MATERIAL SAFETY DATA SHEET

1.1. Product identifier

Product name	**BULLET ROOF MONO BROOF SIMILAR TO RAL 7012**

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

Intended use	**Hybrid polyurea**

Identified Uses	Industrial	Professional
Hybrid polyurea coating	-	✓

1.3. Details of the supplier of the safety data sheet

Name	**Bullet Building Products Ltd**
Full address	**Barbot Hall Industrial Estate**
District and Country	**Mangham Road, Rotherham**
	S61 4RJ, United Kingdom
	Tel: 01274 752643
e-mail address of the competent person responsible for the Safety Data Sheet	**sales@bulletbp.co.uk**

1.4. Emergency telephone number

For urgent inquiries refer to	**United Kingdom** **999/112 emergency** **111 non-emergency medical number** **NHS 111 (England)** **NHS 24 (Scotland)** **NHS Direct (Wales)** **Ireland** **National Poisons Information Centre, Beaumont Hospital, PO Box 1297, Beaumont Road, Dublin 9** **018092166** **018092566**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2020/878.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Flammable liquid, category 3	H226	Flammable liquid and vapour.
Eye irritation, category 2	H319	Causes serious eye irritation.
Skin irritation, category 2	H315	Causes skin irritation.
Skin sensitization, category 1	H317	May cause an allergic skin reaction.
Hazardous to the aquatic environment, chronic toxicity, category 3	H412	Harmful to aquatic life with long lasting effects.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:

Signal words: Warning

Hazard statements:

H226	Flammable liquid and vapour.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H412	Harmful to aquatic life with long lasting effects.
EUH204	Contains isocyanates. May produce an allergic reaction.
EUH205	Contains epoxy constituents. May produce an allergic reaction.

Precautionary statements:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear protective gloves/ protective clothing / eye protection / face protection.
P370+P378	In case of fire: use carbon dioxide, sand, foam or powder to extinguish.
P261	Avoid breathing dust / fume / gas / mist / vapours / spray.
P333+P313	If skin irritation or rash occurs: Get medical advice / attention.
P337+P313	If eye irritation persists: Get medical advice / attention.

Contains: AROMATIC POLYISOCYANIC PREPOLYMER

VOC (Directive 2004/42/EC) :
One - pack performance coatings.
VOC given in g/litre of product in a ready-to-use condition : 205,41
Limit value: 500,00

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

The product does not contain substances with endocrine disrupting properties in concentration ≥ 0.1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

Information not relevant

3.2. Mixtures

Contains:

Identification		**x = Conc. %**	**Classification (EC) 1272/2008 (CLP)**
AROMATIC POLYISOCYANIC PREPOLYMER			
INDEX		18 ≤ x < 19,5	**Eye Irrit. 2 H319, Skin Sens. 1 H317**
EC	*609-378-7*		
CAS	*37273-56-6*		
XYLENE (MIXTURE OF ISOMERS)			
INDEX	*601-022-00-9*	8,5 ≤ x < 10	**Flam. Liq. 3 H226, Acute Tox. 4 H312, Acute Tox. 4 H332, Asp. Tox. 1 H304, STOT RE 2 H373, Eye Irrit. 2 H319, Skin Irrit. 2 H315, STOT SE 3 H335, Aquatic Chronic 3 H412, Classification note according to Annex VI to the CLP Regulation: C**

EC	*215-535-7*		**STA Dermal: 1100 mg/kg, STA Inhalation vapours: 11 mg/l**
CAS	*1330-20-7*		
REACH Reg.	*01-2119488216-32*		
REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE			
INDEX		4 ≤ x < 4,5	**Acute Tox. 4 H302, Aquatic Chronic 3 H412**
EC	*807-935-0*		**LD50 Oral: 632 mg/kg bw**
CAS	*1244733-77-4*		
REACH Reg.	*01-2119486772-26*		
HYDROCARBONS, C9, AROMATICS			
INDEX		2,5 ≤ x < 3	**Flam. Liq. 3 H226, Asp. Tox. 1 H304, STOT SE 3 H335, STOT SE 3 H336, Aquatic Chronic 2 H411, EUH066**
EC	*918-668-5*		
CAS	*128601-23-0*		
REACH Reg.	*01-2119455851-35*		
N,N-DIBENZYLIDEN POLYOXYPROPYLENE DIAMINE (POLYMER)			
INDEX		2 ≤ x < 2,5	**Skin Irrit. 2 H315**
EC	*679-523-7*		
CAS	*136855-71-5*		
ISOBUTYL ACETATE			
INDEX	*607-026-00-7*	1 ≤ x < 1,5	**Flam. Liq. 2 H225, STOT SE 3 H336, EUH066, Classification note according to Annex VI to the CLP Regulation: C**
EC	*203-745-1*		
CAS	*110-19-0*		
REACH Reg.	*01-2119488971-22*		
ANTIMONY TRIOXIDE			
INDEX	*051-005-00-X*	0,25 ≤ x < 0,3	**Carc. 2 H351**
EC	*215-175-0*		
CAS	*1309-64-4*		
REACH Reg.	*01-2119475613-35*		
N-BUTYL ACETATE			
INDEX	*607-025-00-1*	0,25 ≤ x < 0,3	**Flam. Liq. 3 H226, STOT SE 3 H336, EUH066**
EC	*204-658-1*		
CAS	*123-86-4*		
REACH Reg.	*01-2119485493-29*		
REACTION PRODUCTS OF HEXANE-1,6-DIOL WITH 2-(CHLOROMETHYL)OXIRANE (1:2)			
INDEX		0,1 ≤ x < 0,15	**Eye Irrit. 2 H319, Skin Irrit. 2 H315, Skin Sens. 1 H317, Aquatic Chronic 3 H412**
EC	*618-939-5*		
CAS	*933999-84-9*		
REACH Reg.	*01-2119463471-41*		
PHOSPHORIC ACID			
INDEX	*015-011-00-6*	0 ≤ x < 0,05	**Met. Corr. 1 H290, Skin Corr. 1B H314, Eye Dam. 1 H318, Classification note according to Annex VI to the CLP Regulation: B**
EC	*231-633-2*		**Skin Corr. 1B H314: ≥ 25%, Skin Irrit. 2 H315: ≥ 10%, Eye Dam. 1 H318: ≥ 25%, Eye Irrit. 2 H319: ≥ 10%**
CAS	*7664-38-2*		
REACH Reg.	*01-2119485924-24*		
DIBUTYLBIS(DODECYLTHIO)STANNANE			
INDEX		0 ≤ x < 0,05	**Repr. 1B H360FD, Acute Tox. 4 H312, STOT RE 1 H372, Skin Irrit. 2 H315, Skin Sens. 1 H317, Aquatic Chronic 1 H410 M=1**
EC	*214-688-7*		**LD50 Dermal: >1000 mg/kg**
CAS	*1185-81-5*		
REACH Reg.	*01-2119841260-50*		
M-tolylidene diisocyanate			
INDEX	*615-006-00-4*	0 ≤ x < 0,05	**Carc. 2 H351, Acute Tox. 2 H330, Eye Irrit. 2 H319, Skin Irrit. 2 H315, STOT SE 3 H335, Resp. Sens. 1 H334, Skin Sens. 1 H317, Aquatic Chronic 3 H412, Classification note according to Annex VI to the CLP Regulation: 2, C**
EC	*247-722-4*		**Resp. Sens. 1 H334: ≥ 0,1%**
CAS	*26471-62-5*		**STA Inhalation vapours: 0,501 mg/l**

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.
INGESTION: Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.
INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

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

Specific information on symptoms and effects caused by the product are unknown.

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

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.
UNSUITABLE EXTINGUISHING EQUIPMENT
Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.
Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

Send away individuals who are not suitably equipped. Use explosion-proof equipment. Eliminate all sources of ignition (cigarettes, flames, sparks, etc.) from the leakage site.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Without adequate ventilation, vapours may accumulate at ground level and, if ignited, catch fire even at a distance, with the danger of backfire. Avoid bunching of electrostatic charges. When performing transfer operations involving large containers, connect to an earthing system and wear antistatic footwear. Vigorous stirring and flow through the tubes and equipment may cause the formation and accumulation of electrostatic charges. In order to avoid the risk of fires and explosions, never use compressed air when handling. Open containers with caution as they may be pressurised. Do not eat, drink or smoke during use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Store in a cool and well ventilated place, keep far away from sources of heat, naked flames and sparks and other sources of ignition. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

DEU	Deutschland	Technischen Regeln für Gefahrstoffe (TRGS 900) - Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte. MAK- und BAT-Werte-Liste 2020, Ständige Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe, Mitteilung 56
ESP	España	Límites de exposición profesional para agentes químicos en España 2021
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS
FIN	Suomi	HTP-VÄRDEN 2020. Koncentrationer som befunnits skadliga. SOCIAL - OCH HÄLSOVÅRDSMINISTERIETS PUBLIKATIONER 2020:25
GRC	Ελλάδα	Π.Δ. 26/2020 (ΦΕΚ 50/Α` 6.3.2020) Εναρμόνιση της ελληνικής νομοθεσίας προς τις διατάξεις των οδηγιών 2017/2398/ΕΕ, 2019/130/ΕΕ και 2019/983/ΕΕ «για την τροποποίηση της οδηγίας 2004/37/ΕΚ ’’σχετικά με την προστασία των εργαζομένων από τους κινδύνους που συνδέονται με την έκθεση σε καρκινογόνους ή μεταλλαξιγόνους παράγοντες κατά την εργασία’’»
HRV	Hrvatska	Pravilnik o izmjenama i dopunama Pravilnika o zaštiti radnika od izloženosti opasnimkemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 1/2021)
ITA	Italia	Decreto Legislativo 9 Aprile 2008, n.81
LTU	Lietuva	Jsakymas dėl lietuvos higienos normos hn 23:2011 „cheminių medžiagų profesinio poveikio ribiniai dydžiai. Matavimo ir poveikio vertinimo bendrieji reikalavimai“ patvirtinimo
NLD	Nederland	Arbeidsomstandighedenregeling. Lijst van wettelijke grenswaarden op grond van de artikelen 4.3, eerste lid, en 4.16, eerste lid, van het Arbeidsomstandighedenbesluit
PRT	Portugal	Decreto-Lei n.º 1/2021 de 6 de janeiro, valores-limite de exposição profissional indicativos para os agentes químicos. Decreto-Lei n.º 35/2020 de 13 de julho, proteção dos trabalhadores contra os riscos ligados à exposição durante o trabalho a agentes cancerígenos ou mutagénicos
POL	Polska	Rozporządzenie ministra rozwoju, pracy i technologii z dnia 18 lutego 2021 r. Zmieniające rozporządzenie w sprawie najwyższych dopuszczalnych stężeń i natężeń czynników szkodliwych dla zdrowia w środowisku pracy
ROU	România	Hotărârea nr. 53/2021 pentru modificarea hotărârii guvernului nr. 1.218/2006, precum și pentru modificarea și completarea hotărârii guvernului nr. 1.093/2006
SVK	Slovensko	NARIADENIE VLÁDY Slovenskej republiky z 12. augusta 2020, ktorým sa mení a dopĺňa nariadenie vlády Slovenskej republiky č. 356/2006 Z. z. o ochrane zdravia zamestnancov pred rizikami súvisiacimi s expozíciou karcinogénnym a mutagénnym faktorom pri práci v znení neskorších predpisov
SVN	Slovenija	Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu (Uradni list RS, št. 100/01, 39/05, 53/07, 102/10, 43/11 – ZVZD-1, 38/15, 78/18 in 78/19)
GBR	United Kingdom	EH40/2005 Workplace exposure limits (Fourth Edition 2020)
EU	OEL EU	Directive (EU) 2022/431; Directive (EU) 2019/1831; Directive (EU) 2019/130; Directive (EU) 2019/983; Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 98/24/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2022

XYLENE (MIXTURE OF ISOMERS)

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
AGW	DEU	440	100	880	200	SKIN
MAK	DEU	440	100	880	200	SKIN
VLA	ESP	221	50	442	100	SKIN
VLEP	FRA	221	50	442	100	SKIN
HTP	FIN	220	50	440	100	SKIN
TLV	GRC	435	100	650	150	
GVI/KGVI	HRV	221	50	442	100	SKIN
VLEP	ITA	221	50	442	100	SKIN
RD	LTU	221	50	442	100	SKIN
TGG	NLD	210		442		SKIN
VLE	PRT	221	50	442	100	SKIN
NDS/NDSCh	POL	100		200		SKIN
TLV	ROU	221	50	442	100	SKIN
NPEL	SVK	221	50	442	100	SKIN
MV	SVN	221	50	442	100	SKIN
WEL	GBR	220	50	441	100	SKIN
OEL	EU	221	50	442	100	SKIN
TLV-ACGIH			20			

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,327	mg/l
Normal value in marine water	0,327	mg/l
Normal value for fresh water sediment	12,46	mg/kg
Normal value for marine water sediment	12,46	mg/kg
Normal value of STP microorganisms	6,58	mg/l
Normal value for the terrestrial compartment	2,31	mg/kg

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					442 mg/m3	442 mg/m3	221 mg/kg	221 mg/m3
Skin								212 mg/kg bw/d

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,32	mg/l
Normal value in marine water	0,032	mg/l
Normal value for fresh water sediment	11,5	mg/kg dw
Normal value for marine water sediment	1,15	mg/kg dw
Normal value for marine water, intermittent release	0,51	mg/l
Normal value of STP microorganisms	19,1	mg/l
Normal value for the food chain (secondary poisoning)	11,6	mg/kg
Normal value for the terrestrial compartment	0,34	mg/kg dw
Normal value for the atmosphere	NPI	

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral		2 mg/kg bw/d		0,520 mg/kg bw/d				
Inhalation	NPI	5,6 mg/m3	NPI	1,45 mg/m3	NPI	22,6 mg/m3	NPI	8,2 mg/m3
Skin	NPI		NPI	1,04 mg/kg bw/d	NPI		NPI	2,91 mg/kg bw/d

HYDROCARBONS, C9, AROMATICS

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				7,5 mg/kg bw/d				
Inhalation				32 mg/m3				151 mg/m3
Skin				7,5 mg/kg bw/d				12,5 mg/kg bw/d

ISOBUTYL ACETATE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
AGW	DEU	300	62	600 (C)	124 (C)	
VLA	ESP	724	150			
VLEP	FRA	710	150	940	200	
TLV	GRC	950	200	950	200	
GVI/KGVI	HRV	241	50	723	150	
VLEP	ITA	241	50	723	150	
RD	LTU	241	50	723	150	
TGG	NLD	480				
VLE	PRT	241	50	723	150	
NDS/NDSCh	POL	240		720		
TLV	ROU	241	50	723	150	
NPEL	SVK	241	50	723	150	
MV	SVN	300	62	600	124	
WEL	GBR	724	150	903	187	
OEL	EU	241	50	723	150	
TLV-ACGIH			50		150	

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,17	mg/l
Normal value in marine water	0,017	mg/l
Normal value for fresh water sediment	0,877	mg/kg
Normal value for marine water sediment	0,88	mg/kg
Normal value of STP microorganisms	200	mg/l
Normal value for the terrestrial compartment	0,0755	mg/kg

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					600 mg/m3	600 mg/m3	300 mg/m3	300 mg/m3
Skin						10 mg/kg bw/d		10 mg/kg bw/d

SECTION 8. Exposure controls/personal protection ... / >>

N-BUTYL ACETATE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
AGW	DEU	300	62	600 (C)	124 (C)	
VLA	ESP	241	50	724	150	
VLEP	FRA	710	150	940	200	
TLV	GRC	710	150	950	200	
GVI/KGVI	HRV	241	50	723	150	
VLEP	ITA	241	50	723	150	
RD	LTU	241	50	723	150	
TGG	NLD	150				
VLE	PRT	241	50	723	150	
NDS/NDSCh	POL	240		720		
TLV	ROU	241	50	723	150	
NPEL	SVK	241	50	723	150	
MV	SVN	300	62	600	124	
WEL	GBR	724	150	966	200	
OEL	EU	241	50	723	150	
TLV-ACGIH			50		150	

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,18	mg/l
Normal value in marine water	0,018	mg/l
Normal value for fresh water sediment	0,981	mg/kg
Normal value for marine water sediment	0,098	mg/kg
Normal value of STP microorganisms	35,6	mg/l
Normal value for the terrestrial compartment	0,09	mg/kg

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					600 mg/m3	600 mg/m3	300 mg/m3	300 mg/m3
Skin					NPI	11 mg/kg bw/d	NPI	11 mg/kg bw/d

REACTION PRODUCTS OF HEXANE-1,6-DIOL WITH 2-(CHLOROMETHYL)OXIRANE (1:2)

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,011	mg/l
Normal value in marine water	0,001	mg/l
Normal value for fresh water sediment	0,283	mg/kg
Normal value for marine water sediment	0,028	mg/kg
Normal value of STP microorganisms	1	mg/l
Normal value for the food chain (secondary poisoning)	NPI	
Normal value for the terrestrial compartment	0,223	mg/kg
Normal value for the atmosphere	NPI	

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					MED	10,57 mg/m3	0,44 mg/m3	10,57 mg/m3
Skin					0,0226 mg/cm2	MED	0,0226 mg/cm2	6 mg/kg bw/d

SECTION 8. Exposure controls/personal protection ... / >>

PHOSPHORIC ACID

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
AGW	DEU	2		4 (C)		INHAL
MAK	DEU	2		4		INHAL
VLA	ESP	1		2		
VLEP	FRA	1	0,2	2	0,5	
HTP	FIN	1		2		
TLV	GRC	1		3		
GVI/KGVI	HRV	1		2		
VLEP	ITA	1		2		
RD	LTU	1		2		
TGG	NLD	1		2		
VLE	PRT	1		2		
NDS/NDSCh	POL	1		2		
TLV	ROU	1		2		
NPEL	SVK	1		2		
MV	SVN	1		2		
WEL	GBR	1		2		
OEL	EU	1		2		
TLV-ACGIH		1		3		

DIBUTYLBIS(DODECYLTHIO)STANNANE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	ppm	
OEL	EU	0,1		0,2		

M-tolylidene diisocyanate

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,0125	mg/l
Normal value in marine water	0,00125	mg/l
Normal value for fresh water sediment	NEA	
Normal value for marine water sediment	NEA	
Normal value for water, intermittent release	0,125	mg/l
Normal value of STP microorganisms	1	mg/l
Normal value for the food chain (secondary poisoning)	NPI	
Normal value for the terrestrial compartment	1	mg/kg/d
Normal value for the atmosphere	NPI	

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					0,140 mg/m3	0,140 mg/m3	0,035 mg/m3	0,035 mg/m3
Skin	MED	MED	MED	MED	MED	MED	MED	MED

Legend:
(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified ; LOW = low hazard ; MED = medium hazard ; HIGH = high hazard.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.
When choosing personal protective equipment, ask your chemical substance supplier for advice.
Personal protective equipment must be CE marked, showing that it complies with applicable standards.
Provide an emergency shower with face and eye wash station.
HAND PROTECTION
Protect hands with category III work gloves.
The following should be considered when choosing work glove material (see standard EN 374): compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION
Wear category II professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

Consider the appropriateness of providing antistatic clothing in the case of working environments in which there is a risk of explosion.
EYE PROTECTION
Wear airtight protective goggles (see standard EN 166).
RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type A filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.
Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.
ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.
Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	grey	
Odour	characteristic	
Melting point / freezing point	not available	
Initial boiling point	287 °C	Method:OECD 103
Flammability	flammable liquid	
Lower explosive limit	not available	
Upper explosive limit	not available	
Flash point	33 °C	Method:EN ISO 3679
Auto-ignition temperature	not available	
Decomposition temperature	not available	
pH	not applicable	Reason for missing data:substance/mixture reacts with water
Kinematic viscosity	>20,5 mm2/sec (40°C)	
Dynamic viscosity	18000 mPa*s	Temperature: 20 °C
Solubility	reacts with water developing carbon dioxide	
Partition coefficient: n-octanol/water	not applicable	
Vapour pressure	not available	
Density and/or relative density	1,5 g/cm3	Temperature: 20 °C
Relative vapour density	not available	
Particle characteristics	not applicable	

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Information not available

9.2.2. Other safety characteristics

Total solids (250°C / 482°F)	86,30 %
VOC (Directive 2004/42/EC) :	13,69 % - 205,41 g/litre
Explosive properties	not expected
Oxidising properties	not expected

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

ISOBUTYL ACETATE
Decomposes under the effect of heat.Attacks various types of plastic materials.
N-BUTYL ACETATE
Decomposes on contact with: water.
PHOSPHORIC ACID
Decomposes at temperatures above 200°C/392°F.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Stable in normal conditions of use and storage.
DIBUTYLBIS(DODECYLTHIO)STANNANE
Stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The vapours may also form explosive mixtures with the air.

XYLENE (MIXTURE OF ISOMERS)
Stable in normal conditions of use and storage.Reacts violently with: strong oxidants,strong acids,nitric acid,perchlorates.May form explosive mixtures with: air.
REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Stable in normal conditions of use and storage.
ISOBUTYL ACETATE
Risk of explosion on contact with: strong oxidising agents.May react violently with: alkaline hydroxides,potassium tert-butoxide.Forms explosive mixtures with: air.
N-BUTYL ACETATE
Risk of explosion on contact with: strong oxidising agents.May react dangerously with: alkaline hydroxides,potassium tert-butoxide.Forms explosive mixtures with: air.
PHOSPHORIC ACID
Risk of explosion on contact with: nitromethane.May react dangerously with: alkalis,sodium borohydride.

10.4. Conditions to avoid

Avoid overheating. Avoid bunching of electrostatic charges. Avoid all sources of ignition.

ISOBUTYL ACETATE
Avoid exposure to: sources of heat,naked flames.
N-BUTYL ACETATE
Avoid exposure to: moisture,sources of heat,naked flames.
DIBUTYLBIS(DODECYLTHIO)STANNANE
Avoid exposure to: UV rays.

10.5. Incompatible materials

ISOBUTYL ACETATE
Incompatible with: strong oxidants,nitrates,strong acids,strong bases.
N-BUTYL ACETATE
Incompatible with: water,nitrates,strong oxidants,acids,alkalis,zinc.
PHOSPHORIC ACID
Incompatible with: metals,strong alkalis,aldehydes,organic sulphides,peroxides.
DIBUTYLBIS(DODECYLTHIO)STANNANE
Incompatible with: oxidising agents.

10.6. Hazardous decomposition products

In the event of thermal decomposition or fire, gases and vapours that are potentially dangerous to health may be released.

PHOSPHORIC ACID
May develop: phosphoryl oxides.
DIBUTYLBIS(DODECYLTHIO)STANNANE
Per decomposizione sviluppa: anidride carbonica monossido di carbonio ossido di stagno

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

XYLENE (MIXTURE OF ISOMERS)
WORKERS: inhalation; contact with the skin.
POPULATION: ingestion of contaminated food or water; inhalation of ambient air.

N-BUTYL ACETATE
WORKERS: inhalation; contact with the skin.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

XYLENE (MIXTURE OF ISOMERS)
Toxic effect on the central nervous system (encephalopathy); irritating for the skin, conjunctiva, cornea and respiratory apparatus.

N-BUTYL ACETATE
In humans, the substance's vapours cause irritation of the eyes and nose. In the event of repeated exposure, skin irritation, dermatitis (dryness and cracking of the skin) and keratitis appear.

Interactive effects

XYLENE (MIXTURE OF ISOMERS)
Intake of alcohol interferes with the metabolism of the substance, inhibiting it. Ethanol consumption (0.8 g/kg) before a 4-hour exposure to xylene vapours (145 and 280 ppm) causes a 50% reduction in the excretion of methyl hippuric acid, whereas the concentration of xylenes in the blood increases approx. 1.5-2 times. At the same time there is an increase in the secondary side effects of the ethanol. The metabolism of the xylenes is increased by phenobarbital and 3-methyl-colantrene type enzyme inducers. Aspirin and xylenes mutually inhibit their conjugation with the glycine, which results in a decrease in urinary excretion of methyl hippuric acid. Other industrial products can interfere with the metabolism of xylenes.

N-BUTYL ACETATE
A case of acute intoxication been reported involving a 33 year old worker while cleaning a tank with a preparation containing xylenes, butyl acetate and ethylene glycol acetate. The person had irritation of the conjunctiva and upper respiratory tract, drowsiness and motor coordination disorders, which disappeared within 5 hours. The symptoms are attributed to poisoning by mixed xylenes and butyl acetate, with a possible synergistic effect responsible for the neurological effects. Cases of vacuolar keratitis are reported in workers exposed to a mixture of butyl acetate and isobutanol vapours, but with uncertainty concerning the responsibility of a particular solvent (INRC, 2011).

ACUTE TOXICITY

ATE (Inhalation - vapours) of the mixture:	> 20 mg/l
ATE (Oral) of the mixture:	>2000 mg/kg
ATE (Dermal) of the mixture:	>2000 mg/kg

AROMATIC POLYISOCYANIC PREPOLYMER

LD50 (Oral):	> 2000 mg/kg Ratto
LC50 (Inhalation mists/powders):	> 3,82 mg/l/4h

XYLENE (MIXTURE OF ISOMERS)

LD50 (Dermal):	4350 mg/kg Rabbit
STA (Dermal):	1100 mg/kg estimate from table 3.1.2 of Annex I of the CLP (figure used for calculation of the acute toxicity estimate of the mixture)
LD50 (Oral):	3523 mg/kg Rat
LC50 (Inhalation vapours):	26 mg/l/4h Rat
STA (Inhalation vapours):	11 mg/l estimate from table 3.1.2 of Annex I of the CLP (figure used for calculation of the acute toxicity estimate of the mixture)

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE

LD50 (Dermal):	> 2000 mg/kg OECD 402 (IRI 1989b)
LD50 (Oral):	632 mg/kg bw OECD 401 (Stropp, Bayer AG, 1996)
LC50 (Inhalation mists/powders):	> 7 mg/l/4h OECD 403 (IRI 1990a)

N-BUTYL ACETATE

LD50 (Dermal):	> 5000 mg/kg Rabbit
LD50 (Oral):	> 6400 mg/kg Rat
LC50 (Inhalation vapours):	21,1 mg/l/4h Rat

PHOSPHORIC ACID

LD50 (Dermal):	2740 mg/kg Rabbit
LD50 (Oral):	1530 mg/kg Rat
LC50 (Inhalation mists/powders):	> 0,85 mg/l/1h Rat

DIBUTYLBIS(DODECYLTHIO)STANNANE

LD50 (Dermal):	> 1000 mg/kg
LD50 (Oral):	> 2000 mg/kg

M-tolylidene diisocyanate

LD50 (Dermal):	> 9400 mg/kg Rabbit
LD50 (Oral):	> 2000 mg/kg Rat
LC50 (Inhalation vapours):	0,15 mg/l/4h Rat

SKIN CORROSION / IRRITATION

Causes skin irritation

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Skin Irritation: Non-irritating

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye irritation

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Eye Irritation: Non-irritating

RESPIRATORY OR SKIN SENSITISATION

Sensitising for the skin

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Respiratory Irritation: Non-irritating

Skin sensitization

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Not sensitizing - OECD 429 (2005)

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Non-genotoxic

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

XYLENE (MIXTURE OF ISOMERS)
Classified in Group 3 (not classifiable as a human carcinogen) by the International Agency for Research on Cancer (IARC). The US Environmental Protection Agency (EPA) affirms that "the data is inadequate for an assessment of the carcinogenic potential".

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
Not carcinogenic

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

Adverse effects on sexual function and fertility

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
LOAEL = 99 mg/kg bw/day (OECD 416)

Adverse effects on development of the offspring

REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE
NOAEL = at least 500 mg/kg bw/day (OECD 414, rabbit)

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class Viscosity: >20,5 mm2/sec (40°C)

11.2. Information on other hazards

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with human health effects under evaluation.

SECTION 12. Ecological information

This product is dangerous for the environment and the aquatic organisms. In the long term, it have negative effects on aquatic environment.

12.1. Toxicity

DIBUTYLBIS(DODECYLTHIO)STANNANE	
EC50 - for Crustacea	0,11 mg/l/48h
EC50 - for Algae / Aquatic Plants	> 1,6 mg/l/72h
REACTION PRODUCTS OF PHOSPHORYL TRICHLORIDE AND 2-METHYLOXIRANE	
LC50 - for Fish	51 mg/l/96h OECD 203
EC50 - for Crustacea	131 mg/l/48h OECD 201
EC50 - for Algae / Aquatic Plants	82 mg/l/72h OECD 201
Chronic NOEC for Crustacea	32 mg/l OECD 202
Chronic NOEC for Algae / Aquatic Plants	42 mg/l OECD 201
HYDROCARBONS, C9, AROMATICS	
LC50 - for Fish	9,2 mg/l/96h OECD Guideline 203, Oncorhynchus mykiss
EC50 - for Crustacea	3,2 mg/l/48h OECD Guideline 202, Daphnia magna
EC50 - for Algae / Aquatic Plants	2,6 mg/l/72h OECD Guideline 201, Pseudokirchneriella subcapitata
REACTION PRODUCTS OF HEXANE-1,6-DIOL WITH 2-(CHLOROMETHYL)OXIRANE (1:2)	
LC50 - for Fish	30 mg/l/96h OECD Guideline 203, Oncorhynchus mykiss
EC50 - for Crustacea	47 mg/l/48h OECD Guideline 202, Daphnia magna
EC50 - for Algae / Aquatic Plants	23,1 mg/l/72h QSAR, Pseudokirchneriella subcapitata
M-tolylidene diisocyanate	
EC50 - for Crustacea	12,5 mg/l/48h
Chronic NOEC for Crustacea	6,25 mg/l

12.2. Persistence and degradability

REACTION PRODUCTS OF HEXANE-1,6-DIOL WITH 2-(CHLOROMETHYL)OXIRANE (1:2)
Solubility in water > 10000 mg/l

AROMATIC POLYISOCYANIC PREPOLYMER
NOT rapidly degradable

PHOSPHORIC ACID
Solubility in water > 850000 mg/l
Degradability: information not available

XYLENE (MIXTURE OF ISOMERS)
Solubility in water 100 - 1000 mg/l
Rapidly degradable

N-BUTYL ACETATE
Solubility in water 1000 - 10000 mg/l

ISOBUTYL ACETATE
Solubility in water 1000 - 10000 mg/l
Rapidly degradable

12.3. Bioaccumulative potential

REACTION PRODUCTS OF HEXANE-1,6-DIOL WITH 2-(CHLOROMETHYL)OXIRANE (1:2)
Partition coefficient: n-octanol/water 0,822 Log Kow OECD Guideline 107

XYLENE (MIXTURE OF ISOMERS)
Partition coefficient: n-octanol/water 3,12
BCF 25,9

N-BUTYL ACETATE
Partition coefficient: n-octanol/water 2,3
BCF 15,3

ISOBUTYL ACETATE
Partition coefficient: n-octanol/water 2,3
BCF 15,3

12.4. Mobility in soil

XYLENE (MIXTURE OF ISOMERS)
Partition coefficient: soil/water 2,73

N-BUTYL ACETATE
Partition coefficient: soil/water < 3

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

12.6. Endocrine disrupting properties

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with environmental effects under evaluation.

12.7. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to ADR restrictions.

CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

14.1. UN number or ID number

ADR / RID, IMDG, IATA: 1263

The product, if packaged in packages of less than 450 litres, is not subject to ADR regulations as stated in 2.2.3.1.5.

The product, if packaged in packages of less than 450 litres, is not subject to obligations relating to marking, labelling and package testing in accordance with 2.3.2.5 of the IMDG CODE.

14.2. UN proper shipping name

ADR / RID:	PAINT RELATED MATERIAL
IMDG:	PAINT RELATED MATERIAL
IATA:	PAINT RELATED MATERIAL

14.3. Transport hazard class(es)

ADR / RID:	Class: 3	Label: 3
IMDG:	Class: 3	Label: 3
IATA:	Class: 3	Label: 3

14.4. Packing group

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards

ADR / RID:	NO
IMDG:	NO
IATA:	NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 30	Limited Quantities: 5 L	Tunnel restriction code: (D/E)
	Special provision: 163, 367, 650		
IMDG:	EMS: F-E, S-E	Limited Quantities: 5 L	
IATA:	Cargo:	Maximum quantity: 220 L	Packaging instructions: 366
	Passengers:	Maximum quantity: 60 L	Packaging instructions: 355
	Special provision:	A3, A72, A192	

14.7. Maritime transport in bulk according to IMO instruments

Information not relevant

SECTION 15. Regulatory information

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

Seveso Category - Directive 2012/18/EU: P5c

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
Product

Point	3 - 40
Contained substance	
Point	75

Regulation (EU) 2019/1148 - on the marketing and use of explosives precursors
not applicable

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage ≥ than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to Regulation (EU) 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

VOC (Directive 2004/42/EC) :
One - pack performance coatings.

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Liq. 2	Flammable liquid, category 2
Flam. Liq. 3	Flammable liquid, category 3
Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Carc. 2	Carcinogenicity, category 2
Repr. 1B	Reproductive toxicity, category 1B
Acute Tox. 2	Acute toxicity, category 2
Acute Tox. 4	Acute toxicity, category 4
STOT RE 1	Specific target organ toxicity - repeated exposure, category 1
Asp. Tox. 1	Aspiration hazard, category 1
STOT RE 2	Specific target organ toxicity - repeated exposure, category 2
Skin Corr. 1B	Skin corrosion, category 1B
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Resp. Sens. 1	Respiratory sensitization, category 1
Skin Sens. 1	Skin sensitization, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
Aquatic Chronic 2	Hazardous to the aquatic environment, chronic toxicity, category 2
Aquatic Chronic 3	Hazardous to the aquatic environment, chronic toxicity, category 3
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H290	May be corrosive to metals.
H351	Suspected of causing cancer.
H360FD	May damage fertility. May damage the unborn child.
H330	Fatal if inhaled.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure.
H304	May be fatal if swallowed and enters airways.
H373	May cause damage to organs through prolonged or repeated exposure.
H314	Causes severe skin burns and eye damage.

SECTION 16. Other information ... / >>

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.
EUH204	Contains isocyanates. May produce an allergic reaction.
EUH205	Contains epoxy constituents. May produce an allergic reaction.

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE: Identifier in ESIS (European archive of existing substances)
- CLP: Regulation (EC) 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: Regulation (EC) 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA: Time-weighted average exposure limit
- TWA STEL: Short-term exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY
1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 2020/878 (II Annex of REACH Regulation)
4. Regulation (EC) 790/2009 (I Atp. CLP) of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2019/521 (XII Atp. CLP)
16. Delegated Regulation (UE) 2018/1480 (XIII Atp. CLP)
17. Regulation (EU) 2019/1148
18. Delegated Regulation (UE) 2020/217 (XIV Atp. CLP)
19. Delegated Regulation (UE) 2020/1182 (XV Atp. CLP)
20. Delegated Regulation (UE) 2021/643 (XVI Atp. CLP)
21. Delegated Regulation (UE) 2021/849 (XVII Atp. CLP)
22. Delegated Regulation (UE) 2022/692 (XVIII Atp. CLP)

SECTION 16. Other information ... / >>

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

CALCULATION METHODS FOR CLASSIFICATION
Chemical and physical hazards: Product classification derives from criteria established by the CLP Regulation, Annex I, Part 2. The data for evaluation of chemical-physical properties are reported in section 9.
Health hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 3, unless determined otherwise in Section 11.
Environmental hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 4, unless determined otherwise in Section 12.

Changes to previous review:
The following sections were modified:
01 / 02 / 03 / 08 / 09 / 10 / 11 / 12 / 14.