Technical Data Sheet

OPTA CLEAR MEDIUM

Two Part Casting System
Water Clear, UV Stable

Opta-Clear Medium is a two component thermoset system which is water clear when cured. It is ideal for rapid prototyping, embedding or any type of clear casting application.

Special Features

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

Mix Ratio

Opta-Clear Medium Poly A : Opta-Clear Iso B

By Weight	100 : 120

Product Data

Property	Units	Opta-Clear Poly A	Opta-Clear Iso B	Mix
Appearance	-	Clear liquid	Clear liquid	Clear liquid
Viscosity (25°C)	mPa.s	300 – 500	100 – 150	100 – 350
Density (25°C)	g/cm^	1.25 – 1.30	1.08 – 1.13	1.16 – 1.21
Pot Life (200g, 25°C)	Minutes	-	-	23 – 27
Recommended Casting Thickness	mm	-	-	TBC
Cure Time*	Hours	-	-	TBC

*See “Curing” section.

Physical Properties

Properties	Standard	Units	Result (3hr 80°C Post Cure)
Hardness	BS EN ISO 868	Shore D	75 – 80
Linear Shrinkage	500 x 50 x 5 mm	%	TBC
Tensile Strength	BS EN ISO 527	MPa	60 – 64
Elongation at Break	BS EN ISO 527	%	4.5 – 5.5
Tensile Modulus	BS EN ISO 527	MPa	1500 – 1800
Flexural Strength	BS EN ISO 178	MPa	95 – 100
Flexural Modulus	BS EN ISO 178	MPa	2150 – 2450

Temperature Resistance

Cure Schedule	Standard	Units	Glass Transition Temperature (T_g)
7 Day Room Temp.	DMA	°C	46 – 50
3 hours at 80°C	DMA	°C	58 – 62
16 hours at 100°C	DMA	°C	86 – 90

Method of Use

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 sheen. Ensure that the mould is clean and dry. If the mould is made from metal or resin, use a release agent such as Release Agent R7. For flexible moulds we recommend addition cure silicone rubber. Condensation cured silicone rubber should not be used with Opta Clear. It may be necessary to preheat the mould to 40°C in order to prevent shrinkage at the corners and sides of the casting.

Resin Preparation

Open both A and B containers and examine for any signs of crystallization, place in the oven at 45 – 60°C if any crystals are observed. 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. Tints can also be used to produce coloured parts that remain clear. Contact Alchemie's Technical Department for more information. Do not use water based pigments.

Mixing instructions

Mix the two components at 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 may become cloudy in appearance for a few minutes, continue mixing until the liquid becomes clear. Degas for approximately 5 minutes before pouring. Pour the material into the mould in one place to reduce air bubbles. Degas again if necessary, avoid boiling the material at very high vacuum.

Curing

The cure rate is affected by temperature, the product must be cast at temperatures greater than 20°C. To optimise the cure, especially 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. To achieve optimum properties, a post cure is recommended. A typical post cure schedule would be to heat the material for 3 hours at 80°C. To achieve maximum thermal performance an extended post cure of 16 hours at 100°C is advised. To prevent any distortion during the post cure cycle, the unit should be placed on a conformer. When post-curing is complete, let the unit cool down slowly to room temperature, preferably in the oven. Sudden change in temperature can cause distortion or warping.

Polishing tips

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. For general polishing of a moulded part use a fine liquid polish. If a deep scratch needs to be removed then wet and dry paper should be used in the following descending grit sizes 400, 800, 1000 and 1200.

Storage

Opta Clear should be stored in original, unopened containers between 20 and 25°C. It 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, it will have a shelf life of 3 months, from the date of production.

Packaging

Opta-Clear Medium Poly A is supplied in 835g, 4.175kg, and 20.85kg containers.
Opta-Clear Iso B is supplied in 25kg, 1kg and 5kg containers.

Further Information

All data listed relates to typical values. This data should not be considered a product specification.

Our technical advice, whether verbal, or in writing is given in good faith, but without warranty – this also applies where proprietary rights of third parties are involved. It does not release you from the obligation to test the products supplied by us as to their suitability for the intended process and use.

Before using any of our products, users should familiarise themselves with the relevant Technical and MSDS.