TECHNICAL DATA SHEET

ALCHEMIX® EP 421

Two Part High Temperature Aluminium / Epoxy System
90 – 95 Shore D Hardness

ALCHEMIX EP 421 is an extremely high performance castable, two-component, aluminium filled epoxy resin system. The cured system is formulated for the combination of high strength, high glass transition temperature, and thermal properties needed for injection moulding applications. ALCHEMIX EP 421 has an extremely high weight ratio of aluminium (>85%). This pre-blended formulation eliminates the need to blend in dry metallic fillers and eliminates the concern of undispersed aluminium present in shop blended mixtures. ALCHEMIX EP 421 can produce injection moulds capable of moulding high quality prototype and short-run production parts. The moulds can be built from existing parts and models such as SLA, machined modelboard or other patterns.

Special Features

- Extremely high heat resistance (250°C)
- Excellent physical properties
- Low viscosity
- Low shrinkage
- Fast cure

Mix Ratio

	EP 421	:	**H421**
By Weight	100	:	4.4

Product Data

Property	Units	EP 421	H421	Mix
Material	-	Aluminium filled epoxy resin	Formulated amine	Epoxy
Appearance	-	Grey liquid	Amber liquid	Grey liquid
Viscosity (25°C)	mPa.s	150000 – 200000	10 – 20	30000 – 50000
Density (25°C)	g/cm^3	2.33 – 2.43	0.90 – 0.95	2.20 – 2.30
Pot Life (200g, 25°C)	Minutes	-	-	150 – 210
Demould Time (200g, 25°C)	Hours	-	-	16

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Cured Properties

Properties	Standard	Units	Result (Full Post Cure)
Hardness (25°C)	BS 2782: Part 3: Method 365B	Shore D	90 – 95
Linear Shrinkage	500 x 50 x10 mm	%	0.02
Maximum Operating Temperature	Alchemie STM 24	°C	250
Machinability	-	-	Good

High Temperature Performance

Temperature (°C)	Hardness (Shore D)
20	92
60	92
80	92
100	90
120	88
140	87
160	85
200	81
250	75

Method of Use

Preparation

ALCHEMIX EP 421 has an extremely high content of aluminium, it must be carefully and thoroughly mixed before use. A mechanical mixer can be used as well as hand mixing. Begin by transferring the resin from the original container to a clean metal pail. Scrape the liner of the original pail clean and transfer as much material as possible. Some of the aluminium filler on the bottom of the liner will be very dry. Keep the lined pail clean for later use. Mix material for at least 10 minutes. Stop a minimum of three times to scrape down the sidewalls. This stage is very important to break up the resin completely. Undispersed material remaining after this stage of mixing will be very difficult to deal with in the next step.

Mixing Instructions

Once the resin mixture is completely mixed, add the hardener component. Mix carefully for a minimum of 10 minutes. Stop a minimum of three times to scrape down the sidewalls. Thoroughly mix until no lumps are visible. When resin and hardener are completely mixed and the mixture is lump free, transfer the material to the clean container saved from the first step. This will provide enough room for expansion during the de-airing step. Mix again until smooth (approximately 10 minutes) scraping the sides with a spatula a few times. Remove trapped air under vacuum with at least 29 mm of vacuum. The material will rise in the container. Once the rise of bubbles is broken, de-air for a few more minutes before casting. If a high vacuum is achieved the bubbling will not stop, this is normal. The mixture will reach a steady state without a lot of rolling in the container. Deairing is complete at this point.

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Curing and Post Curing

Demould times will vary with the thickness of casting, for example, thin sections may take 16 to 24 hours before they can be demoulded. To achieve full high temperature properties, a step wise post cure treatment is recommended. Allow the product to cure at room temperature for at least 24 hours, then heat to 60°C for 1 hour, followed by 100°C for 1 hour, followed by 150°C for 5 hours. Then allow the product to slowly return to room temperature. For very large casts, it may be necessary to increase these times.

Proper support of the mould is essential. Use a minimum of 30mm to 50mm steel as sidewall and backside support plates. While support requirements vary with part profile, only the lowest profile parts should be considered for reduced sidewall support. Backside support is essential. Pillars should be added wherever possible on support plate cutout areas.

Storage

ALCHEMIX EP 421 and HARDENER H421 should be stored in original, unopened containers.
KEEP THE PACKING TIGHTLY SEALED WHEN NOT IN USE.

ALCHEMIX EP 421 should be stored between **0 – 4°C**. If stored under these conditions, ALCHEMIX EP 421 will have a shelf life of 6 months, from the date of production. If stored at 20 – 25°C, ALCHEMIX EP 421 will have a shelf life of 3 moths, from the date of production. HARDENER H421 should be stored between 20 – 25°C. If stored under these conditions, it will have a shelf life of 6 months, from the date of production.

Packaging

EP 421 is supplied in 2.5kg and 5kg containers.

H421 is supplied in 110g and 220g containers.

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 and MSDS provided by Alchemie Ltd.

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