

Product Description

The Xencast®PX series is a range of industry leading flexible polyurethane rubbers which cure to hardnesses from 30 to 90 'Shore A' whilst retaining excellent tear strength and resilience. Xencast®PX resins are ideal for product applications requiring a flexible yet durable material including soft-grip handles, protective cases, rests, training weapons, tools, wheels, bushes and much more. PX series resins can also be used to produce durable, flexible moulds for concrete casting.

Utilising the latest polymer technology, Xencast®PX resins can be used to create flexible PU rubber parts with superior tear strength, abrasion and wear resistance and chemical tolerance.

The translucent formulation of Xencast®PX series flexible resins means that they accept pigments very well resulting in strong vibrant colours from reduced pigment concentrations. This translucency also makes it possible to use translucent tinting pigments to create semi-transparent coloured components which can even be illuminated.

Advantages

- Available in 30, 60 and 90 Shore A hardness
- Excellent abrasion resistance
- High tear strength
- Dimensional accuracy and fine detail
- Easily pigmented (translucent)
- Easy 1:1 mix ratio

Suggested Applications



PX30 (30 Shore A)

- Soft-grips & handles
- Phone/tablet protectors
- Flexible gator
- Gaskets and seals



PX60 (60 Shore A)

- Grips & handles
- Phone/tablet protectors
- Floor mats
- Soft wheels/tyres
- Training weapons/props
- Gaskets and seals
- Concrete casting moulds



PX90 (90 Shore A)

- Hand tools (e.g. mallets)
- Training weapons/props
- Ski/snowboard edges
- Firm wheels/tyres
- Bushes
- Concrete casting moulds

Key Processing Information

Xencast®PX series flexible resins; key processing information at a glance:

Ease of Use

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

Odour

Xencast®PX resins are almost odourless.

Safety Precautions

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

Ambient Conditions

Ambient temperature should be 20°C. Ensure that both Part A and B are at 20°C before mixing.

Degassing

Although not essential, vacuum degassing Xencast®PX resins will eliminate air bubbles and ensure maximum tear resistance.

Mix Ratio

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

Mixing

Mix thoroughly by hand for around 1-2 minutes.

Pot-Life

Varies between each resin from 5 to 30 mins; see technical data.

Thin Sections

Thin sections will cure more slowly than thick sections. Make sure you allow enough time for thin sections to cure.

Cure Time/Demould

Varies between each resin from 1 to 24hrs; see technical data.

Cure speed

Cure speed can be shortened significantly with elevated temperature.

Pigments and Fillers

Pigment using 'polyurethane' colour pigments or 'translucent tinting pigments'.

- Abrasion resistance
- Superior tear strength
- 30 to 90 'Shore A' flexibility

Technical Data

Cured Properties

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

Property	PX30	PX60	PX90
Hardness (Shore A)	30-35	60-65	88-92
Tensile Strength (MPa)	0.7-1.2	3.4-3.8	8.0-8.5
Elongation (% at break)	100-155	200-260	350-400
Tear Strength (kN/m)	3.5-3.8	19.0-23.0	58.0-62.0
Maximum Operating Temp.*	80°C	80°C	80°C

* Short Term 1 Hour. Exposure to high temperature for prolonged periods of time can lead to excessive shrinkage and damage.

Pot Life & Cure Times

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

Property	PX30	PX60	PX90
Pot-life (mins @ 25°C)	22-28	9-11	4.5-5.5
Demould (hrs @ 25°C)	24	1-2	1
Full cure (days @ 25°C)	7	7	7

Uncured Resin Properties

Property	PX30	PX60	PX90
Mix Ratio (parts by weight)	100:100	100:100	100:100
Viscosity (mPa.s @ 25°C)	350-550	450-650	600-900
Density (g/cm³)	0.99-1.04	1.01-1.06	1.02-1.07
Appearance	Light amber. Translucent.		

Maximum Casting Size

Xencast®PX resins are suitable for small through to large castings, including in very thick section (in excess of 100mm). However, when casting very thick sections, consideration should be given to the possibility of overheating during cure (known as exotherm) especially when working in high ambient temperatures or into moulds which will not allow the heat of the reaction to escape.

Safety

This is not a safety datasheet. Before using any

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®PX series resins:

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 translucent colour effects)
- Metallic powdered pigments such as Pearl Ex®.

Compatible Fillers

- Filler powders are not recommended

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 moulds with a high moisture content (such as alginate) - contact with moisture will cause the resin to foam and will result in an improper cure.
- Do not cast onto porous materials such as wood or concrete without first sealing the material using a suitable sealer such as PVA mould release agent followed by additional release agent such as silicone spray.

Basic Casting Instructions

1. Suitable Moulds



Pigmented PX90 being poured into a CS25 Condensation Cure Silicone mould

A polypropylene mould tray

Xencast®PX series resins are most commonly used in the reproduction of small to medium sized flexible components such as engineering components, protective covers and theatrical props which are normally made by casting the resin into a 'female' silicone mould. Xencast®PX resins are compatible with both addition/platinum cure and condensation/tin cure silicone moulds including Easy Composites' AS40 and CS25 silicone rubbers.

Follow the technical information or user guide for your chosen silicone rubber in order to create your female mould. In all cases, ensure that your silicone mould is clean, dry and in good condition before casting.

Xencast®PX resins can also be cast into other self-releasing mould materials such as polypropylene and polyethylene mould 'trays' and even into rigid moulds made from a range of materials, providing a suitable release agent has been applied. When casting into rigid moulds, always test the suitability and effectiveness of the release agent. **WARNING:** Without the use of a release agent, Xencast®PX resins will bond to a range of substrates including many plastics, paint finishes and metal.

2. Safety

Before starting, take time to read and understand the information provided in the safety datasheet (SDS) including recommendations for suitable skin and eye protection and provision of adequate ventilation.

3. Preparation

For best results ensure that the room temperature, mould and casting resin are at all approximately 20°C before use.

What you'll need:

- Safety equipment including gloves and eye protection (see SDS)
- Suitable mould (see section 1)
- Digital scales
- Clean mixing cup and mixing stick

How much resin?

Before you mix the resin for your casting, you'll need to know how much resin it will require. If you don't know the quantity already then you can find out by filling the mould with water and then weighing the amount of water it holds. Although the resin and water are slightly different densities, this will still give you a close guide as to how much resin to mix. If you use this method, aim to mix about 10% more resin than the weight of the water you measured.

Example: Fill your mould with water and weight the water. If the water weighs 50g then you should aim to mix 55g of resin.

If you use the above method to calculate the amount of resin needed for your casting then it is essential to ensure the mould is FULLY DRIED before you use it. Any traces of water will react with the resin and affect the finished casting and so it is strongly recommended to use a hair dryer or heat-gun to fully dry your mould.

4. Mixing

Xencast®PX resins consists of a Part A and Part B which are mixed together at a ratio of 1:1 by weight.

This means that you should measure an equal weight of Part A and Part B.

This is NOT the same as 1:1 by volume and so you should NOT measure equal quantities by volume. Doing so will result in the ratio between the two parts being incorrect and will reduce the performance of the cured resin.

Place the mixing cup on the scales and zero/tare the scales. Carefully pour in the required weight of Part A, trying to measure as accurately as possible. Next, zero/tare the scales again and weigh in the same amount of Part B.

Using a clean mixing stick, thoroughly mix Part A and Part B together, paying particular attention to the sides and base of the cup and to resin clinging to the mixing stick. Insufficiently thorough mixing is one of the main causes of a poor cure and so aim to spend at least one minute combining the two materials and constantly scraping and mixing the sides and base.

5. Degassing



Easy Composites' DC26 Vacuum Degassing Chamber

Non-Degassed and Degassed Samples

Although not essential, the appearance and mechanical properties of Xencast®PX resins will be improved by degassing the resin after mixing and before casting. Degassing the resin will remove air bubbles introduced during the mixing phase which would otherwise affect the tear-strength and also be visible in the cured material.

Degassing should be undertaken immediately after mixing and completed well within the pot-life of the resin (see technical data on page 1). Degassing chambers and complete degassing systems are available from Easy Composites Ltd.

Depending on the amount of air entrapment and other environmental conditions, complete degassing of the resin will typically take a few minutes.

Once the resin has been degassed it can be poured into the mould (see section 7) whereupon, in certain circumstances, a second degassing cycle can be

undertaken with the resin in the mould although only if this can be completed within the pot-life of the resin.

6. Pot-Life / Working Time

The typical pot-life of Xencast® PX series resins varies between the different versions and is listed in the technical data column on page 1. Pay particular attention to this, especially for PX90 which has a very short pot-life of 4.5 to 5.5 minutes.

Remember; the whole mix of resin must be poured into your moulds within this time. Ideally, as quickly as possible.

If you are degassing the resin (see section 5) then this must be completed and the resin poured into the mould within the pot-life of the resin.

7. Pouring

Pour the resin into your moulds carefully, aiming to pour the resin into a single point on the mould and allowing the mould to fill up from there. Don't pour from a height as this may result in air entrapment.

8. Curing and Demoulding

Different castings will cure at different speeds. Larger castings, particularly those which are thicker, will cure quicker than smaller, thinner castings. In almost all circumstances, Xencast®PX castings should be sufficiently cured to demould and handle in 24hrs.

Please note that Xencast®PX castings will continue to cure and develop their full strength for several days after casting. During this time the component will feel dry and cured but will not have reached its full strength potential.

Significantly reduced cure times (down to a few minutes) can be achieved by curing at an elevated temperature although rapid curing at high temperatures can cause modest shrinkage to occur.

Suggested cure and post-cure cycle:

- Allowing part to cure for 24hrs at ambient temperature
- Post cure at up 80°C for 2hrs

Once fully cured, Xencast®PX castings are safe to handle and use.

Pigmenting



Solid Colour Pigment

Translucent Tinting Pigment

Metallic Powdered Pigment

The translucent formulation of Xencast®PX series resins makes them ideal for pigmenting and ensures that vivid, vibrant castings can be achieved even from low pigment ratios. Alternatively, subtle 'tinting pigments' can be used to create translucent colour effects which can even be illuminated.

When pigmenting the resin, it is essential to use pigments that are compatible with polyurethane resin. See the information below on compatible pigments.

In all cases, pigments should be added to Part A first, using the minimum amount of pigment required to achieve the desired strength of colour; remember that the intensity of the colour may reduce slightly when you mix the pigmented Part A with Part B. You will normally find that darker colours (like black and blue) require less pigment than lighter colours (like yellow and white).

Pigment Pastes (typically 2-6% by weight)

Pigment pastes are the most effective way to add vivid, opaque colour to your castings. The pastes are made from pigment powder that has been extensively milled into a small amount of base resin in order to produce a liquid paste that can be easily dispersed into the casting resin.

Because the pigment paste is made using a base resin, this resin must be the same type as the resin it will be used to pigment. When pigmenting Xencast®PX resins this means the pigment paste must be a 'polyurethane pigment paste'. A full range of Polyurethane Pigments are available from Easy Composites Ltd.

Tinting Pigments (typically a few drops to 2%)

The translucent formulation of Xencast®PX series resins make them ideally suited to 'tinting' using translucent pigments to achieve a semi-transparent coloured appearance. Translucent tints like this can be highly effective when cast components are illuminated internally using LEDs.

Metallic Powdered Pigments (typically 1-2%)

Extremely unique and exciting colour effects can be achieved with the addition of metallic powdered pigments such as Pearl Ex®. These pigments can be added in a range of concentrations to achieve different appearances.

Storage

Xencast PX Series Parts A and B should be stored in original, unopened containers between 20 and 25°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 PX series resins will have a shelf life of 6 months, from the date of production.

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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