Appendix G

BOC GASES

Safety Data Sheet

Product : **F Hydrocarbon Liquid Mix (+n-Pentane)** Page :1/4

MSDS Nr : 543-75-2019BOC Version : 1 Date : 30/07/2002

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name	F Hydrocarbon Liquid Mix (+n-Pentane)
Company identification	see heading and/or footer
Emergency phone numbers	see heading and/or footer

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Preparation
Components/Impurities	Contains n-Pentane {F+;R12|Xn;R65|R66|R67|N;R51,53} {EINECS No. 203-692-4}
EC Nr (from EINECS)	Not applicable for preparations

3 HAZARDS IDENTIFICATION

Hazards identification	Highly flammable Liquid.

4 FIRST AID MEASURES

Inhalation	In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Skin/eye contact	For liquid spillage - flush with water for at least 15 minutes Remove contaminated clothing Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance
Ingestion	Rinse mouth with water, do not induce vomiting, call a doctor.

5 FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	Incomplete combustion may form carbon monoxide.
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.

Special protective equipment for fire fighters	Use self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Environmental precautions	Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Clean up methods	Ventilate area. Absorb excess liquid spillage on inorganic absorbant material such as fine sand, brick dust etc. Place spent absorbant in sealed packages and contact specialist waste disposal contractor.

7 HANDLING AND STORAGE

Handling and storage	Ensure equipment is adequately earthed. Suck back of water into the container must be prevented. Purge air from system before introducing liquid. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Keep away from ignition sources (including static discharges). Segregate from oxidant gases and other oxidants in store. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection	Protect eyes, face and skin from liquid splashes. Ensure adequate ventilation. Do not smoke while handling product.

9 PHYSICAL AND CHEMICAL PROPERTIES

Relative density, gas	Heavier than air
Solubility mg/l water	No reliable data available.

Appearance/Colour	Colourless liquid
Odour	Petroleum-like.
Other data	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY

Stability and reactivity

Can form explosive mixture with air.

May react violently with oxidants.

11 TOXICOLOGICAL INFORMATION

General

n-Pentane - In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination./Irritation to eyes and skin./May cause dermatitis by skin contact./Small amounts of liquid aspirated into the respiratory system during ingestion/vomiting may cause bronchopneumonia or pulmonary oedema.

12 ECOLOGICAL INFORMATION

General

n-Pentane - Toxic to water organisms.

13 DISPOSAL CONSIDERATIONS

General

Avoid discharge to the environment.

Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Do not discharge into any place where its accumulation could be dangerous.

Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

UN Nr	3295
Class	3 (Flammable liquids)
ADR/RID Classification code	3, 2°(b)
ADR/RID Hazard Nr	33
Labelling ADR	Label 3: Danger of fire (flammable liquid).
Other transport information	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking

- valve protection device (where provided) is correctly fitted
- valve outlet cap nut or plug (where provided) is correctly fitted
- there is adequate ventilation.
- compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	Not applicable for preparations
EC Classification	F;R11
-Symbols	F: Highly flammable
Labelling of cylinders	
-Symbols	Label 3: Danger of fire (flammable liquid).
-Risk phrases	R11 Highly flammable
-Safety phrases	S9 Keep container in well ventilated place.
	S16 Keep away from ignition sources - No smoking.
	S33 Take precautionary measures against static discharges.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Ensure operators understand the flammability hazard.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Users of breathing apparatus must be trained.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

End of document.
Number of pages :4

Safety Data Sheet

718800/08

Date of issue: March 18, 2003
Revised: June 13, 2002

***1. Identification of the substance/preparation and the company**

Desmorapid 726 B

Application:
Additives for use in the production of polyurethanes

Rhein Chemie Rheinau GmbH
68219 Mannheim, Germany, Düsseldorfer Str. 23-27
Telephone: +49 621 8907 290 / +49 621 8907 313

***2. Composition/information on ingredients**

weight %:: approx. 100 N,N-dimethylcyclohexylamine
CAS No.: 98-94-2
EEC No.: 202-715-5 Index No.: --
Classification: R10; C R34; Xn R20/21/22; N R51-53

3. Hazards identification

Flammable. Harmful by inhalation, in contact with skin and if swallowed. Causes burns. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. First-aid measures

Eye contact: Contamination of the eyes must be treated by thorough irrigation with water, with the eyelids held open. A doctor (or eye specialist) should be consulted immediately.
Skin contact: After contact with skin, wash immediately with plenty of water and soap.
Swallowing: Should the product be swallowed seek medical advice.
Inhalation: If large amounts of vapour have been inhaled, give the person fresh air, and if necessary seek medical advice.

5. Fire-fighting measures

Extinguishing media: water, foam, dry powder or CO_2 (carbon dioxide)

Further information: During fire-fighting respirator with indipendent air-supply and airtight garment is required.
Make provision for product and fire-fighting water to be retained.

6. Accidental release measures

Do not empty into drains. Take up with absorbent for chemicals or, if necessary with dry sand.

7. Handling and storage

Handling: Observe the usual precautionary measures for chemicals. Avoid contact with skin.
Precautions should generally be taken against electrostatic charges according to the equipment used and the way the product is handled and packaged. Keep away from sources of ignition.

(to be continued)

7. Handling and storage (Continuation)

Storage: Keep container tightly closed and dry. Avoid exposure to temperatures above 25 °C. Keep away from foodstuffs, drinks and tobacco.
Keep away from acids.

Water pollution class (WGK): 1 - slightly hazardous to water
WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999-05-17)

VCI storage class: 3A

***8. Exposure controls/Personal protection**

Respiratory protection: Required at inadequately ventilated workplaces.

Eye protection: goggles/face protection

Hand protection: gloves
Suitable materials for safety gloves, DIN EN 374-3:
Nitrile rubber - NBR: thickness >=0,4mm; breakthrough time >=480min.
Fluorinated rubber - FKM: thickness >=0,7mm; breakthrough time >=480min.
(Source: references in the literature)

Recommendation: contaminated gloves should be disposed of.

Keep working clothes separate. Wash hands before breaks and at end of work.

Safety precautions for handling freshly molded polyurethane parts: see section 16

9. Physical and chemical properties

			tested in accordance with
Form:	liquid		
Colour:	colourless to yellowish		
Odour:	like amine		
Melting point:	-60 °C		DIN 53181
Boiling range:	162-165 °C	at 1013 mbar	DIN 51751
Density:	approx. 0,85 g/cm³	at 20 °C	DIN 51757
Vapour pressure:	3,6 mbar	at 20 °C	
	26 mbar	at 50 °C	
Viscosity:	approx. 1,16 mPa·s	at 25 °C	DIN 53019
Solubility in water:	13,4 g/l at 20 °C		
pH value:	12 at 5 g/l water	at 20 °C	
Flash point:	41 °C		DIN 51755
Ignition temperature:	215 °C		DIN 51794
Partition coeffizient n-octanol/water	2,01		
Explosive limits:	lower: 3,6 % by vol.	upper: 19,0 % by vol.	

10. Stability and reactivity

Thermal decomposition: Does not occur until initial boiling point.
Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.

(to be continued)

10. Stability and reactivity (Continuation)

Hazardous reactions: Note exothermic reaction with isocyanates.
Pay attention to exothermic reaction with acids.

11. Toxicological information

Acute toxicity:
N,N-dimethylcyclohexylamine:
LD_{50} oral, rat: 425 mg/kg
LD_{50} dermal, rat: >400 - <2000 mg/kg
LC_{50} inhalation, rat: 4,45 mg/l, 4,0 h of exposure

Irritating/corrosive effects: Effect on the eyes: severely irritant, can cause clouding of the cornea
Effect on the skin: corrosive

***12. Ecological information**

Do not allow to escape into waters, wastewater or soil.

data on N,N-dimethylcyclohexylamine:

Biological elimination rate: >70 %, i.e. readily eliminated.
test method OECD 302B

Acute fish toxicity: LC50 = 22 <46 mg/l
Test species: Golden orfe (Leuciscus idus) Duration of test: 96 h

Toxicity for Daphnia: EC50 = 75 mg/l Duration of test: 48 h
Test species: Daphnia magna

Toxicity for algae: EC50 = > 2 mg/l
Test species: Green algae (Desmodesmus subspicatus)
Duration of test: 72 h

Acute bacterial toxicity: EC50 = 206 mg/l
Test organism: Pseudomonas putida Duration of test: 17 h

If regulations are followed when introducing effluent into biological waste water treatment plants, no adverse effect on the degradation activity of activated sludge is to be expected.

13. Disposal considerations

The relevant EU Directives and local, regional and national regulations must be complied with. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste Catalogue. It is recommended that details be sorted out with the waste disposer responsible.

The waste can be disposed of in a suitable incinerator under compliance with the relevant legislation.

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry") , they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry.
Containers must be recycled in compliance with national legislation and and environmental regulations.

14. Transport information

GGVSee/IMDG Code: 8 UN No.: 2264 EmS: 8 04
PG: II MPO: NO
GGVSE: Class 8 PG: II RID/ADR: Class 8 PG: II
Warning sign: Hazard no. 83 Substance no. 2264
ADNR: Class 8 PG: II Cat -- ICAO/IATA-DGR: 8 2264 II
Declaration for land shipment: 2264, N,N-Dimethylcyclohexylamin
Declaration for sea shipment: Dimethylcyclohexylamine
Declaration for shipment by air: Dimethylcyclohexylamine
Other information:
Corrosive. Combustible, flash point +41 °C. Slightly toxic. Keep dry. Keep away from foodstuffs, acids and alkalis.

*15. Regulatory information

Labelling in accordance with the EEC directives:
Symbols: C hazard descriptions: corrosive
N dangerous for the environment
N,N-dimethylcyclohexylamine

R 10:	Flammable.
R 20/21/22:	Harmful by inhalation, in contact with skin and if swallowed.
R 34:	Causes burns.
R 51/53:	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S 26:	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 28:	After contact with skin, wash immediately with plenty of water.
S 36/37/39:	Wear suitable protective clothing, gloves and eye/face protection.
S 45:	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 61:	Avoid release to the environment. Refer to special instructions/Safety data sheets.

(to be continued)

***15. Regulatory information** (Continuation)

Technical instruction on air pollution control: Class III, Mass concentration of 150 mg/m³ and below at a mass flow rate of 3 kg/h and above.

VbF (German Regulation on Flammable Liquids): Class A II

The recommendations given in the leaflets of the "Berufsgenossenschaft der Chemischen Industrie" (Employers' Liability Insurance Association for the German Chemical Industry) entitled M 004 "Reizende Stoffe - Ätzende Stoffe" (irritant - caustic substances) and M 053 "Allgemeine Arbeitsschutzmaßnahmen für den Umgang mit Gefahrstoffen" (general work safety measures for the handling of dangerous materials) should be followed.

***16. Other information**

Text of all R phrases referred to in sections 2 and 3:

R 10: Flammable.
R 34: Causes burns.
R 20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R 51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

May react under certain conditions with nitrites or nitrous acid to form nitrosamines. Nitrosamines have been found to be carcinogenic in animal experiments.

All chapters in the SDS which have been changed since last edition are marked with an asterisk in front of the Chapter number. This safety data sheet replaces all previous information.
Revised and valid from: see date of issue

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

Safety Data Sheet

048589/01

***1. Identification of the substance/preparation and the company**

DESMORAPID 1792

Bayer plc, Responsible Care Group
Bayer House, Strawberry Hill, Newbury, Berkshire RG14 1JA
Tel.: 01635 563000 Fax: 01635 563393

***2. Composition/information on ingredients**

Polyol preparation with alkaline character. Contains:

wt.-%: 75-<90 diethylene glycol
CAS No.: 111-46-6
EEC No.: 203-872-2 Index No.: 603-140-00-6
Classified: Xn R22

***3. Hazards identification**

Harmful if swallowed.

***4. First-aid measures**

General: Take off immediately all contaminated clothing.

If aerosol or vapour is inhaled in high concentrations:
Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.
Skin contact: If skin contact occurs, wash immediately with plenty of water and soap. Call a doctor if necessary.
Eye contact: Contamination of the eyes must be treated by thorough irrigation with water, with the eyelids held open. A doctor (or eye specialist) should be consulted immediately.
Swallowing: Should the product be swallowed seek medical advice.

***5. Fire-fighting measures**

Extinguishing media: CO_2, foam, dry powder; for larger fires, water spray can also be used.

Further information: Firemen must wear self-contained breathing apparatus.

***6. Accidental release measures**

Put on protective equipment (see paragraph 8). Do not empty into drains.
Take up with absorbent for chemicals, or if necessary, with dry sand.

***7. Handling and storage**

Handling: Observe the usual precautionary measures for chemicals. Avoid contact with skin.

Storage: Keep container tightly closed and dry. Avoid exposure to temperatures above 50 °C. Keep away from foodstuffs, drinks and tobacco.

Water pollution class (WGK): 1 - slightly hazardous to water
WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999-05-17)

***8. Exposure controls/Personal protection**

Hand protection: protective gloves made of PVC
Eye protection: goggles/face protection

Keep working clothes separate. Wash hands before breaks and at end of work.

***9. Physical and chemical properties** tested in accordance with

Form:	liquid		
Colour:	colourless to yellowish		
Odour:	almost odourless		
Setting point:	-30 °C		
Initial boiling point:	235 °C	at 1013 mbar	
Density:	1,21 g/cm³	at 20 °C	DIN 51757
Vapour pressure:	7 mbar	at 20 °C	
	16 mbar	at 50 °C	
Viscosity:	290 mPa·s	at 25 °C	DIN 53211
Solubility in water:	miscible		
pH value:	8-9 at 100 g/l methanol:water = 9:1		
Flash point:	160 °C		DIN 51758
Ignition temperature:	420 °C		DIN 51794
Explosive limits:	Limits not determined.		

***10. Stability and reactivity**

Thermal decomposition: Does not occur until initial boiling point.
Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.
Hazardous reactions: Note exothermic reaction with isocyanates.

***11. Toxicological information**

diethylene glycol:
LD_{50} oral, rat: 13500 mg/kg
LD_{50} dermal, rabbit: 11890 mg/kg
Experience on humans:
LDLo oral, man: ca.1000 mg/kg
Symptoms of poisoning: Oral intake causes vomiting, diarrhoea and damage to the kidneys and liver. Repeated accidental ingestion causes headache, dizziness, vomiting, oliguria and subsequently anuria. Death due to renal failure.

preparation: Effect on the eyes:
Causes slight temporary reddening and swelling of the conjunctiva.
Effect on the skin:
Causes slight temporary reddening and swelling.

***12. Ecological information**

Do not allow to escape into waterways, waste water or soil.

***13. Disposal considerations**

The relevant EC Directives and local, regional and national regulations must be complied with. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste Catalogue. It is recommended that details be worked out with the waste disposal company responsible.

The waste can be disposed of in a suitable incinerator, provided that national/local legislation is complied with.

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until 'drip-dry'), they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry.
Containers must be recycled in compliance with national legislation and environmental regulations.

14. Transport information

GGVSee/IMDG Code: -- UN No.: -- MFAG: -- EmS: --
PG: -- MPO: --
GGVE/GGVS: Class -- No. -- RID/ADR: Class -- No. --
ADNR: Class -- No. -- Cat -- ICAO/IATA-DGR: not restr.
Declaration for land shipment: --
Declaration for sea shipment: --
Declaration for shipment by air: --
Other information:
Not dangerous cargo. Keep separated from foodstuffs.

***15. Regulatory information**

Labelling as required by the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (as amended) (CHIP) and corresponding EC directives:

Symbol: Xn, hazard description: harmful
Contains: diethylene glycol
R 22: Harmful if swallowed.
S 36: Wear suitable protective clothing.

UK Maximum Exposure Limits (MEL) or Occupational Exposure Standards (OES), per EH40 document (Health & Safety Executive):

TYPE, YEAR	substance	CAS No.	8-hr TWA ppm	8-hr TWA mg/m³	15-min STEL ppm	15-min STEL mg/m³
OES 2000	diethylene glycol (2,2'-oxydiethanol) $HOCH_2CH_2OCH_2CH_2OH$	111-46-6	23	101	-	-

***16. Other information**

In this Safety Data Sheet, all chapters which have been changed since last edition are marked with as asterisk in front of the chapter number. This Safety Data Sheet replaces all previous information.
Revised and valid from: see date of issue

d-2

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

Chemical

SODIUM CHLORIDE

Section 1. Chemical identification

Name: Sodium chloride

Section 2. Composition/information on ingredients

CAS #:7647-14-5 **EINECS No.:231-598-3** **MF: NaCl**

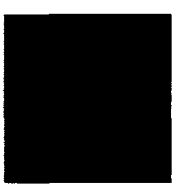
Synonyms

Common salt, dendritis, halite, purex, rock salt, saline, salt, sea salt, table salt, top flake, white crystal.

Section 3. Hazards identification

Label precautionary statements

- Irritant.
- Irritating to the eyes, respiratory system and skin.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- Wear suitable protective clothing.



Irritant

Section 4. First aid measures

In case of eye contact, immediately flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing of the eyes by separating the eyelids with fingers, and seek medical advice.

In case of skin contact, immediately flush skin with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes.

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen.

If swallowed, wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

Section 5. Fire fighting measures

Extinguishing media

- Non-combustible.
- Use extinguishing media appropriate to surrounding fire conditions.

Special fire fighting procedures

For fires involving sodium chloride do not enter any enclosed or confined space fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of the normal products of combustion or oxygen deficiency.
When heated to decomposition it emits toxic fumes of oxides of chlorine and Na_2O.

Section 6. Accidental release measures

- Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.
- Sweep up, place in a bag and hold for waste disposal.
- Avoid raising dust.
- Wash spill site after material pickup is complete.

Section 7. Handling and storage

Store in GREY area.
Refer to Section 8.

Additional information

Reacts violently with bromine trifluoride and lithium.

Section 8. Exposure controls/personal protection .

- Chemical safety goggles.
- Use protective clothing, gloves and mask.
- Safety shower and eye bath.
- Mechanical exhaust required.
- Do not breathe dust.
- Do not get in eyes, on skin, on clothing.
- Wash thoroughly after handling.
- Irritant.
- Keep tightly closed.
- Store in a cool dry place.


Goggles


Gloves


Protective clothing


Wash hands

Section 9. Physical and chemical properties

Appearance and odour
Colorless, transparent cubic crystals; or white, crystalline powder

Physical properties

Melting point:	801°C	Boiling point	1413°C
Vapour pressure:	1 mm @ 865°C	Specific gravity:	2.165

Section 10. Stability and reactivity

Incompatibilities
- Strong oxidising agents.
- Strong acids.
- Protect from moisture.

Hazardous combustion or decomposition products
Nature of decomposition products not known.

Section 11. Toxicological information

Acute effects
- May be harmful by inhalation, ingestion or skin absorption.
- Causes eye irritation.
- Causes skin irritation.
- May cause eye and skin irritation.
- Material is irritating to mucous membranes and upper respiratory tract.

Toxicity data
orl-rat LD_{50}:3 gm/kg

Target organ data
- Behavioural (somnolence) (convulsions or effect on seizure threshold) (muscle contraction or spasticity)
- Cardiac (other changes)
- Endocrine (estrogenic)
- Maternal effects (ovaries, fallopian tubes) (other effects on female)
- Effects on fertility (pre-implantation mortality) (post-implantation mortality) (abortion)
- Effects on embryo or foetus (fetotoxicity) (foetal death)

Section 12. Ecological information

Data not yet available.

Section 13. Disposal considerations

- Contact a licensed professional waste disposal service to dispose of this material.
- Observe all EU, Irish and local environmental regulations.

Section 14. Transport information

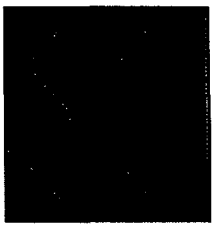
Contact chemical supplier for transportation information.

Section 15. Regulatory information

European information.

- **Irritant**

R36/37/38	Irritating to the eyes, respiratory system and skin.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36	Wear suitable clothing.



Irritant

Section 16. Other information

This MSDS has been prepared in DkIT and is designed for Irish Second Level School Science Laboratories use only where quantities handled are less than 50g. The above information is believed to be correct but does not claim to be all inclusive and shall be used only as a guide. Every effort has been made to ensure that this information provided conforms with the latest available data. DkIT, the Department of Education & Science, Limerick Education Centre, Sigma, Aldrich, Fluka, Dr. Dunlevy or Ms. F. Dunlevy shall not be held liable for any information errors in this MSDS or for any damage resulting from handling or from contact with the above product.

Please address any comments or error observations to: brian.dunlevy@dkit.ie

REFERENCES

Sigma Aldrich Fluka MSDS CD-ROM, Sax CD-ROM, MSDS on Internet.

MATERIAL SAFETY DATA SHEET

GAS OIL
MSDS NO: 08005481

IMPORTANT COMPONENTS:	Petroleum distillate (CAS 64742-79-6).
WARNING STATEMENT:	Possible risk of irreversible effects. If swallowed, seek medical advice immediately and show this container or label. DO NOT INDUCE VOMITING. In case of fire, use foam/dry powder/CO2/Halon – Never use water. Keep out of reach of children. Avoid contact with skin. (Symbol: Harmful.)
APPEARANCE AND ODOUR:	Clear, bright liquid. Characteristic odour.

HEALTH HAZARD INFORMATION

EYE

EFFECT:	Liquid may cause pain, but has no lasting effect. High concentration of vapour or mist may cause irritation. See Toxicology Section.
FIRST AID:	Flush eyes with plenty of water.
PROTECTION:	None required; however, use of eye protection is good industrial practice.

SKIN

EFFECT:	Possible cancer hazard based on skin painting studies in laboratory animals. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. See Toxicology Section.
FIRST AID:	Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse.
PROTECTION:	Avoid prolonged or repeated skin contact. Wear protective clothing and gloves if prolonged or repated contact likely.

INHALATION

EFFECT:	None expected under normal conditions of use. High concentrations of vapour or mist can produce dizziness, headache and nausea. See Toxicology Section.
FIRST AID:	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Seek medical advice.
PROTECTION:	Use with adequate ventilation. Avoid breathing vapour and/or mist. If ventilation is inadequate, use respirator which will protect against organic vapour/mist.

HEALTH HAZARD INFORMATION -- CONTINUED

EYE

EFFECT:	Low viscosity product. Harmful or fatal if liquid aspirated into the lungs.
FIRST AID:	If swallowed, do NOT induce vomiting. Get immediate medical attention.

FIRE AND EXPLOSION INFORMATION

FLASHPOINT:	Greater than 60°C (IP34/D93).
FLAMMABLE LIMITS:	UPPER: 7.5%. LOWER: 0.6%.
AUTOIGNITION TEMPEATURE:	336°C, (Approx.).
EXTINGUISHING MEDIA:	Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, halogenated agents, foam, steam). Never use water.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Flammable liquid.
PRECAUTIONS:	Keep away from ignition sources (e.g., heat and open flames).

REACTIVITY INFORMATION

HAZARDOUS DECOMPOSITION:	Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.
STABILITY:	Stable.

CHEMICAL AND PHYSICAL PROPERTIES

BOILING POINT:	170°C to 380°C, Range Approx.
SOLUBILITY IN WATER:	Negligible, below 0.1%.
SPECIFIC GRAVITY (WATER=1):	0.845 to 0.875 (Approx.).
VISCOSITY:	1.5-5.5 cS @ 40°C.

STORAGE AND ENVIRONMENTAL PROTECTION

STORAGE REQUIREMENTS:	Store in suitably designed tanks and storage areas away from heat, ignition sources, and open flames, in compliance with national and local regulations and codes of practice.
SPILLS AND LEAKS:	Eliminate all ignition sources. Contain the spill to the smallest area possible using dikes, dams or booms as appropriate. Remove mechanically or by using a fire retardant, absorbant material (e.g. sorbent pillows, dirt, sand, sawdust).
WASTE DISPOSAL:	Incineration in an approved facility is recommended unless directed otherwise by appropriate authority. This material and its container must be disposed of in a safe way.
SPECIAL PRECAUTIONS:	Avoid strong oxidisers

GAS OIL

MSDS NO: 08005481

TOXICOLOGICAL INFORMATION

EYE:	Similar products have produced maximum eye irritation scores ranging from 0.67 tp 1.0/110.0; 24 hours (rabbits).
SKIN:	Similar products have produced primary skin irritation scores ranging from 0.67 to 7.6/8.0 (rabbits). Dermal LD50 for products was greater than 2 g/kg (rabbit); practically non-toxic for acute exposures by this route.
INGESTION:	For a similar product, oral LD50 was greater than 5 g/kg (rat); practically non-toxic for acute exposures by this route.

Similar products have produced a weak to moderate carcinogenic response in laboratory animals. Therefore, there may be a potential risk of skin cancer from prolonged or repeated skin contact with this product in the absense of good personal hygiene. Occasional skin contact with this product is not expected to have serious effects, but good personal hygiene should be practiced and repeated skin contact avoided. This product can also produce moderate skin irritation upon prolonged or repeated skin contact. Personal hygiene measures taken to prevent skin irritation are expected to be adequate to prevent undue risk of skin cancer.

This product has a sufficiently low vapour pressure to prevent hazardous buildup of vapours unless the product is heated or used in a confined space with inadequate ventilation. Inhalation of high concentration of vapours can produce headache, dizziness, nausea and possibly irritation of the eye, nose and throat.

Aspiration of this product into the lungs can cause chemical pneumonia and can be fatal. Aspiration into the lungs can occur while vomiting after ingestion of this product. Do not siphon by mouth.

Ingestion can cause nausea, irritation of the digestive tract and abdominal pain.

REGULATORY INFORMATION

EEC INVENTORY (EINECS): In compliance.

EEC DANGEROUS SUBSTANCES CLASSIFICATION: Harmful.

IMO/IMDG: Gas oil, Class 3.3, UN1202.

SUPPLEMENTAL INFORMATION

Elf gas oil is intended for use as a fuel for commercial and industrial boilers for space heating applications, for furnaces and dryers, and as a fuel for use in gas turbines and off-road diesel engined vehicles. It SHOULD NOT be used as a fuel for diesel powered vehicles on public roads (illegal). It SHOULD NOT be used as a solvent or a cleaning agent.

ISSUE INFORMATION

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

ISSUED: 1st November 1990.

Safety Data Sheet

776053/06

Date of issue: November 29, 2002
Revised: November 29, 2002

*1. Identification of the substance/preparation and the company

DESMODUR 44 V 40 L

Application:
Di-/polyisocyanate components for the production of polyurethanes

Bayer plc, Responsible Care Group
Bayer House, Strawberry Hill, Newbury, Berkshire RG14 1JA
Tel.: 01635 563000 Fax: 01635 563563

*2. Composition/information on ingredients

wt.-%: >98 diphenyl methane diisocyanate, isomers and homologues
CAS No.: 9016-87-9
Classification: Xn R20; Xi R36/37/38; R42/43

3. Hazards identification

Harmful by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.

For their own protection, persons who suffer from hypersensitivity of the respiratory tract (e.g. asthmatics and chronic bronchitis sufferers) should avoid handling this product. Symptoms affecting the respiratory tract can also occur several hours after overexposure. Vapours and aerosols are the primary risk to the respiratory tract.

4. First-aid measures

General: Soiled, soaked clothing and shoes must be immediately removed, decontaminated and disposed of.

If aerosol or vapour is inhaled in high concentrations:
Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

Skin contact: In the event of contact with the skin, preferably wash with a cleanser based on polyethylene glycol or with plenty of warm water and soap. Consult a doctor in the event of a skin reaction.

Eye contact: In the event of contact with the eyes, hold the eyes open and rinse with lukewarm water for a sufficiently long period of time (10 minutes). Immediately consult a doctor (ophthalmologist).

Swallowing: DO NOT induce the patient to vomit, medical advice is required.

Information for the physician:
The product irritates the respiratory tract and may trigger sensitisation of the skin and respiratory tract. Treatment of acute irritation or bronchial constriction is primarily symptomatic. Extended medical care may be necessary, depending on the extent of the exposure and the symptoms.

5. Fire-fighting measures

Extinguishing media: CO_2, foam, dry powder; for larger fires, water spray can also be used.

Further information: In the event of fire, carbon monoxide, nitrogen oxides, isocyanate vapour, and traces of hydrogen cyanide may be released. Firemen must wear self-contained breathing apparatus.
Evacuate personnel located downwind. Do not allow contaminated extinguishing water to enter the soil, ground water or surface waters.

***6. Accidental release measures**

Put on protective equipment (see Chapter 8). Cover with damp, fluid-binding material (for example, sand, sawdust, chemical binder based on calcium silicate hydrate). Transfer to waste container after approx. 1 hour and do not seal (CO_2 formation!). Keep damp and in the open air in a safe place for 7 to 14 days. Waste should be disposed of as described in Chapter 13, "Disposal considerations".

***7. Handling and storage**

Handling: Observe the usual precautionary measures for chemicals. Avoid contact with skin. In all workplaces or parts of the plant where high concentrations of isocyanate aerosols and/or vapors may be generated (e.g. during pressure release, mold venting or when cleaning mixing heads with an air blast), appropriately located exhaust ventilation must be provided in order to prevent occupational exposure limits from being exceeded. The air should be drawn away from the personnel handling the product and the efficiency of the exhaust equipment should be periodically checked.

Storage: Keep container tightly closed and dry.
Keep separated from foodstuffs.
Prevent cooling below 10 °C and heating above 35 °C.
For further specific information, see our publication "Technical Information"

Water pollution class (WGK): 1 - slightly hazardous to water
WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999-05-17)

VCI Storage Class: 10

Protection against fire and explosion:
Explosion protection not required.

***8. Exposure controls/Personal protection**

Occupational Exposure Limits are listed in Chapter 15, "Regulatory information".

For technical protective measures to limit exposure see also Chapter 7, "Handling and storage".

(to be continued)

*8. **Exposure controls/Personal protection** (Continuation)

Respiratory protection:
Required at inadequately ventilated workplaces. If product is sprayed, wear air-fed mask or (for short periods only) a combination of charcoal filter and particulate filter mask (both of these types of mask should be of a type approved by the Health and Safety Executive).

Eye protection: goggles/face protection

Hand protection:
Suitable materials for safety gloves; DIN EN 374-3:
Polychloroprene - CR: thickness >=0,5mm; breakthrough time >=480min.
Nitrile rubber - NBR: thickness >=0,35mm; breakthrough time >=480min.
Butyl rubber - IIR: thickness >=0,5mm; breakthrough time >=480min.
Fluorinated rubber - FKM: thickness >=0,4mm; breakthrough time >=480min.
Polyvinyl chloride - PVC: thickness >=0,5mm; breakthrough time >=480min.

Recommendation: contaminated gloves should be disposed of.

Store work clothes and street clothes separately. Wash hands before breaks and at end of work. Decontaminate, destroy and dispose of soiled protective clothing
(see Section 13)

Safety precautions for handling freshly molded polyurethane parts: see Chapter 16

9. **Physical and chemical properties**

			tested in accordance with
Form:	liquid		
Colour:	brown		
Odour:	earthy, musty		
Pour point:	-18 °C		DIN ISO 3016
Initial boiling point:	>300 °C	at 1013 mbar	
Density:	1,24 g/cm³	at 20 °C	DIN 51757
Vapour pressure:	ca. 14 mbar	at 20 °C	EG A 4
	ca. 19 mbar	at 50 °C	EG A 4
	MDI:		
	<0,00001 mbar	at 20 °C	
	0,00016 mbar	at 50 °C	
Viscosity:	350-450 mPa·s	at 20 °C	DIN 53019
Solubility in water:	insoluble, reacts		
pH value:	not applicable		
Flash point:	243 °C		DIN EN 22719
Ignition temperature:	>500 °C		DIN 51794
Explosive limits:	Limits not determined.		

10. **Stability and reactivity**

Thermal decomposition: Polymerises at about 200 °C with evolution of CO_2.

Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.

(to be continued)

10. Stability and reactivity (Continuation)
Hazardous reactions:
Exothermic reaction with amines and alcohols; reacts with water forming CO_2; in closed containers, risk of bursting owing to increase of pressure.

***11. Toxicological information**
Acute toxicity:
Test results obtained on animal studies:
diphenyl methane diisocyanate, isomers and homologues:
LD_{50} oral, rat (female): >15000 mg/kg
LC_{50} inhalation, rat: 490 mg as aerosol/m³, 4,0 h of exposure.
Concentration of the saturated vapour of Diphenylmethane-4,4'-diisocyanate (MDI) at 25 °C: 0,09 mg/m³

In a long-term inhalation study, rats were exposed over a period of 2 years to mechanically generated respirable aerosols (aerodynamic diameter 95 % less than 5 µm) of polymeric MDI (PMDI) in concentrations of 0,2, 1,0 and 6,0 mg PMDI/m³. The group of animals exposed to the highest concentration suffered an increased incidence of lung tumours, persistent inflammatory changes to the nose, respiratory tract and lungs, and yellowish deposits in the respiratory tract and lungs. The animals in the the 1,0 mg/m³ group exhibited slight irritation and inflammatory changes to the nose, respiratory tract and lungs, but did not develop lung tumours and/or deposits. Animals in the 0,2 mg/m³ group suffered no irritation; this concentration was therefore deemed to constitute the "no-effect level".

Irritating/corrosive effects: Effect on the eyes:
Causes slight temporary reddening and swelling of the conjunctiva and slight reversible clouding of the cornea. In high concentrations vapour of product has irritating effects on eyes and mucous membranes.
Effect on the skin:
Irritant. Prolonged contact with the skin may cause tanning and irritant effects.
Effect on the respiratory tract:
In high concentrations vapour of product has irritating effects on eyes and mucous membranes.

Special properties/effects:
Experience on humans:
Irritation of the mucous membranes in the nose, throat and lungs, dryness of the throat, pressure on the chest, sometimes accompanied by breathing difficulties and headaches.
Possible delayed appearance of the symptoms and allergic reaction in susceptible persons.

Sensitisation:
May cause sensitisation by inhalation.
The following information has been obtained:
Dermal sensitisation: inconclusive, because of conflicting experimental results.

12. Ecological information

Do not allow to escape into waterways, waste water or soil.

Behaviour in open waters: Immiscible with water.
Reacts with water at the interface producing CO_2 and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by water-soluble solvents. Previous experience shows that polyurea is inert and non-degradable.

Data on diphenylmethane diisocyanate, isomers and homologues:

Biodegradability: 0 % after 28 days (respirometer test)

Acute fish toxicity: LC0 = >1000 mg/l
Test species: Brachydanio rerio Duration of test: 96 h

Toxicity for Daphnia: EC50 = >1000 mg/l Duration of test: 24 h

Acute bacteria toxicity: EC50 = >100 mg/l
Tested on activated sludge microorganisms. Duration of test: 3 h

13. Disposal considerations

The relevant EC Directives and local, regional and national regulations must be complied with. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste Catalogue. It is recommended that details be worked out with the waste disposal company responsible.

The waste can be disposed of in a suitable incinerator, provided that national/local legislation is complied with.

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until 'drip-dry'), any product residue adhering to their walls has been rendered harmless, and the product and hazard labelling has been invalidated they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry.
Containers must be recycled in compliance with national legislation and environmental regulations.

***14. Transport information**

GGVSee/IMDG Code: -- UN No.: -- EmS: --
PG: -- MPO: --
GGVSE: Class -- PG: -- RID/ADR: Class -- PG: --
ADNR: Class -- PG: -- Cat -- ICAO/IATA-DGR: not restr.
Declaration for land shipment: --
Declaration for sea shipment: --
Declaration for shipment by air: --
Other information:
Not dangerous cargo. Irritating to skin and eyes. Keep dry. Avoid heat above +50 °C. Avoid temperatures below 0 °C. Keep away from foodstuffs, acids and alkalis.
Further information can be found in Chapter 16.

***15. Regulatory information**

Labelling as required by the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3), in accordance with EC Directives:
Symbol: Xn, hazard description: harmful
Contains: diphenyl methane diisocyanate, isomers and homologues
R 20: Harmful by inhalation.
R 36/37/38: Irritating to eyes, respiratory system and skin.
R 42/43: May cause sensitisation by inhalation and skin contact.
S 23: Do not breathe vapour/spray.
S 36/37: Wear suitable protective clothing and gloves.
S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

UK Maximum Exposure Limits (MEL) or Occupational Exposure Standards (OES), per EH40 document (Health & Safety Executive):

TYPE, YEAR	substance	CAS-No.	8-hr TWA ppm	8-hr TWA mg/m³	15-min STEL ppm	15-min STEL mg/m³
MEL 2002	isocyanates, all (as -NCO) (+ can cause respiratory sensitisation)	-	-	0.02	-	0.07

This product may contain traces of phenylisocyanate. See Maximum Exposure Limit for isocyanates.

Not subject to the German Regulation on Flammable Liquids (VbF).

The Health and Safety Executive has published two items of guidance on the subject of isocyanates: 'Isocyanates: toxic hazards and precautions' (EH16), and 'Isocyanates: medical surveillance' (MS8). The guidance in these publications should be implemented.

***16. Other information**

R 20: Harmful by inhalation.
R 36/37/38: Irritating to eyes, respiratory system and skin.
R 42/43: May cause sensitisation by inhalation and skin contact.

For internal US delivery:
Under §172.101, Appendix A, DOT (Department of Transportation) it is requested: MDI Reportable Quantity (RQ): 5000lbs (2270kg).

ISOPA Guidelines for Safe Loading/Unloading, Transportation, Storage of TDI and MDI:
ISOPA Order No. PSC-0005-GUIDL

Safety precautions for handling freshly molded polyurethane parts:

Depending on the production parameters, any uncovered surfaces of polyurethane moldings produced using this raw material may contain traces of substances (e. g. starting and reaction products, catalysts, release agents) with hazardous characteristics (e. g. harmful, irritating, corrosive, sensitizing).

***16. Other information** (Continuation)

Skin contact with traces of these substances should be avoided. When demolding or otherwise handling freshly molded polyurethane parts, protective textile gloves should be worn as a minimum. Their palm and finger areas should preferably be coated on the outside with nitrile rubber, PVC or polyurethane.
The wearing of protective clothing (if necessary with long sleeves) suited to the conditions normally encountered when handling freshly molded polyurethane parts is recommended.

All chapters in the SDS which have been changed since last edition are marked with an asterisk in front of the Chapter number. This Safety Data Sheet replaces all previous information.
Revised and valid from: see date of issue

d-5

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

DR. D. LAVELLE & ASSOCIATES LTD.
CONSULTING ENGINEERS Email: mail@drlavelle.co.uk Web: www.drlavelle.co.uk
29 SHORE ROAD HOLYWOOD CO. DOWN BT18 9HX Tel: 028 90425114 Fax: 028 90423068

SEAN QUINN GROUP CO. FERMANAGH DERRYLIN POLYURETHANE FACTORY

We would advise you as follows regarding the various installations at the above project:-

ELECTRICAL

The lighting load is approximately 70amps per phase and the controls of the lights are highly flexible so that areas can be omitted or reduced as required.

The fittings including the external fittings are all low energy fittings.

The electrical distribution has been designed for primarly safety and also efficiency in mind.

When the plant settles down, consideration will be given to the provision to of power factor correction, if this is required.

The motors have been chosen with variable speed drives where appropriate and operate very efficiently.

MECHANICAL

The heating installation which is essential in this environment is by the simple method of using radiators mounted at suitable locations at intermediate levels. This method of heating avoids large air flows by its nature.

Mixing valves controlled in 3 separate areas, factory, storage and office, so that the variant requirements of the different areas can be easily organised.

The possibility also exists of reducing the heat in particular areas by simply turning off the radiators as required.

Water heating is by small capacity electric water heaters as the requirements would not justify storage and distribution.

Safety Data Sheet

884425/03

1. Identification of the substance/preparation and the company

BAYMER trial product PU 27HB08

Bayer AG, PU-S Umwelt und Produktsicherheit
D-51368 Leverkusen, Telephone: (0214) 3031495
In case of emergency: (0214) 303030 (Werkfeuerwehr Bayer Leverkusen)

2. Composition/information on ingredients

Polyol preparation

weight %: 10-<15 tris-(2-hydroxyethyl)-amine
CAS No.: 102-71-6
EEC No.: 203-049-8 Index No.: --
Classified: --

3. Hazards identification

Hazard warning not required.

4. First-aid measures

Skin contact: After contact with skin, wash immediately with plenty of water and soap.

Eye contact: Contamination of the eyes must be treated by thorough irrigation with water, with the eyelids held open. A doctor (or eye specialist) should be consulted immediately.

Swallowing: Should the product be swallowed seek medical advice.

5. Fire-fighting measures

Extinguishing media: CO_2, foam, dry powder; in cases of larger fires, water spray should be used.

Further information: Firemen have to wear self-contained breathing apparatus.

6. Accidental release measures

Do not empty into drains. Take up with absorbent for chemicals or, if necessary with dry sand.

7. Handling and storage

Handling: Observe the usual precautionary measures for chemicals. Avoid contact with skin.

Storage: Keep container tightly closed and dry.
Keep separated from foodstuffs.
Storage temperature regarding personal safety: max. 50 °C.
Further specific information see our :"Technical Information"

Water pollution class (WGK): 2 - impairment of water quality
WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999-05-17)

VCI storage class: 10

***8. Exposure controls/Personal protection**

Workplace-related thresholds are listed in Chapter 15 "Regulations".

Hand protection: protective gloves made of PVC
Eye protection: goggles/face protection

Keep working clothes separate. Wash hands before breaks and at end of work.

Safety precautions for handling freshly molded polyurethane parts:

Depending on the production parameters, any uncovered surfaces of polyurethane moldings produced using this raw material may contain traces of substances (e.g. starting and reaction products, catalysts, release agents) with hazardous characteristics (e.g. harmful, irritating, corrosive, sensitizing).

In order to prevent skin contact with the traces of these substances, fully buttoned work clothing and protective gloves whose palm and finger areas at least are coated on the outside with nitrile rubber, PVC or polyurethane should be worn when demolding or otherwise handling the freshly molded polyurethane parts.

9. Physical and chemical properties

			tested in accordance with
Form:	liquid		
Colour:	colourless to yellowish		
Odour:	fruity aromatic		
Pour point:	-13 °C		DIN ISO 3016
Initial boiling point:	235 °C	at 1013 mbar	
Density:	1,20 g/cm³	at 20 °C	DIN 51757
Vapour pressure:	<1 mbar	at 20 °C	
	5 mbar	at 50 °C	
Viscosity:	approx. 3000 mPa·s	at 20 °C	DIN 53019
Solubility in water:	not miscible		
pH value:	approx. 9 at 100 g/l	methanol:water = 9:1	
Flash point:	187 °C		DIN EN 22719
Ignition temperature:	385 °C		DIN 51794
Explosive limits:	Limits not determined.		

10. Stability and reactivity

Thermal decomposition: Does not occur until initial boiling point.
Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.
Hazardous reactions: No hazardous reaction when used as directed.

11. Toxicological information

Acute toxicity:
No toxicological studies of the product have yet been carried out.

Test results of the following component of the preparation:

tris-(2-hydroxyethyl)-amine:
LD_{50} oral, rat: 8000 mg/kg

(to be continued)

11. Toxicological information (Continuation)
preparation: Effect on the eyes:
Weak irritation on the eyes possible.
Effect on the skin:
No irritation at the skin will be expected.

12. Ecological information
Do not allow to escape into waters, wastewater or soil.

preparation: no data avalaible
Datas of relevant components:
data on tris(β-chloroisopropyl)-phosphate:

Biodegradability: 14 % after 28 days (OECD 301 E)

Acute fish toxicity: LC50 = 56,2 mg/l
Test species: Zebra barbel (Brachydanio rerio) Duration of test: 96 h

Acute bacteria toxicity: EC50 = 784 mg/l
Tested on activated sludge microorganism. Duration of test: 3 h

13. Disposal considerations
The relevant EU Directives and local, regional and national regulations must be complied with. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste Catalogue. It is recommended that details be sorted out with the waste disposer responsible.

The waste can be disposed of in a suitable incinerator under compliance with the relevant legislation.

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry") , they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry.
Containers must be recycled in compliance with national legislation and and environmental regulations.

***14. Transport information**
GGVSee/IMDG Code: -- UN No.: -- EmS: --
PG: -- MPO: --
GGVSE: Class -- PG: -- RID/ADR: Class -- PG: --
ADNR: Class -- PG: -- Cat -- ICAO/IATA-DGR: not restr.
Declaration for land shipment: --
Declaration for sea shipment: --
Declaration for shipment by air: --
Other information:
Not dangerous cargo. Avoid heat above +50 °C. Keep separated from food-stuffs.

***15. Regulatory information**

No labelling is required in accordance with the EEC directives.

Protection of workers: TRGS 900 "Atmospheric Threshold Value":
triethanolamine CAS No.: 102-71-6
-- ml/m³ (ppm) = 5,0 mg/m³ (E);
maximum limit of excess factor: -
Remarks: --

German "TA-Luft": With certain processes, for example spraying or processing at high temperatures, a check should be carried out to ensure compliance with the German "TA-Luft" technical instruction on air pollution control.

Not subject to the German Regulation on Flammable Liquids (VbF).

***16. Other information**

In the Safety Data Sheet all chapters which have been changed since last edition are marked with an asterisk in front of the chapter number. This safety data sheet replaces all previous information.
Revised and valid from: see date of issue

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

Section G Tables

Table G.1(i)

Ref No. or Code	Material /Substance	CAS Number	Danger Category	Amount Stored (tonnes)	Annual Usage (tonnes)	Nature of Use	R(3) - Phrase	S(3) - Phrase
Not Applicable	Pentane	109-66-0	Not Available	12	11,040	Blowing Agent	R11	S9, S16, S33
Not Applicable	MDI Desmodur 44V40L	9016-87-9	Not Available	120	163,080	PIR Component	R20, R36, R37, R38, R42, R43	S33, S36, S37, S45
Not Applicable	Polyol PU27HB08	Not Available	Not Available	70	68,172	PIR Component	No labelling required	No labelling required
Not Applicable	Desmorapid 1792	111-46-6	Not Available	4	2208	Catalyst	R22	S36
Not Applicable	Desmorapid 726B	98-94-2	Not Available	2	732	Catalyst	R10, R20, R21,R22, R34, R51, R53	S26, S28, S36, S37, S39, S45, S61
Not Applicable	Diesel	68334-30-5	Not Available	15	150	Heating and Vehicles	R40, R52, R53,R65	S2, S24,S36, S37, S43, S61, S62
Not Applicable	Salt	7647-14-5	Not Available	0.5	2	Water Softening Agent	R36, R37, R38	S26, S36

Table G.1(ii)

Ref No. or Code	Material / Substance	TA Luft Class 1,2 or 3	Odour			EU Lists I and II			
			Odorous Yes/No	Description	Threshold $\mu g/m^3$	Dangerous Substances Directive 76/464/EEC		Groundwater Directive 80/68/EEC	
						List I	List II + 129	List I	List II
Not Applicable	Pentane	Refer to dispersion model	Yes	Petroleum like	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	MDI 44V40L	Refer to dispersion model	Yes	Earthy Musty	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	Polyol PU27HB08	Refer to dispersion model	Yes	Fruity aromatic	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	Desmorapid 1792	Refer to dispersion model	Yes	Almost odourless	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	Desmorapid 726B	Refer to dispersion model	Yes	Amine like odour	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	Diesel	Refer to dispersion model	Yes	Petroleum like	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model
Not Applicable	Salt	Not Applicable	No	Not Applicable	Not Available	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model	Refer to dispersion model