

Casting resins

Casting resins – a comparison of our products

Attributes of components/processing	hard polyurethane casting resins (PUR)				elastic polyurethane casting resins (PUR)		unsaturated polyester casting resins (UP)	gypsum/acrylic c. resins	Epoxy casting resins		
	PUR quick casting resin G26	PUR quick casting resin G27	PUR light casting resin M66 G	PUR casting resin 1784/330	PUR casting/moulding resin U1404	PUR casting resin 1770/330	polyester casting resin GTS	polyester casting resin R&G	Acrystal Prima acrylic resin	Epoxy casting resin, limp	
Colour/Transparency resin	beige, opaque	beige, opaque	brown, opaque	colourless, transparent	colourless, transparent	colourless, transparent	colourless, transparent	colourless, transparent	white, opaque	colourless, transparent	
Colour/Transparency hardener	red-brown, opaque	brown, opaque	red-brown, opaque	colourless, transparent	reddish, transparent (both hardeners)	colourless, transparent	colourless, transparent	colourless, transparent	white, opaque	colourless, transparent	
Fillers	w/o filler	w/o filler	resin with filler, hardener w/o filler	w/o filler	w/o filler	w/o filler	w/o filler	w/o filler	w/o filler	w/o filler	
Density resin (at RT ⁸⁾)	app. 1.01 g/cm ³	app. 1.0 g/cm ³	none given	1.05 g/cm ³	app. 1.05 g/cm ³	app. 1.1 g/cm ³	non given	app. 1.12 g/cm ³	1.02 g/cm ³	app. 1.14 g/cm ³	
Density hardener (at RT ⁸⁾)	app. 1.13 g/cm ³	app. 1.14 g/cm ³	none given	1.10 g/cm ³	app. 1.03 g/cm ³ (hardener 1404)	app. 1.1 g/cm ³	non given	app. 1.16 g/cm ³	2.75 g/cm ³	app. 0.95 g/cm ³	
Viscosity resin (at RT ⁸⁾)	app. 170 mPa.s	app. 70 mPa.s	low viscosity	1,500-1,900 mPa.s	app. 6,500 mPa.s	app. 600-1,000 mPa.s	non given	app. 1,000 ± 100 mPa.s	20-60 mPa.s	app. 950 mPa.s	
Viscosity hardener (at RT ⁸⁾)	app. 40 mPa.s	app. 60 mPa.s	app. 30 mPa.s	app. 2,000 mPa.s	app. 300 mPa.s (both hardeners)	app. 2,000 mPa.s	thin fluid	thin fluid	powder	app. 15 mPa.s	
Mixture viscosity (at RT ⁸⁾)	app. 85 mPa.s	app. 50 mPa.s	pourable	1,200-1,800 mPa.s	3,000-5,800 mPa.s ²⁾	450-500 mPa.s	app. 900 mPa.s	none given	none given	none given	
Mixing ratio by weight (resin:hardener)	1:1	1:1	100:55 (volumes 100:30)	1:2	²⁾	1:1 - 1.5:1	100:0.6 - 100:2 ⁵⁾	100:0.6 - 100:1 ⁵⁾	1:2.5	100:37	
Working life (at RT ⁸⁾)	app. 4-5 min. (for 200 g)	app. 2 min. (for 200 g)	45-60 min. (for 10 kg)	app. 15 minutes	25-100 min. ²⁾	12-15 min.	15-60 min. ⁵⁾	10-20 min. ⁵⁾	app. 20-100 min.	15 hours	
Linear shrinkage	app. 0.4 %	app. 0.2 %	app. 0.8 %	< 0.5 % (< 5 mm thickness)	< 0.1 %	< 0.5 %	app. 7 %	app. 7 %	0 %	1-3 %	
De-moulding time (at RT ⁸⁾)	> 30 min.	> 20 min.	> 8-16 hours	35-40 minutes	app. 24 hours	< 1 h. (5 mm thickness)	0.75-10 hours ⁵⁾	app. 60-90 min.	app. 15-30 min.	at least 24 hours	
Curing time (at RT ⁸⁾)	3 days	3 days	> 8-16 hours + temp. ³⁾	6-8 hours	3-7 days ²⁾	2-4 hours	non given	none given	3 days	24-48 hours	
Shelf life minimum, resin (unopened 15-25 °C)	12 months	12 months	6 months	12 months	12 months	12 months	6 months	3-6 months	24 months	at least 24 months	
Shelf life minimum, hardener (unopened 15-25 °C)	12 months	12 months	12 months	12 months	12 months	12 months	6 months	3-6 months	24 months	at least 24 months	
Toxicology/Safety instructions	resin Xn, hardener Xi	resin Xn, hardener Xi	resin safety label not required, hardener Xn	toxicologically safe (safety label not required)	Xn (resin U1404), N (hardener U1404), N/Xn (hardener U1419 L)	toxicologically safe (safety label not required)	Xn (resin), N/A (hardener)	Xn (resin), N/A (hardener)	toxicologically safe (safety label not required)		
Attributes of cured material											
Colour/Transparency	beige-brown, opaque	beige, opaque	brown, opaque	colourless, transparent	reddish, transparent	colourless, transparent	colourless, transparent	colourless, transparent	white, opaque	colourless, transparent	
Density (at RT ⁸⁾)	app. 1.1 g/cm ³	app. 1.1 g/cm ³	app. 0.9 g/cm ³	app. 1.1 g/cm ³	app. 1.05 g/cm ³	app. 1.1 g/cm ³	app. 1.12 g/cm ³	app. 1.22 g/cm ³	1.85 g/cm ³	1.25 g/cm ³	
Shore hardness ¹⁾	app. 70 Sh-D	app. 70 Sh-D	app. 67 Sh-D ³⁾	80-82 Sh-D ⁴⁾	40-80 Sh-A ²⁾	40-70 Sh-A (through the mixing ratio)	non given	non given	app. 80 Sh-D	app. 80 Sh-D	
Impact resistance (at RT ⁸⁾)	app. 30 kJ/m ²	25 kJ/m ²	8 kJ/m ² ³⁾	none given	not relevant	not relevant	app. 8 kJ/m ² ⁶⁾	app. 8 kJ/m ²	non given	app. 27 kJ/m ²	
Elongation at break (at RT ⁸⁾)	app. 15 %	app. 7 %	none given	none given	600-1,000 % ²⁾	non given	non given	app. 2.5 %	non given	non given	
Tear resistance (at RT ⁸⁾)	app. 23 N/mm ²	app. 32 N/mm ²	none given	none given	3-16 N/mm ² , tear propagation strength 7-40 N/mm ² ²⁾	app. 28 N/mm ²	app. 55 N/mm ² ⁶⁾	app. 55 N/mm ²	non given	non given	
Modulus of elasticity (at RT ⁸⁾)	app. 1,100 N/mm ²	app. 1,300 N/mm ²	app. 1,350 N/mm ² ³⁾	app. 1,900 mPa.s	not relevant	not relevant	app. 3,500 N/mm ² ⁶⁾	app. 3,500 N/mm ²	non given	app. 3,500 N/mm ²	
Transversal strength (at RT ⁸⁾)	app. 45 N/mm ²	app. 55 N/mm ²	app. 35 N/mm ² ³⁾	none given	not relevant	not relevant	app. 90 N/mm ² ⁶⁾	app. 90 N/mm ²	18 N/mm ²	100 N/mm ²	
Heat resistance	up to app. 75 °C	up to app. 80 °C	up to app. 70 °C	up to 75 °C, short term up to 180 °C	up to app. 70 °C	> 140 °C	up to app. 70 °C	up to app. 70 °C	> 80 °C	60 °C	
UV resistance	no	no	no	yes	no	yes	yes	yes	yes	non given	
Moisture resistance (freshwater)	yes	yes	yes	yes	yes	yes	yes	yes	conditional ⁷⁾	yes	
Comments											
Special features	- very impact resistant - very low viscosity (very pourable) - takes fillers excellently - very easy to mix (1:1) - short working life and de-moulding time - little shrinkage - cures to a very machinable substance	- very impact resistant - very low viscosity (very pourable) - takes fillers well - little odour - very easy to mix (1:1) - very short working life and de-moulding time - very little shrinkage - cures to a very machinable substance - takes colouring well - takes paint well	- very lightweight - low viscosity (pourable) - relatively long working life and de-moulding time - cures to a very machinable substance - takes primer and paint excellently	- colourless a. crystal clear - UV resistant - little odour - very low viscosity (very pourable) - short working life and de-moulding time - little shrinkage - using a vacuum device produces better results - takes colouring well - cures to a very machinable substance - very scratch resistant - polishes well - very temperature resistant		- various Shore hardness values, working life and mechanical stability adjustable through the mixing ratios (see tables at each product) - little moisture-sensitive - very little shrinkage - for a comparison to silicone: see Comparison Table for elastic moulding materials	- colourless a. crystal clear - UV resistant - various Shore hardness values adjustable through the mixing ratios - little odour - little moisture-sensitive - very low viscosity (very pourable) - using a vacuum device produces better results - takes colouring well	- colourless a. crystal clear - UV resistant - very low viscosity (very pourable) - mixing ratio, working life and de-moulding time depend on amount used (see table at the product) - very high shrinkage - takes colouring well - cures to a very machinable substance	- colourless a. crystal clear - UV resistant - very low viscosity (very pourable) - mixing ratio, working life and de-moulding time depend on amount used (see table at the product) - very high shrinkage - takes colouring well - not sensitive to tears - cures to a very machinable substance	- takes fillers excellently - very little odour - low viscosity (very pourable) - short working life and de-moulding time - no shrinkage - mechanical attributes much better than plaster - grinding, drilling, sawing - takes colouring	- colourless a. crystal clear - very low viscosity - no vacuum device necessary - takes colouring well - cures to a very machinable substance
Intended use	- used variably for quick pouring of models, trial casts, moulded parts, arts and crafts objects (also for complicated shapes)	- specially for complicated shapes and surface textures - very quick even with thin walled pieces	- specially for manual pouring of large objects and sheets for model making	- for crystal clear, hard and temperature resistant pieces up to a wall thickness of 25 mm		- for making moulds for complicated master patterns (alternative to silicone) - casting material for producing flexible moulded pieces	- for crystal clear, elastic pieces up to a wall thickness of 20 mm and as transparent film usable	- for crystal clear, hard cast pieces to be used in model making, decoration...	- for crystal clear, hard cast pieces to be used in model making, decoration ...	- for pouring small and large volume pieces, figures, prototypes etc. - also good for pouring very thin coats	- for crystal clear, hard cast pieces to be used in model making, decoration ...

¹⁾ Please note that for materials that are hard when cured the Shore hardness D is given, for elastic materials the Shore hardness A is given.

²⁾ The U1404 PUR moulding/casting resin is available with two different hardeners. By changing the mixing ratio between resin and hardener(s) a large range of attributes can be achieved. Please consult the corresponding table found at the product.

³⁾ Data after annealing for 8-12 hours at 80 °C

⁴⁾ Data after annealing for 8-2 hours at 80 °C

⁵⁾ In the case of polyester casting resins this data is dependent on the amount being used. Please consult the corresponding tables at the products.

⁶⁾ Data after annealing for 2 hours at 100 °C

⁷⁾ Acrystal products can withstand weathering but are not suitable for uses requiring prolonged periods of exposure to water.

⁸⁾ RT = room temperature