

### ОБЩИЕ СВОЙСТВА:

Система из эпоксидной смолы REVOWRAP 110 специально разработана для пропитки стеклянных, углеродных и арамидных технических тканей для ремонта трубы. Эта система может быть нанесена вручную ламинированием, путем намотки нити накала или инфузионными методами. Система REVOWRAP 110 предназначена для применения при температуре до 110°C. Она отлично наносится при температуре окружающей среды при 60-минутным сроком пригодности. Она обеспечивает отличные механические, термические и химические стойкие свойства.

### ФИЗИЧЕСКИЕ ХАРАКТЕРИСТИКИ:

СОСТАВ	СМОЛА	ОТВЕРДИТЕЛЬ	СМЕСЬ
Соотношение смеси по объему при 25°C	100	25	
Внешний вид	Жидкость	Жидкость	Жидкость
Цвет	Прозрачный	оранжевый	
Вязкость при 25°C (МПа) (BROOKFIELD LVT)	900	950	2,000
Удельный вес при 25°C (ISO 1675: 1985)			-
Удельный вес отвержденного продукта при температуре 23°C (ISO 2781 : 1996)	-	-	
Срок годности при 25°C на 500 г (мин)			65

### МЕХАНИЧЕСКИЕ ХАРАКТЕРИСТИКИ:

Окончательная твердость	ISO 527 : 1993	МПа	87
Предел прочности	ISO 527 : 1993	МПа	65 ± 5
Удлинение при разрыве	ISO 527 : 1993	%	5.0
Модуль на изгиб	ISO 178 : 1993	МПа	131 ± 5
Модуль упругости при изгибе (МПа)	ISO 178 : 1993	МПа	3500 ± 200

### ТЕРМИЧЕСКАЯ ОБРАБОТКА:

Для Revowrap110 не требуется термическая обработка, она предназначена для отверждения в условиях окружающей среды. В том случае, если температура окружающей среды ниже 9 °C, рекомендуется предварительно отверждать эпоксидную смолу в течение 8 часов при температуре 80 градусов Цельсия.

### ХРАНЕНИЕ И СТАБИЛЬНОСТЬ:

Срок годности смолы составляет 9 месяцев, а отвердителя - 24 месяца в сухом месте и в оригинальной закрытой таре при температуре от 10°C до 25°C. любая открытая банка должна быть плотно закрыта сухим азотным одеялом.

### УПАКОВКА:

СМОЛА	ОТВЕРДИТЕЛЬ
1 кг	250 г
5 кг	1.25 кг
25 кг	6.25 кг

### БЕЗОПАСНОСТЬ И ОБРАЩЕНИЕ:

При обращении с этими продуктами следует соблюдать обычные меры предосторожности по охране труда и технике безопасности: обеспечить хорошую вентиляцию. Наденьте перчатки, защитные очки и непромокаемую одежду.

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Для получения дополнительной информации, пожалуйста, обратитесь к паспорту безопасности продукта.

### Гарантия:

Информация наших технических паспортов основана на наших нынешних знаниях и результатах испытаний, проведенных в определенных условиях. Пользователь несет ответственность за определение пригодности продуктов CARBONTECH в своих собственных условиях, прежде чем приступить к предлагаемому применению.

CARBONTECH отказывается давать какие-либо гарантии относительно пригодности продукта в каком-либо конкретном применении. CARBONTECH не несет никакой ответственности за ущерб, причиненный в результате любого инцидента, возникшего в результате использования этих продуктов.

Условия гарантии регулируются нашим общим условием продажи.



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# Revowrap 110

PRODUCT SHEET

**CARBONTECH**  
COMPOSITE SYSTEMS





PRODUCT OVERVIEW

**REVOWRAP 110**

-50°C to 109°C with no pressure limitations!

Revowrap is an engineered composite solution used to restore damaged critical assets back to the original design specification of the equipment. Each repair is engineered using ASME PCC2 or ISO TS 24817 engineering codes for High risk non-metallic repairs. Carbontech engineers have the technology to perform FEA (Finite element analysis) on both the damaged piping systems and the Revowrap composite repair system. Revowrap provides reinforcement of the piping in both the axial and hoop directions, and delivers uniform loading throughout the repair. The "Revowrap110 ®" composite systems are engineered to operate in working temperatures from -50°C to 109°C and bares no pressure limitations. Our composite systems can be applied by hand lamination or by infusion methods and may be applied to live piping systems without shutting down for the repair. Revowrap may be applied to any pipe size, most substrates and almost any piping configuration including tanks, vessels, flanges, and other compromised structural assets.



PRODUCT PERFORMANCE INDICATORS

<b>REVOWRAP 110</b>	ASME PCC2 Compliant	Fully Compliant
	ISO T- 24817 Compliant	Fully Compliant
	Minimum Application Temperature	8°C
	Maximum Application Temperature	100°C
	Minimum Allowable Operating Temperature	-50°C
	Maximum Allowable Operating Temperature	109°C for non Leaking Defects
	Maximum Allowable Operating Pressure	No Limitations
	Shelf Life	2 Years – Extendable
	Set Time @29°C	4 Hours
	Minimum Pipe Diameter	No Limitations
	Maximum Pipe Diameter	No Limitations
	Repair Lifespan	Up to 20 Years
	Through Wall Defects	Permissible



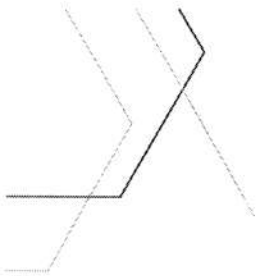


PRODUCT ISO TS-24BT7 & ASME PCC2 QUALIFICATION DATA

REVOWRAP 110	TEST	TEST CODE	METRIC	IMPERIAL
	Ply Thickness	N/A	4mm	0.01575 Inch
	Tensile Modulus Hoop	ASTM D3039	48.8 GPa	7077.8 ksi
	Tensile Modulus Axial	ASTM D3039	41 GPa	5947 ksi
	Tensile Strength Hoop	ASTM D3039	568 MPa	82.4 ksi
	Tensile Strength Axial	ASTM D3039	229 MPa	33.2 ksi
	Tensile strain to failure	ASTM D3039	1.1%	1.1%
	In plane shear modulus	ASTM D5379	1.6 GPa	232 ksi
	Compressive modulus -filler putty	ASTM D695	2.55 GPa	369.8 ksi
	Poisson's Ratio	ASTM D3039	0.33	0.33
	CIE (mm/mm°C, in/in°F)	ASTM E831	1.45x10 <sup>-6</sup>	8.6x10 <sup>-7</sup>
	Heat Distortion Temperature	ASTM D648-07	124°C	255°F
	Shore D Hardness	ASTM D2583	92	92
	Lap Shear Strength - SA2.5	ASTM D3165	14.1MPa	2.05 ksi
	Lap Shear Strength - Bristle Blaster®	ASTM D3165	7.71MPa	1.12 ksi
Lap Shear Strength - Hand Sanded	ASTM D3165	5.86 MPa	0.85 ksi	







PACKAGING INFORMATION

CARBON FIBER FABRIC

Product Code	Description
RCT-50-10	Carbon Cloth: T- 0.44mm-W-50mm x L-100 Meter
RCT-80-10	Carbon Cloth: T- 0.44mm-W-80mm x L-100 Meter
RCT-100-10	Carbon Cloth: T- 0.44mm-W-100mm x L-100 Meter
RCT-150-10	Carbon Cloth: T- 0.44mm-W-150mm x L-100 Meter
RCT-250-10	Carbon Cloth: T- 0.44mm-W-250mm x L-50 Meter
RCT-330-10	Carbon Cloth: T- 0.44mm-W-330mm x L-50 Meter

PRIMER

Product Code	Description
R110-P-A-1	Revowrap110 Primer, Part A, 250g
R110-P-B-1	Revowrap110 Primer, Part B, 68g
R110-P-A-2	Revowrap110 Primer, Part A, 500g
R110-P-B-2	Revowrap110 Primer, Part B, 131g
R110-P-A-3	Revowrap110 Primer, Part A, 1000g
R110-P-B-3	Revowrap110 Primer, Part B, 256g
R110-P-A-4	Revowrap110 Primer, Part A, 10000g
R110-P-B-4	Revowrap110 Primer, Part B, 10000g

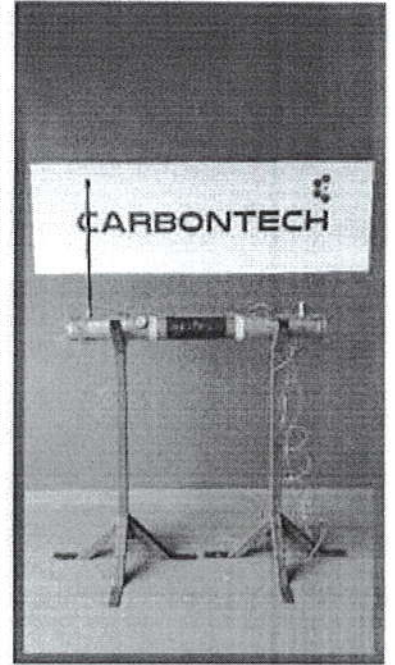
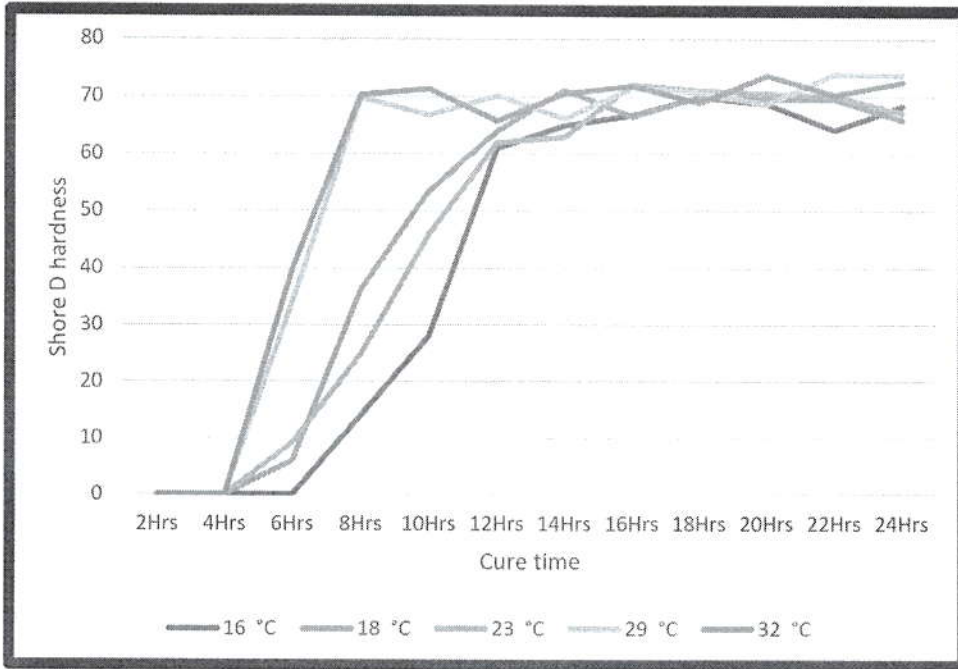
SATURATOR

Product Code	Description
R110-S-A-1	Revowrap110 Saturator, Part A, 260g
R110-S-B-1	Revowrap110 Saturator, Part B, 68g
R110-S-A-2	Revowrap110 Saturator, Part A, 510g
R110-S-B-2	Revowrap110 Saturator, Part B, 131g
R110-S-A-3	Revowrap110 Saturator, Part A, 1010g
R110-S-B-3	Revowrap110 Saturator, Part B, 256g
R110-S-A-4	Revowrap110 Saturator, Part A, 25000g
R110-S-B-4	Revowrap110 Saturator, Part B, 25000g

REVOWRAP 110



## Revowrap 110 cure time VS Shore D Hardness

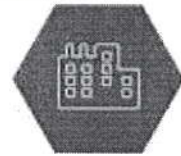


### ADVANTAGES

- ⚡ Fast, Non-invasive repair - does not require hot work
- ⚡ Repairs done live – no unplanned downtime
- ⚡ Can Handle complex geometries
- ⚡ Resistant to Harsh chemicals

### INDUSTRIES

- ⚡ Oil and Gas facilities
- ⚡ Petrochemical plants
- ⚡ Chemical plants
- ⚡ Transmission Pipelines
- ⚡ Potable water



### USES

- ⚡ Internal Corrosion
- ⚡ External corrosion
- ⚡ Mechanical damages
- ⚡ Weld Anomalies





## CARBONTECH

The place chemistry, engineering and global expertise are brought together to drive progressive innovation in advanced composite technologies for the emergency repair of critical assets "There is nothing generic about us" we don't just sell pipe wraps; we provide accurate engineering backing to deliver tailored solutions

Sound and responsible engineering is the basis on which we build our company, products and services. It is the core to our success and it is the foundation on which we have engineered and manufactured our innovative and bespoke products

We strive by a zero-failure philosophy and warrant our engineered composite solutions are tested, proven and validated. We vow to provide dependable, responsible and accurate information regarding the capabilities of our systems

[www.revowrap.com](http://www.revowrap.com)

### CONTACT DETAILS

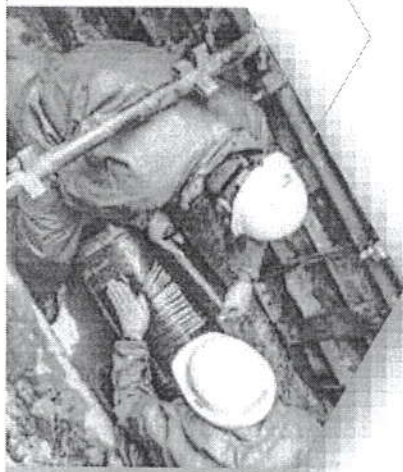
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### PHYSICAL ADDRESS

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PROGRESSIVE COMPOSITE ENGINEERING







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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>PRIMARY EPOXY - PART A</b>	<b>R110-P-A</b>	

### 1 Product and Company Identification

- 1.1 Product identifier:
- 1.2 Product types: R110-P-A
- 1.3 Company identification: Carbontech Composite Systems  
27 7<sup>th</sup> Avenue  
Edenvale  
1609, Johannesburg  
South Africa  
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[info@carbontech-composites.com](mailto:info@carbontech-composites.com)

### 2 Hazard(s) Identification

- 2.1 Hazard description: Xi Irritant  
N Dangerous for the environment
- 2.2 Information concerning particular hazards for human and environment:  
R 36/38 Irritating to eyes and skin.  
R 43 May cause sensitization by skin contact.  
R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
Contains epoxy constituents. See information supplied by the manufacturer.

### 3 Composition / Information on Ingredients



- 3.1 Application of the substance / the preparation: Epoxy resin.
- 3.2 Chemical characterization
- 3.2.1 Description: Mixture of substances listed below with non-hazardous additions.
- 3.3 Dangerous components:  
CAS: 25068-38-6  
EINECS: 500-033-5  
reaction product: bisphenol A-(epichlorohydrin); epoxy resin  
(number average molecular weight  $\leq 8700$ )  
Xi, N; R 36/38-43-51/53  
50-100%  
Epoxy derivatives  
Xi, N; R 43-51/53  
2.5-10%

### 4 First-Aid Measures

- 4.1 After inhalation: Supply fresh air and to be sure call for a doctor.  
In case of unconsciousness place patient stably in side position for transportation.
- 4.2 After skin contact: Immediately wash with water and soap and rinse thoroughly.
- 4.3 After eye contact: Rinse opened eye for several minutes under running water.  
Then consult a doctor.
- 4.4 After swallowing: Do not induce vomiting; call for medical help immediately.

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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>PRIMARY EPOXY - PART A</b>	<b>R110-P-A</b>	

## 5 Fire-Fighting Measures

- 5.1 Suitable extinguishing agents: CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- 5.2 For safety reasons unsuitable extinguishing agents: Water with full jet
- 5.3 Special hazards caused by the substance, its products of combustion or resulting gases:
- 5.3.1 In case of fire, the following can be released: Carbon monoxide (CO)
- 5.4 Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:  
Hydrogen chloride (HCl)
- 5.5 Protective equipment:  
Wear fully protective suit.  
Wear self-contained respiratory protective device.
- 5.6 Additional information:  
Collect contaminated firefighting water separately. It must not enter the sewage system.  
Dispose of fire debris and contaminated firefighting water in accordance with official regulations.

## 6 Accidental Release Measures

- 6.1 Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
- 6.2 Measures for environmental protection: Do not allow to enter sewers/ surface or ground water.
- 6.3 Measures for cleaning/collecting: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

## 7 Handling and Storage

- 7.1 Handling:
- 7.1.1 Information for safe handling: Ensure good ventilation/exhaustion at the workplace.
- 7.1.2 Information about fire - and explosion protection: No special measures required.
- 7.2 Storage:
- 7.2.1 Requirements to be met by storerooms and receptacles:  
Prevent any seepage into the ground.
- 7.2.2 Information about storage in one common storage facility:  
Store away from foodstuffs.
- 7.2.3 Further information about storage conditions: Store in cool, dry conditions in well-sealed receptacles.
- 7.2.4 Storage class:
- 7.2.4.1 Class according to regulation on flammable liquids:  
Void

## 8 Exposure Controls / Personal Protective

- 8.1 Additional information about design of technical facilities:  
No further data; see item 7.
- 8.2 Ingredients with limit values that require monitoring at the workplace:  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

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- 8.3 Personal protective equipment:
- 8.4 General protective and hygienic measures: The usual precautionary measures are to be adhered to when handling chemicals. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.
- 8.5 Respiratory protection: Not necessary if room is well-ventilated.
- 8.6 Protection of hands: Protective gloves
- 8.7 Material of gloves: Synthetic rubber gloves
- 8.8 Eye protection: Safety glasses  
Tightly sealed goggles
- 8.9 Body protection: Protective work clothing

**9 Physical and Chemical Properties**

- 9.1 General Information
- 9.1.1 Form: Fluid
- 9.1.2 Colour: Colourless
- 9.1.3 Odour: Weak, characteristic
- 9.2 Change in condition
- 9.2.1 Melting point/Melting range: NA°C
- 9.2.2 Boiling point/Boiling range: >200°C (DIN 53171)
- 9.2.3 Flash point: >110°C (ISO 2719)
- 9.3 Ignition temperature: >300°C (DIN 51 794)
- 9.4 Decomposition temperature: >200°C (DIN 53171)
- 9.5 Self-igniting: Product is not self-igniting.
- 9.6 Danger of explosion: Product does not present an explosion hazard.
- 9.7 Density at 25°C: 1.13 g/cm<sup>3</sup>
- 9.8 Solubility in / Miscibility with water: Insoluble.
- 9.9 Organic solvents: Soluble in many organic solvents

**10 Stability and Reactivity**

- 10.1 Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- 10.2 Dangerous reactions: May produce violent reactions with bases and numerous organic substances including alcohols and amines. Exothermic polymerization.
- 10.3 Dangerous decomposition products: Irritant gases/vapours





**11 Toxicological Information**

- 11.1 Acute toxicity:
  - 11.1.1 LD/LC50 values relevant for classification:
    - 11.1.1.1 25068-38-6 reaction product:
      - bisphenol A-(epichlorohydrin); epoxy resin (number  
Average molecular weight ≤8700)  
Oral LD50 11400 mg/kg (rat)  
Dermal LD50 >2000 mg/kg (rabbit)
  - 11.2 Epoxy derivatives
    - Oral LD50 >9600 mg/kg (rat)  
Dermal LD50 >3800 mg/kg (rabbit)  
In-halative LC50/4 h >5 mg/l (rat)
- 11.3 Primary irritant effect:
  - 11.3.1 On the skin: Irritant to skin and mucous membranes.
  - 11.3.2 On the eye: Irritating effect.
  - 11.3.3 Sensitization: Sensitization possible through skin contact.

**12 Ecological Information**

- 12.1 Information about elimination (persistence and degradability):
- 12.2 Other information: The product is difficultly biodegradable.
- 12.3 General notes: At present there are no ecotoxicological assessments.

**13 Disposal Considerations**

- 13.1 Product Recommendation:
  - Must not be disposed together with household garbage.
  - Do not allow product to reach sewage system.
  - Dispose of the product by burning in a suitable incinerator or bury in an approved land field following all applicable local and/or national regulations.
- 13.2 Uncleaned packaging Recommendation:
  - Empty containers may not be disposed of unless any remaining material adhering to the internal walls have been removed.
  - Disposal must be made according to official regulations.



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#### 14 Transport Information



14.1	Land transport ADR/RID (cross-border)	
14.1.1	ADR/RID class:	9 Miscellaneous dangerous substances and articles.
14.1.2	Danger code (Kemler):	90
14.1.3	UN-Number:	3082
14.1.4	Packaging group:	III
14.1.5	Hazard label:	9
14.1.6	Description of goods:	3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)
14.2	Maritime transport IMDG:	
14.2.1	IMDG Class:	9
14.2.2	UN Number:	3082
14.2.3	Label:	9
14.2.4	Packaging group:	III
14.2.5	Marine pollutant:	No
14.2.6	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)
14.3	Air transport ICAO-TI and IATA-DGR:	
14.3.1	ICAO/IATA Class:	9
14.3.2	UN/ID Number:	3082
14.3.3	Label:	9
14.3.4	Packaging group:	III
14.3.5	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)

#### 15 Regulatory Information

15.1	Labelling according to EU guidelines:	The product has been marked in accordance with EU Directives / respective national laws.
15.2	Code letter and hazard designation of product:	Xi Irritant N Dangerous for the environment
15.3	Hazard-determining components of labelling:	
15.3.1	Reaction product:	bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight $\leq 6700$ ) Epoxy derivatives
15.4	Risk phrases:	36/38 Irritating to eyes and skin. 43 May cause sensitization by skin contact. 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
15.5	Safety phrases:	24 Avoid contact with skin. 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 28 After contact with skin, wash immediately with plenty of water. 37/39 Wear suitable gloves and eye/face protection. 57 Use appropriate container to avoid environmental contamination.

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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>PRIMARY EPOXY - PART A</b>	<b>R110-P-A</b>	

- |   |  |
|---|--|
| <p>15.6 Special labelling of certain preparations:</p> <p>15.7 National regulations:</p> <p>15.8 Classification according to VbF:</p> <p>15.9 Water hazard class:</p> | <p>60 This material and its container must be disposed of as hazardous waste.</p> <p>Contains epoxy constituents. See information supplied by the manufacturer.</p> <p>Void</p> <p>Water hazard class 2 (Self-assessment): hazardous for water</p> |
|---|--|

**16 Other Information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- |  |  |
|--|--|
| <p>16.1 Relevant R-phrases:</p> <p>16.2 Department issuing MSDS:</p> | <p>36/38 Irritating to eyes and skin.</p> <p>43 May cause sensitization by skin contact.</p> <p>51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p> <p>Product Safety and Toxicology</p> |
|--|--|



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**1 Product and Company Identification**

- 1.1 Product identifier:
- 1.2 Product types: R110-P-B
- 1.3 Company identification: Carbontech Composite Systems  
27 7<sup>th</sup> Avenue  
Edenvale  
1609, Johannesburg  
South Africa  
[www.carbontech-composites.com](http://www.carbontech-composites.com)  
[info@carbontech-composites.com](mailto:info@carbontech-composites.com)

**2 Hazard(s) Identification**

- 2.1 Hazard description: C Corrosive
- 2.2 Information concerning particular hazards for human and environment:  
R 21/22 Harmful in contact with skin and if swallowed.  
R 34 Causes burns.  
R 43 May cause sensitization by skin contact.  
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**3 Composition / Information on Ingredients**

- 3.1 Application of the substance / the preparation: Hardener.
- 3.2 Chemical characterization
- 3.3 Description Mixture of substances listed below with non-hazardous additions.
- 3.4 Dangerous components:  
CAS: 2855-13-2  
EINECS: 220-666-8  
3-aminomethyl-3,5,5-trimethylcyclohexylamine  
C, R 21/22-34-43-52/53  
25-50%  
CAS: 39423-51-3  
EINECS: 500-105-6  
Polyoxyalkyleneamine  
C, R 21/22-34  
25-50%

**4 First-Aid Measures**

- 4.1 After inhalation: Supply fresh air and to be sure call for a doctor.  
In case of unconsciousness place patient stably in side position for transportation.
- 4.2 After skin contact: Immediately wash with water and soap and rinse thoroughly.
- 4.3 After eye contact: Rinse opened eye for several minutes under running water.  
Then consult a doctor.
- 4.4 After swallowing: Do not induce vomiting; call for medical help immediately.



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**5 Fire-Fighting Measures**

- 5.1 Suitable extinguishing agents: CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- 5.2 For safety reasons unsuitable extinguishing agents: Water with full jet
- 5.3 Special hazards caused by the substance, its products of combustion or resulting gases:
- 5.3.1 In case of fire, the following can be released: Nitrogen oxides (NO<sub>x</sub>)  
Carbon monoxide (CO)
- 5.4 Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:  
Hydrogen chloride (HCl)
- 5.5 Protective equipment: Wear fully protective suit.  
Wear self-contained respiratory protective device.
- 5.6 Additional information: Collect contaminated firefighting water separately. It must not enter the sewage system.  
Dispose of fire debris and contaminated firefighting water in accordance with official regulations.

**6 Accidental Release Measures**

- 6.1 Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
- 6.2 Measures for environmental protection: Do not allow to enter sewers/ surface or ground water.
- 6.3 Measures for cleaning/collecting: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Dispose contaminated material as waste according to item 13.  
Ensure adequate ventilation.

**7 Handling and Storage**

- 7.1 Handling:
- 7.1.1 Information for safe handling: Ensure good ventilation/exhaustion at the workplace  
Open and handle receptacle with care.
- 7.1.2 Information about fire - and explosion protection: Protect from heat.
- 7.2 Storage:
- 7.2.1 Requirements to be met by storerooms and receptacles:  
Prevent any seepage into the ground.
- 7.2.2 Information about storage in one common storage facility:  
Store away from foodstuffs.
- 7.2.3 Further information about storage conditions: Store in cool, dry conditions in well-sealed receptacles.
- 7.2.4 Storage class:
- 7.2.4.1 Class according to regulation on flammable liquids: Void





**8 Exposure Controls / Personal Protective**

- 8.1 Additional information about design of technical facilities:
  - No further data; see item 7.
- 8.2 Ingredients with limit values that require monitoring at the workplace:
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- 8.3 Additional Information:
  - The list is valid during the making were used as basis.
- 8.4 Personal protective equipment:
  - 8.4.1 General protective and hygienic measures:
    - The usual precautionary measures are to be adhered to when handling chemicals.
    - Immediately remove all soiled and contaminated clothing
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes and skin.
  - 8.4.2 Respiratory protection:
    - Not necessary if room is well-ventilated.
  - 8.4.3 Protection of hands:
    - Protective gloves
  - 8.4.4 Material of gloves:
    - PVC gloves
  - 8.4.5 Eye protection:
    - Safety glasses
    - Tightly sealed goggles
  - 8.4.6 Body protection:
    - Protective work clothing

**9 Physical and Chemical Properties**

- 9.1 General Information
  - 9.1.1 Form:
    - Fluid
  - 9.1.2 Colour:
    - Orange
  - 9.1.3 Odour:
    - Weak, characteristic
- 9.2 Change in condition
  - 9.2.1 Melting point/Melting range:
    - NA°C
  - 9.2.2 Boiling point/Boiling range:
    - >200°C (DIN 53171)
  - 9.2.3 Flash point:
    - >110°C (ISO 2719)
- 9.3 Ignition temperature:
  - >300°C (DIN 51 794)
- 9.4 Decomposition temperature:
  - >260°C (DIN 53171)
- 9.5 Self-igniting:
  - Product is not self-igniting.
- 9.6 Danger of explosion:
  - Product does not present an explosion hazard.
- 9.7 Density at 20°C:
  - 0.94 g/cm<sup>3</sup>
- 9.8 Solubility in / Miscibility with water:
  - Not miscible or difficult to mix.
- 9.9 Organic solvents:
  - Soluble in many organic solvents
- 9.10 pH-value at 20°C:
  - >10



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**10 Stability and Reactivity**

- 10.1 Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- 10.2 Dangerous reactions: Strong exothermic reaction with acids.
- 10.3 Dangerous decomposition products: Corrosive gases / vapours  
Ammonia

**11 Toxicological Information**

- 11.1 Acute toxicity:
  - 11.1.1 LD/LC50 values relevant for classification: 2855-13-2 3-aminomethyl-3,5,5-trimethylcyclohexylamine  
Oral LD50 1030 mg/kg (rat)  
Dermal LD50 1840 mg/kg (rabbit)
- 11.2 Primary irritant effect:
  - 11.2.1 On the skin: Caustic effect on skin and mucous membranes.
  - 11.2.2 On the eye: Strong caustic effect.
  - 11.2.3 Sensitization: Sensitization possible through skin contact.
- 11.3 Additional toxicological information: Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

**12 Ecological Information**

- 12.1 Information about elimination (persistence and degradability):
- 12.2 Other information: The product is difficultly biodegradable.
- 12.3 Ecotoxicological effects:
  - 12.3.1 Aquatic toxicity: 2855-13-2 3-aminomethyl-3,5,5-trimethylcyclohexylamine  
EC50 (24h) 44 mg / l (daphnies)  
EC50 (72h) 37 mg/l (alga)  
LC 50 (96h) 110 mg / l (fish)

**13 Disposal Considerations**

- 13.1 Product Recommendations: Dispose of the product by burning in a suitable incinerator or bury in an approved land field following all applicable local and/or national regulations.
- 13.2 European waste catalogue: 20 01 27 paint, inks, adhesives and resins containing dangerous substances.
- 13.3 Uncleaned packaging Recommendations: Empty containers may not be disposed of unless any Remaining material adhering to the internal walls has been removed.  
Disposal must be made according to official regulations.
- 13.4 Recommended cleansing agents: Water, if necessary together with cleansing agents.



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**14 Transport Information**



14.1	Land transport ADR/RID (cross-border)	
14.1.1	ADR/RID class:	8 Corrosive substances.
14.1.2	Danger code (Kemler):	80
14.1.3	UN-Number:	1760
14.1.4	Packaging group:	III
14.1.5	Hazard label:	8
14.1.6	Description of goods:	1760 CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)
14.2	Maritime transport IMDG	
14.2.1	IMDG Class:	8
14.2.2	UN Number:	1760
14.2.3	Label:	8
14.2.4	Packaging group:	III
14.2.5	EMS Number:	8-15
14.2.6	Marine pollutant:	No
14.2.7	Proper shipping name:	CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)
14.3	Air transport ICAO-TI and IATA-DGR	
14.3.1	ICAO/IATA Class:	8
14.3.2	UN/ID Number:	1760
14.3.3	Label:	8
14.3.4	Packaging group:	III
14.3.5	Proper shipping name:	CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)

**15 Regulatory Information**

15.1	Labelling according to EU guidelines:	The product has been marked in accordance with EU Directives / respective national laws.
15.2	Code letter and hazard designation of product:	C Corrosive
15.3	Hazard-determining components of labelling:	3-aminomethyl-3,5,5-trimethylcyclohexylamine
15.4	Risk phrases:	21/22 Harmful in contact with skin and if swallowed. 34 Causes burns. 43 May cause sensitization by skin contact. 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
15.5	Safety phrases:	20 When using do not eat or drink. 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 27/28 After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. 36/37/39 Wear suitable protective clothing, gloves and eye/face protection. 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>PRIMARY EPOXY - PART B</b>	<b>R110-P-B</b>	

- 15.6 National regulations:
- 15.7 Classification according to VbF: Void
- 15.8 Waterhazard class: Water hazard class 1 (Self-assessment); slightly hazardous for water.

## 16 Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- 16.1 Relevant R-phrases: 21/22 Harmful in contact with skin and if swallowed.  
34 Causes burns.  
43 May cause sensitization by skin contact.  
52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 16.2 Department issuing MSDS: Product Safety and Toxicology



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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>SATURATION EPOXY - PART A</b>	<b>R110-S-A</b>	

**1 Product and Company Identification**

1.1	Product identifier:	
1.2	Product types:	R110-S-A
1.3	Company identification:	Carbontech Composite Systems 27 7 <sup>th</sup> Avenue Edenvale 1609, Johannesburg South Africa <a href="http://www.carbontech-composites.com">www.carbontech-composites.com</a> <a href="mailto:info@carbontech-composites.com">info@carbontech-composites.com</a>

**2 Hazard(s) Identification**

2.1	Hazard description:	Xi Irritant N Dangerous for the environment
2.2	Information concerning particular hazards for human and environment:	R 36/38 Irritating to eyes and skin. R 43 May cause sensitization by skin contact. R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Contains epoxy constituents. See information supplied by the manufacturer.

**3 Composition / Information on Ingredients**

3.1	Application of the substance / the preparation:	Epoxy resin.
3.2	Chemical characterization	
3.2.1	Description	Mixture of substances listed below with non-hazardous additions.
3.3	Dangerous components:	CAS: 25068-38-6 EINECS: 500-033-5 reaction product: bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight ≤8700) Xi, N; R 36/38-43-51/53 50-100% Epoxy derivatives Xi, N; R 43-51/53 2.5-10%



**4 First-Aid Measures**

4.1	After inhalation:	Supply fresh air and to be sure call for a doctor. In case of unconsciousness place patient stably in side position for transportation.
4.2	After skin contact:	Immediately wash with water and soap and rinse thoroughly.
4.3	After eye contact:	Rinse opened eye for several minutes under running water. Then consult a doctor.
4.4	After swallowing:	Do not induce vomiting, call for medical help immediately.

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**5 Fire-Fighting Measures**

- 5.1 Suitable extinguishing agents: CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- 5.2 For safety reasons unsuitable extinguishing agents: Water with full jet
- 5.3 Special hazards caused by the substance, its products of combustion or resulting gases:
- 5.3.1 In case of fire, the following can be released: Carbon monoxide (CO)
- 5.4 Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:  
Hydrogen chloride (HCl)
- 5.5 Protective equipment: Wear fully protective suit.  
Wear self-contained respiratory protective device.
- 5.6 Additional information: Collect contaminated firefighting water separately. It must not enter the sewage system.  
Dispose of fire debris and contaminated firefighting water in accordance with official regulations.

**6 Accidental Release Measures**

- 6.1 Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
- 6.2 Measures for environmental protection: Do not allow to enter sewers/ surface or ground water.
- 6.3 Measures for cleaning/collecting: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**7 Handling and Storage**



- 7.1 Handling:
- 7.1.1 Information for safe handling: Ensure good ventilation/exhaustion at the workplace.
- 7.1.2 Information about fire - and explosion protection: No special measures required.
- 7.2 Storage:
- 7.2.1 Requirements to be met by storerooms and receptacles:  
Prevent any seepage into the ground.
- 7.2.2 Information about storage in one common storage facility:  
Store away from foodstuffs.
- 7.2.3 Further information about storage conditions: Store in cool, dry conditions in well-sealed receptacles.
- 7.2.4 Storage class:
- 7.2.4.1 Class according to regulation on flammable liquids:  
Void

**8 Exposure Controls / Personal Protective**

- 8.1 Additional information about design of technical facilities:  
No further data, see item 7.
- 8.2 Ingredients with limit values that require monitoring at the workplace:  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

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	<b>SATURATION EPOXY - PART A</b>	<b>R110-S-A</b>	

- |     |   |   |
|-----|---|---|
| 8.3 | Personal protective equipment:            |   |
| 8.4 | General protective and hygienic measures: | <p>The usual precautionary measures are to be adhered to when handling chemicals.</p> <p>Immediately remove all soiled and contaminated clothing</p> <p>Wash hands before breaks and at the end of work.</p> <p>Avoid contact with the eyes and skin.</p> |
| 8.5 | Respiratory protection:                   | Not necessary if room is well-ventilated.   |
| 8.6 | Protection of hands:                      | Protective gloves   |
| 8.7 | Material of gloves:                       | Synthetic rubber gloves   |
| 8.8 | Eye protection:                           | Safety glasses<br>Tightly sealed goggles  |
| 8.9 | Body protection:                          | Protective work clothing  |

## 9 Physical and Chemical Properties

- |       |   |   |
|-------|---|---|
| 9.1   | General Information                     |   |
| 9.1.1 | Form:                                   | Fluid   |
| 9.1.2 | Colour:                                 | Colourless                                    |
| 9.1.3 | Odour:                                  | Weak, characteristic                          |
| 9.2   | Change in condition                     |   |
| 9.2.1 | Melting point/Melting range:            | NA°C  |
| 9.2.2 | Boiling point/Boiling range:            | >200°C (DIN 53171)                            |
| 9.2.3 | Flash point:                            | >110°C (ISO 2719)                             |
| 9.3   | Ignition temperature:                   | >300°C (DIN 51 794)                           |
| 9.4   | Decomposition temperature:              | >200°C (DIN 53171)                            |
| 9.5   | Self-igniting:                          | Product is not self-igniting.                 |
| 9.6   | Danger of explosion:                    | Product does not present an explosion hazard. |
| 9.7   | Density at 25°C:                        | 1.13 g/cm <sup>3</sup>                        |
| 9.8   | Solubility in / Miscibility with water: | Insoluble.                                    |
| 9.9   | Organic solvents:                       | Soluble in many organic solvents              |



## 10 Stability and Reactivity

- |      |   |  |
|------|---|--|
| 10.1 | Thermal decomposition / conditions to be avoided: | No decomposition if used according to specifications.  |
| 10.2 | Dangerous reactions:                              | <p>May produce violent reactions with bases and numerous organic substances including alcohols and amines.</p> <p>Exothermic polymerization.</p> |
| 10.3 | Dangerous decomposition products:                 | Irritant gases/vapours   |



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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>SATURATION EPOXY - PART A</b>	<b>R110-S-A</b>	

**11 Toxicological Information**

- 11.1 Acute toxicity:
  - 11.1.1 LD/LC50 values relevant for classification:
  - 11.1.1.1 25068-38-6 reaction product:
    - bisphenol A-(epichlorohydrin); epoxy resin (number
    - Average molecular weight ≤8700)
    - Oral LD50 11400 mg/kg (rat)
    - Dermal LD50 >2000 mg/kg (rabbit)
- 11.2 Epoxy derivatives
  - Oral LD50 >9600 mg/kg (rat)
  - Dermal LD50 >3800 mg/kg (rabbit)
  - In-halative LC50/4 h >5 mg/l (rat)
- 11.3 Primary irritant effect:
  - 11.3.1 On the skin: Irritant to skin and mucous membranes
  - 11.3.2 On the eye: Irritating effect.
  - 11.3.3 Sensitization: Sensitization possible through skin contact.

**12 Ecological Information**



- 12.1 Information about elimination (persistence and degradability):
- 12.2 Other information: The product is difficultly biodegradable.
- 12.3 General notes: At present there are no ecotoxicological assessments.

**13 Disposal Considerations**

- 13.1 Product Recommendation:
  - Must not be disposed together with household garbage.
  - Do not allow product to reach sewage system.
  - Dispose of the product by burning in a suitable incinerator or bury in an approved land field following all applicable local and/or national regulations.
- 13.2 Uncleaned packaging Recommendation:
  - Empty containers may not be disposed of unless any remaining material adhering to the internal walls have been removed
  - Disposal must be made according to official regulations.



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**14 Transport Information**

14.1	Land transport ADR/RID (cross-border)	
14.1.1	ADR/RID class:	9 Miscellaneous dangerous substances and articles.
14.1.2	Danger code (Kemler):	90
14.1.3	UN-Number:	3082
14.1.4	Packaging group:	III
14.1.5	Hazard label:	9
14.1.6	Description of goods:	3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)
14.2	Maritime transport IMDG:	
14.2.1	IMDG Class:	9
14.2.2	UN Number:	3082
14.2.3	Label:	9
14.2.4	Packaging group:	III
14.2.5	Marine pollutant:	No
14.2.6	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)
14.3	Air transport ICAO-TI and IATA-DGR:	
14.3.1	ICAO/IATA Class:	9
14.3.2	UN/ID Number:	3082
14.3.3	Label:	9
14.3.4	Packaging group:	III
14.3.5	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxy resins)



**15 Regulatory Information**

15.1	Labelling according to EU guidelines:	The product has been marked in accordance with EU Directives / respective national laws.
15.2	Code letter and hazard designation of product:	XI Irritant N Dangerous for the environment
15.3	Hazard-determining components of labelling:	
15.3.1	Reaction product:	bisphenol A-(epichlorohydrin); epoxy resin (number average molecular weight $\leq 8700$ ) Epoxy derivatives
15.4	Risk phrases:	36/38 Irritating to eyes and skin. 43 May cause sensitization by skin contact. 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
15.5	Safety phrases:	24 Avoid contact with skin. 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 28 After contact with skin, wash immediately with plenty of water. 37/39 Wear suitable gloves and eye/face protection. 57 Use appropriate container to avoid environmental contamination.

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	<b>SATURATION EPOXY - PART A</b>	<b>R110-S-A</b>	

- |   |   |
|---|---|
| <p>15.6 Special labelling of certain preparations:</p> <p>15.7 National regulations:</p> <p>15.8 Classification according to VbF:</p> <p>15.9 Water hazard class:</p> | <p>60 This material and its container must be disposed of as hazardous waste.</p> <p>Contains epoxy constituents. See information supplied by the manufacturer.</p> <p>Void</p> <p>Water hazard class 2 (Self-assessment): hazardous for water.</p> |
|---|---|

**16 Other Information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- |  |  |
|--|--|
| <p>16.1 Relevant R-phrases:</p> <p>16.2 Department issuing MSDS:</p> | <p>36/38 Irritating to eyes and skin.</p> <p>43 May cause sensitization by skin contact.</p> <p>51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p> <p>Product Safety and Toxicology</p> |
|--|--|



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	<b>MATERIAL SAFETY DATA SHEET</b>		
	<b>SATURATION EPOXY - PART B</b>	<b>R110-S-B</b>	

### 1 Product and Company Identification

- 1.1 Product identifier: R110-S-B
- 1.2 Product types: R110-S-B
- 1.3 Company identification: Carbontech Composite Systems  
27 7<sup>th</sup> Avenue  
Edenvale  
1609, Johannesburg  
South Africa  
[www.carbontech-composites.com](http://www.carbontech-composites.com)  
[info@carbontech-composites.com](mailto:info@carbontech-composites.com)

### 2 Hazard(s) Identification

- 2.1 Hazard description: C Corrosive
- 2.2 Information concerning particular hazards for human and environment:  
R 21/22 Harmful in contact with skin and if swallowed.  
R 34 Causes burns.  
R 43 May cause sensitization by skin contact.  
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.



### 3 Composition / Information on Ingredients

- 3.1 Application of the substance / the preparation: Hardener.
- 3.2 Chemical characterization
- 3.2.1 Description Mixture of substances listed below with non-hazardous additions.
- 3.3 Dangerous components:  
CAS: 2855-13-2  
EINECS: 220-666-8  
3-aminomethyl-3,5,5-trimethylcyclohexylamine  
C; R 21/22-34-43-52/53  
25-50%  
CAS: 39423-51-3  
EINECS: 500-105-6  
Polyoxyalkyleneamine  
C; R 21/22-34  
25-50%

### 4 First-Aid Measures

- 4.1 After inhalation: Supply fresh air and to be sure call for a doctor.  
In case of unconsciousness place patient stably in side position for transportation.
- 4.2 After skin contact: Immediately wash with water and soap and rinse thoroughly.
- 4.3 After eye contact: Rinse opened eye for several minutes under running water.  
Then consult a doctor.
- 4.4 After swallowing: Do not induce vomiting, call for medical help immediately.

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## 5 Fire-Fighting Measures

- 5.1 Suitable extinguishing agents: CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- 5.2 For safety reasons unsuitable extinguishing agents: Water with full jet
- 5.3 Special hazards caused by the substance, its products of combustion or resulting gases:
- 5.3.1 In case of fire, the following can be released: Nitrogen oxides (NO<sub>x</sub>)  
Carbon monoxide (CO)
- 5.4 Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:  
Hydrogen chloride (HCl)
- 5.5 Protective equipment: Wear fully protective suit.  
Wear self-contained respiratory protective device.
- 5.6 Additional information: Collect contaminated firefighting water separately. It must not enter the sewage system.  
Dispose of fire debris and contaminated firefighting water in accordance with official regulations.

## 6 Accidental Release Measures



- 6.1 Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
- 6.2 Measures for environmental protection: Do not allow to enter sewers/ surface or ground water.
- 6.3 Measures for cleaning/collecting: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Dispose contaminated material as waste according to item 13.  
Ensure adequate ventilation.

## 7 Handling and Storage

- 7.1 Handling:
- 7.1.1 Information for safe handling: Ensure good ventilation/exhaustion at the workplace.  
Open and handle receptacle with care.
- 7.1.2 Information about fire - and explosion protection: Protect from heat.
- 7.2 Storage:
- 7.2.1 Requirements to be met by storerooms and receptacles: Prevent any seepage into the ground.
- 7.2.2 Information about storage in one common storage facility: Store away from foodstuffs.
- 7.2.3 Further information about storage conditions: Store in cool, dry conditions in well-sealed receptacles.
- 7.2.4 Storage class:
- 7.2.4.1 Class according to regulation on flammable liquids: Void

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**8 Exposure Controls / Personal Protective**



- 8.1 Additional information about design of technical facilities:
  - No further data; see item 7.
- 8.2 Ingredients with limit values that require monitoring at the workplace:
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- 8.3 Additional Information:
  - The list is valid during the making were used as basis.
- 8.4 Personal protective equipment:
  - 8.4.1 General protective and hygienic measures:
    - The usual precautionary measures are to be adhered to when handling chemicals.
    - Immediately remove all soiled and contaminated clothing
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes and skin.
  - 8.4.2 Respiratory protection:
    - Not necessary if room is well-ventilated.
  - 8.4.3 Protection of hands:
    - Protective gloves
  - 8.4.4 Material of gloves:
    - PVC gloves
  - 8.4.5 Eye protection:
    - Safety glasses
    - Tightly sealed goggles
  - 8.4.6 Body protection:
    - Protective work clothing

**9 Physical and Chemical Properties**

- 9.1 General Information
  - 9.1.1 Form: Fluid
  - 9.1.2 Colour: Orange
  - 9.1.3 Odour: Weak, characteristic.
- 9.2 Change in condition
  - 9.2.1 Melting point/Melting range: NA°C
  - 9.2.2 Boiling point/Boiling range: >200°C (DIN 53171)
  - 9.2.3 Flash point: >110°C (ISO 2719)
- 9.3 Ignition temperature: >300°C (DIN 51 794)
- 9.4 Decomposition temperature: >260°C (DIN 53171)
- 9.5 Self-igniting: Product is not self-igniting.
- 9.6 Danger of explosion: Product does not present an explosion hazard.
- 9.7 Density at 20°C: 0.94 g/cm<sup>3</sup>
- 9.8 Solubility in / Miscibility with water: Not miscible or difficult to mix.
- 9.9 Organic solvents: Soluble in many organic solvents
- 9.10 pH-value at 20°C: >10

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### 10 Stability and Reactivity

- 10.1 Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- 10.2 Dangerous reactions: Strong exothermic reaction with acids.
- 10.3 Dangerous decomposition products: Corrosive gases / vapours  
Ammonia

### 11 Toxicological Information

- 11.1 Acute toxicity:
- 11.1.1 LD/LC50 values relevant for classification: 2855-13-2 3-aminomethyl-3,5,5-trimethylcyclohexylamine  
Oral LD50 1030 mg/kg (rat)  
Dermal LD50 1840 mg/kg (rabbit)
- 11.2 Primary irritant effect:
- 11.2.1 On the skin: Caustic effect on skin and mucous membranes.
- 11.2.2 On the eye: Strong caustic effect.
- 11.2.3 Sensitization: Sensitization possible through skin contact.
- 11.3 Additional toxicological information: Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

### 12 Ecological Information



- 12.1 Information about elimination (persistence and degradability):
- 12.2 Other information: The product is difficultly biodegradable.
- 12.3 Ecotoxicological effects:
- 12.3.1 Aquatic toxicity: 2855-13-2 3-aminomethyl-3,5,5-trimethylcyclohexylamine  
EC50 (24h) 44 mg / l (daphnies)  
EC50 (72h) 37 mg/l (alga)  
LC 50 (96h) 110 mg / l (fish)

### 13 Disposal Considerations

- 13.1 Product Recommendations: Dispose of the product by burning in a suitable incinerator or bury in an approved land field following all applicable local and/or national regulations.
- 13.2 European waste catalogue 20 01 27 paint, inks, adhesives and resins containing dangerous substances.
- 13.3 Uncleaned packaging Recommendations: **Empty containers may not be disposed of unless any Remaining material adhering to the internal walls has been removed.**  
Disposal must be made according to official regulations.
- 13.4 Recommended cleansing agents: Water, if necessary together with cleansing agents.

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**14 Transport Information**

14.1	Land transport ADR/RID (cross-border)	
14.1.1	ADR/RID class:	8 Corrosive substances.
14.1.2	Danger code (Kemler):	80
14.1.3	UN-Number:	1760
14.1.4	Packaging group:	III
14.1.5	Hazard label:	8
14.1.6	Description of goods:	1760 CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)
14.2	Maritime transport IMDG	
14.2.1	IMDG Class:	8
14.2.2	UN Number:	1760
14.2.3	Label:	8
14.2.4	Packaging group:	III
14.2.5	EMS Number:	8-15
14.2.6	Marine pollutant:	No
14.2.7	Proper shipping name:	CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)
14.3	Air transport ICAO-TI and IATA-DGR	
14.3.1	ICAO/IATA Class:	8
14.3.2	UN/ID Number:	1760
14.3.3	Label:	8
14.3.4	Packaging group:	III
14.3.5	Proper shipping name:	CORROSIVE LIQUID, N.O.S. (Polyoxyalkyleneamine)



**15 Regulatory Information**

15.1	Labelling according to EU guidelines:	The product has been marked in accordance with EU Directives / respective national laws.
15.2	Code letter and hazard designation of product:	C Corrosive
15.3	Hazard-determining components of labelling:	3-aminomethyl-3,5,5-trimethylcyclohexylamine
15.4	Risk phrases:	21/22 Harmful in contact with skin and if swallowed. 34 Causes burns. 43 May cause sensitization by skin contact. 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
15.5	Safety phrases:	20 When using do not eat or drink. 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. 27/28 After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. 36/37/39 Wear suitable protective clothing, gloves and eye/face protection. 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

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- 15.6 National regulations: Void
- 15.7 Classification according to VbF: Void
- 15.8 Waterhazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water

#### 16 Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- 16.1 Relevant R-phrases: 21/22 Harmful in contact with skin and if swallowed.  
 34 Causes burns.  
 43 May cause sensitization by skin contact.  
 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 16.2 Department issuing MSDS: Product Safety and Toxicology

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