

**1,4-DIAMINOBTANE****1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**

Product name : Diaminobutane
Chemical name : 1,4-Diaminobutane
Synonyms : Butane-1,4-diamine, Tetramethylene diamine.
Butylenediamine.
Chemical formula : C₄H₁₂N₂.
Substance/preparation : Substance.
Use of the substance/preparation : Intermediate used in the Pharmaceutical and Agrochemical industry.
Supplier's name/address : DSM Specialty Intermediates BV
P.O. Box 5489
6130 PL Sittard
The Netherlands
Emergency telephone : 31-(0)46-47655555.

2. COMPOSITION/INFORMATION ON INGREDIENTS.

Chemical name	CAS-no.	EG-no.	ANNEX-I no.	Symbol	R-phrase	%(w/w)
1,4-Diaminobutane	110-60-1	203-782-3	-	T	21/22 - 23 - 34	> 99

For the complete text of the R-phrases, see section 15.

Occupational Exposure Limit(s), if available, are listed in section 8.

3. HAZARD IDENTIFICATION.

Physical/chemical hazards : Flammable solid.
Environmental hazards : Slightly water endangering substance.
See section 12 and 15.
Health hazards : Toxic by inhalation. Causes burns.
Harmful in contact with skin and if swallowed.
Symptom(s) of (over)exposure : See section 4.
NFPA-code (704) :

Hazards

Flammability
Health
Reactivity

**4. FIRST-AID MEASURES.****General**

: Protection of first-aiders;
Use appropriate protection (see section 8).
Move exposed person to fresh air. Remove contaminated clothing and shoes.

**1,4-DIAMINOBTANE****Inhalation**

- Effects** : Corrosive to tissue of the mucous membranes and upper respiratory tract.
- Symptoms** : Sore throat, coughing, lung oedema.
- First-aid** : Remove victim to fresh air. Keep victim warm and at rest in half upright position. Notify a doctor.

Skin contact

- Effects** : Corrosive.
- Symptoms** : Redness, pain, burns, skin damage.
- First-aid** : Immediately remove contaminated clothing. Wash off with plenty of water. Consult a doctor.

Eye contact

- Effects** : Severely corrosive.
- Symptoms** : Pain, severe burns, eye lesions, eye damage.
- First-aid** : Immediately wash out with plenty of water, then accompany victim to a doctor.

Ingestion

- Effects** : Corrosive.
- Symptoms** : Swallowing can cause burns of the mouth, throat and stomach. Abdominal pain.
- First-aid** : Wash out mouth with plenty of water. Make victim drink much water. Do not induce vomiting. Notify a doctor.

5. FIRE-FIGHTING MEASURES.**Extinguishing media**

- Suitable** : Water spray, dry chemical, alcohol-resistant foam or carbon dioxide
- Hazardous thermal decomposition and combustion products** : May produce toxic and/or corrosive products such as carbon monoxide, ammonia and nitrogen oxides (NO, NO₂...).
- Protection of firefighters** : Fire-fighters should wear proper protective equipment and self-contained breathing apparatus with full face-piece operated in a positive mode.
- Special risks** : See section 3.

6. ACCIDENTAL RELEASE MEASURES.

- Personal precautions** : Avoid any contact with the substance. Use appropriate protection. (see section 8).
- Environmental precautions** : Slightly water endangering substance. See section 12 and 15. If the substance has contaminated surface water, inform the appropriate authorities.
- Methods for cleaning up** : Avoid dust generation. Shovel up carefully spilled material and recycle if possible. Wash away remainder with plenty of water. See section 8 and 13.

**1,4-DIAMINOBTANE****7. HANDLING AND STORAGE.**

- Handling** : Avoid any contact with the substance.
Use appropriate personal protection (see section 8)
Ventilate areas. Keep container tightly closed.
- Storage** : Store in closed containers. Store under nitrogen.
Store away from oxidizing substances.
- Packaging materials** : Steel containers.
- Use of the substance/preparation** : See section 1.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION.

Avoid exposure first of all by technical and/or organizational measures.

Occupational exposure limits

- MAC value** : Not established.
- Other exposure limits** : Provisional occupational exposure limit:
2 ppm or 7 mg/m³ (DSM advice).
- Engineering measures** : Above 64 °C;
Use in closed systems. Use explosion-proof electrical
equipment. Ventilation, spatial exhaust, local exhaust or
respiratory protection.
- Hygienic measures** : When using do not eat, drink or smoke.
Eye wash and safety shower facility.
- Respiratory system** : If exposed to concentrations above the provisional
occupational exposure limit use self-contained breathing
apparatus.
- Hand protection** : Use neoprene or butyl rubber gloves.
- Breakthrough time** : 4 – 8 hours.
- Eye protection** : Face-shield or eye protection combined with respiratory
protection [fresh-air hood].
- Skin protection** : Protective clothing (throw-away)overall.
- Environmental exposure controls** : Avoid environmental release.
- Remarks** : None.

9. PHYSICAL AND CHEMICAL PROPERTIES.

- Appearance** : Solid at temperatures below 27°C.
Liquid above 27°C.
- Colour** : Colourless.
- Odour** : Pungent. Evil-smelling.
- pH** : Not available.
- Boiling point** : 158 -160°C
- Melting point** : 27°C
- Flash point** : 64°C

**1,4-DIAMINOBTANE**

Lower explosion limit	: 0.7 vol-%.
Upper explosion limit	: 11.2 vol-%.
Autoignition temperature	: Not available.
Flammability	: Flammable.
Oxidizing properties	: Not available.
Vapour pressure	: Not available.
Vapour density (air=1)	: 3
Density	: 0.872 (30°C).
Solubility in water	: 40 g/l (20°C).
Soluble in	: Ethanol and ether.
Octanol/water coefficient	: Log P _{ow} = - 0.65

10. STABILITY AND REACTIVITY.

General	: Stable under recommended storage and handling conditions. See section 7.
Conditions to avoid	: Heat, flame and other sources of ignition.
Materials to avoid	: Strong oxidizing agents, acids, aldehydes, ketones, isocyanates, halones, phenols and nitrates.
Hazardous decomposition products	: Possibly corrosive and/or toxic decomposition products such as carbon monoxide, ammonia and nitrogen oxides (NO, NO ₂ ...).

11. TOXICOLOGICAL INFORMATION.**Irritation**

Eyes	: Corrosive.
Skin	: Corrosive.
Respiratory system	: Corrosive.

Acute toxicity

Oral	: LD ₅₀ Rat	: 740 mg/kg
Dermal	: LD ₅₀ Rabbit	: 900 mg/kg
Inhalation	: LC ₅₀ Rat 4h.	: 1.1 mg/l

Chronic toxicity : NOEC = 10 mg/m³.
4 Week study (rat; 4 hrs/day, 5 days/week; inhalation)

Sensitization	: No skin sensibilisation.
Carcinogenicity	: None expected.
Mutagenicity	: Not mutagenic in Ames test
Reproductive toxicity	: No relevant data available.
Epidemiological data	: No relevant data available.

**1,4-DIAMINOBTANE****12. ECOLOGICAL INFORMATION.**

Ecotoxicity	: 96 St LC ₅₀ Fish : 730 mg/l. 48 St EC ₅₀ Daphnia: not available. 72 St IC ₅₀ Algae : not available.
Mobility	: See data on vapour pressure, watersolubility and log P _{ow} .
Persistence and degradability	: Readily biodegradable.
Bio-accumulative potential	: Log P _{ow} = - 0.65, resulting in no bio-accumulation.
Others	: Not available.

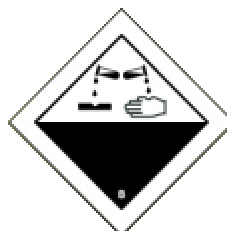
13. DISPOSAL CONSIDERATIONS.

Responsibility also of the receiver to have knowledge of national and local regulations.

Methods of disposal	: Combustion in an incinerator for chemical waste according to national and local regulations. Controlled biodegradation in a waste-water treatment plant is possible.
Contaminated packaging	: After cleaning, re-use is possible. Contaminated packaging must be disposed of in a safe way.
Hazard(s)	: See section 3.

14. TRANSPORT INFORMATION.

UN-number	: UN3259
Kemmler code	: 80 UN3259
Class ADR/RID/IMO/IATA	: 8
Proper shipping name	: Polyamines, solid, corrosive, n.o.s.
Technical/chemical name	: 1,4-Diaminobutane
Max.fill. grade tank (%)	: 94
Hazard label ADR/RID/IMO/IATA	:



Packing group ADR/RID/IMO/IATA	: II
Packing instr. (PA/CAO)	: 814 (PA) en 815 (CAO)
Ems number	: F-A, S-B
Tremcard-nr.	: 80GC8-II+III

**1,4-DIAMINOBTANE****15. REGULATORY INFORMATION.**

Responsibility also of the receiver to have knowledge of national and local regulations.

Labelling : DSM-labelling conform directive 67/548/EEC.

Labelname : 1,4-Diaminobutane.

Symbol :



Toxic

Risk phrases : **R21/22** = Harmful in contact with skin and if swallowed.

R23 = Toxic by inhalation.

R34 = Causes burns.

Safety phrases : **S24/25** = Avoid contact with skin and eyes.

S26 = In case of contact with the eyes, rinse immediately with plenty of water and seek medical advice

S45 = In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

National regulations

WGK (Germany) : Class 1 = Slightly water endangering .
(DSM-classification conform VwVwS).

TSCA inventory listed : Yes

DSL inventory listed : Not. (NDSL: Yes).

16. OTHER INFORMATION.

Training advice : Handling of this substance is restricted to skilled personnel only.

Sources of key data : Literature data and/or investigation reports are available from the manufacturer.

Issue nr. : 03/03-01.

Update motive : Adaption conform directive 2001/58/EC.

Replaces SDS dated : 23-06-2000.

SDS revised by : M. Arnoldussen
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