

# CASTING RESINS FOR ELECTRONICS AND ELECTRICAL INSTALLATIONS

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## GURONIC AND RAPID CASTING RESINS

Suitable for sensor and control systems in the automotive and industry areas

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# ALTERNATIVE ENCAPSULANTS FOR HIGH PROTECTION AND RELIABILITY

The demands on electrical and electronic device components are constantly increasing, which in turn cause these to reach their performance limits. The safe use of materials in production and from an environmental stand point have also come into focus in recent years. Our RAPID and GURONIC casting compounds meet all of these requirements.

## One Connectivity Partner

We can be your partner for multiple connectivity and encapsulation technology needs. Having developed and manufactured high-standard casting resins for cable insulation and automotive applications for over 30 years, we are ready to help. You can count on our dedicated engineering team to develop casting and coating materials for electronics, and to provide customized resin formulation and development services.

## Reliability + Protection

**Designed to deliver high reliability even in low temperatures, our casting resins show excellent mechanical and electrical properties to provide a high level of protection of your components.**

Designed for electrical engineering and electronics applications, RAPID and GURONIC two-component cold casting resins are especially well-suited for potting and coating to protect against moisture, environmental influences, mechanical shock and vibration. Thanks to their water-repelling properties, RAPID polyurethane encapsulants are very resistant to hydrolysis. GURONIC casting resins' sensitivity to moisture is very low, ensuring easy handling and safe processing.

## Easy + Safe Installation

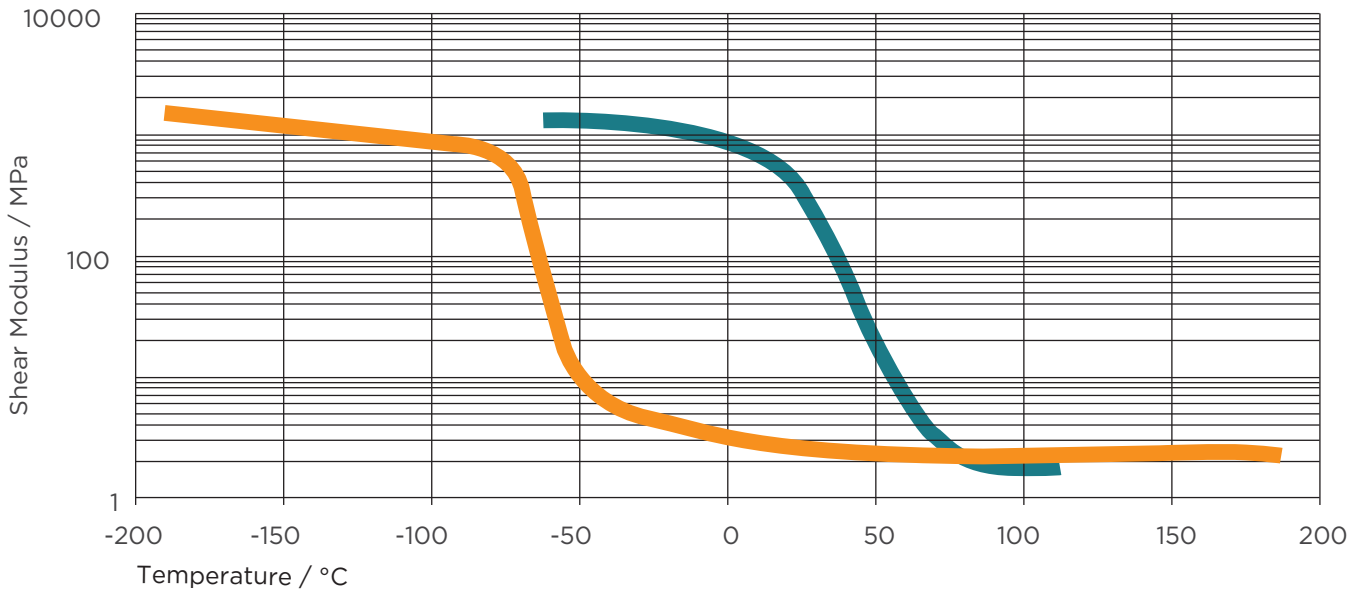
**Our casting resins require no special protective measures for production and are safe to use even at high voltages.**

Our RAPID polyurethane and GURONIC casting resins can easily be handled with ordinary two-component dispensing devices. RAPID and GURONIC resins have no solvents and are epoxy and silicone free. The GURONIC resin provides no exothermic reaction during cure, requires no special protective measures for production and are safety-class free.

## Excellent Flexibility Even at Low Temperatures

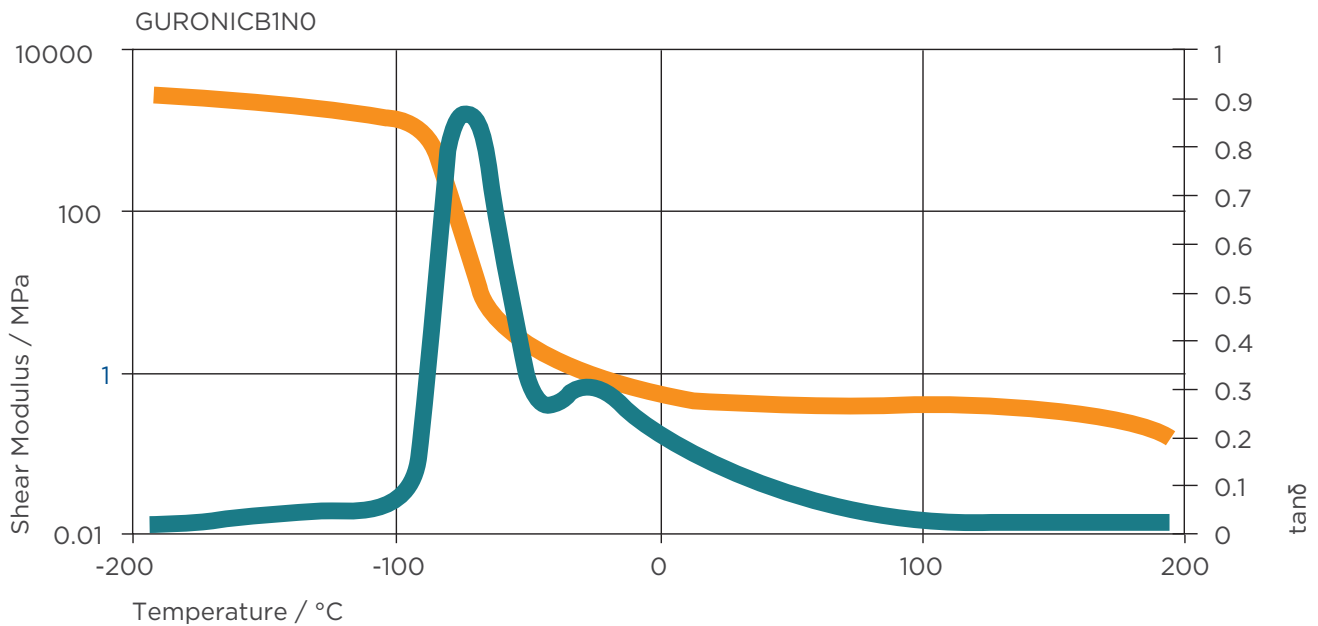
From rubber-elastic encapsulants offering excellent flexibility at low temperatures to tough, rigid resins with high tensile strength, we offer you a wide range of potting materials.

## Shear Modulus at Glass Transition Temperature



- █ RAPID Y 16
- █ RAPID 3010 B

Graphic representation of the Shear Modulus dependent on temperature for different RAPID casting resin grades used to determine the glass transition temperature according to German industrial standard DIN 53445.



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

# RAPID POLYURETHANE CASTING RESIN

## Features & Benefits

- For casting, encapsulation, dam-and-fill, cover
- Silicone-free
- Protection against moisture, vibration and shock
- Finishes available from elastic to tough and rigid

## Relevant Standards

- Mechanical properties according to DIN 57291-2
- Certified according to ISO/TS 16949, ISO 9001, ISO 14001, OHSAS 18001 and local certification according to AEO

## The RAPID Product Family

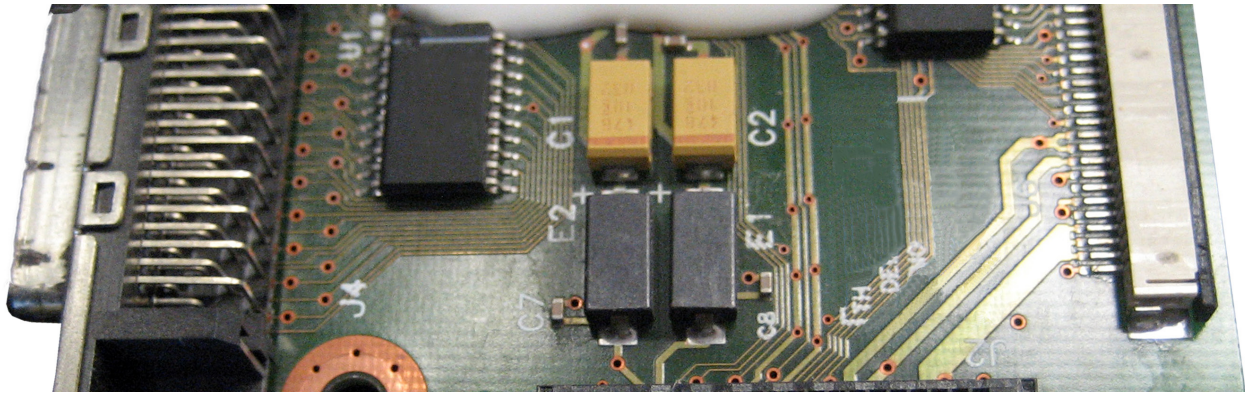
### Technical Data

(valid for the cured material if not stated otherwise)

			P1 opaque	P1T opaque	Y16 black
			elastic, flexible at low temp	elastic, flexible at low temp.	elastic, flexible at low temp.
Mixing ratio	weight volume		100 : 13.5 100 : 10.5	100 : 19 100 : 16.1	100 : 19.5 100 : 14.8
Pot life	at 23 °C at 40 °C at 60 °C	IEC 60455-2	4 min - -	43 min 23 min 9 min	28 min 20 min 12 min
Cure time to standstill	at 23 °C	[ENG- FB-401-50018-7] (internal)	120 min	230 min	180 min
Exothermic temperature rise	at 23 °C	IEC 60455-2	64 °C	43 °C	60 °C
Viscosity of fresh mixture [Pa*s]	at 20 °C at 40 °C at 60 °C	DIN 53019 AA03/45 (intern)	19.9 7.2 2.7	21.9 7.6 3.6	6.7 2.6 1.2
Dielectric strength of the mixture [kV/mm]	at 23 °C	VDE 0370 / IEC 156	19	21	19
Density of cured material [g/cm <sup>3</sup> ]		calculated	1.00	1.00	0.98
Hardness Shore	at 23 °C	ISO 868	A 43	A 49	A 64
Tensile strength [N/mm <sup>2</sup> ]	at 23 °C	ISO 527	0.8	0.8	1.5
Elongation at break [%]	at 23 °C	ISO 527	90	45	40
Glass transition temperature		ISO 11357	-40 °C	-40 °C	-75 °C
Typical operation temperature range [°C]		100 cycles without cracking	-40 to +150	-40 to +150	-40 to +130
Relative permittivity $\epsilon_r$ (23°C, 50 Hz, 500 V/s)		DIN EN IEC 62631-2-1	4.8	4.8	2.5
Thermal expansion coefficient linear [K <sup>-1</sup> ]		ISO 11359	2.1 x10 <sup>-4</sup> (-20°C to 140°C)	2.1 x10 <sup>-4</sup> (-20°C to 180°C)	2.2 x10 <sup>-4</sup> (-20°C to 140°C)
Thermal conductivity [W/(m*K)]	at 23°C	ISO 22007	0.2	0.2	0.2
Water uptake [%]		ISO 62	0.2	0.2	0.15

n.m. = not measured

The data presented in this leaflet is 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 constants 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 DIN 57291-2.



R2 black	3010 B blue	C0 opaque	FR light beige	FY-N black
elastic, flexible at low temp.,	elastic, flexible at low temp.	tough elastic, high resistance against oil and fuel	oil-resistant, flame-retardant, UL 94 V-0	elastic, flexible at low temp. flame-retardant, UL 94 V-0
100 : 41.7 100 : 33.3	100 : 32 100 : 31.5	100 : 43.5 100 : 40	100 : 25.6 100 : 30.5	100 : 11.7 100 : 13
28 min 17 min 7 min	15 min 8 min 4 min	30 min 20 min 8 min	23 min 16 min -	18 min 22 min 10 min
42 min	20 min	60 min	50 min	50 min
90 °C	89 °C	93 °C	50 °C	42 °C
0.8 0.3 0.1	2.3 0.9 0.3	1.9 0.7 0.3	1.2 0.8 0.4	11.0 4.4 1.6
19	13	15	21	19
1.05	1.22	1.17	1.42	1.36
A 74	D 54	D 35	D 75	A 71
1.5	13.3	12.0	26.0	1.65
35	45	100	5	34
0 °C	n.m.	n.m.	50 °C	n.m.
n.b.	n.m.	n.m.	n.m.	-40 to +140
n.b.	4.7	9.9	5.0	n.m.
n.b.	1.8 x10 <sup>-4</sup> (+25 - 140 °C)	2.3 x10 <sup>-4</sup> (+25 - 120 °C)	n.m.	n.m.
0.2	0.3	0.2	0.4	0.4
0.2	< 0.1	0.4	0.4	0.04

# GURONIC CASTING RESIN

## TECHNICAL DATA

### Features & Benefits

- For potting and coating
- Free of isocyanate, epoxy and silicone
- Protection against humidity, shock and vibration
- Remains elastic up to -70 °C

### Relevant Standards

- Environmentally friendly, label-free to CLP VO 1272/2008/EG and REACH VO 1907/2006
- Mechanical properties to DIN 57291-2
- Certified to ISO/TS 16949, ISO 9001, ISO 14001, OHSAS 18001 and local certification according to AEO

### GURONIC Product Family

#### Technical Data

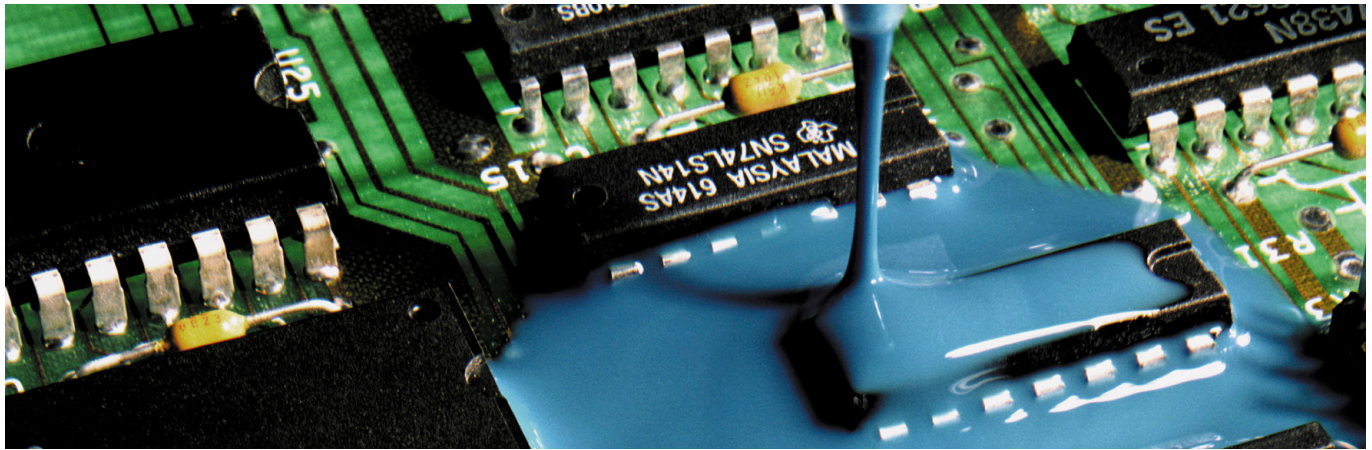
(valid for the cured material if not stated otherwise)

		Standard blue		
		soft elastic, flexible at low temp.		
		A1	B1	C1
Mixing ratio	weight volume	100 : 66.7 100 : 96,5	100 : 50 100 : 72.4	100 : 33.3 100 : 48.3
Pot life	at 23 °C at 40 °C at 60 °C	IEC 60455-2	184 min 93 min 60 min	75 min 45 min 35 min
Cure time to standstill	at 23 °C	[ENG-FB-401-50018-7] (internal)	20 h	7 h
Exothermic temperature rise	at 23 °C	IEC 60455-2	none	
Viscosity of fresh mixture	at 20 °C [Pa*s] at 40 °C at 60 °C	DIN 53019 AA03/45 (internal)	4.5 2.1 1.0	5.5 2.0 1.0
Dielectric strength of the mixture	[kV/mm] at 23 °C	VDE 0370 / IEC 156	10	
Density of cured material	[g/cm <sup>3</sup> ]	calculated	1.18	1.21
Hardness Shore	at 23 °C	ISO 868	A 11	A 13
Tensile strength	[N/mm <sup>2</sup> ] at 23 °C	ISO 527	0.38	0.34
Elongation at break	[%] at 23 °C	ISO 527	179	139
Glass transition temperature		ISO 11357	< -40 °C	
Typical operation temperature range	[°C]	100 cycles without cracking	n.m.	
Relative permittivity	(23°C, 50 Hz, 500 V/s) <sub>r</sub>	DIN EN IEC 62631-2-1	n.m.	n.m.
Thermal expansion coefficient linear	[K <sup>-1</sup> ]	ISO 11359	n.m.	3.3 x10 <sup>-4</sup> (-70°C to 45°C)
Thermal conductivity	[W/(m*K)] at 23 °C	ISO 22007	0.3	
Water uptake	[%]	ISO 62	0.2	

n.m. = not measured

The data presented in this leaflet is 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 constants 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 DIN 57291-2.





B1N0 blue or beige		B1S0 beige	C400-0 transparent		CH00-0S black	DOFRO brown
elastic, flexible at low temp.		elastic, flexible at low temp.	soft elastic, flexible at low temp.		soft elastic, flexible at low temp.	soft elastic, flexible at low temp., flame-retardant, UL 94 V-0
B1N0	B5N0	B1S0	C400-0	C500-0	CH00-0S	DOFRO
100 : 50 100 : 73.9		100 : 50 100 : 71.3	100 : 100 100 : 100		100 : 100 100 : 100	100 : 25 100 : 42.5
8 min 9 min 11 min	23 min 19 min 14 min	5 min 7 min 7 min	36 min 26 min 10 min	300 min 130 min 60 min	28 min 26 min 23 min	- - 35 min
4 h	8 h	2 h	6- 8 h	24 h	315 min	16 h
none	none	none	none	none	none	none
23.0 10.1 5.1	26.0 11.5 4.5	32.7 13.5 6.5	16.6 8.0 3.3	9.3 3.8 1.7	13.5 5.8 3.0	40.8 14.0 5.8
14		14	31	15	13	
1.20		1.17	0.92		0.94	1.45
A 22		A 22	A 11		A 11	A 18
0.31		0.34	0.2		0.2	0.8
91		103	75		90	180
< -40 °C		< -40 °C	-85 °C		-85 °C	-75 °C
-40 to +125		-40 to +130	-40 to +125		-40 to +125	-40 to +130
2.2		3.6	2.0		2.0	3.7
2.2 x10 <sup>-4</sup> (-70°C to 100°C)		5.5 x10 <sup>-4</sup> (25°C to 150°C)	2.7 x10 <sup>-4</sup> (-20°C to 100°C)		2.7 x10 <sup>-4</sup> (-20°C to 100°C)	1.7 x10 <sup>-4</sup> (-40°C to 100°C)
0.3		0.3	0.2		0.2	0.5
0.2		0.25	0.25		0.5	0.3

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TE Connectivity is a global industrial technology leader creating a safer, sustainable, productive and connected future. Our broad range of connectivity and sensor solutions, proven in the harshest environments, enable advancements in transportation, industrial applications, medical technology, energy, data communications and the home. With approximately 80,000 employees, including more than 7,500 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS.

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