

## Safety Data Sheet

822047/06

Date of issue: August 7, 2006  
Revised: January 16, 2003

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

DESMODUR VKS 20 F

**Application:**

Hardener for coating materials or adhesives

Bayer MaterialScience AG, HSEQ-PRC (Product Safety)

51368 Leverkusen, Germany, Tel.: +49 214 30 25026

Fax: +49 214 30 50035, e-mail: productsafety@bayermaterialscience.com

In case of emergency: +49 214 30 99300 (Sicherheitszentrale Bayer)

+44 1635 563000 (Bayer plc,

Responsible Care Group, Newbury RG14 1JA, UK)

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

polyisocyanate based on diphenylmethane diisocyanate

diphenylmethane-diisocyanate, isomers and homologues

weight %: > 99,5

CAS No.: 9016-87-9

Index No.: --

EEC No.: --

Classification: Xn R20; Xi R36/37/38; R42/43

Specific threshold concentration

Xn ; R 42 = from 0,1 %

Xn ; R 42/43 = from 1 %

Xn ; R 36/37/38-42/43 = from 5 %

Xn ; R 20-36/37/38-42/43 = from 25 %

Classification/labeling analogous to Index No.: 615-005-00-9

### 3. Hazards identification

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

### \*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.

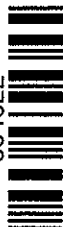
After skin contact: In the event of contact with the skin, preferably wash with a cleanser based on polyethylene glycol or with plenty of warm water and soap. Consult a doctor in the event of a skin reaction.

After eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.

After swallowing:

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

(to be continued)



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**\*4. First-aid measures (Continuation)**

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<sub>2</sub>, foam, dry powder;

in cases of larger fires, water spray should be used.

For reasons of security unsuitable extinguishing media: water jet

In case of fire, formation of carbon monoxide, nitrogen oxide, isocyanate vapour, and traces of hydrogen cyanide is possible. Firemen have to wear self-contained breathing apparatus. Do not let enter contaminated extinguishing water into the soil, groundwater or surface waters.

Fire in vicinity poses risk of pressure build-up and rupture. Containers at risk from fire should be cooled with water and, if possible, removed from the danger area.

**\*6. Accidental release measures**

Put on protective equipment (see chapter 8). Ensure adequate ventilation/exhaust ventilation. Keep unauthorized persons away. Do not empty into drains. Remove mechanically; cover remainders with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO<sub>2</sub>!). Keep damp in a safe ventilated area for several days.

For further disposal measures see chapter 13.

**\*7. Handling and storage**

Handling: Ensure adequate ventilation or exhaust ventilation in the working area. Exhaust ventilation necessary if product is sprayed. The personal protective measures described in Chapter 8 must be observed. The threshold limit values noted in Chapter 8 must be monitored. Avoid contact with skin and eyes.

In all areas where isocyanate aerosols and/ or vapour concentrations are produced in elevated concentrations, exhaust ventilation must be provided in such a way that the occupational exposure limit (OEL) is not exceeded. The air should be drawn away from the personnel handling the product.

Storage: Keep container tightly closed and dry. Further information on the storage conditions which must be observed to preserve quality can be found in our product informations sheet.

VCI storage class: 10

(VCI = German Association of the Chemical Industry)



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<b>*9. Physical and chemical properties</b> (Continuation) tested in accordance with			
Pour point:	-24 °C		DIN ISO 3016
Initial boiling point:	>300 °C	at 1013 hPa	
Density:	1,24 kg/l	at 20 °C	DIN 51757
Vapour pressure:	1 hPa	at 20 °C	
	12 hPa	at 50 °C	
diphenyl-methane-diisocyanate	< 0,00001 mbar	at 20 °C	
Viscosity:	approx. 200 mPa·s	at 25 °C	DIN 53019
Solubility in water:	insoluble, reacts		
pH value:	not applicable		
Flash point:	> 250 °C		DIN 51758
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<sub>2</sub>.  
 Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly.

Hazardous reactions:

Exothermic reaction with amines and alcohols; reacts with water forming CO<sub>2</sub>, in closed containers risk of bursting owing to increase of pressure.

**\*11. Toxicological information**

Acute toxicity:

LD<sub>50</sub> oral, rat: more than 15000 mg/kg

LC<sub>50</sub> inhalation, rat: 370 mg as aerosol/m<sup>3</sup>, 4,0 h of exposure.

Concentration of the saturated vapour of 4,4-MDI at 25 °C: 0,09 mg/m<sup>3</sup>

Effect on the eyes: irritant

Effect on the skin: irritant

Effect on the respiratory tract: irritant

Long-term inhalation study of tech. diphenylmethane diisocyanate (PMDI) carried out using mechanically produced, inhalable PMDI aerosols.

Aerodynamic diameter: 95 % below 5 µm

Concentrations: 0,2 ; 1,0 and 6,0 mg/m<sup>3</sup>

Animal groups: 120 rats in each (60 female, 60 male)

Results after clinical and histopathological examination of the animals:

0,2 mg aerosols/m<sup>3</sup>: No irritation of the respiratory tract or lungs - "no effect level" (NOEL).

1,0 mg aerosols/m<sup>3</sup>: Slight irritation of and inflammatory changes to the nose, respiratory tract and lungs. No lung tumours.

6,0 mg aerosols/m<sup>3</sup>: More severe irritation of and chronic inflammatory changes to the nose, respiratory tract and lungs. Accumulation of a yellow substance in the lungs. 8 benign (statistically increased) and 1 malignant (statistically insignificant) lung tumours were found.

The overall increased incidence of lung tumours only in the group which received the highest concentration is closely attributed to the chronic irritation of and the inflammatory changes to the respiratory organs and to the accumulation of the yellow substance in the lungs of the animals.

(to be continued)

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**\*11. Toxicological information (Continuation)**

Special properties/effects:

Over-exposure, especially when spraying coatings containing isocyanate without the necessary precautions, entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract.

Delayed appearance of the complaints and development of hyper-sensitivity (difficult breathing, coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations including concentrations below the German control limit (MAK-value). In case of longer contact with skin, tanning and irritating effects are possible.

**\*12. Ecological information**

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

The product reacts with water at the interface forming CO<sub>2</sub> and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents.

data on diphenylmethane-diisocyanate, isomers and homologues

Biodegradability: 0 %, i.e. not degradable.

Degradation rate in 28 days.

(Method: respirometer test)

Acute fish toxicity: LC<sub>0</sub> = >1000 mg/l

Test species: Brachydanio rerio (Zebra barbel)                      Duration of test: 96 h

Acute bacteria toxicity: EC<sub>50</sub> = >100 mg/l

Tested on activated sludge microorganism.                      Duration of test: 3 h

Acute toxicity for daphnia: EC<sub>50</sub> = >1000 mg/l

Test species: Daphnia magna    Duration of test: 24 h

**\*13. Disposal considerations**

Dispose in accordance with applicable international, national and local laws, ordinances and statutes.

For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

After final product withdrawal, all residues must be removed from containers (drip-free, powder-free or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated. Containers must be recycled in compliance with national legislation and and environmental regulations.

**\*14. Transport information**

GGVSE: --      UN: NODG PG: --

RID/ADR: --      UN: NODG PG: --

ADNR: --      UN: NODG PG: --

GGVSee/IMDG Code: --      UN: NODG PG: --      MPO: --



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### \*14. Transport information (Continuation)

ICAO-TI/IATA-DGR: -- UN: NRES PG: --

Declaration for land shipment: --

Declaration for sea shipment: --

Declaration for shipment by air: --

Other information:

Not dangerous cargo. Irritating to skin and eyes. Avoid temperatures below +10 °C. Avoid heat above +50 °C. Keep dry. Keep away from foodstuffs, acids and alkalis.

### \*15. Regulatory information

Labelling in accordance with the EEC directives:

Symbol: Xn, hazard description: harmful

Contains: diphenylmethane-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 sensitization 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).

TRGS 905-classification:

Tech. ("polymer") MDI (pMDI) CAS No.: 9016-87-9 (in the form of respirable aerosols, measured as the alveolar aerosol content)  
cancerogenic, category 3

Any existing national regulations on the handling of isocyanates must be observed.

Swiss law of poison: class of poison 3; BAG-T-No. 614463.

### \*16. Other information

All components of this product are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS) under the provisions laid down in the corresponding EEC-Directive.

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

R 20: Harmful by inhalation.

R 36/37/38: Irritating to eyes, respiratory system and skin.

R 42/43: May cause sensitization by inhalation and skin contact.

The presented Safety Data Sheet has been altered.

The reason for the alteration is as follows:

revised text (see chapter 2, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15 and 16)

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 above details do not imply any guarantee concerning composition, properties or performance.