

Technical information

MICARES[®] 721 R1

Two-component casting resin

TYPE Micares[®] 721 R1 is a casting resin system based on polyurethane, consisting of resin and hardener. This two component potting compound, designed for use in the electrotechnics and the electronics, is thermal-curing, solvent-free and liquid at ambient temperature (RT). The resin component contains the filler and is pre - evacuated.

GENERAL PROPERTIES Good mechanical strength properties. High impact strength and good dimension stability. The resin adheres well to metals and other materials and resists tracking. Dielectric losses are low even at high temperatures. Glass transition temperature: 95 – 110°C

USE A casting resin for mechanical and especially electrical applications for any voltage. For high mechanical, thermal or chemical stress requirements.

SUPPLY Micares[®] 721 R1 consists of two components (resin and hardener):
- Resin 721 R1 = filled PUR - resin system
- Hardener P 978 = unfilled modified MDI - hardener

Containers / Weights	Resin 721 R1	Hardener P 978
200 l - steel drum	300 kg	250 kg
25 l - bucket (resin); can (hardener)	35,7 kg	6 - 24 kg
630 / 1000 l - container	on request	
Mixing ratio (parts by weight)	2,5	1
Shelf life (months)	6	9
Storage temperature	<40 °C	15 – 35 °C
Toxicity (Swiss classification) / BAG #	4 / 619004	3 / 614463



STORAGE

Both components should be stored in appropriate room in their originally sealed containers. **Avoid storage outside!**

The resin is chemically stable. However, before use, it must be carefully stirred with a suitable stirrer since all resins containing a mineral filler tend to build deposits. Stirring with particular care is necessary in case, when the resin has been stored for a long period of time.

Important:

The hardener must be kept away from any exposure to humidity. It should always be stored well sealed.

MIXING

The resin and hardener are mixed according to the specified ratio, at ambient temperature, preferably using automatic dosing and mixing equipment.

If the resin has been stored for a long period of time, it is recommended to stir well the complete content of the container and to check the viscosity before the processing is being started. Formation of lumps has to be prevented by applying appropriate stirring conditions.

CASTING

The mixture is applied at ambient temperature (above 18°C). The moulds should be treated with a release agent (e.g. MICAFIL 8055), to facilitate the subsequent mould removal. The moulds should be designed for bottom-filling. Such a design would allow the air in the mould to escape at the highest point. The moulds should preferably be slightly inclined for filling.

For sophisticated components, or if optimal electrical properties are specified, a casting under vacuum is required.

Cycle times could be significantly reduced by preheating the moulds to approx. 60 - 100°C, depending on the shape and the size of the components. It is also possible to increase the reactive capacity of the casting resin compound by adding a catalyst (0,1 to 1 ‰), without adverse effects on the final properties of the resin.

**HARDENING
CONDITIONS**

To achieve fast hardening and to obtain optimal final properties, a post-hardening at T=120°C for 7h is necessary.

Under ideal conditions, e.g. optimal material mass distribution, well-designed moulds etc. and, if the moulds are preheated, the resin will often generate sufficient heat by exothermal reaction. Hence, there is no post-hardening (in oven) required.

MACHINABILITY

The casting resin compound can be sawn, milled, turned or drilled with conventional metal-machining tools.

**SAFETY
PRECAUTIONS**

Many synthetic resin components are found to be likely for causing skin irritation, or otherwise affect health, if placed into a direct contact with the skin, or if their vapor has been inhaled. Adequate ventilation, use of protective clothing, goggles, gloves and chem. resistant shoes, clean working conditions and careful personal hygiene are usually sufficient as accident prevention measures. Medical advice is essential in all severe cases. MICARES resins are not to be considered a health hazard.

MICARES hardener is a toxic substance, but has a low vapor pressure at ambient temperature and it may be applied without special equipment, providing that care is taken to avoid possible skin, mucous membranes, or eye contact. For further details regarding safety, please refer to the safety datasheet.

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	Properties		Standards	Units	Values
Resin 721 R1	Color		RAL		~3016 red
	Density		DIN 51757	g/cm ³	1,60 - 1,66
	Viscosity (as delivered)	25°C	Brookfield	Pa s	3 – 6
Hardener P 978	Density		DIN 51757	g/cm ³	1,22 - 1,24
	Viscosity (as delivered)	25°C	Brookfield	mPa s	150 – 250
	Vapor pressure	25°C		mbar	< 10 ⁻⁵
Casting resin compound	Mixing ratio (resin / hardener)			parts by weight	2,5 : 1
	Initial viscosity	25°C	Brookfield	Pa s	1,2 - 2,2
	Gel time	23°C	DIN 16945	min	40 – 80
	Hardening (conditions)			7 h	120°C
				48 h	25°C
Density		ISO 1183	g/cm ³	1,5 - 1,6	
Electrical properties	Dielectric strength 50 Hz, h = 2mm	20 s	IEC 243	kV/mm	18 – 24
	Spec. surface resistance	20°C	IEC 93	Ω	10 ¹²
	Spec. volume resistance	20°C	IEC 93	Ω cm	10 ¹⁴
	Dissipation factor tan δ 50 Hz	23°C	IEC 250		<0,04
		70°C		<0,07	
	Relative permittivity ε _r 50 Hz	23°C	IEC 250		4 – 5
		70°C		5 – 6	
Comparative tracking index		IEC 112		CTI 600	
Arc resistance		ASTM D 495	s	130 - 135	
Mechanical properties	Tensile strength		ISO 527	N/mm ²	50 - 60
	Elongation at breaking point		ISO 527	%	1,5 - 3,0
	Flexural strength		ISO 178	N/mm ²	85 - 100
	Impact strength		ISO 179	kJ/m ²	10 - 15
	Ball indentation hardness		DIN 53456	N/mm ²	180 - 200
	Flexural modulus of elasticity (three-point method)		ISO 178	N/mm ²	3600 - 4000

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	Properties	Standards	Units	Values
Thermal properties	Glass transition temperature Tg	IEC 1006	°C	95 - 110
	Heat distortion temperature	ISO 75	°C	80 - 85
	Linear thermal expansion 20 - 100°C	VSM 77110	10 ⁻⁶ K ⁻¹	35 - 45
	Thermal conductivity 20 - 100°C	VDE 0304 T1	W/m K	0,4 - 0,5
	Thermal class	IEC 85	°C	B
Physical and chemical properties	Cold water absorption 24h / H ₂ O (method 1)	ISO 62	weight %	0,2 - 0,3
	Boiling water absorption 30 min / H ₂ O (method 3)	ISO 62	weight %	0,3 - 0,4

These properties have been determined by the above shown methods. The data given are valid for standard test specimen only. Unless otherwise specified, all data were measured at ambient temperature on specimen as manufactured and without particular treatment.

The contents of this publication are based on our present experience. They are an indication for application of our products without any liability for ourselves. Notice of legal requirements and existing patent rights has to be taken.

Due to the many application and manufacturing process possibilities, we cannot give any warranty for the technical results in individual cases.



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