Section 1. Identification of the substance/preparation and of the company/undertaking

Product name: LOCTITE EA 9464 B

Other means of identification: LOCTITE EA 9464B EXTSFG
Product code: IDH2019813
Recommended use of the chemical and restrictions on use

Intended use: Epoxy adhesive
Manufacturer/Importer/Distributor Representative Company

Henkel Adhesive Tech. Vietnam Co., Ltd,
No. 7, Road 9A Bien Hoa II Industrial Zone,
Bien Hoa City,
810000 Dong Nai Province

Vietnam

Phone: +84 (28) 7100 6301
Fax-no.: +84 (28) 7100 6300

E-mail address of person responsible for Safety Data Sheet: ap-ua-psra.sea@henkel.com

Emergency Telephone for Chemical Accidents: FOR EMERGENCIES ONLY (Spill, major leak, Fire, Exposure, or Accident). Call: +84 28 71006388

Section 2. Hazards identification

GHS Classification:

Hazard Class	Hazard Category
Skin corrosion/irritation	Category 1B
Serious eye damage/eye irritation	Category 1
Skin sensitizer	Category 1
Toxic to reproduction	Category 2

GHS label elements:

Hazard pictogram:



Signal word: Danger

Hazard statement:
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H361 Suspected of damaging fertility or the unborn child.

Precaution:

Prevention:
P201 Obtain special instructions before use.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340+P310 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P363 Wash contaminated clothing before reuse.

Disposal:
P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Section 3. Composition / information on ingredients

Substance or Mixture:
Mixture

Declaration of hazardous chemical:

Hazard component CAS-No.	Content	GHS Classification
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated 68683-29-4	10- 30 %	Skin corrosion/irritation 2 H315 Skin Sensitization 1 H317
Barite (Ba(SO4)) 13462-86-7	10- 30 %	
benzyl alcohol 100-51-6	1- 10 %	Acute toxicity 4; Oral H302 Serious eye damage/eye irritation 2A H319 Skin Sensitization 1B H317
formaldehyde, polymeric reaction products with 4-tertbutylphenol, m-phenylenebis(methylamine) and trimethylhexane-1,6-diamine	1- 10 %	Skin corrosion/irritation 1B H314 Serious eye damage/eye irritation 1 H318 Skin Sensitization 1A H317 Chronic hazards to the aquatic environment 3 H412
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	1- 10 %	Acute toxicity 4; Oral H302 Skin corrosion/irritation 1B H314 Skin Sensitization 1 H317 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
2,2',2"-Nitrilotriethanol 102-71-6	1- 10 %	
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 5; Inhalation H333 Skin corrosion/irritation 1B H314 Serious eye damage/eye irritation 1 H318 Skin Sensitization 1A H317 Acute hazards to the aquatic environment 3 H402
2-piperazin-1-ylethylamine 140-31-8	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 3; Dermal H311 Skin corrosion/irritation 1B H314 Skin Sensitization 1B H317 Reproductive toxicant. 2 H361 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
Silica, amorphous, fumed, cryst.-free 112945-52-5	1- 10 %	
m-Phenylenebis(methylamine) 1477-55-0	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 4; Inhalation H332 Skin corrosion/irritation 1B H314 Serious eye damage/eye irritation 1

		H318 Skin Sensitization 1B H317 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
Carbon black 1333-86-4	0.1- 1 %	

Section 4. First aid measures

Inhalation: Move to fresh air. If symptoms persist, seek medical advice.

Skin contact: Rinse with running water and soap.
Obtain medical attention if irritation persists.

Eye contact: Rinse immediately with plenty of running water (for 10 minutes), seek medical attention from a specialist.

Ingestion: Rinse mouth, drink 1-2 glasses of water, do not induce vomiting, consult a doctor.

Indication of immediate medical attention and special treatment needed: See section: Description of first aid measures

Section 5. Fire fighting measures

Suitable extinguishing media: Carbon dioxide, foam, powder

Improper extinguishing media: High pressure waterjet

Specific hazards arising from the chemical: In the event of a fire, carbon monoxide (CO), carbon dioxide (CO2) and nitrogen oxides (NOx) can be released.

Special protection equipment and precautions for firefighters: Wear protective equipment.
Wear self-contained breathing apparatus.

Additional fire fighting advice: In case of fire, keep containers cool with water spray.

Section 6. Accidental release measures

Personal precautions: Avoid contact with skin and eyes.
Wear protective equipment.
Ensure adequate ventilation.

Environmental precautions: Do not empty into drains / surface water / ground water.

Clean-up methods: For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.
Dispose of contaminated material as waste according to Section 13.

Section 7. Handling and storage

Handling:

Avoid skin and eye contact.
Use only in well-ventilated areas.
Gloves and safety glasses should be worn
See advice in section 8

Storage:

Store in sealed original container.
Protect against contamination.Store in a cool, well-ventilated place.
Refer to Technical Data Sheet.

Section 8. Exposure controls / personal protection

Components with specific control parameters for workplace:

BARIUM AND SOLUBLE COMPOUNDS, AS BA 13462-86-7	**Value type**	Time Weighted Average (TWA):
	mg/m³	0.5
	Remarks	ACGIH
TRIETHANOLAMINE 102-71-6	**Value type**	Time Weighted Average (TWA):
	mg/m³	5
	Remarks	ACGIH
Particles (insoluble or poorly soluble) not otherwise specified, respirable particles 112945-52-5	**Value type**	Time Weighted Average (TWA):
	mg/m³	3
	Remarks	ACGIH
Particles (insoluble or poorly soluble) not otherwise specified, inhalable particles 112945-52-5	**Value type**	Time Weighted Average (TWA):
	mg/m³	10
	Remarks	ACGIH
m-Xylene α,α'-diamine 1477-55-0	**Value type**	Ceiling Limit Value:
	ppm	0.018
	Remarks	ACGIH
m-Xylene α,α'-diamine 1477-55-0	**Value type**	Skin designation:
	Remarks	ACGIH Danger of cutaneous absorption
CARBON BLACK, INHALABLE FRACTION 1333-86-4	**Value type**	Time Weighted Average (TWA):
	mg/m³	3
	Remarks	ACGIH
CARBON BLACK 1333-86-4	**Value type**	Time Weighted Average (TWA):
	mg/m³	3.5
	Remarks	VN OEL
CARBON BLACK 1333-86-4	**Value type**	Short-term exposure limit (STEL):
	mg/m³	7
	Remarks	VN OEL

Respiratory protection:
Ensure adequate ventilation.
An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
Filter type: A (EN 14387)

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing.
Protective eye equipment should conform to EN166.

Body protection:	Wear suitable protective clothing. Protective clothing should conform to EN 14605 for liquid splashes or to EN 13982 for dusts.
Engineering controls:	Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.
General protection and hygiene measures:	The workplace should be equipped with an emergency shower and eye-rinsing facility.
Hygienic measures:	Wash hands before work breaks and after finishing work. Do not eat, drink or smoke while working. Take off contaminated clothing and wash before reuse.

Section 9. Physical and chemical properties

Appearance:	Black liquid
Odor:	Typical
Odor threshold (CA):	No data available.
pH:	Not applicable, Product is non-soluble (in water).
Melting point / freezing point:	Not applicable, Product is a liquid
Specific gravity:	No data available.
Boiling point:	> 150 °C (> 302 °F)
Flash point:	> 80.00 °C (> 176 °F)
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Lower explosive limit:	No data available.
Upper explosive limit:	No data available.
Vapor pressure: (; 20 °C (68 °F))	< 700 mbar
Vapor density:	> 1
Density:	1.36 g/cm3
Solubility:	No data available.
Partition coefficient: n-octanol/water:	No data available.
Auto ignition:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.
VOC content: (2010/75/EC)	< 3 %

Section 10. Stability and reactivity

Reactivity/Incompatible materials:	Keep away from strong oxidizing agents, strong Lewis or mineral acids.
Chemical stability:	Stable under recommended storage conditions.
Conditions to avoid:	Stable under normal conditions of storage and use. Avoid contact with water. Avoid contact with acids and oxidizing agents.
Hazardous decomposition products:	carbon oxides.

Section 11. Toxicological information

Oral toxicity: Acute toxicity estimate (ATE) : > 2,000 mg/kg
Method: Calculation method

Inhalative toxicity: Acute toxicity estimate (ATE) : > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Dermal toxicity: Acute toxicity estimate (ATE) : > 2,000 mg/kg
Method: Calculation method

Health Effects:
Skin: Causes skin burns.
May cause an allergic skin reaction.
Eyes: Causes serious eye damage.
Symptoms of Overexposure**:** Causes burns.
SKIN: Rash, Urticaria.

Acute oral toxicity:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated 68683-29-4	Value type	LD50
	Value	> 15,380 mg/kg
	Species	rat
	Method	not specified
Barite (Ba(SO4)) 13462-86-7	Value type	LD50
	Value	30,700 - 36,400 mg/kg
	Species	rat
	Method	not specified
Barite (Ba(SO4)) 13462-86-7	Value type	LD50
	Value	> 15,000 mg/kg
	Species	rat
	Method	not specified
benzyl alcohol 100-51-6	Value type	Acute toxicity estimate (ATE)
	Value	1,200 mg/kg
	Species	
	Method	Expert judgement
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Value type	LD50
	Value	1,980 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
2,2',2''-Nitrilotriethanol 102-71-6	Value type	LD50
	Value	6,400 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	Acute toxicity estimate (ATE)
	Value	1,030 mg/kg
	Species	
	Method	Expert judgement
Silica, amorphous, fumed, cryst.-free 112945-52-5	Value type	LD50
	Value	> 5,000 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
m-Phenylenebis(methylamine) 1477-55-0	Value type	LD50
	Value	930 mg/kg
	Species	rat
	Method	equivalent or similar to OECD Guideline 401 (Acute Oral Toxicity)
Carbon black 1333-86-4	Value type	LD50
	Value	> 8,000 mg/kg
	Species	rat
	Method	equivalent or similar to OECD Guideline 401 (Acute Oral Toxicity)

Acute inhalative toxicity:

benzyl alcohol 100-51-6	Value type	LC50
	Value	> 5.4 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	LC50
	Value	> 5.01 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	Acute toxicity estimate (ATE)
	Value	5.011 mg/l
	Exposure time	
	Species	
	Method	Expert judgement
2-piperazin-1-ylethylamine 140-31-8	Value type	Acute toxicity estimate (ATE)
	Value	> 10 mg/l
	Exposure time	4 h
	Species	
	Method	Expert judgement
Silica, amorphous, fumed, cryst.-free 112945-52-5	Value type	LC0
	Value	0.139 mg/l
	Exposure time	4 h
	Species	rat
	Method	not specified
m-Phenylenebis(methylamine) 1477-55-0	Value type	LC50
	Value	1.34 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)

Acute dermal toxicity:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated 68683-29-4	Value type	LD50
	Value	> 3,000 mg/kg
	Species	rabbit
	Method	not specified
benzyl alcohol 100-51-6	Value type	Acute toxicity estimate (ATE)
	Value	2,500 mg/kg
	Species	
	Method	Expert judgement
benzyl alcohol 100-51-6	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rabbit
	Method	not specified
2,2',2"-Nitrilotriethanol 102-71-6	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rabbit
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rat
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
2-piperazin-1-ylethylamine 140-31-8	Value type	LD50
	Value	866 mg/kg
	Species	rabbit
	Method	Draize Test
Silica, amorphous, fumed, cryst.-free 112945-52-5	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rabbit
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
m-Phenylenebis(methylamine) 1477-55-0	Value type	LD50
	Value	> 3,100 mg/kg

	Species	rat
	Method	not specified
Carbon black 1333-86-4	Value type	LD50
	Value	> 15,400 mg/kg
	Species	rabbit
	Method	not specified

Skin corrosion/irritation:

benzyl alcohol 100-51-6	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Result	Category 1B (corrosive)
	Exposure time	
	Species	rabbit
	Method	BASF Test
2,2',2"-Nitrilotriethanol 102-71-6	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-piperazin-1-ylethylamine 140-31-8	Result	corrosive
	Exposure time	20 min
	Species	rabbit
	Method	not specified
Silica, amorphous, fumed, cryst.-free 112945-52-5	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Carbon black 1333-86-4	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

Serious eye damage/irritation:

benzyl alcohol 100-51-6	Result	irritating
	Exposure time	24 h
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2,2',2"-Nitrilotriethanol 102-71-6	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	Draize Test
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Result	corrosive
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Silica, amorphous, fumed, cryst.-free 112945-52-5	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Carbon black 1333-86-4	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Result	sensitising
	Test type	Skin sensitisation
	Species	
	Method	QSAR (Quantitative Structure Activity Relationship)
2,2',2"-Nitrilotriethanol 102-71-6	Result	not sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	OECD Guideline 406 (Skin Sensitisation)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Result	sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	OECD Guideline 406 (Skin Sensitisation)
2-piperazin-1-ylethylamine 140-31-8	Result	sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
m-Phenylenebis(methylamine) 1477-55-0	Result	Sub-Category 1B (sensitising)
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Carbon black 1333-86-4	Result	not sensitising
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)

Germ cell mutagenicity:

benzyl alcohol 100-51-6	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	equivalent or similar to OECD Guideline 471 (Bacterial Reverse Mutation Assay)
benzyl alcohol 100-51-6	Result	negative
	Type of study / Route of administration	intraperitoneal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	JAPAN: Guidelines for Screening Mutagenicity Testing Of Chemicals
2,2',2"-Nitrilotriethanol 102-71-6	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2,2',2"-Nitrilotriethanol 102-71-6	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
2,2',2"-Nitrilotriethanol 102-71-6	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2,2',2"-Nitrilotriethanol 102-71-6	Result	negative
	Type of study / Route of administration	sister chromatid exchange assay in mammalian cells
	Metabolic activation / Exposure time	with and without
	Method	not specified
2,2',2"-Nitrilotriethanol 102-71-6	Result	negative
	Type of study / Route of administration	dermal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	Micronucleus assay
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	EU Method B.13/14 (Mutagenicity)
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	DNA damage and repair assay, unscheduled DNA synthesis in mammalian cells in vitro
	Metabolic activation / Exposure time	with and without
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	intraperitoneal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	not specified
Silica, amorphous, fumed, cryst.-free 112945-52-5	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	
	Method	not specified
Silica, amorphous, fumed, cryst.-free	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test

112945-52-5	Metabolic activation / Exposure time	
	Method	not specified
Silica, amorphous, fumed, cryst.-free 112945-52-5	Result	negative
	Type of study / Route of administration	DNA damage and repair assay, unscheduled DNA synthesis in mammalian cells in vitro
	Metabolic activation / Exposure time	
	Method	not specified
m-Phenylenebis(methylamine) 1477-55-0	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	not specified
m-Phenylenebis(methylamine) 1477-55-0	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	not specified
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	sister chromatid exchange assay in mammalian cells
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 479 (Genetic Toxicology: In Vitro Sister Chromatid Exchange Assay in Mammalian Cells)
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	in vitro mammalian cell micronucleus test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 490 (In Vitro Mammalian Cell Gene Mutation Tests Using the Thymidine Kinase Gene)
Carbon black 1333-86-4	Result	negative
	Type of study / Route of administration	inhalation
	Metabolic activation / Exposure time	
	Species	rat
	Method	OECD Guideline 489 (In Vivo Mammalian Alkaline Comet Assay)

Repeated dose toxicity:

benzyl alcohol 100-51-6	Result	NOAEL=400 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	13 weeksonce daily, 5 days/week
	Species	rat
	Method	equivalent or similar to OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
2,2',2"-Nitrilotriethanol 102-71-6	Result	NOAEL=1,000 mg/kg
	Route of application	oral: feed
	Exposure time / Frequency of treatment	91 ddaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
2,2',2"-Nitrilotriethanol 102-71-6	Result	NOAEL=125 mg/kg
	Route of application	dermal
	Exposure time / Frequency of treatment	90 d5 d/w
	Species	rat
	Method	OECD Guideline 411 (Subchronic Dermal Toxicity: 90-Day Study)
2,2',2"-Nitrilotriethanol 102-71-6	Result	
	Route of application	inhalation
	Exposure time / Frequency of treatment	28 d6 h/d, 5 d/w
	Species	rat
	Method	OECD Guideline 412 (Repeated Dose Inhalation Toxicity: 28/14-Day)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Result	NOAEL=< 60 mg/kg
	Route of application	oral: drinking water
	Exposure time / Frequency of treatment	13 weeks
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
2-piperazin-1-ylethylamine 140-31-8	Result	NOAEL=2000 ppm
	Route of application	oral: drinking water
	Exposure time / Frequency of treatment	>= 28 ddaily
	Species	rat
	Method	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
m-Phenylenebis(methylamine) 1477-55-0	Result	LOAEL=>= 600 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	28 daysdaily
	Species	rat
	Method	Guidelines for 28-Day Repeat Dose Toxicity Test (Japan)
Carbon black 1333-86-4	Result	NOAEL=> 1,000 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	90 ddaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
Carbon black 1333-86-4	Result	NOAEL=1 mg/m3
	Route of application	inhalation
	Exposure time / Frequency of treatment	13 w6 h/d, 5 d/w
	Species	rat
	Method	not specified

Section 12. Ecological information

General ecological information: Do not empty into drains / surface water / ground water.

Ecotoxicity:

Toxicity:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated 68683-29-4	Value type	EC50
	Value	1,000 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated 68683-29-4	Value type	EC50
	Value	> 1,000 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	not specified
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Barite (Ba(SO4)) 13462-86-7	Value type	LC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Danio rerio
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
	Value type	NOEC
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	33 d
	Species	Danio rerio
	Method	OECD Guideline 210 (fish early lite stage toxicity test)
Barite (Ba(SO4)) 13462-86-7	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Barite (Ba(SO4)) 13462-86-7	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata (reported as Raphidocelis subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata (reported as Raphidocelis subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Barite (Ba(SO4)) 13462-86-7	Value type	EC0
	Value	> 10,000 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	30 min
	Species	
	Method	not specified
benzyl alcohol 100-51-6	Value type	LC50
	Value	460 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	EPA OPP 72-1 (Fish Acute Toxicity Test)
benzyl alcohol 100-51-6	Value type	EC50
	Value	230 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
benzyl alcohol 100-51-6	Value type	EC50
	Value	770 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata

	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	310 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
benzyl alcohol 100-51-6	Value type	EC10
	Value	658 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	17 h
	Species	Pseudomonas putida
	Method	DIN 38412, part 8 (Pseudomonas Zellvermehrungshemm-Test)
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Value type	EC50
	Value	47.9 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Value type	EC50
	Value	32.3 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	6.97 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
2,2',2"-Nitrilotriethanol 102-71-6	Value type	LC50
	Value	11,800 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
2,2',2"-Nitrilotriethanol 102-71-6	Value type	EC50
	Value	609.88 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Ceriodaphnia dubia
	Method	other guideline:
2,2',2"-Nitrilotriethanol 102-71-6	Value type	EC50
	Value	512 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus (reported as Scenedesmus subspicatus)
	Method	DIN 38412-09
	Value type	EC10
	Value	26 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus (reported as Scenedesmus subspicatus)
	Method	DIN 38412-09
2,2',2"-Nitrilotriethanol 102-71-6	Value type	EC0
	Value	1,000 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	30 min
	Species	
	Method	not specified
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	LC50
	Value	110 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Leuciscus idus
	Method	EU Method C.1 (Acute Toxicity for Fish)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	EC50
	Value	23 mg/l
	Acute Toxicity Study	Daphnia

	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	EC10
	Value	11.2 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	EU Method C.3 (Algal Inhibition test)
	Value type	EC50
	Value	> 50 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	EU Method C.3 (Algal Inhibition test)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Value type	EC10
	Value	1,120 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	18 h
	Species	Pseudomonas putida
	Method	DIN 38412, part 8 (Pseudomonas Zellvermehrungshemm-Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	LC50
	Value	> 100 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Salmo gairdneri (new name: Oncorhynchus mykiss)
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	EC50
	Value	32 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	NOEC
	Value	31 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EC50
	Value	495 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	EC10
	Value	100 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	17 h
	Species	
	Method	not specified
Silica, amorphous, fumed, cryst.-free 112945-52-5	Value type	LC50
	Value	> 10,000 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Brachydanio rerio (new name: Danio rerio)
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
m-Phenylenebis(methylamine) 1477-55-0	Value type	LC50
	Value	87.6 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Oryzias latipes
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
m-Phenylenebis(methylamine) 1477-55-0	Value type	EC50
	Value	15.2 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)

m-Phenylenebis(methylamine) 1477-55-0	Value type	EC50
	Value	33.3 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	22.9 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
m-Phenylenebis(methylamine) 1477-55-0	Value type	EC50
	Value	> 1,000 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	30 min
	Species	activated sludge
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
Carbon black 1333-86-4	Value type	LC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Brachydanio rerio (new name: Danio rerio)
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
Carbon black 1333-86-4	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Daphnia
	Exposure time	24 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Carbon black 1333-86-4	Value type	NOEC
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Carbon black 1333-86-4	Value type	EC0
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge, domestic
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

Persistence and degradability:

benzyl alcohol 100-51-6	Result	readily biodegradable
	Route of application	aerobic
	Degradability	92 - 96 %
	Method	OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I))
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)
2,2',2"-Nitrilotriethanol 102-71-6	Result	readily biodegradable
	Route of application	aerobic
	Degradability	97 - 100 %
	Method	EU Method C.4-B (Determination of the "Ready" BiodegradabilityModified OECD Screening Test)
	Result	inherently biodegradable
	Route of application	aerobic
	Degradability	99 %
	Method	EU Method C.9 (Biodegradation: Zahn-Wellens Test)

3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	8 %
	Method	EU Method C.4-A (Determination of the "Ready" BiodegradabilityDissolved Organic Carbon (DOC) Die-Away Test)
2-piperazin-1-ylethylamine 140-31-8	Result	under test conditions no biodegradation observed
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
m-Phenylenebis(methylamine) 1477-55-0	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	49 %
	Method	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)

Bioaccumulative potential / Mobility in soil:

Barite (Ba(SO4)) 13462-86-7	Bioconcentration factor (BCF)	74.4
	Exposure time	
	Species	Lepomis macrochirus
	Temperature	
	Method	other guideline:
benzyl alcohol 100-51-6	LogPow	1.05
	Temperature	20 °C
	Method	EU Method A.8 (Partition Coefficient)
N,N'-Bis(3-aminopropyl)piperazine 7209-38-3	LogPow	-1.43
	Temperature	25 °C
	Method	QSAR (Quantitative Structure Activity Relationship)
2,2',2"-Nitrilotriethanol 102-71-6	LogPow	-1.9
	Temperature	25 °C
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
3- Aminomethyl-3,5,5-trimethylcyclohexylamine 2855-13-2	LogPow	0.99
	Temperature	23 °C
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
2-piperazin-1-ylethylamine 140-31-8	LogPow	-1.48
	Temperature	
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
m-Phenylenebis(methylamine) 1477-55-0	LogPow	0.18
	Temperature	25 °C
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)

Section 13. Disposal considerations

Product

Method of disposal: Dispose of in accordance with local and national regulations.

Packaging

Disposal of uncleaned packages: Packaging that cannot be cleaned are to be disposed of in the same manner as the product.

Section 14. Transport information

Road transport ADR:

Class:	8
Packing group:	II
Classification code:	C7
Hazard ident. number:	80
UN no.:	2735
Label:	8
Technical name:	AMINES, LIQUID, CORROSIVE, N.O.S. (Bis(aminopropyl)piperazine,Isophoronediamine)

Railroad transport RID:

Class:	8
Packing group:	II
Classification code:	C7
Hazard ident. number:	80
UN no.:	2735
Label:	8
Technical name:	AMINES, LIQUID, CORROSIVE, N.O.S. (Bis(aminopropyl)piperazine,Isophoronediamine)

Inland water transport ADN:

Class:	8
Packing group:	II
Classification code:	C7
Hazard ident. number:	80
UN no.:	2735
Label:	8
Technical name:	AMINES, LIQUID, CORROSIVE, N.O.S. (Bis(aminopropyl)piperazine,Isophoronediamine)

Marine transport IMDG:

Class:	8
Packing group:	II
UN no.:	2735
Label:	8
EmS:	F-A ,S-B
Seawater pollutant:	-
Proper shipping name:	AMINES, LIQUID, CORROSIVE, N.O.S. (Bis(aminopropyl)piperazine,Isophoronediamine)

Air transport IATA:

Class:	8
Packing group:	II
Packaging instructions (passenger):	851
Packaging instructions (cargo):	855
UN no.:	2735
Label:	8
Proper shipping name:	Amines, liquid, corrosive, n.o.s. (Bis(aminopropyl)piperazine,Isophoronediamine)

Section 15. Regulatory information

Regulatory Information: This Safety Data Sheet has been generated based on

LAW ON CHEMICALS No. 06/2007/QH12, issued on November 21,

2007;

Decree No. 113/2017/ND-CP SPECIFYING AND PROVIDING GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS, issued on November 25, 2017;

Circular No 32/2017/TT-BCT SPECIFYING AND PROVIDING GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS AND THE GOVERNMENT'S DECREE NO. 113/2017/ND-CP DATED OCTOBER 09, 2017 SPECIFYING AND PROVIDING GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS, issued on December 28, 2017;

Decree No. 82/2022/ND-CP AMENDMENTS TO SOME ACTICLES OF GOVERNMENT'S DECREE NO.113/2017/ND-CP DATED OCTOBER 09, 2017 SPECIFYING AND PROVIDING GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS, issued on December 22, 2022;

Circular No. 17/2022/TT-BCT AMENDMENTS TO SOME ACTICLES OF CIRCULAR NO. 32/2017/TT-BCT DATED DECEMBER 28, 2017 OF THE MINISTER OF INDUSTRY AND TRADE ON ELABORATION AND PROVISION OF GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS AND THE GOVERNMENT'S DECREE NO. 113/2017/ND-CP DATED OCTOBER 09, 2017 ON ELABORATION AND PROVISION OF GUIDELINES FOR IMPLEMENTATION OF CERTAIN ARTICLES OF THE LAW ON CHEMICALS, issued on December 22, 2022.

Section 16. Other information

Disclaimer:

This Safety Data Sheet has been generated based on LAW ON CHEMICALS No. 06/2007/QH12; Decree No. 113/2017/ND-CP; Circular No 32/2017/TT-BCT; Decree No. 82/2022/ND-CP and Circular No. 17/2022/TT-BCT.
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