according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

SECTION 1. IDENTIFICATION

Product name : CARADOL MC28-02

Product code : U3110

Other means of identification : Polyether polyol

Manufacturer or supplier's details

Manufacturer/Supplier : Shell Chemicals Canada

PO Box 4280 STN C CALGARY AB T2T 5Z5

Canada

Telephone : 1-855-697-4355

Telefax : 1-866-213-7508

Emergency telephone number

CHEMTREC (24 hr) : 1-800-424-9300

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 those

listed in Section 1 without first seeking the advice of the sup-

plier.

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 Man-

agement B.V. and Shell Brands Inc. and used by affiliates of

Shell plc.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

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

GHS label elements

Hazard pictograms :

Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:

Not classified as a physical hazard under GHS criteria.

HEALTH HAZARDS:

Not classified as a health hazard under GHS criteria.

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

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.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Substance name : CARADOL MC28-02, 9082-00-2

CAS-No. : 9082-00-2

Components

	Common Name/Synonym	CAS-No.	Concentration (% w/w)
Polyalkylene glycol	PAG	9082-00-2	<= 100

SECTION 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 wa-

ter 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.

If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities

are swallowed, however, get medical advice.

according to the Hazardous Products Regulations

CARADOL MC28-02

Version 2.5

Revision Date: 2025-05-16

SDS Number: 800001005684 Print Date: 2025-05-21

Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

Most important symptoms and effects, both acute and

delayed

Not considered to be an inhalation hazard under normal conditions of use.

Possible respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, cough-

ing, and/or difficulty breathing.

No specific hazards under normal use conditions.

Skin irritation signs and symptoms may include a burning sen-

sation, redness, or swelling.

Eye irritation signs and symptoms may include a burning sen-

sation, redness, swelling, and/or blurred vision.

Ingestion may result in nausea, vomiting and/or diarrhoea.

Protection of first-aiders When administering first aid, ensure that you are wearing the

appropriate personal protective equipment according to the

incident, injury and surroundings.

Call a doctor or poison control center for guidance. Notes to physician

> Treat symptomatically. Following cases of gross overexposure, investigation of liver, kidney and eye function may be advisable. Records of such incidents should be maintained

for future reference.

SECTION 5. FIRE-FIGHTING MEASURES

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

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

only.

Unsuitable extinguishing

media

Do not use water in a jet.

Specific hazards during fire-

fighting

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 meth-

ods

Standard procedure for chemical fires.

Special protective equipment:

for firefighters

Proper protective equipment including chemical resistant 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).

Further information Clear fire area of all non-emergency personnel.

All storage areas should be provided with adequate fire

according to the Hazardous Products Regulations

CARADOL MC28-02

Version 2.5

Revision Date: 2025-05-16

SDS Number: 800001005684

Print Date: 2025-05-21

Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

fighting facilities.

Keep adjacent containers cool by spraying with water.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec: :

tive 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 riv-

ers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental contami-

nation

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.

SECTION 7. HANDLING AND STORAGE

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

Technical measures : 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.

Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this

material.

Ensure that all local regulations regarding handling and stor-

age facilities are followed.

Advice on safe handling : In accordance with good industrial hygiene practices, precau-

tions should be taken to avoid breathing of material. Use local exhaust extraction over processing area.

Avoid unintentional contact with isocyanates to prevent uncon-

trolled polymerisation.

Avoid contact with skin, eyes and clothing.

Air-dry contaminated clothing in a well-ventilated area before

laundering.

Do not empty into drains. Handling Temperature:

Ambient.

When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

Extinguish any naked flames. Do not smoke. Remove ignition

sources. Avoid sparks.

Avoidance of contact : Avoid contact with isocyanates, copper and copper alloys,

zinc, strong oxidizing agents, and water.

Product Transfer : Lines should be purged with nitrogen before and after product

transfer. Keep containers closed when not in use.

Conditions for safe storage : Refer to section 15 for any additional specific legislation cov-

ering the packaging and storage of this product.

Storage period : 24 Months

Further information on stor-

age stability

Prevent all contact with water and with moist atmosphere.

Tanks must be clean, dry and rust-free.

Prevent ingress of water.

Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat. Nitrogen blanket recommended for large tanks (capacity 100

m3 or higher).

Drums should be stacked to a maximum of 3 high.

Storage Temperature:

Ambient.

Storage should be handled at temperatures such that viscosi-

ties are less than 500 cSt; typically at 25-50 °C.

Tanks should be fitted with heating coils in areas where the ambient temperatures are below the recommended product

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

handling temperatures. Heating coil skin temperatures should

not exceed 100 °C.

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

epoxy paint, zinc silicate paint.

Unsuitable material: Copper., Copper alloys.

Specific end use(s)

Specific use(s) : Not applicable

Ensure that all local regulations regarding handling and stor-

age facilities are followed.

SECTION 8. EXPOSURE CONTROLS/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 con-

according to the Hazardous Products Regulations

CARADOL MC28-02

Version 2.5

Revision Date: 2025-05-16

SDS Number: 800001005684

Print Date: 2025-05-21

Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

taminated clothing and footwear that cannot be cleaned.

Practice good housekeeping.

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

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 non-perfumed moisturizer is recommended.

Eye protection

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

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

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

work clothes.

It is good practice to wear chemical resistant gloves.

Protective measures : Personal protective equipment (PPE) should meet recom-

mended national standards. Check with PPE suppliers. The following information, while appropriate for the product is general in nature. The selection of Personal Protective Equipment will vary depending on the conditions of use.

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

toilet.

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 envi-

ronmental legislation.

Information on accidental release measures are to be found in

section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state : Liquid.

Colour : Clear colourless

Odour : odourless

Odour Threshold : Data not available

Melting / freezing point : Data not available

Boiling point/boiling range : Typical $> 180 \, ^{\circ}\text{C}$

Decomposes

Flammability (solid, gas) : Not applicable

Upper explosion limit / Upper

flammability limit

: Data not available

according to the Hazardous Products Regulations

CARADOL MC28-02

Version 2.5

Revision Date: 2025-05-16

SDS Number: 800001005684 Print Date: 2025-05-21

Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

Lower explosion limit / Lower : Data not available

flammability limit

Typical > 197 °C Flash point

Method: ASTM D93 (PMCC)

Data not available Auto-ignition temperature

Decomposition temperature : Data not available

рΗ Data not available

Viscosity

Typical 1,400 mPa.s (25 °C) Viscosity, dynamic

Method: ASTM D445

Viscosity, kinematic Data not available

Solubility(ies)

Water solubility Slightly soluble.

Partition coefficient: n-

octanol/water

Data not available

Vapour pressure < 10 hPa

Relative density 1.02

Method: ASTM D4052

Density Typical 1,021 kg/m3 (20 °C)

Method: ASTM D4052

Relative vapour density Data not available

Particle characteristics

Particle size Data not available

9.2 Other information

Explosives Not applicable

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

Oxidizing properties : Data not available

Evaporation rate : 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.

Surface tension : Data not available

Molecular weight : Data not available

SECTION 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 reac- :

tions

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.

SECTION 11. TOXICOLOGICAL INFORMATION

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

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

stances.

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

ponent(s).

Information on likely routes of exposure

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:

Genotoxicity in vivo : Remarks: Based on available data, the classification criteria

are not met.

Carcinogenicity

Product:

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

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

IARC No component of this product present at levels greater than or equal to 0.1% is

identified as probable, possible or confirmed human carcinogen by IARC.

OSHANo component of this product present at levels greater than or equal to 0.1% is

on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is

identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

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.

SECTION 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

representative of the product as a writ

individual component(s).

Ecotoxicity

Product:

Toxicity to fish : LC50 : > 100 mg/l

Remarks: Based on available data, the classification criteria

are not met.

Practically non toxic:

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

Toxicity to daphnia and other :

aquatic invertebrates

EC50: > 100 mg/l

Remarks: Based on available data, the classification criteria

are not met.

Practically non toxic:

Toxicity to algae/aquatic

plants

EC50: > 100 mg/l

Remarks: Practically non toxic:

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

Toxicity to fish (Chronic tox-

city)

Remarks: Data not available

Toxicity to daphnia and other : aquatic invertebrates (Chron-

ic toxicity)

Remarks: Data not available

Toxicity to microorganisms : 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.

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

SECTION 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 determine the proper waste classification and disposal meth-

ods in compliance with applicable regulations.

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023

Date of first issue: 22.07.2013

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 na-

tional requirements and must be complied with.

Contaminated packaging : 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.

SECTION 14. TRANSPORT INFORMATION

National Regulations

TDG

Not regulated as a dangerous good

International Regulations

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

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

SECTION 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.

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

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

DSL : Listed

IECSC : Listed

ENCS : Listed

KECI : Listed

NZIoC : Listed

PICCS : Listed

TSCA : Listed

TCSI : Listed

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

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 - 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

according to the Hazardous Products Regulations

CARADOL MC28-02

Version Revision Date: SDS Number: Print Date: 2025-05-21

2.5 2025-05-16 800001005684 Date of last issue: 07.09.2023 Date of first issue: 22.07.2013

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

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 quoted 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).

Revision Date : 2025-05-16 Date format : mm/dd/yyyy

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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