



DIVERSE URETHANES

PRODUCT DATA SHEET

RIM 0562 - A RIM system

1. INTRODUCTION

Rim 0562 is a black pigmented polyol blend. It is designed for use in the production of very stiff RIM applications where moderate heat distortion properties are required (up to 60°C). It is normally used with MR200 isocyanate.

2. TYPICAL PHYSICAL PROPERTIES

Appearance : Black liquid
Specific gravity : 1,02 - 1,12

3. PROCESSING DETAILS

Mixing Ratio : 100 : 123 Polyol : MR200 by mass
Reaction Rate : (Polyol system @ 30°C and MR200 @ 30°C, hand mix) (Reef altitude)

Cream Time : 29 - 36 seconds
End of Rise Time : 50 - 55 seconds
Free Rise Density : 300 - 350kg/m³ (Reef altitude cup test)

Note: This product contains immiscible pigments and chain extenders, which settle out on standing. The product must therefore be agitated before and during use.

PROCESSING TEMPERATURES

The polyol should be adjusted to 40°C and the isocyanate to between 25 - 27°C prior to ratio setting on machine.

Mixing may be via low pressure mechanical mix or high pressure impingement. Nucleation is recommended. Mould preheat to 50 - 55°C is normally required.

4. STORAGE RECOMMENDATIONS

Storage Temperature - Below 25°C.

Storage Pressure - atmospheric.

General - Keep container closed when not in use. Store in cool, well ventilated place out of direct sunlight and away from incompatible material (See Stability and Reactivity - Safety Data Sheet).

This blend is hygroscopic and should therefore be protected from contamination with moisture by keeping containers properly sealed when not in use. Under temperate conditions the storage life of this polyol blend is six months. The blend should be re-mixed thoroughly prior to use as separation of the compounded ingredients may occur on standing.

Follow all MSDS sheet and label warnings even after container is empty.

5. **FIRE AND EXPLOSION HAZARDS**

This material is not readily ignited but like most organic materials it will burn if involved in a fire.

6. **HEALTH CONSIDERATIONS**

Consideration of the composition of this product coupled with several years' experience in the manufacture and use of similar products, indicates that it does not present a significant health hazard to users.

Normal standards of industrial hygiene should however, be observed when handling this material and suitable clothing and eye protection must be worn. Should the material be splashed on the skin or in the eyes, it should be removed promptly by copious irrigation with clean water. Following eye contamination it is a suitable precaution to have the person affected medically examined.

7. **WASTE DISPOSAL**

The recommended procedure for disposing of waste polyol blend is either burying on an approved tip or burning under carefully controlled conditions. However, customers are advised to check their local, provincial or national legislation governing the disposal of waste materials.

8. **SPILLAGES**

Excessive spillages should be contained by, and covered with, large quantities of sand, earth or similar absorbent material which is then brushed in vigorously to assist absorption. The mixture can then be shovelled up into drums or plastic bags, and disposed of as described in the previous section.

9. The information provided in this data sheet and otherwise supplied to users is based on our general experience and upon tests which are believed to be reliable. However, because we have no control over the exact manner in which the information is used, we cannot guarantee the results to be obtained. Furthermore we make no express or implied warranty of merchantability or fitness of the product for a particular purpose.

The information given in this safety data sheet is based on our general experience and upon tests which are believed to be reliable.

SAFETY DATA SHEET

MR200

1. INTRODUCTION:

MR200 is a diisocyanate diphenylmethane (MDI) based composition containing some higher functionality isocyanates. It was developed principally for use in the production of rigid polyurethane foam. It is also recommended for some structural foam systems as well as for semi-rigid foam formulations often used in automotive interior trim components.

If it is intended to use this product in a different application Diverse Urethanes should be contacted for advice.

2. TYPICAL PROPERTIES:

| | | |
|---------------------------------|---|-------------------|
| Appearance | : | Dark brown liquid |
| Specific gravity at 25°C | : | 1.23 |
| Viscosity at 25°C, mPa S | : | 220 |
| Isocyanate (NCO) value | : | 30.8 |
| Flash point ^(b) , °C | : | 230°C (Open cup) |
| Fire point ^(b) , °C | : | 245°C (Open cup) |

3. HEALTH AND SAFETY ADVICE:

The appropriate health and safety advice can be found in the Safety Data Sheet for MR200 attached. All users of this product are advised to read the publication PU 193-IE MDI-based compositions: Hazards and safe-handling procedures.

4. STORAGE AND HANDLING RECOMMENDATIONS:

Containers of MR200 should be kept properly closed and stored indoors in a well-ventilated area under normal factory conditions.

Storage at room temperature (20-25°C) provides a convenient viscosity for handling. Storage at low temperatures (below 15°C) is not recommended because it may lead to some crystallisation; this material must therefore be protected from frost.

If under abnormal storage conditions (below 15°C), some crystallisation does occur, the material should be heated as rapidly as possible to 70-80°C to melt it out, then be thoroughly agitated to ensure homogeneity and cooled before use.

Storage at temperatures above about 50°C is not recommended since this can lead to the formation of insoluble solids and it also increases the rate of viscosity increase on extended storage.

Reaction with atmospheric moisture is prevented by storing MR200 in carefully sealed containers or under a dry nitrogen or dry air atmosphere. During handling the product must be protected from water ingress and from atmospheric moisture; containers must be resealed or kept under dry nitrogen/air atmosphere after each sampling. The

reaction of isocyanates with water leads to the formation of insoluble ureas and carbon dioxide gas which can lead to pressure build-up in closed containers; containers used for MR200 must therefore be absolutely dry.

Under the recommended storage conditions, MR200 has a storage life of 3 months on the customers premises.

The precautions necessary when handling MR200, (i.e. MDI) and the decontamination procedures recommended to be used in case of spillage are described fully in the publication PU 193-1E MDI-based compositions: Hazards and safe-handling procedures.

5. RECOMMENDED MELTING PROCEDURE:

Should it prove necessary to melt MR200, procedures are given in the publication PU 181-15E Recommended melting procedures for MDI-based isocyanates.

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All sales of this product shall be subject to Diverse Urethanes' Standard Conditions of Sale.

SAFETY DATA SHEET

MR200

1. **IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND COMPANY / UNDERTAKING:**

Product Name : MR200

2. **COMPOSITION/INFORMATION ON INGREDIENTS**

Product Description

Diisocyanato diphenylmethane (MDI) based composition.

| <u>Hazardous</u> | <u>Cas No.</u> | <u>% (w/w)</u> | <u>Symbol</u> | <u>R Phrases</u> |
|---|-----------------------|-----------------------|----------------------|-------------------------|
| Diphenylmethanediisocyanate, isomers and homologues | 009016-87-9 | >25 | Xn | R20 R42 R36/37/38 |

3. **HAZARDS IDENTIFICATION**

Harmful by inhalation.

This product is a respiratory irritant and potential respiratory sensitiser: Repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons. Irritating to eyes and skin.

Repeated and/or prolonged contact may cause skin sensitisation.

Irritating to eyes and skin.

Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures.

4. **FIRST AID MEASURES**

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Inhalation

Remove patient from exposure, keep warm and at rest. Obtain medical attention. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is laboured, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing.

Skin Contact

Remove contaminated clothing. Wash immediately with water followed by soap and water. If symptoms develop, obtain medical attention. Contaminated clothing should be thoroughly cleaned.

Eye Contact

Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention.

Ingestion

Provided the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Do not induce vomiting. Obtain immediate medical attention.

Further Medical Treatment

Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

5. **FIRE-FIGHTING MEASURES**

Not classed as flammable.

If involved in a fire, it may emit noxious and toxic fumes.

Containers may burst if overheated.

Due to reaction with water producing CO₂-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.

Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN.

Extinguishing Media

Foam, CO₂ or dry powder. Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water

Fire Fighting Protective Equipment

Suitable respiratory protection with full face piece and positive air supply. PVC boots, gloves, and protective clothing should be worn.

6. **ACCIDENTAL RELEASE MEASURES**

Clean-up should only be performed by trained personnel.

People dealing with major spillage's should wear full protective clothing including respiratory protection.

Evacuate the area. Prevent further leakage, spillage or entry into drains.

Absorb spillage's onto sand, earth or any suitable absorbent material. Do not absorb onto sawdust or other combustible materials. Shovel into open-top drums for further decontamination. Wash the spillage's area clean with liquid decontaminant. Test atmosphere for MDI vapour.

Neutralise small spillage's with decontaminant. Remove and dispose of residues.

The compositions of liquid decontaminants are given in Section 16.

See also brochure PU 193-1 (see section 16).

7. **HANDLING AND STORAGE**

7.1 **Handling**

Do not breathe vapour/spray. Avoid contact with skin and eyes. Atmospheric concentrations should be minimised and kept as low and reasonably practicable below the occupation exposure limit. The efficiency of the ventilation must be monitored regularly because of the possibility of blockage.

When the product is sprayed or heated, suitable respiratory protection equipment with positive air supply may be required. Keep equipment clean. A basic essential in sampling, handling and storage is the prevention of contact with water.

Keep stocks of decontaminant readily available. The compositions of liquid decontaminants are given in section 16. See also brochure PU 193-1 (see section 16).

7.2 **Storage**

Keep containers properly sealed and store indoors in a well ventilated area. Keep away from frost. Keep away from moisture. If a container is contaminated, do not reseal it. Due to reaction with water producing CO₂-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.

Unsuitable containers : copper, copper alloy and galvanised surfaces.

Suitable containers : stainless steel or mild steel.

Storage Temperature : 15 - 35°C.

8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

Wear suitable protective clothing, gloves and eye/face protection. MDI can only be smelled if the occupational exposure limit has been exceeded considerably.

Atmospheric concentrations should be minimised and kept as low as reasonably practicable below the occupational exposure limit.

Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitization conditions should not work with MDI based products.

The Occupational Exposure Limits listed below do not apply to previously sensitized individuals. Sensitized individuals should be removed from any further exposure.

Respirators

Suitable respiratory equipment with positive air supply should be used in cases of insufficient ventilation or where operational procedures demand it.

Eye Protection

Chemical safety goggles. Full face shield if splashing is possible.

Gloves

The following protective materials are recommended:

- Neoprene.
- Nitrile butadiene rubber.
- Butyl rubber.
- PVC (Heavy duty).

Thin disposable gloves should be avoided for repeated or long term use.

Other

Overalls (preferably heavy cotton) or Tyvek-Pro Tech "C", Tyvek-Pro "F" disposable overall. Contaminated clothing should be thoroughly cleaned before re-use.

Occupational Exposure Limits

| Hazardous Ingredient(s) | LTEL ppm | 8hr TWA mg/m³ | STEL ppm mg/m³ | Notes |
|--|---------------------|---|--------------------------------------|--------------|
| Isocyanates, all (as -NCO) (Diphenylmethane 4,4'diisocyanate) | - | 0.02 | - 0.07 | MEL Sen |

9. **STABILITY AND REACTIVITY**

Incompatible materials and conditions: water, alcohol's, amines, bases and acids. Avoid high temperatures.

Hazardous Reactions

Stable at room temperature. Reaction with water (moisture) produces CO₂-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents.

Hazardous Decomposition Product(s)

Highly unlikely under normal industrial use

10. **TOXICOLOGICAL INFORMATION**

This health hazard assessment is based on information available on similar products.

Inhalation

This product is a respiratory irritant and potential respiratory sensitiser; repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibility combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.

Median Lethal Concentration (4 hrs) (respirable aerosol) : 490 mg/m³ (rat).

Skin Contact

Moderate irritant.

Repeated and/or prolonged contact may cause skin sensitisation.

Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitiser including diisocyanates. These results emphasise the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

Dermal Median Lethal Dose : > 5000 mg/kg (rabbit).

Eye Contact

The vapour, aerosol and liquid are irritant.

Ingestion

Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

Oral Median Lethal Dose > 5000 mg/kg (rat).

Long Term Exposure

Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m³), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m³ and no effects at 0.2 mg/m³. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur. Industrial experience in humans has not shown any links between MDI exposure and cancer developments.

There are reports that chronic exposure by inhalation may result in permanent decrease in lung function.

No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations, which are well in excess of defined occupational exposure limits.

There is no substantial evidence of mutagenic potential.

11. **ECOLOGICAL INFORMATION**

Environmental Fate and Distribution

By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise.

Persistence and Degradation

Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino - diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

Toxicity

By comparison with an analogous product, the following values are anticipated.

LCO (zebra fish) > 1000 mg/l
EC50 (Daphnia magna) (24 hour) > 1000 mg/l
EC50 (E.Coli) > 100 mg/l

The measured ecotoxicity is that of the hydrolysed product, generally under conditions maximising production of soluble species. Even so, the observed ecotoxicity is low/very low. A pond study showed gross contamination caused no significant toxic effects on a wide variety of flora in all trophic levels (including fish). no detectable diaminodiphenylmethane (MDA), and no evidence of bioaccumulation of MDI or MDA.

12. **DISPOSAL CONSIDERATIONS**

The generation of waste should be avoided or minimised wherever possible. Disposal should be in accordance with local, state or national legislation. Untreated material is not suitable for disposal. Waste, even small quantities, should never be poured down drains, sewers or water courses.

Small quantities and empty drums - pretreat to neutralise prior to disposal.

Large quantities - incinerate under approved controlled conditions, using incinerators suitable for the disposal of noxious chemical waste. Empty drums should be decontaminated and either passed to an approved drum reconditioner or destroyed.

See also brochure PU 193-1 (see section 16).

13. **TRANSPORT INFORMATION**

Not classified as dangerous for transport.

14. **REGULATORY INFORMATION**

EC Classification : HARMFUL

Hazard Symbol : Xn

Risk Phrases : R20 - Harmful by inhalation.
R36/37/38 - Irritating to eyes, respiratory system and skin.
: R42 - May cause sensitisation by inhalation.

Safety Phrases : S22 - Do not breathe dust.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 - After contact with skin, wash immediately with plenty of warm soapy water.
S38 - In case of insufficient ventilation, wear suitable respiratory equipment.
S45 - In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

15. **OTHER INFORMATION**

This data sheet was prepared in accordance with Directive 93/112/EC.

Liquid MDI decontaminants:

Decontaminant 1 :

| | | |
|---------------------------------|---|-----|
| - Water | - | 90% |
| - Concentrated ammonia solution | - | 8% |
| - Liquid detergent | - | 2% |

Decontaminant 2 :

| | | |
|--------------------|---|------------|
| - Water 90 | - | 95% |
| - Sodium carbonate | - | 5 - 10% |
| - Liquid detergent | - | 0.2 - 0.5% |

Decontaminant 1 contains ammonia. Ammonia presents health hazards. (See supplier safety information).

Decontaminant 2 reacts slower with MDI but is more environmentally friendly than decontaminant 1.

Literature reference: PU 193-1: "MDI-Based Compositions : Hazards and Safe Handling Procedures".