dermal	systemic	short-term	0.003 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01

### 16.3.4. Worker exposure: Use in semi-closed process with opportunity for exposure; Mixing operations (PROC4, PROC5)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.033 mg/m <sup>3</sup> (ART v1.5)	0.026
Inhalation	systemic	short-term	0.132 mg/m <sup>3</sup> (ART v1.5)	0.021
PROC4, dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
PROC4, dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038
PROC5, dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
PROC5, dermal	systemic	short-term	0.137 mg/kg	0.076

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			bw/day (ECETOC TRA 3.1)	
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### 16.3.5. Worker exposure: Material transfers (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.1 mg/m <sup>3</sup> (ART v1.5)	0.08
Inhalation	systemic	short-term	0.4 mg/m <sup>3</sup> (ART v1.5)	0.064
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 16.3.6. Worker exposure: Small package filling; Small scale weighing (PROC9)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.099 mg/m <sup>3</sup> (ART v1.5)	0.079
Inhalation	systemic	short-term	0.396 mg/m <sup>3</sup> (ART v1.5)	0.063
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

### 16.3.7. Worker exposure: Rolling, Brushing (PROC10)

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Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.033 mg/m <sup>3</sup> (ART v1.5)	0.026
Inhalation	systemic	short-term	0.132 mg/m <sup>3</sup> (ART v1.5)	0.021
dermal	systemic	long-term	0.274 mg/kg bw/day (Chesar 3.5)	0.762
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 16.3.8. Worker exposure: Dipping, immersion and pouring (PROC13)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ART v1.5)	< 0.01
dermal	systemic	long-term	0.137 mg/kg bw/day (Chesar 3.5)	0.381
dermal	systemic	short-term	0.137 mg/kg bw/day (ECETOC TRA 3.1)	0.076

### 16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES17: Use in rubber and non-rubber polymers., Professional

#### 17.1. Title section

<b>Structured Short Title</b>	: Widespread use by professional workers; Polymer preparations and compounds (PC32); Various sectors (SU11, SU12).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC8f</b> : Widespread use leading to inclusion into/onto article (outdoor)
<b>Process category(ies)</b>	: <b>PROC8a</b> : Transfer of substance or mixture (charging/discharging) at non dedicated-facilities <b>PROC8b</b> : Transfer of substance or mixture (charging/discharging) at dedicated facilities <b>PROC14</b> : Tableting, compression, extrusion, pelettisation, granulation <b>PROC15</b> : Use as laboratory reagent <b>PROC21</b> : Low energy manipulation and handling of substances bound in/on materials and/or articles
<b>Product (sub) category(ies)</b>	: <b>PC32</b> : Polymer preparations and compounds
<b>Sector(s) of use</b>	: <b>SU11</b> : Manufacture of rubber products <b>SU12</b> : Manufacture of plastics products, including compounding and conversion

Contributing Scenario (CS) Environment		
CS1	Use in rubber and non-rubber polymers.	ERC8f

Contributing Scenario (CS) Worker		
CS2	Material transfers	PROC8a, PROC8b
CS3	Tableting, compression, extrusion or pelletisation	PROC14
CS4	Laboratory activities; Low energy manipulation and handling of substances bound in/on materials and/or articles	PROC15, PROC21

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### 17.2. Conditions of use affecting exposure

#### 17.2.1. Control of environmental exposure: Use in rubber and non-rubber polymers. (ERC8f)

Amount used, frequency and duration of use (or from service life)	
Daily amount for wide dispersive uses	: 0.11 kg
Emission days per year	: 365

Conditions and measures related to sewage treatment plant	
STP type	: Municipal Sewage Treatment Plant Water - minimum efficiency of 91.66 %

Conditions and measures related to treatment of waste (including article waste)	
Waste disposal methods	: For general information on waste disposal see section 13.

#### 17.2.2. Control of worker exposure: Material transfers (PROC8a, PROC8b)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid in solution medium viscosity
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

Technical and organisational conditions and measures	
Use in contained systems Inhalation - minimum efficiency of 90 %	
Activity class	: Transfer of liquid products - falling liquids

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Application rate	: > 1,000 L/min
Handling type	: Splash loading

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use	: Indoor use
Room size	: 300 m <sup>3</sup>
Temperature	: Assumes process temperature up to 40 °C
Ventilation rate	: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

### 17.2.3. Control of worker exposure: Tableting, compression, extrusion or pelletisation (PROC14)

#### Product (article) characteristics

Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 100 hPa (120 °C)

#### Amount used, frequency and duration of use (or from service life)

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Duration	: Covers exposure up to 8 h
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Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Temperature	: Assumes process temperature up to 120 °C
Ventilation rate	: Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

### 17.2.4. Control of worker exposure: Laboratory activities; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC15, PROC21)

Product (article) characteristics	
Concentration of substance in product	: Covers concentrations up to 3 %
Physical form of product	: Solid, high dustiness
Vapour pressure	: 0.000867 mPa (40 °C)

Amount used, frequency and duration of use (or from service life)	
Duration	: Covers exposure up to 8 h

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

Wear suitable protective clothing.  
Use suitable eye protection.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.  
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.  
Dermal - minimum efficiency of 90 %

For further specification, refer to section 8 of the SDS.

### Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Temperature : Assumes process temperature up to 40 °C

Ventilation rate : Provide a basic standard of general ventilation (1 to 3 air changes per hour).

### Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply

On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection.  
For further specification, refer to section 8 of the SDS.

## 17.3. Exposure estimation and reference to its source

### 17.3.1. Environmental release and exposure: Use in rubber and non-rubber polymers. (ERC8f)

Release route	Release	Release estimation method
Water	5 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC based

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.049 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.00862 mg/kg wet weight (Chesar 3.5)	< 0.01

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Top predator's prey (marine water)	0.00843 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.615 mg/kg wet weight (Chesar 3.5)	0.161
Man via environment - Inhalation	0.0000008 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00353 mg/kg bw/day (Chesar 3.5)	0.027

### 17.3.2. Worker exposure: Material transfers (PROC8a, PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	0.089 mg/m <sup>3</sup> (ART v1.5)	0.071
Inhalation	systemic	short-term	0.356 mg/m <sup>3</sup> (ART v1.5)	0.057
dermal	systemic	long-term	0.274 mg/kg bw/day (Chesar 3.5)	0.762
dermal	systemic	short-term	0.274 mg/kg bw/day (ECETOC TRA 3.1)	0.152

### 17.3.3. Worker exposure: Tableting, compression, extrusion or pelletisation (PROC14)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	1 mg/m <sup>3</sup> (Chesar 3.5)	0.8
Inhalation	systemic	short-term	4 mg/m <sup>3</sup> (Chesar 3.5)	0.64
dermal	systemic	long-term	0.069 mg/kg bw/day (Chesar 3.5)	0.191
dermal	systemic	short-term	0.069 mg/kg bw/day (ECETOC TRA 3.1)	0.038

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### 17.3.4. Worker exposure: Laboratory activities; Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC15, PROC21)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	1 mg/m <sup>3</sup> (Chesar 3.5)	0.8
Inhalation	systemic	short-term	4 mg/m <sup>3</sup> (Chesar 3.5)	0.64
PROC15, dermal	systemic	long-term	0.007 mg/kg bw/day (Chesar 3.5)	0.019
PROC15, dermal	systemic	short-term	0.007 mg/kg bw/day (ECETOC TRA 3.1)	< 0.01
PROC21, dermal	systemic	long-term	0.057 mg/kg bw/day (Chesar 3.5)	0.157
PROC21, dermal	systemic	short-term	0.057 mg/kg bw/day (ECETOC TRA 3.1)	0.032

### 17.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

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### ES18: Use in adhesives and sealants, Consumer

#### 18.1. Title section

<b>Structured Short Title</b>	: Consumer use; Adhesives, sealants (PC1).
<b>Substance</b>	: 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol EC-No.: 204-327-1 CAS-No.: 119-47-1

<b>Environmental release category(ies)</b>	: <b>ERC8f</b> : Widespread use leading to inclusion into/onto article (outdoor)
<b>Product (sub) category(ies)</b>	: <b>PC1</b> : Adhesives, sealants

Contributing Scenario (CS) Environment		
<b>CS1</b>	<b>Use in adhesives and sealants</b>	<b>ERC8f</b>

Contributing Scenario (CS) Consumer		
<b>CS2</b>	<b>Use of universal/wood glue.; FEICA_SCED_1_01_a_v1</b>	<b>PC1</b>
<b>CS3</b>	<b>Glues DIY-use (carpet glue, tile glue, wood parquet glue); FEICA_SCED_1_02_a_v1</b>	<b>PC1</b>
<b>CS4</b>	<b>Sealants; FEICA_SCED_1_04_a_v1</b>	<b>PC1</b>

#### 18.2. Conditions of use affecting exposure

##### 18.2.1. Control of environmental exposure: Use in adhesives and sealants (ERC8f)

Amount used, frequency and duration of use (or from service life)	
Daily amount for wide dispersive uses	: 11 g
Emission days per year	: 365

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### Conditions and measures related to sewage treatment plant

STP type : Municipal Sewage Treatment Plant  
Water - minimum efficiency of 91.66 %

### Conditions and measures related to treatment of waste (including article waste)

Waste disposal methods : For general information on waste disposal see section 13.

### 18.2.2. Control of consumer exposure: Use of universal/wood glue.; FEICA\_SCED\_1\_01\_a\_v1 (PC1)

#### Product (article) characteristics

Concentration of substance in product : Covers concentrations up to 0.3 %

Dermal transfer factor : = 0.1

inhalative transfer factor : = 0.1

#### Amount used, frequency and duration of use (or from service life)

Amount per use : 9 g

Duration : Covers exposure up to: 6 h

Use frequency : 0.5 times per year

Use frequency : 1 events per day

#### Other conditions affecting consumers exposure

Indoor or outdoor use : Indoor use

Body parts exposed : Assumes that potential dermal contact is limited to fingertips.

adult :

### 18.2.3. Control of consumer exposure: Glues DIY-use (carpet glue, tile glue, wood parquet glue); FEICA\_SCED\_1\_02\_a\_v1 (PC1)

#### Product (article) characteristics

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Concentration of substance in product	:	Covers concentrations up to 0.3 %
Dermal transfer factor	:	= 0.1

Amount used, frequency and duration of use (or from service life)		
Amount per use	:	76 kg
Duration	:	Covers exposure up to: 4 h
Use frequency	:	55 times per year
Use frequency	:	1 events per day

Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.
adult	:	

### 18.2.4. Control of consumer exposure: Sealants; FEICA\_SCED\_1\_04\_a\_v1 (PC1)

Product (article) characteristics		
Concentration of substance in product	:	Covers concentrations up to 0.3 %
Dermal transfer factor	:	= 0.1

Amount used, frequency and duration of use (or from service life)		
Amount per use	:	150 g
Duration	:	Covers exposure up to: 0.75 h
Use frequency	:	3 times per year
Use frequency	:	1 events per day

Other conditions affecting consumers exposure		
Indoor or outdoor use	:	Indoor use
Body parts exposed	:	Assumes that potential dermal contact is limited to fingertips.

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adult :

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

#### 18.3.1. Environmental release and exposure: Use in adhesives and sealants (ERC8f)

Release route	Release	Release estimation method
Water	5 %	ERC based
Air	15 %	ERC based
Soil	0.5 %	ERC based

Protection Target	Exposure estimate	Risk Characterisation Ratio (RCR)
Predator's prey (freshwater)	0.047 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (marine water)	0.0084 mg/kg wet weight (Chesar 3.5)	< 0.01
Top predator's prey (marine water)	0.00838 mg/kg wet weight (Chesar 3.5)	< 0.01
Predator's prey (terrestrial)	1.599 mg/kg wet weight (Chesar 3.5)	0.16
Man via environment - Inhalation	0.0000008 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Man via environment - Oral	0.00336 mg/kg bw/day (Chesar 3.5)	0.026

#### 18.3.2. Consumer exposure: Use of universal/wood glue.; FEICA\_SCED\_1\_01\_a\_v1 (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	0.021 mg/kg bw/day (ECETOC)	0.165

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			TRA Consumer v3.1)	
dermal	systemic	short-term	0.021 mg/kg bw/day (Chesar 3.5)	0.032

<b>Additional information on exposure estimation</b>
Oral exposure is considered to be not relevant.

### 18.3.3. Consumer exposure: Glues DIY-use (carpet glue, tile glue, wood parquet glue); FEICA\_SCED\_1\_02\_a\_v1 (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01
Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	< 0.001 mg/kg bw/day (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	short-term	< 0.001 mg/kg bw/day (Chesar 3.5)	< 0.01

<b>Additional information on exposure estimation</b>
Oral exposure is considered to be not relevant.

### 18.3.4. Consumer exposure: Sealants; FEICA\_SCED\_1\_04\_a\_v1 (PC1)

Exposure route	Health effect	Exposure indicator	Exposure estimate	Risk Characterisation Ratio (RCR)
Inhalation	systemic	long-term	< 0.001 mg/m <sup>3</sup> (Chesar 3.5)	< 0.01

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Inhalation	systemic	short-term	< 0.001 mg/m <sup>3</sup> (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	long-term	< 0.001 mg/kg bw/day (ECETOC TRA Consumer v3.1)	< 0.01
dermal	systemic	short-term	< 0.001 mg/kg bw/day (Chesar 3.5)	< 0.01

### Additional information on exposure estimation

Oral exposure is considered to be not relevant.

### 18.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

#### Guidance to Downstream Users

Not applicable