SAFETY DATA SHEET

Di-(2-ethylhexyl) amine
10190

Version / Revision	4	**Revision Date**	30-Apr-2020
Supersedes Version	3.00	**Issuing date**	15-May-2020

SECTION 1: Identification of the substance / mixture and of the company / undertaking

1.1. Product identifier

Identification of the substance/preparation **Di-(2-ethylhexyl) amine**

CAS-No 106-20-7
EC No. 203-372-4
Registration number (REACh) 01-2119977118-28

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Intermediate
Lubricants and lubricant additives Formulation
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking Identification
OQ Chemicals GmbH
Rheinpromenade 4A
D-40789 Monheim
Germany

Product Information
Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number +65 3158 1198 (available 24/7)
000800 100 7479 (for domestic shipments only)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

Acute oral toxicity Category 4, H302
Acute dermal toxicity Category 3, H311
Acute inhalation toxicity Category 3, H331
Skin corrosion/irritation Category 1B, H314
Serious eye damage/eye irritation Category 1, H318
Environmental hazard Aquatic Chronic 1; H410, M-Factor: 1 (self-classification)

Additional information
For full text of Hazard- and EU Hazard-statements see SECTION 16.

2.2. Label elements

Labelling according to Regulation 1272/2008/EC and its amendments (CLP Regulation).

Hazard pictograms

Signal word **Danger**

Hazard statements
H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H331: Toxic if inhaled.
H314: Causes severe skin burns and eye damage.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary statements
P260: Do not breathe gas/mist/vapours.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P321: Specific treatment: IF ON SKIN: Wash off with 3% acetic acid followed by large amounts of plain water for at least 5 min as a final step.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.
P391: Collect spillage.
P403 + P233: Store in a well ventilated place. Keep container tightly closed.

2.3. Other hazards

Components of the product may be absorbed into the body through the skin
Vapour/air-mixtures are explosive at intense warming

PBT and vPvB assessment This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	REACh-No	1272/2008/EC	Concentration (%)
Bis-(2-ethylhexyl)-amine	106-20-7	01-2119977118-28	Acute Tox. 4; H302 Acute Tox. 3; H311 Acute Tox. 3, H331 Skin Corr. 1B; H314 Eye Dam. 1; H318 Aquatic Chronic 1;	> 99,0

			H410 M-Factor: 1 (self-classification)	

For full text of Hazard- and EU Hazard-statements see SECTION 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Keep at rest. Aerate with fresh air. Call a physician immediately. Symptoms of poisoning may develop many hours after exposure.

Eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Skin
Wash off with 3% acetic acid followed by large amounts of plain water for at least 5 min as a final step. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.

Ingestion
Call a physician immediately. Do not induce vomiting without medical advice.

4.2. Most important symptoms and effects, both acute and delayed

Main symptoms
shortness of breath, convulsions, cough, hypertensive effect, nausea, vomiting, circulatory collapse, discomfort.

Special hazard
Stomach perforation, Lung oedema.

4.3. Indication of any immediate medical attention and special treatment needed

General advice
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat as an alkaline substance (similar to ammonia). If ingested, irrigate the stomach. Treat skin and mucous membranes with antihistamine and corticoids. In case of lung irritation, first treatment with cortisone spray. Symptoms may be delayed. Later control for pneumonia and lung oedema.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
alcohol-resistant foam, dry chemical, carbon dioxide (CO2), water spray

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:

carbon monoxide (CO)
carbon dioxide (CO2)
nitrogen oxides (NOx)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Vapours are heavier than air and may spread along floors
Vapour/air-mixtures are explosive at intense warming

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting
Cool containers / tanks with water spray. Dike and collect water used to fight fire. Water run-off and vapor cloud may be corrosive. Water run-off can cause environmental damage. Keep people away from and upwind of fire. Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant). Water runoff can cause environmental damage.

6.3. Methods and material for containment and cleaning up

Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up
Soak up with inert absorbent material. DO NOT use combustible materials such as sawdust. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes and clothing. Do not use compressed air for filling, discharging or handling. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in

work rooms. Refill and handle product only in closed system.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Incompatible products
strong acids
oxidizing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour/air-mixtures are explosive at intense warming.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Handle under nitrogen, protect from moisture. Keep at temperatures between -1 and 38 °C (30 and 100 °F).

Temperature class
T3

7.3. Specific end use(s)

Intermediate
Lubricants and lubricant additives Formulation

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits India

No exposure limits established.

8.2. Exposure controls

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Respiratory protection
Respirator with A filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material	Viton
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,5 mm
Break through time	> 480 min

Suitable material	polyvinylchloride
Evaluation	Information derived from practical experience
Glove thickness	approx 0,8 mm

Eye protection
Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.
Equipment should conform to EN 166

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Environmental exposure controls
Use product only in closed system. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	colourless
Odour	amine-like
Odour threshold	No data available
pH	9,0 (0,01 g/l in water @ 25 °C (77 °F)) DIN 19268
Melting point/range	- 89 °C
Boiling point/range	277 °C @ 1013 hPa
Flash point	130 °C @ 1013 hPa
Method	DIN EN ISO 2719
Evaporation rate	No data available
Flammability (solid, gas)	Does not apply, the substance is a liquid
Lower explosion limit	0,6 Vol %
Upper explosion limit	3,7 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
0,0023	0,0002	< 0,001	20	68	
0,037	0,0037	< 0,001	50	122	

Vapour density No data available

Relative density

Values	@ °C	@ °F	Method
0,8040	20	68	DIN 51757

Solubility 14 mg/l @ 20 °C, in water, OECD 105
log Pow 7,3 (measured), OECD 117
Autoignition temperature 245 °C @ 1001 hPa
Method DIN 51794
Decomposition temperature No data available
Viscosity 3,7 mPa*s @ 20 °C
Method ASTM D445, dynamic
Oxidizing properties Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties
Explosive properties Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties

9.2. Other information

Molecular weight 241,46
Molecular formula C16 H35 N
log Koc 5,5 @ 23 °C OECD 121
Dissociation constant pKa 10,59 @ 25 °C (77 °F) (calculated)
Refractive index 1,442 @ 20 °C
Surface tension 48,0 mN/m (0,0125 g/l @ 20°C (68°F)), OECD 115

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Vapour/air-mixtures are explosive at intense warming.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

strong acids, oxidizing agents.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed. If heated to thermal decomposition the following decomposition products may occur depending on the conditions. carbon monoxide (CO). nitrogen oxides (NOx). cyanides. nitric acid. nitriles.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure Ingestion, Inhalation, Skin contact, Eye contact

Acute toxicity				
Bis-(2-ethylhexyl)-amine (106-20-7)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	1008 mg/kg	rat, male/female	OECD 401
Dermal	LD50	958 mg/kg	rabbit	
Inhalative	LC50	0,91 mg/l (4h)	rat, male/female	aerosol OECD 403

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
Assessment
The available data lead to the classification given in section 2

Irritation and corrosion				
Bis-(2-ethylhexyl)-amine (106-20-7)				
Target Organ Effects	Species	Result	Method	
Skin	rabbit	corrosive		
Respiratory tract	rat	irritating	Inhalation Risk Test	
Respiratory tract	mouse	irritating	RD50	
Eyes	rabbit	corrosive		

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
Assessment
The available data lead to the classification given in section 2

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
Assessment
Skin sensitization was not tested due to the corrosive properties of the substance
For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity				
Bis-(2-ethylhexyl)-amine (106-20-7)				
Type	Dose	Species	Method	
Subacute toxicity	NOAEL: 75 mg/kg/d	rat, male/female	OECD 422	Oral

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
Assessment
Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Bis-(2-ethylhexyl)-amine (106-20-7)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study

		Escherichia coli			
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation) HPRT	In vitro study
Reproductive toxicity	NOEL 75 mg/kg/d	rat		OECD 422	
Developmental Toxicity	NOEL 75 mg/kg/d	rat		OECD 422	
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 487 micronucleus test	In vitro study

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7

CMR Classification

The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B

Evaluation

In vitro tests did not show mutagenic effects
No reprotoxic effects in the absence of maternal toxicity
No cancer study was conducted

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7

Main symptoms

shortness of breath, convulsions, cough, hypertensive effect, nausea, vomiting, circulatory collapse, discomfort.

Target Organ Systemic Toxicant - Single exposure

no data available

Target Organ Systemic Toxicant - Repeated exposure

no data available

Aspiration toxicity

no data available

Other adverse effects

Components of the product may be absorbed into the body through the skin.

Note

Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:
http://echa.europa.eu/information-on-chemicals/registered-substances.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
Bis-(2-ethylhexyl)-amine (106-20-7)			
Species	Exposure time	Dose	Method
Leuciscus idus (Golden orfe)	96h	LC50: > 1,5 - < 2,2 mg/l	DIN 38412, part 15
Daphnia magna (Water flea)	48h	EC50: 2,2 mg/l	79/831/EEC.C2
Desmodesmus subspicatus	72h	EC50: 1,55 mg/l (Growth rate)	OECD 201
Activated sludge (bacteriae)	3 h	EC50: 89 mg/l	OECD 209

Long term toxicity				
Bis-(2-ethylhexyl)-amine (106-20-7)				
Type	Species	Dose	Method	

Reproductive toxicity	Daphnia magna (Water flea)	NOEC: 0,069 mg/l (21d)	OECD 211	
Reproductive toxicity	Daphnia magna (Water flea)	LOEC: 0,133 mg/l/21d	OECD 211	
Reproductive toxicity	Earthworm	NOEC: 20 mg/l (56d)	OECD 222	
Aquatic toxicity	Desmodesmus subspicatus	NOEC: 0,14 mg/l (3d)	OECD 201	

12.2. Persistence and degradability

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
Biodegradation
69 % (28 d), activated sludge (domestic), adapted, aerobic, OECD 301 B, Readily biodegradable, failing 10-d window.

Abiotic Degradation		
Bis-(2-ethylhexyl)-amine (106-20-7)		
Type	Result	Method
Hydrolysis	not expected	
Photolysis	Half-life (DT50): 3,67 h	SRC AOP v1.92

12.3. Bioaccumulative potential

Bis-(2-ethylhexyl)-amine (106-20-7)		
Type	Result	Method
log Pow	7,3	measured, OECD 117
BCF	Significant bioaccumulation not to be expected	QSAR

12.4. Mobility in soil

Bis-(2-ethylhexyl)-amine (106-20-7)		
Type	Result	Method
Surface tension	48,0 mN/m (0,0125 g/l @ 20°C (68°F))	OECD 115
Adsorption/Desorption	log Koc: 5,5 @ pH 7	OECD 121
Distribution to environmental compartments	Air: 0% Soil: 49,5% Water: 0% Sediment: 50,1% Suspended sediment: 0,3%	Calculation according Mackay, Level I

12.5. Results of PBT and vPvB assessment

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
No data available

Note
Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.
Hazardous waste according to European Waste Catalogue (EWC)

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

ICAO-TI / IATA-DGR

14.1. UN number	UN 2922
14.2. UN proper shipping name	Corrosive liquid, toxic, n.o.s. (Di-(2-ethylhexyl) amine)
14.3. Transport hazard class(es)	8
Subsidiary Risk	6.1
14.4. Packing group	II
14.5. Environmental hazards	Fish and tree
14.6. Special precautions for user	no data available

IMDG

14.1. UN number	UN 2922
14.2. UN proper shipping name	Corrosive liquid, toxic, n.o.s. (Di-(2-ethylhexyl) amine)
14.3. Transport hazard class(es)	8
Subsidiary Risk	6.1
14.4. Packing group	II
14.5. Environmental hazards	
Marking	Fish and tree
Marine pollutant	yes
14.6. Special precautions for user	
EmS	F-A, S-B
14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code	not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation 1272/2008, Annex VI
not listed

International Inventories

Bis-(2-ethylhexyl)-amine, CAS: 106-20-7
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2033724 (EU)
ENCS (2)-138 (JP)
ENCS (2)-176 (JP)
ISHL (2)-138 (JP)
ISHL (2)-176 (JP)
ISHL 2-(10)-66 (JP)
KECI 97-1-120 (KR)
KECI KE-05-0210 (KR)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC (NZ)
TCSI (TW)

National regulatory information India

Hazardous Chemicals, Schedule 2: Threshold Quantities at an Isolated Storage
not listed

Hazardous Chemicals, Schedule 3: Threshold Quantities in an Industrial Installation
not listed

For details and further information please refer to the original regulation.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3
H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H331: Toxic if inhaled.
H410: Very toxic to aquatic life with long lasting effects.

Abbreviations
A table of terms and abbreviations can be found under the following link:
http://echa.europa.eu/documents/10162/13632/information_requirements_r20_en.pdf

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).

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End of Safety Data Sheet