


ARALDITE® 2047-1 RESIN

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Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.

2.2 Label elements**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms	:	
Signal Word	:	Danger
Hazard Statements	:	H225 Highly flammable liquid and vapour. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H335 May cause respiratory irritation.
Precautionary Statements	:	Prevention: P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P280 Wear protective gloves/ eye protection/ face protection. Response: P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. P362 + P364 Take off contaminated clothing and wash it before reuse. P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. Storage: P235 Keep cool. Disposal: P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients which must be listed on the label:

methyl methacrylate

methacrylic acid

2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, phosphate

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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
3.2 Mixtures
Hazardous ingredients

Chemical Name	CAS-No. EC-No. Registration number	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration (%)
methyl methacrylate	80-62-6 201-297-1	F; R11 Xi; R37/38 R43	Flam. Liq.2; H225 STOT SE3; H335 Skin Irrit.2; H315 Skin Sens.1; H317	30 - 60
monoalkyl or monoaryl or monoalkylary esters of methacrylic acid	7534-94-3 231-403-1	Xi; R36/37/38 Xi; R36/37/38 Xi; R36/37/38 N; R51-R53	Skin Irrit.2; H315 Eye Irrit.2; H319 STOT SE3; H335	3 - 7
methacrylic acid	79-41-4 201-204-4	C; R35 Xn; R21/22	Acute Tox.4; H302 Skin Corr.1A; H314 STOT SE3; H335 Eye Dam.1; H318 Acute Tox.4; H332 Acute Tox.3; H311	1 - 3
2-Propenoic acid, 2- methyl-, 2-hydroxyethyl ester, phosphate	52628-03-2 258-053-2	C; R34 C; C; R34	Skin Corr.1B; H314	1 - 3
2,2'-[(4- methylphenyl)imino]bis ethanol	3077-12-1 221-359-1	Xn; R22 Xn; Xn; R22 Xi; R41 Xi; Xi; R41	Acute Tox.4; H302 Eye Dam.1; H318	1 - 3
N,N-dimethylaniline	121-69-7 204-493-5	N; R51/53 Carc.Cat.3; R40 Xn; Carc.Cat.3; R40 T; R23/24/25 T; R23/24/25 N; R51-R53	Carc.2; H351 Aquatic Chronic2; H411 Acute Tox.3; H301 Acute Tox.3; H311 Acute Tox.3; H331	0.1 - 1

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.
Consult a physician.
Show this material safety data sheet to the doctor in

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attendance.

- If inhaled : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion.
If symptoms persist, call a physician.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

None known.

4.3 Indication of any immediate medical attention and special treatment needed**SECTION 5: Firefighting measures****5.1 Extinguishing media**

Suitable extinguishing media : No data is available on the product itself.

Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

Unsuitable extinguishing media : High volume water jet

No data is available on the product itself.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Do not use a solid water stream as it may scatter and spread fire.

Hazardous combustion products : No data is available on the product itself.

5.3 Advice for firefighters

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.

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- Specific extinguishing methods : No data is available on the product itself.
- Further information : Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

- Personal precautions : Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

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 : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

None

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

- Advice on safe handling : Avoid contact with skin and eyes. For personal protection see section 8. Persons with a history of skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Container may be opened only under exhaust ventilation hood. Dispose of rinse water in accordance with local and national

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regulations.

- Advice on protection against fire and explosion : Avoid formation of aerosol. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : No smoking. Store in cool place. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Electrical installations / working materials must comply with the technological safety standards.
- Advice on common storage : Reducing agents
Strong oxidizing agents
Heavy metal salts
- Other data : No decomposition if stored and applied as directed.

7.3 Specific end use(s)**SECTION 8: Exposure controls/personal protection****8.1 Control parameters****Occupational Exposure Limits**

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
methyl methacrylate	80-62-6	TWA	50 ppm 210 mg/m ³	CH SUVA
Further information	Sensitizers; Substances marked with an S can lead to very strong allergic reactions., National Institute for Occupational Safety and Health, Institut National de Recherche et de Sécurité pour la prévention des accidents du travail et des maladies professionnelles, Harm to the unborn child is not to be expected when the OEL-value is respected			
		STEL	100 ppm 420 mg/m ³	CH SUVA
Further information	Sensitizers; Substances marked with an S can lead to very strong allergic reactions., National Institute for Occupational Safety and Health, Institut National de Recherche et de Sécurité pour la prévention des accidents du travail et des maladies professionnelles, Harm to the unborn child is not to be expected when the OEL-value is respected			
		TWA	50 ppm	2009/161/EU
Further information	Indicative			
		STEL	100 ppm	2009/161/EU
Further information	Indicative			
Talc (Mg ₃ H ₂ (SiO ₃) ₄)	14807-96-6	TWA (alveolate dust)	2 mg/m ³	CH SUVA

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Further information	In case of quartz or asbestos contents, the corresponding MAC-values are to be used, Occupational Safety and Health Administration, Harm to the unborn child is not to be expected when the OEL-value is respected			
methacrylic acid	79-41-4	TWA	5 ppm 18 mg/m ³	CH SUVA
Further information	Harm to the unborn child is not to be expected when the OEL-value is respected			
		STEL	10 ppm 36 mg/m ³	CH SUVA
Further information	Harm to the unborn child is not to be expected when the OEL-value is respected			
N,N-dimethylaniline	121-69-7	STEL	10 ppm 50 mg/m ³	CH SUVA
Further information	Toxic by skin resorption possible; Substances, which are easily absorbed through the skin, can give by additional skin resorption a substantial higher risk compared to only inhalation by the airways., Carcinogenic Category 3, National Institute for Occupational Safety and Health			
		TWA	5 ppm 25 mg/m ³	CH SUVA
Further information	Toxic by skin resorption possible; Substances, which are easily absorbed through the skin, can give by additional skin resorption a substantial higher risk compared to only inhalation by the airways., Carcinogenic Category 3, National Institute for Occupational Safety and Health			

8.2 Exposure controls

Personal protective equipment

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles

Hand protection

Material : butyl-rubber

Break through time : > 8 h

Solvent-resistant gloves (butyl-rubber)

Nitrile rubber

10 - 480 min

Remarks

: Solvent-resistant gloves
The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it.
Before removing gloves clean them with soap and water.

Skin and body protection

: impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection

: In the case of vapor formation use a respirator with an approved filter.

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SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

Appearance	: paste
Color	: gray
Odor	: ester-like
pH	: Not applicable
Boiling point	: > 100 °C Method: estimated
Flash point	: > 10 °C Method: closed cup
Upper explosion limit	: 12,5 %(V) Method: estimated
Lower explosion limit	: 2,1 %(V) Method: estimated
Vapor pressure	: < 38 hPa (20 °C) Method: estimated
Relative vapor density	: ca. 1 (20 °C)
Density	: 1,3 g/cm ³ (20 °C)
Solubility(ies) Water solubility	: slightly soluble Method: estimated
Autoignition temperature	: 430 °C
Decomposition temperature	: > 200 °C
Viscosity Viscosity, dynamic	: 55.000 - 80.000 mPa.s (23 °C)

9.2 Other information

No data available

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Ingredients:

methacrylate:
Acute dermal toxicity : LD50 (Rabbit, male): > 5.000 mg/kg
Method: OECD Test Guideline 402

methacrylic acid:
Acute dermal toxicity : LD50 (Rabbit): 500 - 1.000 mg/kg
GLP: no

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation**Ingredients:**

methacrylic acid:
Species: Rabbit
Assessment: Corrosive
Method: OECD Test Guideline 404
Result: Corrosive
GLP: yes

Serious eye damage/eye irritation**Ingredients:**

methacrylic acid:
Species: Rabbit
Assessment: Corrosive
Result: Irreversible effects on the eye
GLP: no

Respiratory or skin sensitization**Ingredients:**

2-Propenoic acid, 2-methyl-, methyl ester:
Routes of exposure: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: Causes sensitization.

2-Propenoic acid, 2-methyl-:
Routes of exposure: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitization.

Assessment: No data available

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Germ cell mutagenicity**Ingredients:**

methacrylic acid:
Genotoxicity in vitro : Concentration: 33 - 4000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Ingredients:

methacrylic acid:
Genotoxicity in vivo : Cell type: Somatic
Application Route: Inhalation
Exposure time: 2 h
Dose: 100 - 1000 ppm
Method: OECD Test Guideline 475
Result: Not classified due to inconclusive data.
GLP: no

Application Route: Inhalation
Exposure time: 6 h
Dose: 100 - 9000 ppm
Method: OECD Test Guideline 478
Result: negative
GLP: no

Carcinogenicity**Ingredients:**

methacrylic acid:
Species: Rat, (male and female)
Application Route: Inhalation
Exposure time: 24 month(s)
Dose: 250 - 1000 ppm
Frequency of Treatment: 5 daily
Method: OECD Test Guideline 453
Result: negative

Species: Rat, (male and female)
Application Route: Oral
Exposure time: 24 month(s)
Dose: 12 - 3300 ppm
Frequency of Treatment: 7 daily
Result: negative

Carcinogenicity - Assessment : No data available

Reproductive toxicity

Effects on fertility : No data available

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Effects on fetal development : No data available

Reproductive toxicity - : No data available
Assessment

STOT-single exposure

No data available

STOT-repeated exposure

No data available

Repeated dose toxicity**Ingredients:**

methacrylic acid:

Species: Rat, male and female

NOEC: 500

Test atmosphere: vapor

Exposure time: 2 yr Number of exposures: 5 d

Method: OECD Test Guideline 453

Repeated dose toxicity - : No data available
Assessment

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

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Further information**Product:**

Remarks: Solvents may degrease the skin.

SECTION 12: Ecological information**12.1 Toxicity****Ingredients:**

methyl methacrylate:

Toxicity to fish : LC50: 191 mg/l
Exposure time: 96 h

methacrylic acid:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 85 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: Fish Acute Toxicity Test
GLP: yes
Remarks: Toxic to aquatic organisms.

Ingredients:

methyl methacrylate:

Toxicity to daphnia and other aquatic invertebrates : EC50: 69 mg/l
Exposure time: 48 h

methacrylic acid:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 130 mg/l
Exposure time: 48 h
Test Type: flow-through test
Test substance: Fresh water
Method: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids
GLP: yes

Ingredients:

methyl methacrylate:

Toxicity to algae : IC50: > 110 mg/l
Exposure time: 72 h

methacrylic acid:

Toxicity to algae : ErC50 (Selenastrum capricornutum (green algae)): 45 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

M-Factor (Acute aquatic toxicity) : No data available

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Ingredients:

methacrylic acid:

Toxicity to fish (Chronic toxicity) : GLP: yes

NOEC: 10 mg/l

Exposure time: 35 d

Species: Brachydanio rerio (zebrafish)

Test Type: flow-through test

Test substance: Fresh water

Method: OECD Test Guideline 210

GLP: yes

Ingredients:

methacrylic acid:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 53 mg/l

Exposure time: 21 d

Species: Daphnia magna (Water flea)

Test Type: flow-through test

Test substance: Fresh water

Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : No data available

Ingredients:

methacrylic acid:

Toxicity to bacteria : EC50 (Pseudomonas putida): 270 mg/l

Exposure time: 17 h

Test Type: static test

Test substance: Fresh water

Method: DIN 38 412 Part 8

GLP: yes

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment Acute aquatic toxicity : No data available

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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Remarks : No data available

Further information:
No data available

12.2 Persistence and degradability**Ingredients:**

methyl methacrylate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: > 60 %
Exposure time: 28 d

methacrylic acid:

Biodegradability : Inoculum: activated sludge
Concentration: 3 mg/l
Result: Readily biodegradable.
Biodegradation: 86 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Stability in water : No data available

Ingredients:

methacrylic acid:

Photodegradation : Test Type: Air

12.3 Bioaccumulative potential**Ingredients:**

methyl methacrylate:

Bioaccumulation : Bioconcentration factor (BCF): 3

12.4 Mobility in soil

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Mobility : No data available

Distribution among environmental compartments : No data available

Stability in soil : No data available

12.5 Results of PBT and vPvB assessment

Assessment - Product : 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..

12.6 Other adverse effects

Environmental fate and pathways : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Ozone-Depletion Potential : No data available

Additional ecological information - Product : Remarks: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Global warming potential (GWP) : No data available

SECTION 13: Disposal considerations**13.1 Waste treatment methods**

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

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IATA

14.1 UN number : UN 1133
14.2 UN proper shipping name : Adhesives
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
Labels : Flammable Liquids
Packing instruction (cargo aircraft) : 364
Packing instruction (passenger aircraft) : 353

IMDG

14.1 UN number : UN 1133
14.2 UN proper shipping name : ADHESIVES
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
Labels : 3
EmS Code : F-E, S-D
14.5 Environmental hazards
Marine pollutant : no

ADR

14.1 UN number : UN 1133
14.2 UN proper shipping name : ADHESIVES
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
Labels : 3
14.5 Environmental hazards
Marine pollutant : no

RID

14.1 UN number : UN 1133
14.2 UN proper shipping name : ADHESIVES
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
Labels : 3
14.5 Environmental hazards
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

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SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

The ingredients of this product are reported in the following inventories:

CH INV	: The mixture contains substances listed on the Swiss Inventory
TSCA	: Not On TSCA Inventory
DSL	: This product contains the following components that are not on the Canadian DSL nor NDSL.
AICS	: Not in compliance with the inventory
NZIoC	: Not in compliance with the inventory
ENCS	: Not in compliance with the inventory
ISHL	: Not in compliance with the inventory
KECI	: Not in compliance with the inventory
PICCS	: Not in compliance with the inventory
IECSC	: Low volume exemption

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA)

15.2 Chemical Safety Assessment**SECTION 16: Other information****Full text of R-Phrases**

R11	: Highly flammable.
R21/22	: Harmful in contact with skin and if swallowed.
R22	: Harmful if swallowed.
R23/24/25	: Toxic by inhalation, in contact with skin and if swallowed.
R34	: Causes burns.
R35	: Causes severe burns.
R36/37/38	: Irritating to eyes, respiratory system and skin.

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R37/38	: Irritating to respiratory system and skin.
R40	: Limited evidence of a carcinogenic effect.
R41	: Risk of serious damage to eyes.
R43	: May cause sensitization by skin contact.
R51	: Toxic to aquatic organisms.
R51/53	: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	: May cause long-term adverse effects in the aquatic environment.

Full text of H-Statements

H225	: Highly flammable liquid and vapour.
H301	: Toxic if swallowed.
H302	: Harmful if swallowed.
H311	: Toxic in contact with skin.
H314	: Causes severe skin burns and eye damage.
H315	: Causes skin irritation.
H317	: May cause an allergic skin reaction.
H318	: Causes serious eye damage.
H319	: Causes serious eye irritation.
H331	: Toxic if inhaled.
H332	: Harmful if inhaled.
H335	: May cause respiratory irritation.
H351	: Suspected of causing cancer.
H411	: Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Chronic	: Chronic aquatic toxicity
Carc.	: Carcinogenicity
Eye Dam.	: Serious eye damage
Eye Irrit.	: Eye irritation
Flam. Liq.	: Flammable liquids
Skin Corr.	: Skin corrosion
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitization
STOT SE	: Specific target organ systemic toxicity - single exposure

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE. THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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