

GURONIC Casting Resin The Alternative Encapsulant

GURONIC Casting Resin for Electronics

Properties

Details

Advantages

Mechanical Properties



soft-elastic

- excellent mechanical damping up to 1000 G

- reliable protection against vibration and shock
- extremely low stress on parts and soldered joints
- re-enterable, repair possible

Electrical Properties



good dielectric

- excellent electrical insulation
- high electric breakdown strength

- minimal impact on electronics
- safe to use even at high voltages

Flexibility at Low Temperatures



glass transition approx. - 80 °C

- resin stays soft at low temperatures
- excellent mechanical damping especially at low temperatures

- minimal stress on parts and soldered joints at low temperatures and during temperature shocks
- protection against vibration and shock even at low temperatures

Manufacturing



- variable potlife
- convenient mixing ratio (typically 1:1 to 3:1)
- no exothermic reaction during cure
- virtually no cure shrinkage

- adjustable to process conditions
- easy to manufacture
- easy potting of big volumes

Environmental



safety class free according to 91/155/EWG

- no solvents, no VOC
- no epoxy
- no isocyanate
- no silicone

- no special protective measures for production

The GURONIC product family

Technical Data

(valid for the cured material, if not stated otherwise)

		Standard blue elastic, flexible at low temp.		B1NO blue or beige elastic, flexible at low temp.	
Variants (fast cure / slow cure)		B1	B2	B1NO	B5NO
Pot life at 23 °C	[HD 631.1 S2]	15 min	3 h	10 min	2 h
Cure Time	at 23 °C until fully cured at 80 °C until solid cure at 80 °C until fully cured	12 h 45 min 2 h	72 h 3 h 9 h	12 h 25 min 1 h	72 h 3 h 8 h
Mixing ratio	by weight	2 : 1		2 : 1	
	by volume	1.38 : 1		1.34 : 1	
Viscosity of fresh mixture [Pa s]	at 20 °C [DIN 53019] at 50 °C	5 1		25 4	
Temperature rise during cure		none		none	
Chemical base of resin and hardener		Modified hydrocarbon resin. Not safety			
Density of cured product [g/cm ³]	[EN ISO 1183-1]	1.18		1.21	
Glass transition temperature [°C]	[DIN 53445]	-82.5		-78	
Typical operation temperature range [°C]		-70 to +85		-70 to +120	
Hardness Shore A	[ISO 868]	A 10		A 20	
Tear strength [N/mm ²]	[ISO 527]	0,5		0.9	
Elongation at break [%]	[ISO 527]	89		170	
Dielectric breakdown strength [kV/mm]	[DIN VDE 0370 / IEC 156]	15		15	
Relative permittivity ϵ_r (0 °C - 50 °C, 10 Hz - 10 ⁵ Hz)		2.5 to 2.6		2.2	
Thermal conductivity [W/(mK)] at 23 °C		0,25		0.31	
Thermal expansion coefficient (20 °C to 100 °C)	linear - [K ⁻¹]	3.3 x10 ⁻⁴		2.1 x10 ⁻⁴	
	cubic - [K ⁻¹]			5.5 x10 ⁻⁴	
Water uptake [%]	[DIN EN ISO 62]	0.2		ca. 0.2	

n.m. = not measure

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not release the user from checking all supplies carefully. We reserve the right to alter product data within the scope of technical process or new developments. The mechanical properties of the cured materials are measured after standard cure conditions (24 h 23°C, 24 h 80°C) according to HD 631.1 S2.

flame retardant

C400-0 transparent elastic, flexible at low temp. transparent		FY15-H brown hard-elastic, flexible at low temp.	FR brown elastic, self-extinguishing UL 94 V-0	DOFRO brown elastic, self-extinguishing, UL 94 V-0	P500-H transparent soft-elastic, flexible at low temp., transparent
C400-0	C500-0	FY15-H	FR 5	DOFRO 0.15	P500-H
10 min	2 h	30 min	15 min	2 h	2 h
8 h 25 min 1 h	48 h 3 h 8 h	48 h 40 min 8 h	48 h 60 min 3 h	12 h 45 min 2 h	72 h 1 h 12 h
1 : 1		1,2 : 1	4 : 1	4 : 1	5 : 3
1 : 1		1 : 1.07	2,35 : 1	2,32 : 1	5 : 3
7 1.5		25 5.5	33 5	60 7.5	24 4.7
none		none	none	none	none
classified. Not hazardous					
0.94		1.03	1.40	1.48	0.96
-78		ca. -65	-82	-75	ca. -50
-70 to +120		-50 to +100	-70 to +90	-65 to +130	-40 to +120
A 15		A 44	A 10	A 25	A 12
0.3		0.8	0.4	0.5	0.3
90		45	150	80	100
31		10	15	15	18
2.0		n.m.	2.9 to 3.0	3.6 to 3.7	3.0 to 3.8
0.2		ca. 0.3	0.37	0.52	ca. 0.2
2.2 x10 ⁻⁴		2.0 x10 ⁻⁴	3.1 x10 ⁻⁴	1.7 x10 ⁻⁴	2.2 x10 ⁻⁴
6.4 x10 ⁻⁴		6.1 x10 ⁻⁴			6.7 x10 ⁻⁴
ca. 0.2		ca. 0.2	0.3	ca. 0.3	ca. 0.2

GURONIC Casting Resin for Electronics



Potting resin production

TE Connectivity, a first choice partner when it comes to developing new materials and offering services tailored to your needs. You have not found the right material in our assortment? We also offer customized resin formulation and development services. Whatever your project may entail, we will provide the expert consulting you need to make it a success.



GURONIC C400-0 twin cartridge



GURONIC gel

Encapsulation Technology and Services

- Casting resins
- Materials consulting
- Customized development
- Casting and coating service
- Sample and pilot production
- Inspection and testing
- Tooling



GURONIC customized potting



GURONIC products

We provide the expertise and tailored services you need

Phone hotline
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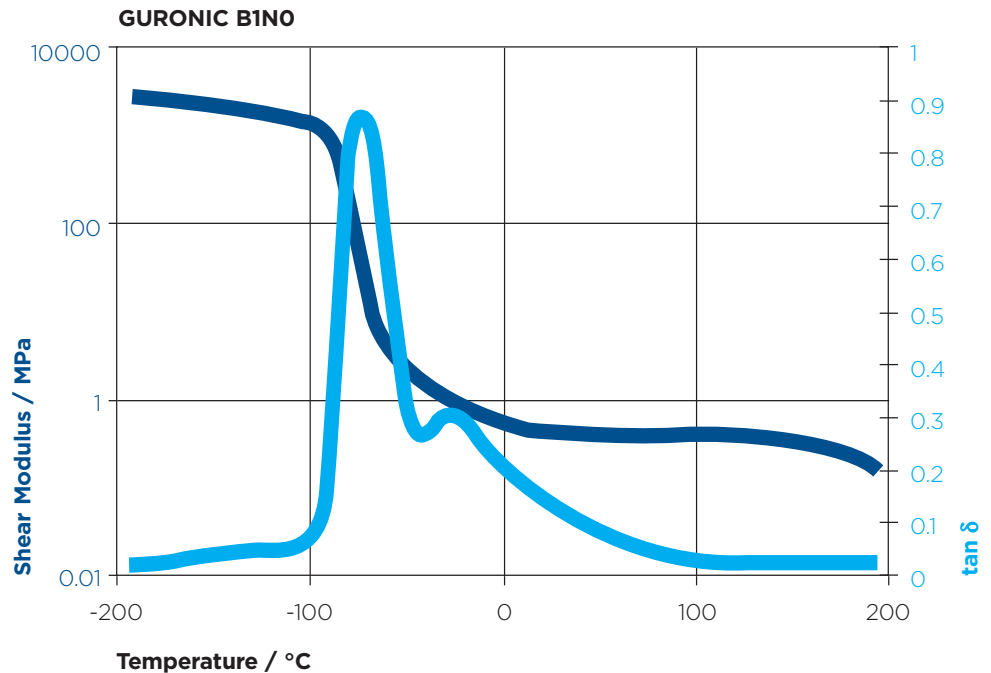
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Tyco Electronics Raychem GmbH,
Falkenberg site

GURONIC Casting Resin for Electronics



Shear Modulus and damping (tan δ) dependent on temperature for GURONIC B1N0, used to determine the glass transition temperature according to German industrial standard DIN 53445.

GURONIC casting resins show excellent mechanical damping properties even at low temperatures. GURONIC is soft-elastic over the whole application temperature range.

As a member of TE Connectivity we cultivate worldwide customer relationships with our international sales organization. For your applications we develop and manufacture high standard casting resins. Our company is certified according to OHSAS 18001, DIN EN ISO 9001 as well as to DIN EN ISO 14001.

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GURONIC B1N0-0

Technical Data Sheet

Properties of Components:

Chemical base of component A and B:		modified hydrocarbon resin
Mixing ratio Component A : Component B by weight:		2 : 1
Mixing ratio Component A : Component B by volume:		1.34 : 1
Pot life at 23 °C (HD 631.1 S2):		ca. 10 min
Cure time:		at 23 °C: ca. 12 h; at 80 °C: ca. 1 h
Exothermic reaction:		none
Volume shrinkage (EN ISO 3521):		< 1 %
Density at 23 °C:	component A:	1.40 g/cm ³
(EN ISO 1183-1)	component B:	0.96 g/cm ³
	final product:	1.21 g/cm ³
Viscosity of component A (DIN 53019):		ca. 50 Pa·s (20 °C); 8 Pa·s (60°C)
Viscosity of component B (DIN 53019):		ca. 7 Pa·s (20 °C); 2 Pa·s (60°C)
Viscosity of fresh mixture (DIN 53019):		25 Pa·s (20 °C); 4 Pa·s (50°C)
Dielectric strength at 23 °C (VDE 0370/IEC 156):		15 kV/mm

Properties of cured Product:

State:		soft elastic
Colour:		beige
Hardness Shore A (ISO 868):		20
Tensile strength at 23 °C (ISO 527):		0.9 N/mm ²
Elongation at break at 23 °C (ISO 527):		170 %
Reduction of weight at 150°C, 26 days (HD 631.1 S2):		< 0.6 %
Shear modulus at 23 °C (DIN 53445):		ca. 0.5 N/mm ²
Glass transition temperature (DIN 53445):		-78 °C
Logarithmic decrement of mechanic attenuation (DIN 53445):		0.45 (23 °C) or 2.7 (-68 °C)
Relative permittivity (ϵ_r) at	10 °C and 100 Hz:	2.20
	50 °C and 100 Hz:	2.17
	10 °C and 10 ⁵ Hz:	2.19
	50 °C and 10 ⁵ Hz:	2.15
Tangent delta (tg δ) at	10 °C and 100 Hz:	3 x 10 ⁻³
	50 °C and 100 Hz:	3 x 10 ⁻³
	10 °C and 10 ⁵ Hz:	5 x 10 ⁻³
	50 °C and 10 ⁵ Hz:	4 x 10 ⁻³
Linear thermal coefficient of expansion:	from -75 to -45 °C:	2.3 x 10 ⁻⁴ K ⁻¹
	from -20 to +100 °C:	2.1 x 10 ⁻⁴ K ⁻¹
Thermal conductivity at 23 °C:		0.31 W / (m K)
Water absorption (DIN EN ISO 62):		ca. 0.2 %
Solubility in water:		insoluble



GURONIC B1N0-0 Component A - resin

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EG-Safety Data Sheet according to REACH VO(EG) 1907/2006

0 Data Sheet Information

Edition: 28.03.2011
Supersedes Edition: 02.09.2010

1 Identification of the Substance / Mixture and of the Company

Commercial Name: **GURONIC B1N0-0
Component A - resin**

Designated Use: cold applied two-component potting and casting resin

Company: Tyco Electronics Raychem GmbH **Phone:** +49 (0) 35 36 54 47 40-0
Fax: +49 (0) 35 36 54 47 40-40

Address: Factory Falkenberg
Hellsternstrasse 1
04895 Schmerkendorf
Germany

E-Mail: guronic@te.com

24 h Emergency Phone Number: Giftnotruf Berlin **Phone:** +49 (0) 30-19240

2 Hazards Identification

Not classified according to Directive 1999/45/EC and CLP Regulation No. 1272/2008/EC.

Specific hazards according to Human and Environment: Material has no hazard under normal working conditions.

3 Composition / Information of Ingredients

Filled modified hydrocarbon resin

Hazardous Ingredients :

Substance:	CAS-No.:	EG-No.:	Weight %:	Symbol:
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4 First-Aid Measures

General Advice:	Remove contaminated clothing immediately and wash thoroughly before reuse.
Inhalation of Aerosols or Vapour in High Concentration:	Apply fresh air; consult medical attention in case of discomfort.
Skin Contact:	First wipe off, then wash thoroughly with water and soap. Apply skin cream.
Eye Contact:	In case of eye contact, immediately hold eyelids apart and rinse thoroughly with plenty of water for at least 15 minutes. Immediate medical attention required.
Ingestion:	Avoid vomiting, wash mouth thoroughly, drink plenty of water, consult medical attention.
Advice for Physician:	---

5 Fire-Fighting Measures

Suitable Extinguishing Media:	Dry powder, foam, CO ₂
Special Exposure Hazards:	Carbon monoxide and carbon dioxide may be released in case of fire.
Protective Measures:	Wear self contained breathing apparatus in close proximity or confined spaces. Fire-fighters must wear fire resistant personnel protective equipment.
Other Precautions:	Do not let contaminated fire fighting water enter drains. In case of surrounding fire, cool containers with water and remove them from danger zone if possible.

6 Accidental Release Measures

Personal Precautions:	Provide ventilation.
Environmental Precautions:	Prevent discharges into soils, waters, sewers or drains.
Methods for Cleaning Up:	Soak up with inert absorbent material (e.g. sand, sawdust, oil absorber). Collect and dispose of in accordance with local regulation (see section 13).
Recommended cleaning agents:	gasoline, petroleum, solvent

7 Handling and Storage

Handling:	Good ventilation is to be provided/ installed at the working place.
Fire and Explosion Protection:	Keep away from ignition sources.
Storage:	Store in closed container in dry, well-ventilated and cold area. Keep separated from food.
Storage Temperature:	-20 °C to +40 °C
Recommended Storage Temperature:	~ +25 °C.

8 Exposure Control and Personal Protection

Exposure limits for the occurrence of respirable aerosols:

Atmospheric Workplace Control Parameter TRGS 900:

substance:	CAS-Nr.:	Type:	Value:	Unit:
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Exposure limits:

Product does not contain relevant amounts of substances that are subject to working place monitoring.

Personal Protection:

Respect the normal rules of industrial hygiene.
Negligible

Respiratory Protection:

Eye Protection:

Wear tightly fitting safety goggles.

Hand Protection:

In case of a potential skin contact the use of PE gloves for single use give sufficient protection. These gloves resist penetration for more than 30 min. Damaged gloves should be replaced.

Body Protection:

Normally used protective clothing when handling with chemicals.

General Protective Measures:

Respect normal rules of industrial hygiene.
Do not eat, drink or smoke during work.
Keep food separated. Wash hands thoroughly before breaks and after work.
Avoid contact with eyes, skin and clothing.
Do not inhale vapours.

9 Physical and Chemical Properties

Appearance:

viscous

Colour:

beige

Odour:

specific

Aggregate State Modification:

Melting Point:

n.a.

Boiling Point:

> 230 °C

Flash Point:

> 200 °C

Ignition Temperature:

n.d.

Lower Explosion Limit (Vol-%):

n.a.

Upper Explosion Limit (Vol-%):

n.a.

Vapour Pressure (20 °C):

< 0.01 hPa

Density at 23 °C (EN ISO 1183-1):

1.4 g/cm³

Viscosity at 20 °C (DIN 53019):

ca. 50 Pa·s

Solubility:

very low in water

n. d.: not determined

n.a.: not applicable

10 Stability and Reactivity

Conditions to Avoid:	Excessive temperatures. Decomposition begins at ca. 200 °C.
Materials to Avoid:	Avoid storage with flammable materials.
Dangerous Reactions:	No dangerous reaction when handled and stored properly.
Hazardous Decomposition Products:	No dangerous decomposition product when handled and stored properly. In case of fire carbon monoxide and carbon dioxide may be released.

11 Toxicological Information

Acute Toxicity:	
Experiences with Humans:	No health effects are known, if the normal rules of industrial hygiene are respected.
Practical Experiences:	The product may cause irritations by skin or eye contact.
Sensitization:	No effects are known.
Additional Information:	According to our present knowledge no adverse health effects are to be expected if handled properly and for the intended use only.

12 Ecological Information

General information:	Does not contain any heavy metals or PCB.
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13 Disposal Considerations

Recommendation:	Dispose of in compliance with local/federal regulation.
Accountability:	Consider the local regulations.
Residues / void containers (recommendation):	Mix residues of resin with hardener in order to cure. Cured resin and empty containers may be added to domestic waste.

14 Transport Information

Not classified as dangerous goods according to transport regulations (for land transport ADR / RID, inland waterway transport ADN/ADNR, sea transport IMDG, air transport IATA).

15 Regulatory Information

Not classified according to Directive 1999/45/EC and CLP Regulation No. 1272/2008/EC.
Water Hazard class: 2 (water hazard)

16 Other Information

The information given in this Safety Data Sheet is correct to the best of our knowledge, experience and believe at the date of its publication. The information provided is designated only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as warranty or quality specification. The information only relates to the specific material and use designated and may not be valid for combinations with any other materials or in any process, unless specified in the text.



**GURONIC B1N0-0/ B3N0-0/
C300-0/ C350-0/ C400-0/
C500-0/ CH00-0S/ D0FR0 0.15/
B1S0-0
Component B -hardener**

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EC-Safety Data Sheet according to REACH VO(EC) 1907/2006

0 Data Sheet Information

Edition: 16.07.2012
Supersedes Edition: 21.03.2011

1 Identification of the Substance / Mixture and of the Company

Commercial Name: **GURONIC B1N0-0/ B3N0-0/ C300-0/ C350-0/ C400-0/
C500-0/ CH00-0S/ D0FR0 0.15/ B1S0-0
Component B - hardener**

Designated Use: cold applied two-component potting and casting resin

Company: Tyco Electronics Raychem GmbH **Phone:** +49 (0) 35 36 54 47 40-0
Fax: +49 (0) 35 36 54 47 40-40

Address: Factory Falkenberg
Hellsternstrasse 1
04895 Schmerkendorf
Germany

E-Mail: guronic@te.com

24 h Emergency Phone Number: Giftnotruf Berlin **Phone:** +49 (0) 30-19240

2 Hazards Identification

Not classified according to Directive 67/548/EEC and CLP Regulation No. 1272/2008/EC.

Specific hazards according to Human and Environment: Material has no hazard under normal working conditions.

3 Composition / Information of Ingredients

modified hydrocarbon resin.

Hazardous Ingredients :

Substance:	CAS-No.:	EG-No.:	Weight %:	Symbol:
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**GURONIC B1N0-0/ B3N0-0/
C300-0/ C350-0/ C400-0/
C500-0/ CH00-0S/ D0FR0 0.15/
B1S0-0
Component B -hardener**

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4 First-Aid Measures

General Advice:	Remove contaminated clothing immediately and wash thoroughly before reuse.
Inhalation of Aerosols or Vapour in High Concentration:	Apply fresh air; consult medical attention in case of discomfort.
Skin Contact:	First wipe off, then wash thoroughly with water and soap. Apply skin cream.
Eye Contact:	Rinse thoroughly with plenty of water for at least 15 minutes. Immediate medical attention required.
Ingestion:	Avoid vomiting, wash mouth thoroughly, drink plenty of water, consult medical attention.
Advice for Physician:	---

5 Fire-Fighting Measures

Suitable Extinguishing Media:	Dry powder, foam, CO ₂ .
Special Exposure Hazards:	Carbon monoxide, carbon dioxide and irritating vapours may be released in case of fire.
Protective Measures:	Wear self contained breathing apparatus. Fire-fighters must wear fire resistant personnel protective equipment. Do not inhale combustion gas.
Other Precautions:	Do not let contaminated fire fighting water enter drains. Possible pressure build-up and burst of containers in case of surrounding fire. Cool containers with water spray and remove them from danger zone if possible.

6 Accidental Release Measures

Personal Precautions:	No special measures necessary. Avoid eye and skin contact.
Environmental Precautions:	Prevent discharges into soils, waters, sewers or drains.
Methods for Cleaning Up:	Soak up with inert absorbent material (e.g. sand, sawdust, oil absorber). Collect and dispose of in accordance with local regulation (see section 13).
Recommended cleaning agents:	gasoline, petroleum, solvent

7 Handling and Storage

Handling:	General precautions for handling of chemicals have to be regarded.
Fire and Explosion Protection:	Keep away from heat and ignition sources.
Storage:	Store in closed container in dry, well-ventilated and cold area. Keep separated from food. Prevent contact with air/oxygen.
Storage Temperature:	-20 °C to +40 °C
Recommended Storage Temperature:	~ +25 °C

8 Exposure Control and Personal Protection

Exposure limits:	Product does not contain relevant amounts of substances that are subject to working place monitoring.
Technical Protection Measures:	Use closed processing equipment if possible.
Personal Protection:	Respect the normal rules of industrial hygiene
Respiratory Protection:	Negligible
Eye Protection:	Tightly fitting safety goggles.
Hand Protection:	PE gloves for single use, resist penetration for more than 30 min. Damaged gloves should be replaced.
Body Protection:	Normally used protective clothing when handling with chemicals.
General Protective Measures:	Respect normal rules of industrial hygiene. Do not eat, drink or smoke during work. Keep food separated. Wash hands thoroughly before breaks and after work. Avoid contact with eyes, skin and clothing. Do not inhale vapours.

9 Physical and Chemical Properties

Appearance:	liquid
Colour:	transparent – light yellow
Odour:	specific
Aggregate State Modification:	
Melting Point:	n.d.
Boiling Point:	n.d.
Flash Point:	ca. 300 °C
Ignition Temperature:	ca. 360 °C
Lower Explosion Limit (Vol-%):	n.a.
Upper Explosion Limit (Vol-%):	n.a.
Vapour Pressure (20 °C):	< 0.01 hPa
Density at 23 °C (EN ISO 1183-1):	0.96 g/cm ³
Viscosity at 20 °C (DIN 53019):	ca. 7 Pa·s
Solubility:	insoluble in water

n. d.: not determined

n.a.: not applicable

10 Stability and Reactivity

Conditions to Avoid:	Excessive temperatures. Decomposition begins at ca. 300 °C. Protect against damp and light.
Materials to Avoid:	Prevent contact with air/oxygen.
Dangerous Reactions:	Oxidized with air.
Hazardous Decomposition Products:	Carbon monoxide, carbon dioxide



**GURONIC B1N0-0/ B3N0-0/
C300-0/ C350-0/ C400-0/
C500-0/ CH00-0S/ D0FR0 0.15/
B1S0-0
Component B -hardener**

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11 Toxicological Information

Acute Toxicity:
LD50 (oral, rat): > 10000 mg/kg
Skin: No irritating effects known.
Eyes: No irritating effects known.

12 Ecological Information

General information: Does not contain any heavy metals or PCB.

13 Disposal Considerations

Recommendation: Dispose of in compliance with local/federal regulation.
Accountability: Consider the local regulations.
Residues / void containers (recommendation): Mix residues of resin with hardener in order to cure. Cured resin and empty containers may be added to domestic waste.

14 Transport Information

Not classified as dangerous goods according to transport regulations (for land transport ADR / RID, inland waterway transport ADN/ADNR, sea transport IMDG, air transport IATA).

15 Regulatory Information

Not classified according to Directive 67/548/EEC and CLP Regulation No. 1272/2008/EC.

Water Hazard class: 1 (weak water hazard)

16 Other Information

The information given in this Safety Data Sheet is correct to the best of our knowledge, experience and believe at the date of its publication. The information provided is designated only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as warranty or quality specification. The information only relates to the specific material and use designated and may not be valid for combinations with any other materials or in any process, unless specified in the text.