

camattini spa thermosetting resins

Resin
PL 501LRHardener
G 27Mixing ratio by weight
100:23**Applications:** Encapsulation of transformers, igniters, submersible pumps, capacitors.**Processing:** Manual casting. Undervacuum casting.**Description:** Two components polyurethane system filled with no-abrasive fillers. Self-extinguishing. Long pot-life. Moderate curing time. The system is available in other versions: MR (medium reactivity) and HR (high reactivity). Good electrical and mechanical properties. The system is UL 94 V-0 listed (File E116643).**SYSTEM SPECIFICATIONS****Resin**

Viscosity at:	25°C	IO-10-50	mPas	7.500	11.000
Density at:	25°C	IO-10-51 (ASTM D 1475)	g/ml	1,52	1,56
Gelation time	25°C 100ml	IO-10-52a (UNI 8701)	min	32	42

Hardener

Viscosity at:	25°C	IO-10-50	mPas	25	40
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TYPICAL SYSTEM CHARACTERISTICS**Processing Data**

Mixing ratio by weight	for 100 g resin	g	100:23
Mixing ratio by volume	for 100 ml resin	ml	100:30
Resin Colour			Various colours
Hardener Colour			Various colours

Density at:	25°C Hardener	IO-10-51 (ASTM D 1475)	g/ml	1,20	1,22
Pot life at:	25°C (3.000 mPas)	IO-10-50 (*)	min	14	18
	40°C (3.000 mPas)		min	12	16
Initial mixture viscosity at:	25°C	IO-10-50	mPas	800	1.400
	40°C		mPas	700	1.000
Gelation time	25°C (15ml;6mm)	IO-10-73 (*)	min	60	90
Demoulding time	25°C (15ml;6mm)	(*)	h	4	6
Post-curing	60°C	(**)	h	(15)	

TYPICAL CURED SYSTEM PROPERTIES
Properties determined on specimens cured: 24 h TA + 15 h 60°C

Surface			Bright	
Density	IO-10-54 (ASTM D 792)	g/ml	1,45	1,49
Hardness	IO-10-58 (ASTM D 2240)	Shore D/15	84	87
Glass transition (Tg)	IO-10-69 (ASTM D 3418)	°C	39	43
Water absorption (24h RT)	IO-10-70 (ASTM D 570)	%	0,10	0,20
Water absorption (2h 100°C)	IO-10-70 (ASTM D 570)	%	0,80	1,00
Linear thermal expansion (Tg -10°C)	IO-10-71 (ASTM E 831)	10 ⁻⁶ /°C	60	70
Linear thermal expansion (Tg +10°C)	IO-10-71 (ASTM E 831)	10 ⁻⁶ /°C	125	135
Thermal shock (n°10 cycles passed)	IO-10-67 (inserto metallico Olyphant)	°C	- 45	+ 165
Flammability	IO-10-68 (UL 94 V-0)	mm	6,4	
Max recommended operating temperature	IEC 60085 (***)	°C	130	
Dielectric constant at:	IO-10-59 (ASTM D 150)		4,0	5,0
Loss factor at:	IO-10-59 (ASTM D 150)	x 10 ⁻³	30	45
Volume resistivity at:	IO-10-60 (ASTM D 257)	Ohm x cm	1 x 10 ¹⁵	3 x 10 ¹⁵
Dielectric strength	IO-10-61 (ASTM D 149)	kV/mm	17	21
Flexural strength	IO-10-66 (ASTM D 790)	MN/m ²	52	62
Strain at break	IO-10-66 (ASTM D 790)	%	2,5	4,5
Flexural elastic modulus	IO-10-66 (ASTM D 790)	MN/m ²	3.000	4.000
Tensile strength	IO-10-63 (ASTM D 638)	MN/m ²	28	35
Elongation at break	IO-10-63 (ASTM D 638)	%	1,5	2,5
Compressive strength	IO-10-72 (ASTM D 695)	MN/m ²	54	60

IO-00-00 = Camattini's test method. The correspondent international method is indicated whenever possible.

nd = not determined na = not applicable RT = laboratory room temperature (23±2°C)

 Conversion units: 1 mPas = 1 cPs 1MN/m² = 10 kg/cm² = 1 MPa

(*) for larger quantities pot life is shorter and exothermic peak increases

(**) the brackets mean optionality

(***) the maximum recommended operating temperature is given on the basis of available laboratory information. Users should make their own assessments to verify the real component thermal class which is the result of the applied construction technology and used protective materials.

- Instructions:** In pre-filled products it is a good practice to check and carefully rehomogenize the material if some settlement is present. Add the proper quantity of the hardener to the resin, mix carefully. Avoid air trapping. For some applications it can be useful pre-heat the components and/or carry on a deaeration step under vacuum of the mixture before casting.
- Post-curing** For room temperature curing system the post-curing allows the fast stabilization of the material and the obtainment of the best electrical and mechanical properties. During curing process it is advisable to avoid thermal variations higher than 10°C/hour.
- Storage:** Polyurethane resins and the isocyanate based hardeners can be stored for six months in the original sealed containers kept in a cool and dry place. The hardeners may present an increase in viscosity that do not change the cured system properties. After that period, or if the material has been stocked in anomalous conditions, pre-filled resins can be settled down and their use is possible only if they are accurately re-homogenized with the help, if necessary, of a mechanical mixer. Both components are moisture sensitive therefore it is a good practice to close the vessels immediately after each use. Moisture absorption may cause the expansion of the product during application and/or the hardener may crystallize during storage. The isocyanates may crystallize at low temperatures. To restore the original conditions, heat the material at 70-80°C avoiding local overheating. Before use, the product must be rehomogenized and cooled down at room temperature.
- Handling precautions:** Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

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The information given in this publication is based on the present state of our technical knowledge but buyers and users should make their own assessments of our products under their own application conditions.