

Toughened Polyurethane Casting Resin



User Guide

Product Description

Xencast® P6 is an industry leading, high strength polyurethane casting resin. Xencast® P6 produces strong, resilient castings with excellent surface detail making it the preferred choice of rapid prototypers, engineers and low-volume manufacturers. Xencast® P6 has a pot-life (working time) of around 5-6 mins and can typically be demoulded in around 1hr.

Utilising the latest polymer technology, Xencast® P6 is able to deliver a ‘fast cast’ polyurethane resin with cured mechanical properties closer to the strength and resilience of thermoplastics, even in thin section.

P6’s translucent formulation means that it accepts pigments very well resulting in strong vibrant colours from reduced pigment concentrations whilst its low viscosity and minimal filler content ensures excellent flow properties and unsurpassed detail reproduction.

Xencast P6 can be used with or without vacuum degassing however for best results a vacuum degassing cycle, either before or after pouring, is recommended. P6 is also highly reactive to moisture content and is therefore not suitable for casting directly into wood or other moisture harbouring materials.

Advantages

- Excellent mechanical properties (less brittle, more resilient)
- Fine surface detail reproduction
- Fast de-mould time (1hr)
- Low viscosity (minimal filler)
- Easily pigmented (translucent)
- Supports a high ratio of filler
- Clean, paint-able finish
- Very machinable

Suggested Uses

- Production/engineering components
- Reproduction of 3D prints
- Product prototypes
- RPG miniatures/figures
- Model making/scenarios
- Sculpture/artwork reproductions
- Cold castings (addition of metal powders)

Considerations

- Requires degassing for best results
- Highly susceptible to moisture content (unsuitable for casting into wood)
- More aggressive to silicone moulds (compared to conventional polyurethanes)

Key Processing Information

For best results, Xencast®P6 should be degassed however good results can still be achieved without degassing. Degassing can be undertaken after mixing (before pouring into your mould), or when the resin is in the mould (if the size of your mould and degassing chamber allow).

Components ‘A’ and ‘B’ should be mixed together quickly and thoroughly by hand at a ratio of 1:1 by weight. Note: Xencast P6 requires more vigorous mixing than conventional fast-cast polyurethanes.

The resin must be poured into the mould quickly as the pot-life of Xencast® P6 is very short (less than 6 mins). If you are degassing the resin, either before pouring or in-mould, make sure you can undertake this within the 5-6min pot-life.

If fillers or pigments are to be used these should be mixed into either part A or part B or both before the final combined mix to increase working time.

For large castings with a thickness above 50mm (2”) aluminium trihydroxide (ATH) filler should be added to reduce overheating and during cure.

Xencast® P6 key processing information at a glance:

- Tough and durable
- Superior strength
- Precise detail
- Fast curing

Technical Data

Uncured Resin Properties

Property	Part	Value
Material	A	Formulated Polyol
	B	Isocyanate
	Mix	Polyurethane
Appearance	A	Translucent cream
	B	Amber liquid
	Mix	Translucent cream
Viscosity (mPa.s) @ 25°C	A	200-250
	B	40-60
	Mix	60-100
Density (g/cm³)	A	1.02 - 1.07
	B	1.10 - 1.15
	Mix	1.06 - 1.11

Mixing & Cure Times

Values are approximate and will depend on a number of variables:

Property	Minutes
Pot Life (200g @ 25°C)	6
Demould Time (50g, 10mm @ 25°C)	50 - 60

Cured Properties

The below properties are for a cured sample of Xencast® P6 following a post-cure of 3hrs at 80°C.

Property	Units	Value
Flexural Strength	MPa	53 - 57
Tensile Strength	MPa	38 - 42
Flexural Modulus	MPa	1250 - 1450
Shore Hardness	Shore D	75 - 80
Linear Shrinkage	%	< 0.1
Elongation at Break	%	5 - 7
Glass Transition Temp	°C	70 - 75

Xencast® P6 key processing information at a glance:

Ease of Use

Suitable for professional and hobby use (follow SDS advice).

Odour

P6 is almost odourless.

Safety Precautions

Wear gloves and goggles and work in a well ventilated area. Always read the SDS before use.

Ambient Conditions

Can be used from 10 to 30°C although pot-life and cure time will be affected significantly.

Degassing

Not necessary. Simply mix and pour.

Mix Ratio

Mix 'Part A' and 'Part B' 1:1 by weight. Use digital scales.

Mixing

Mix thoroughly by hand for at around 1 minute.

Pot-Life

6 minutes. Be sure to pour your casting(s) before this time.

Exotherm (Over-Heating)

Resin will heat-up whilst it cures. Large mouldings will require a filler. Once mixed, pour resin immediately.

Thin Sections

Suitable for fine detail. Minimum section thickness is 0.5mm.

Maximum Volume

Maximum castable volume for unfilled resin depends on mould shape and material but is approx. 10cm³ in the 'thickest' areas.

Cure Time/Demould

Larger/thicker castings will heat up more and cure quicker (around 30mins). Small castings or thin sections will take longer (around 60mins).

Pigments and Fillers

A wide range of pigments and fillers (including metal powders) can be added to change the properties and appearance of castings.

Shelf life

6 months, from the date of production.

Effects of Fillers

Glass Bubbles; Decreases weight, Reduces Strength, Increases Viscosity, Reduces Cost, Reduces Transparency, increases thermal insulation.

Fumed Silica; Increases Viscosity, Reduces Transparency.

Aluminium Trihydroxide; Increases Weight, Increases Hardness, Increases Temperature Stability,

Maximum Size

Xencast®6 is a fast curing resin design for small to medium sized castings. The critical factor is the cubic dimensions of the casting at its thickest point which should not exceed 10cm³ (10cm x 10cm x 10cm) - too much heat will build up in cubic volumes greater than this. Please note, this does not mean that the maximum dimension for castings is 10cm - there is no limit to any one dimension providing that the casting is not too thick at the same time.

Larger castings are possible but require the addition of a suitable filler powder.

Pack Size

The resin is supplied in a choice of 1kg, 2kg, 4kg, 10kg and 50kg packs each containing the correct ratios of Part A and Part B.

For larger quantities or pack sizes please contact us.

Storage

Xencast P6 Parts A and B should be stored in original, unopened containers between 20 and 25°C. Xencast P6 Part B may crystallise partially or completely if not stored at above 20°C. Like all polyurethanes, both components are moisture sensitive. Moisture absorption will cause excessive aeration in cast parts. KEEP THE PACKING TIGHTLY SEALED WHEN NOT IN USE.

If stored under the above conditions, Xencast P6 Parts A and B will have a shelf life of 6 months, from the date of production.

Compatibility Information

Although by no means an exhaustive list, the mould materials, pigments and additives listed below have all been tested and are known to work well with Xencast® P6:

Compatible Moulds

- Condensation/tin cure RTV silicone rubber (such as CS25)
- Addition/platinum cure RTV silicone rubber (such as AS40)
- Polypropylene and polyethylene mould 'trays'

Compatible Pigments

- Polyurethane colour pigment (for vivid opaque colours)
- *Translucent Tinting Pigment* (for less vivid opaque colours)
- PearlEx® powder pigments (for shimmering effects)

For solid/rigid moulds such as aluminium tooling then a release agent will be required. We recommend using PTFE spray or our RW4 spraywax. Whilst these products will help to release the cured resin, they may leave behind a slight texture in the surface and potentially hinder secondary processes such as bonding or painting.

Compatible Fillers

- All conventional dry filler powders
- All metal powders (for realistic cold castings)
- Photoluminescent (glow in the dark) powders

What to Avoid

- Do not cast into latex rubber moulds without first applying and testing a suitable release agent.
- Do not cast onto substrates or into mould with a high moisture content (such as alginate) - contact with moisture will cause the resin to foam and will result in an improper cure.

Disclaimer

This data is not to be used for specifications. Values listed are for typical properties and should not be considered minimum or maximum.

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