

## Description

ALCHEMIX PU 3684 is a fast curing polyurethane casting system designed for applications requiring parts with high stiffness. The low colour of the system allows for easy pigmentation. ALCHEMIX PU 3684 can be filled with mineral or metallic fillers for reduced shrinkage.

## Features

- High stiffness
- Low colour
- Fast cure

## Mix Ratio

	PU 3684A	PU 3684B
By Weight	100	100

## Component Data

	Conditions	PU 3684A	PU 3684B
Description	-	Polyol	Isocyanate
Appearance	-	Off-white liquid	Straw coloured liquid
Viscosity	25°C	300 – 500 mPa.s	200 – 400 mPa.s
Density	25°C	1.00 – 1.05 gcm <sup>-3</sup>	1.18 – 1.23 gcm <sup>-3</sup>

## Cure Data

	Conditions	Typical Value
Appearance	-	Off-white
Mixed Viscosity	25°C	250 – 450 mPa.s
Mixed Density	25°C	1.08 – 1.13 gcm <sup>-3</sup>
Pot Life	200g, 25°C	5 – 7 minutes
Demould Time <sup>1</sup>	50g, 10mm thickness, 25°C	30 – 40 minutes
Maximum Casting Thickness	-	25 mm

<sup>1</sup> See “Curing and Post Cure” section below

## Cured Properties

	Standard	Typical Value	
		Standard Cure <sup>2</sup>	Post Cure <sup>3</sup>
Hardness	ISO 868	82 – 86 D	82 – 86 D
Linear Shrinkage <sup>4</sup>	500 x 50 x 10mm	< 0.20%	< 0.20%
Tensile Strength	ISO 527	49 – 54 MPa	70 – 75 MPa
Elongation at Break	ISO 527	1.6 – 3.6 %	3.7 – 5.7 %
Tensile Modulus	ISO 527	1600 – 1900 MPa	1600 – 1900 MPa
Flexural Strength	ISO 178	67 – 72 MPa	92 – 97 MPa
Flexural Modulus	ISO 178	2200 – 2500 MPa	2200 – 2500 MPa
Glass Transition Temperature (T <sub>g</sub> ) <sup>5</sup>	DMA	54 – 58 °C	68 – 73 °C

<sup>2</sup> & <sup>3</sup> See “Curing and Post Cure” section below

<sup>4</sup> See “Shrinkage” section below.

<sup>5</sup> T<sub>g</sub> will depend on exotherm generated during the reaction.

## Mould Preparation

Ensure that the mould is clean and dry and if the mould is made from metal or resin, use a release agent such as Release Agent R7. For flexible moulds, use ALCHEMIX RTV Silicone Rubber. Never use silicone release agents if the units are to be painted.

## Resin Preparation

Mix the Part A container thoroughly in order to homogenise the resin. For best results, ensure the two components are at between 20 – 25°C before use.

## Processing Instructions

Thoroughly mix the two components according to the indicated mixing ratio, avoiding air entrapment and ensuring that the material at the bottom and sides of the container is well stirred into the centre. Pour carefully in one place into the

mould in order to avoid air inclusion. The mixing and processing operations should be completed within the pot life of the system.

The system is suitable for use with various fillers, including ALCHEMIX A91 Aluminium Trihydroxide and ALCHEMIX A83 Aluminium Powder. The appropriate filler loading will vary with filler type and the intended application and should be determined by customer testing. Typically, the maximum filler loading is 100 parts filler to 100 parts resin (measured by weight). To ensure effective mixing, we recommend adding the filler in equal quantities to the A and B components prior to mixing.

Large quantities of material, filled or unfilled, will always produce more heat and will gel quicker than smaller amounts.

## Curing and Post Cure

The precise demould time will vary with the casting thickness, as thin section units will cure slower than thicker section units. When casting thin wall sections, ensure that the mould and resin components are at least 20 – 25°C to facilitate a full cure. Using filler will give a longer cure time.

To achieve optimum properties, a post cure is recommended. A typical post cure schedule would be a heat treatment of 3 hours at 80°C. The part should be fully supported during the post cure cycle to prevent any distortion. When post-curing is complete, allow the part to cool down slowly to room temperature, preferably in the oven. Sudden change in temperature can cause distortion or warping

## Shrinkage

The shrinkage value above is quoted as a guide only. Shrinkage will vary with each mould design, as factors such as mould size and geometry can affect the degree of shrinkage. Generally speaking, large, thick castings will have a greater degree of shrinkage than small, thin castings. Other factors, such as mould temperature, resin temperature and the addition of fillers can also have an effect. Post curing the part can also lead to a greater degree of shrinkage. Please contact Alchemie Ltd for more information.

## Storage

ALCHEMIX PU 3684A and B should be stored in original, unopened containers between 20 and 25°C. ALCHEMIX PU 3684B 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, ALCHEMIX PU 3684A and B will have a shelf life of 6 months, from the date of production.

## Packaging

ALCHEMIX PU 3684A is supplied in 1kg, 5kg and 25kg kits. ALCHEMIX PU 3684B is supplied in 1kg, 5kg and 25kg kits. Please contact Alchemie Ltd for bulk supply.

## Further Information

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

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 Data Sheet (TDS) and Safety Data Sheets (SDS) provided by Alchemie Ltd.

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