# Technical Information
# MICARES â 751 R1

Two-component casting resin

**TYPE**

Micares® 751 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 thermo-curing. Micares® 751 R1 is solvent-free and liquid at ambient temperature (RT). The resin component contains the filler and is degassed.

**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. Good thermal endurance.
Glass transition temperature: 55 - 65°C Hardness, Shore D: 80

**USE**

A casting resin for mechanical and especially electrical applications for low and middle voltage, e.g. for capacitors and for power or instrument transformers. For high mechanical, thermal or chemical stress requirements. The flexibility of the resin allows the embedding of sharp edged pieces without intermediate compressible layers.

**SUPPLY**

Micares® 751 R1 consists of two components (resin and hardener):
- Resin 751 R1 = filled PUR - resin system
- Hardener P 978 = unfilled modified MDI - hardener

| **Containers / Weights** | **Resin 751 R1** | **Hardener P 978** |
|---|---|---|
| 200 l - steel drum | 300 kg | 250 kg |
| 25 l - bucket (resin); 10 l - can (hardener) | 37,5 kg | 6 - 24 kg |
| 630 / 1000 l - container | on request | |
| Mixing ratio (parts by weight) | 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!**<br><br>The resin is chemically stable. However, before use, it must be carefully stirred with a suitable equipment 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.<br><br>**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.<br>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 of the moulds to approx. 40 - 80°C, depending on the shape and the size of the components.<br><br>It is 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=100°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 liable for causing skin irritation, or otherwise affect health, if placed into a direct contact with the skin, or if their vapors have 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 or doubtful cases. MICARES resins are not to be considered a health hazard.<br><br>MICARES hardener is a toxic substance, but it 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.<br><br>For further details regarding safety, please refer to the safety datasheet. |

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| | Properties | | Standards | Units | Values |
|---|---|---|---|---|---|
| **Resin 751 R1** | Color | | RAL | | ~3016 red |
| | Density | | DIN 51757 | g/cm$^3$ | 1,75 - 1,85 |
| | Viscosity (as delivered) | 25°C | Brookfield | Pa s | 9 - 18 |
| **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 | 5 : 1 |
| | Initial viscosity | 25°C | Brookfield | Pa s | 3,0 - 3,5 |
| | Gel time | 23°C | DIN 16945 | min | 180 - 300 |
| | Hardening (conditions) | | | 28h/ 25°C | 7h/ 100°C |
| | Density | | ISO 1183 | g/cm$^3$ | 1,7 - 1,8 |
| **Electrical properties** | Dielectric strength<br>50 Hz, h = 2mm | 20 s | IEC 243 | kV/mm | 16 - 20 |
| | Spec. surface resistivity | 20°C | IEC 93 | Ω | $10^{15}$ |
| | Spec. volume resistivity | 20°C | IEC 93 | Ω cm | $10^{15}$ |
| | Dissipation factor tan δ<br>50 Hz | 23°C<br>70°C | IEC 250 | | 0,01<br>0,07 |
| | Relative permittivity $\varepsilon_r$<br>50 Hz | 23°C<br>70°C | IEC 250 | | 4,7 - 5,2<br>8,0 - 8,5 |
| | Comparative tracking index | | IEC 112 | | CTI 600 |
| | Arc resistance | | ASTM D-495 | s | 135 - 145 |
| **Mechanical properties** | Tensile strength | | ISO 527 | N/mm$^2$ | 40 - 45 |
| | Elongation at breaking point | | ISO 527 | % | 2 - 3 |
| | Flexural strength | | ISO 178 | N/mm$^2$ | 75 - 85 |
| | Impact strength | | ISO 179 | kJ/m$^2$ | 10 - 15 |
| | Ball indentation hardness | | DIN 53456 | N/mm$^2$ | 70 - 80 |
| | Flexural modulus of elasticity (three-point method) | | ISO 178 | N/mm$^2$ | 6000 - 8000 |
| **Thermal properties** | Glass transition temperature Tg | | IEC 1006 | °C | 55 - 65 |
| | Heat distortion temperature | | ISO 75 | °C | 40 - 45 |
| | Linear thermal expansion | 20 - 100°C | VSM 77110 | $10^{-6}$ K$^{-1}$ | 90 - 110 |
| | Thermal conductivity | 20 - 100°C | VDE 0304 T1 | W/m K | 0,6 - 0,7 |
| | Thermal class | | IEC 85 | °C | B |

# MICARES â 751 R1

| | Properties | | Standards | Units | Values |
|---|---|---|---|---|---|
| **Physical and chemical properties** | Cold water absorption 24h / $H_2O$ (method 1) | | ISO 62 | weight % | 0,3 - 0,5 |
| | Boiling water absorption 30 min / $H_2O$ (method 3) | | ISO 62 | weight % | 0,5 - 0,7 |
| | Hardness, Shore D | 25°C | DIN 53505 | | 80 |

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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