

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: **2551**  
Version: **GHS 3.0 en**  
Replaces version of: 2022-05-04  
Version: (GHS 2)

date of compilation: 2020-12-11  
Revision: 2024-03-02

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

### 1.1 Product identifier

Identification of the substance	<b>Epoxy systems Aradur® H 2 hardener</b>
Article number	2551
CAS number	90640-67-8
Alternative name(s)	Amines, polyethylenepoly-, triethylenetetramine fraction

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

Relevant identified uses:	Laboratory chemical Laboratory and analytical use Adhesive
Uses advised against:	Do not use for squirting or spraying. Do not use for products which come into direct contact with the skin. Do not use for private purposes (household). Food, drink and animal feedingstuffs.

### 1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG  
Schoemperlenstr. 3-5  
D-76185 Karlsruhe  
Germany

**Telephone:** +49 (0) 721 - 56 06 0

**Telefax:** +49 (0) 721 - 56 06 149

**e-mail:** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

**Website:** [www.carlroth.de](http://www.carlroth.de)

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

**e-mail (competent person):** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

### 1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification acc. to GHS**

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.1O	Acute toxicity (oral)	4	Acute Tox. 4	H302
3.1D	Acute toxicity (dermal)	4	Acute Tox. 4	H312
3.2	Skin corrosion/irritation	1	Skin Corr. 1	H314
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4S	Skin sensitisation	1	Skin Sens. 1	H317

For full text of abbreviations: see SECTION 16

### The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis.

## 2.2 Label elements

### Labelling

#### Signal word

**Danger**

#### Pictograms

GHS05, GHS07



#### Hazard statements

H302+H312 Harmful if swallowed or in contact with skin  
H314 Causes severe skin burns and eye damage  
H317 May cause an allergic skin reaction

#### Precautionary statements

##### Precautionary statements - prevention

P260 Do not breathe dusts or mists  
P280 Wear protective gloves/protective clothing

##### Precautionary statements - response

P302+P352 IF ON SKIN: Wash with plenty of soap and water  
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P363 Wash contaminated clothing before reuse

##### Precautionary statements - disposal

P501 Dispose of contents/container to industrial combustion plant

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### 2.3 Other hazards

#### Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

#### Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Amines, polyethylenepoly-, triethylenetetramine fraction
Molecular formula	$C_6H_{18}N_4$
Molar mass	146.2 g/mol
CAS No	90640-67-8

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off immediately all contaminated clothing.

#### Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

#### Following skin contact

After contact with skin, wash immediately with plenty of water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure. In case of skin reactions, consult a physician.

#### Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

#### Following ingestion

Rinse mouth immediately and drink plenty of water. Rinse mouth with water (only if the person is conscious). Call a physician immediately. If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects).

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

Corrosion, Vomiting, Risk of blindness, Gastric perforation, Risk of serious damage to eyes, Allergic reactions

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

none

## Epoxy systems Aradur® H 2 hardener

article number: 2551

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media



##### Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings!  
water spray, alcohol resistant foam, dry extinguishing powder, BC-powder, carbon dioxide (CO<sub>2</sub>)

##### Unsuitable extinguishing media

water jet

#### 5.2 Special hazards arising from the substance or mixture

Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air.

##### Hazardous combustion products

In case of fire may be liberated: Nitrogen oxides (NO<sub>x</sub>), Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>)

#### 5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures



##### For non-emergency personnel

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray.

#### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

#### 6.3 Methods and material for containment and cleaning up

##### Advice on how to contain a spill

Covering of drains.

##### Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

##### Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

#### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

Provision of sufficient ventilation. Handle and open container with care. Clear contaminated areas thoroughly.

#### Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

#### 7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed.

#### Incompatible substances or mixtures

Observe hints for combined storage.

#### Consideration of other advice:

#### Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

#### 7.3 Specific end use(s)

No information available.

### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

##### National limit values

##### Occupational exposure limit values (Workplace Exposure Limits)

This information is not available.

##### Human health values

Relevant DNELs and other threshold levels				
Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	0.54 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects

##### Environmental values

Relevant PNECs and other threshold levels				
End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0.027 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0.003 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	0.13 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	8.572 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	0.857 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	1.25 mg/kg	terrestrial organisms	soil	short-term (single instance)

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### 8.2 Exposure controls

#### Individual protection measures (personal protective equipment)

##### Eye/face protection



Use safety goggle with side protection. Wear face protection.

##### Skin protection



##### • hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

##### • type of material

Butyl caoutchouc (butyl rubber)

##### • material thickness

≥0,5 mm

##### • breakthrough times of the glove material

>480 minutes (permeation: level 6)

##### • other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

##### Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C, colour code: Brown).

##### Environmental exposure controls

Keep away from drains, surface and ground water.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless - whitish
Odour	faintly perceptible
Melting point/freezing point	<-70 °C at 1,013 hPa
Boiling point or initial boiling point and boiling range	274.6 °C at 1,013 hPa (ECHA)
Flammability	this material is combustible, but will not ignite readily
Lower and upper explosion limit	1 vol% (LEL) - 3.6 vol% (UEL)
Flash point	118 °C (c.c.) (ECHA)
Auto-ignition temperature	325 °C at 1,025 hPa
Decomposition temperature	>240 °C
pH (value)	~13 (in aqueous solution: 1,000 g/l, 20 °C)
Kinematic viscosity	28.6 mm <sup>2</sup> /s at 20 °C 10.8 mm <sup>2</sup> /s at 40 °C
Dynamic viscosity	13.9 mPa s at 40 °C
<u>Solubility(ies)</u>	
Water solubility	>1,000 g/l at 20 °C (ECHA)
Solubility in methanol	partially soluble
Solubility in organic solvents	partially soluble
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	-2.65 (TETA)
Soil organic carbon/water (log KOC)	3.2 (ECHA)
Vapour pressure	0.346 Pa at 20 °C
<u>Density and/or relative density</u>	
Density	0.971 g/cm <sup>3</sup> at 25 °C
Relative vapour density	5.04 (air = 1)
Particle characteristics	not relevant (liquid)
<u>Other safety parameters</u>	
Oxidising properties	none

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### 9.2 Other information

Information with regard to physical hazard classes:

hazard classes acc. to GHS (physical hazards): not relevant

Other safety characteristics:

There is no additional information.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

This material is not reactive under normal ambient conditions.

#### If heated

Vapours may form explosive mixtures with air.

### 10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

### 10.3 Possibility of hazardous reactions

**Violent reaction with:** strong oxidiser, Strong acid

### 10.4 Conditions to avoid

Keep away from heat. Decomposition takes place from temperatures above: >240 °C.

### 10.5 Incompatible materials

acids, copper, nickel, cobalt

### 10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Classification acc. to GHS

#### Acute toxicity

Harmful if swallowed. Harmful in contact with skin.

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	1,862 mg/kg	rat		ECHA
dermal	LD50	1,465 mg/kg	rabbit		ECHA

#### Skin corrosion/irritation

Causes severe skin burns and eye damage.

#### Serious eye damage/eye irritation

Causes serious eye damage.

#### Respiratory or skin sensitisation

May cause an allergic skin reaction.

#### Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.



# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### Carcinogenicity

Shall not be classified as carcinogenic.

### Reproductive toxicity

Shall not be classified as a reproductive toxicant.

### Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

### Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

### Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

### Symptoms related to the physical, chemical and toxicological characteristics

#### • If swallowed

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

#### • If in eyes

causes burns, Causes serious eye damage, risk of blindness

#### • If inhaled

irritant effects, cough, Dyspnoea

#### • If on skin

causes severe burns, causes poorly healing wounds, May produce an allergic reaction, pruritis, localised redness

#### • Other information

none

### 11.2 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

## SECTION 12: Ecological information

### 12.1 Toxicity

Harmful to aquatic life with long lasting effects.

Aquatic toxicity (acute)				
Endpoint	Value	Species	Source	Exposure time
LC50	330 mg/l	fish	ECHA	96 h
EC50	31.1 mg/l	aquatic invertebrates	ECHA	48 h
ErC50	20 mg/l	algae	ECHA	72 h

Aquatic toxicity (chronic)				
Endpoint	Value	Species	Source	Exposure time
EC50	<10 mg/l	aquatic invertebrates	ECHA	21 d

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### 12.2 Persistence and degradability

Theoretical Oxygen Demand (without nitrification): 1.641 mg/mg

Theoretical Oxygen Demand (with nitrification): 2.366 mg/mg

Theoretical Carbon Dioxide: 1.806 mg/mg

#### Biodegradation

Not readily biodegradable.

Process of degradability		
Process	Degradation rate	Time
biotic/abiotic	0 %	28 d
oxygen depletion	0 %	162 d
DOC removal	20 %	84 d

### 12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)	-2.65 (TETA)
---------------------------	--------------

### 12.4 Mobility in soil

The Organic Carbon normalised adsorption coefficient	3.2 (ECHA)
--	------------

### 12.5 Results of PBT and vPvB assessment

Data are not available.

### 12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

### 12.7 Other adverse effects

Data are not available.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packagings

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used. Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

#### Relevant provisions relating to waste(Basel Convention)

#### Properties of waste which render it hazardous

H8 Corrosives

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

## SECTION 14: Transport information

### 14.1 UN number

UN RTDG	UN 2259
IMDG-Code	UN 2259
ICAO-TI	UN 2259

### 14.2 UN proper shipping name

UN RTDG	TRIETHYLENETETRAMINE
IMDG-Code	TRIETHYLENETETRAMINE
ICAO-TI	Triethylenetetramine

### 14.3 Transport hazard class(es)

UN RTDG	8
IMDG-Code	8
ICAO-TI	8

### 14.4 Packing group

UN RTDG	II
IMDG-Code	II
ICAO-TI	II

### 14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

### 14.6 Special precautions for user

There is no additional information.

### 14.7 Transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

### 14.8 Information for each of the UN Model Regulations

#### Transport information National regulations Additional information (UN RTDG)

UN number	2259
Class	8
Packing group	II
Danger label(s)	8



Special provisions (SP)	- UN RTDG
-------------------------	--------------



# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

<b>Excepted quantities (EQ)</b>	E2 UN RTDG
<b>Limited quantities (LQ)</b>	1 L UN RTDG
<b>Emergency Action Code</b>	2X
<b>International Maritime Dangerous Goods Code (IMDG) - Additional information</b>	
Proper shipping name	TRIETHYLENETETRAMINE
Particulars in the shipper's declaration	UN2259, TRIETHYLENETETRAMINE, 8, II
Marine pollutant	-
Danger label(s)	8
	
Special provisions (SP)	-
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
EmS	F-A, S-B
Stowage category	B
Segregation group	18 - Alkalis
<b>International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information</b>	
Proper shipping name	Triethylenetetramine
Particulars in the shipper's declaration	UN2259, Triethylenetetramine, 8, II
Danger label(s)	8
	
Excepted quantities (EQ)	E2
Limited quantities (LQ)	0,5 L

## SECTION 15: Regulatory information

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

There is no additional information.

#### Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

### National inventories

Country	Inventory	Status
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
KR	KECI	substance is listed
NZ	NZIoC	substance is listed
VN	NCI	substance is listed

#### Legend

ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
REACH Reg.	REACH registered substances

### 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$ .	yes
14.8		Emergency Action Code: 2X	yes
15.1		National inventories: change in the listing (table)	yes

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	$\equiv$ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Epoxy systems Aradur® H 2 hardener

article number: 2551

Abbr.	Descriptions of used abbreviations
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
LEL	Lower explosion limit (LEL)
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
UEL	Upper explosion limit (UEL)
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative

### Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

### List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.

### Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.