## **CARADOL MC28-02**

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#### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : CARADOL MC28-02

Product code : U3110

Synonyms : Polyol CAS-No. : 9082-00-2

Other means of identification : Polyether polyol

## Manufacturer or supplier's details

Supplier :

SHELL EASTERN CHEMICALS (S)

A REGISTERED BUSINESS OF SHELL EASTERN

TRADING (PTE) LTD (UEN:198902087C)

9 North Buona Vista Drive, #07-01

The Metropolis Tower 1

Singapore 138588 Singapore

Telephone : +65 6384 8269 Telefax : +65 6384 8454

Contact for Safety Data

Sheet

Emergency telephone : +65 65429595 (Alert SGS)

number

Recommended use of the chemical and restrictions on use

Recommended use : Use for the manufacture of polyurethane products.

Restrictions on use : This product must not be used in applications other than the

above without first seeking the advice of the supplier.

Other information : CARADOL is a trademark owned by Shell Trademark

Management B.V. and Shell Brands Inc. and used by affiliates

of Royal Dutch Shell plc.

#### 2. HAZARDS IDENTIFICATION

#### **GHS Classification**

Based on available data this substance / mixture does not meet the classification criteria.

**GHS** label elements

Hazard pictograms : No Hazard Symbol required

Signal word : No signal word

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Hazard statements : PHYSICAL HAZARDS:

Not classified as a physical hazard under GHS criteria.

**HEALTH HAZARDS:** 

Not classified as a health hazard under GHS criteria.

**ENVIRONMENTAL HAZARDS:** 

Not classified as an environmental hazard under GHS criteria.

Precautionary statements

Prevention:

No precautionary phrases.

Response:

No precautionary phrases.

Storage:

No precautionary phrases.

Disposal:

No precautionary phrases.

#### Other hazards which do not result in classification

None known.

#### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

#### **Hazardous components**

Chemical name	CAS-No.	Classification	Concentration (% w/w)
Polyalkylene glycol	9082-00-2		<= 100

## 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal

conditions.

If inhaled : No treatment necessary under normal conditions of use.

If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with

water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.

Remove contact lenses, if present and easy to do. Continue

rinsing.

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#### 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Large fires should only be fought by properly trained fire

for future reference.

fighters.

Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small

be advisable. Records of such incidents should be maintained

fires only.

Unsuitable extinguishing

media

: Do not use water in a jet.

Specific hazards during

firefighting

Will only burn if enveloped in a pre-existing fire. Hazardous combustion products may include:

Carbon dioxide

Unidentified organic and inorganic compounds.

Toxic gases
Carbon monoxide.

Specific extinguishing

methods

: Standard procedure for chemical fires.

Clear fire area of all non-emergency personnel.

All storage areas should be provided with adequate fire

fighting facilities.

Keep adjacent containers cool by spraying with water.

Special protective equipment : Proper protective equipment including chemical resistant

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for firefighters

gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

#### 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Observe all relevant local and international regulations.

: Avoid contact with skin, eyes and clothing. Avoid inhaling vapour and/or mists.

Extinguish any naked flames. Do not smoke. Remove ignition

sources. Avoid sparks.

Environmental precautions : Remove all possible sources of ignition in the surrounding

area

Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental

contamination.

Ventilate contaminated area thoroughly.

Methods and materials for containment and cleaning up

For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Proper disposal should be evaluated based on regulatory status of this material (refer to Section 13), potential contamination from subsequent use and spillage, and regulations governing disposal in the local area.

Additional advice : For guidance on selection of personal protective equipment

see Section 8 of this Safety Data Sheet.

For guidance on disposal of spilled material see Section 13 of

this Safety Data Sheet.

#### 7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or direct contact with material. Only use in

well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see

Section 8 of this Safety Data Sheet.

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	Use the information in this data sassessment of local circumstance appropriate controls for safe hand this material.  Ensure that all local regulations ratorage facilities are followed.	es to help determine dling, storage and disposal o
Advice on safe handling	<ul> <li>In accordance with good industrial precautions should be taken to at Use local exhaust extraction over Avoid unintentional contact with it uncontrolled polymerisation.</li> <li>Avoid contact with skin, eyes and Air-dry contaminated clothing in a laundering.</li> <li>Do not empty into drains.</li> <li>Handling Temperature:</li> <li>Ambient.</li> <li>When handling product in drums worn and proper handling equipment.</li> </ul>	void breathing of material. r processing area. isocyanates to prevent d clothing. a well-ventilated area before , safety footwear should be
	Extinguish any naked flames. Do sources. Avoid sparks.	not smoke. Remove ignition
Avoidance of contact	: Avoid contact with isocyanates, or zinc, strong oxidizing agents, and	
Product Transfer	: Lines should be purged with nitro transfer. Keep containers closed	
Storage		
Conditions for safe storage	<ul> <li>Refer to section 15 for any addition covering the packaging and storage</li> </ul>	
Storage period	: 24 month(s)	
Other data	<ul> <li>Prevent all contact with water and Tanks must be clean, dry and rus Prevent ingress of water.</li> <li>Must be stored in a diked (bunde from sunlight, ignition sources an Nitrogen blanket recommended f m3 or higher).</li> <li>Drums should be stacked to a ma</li> </ul>	et-free.  ed) well- ventilated area, awand other sources of heat.  for large tanks (capacity 100
	Storage Temperature: Ambient.	
	Storage should be handled at ter viscosities are less than 500 cSt; Tanks should be fitted with heatir ambient temperatures are below handling temperatures. Heating on texceed 100 °C.	typically at 25-50 °C.  ng coils in areas where the the recommended product

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: Suitable material: Stainless steel., For container paints, use Packaging material

epoxy paint, zinc silicate paint.

Unsuitable material: Copper., Copper alloys.

Specific use(s) : Not applicable

Ensure that all local regulations regarding handling and

storage facilities are followed.

#### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

#### Components with workplace control parameters

#### Biological occupational exposure limits

No biological limit allocated.

#### **Monitoring Methods**

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany http://www.dguv.de/inhalt/index.jsp

L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

#### **Engineering measures**

: Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. Adequate ventilation to control airborne concentrations. The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

#### General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

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> Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

Drain down system prior to equipment break-in or maintenance.

Retain drain downs in sealed storage pending disposal or subsequent recycle.

#### Personal protective equipment

#### **Protective measures**

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory protection : No respiratory protection is ordinarily required under normal

conditions of use.

In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.

Hand protection Remarks

: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Nitrile rubber. Incidental contact/Splash protection: PVC, neoprene or nitrile rubber gloves For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a nonperfumed moisturizer is recommended.

Eye protection

If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

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Skin and body protection Skin protection is not ordinarily required beyond standard

work clothes.

It is good practice to wear chemical resistant gloves.

Hygiene measures : Wash hands before eating, drinking, smoking and using the

Launder contaminated clothing before re-use.

#### **Environmental exposure controls**

General advice : Local guidelines on emission limits for volatile substances

must be observed for the discharge of exhaust air containing

vapour.

Minimise release to the environment. An environmental assessment must be made to ensure compliance with local

environmental legislation.

Information on accidental release measures are to be found in

section 6.

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

: Liquid. **Appearance** 

Colour Clear colourless

Odour : odourless

Odour Threshold Data not available Data not available Hq Melting / freezing point : Data not available

Boiling point/boiling range : Typical > 180 °C / > 356 °FDecomposes

Typical > 197 °C / > 387 °F Flash point

Method: ASTM D93 (PMCC)

Evaporation rate : Data not available Flammability (solid, gas) : Not applicable

Upper explosion limit : Data not available Lower explosion limit : Data not available

Vapour pressure : < 10 hPa

Relative vapour density : Data not available

: 1.02Method: ASTM D4052 Relative density

: Typical 1,021 kg/m3 (20 °C / 68 °F) Density

Method: ASTM D4052

Solubility(ies)

Water solubility : Slightly soluble.

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Partition coefficient: n-

octanol/water

: Data not available

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Auto-ignition temperature : Data not available

Decomposition temperature : Data not available

Viscosity

Viscosity, dynamic : Typical 1,400 mPa.s (25 °C / 77 °F)

Method: ASTM D445

Viscosity, kinematic : Data not available

Explosive properties : Not applicable

Oxidizing properties : Data not available

Surface tension : Data not available

Conductivity: > 10,000 pS/m

A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid, This material is not expected to be

a static accumulator.

Particle size : Data not available

Molecular weight : Data not available

## 10. STABILITY AND REACTIVITY

Reactivity : The product does not pose any further reactivity hazards in

addition to those listed in the following sub-paragraph.

Chemical stability : No hazardous reaction is expected when handled and stored

according to provisions Hygroscopic.

Possibility of hazardous

reactions

: Polymerises exothermically with di-isocyanates at ambient

temperatures.

The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of reaction partners is good or is supported by stirring or by the presence

of solvents.

Reacts with strong oxidising agents.

Conditions to avoid : Heat, flames, and sparks.

Product cannot ignite due to static electricity.

Incompatible materials : Avoid contact with isocyanates, copper and copper alloys,

zinc, strong oxidizing agents, and water.

Hazardous decomposition

products

: Unknown toxic products may be formed.

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#### 11. TOXICOLOGICAL INFORMATION

Basis for assessment : Information given is based on data obtained from similar

substances.

Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for

individual component(s).

Exposure routes : Exposure may occur via inhalation, ingestion, skin absorption,

skin or eye contact, and accidental ingestion.

**Acute toxicity** 

**Product:** 

Acute oral toxicity : LD 50 : > 2,000 mg/kg

Remarks: Based on available data, the classification criteria

are not met.

Acute inhalation toxicity : Remarks: Based on available data, the classification criteria

are not met.

Acute dermal toxicity : LD 50 : > 2,000 mg/kg

Remarks: Low toxicity

Based on available data, the classification criteria are not met.

#### Skin corrosion/irritation

#### **Product:**

Remarks: Based on available data, the classification criteria are not met.

## Serious eye damage/eye irritation

## Product:

Remarks: Based on available data, the classification criteria are not met.

## Respiratory or skin sensitisation

#### **Product:**

Remarks: Based on available data, the classification criteria are not met.

#### Germ cell mutagenicity

#### **Product:**

: Remarks: Based on available data, the classification criteria

are not met.

## Carcinogenicity

## **Product:**

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Remarks: Based on available data, the classification criteria are not met.

Material	GHS/CLP Carcinogenicity Classification
Polyalkylene glycol	No carcinogenicity classification.

#### Reproductive toxicity

**Product:** 

Remarks: Based on available data, the classification criteria are not met.

## STOT - single exposure

#### **Product:**

Remarks: Based on available data, the classification criteria are not met.

## STOT - repeated exposure

#### **Product:**

Remarks: Based on available data, the classification criteria are not met.

## **Aspiration toxicity**

#### **Product:**

Not an aspiration hazard.

#### **Further information**

#### **Product:**

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

#### 12. ECOLOGICAL INFORMATION

Basis for assessment

: Incomplete ecotoxicological data are available for this product. The information given below is based partly on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

#### **Ecotoxicity**

#### **Product:**

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Toxicity to fish (Acute

toxicity)

LC50 : > 100 mg/l

Remarks: Based on available data, the classification criteria

are not met.

Practically non toxic:

Toxicity to crustacean (Acute

toxicity)

: EC50: > 100 mg/l

Remarks: Based on available data, the classification criteria

are not met.

Practically non toxic:

Toxicity to algae/aquatic

plants (Acute toxicity)

: EC50 : > 100 mg/l

Remarks: Practically non toxic:

Based on available data, the classification criteria are not met.

Toxicity to fish (Chronic

toxicity)

: Remarks: Data not available

Toxicity to crustacean

(Chronic toxicity)
Toxicity to microorganisms

(Acute toxicity)

: Remarks: Data not available

: IC50 : > 100 mg/l

Remarks: Based on available data, the classification criteria

are not met.

Practically non toxic:

## Persistence and degradability

**Product:** 

Biodegradability : Remarks: Readily biodegradable.

**Bioaccumulative potential** 

**Product:** 

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Partition coefficient: n-

octanol/water

: Remarks: Data not available

Mobility in soil

Product:

Mobility : Remarks: If the product enters soil, one or more constituents

will or may be mobile and may contaminate groundwater.

Other adverse effects

no data available

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods** 

Waste from residues : Recover or recycle if possible.

It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to

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determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water

courses.

Waste product should not be allowed to contaminate soil or

water.

Disposal should be in accordance with applicable regional,

national, and local laws and regulations.

Local regulations may be more stringent than regional or national requirements and must be complied with.

·

: Drain container thoroughly.

After draining, vent in a safe place away from sparks and fire.

Send to drum recoverer or metal reclaimer.

Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

#### 14. TRANSPORT INFORMATION

Contaminated packaging

#### **International Regulations**

#### **ADR**

Not regulated as a dangerous good

#### IATA-DGR

Not regulated as a dangerous good

#### **IMDG-Code**

Not regulated as a dangerous good

## Maritime transport in bulk according to IMO instruments

Pollution category : Z Ship type : 3

Product name : Glycerol, propoxylated and ethoxylated

#### Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage,

for special precautions which a user needs to be aware of or

needs to comply with in connection with transport.

**Additional Information**: This product may be transported under nitrogen blanketing.

Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a

confined space entry.

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

Code

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#### 15. REGULATORY INFORMATION

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

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Vietnamese regulations on transport:

Decree 42/2020/ND-CP: Decree on the list of dangerous goods, transportation of dangerous goods by road motor vehicles and transportation of dangerous goods on inland waterways Vietnamese Law of Chemicals:

Decree 113/2017/NĐ-CP to guide how to implement Law of Chemical;

Law of Technical Standardize; Decree 43/2017/NĐ-CP about labelling.

Article 29, Law on Chemical and Annex 9, Clause 7 of Circular 32/2017/TT-BCT dated 28 December 2017 of the Ministry of Industry.

Decree 111/2021/NĐ-CP: Amendments to some articles of Government's decree 43/2017/NĐ-CP dated April 14, 2017on goods labels.

#### Other international regulations

#### The components of this product are reported in the following inventories:

AIIC : Listed DSL Listed **IECSC** : Listed **ENCS** : Listed : Listed KECI **NZIoC** : Listed **PICCS** : Listed **TSCA** : Listed TCSI : Listed

#### **16. OTHER INFORMATION**

## **Abbreviations and Acronyms**

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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 -

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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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; 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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG -Transportation of Dangerous Goods; TECI - 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; WHMIS - Workplace Hazardous Materials Information System

#### **Further information**

Training advice : Provide adequate information, instruction and training for

operators.

Other information : A vertical bar (|) in the left margin indicates an amendment

from the previous version.

Sources of key data used to compile the Safety Data

Sheet

: The guoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU

IUCLID date base, EC 1272 regulation, etc).

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. 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 a 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.

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