# TECHNICAL DATA SHEET

# PRODUCT: WATER CLEAR POLYURETHANE CASTING RESIN

## DESCRIPTION

Easy Composites' Water Clear Polyurethane Casting Resin is a two part hand casting resin that is water clear when cured. This advanced formula resin cures within 60mins of casting.

**Features:**

- Optically clear
- UV stable
- Polishable to a high gloss
- Low viscosity
- Easily pigmented

## USES

The resin is ideal for embedding, rapid prototyping or any type of casting where an ultra clear or coloured translucent part is required. The resin can be used with or without vacuum degassing.

## PROPERTIES

| Property | Units | Part A | Part B | Combined |
|---|---|---|---|---|
| **Material** | - | Formulated Polyol | Isocyanate | Polyurethane |
| **Appearance** | - | Clear liquid | Clear liquid | Clear liquid |
| **Viscosity @20 °C** | mPa.s. | 400 – 500 | 20 – 40 | 100 – 200 |
| **Density @20 °C** | g/cm$^3$ | 1.01 – 1.06 | 1.04 – 1.09 | 1.03 – 1.08 |
| **Minimum Casting Thickness** | mm | - | - | 2 |
| **Maximum Casting Thickness** | mm | | | 15 |

## POT LIFE & CURE

| Pot-Life @ 25°C | Demould Time @ 25°C | Demould Time @ 50°C | Demould Time @ 65°C |
|---|---|---|---|
| 12-17mins | 60mins | - | - |

## CURED PROPERTIES

| Hardness | Linear Shrinkage | Tensile Strength | Elongation at Break | Flexural Strength | Flexural Modulus | H.D.T |
|---|---|---|---|---|---|---|
| BS 2782: Part 3: Method 365B | 500 x 50 x10 mm | BS 2782: Part 3: Method 320B | BS 2782: Part 3: Method 320B | BS 2782: Part 3: Method 335A | BS 2782: Part 3: Method 335A | |
| Shore D | % | MPa | % | MPa | MPa | °C |
| 85-90 | < 0.2 | 50-55 | 10-15 | 50-55 | 2200-2400 | 48-53 |

## MIXING RATIO

**100 p.b.w. Water Clear Casting Resin Part A**
**120 p.b.w. Water Clear Casting Resin Part B**

## MOULD PREPARATION

Before use ensure that the master model from which the mould is made has the exact finish that is required in the cast or finished units, i.e. for optimum clarity polish the master model to a very high gloss shine. Ensure that the mould is clean and dry. If the mould is made from metal or resin, use a compatible release agent.

For flexible moulds we recommend Easy Composites' Addition Cure Silicone Rubber. Condensation cured silicone rubber should not be used with this casting resin.

When embedding an object ensure the object is thoroughly dry. Very thin Perspex rods are

| | |
|---|---|
| | useful for holding the units in place this will eliminate the need for casting in layers and so avoid join lines.<br><br>When casting rectangular shapes, preheat the mould to 45 – 50°C in order to prevent shrinkage at the corners of the block. If the casting has thin sections, it is advisable to preheat the mould to 45 – 50°C. |
| **RESIN PREPARATION** | Open both A and B containers and examine for any signs of crystallization. If any crystals are observed place in an oven at 45–60°C for several minutes.<br><br>Ensure that both components are between 20 – 25°C before mixing. If using pigments, add the pigment to the part A. We suggest using 1 – 3% pigment. Do not use water based pigments. |
| **MIXING INSTRUCTIONS** | Easy Composites' Water Clear Polyurethane Casting Resin can be used without the assistance of vacuum degassing but under such conditions it is very difficult to get a perfectly clear, bubble-free casting. Degas in a purpose-built de-gassing chamber for best results.<br><br>Mix the two components in the correct ratio, mixing carefully to avoid air inclusion and making sure that the material at the sides and at the bottom of the mix vessel is well stirred in to the middle. The material will be cloudy in appearance for a few minutes, continue mixing until the liquid becomes clear.<br><br>Degas for approximately 5 minutes before pouring. Pour the material into the mould, onto the sides and in one place to reduce air bubbles. Degas again if necessary, avoid boiling the material at very high vacuum. |
| **CURING** | If the casting has thin sections, it is advisable either to use preheated moulds (see "Mould Preparation" above), or to post cure the castings after gelation in an oven at 40 – 50°C for 3 hours. Allow the casting to cure for at least 48 hours before machining or polishing. To avoid distortion ensure that the material does not reach temperatures above 60°C during machining or polishing. |
| **STORAGE** | Both parts of the casting resin should be stored in their original, unopened containers between 20 and 25°C. 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. |
| **SHELF LIFE** | If stored under the above conditions the resin and hardener will have a shelf life of 6 months, from the date of production. |

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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Before using any of our products, users should familiarise themselves with the relevant Technical and MSDS provided by Easy Composites Ltd.

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