RESIN CASTING STARTER KIT INSTRUCTIONS

READ IN FULL BEFORE USE

Key Features

- Make Stunning Moulds & Casts
- Good Dimensional Accuracy
- Easy & Fast to Demould
- Easily Pigmented
- Supports High Level of Fillers
- No Degassing Necessary
- All you Need Kit

Before you Begin

These instructions explain the correct procedure for using the Xencast® Resin Casting Starter Kit to make silicone moulds which can be used to cast parts using the Xencast® P2 Fast Cast Polyurethane Casting Resin to make exact copies of the original piece.

Before starting work, please read these instructions in full as they contain information essential to the safe and successful use of the Xencast Starter Kit. We also recommend reading the Safety Data Sheet (SDS) fully.

PDF Adobe **DOWNLOAD PDF** **SDS** Safety Data Sheet

Safety

The products in this kit are for professional use. It is essential to read and understand the safety and technical information in full before use.

Follow the guidelines for safe use outlined in the SDS which include the use of appropriate hand and eye protection during mixing and use.

Read and follow the guidance about *exotherm* later in this document to avoid potentially dangerous overheating of the mixed resin.

Ambient Conditions

The Xencast Fast Cast Polyurethane Resin used in the Xencast Resin Casting Starter Kit is very fast curing and will work best in an ambient temperature. For best results, work in a low humidity environment and only ever work in temperatures between 15°C and 25°C.

The optimum temperature for silicone mould making and resin casting is 20°C. All timings provided in this guide are approximate and apply when working in an ambient temperature of 20°C. Working in warmer conditions (up to 25°C) will reduce curing times, working in cooler conditions (minimum of 15°C) will lengthen cure times (for the resin, the silicone is unaffected by heat).

Resin Reactivity, Measuring and Mixing

Exotherm

Resin will heat-up whilst it cures. As soon as you mix the resin with the hardener you should start working with it immediately and complete the mixing and pouring stage quickly. It is advisable when casting with a large quantity of resin that you will require a filler. If you mix too much resin and have a considerable amount left-over in the pot, there is a risk that the resin will become very hot and could start to smoke. If you do have a large amount left over you should immediately place it safely outside.

Mix Ratio

Epoxy resins and silicones must be mixed at their correct mix ratio. The correct ratio for the Xencast P2 is 1 to 1 by weight. The correct ratio for the CS25 silicone is 100 Parts silicone rubber to 5 parts catalyst by weight. Mix ratios must be as accurate as possible; ideally to within 1 or 2 grams.

Never alter the mix ratio: adding more or less hardener will not alter the cure speed and instead will prevent the resin from curing properly at all. Use digital scales to accurately weigh out the correct ratio of resin to hardener.

Thorough Mixing

An easy mistake to make when working with resins is to not mix them thoroughly enough. Every time you mix up a new batch of silicone or resin, make sure that you mix the batch as thoroughly as possible, ensuring that you combine resin from the corners, base and sides of the mixing pot, along with resin or hardener on the mixing stick itself. Aim to spend a couple of minutes thoroughly mixing each batch and try to mix steadily so you don't add unwanted air into the mix.

Kit Contents

- 952g CS25 Condensation Cure RTV Silicone Rubber
- 48g CS25 Condensation Cure Silicone Catalyst
- 1kg Fast-Cast Polyurethane Casting Resin Part A
- 1kg Fast-Cast Polyurethane Casting Resin Part B
- 2 x Fluted Signboard Sheets (approx A4)
- 5 Pairs Nitrile Gloves, 2 large & 4 small Mixing Cups and Mixing Sticks
- 5ml Syringe & 10g Filleting Wax

Uses for This Kit

This simple, great value kit can be used for many applications including to produce design concepts, replicate small engineering parts, copy figurines or reproduce original sculptures. In fact, anything that you would like to be able to make or copy in plastic is a potential use for this kit.

The example project for this guide was to make a silicone mould from a little Alien model made from Fimo (polymer clay) using the CS25 Condensation Cure Silicone Rubber and then cast replica aliens using the Xencast P2 Fast-Cast Polyurethane Resin.

The kit has everything needed to create an army of small aliens. The additional images at the end of the guide show the aliens produced using the same process and materials with the addition of Easy Composites Translucent Tinting Pigments.

Description of Kit Materials

CS25 Condensation Cure Silicone Rubber

CS25 Condensation Cure Silicone Rubber is a low viscosity, two-part condensation cure silicone rubber. It is used for mould making where it is mixed (with its catalyst) and then poured around a pattern to create a flexible silicone mould.

The CS25 Condensation Cure Silicone Rubber has been specially selected for its ease of use, excellent performance and great value.

Once cured the silicone rubber is very soft and flexible making it perfect for casting complicated or intricate shapes where the cast part can be easily removed from the silicone mould. The long pot-life of this silicone allows plenty of time for careful pouring and self de-gassing although forced degassing in a vacuum chamber can also be performed if required.

The cured mould can then be used to produce precise replicas of the original part, including fine surface detail, out of a range of materials including polyester, epoxy and polyurethane resin, urethane foam, wax, casting plaster, Jesmonite, reconstituted stone and the GlassCast® epoxy range.

Xencast P2 Fast-Cast Polyurethane Casting Resin

The Xencast P2 Fast-Cast Polyurethane Casting Resin is a high quality, low viscosity odourless general purpose casting resin for use in model/sculpture casting, pattern making, prototyping and product development.

As the name suggests the resin is very fast curing making it ideal for production runs whilst its low price ensures that even larger castings can be produced cost effectively. and can be filled when used for larger scale projects.

P2 Fast-Cast is also one of the lowest viscosity casting resins on the market enabling it to flow freely into the most complex moulds where it with faithfully recreate even the finest surface detail. The ultralow viscosity also opens up the possibility of casting without the need for degassing the mixed resin before pouring.

Step By Step Practical Guide

1. Choose a suitable original ‘master’ part.

CS25 Condensation Cure Silicone Rubber is compatible with just about any material and will reliably not stick to metals, woods, plastics and ceramics. The only consideration when choosing a suitable part to copy (a ‘master’) is to ensure that its surface is relatively none-porous.

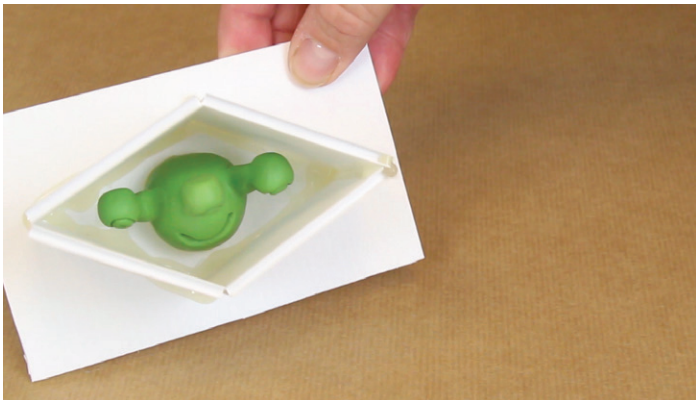
Particularly porous surfaces may allow the liquid silicone to ‘soak’ into the original part which will make the silicone difficult to separate from the original part and leave the mould with an overly rough texture - in cases where the master is porous you will need to seal the surface first.

Suitable ‘masters’ for your first project would be any existing small mechanical parts, figurines, sculptures, Architechtural pieces, original parts you have carved or constructed; in fact, just about anything with a reasonably smooth surface.

2. Position the part in a ‘set-up’ box

Included in the kit are two sheets of plastic signboard which can be easily cut with a craft knife and made in to a set-up box using a hot-melt glue-gun. The set-up box is intended to hold the silicone rubber around your part whilst the silicone cures to create the mould. You could alternatively use a ready made container as long as it is watertight and allows for a 10mm gap all around the master part. You should aim to use a setup box that is only slightly larger than the part you wish to take a mould from, so as not to waste additional silicone.

Once you have a suitable set-up box, the master part can be secured upright to the bottom of the box with filleting wax or glue. If glue is used it must be dry before pouring silicone over it.



Silicone rubber will not stick to any conventional material that has a reasonably hard, smooth surface therefore no release agent or further preparation is required.

2. Measure and mix the silicone rubber

CS25 Condensation Cure Silicone Rubber needs to be mixed thoroughly with its catalyst to cure. The mix ratio for this silicone is 100 parts silicone rubber to 5 parts catalyst and the pot life is 60 - 90 minutes with a curing time of 24 hrs.

The mix ratios provided are ‘parts by weight’ and not parts by volume. For accurate mixing it is essential to use digital scales and aim to be accurate to within around 1 gram.

Measure out the silicone rubber into one of the mixing cups provided in the kit. Then shake the catalyst well and using the syringe measure out the required amount of catalyst and dispense into the silicone mixing cup. If you are measuring out large quantities of catalyst use the digital scales and another mixing cup. Mix the silicone with its catalyst, taking lots of care to ensure that the catalyst is completely mixed with the silicone. Mix slowly and steadily until a consistent colour is reached. Scrape the sides and bottom of the mixing cup to make sure that no unmixed silicone is clinging to the sides of the mixing cup. Remember that the two liquids are of very different densities which means that the catalyst has a habit of floating on top of the silicone during mixing and not dispersing properly throughout the silicone. Spend several minutes mixing the two together whilst at the same time trying not to aerate the silicone. If you notice some air bubbles in the silicone this can be solved during the pour.

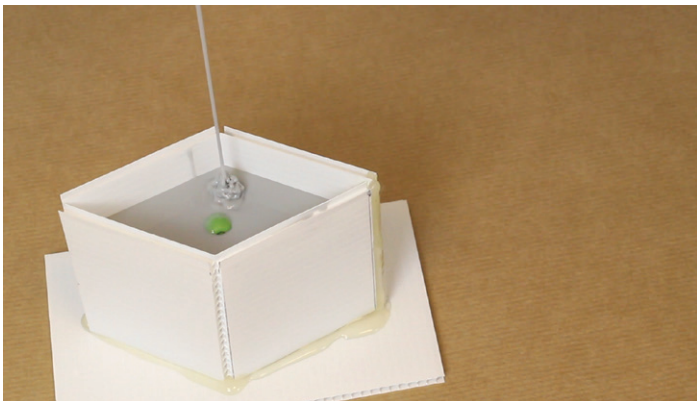
3. Pour the silicone rubber into the set-up box

To ensure a good surface finish on the parts that are made using the mould it is important to ensure that the silicone rubber does not contain any air bubbles.

In a professional environment this would be achieved through the use of a vacuum de-gassing chamber and so without this equipment we need to be careful not to mix air into the silicone in the first place and secondly using a process called ‘stretch pouring’ to remove any trapped air.

Position the set-up box either on the floor or on a low table and then very gently and carefully pour the mixed silicone into the lowest point of the set-up box, not directly onto the master. As the silicone pours it will stretch out to a very thin ‘stretched-out’ trickle of silicone and in doing so any trapped air will be forced to the surface and out of the silicone. Done carefully this process can be highly effective at the removal of air from silicone and yield excellent results.

Keep pouring until the silicone covers the top of the master part. If you have bonded the master part to the bottom of the set-up box then keep pouring the silicone until you have covered the original part completely, allowing around 10mm additional silicone above the top of the part.



4. Allow the silicone to cure

The CS25 Condensation Cure RTV Silicone included in the kit will take around 24hrs to cure at room temperature and average humidity.

5. Remove the original from the silicone mould

Once the silicone has fully cured the resulting flexible rubber block (containing the original part) can now be removed from the set-up box. The silicone should feel dry and reasonably firm (although of course, it is a flexible rubber). Do not attempt to 'demould' until you are confident that the rubber has fully cured.

Depending on the shape and complexity of the part it may be possible to simply stretch the mould slightly and pull the original part from the mould. Other shapes will require that the mould is cut open to remove the part.

If necessary, a sharp scalpel blade can be used to carefully cut the mould. When cutting a mould it is recommended to try to 'zig zag' the cut line to create a natural 'registration' for the two cut edges of the mould when they are put back together, ensuring that they align correctly. You may only need to cut part way down the mould. If the mould has been cut into 2 halves you should always use the mould in conjunction with the original set-up box to ensure that the two halves are held together correctly and securely and cannot distort.

6. Measure and mix the casting resin

The Xencast P2 Fast-Cast Polyurethane Resin is a very fast curing casting resin and you should ensure that you have everything prepared before you mix the resin parts A and B together - as soon as parts A and B are combined the curing process will begin.

The Fast-Cast resin included in the kit uses a convenient 1 to 1 mix ratioby weight. Shake part A of the resin thoroughly then measure out the required amount into a mixing cup. Next measure out an equal amount of part B of the resin into a seperate mixing cup. Combine parts A and B mixing steadily and thoroughly scraping the sides and bottom. Mix enough resin to fill the new mould in one pour.

When mixing, it is important to avoid unnecessary air inclusion, ensure that mixing is done thoroughly and that the two parts are accurately weighed.

The pot life of the Xencast P2 Fast-Cast Polyurethane Resin is between 2-3 minutes so you will need to be prepared to pour quickly. If the resin will be pigmented with colour or metal powders it is important to add these to part A of the resin before combining with part B to maximise the mixing time.

7. Pour the mixed resin into the silicone mould

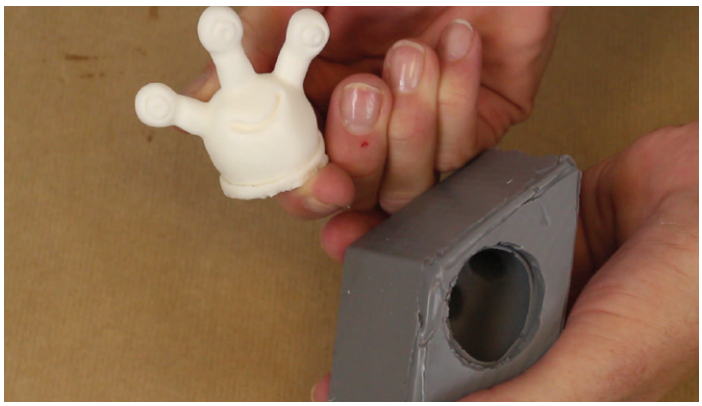
Carefully pour the mixed resin into the lowest part of the silicone mould. Continue pouring into the same place and allow the resin to fill up the mould. If the mould has undercuts or awkward shapes then you can agitate the mould slightly to ensure that this resin fills the hard to reach areas without trapping air.

Fill the mould all the way up to the very top (in some instances it is advisable to overfill the mould by 1mm) and then set the mould on one side to cure). This resin cures in under 30 minutes.

8. Allow the resin to cure and demould

The Fast -ast resin will cure and be ready to demould within an 30 minutes. Once the resin feels fully hardened and cool to touch it can be removed from the mould.

The mould can now be used to create many castings in a single day!



The Xencast® Resin Casting Starter Kit is great for beginners to get started with silicone mould making and resin casting through to advanced modellers who need a complete kit for a specific project - it's a great value way to get everything you need in one kit!

9. Examples of castings from the project

The following images were taken from the alien army casting project using the Xencast Resin Casting Starter Kit. In images 1 and 3 Translucent Tinting Pigments were added to the Xencast P2 Resin.

Image 1. Aliens cast using the Xencast Resin Casting Starter Kit and Green Translucent Tinting Pigment.

(From left to right - with 2 drops, 5 drops, 10 drops, 20 drops and 40 drops).

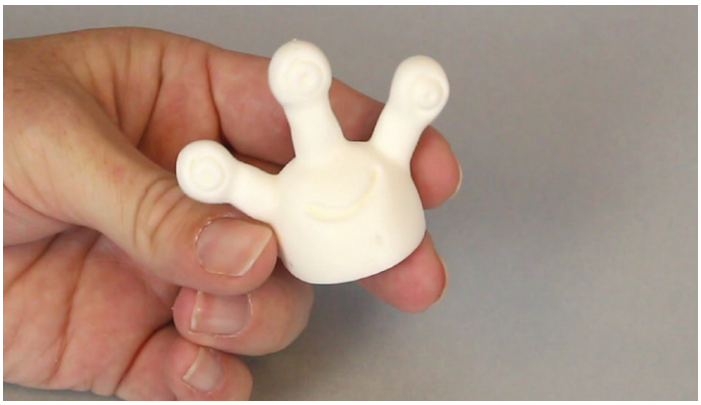


Image 2. Base Colour of Xencast P2 Fast Cast Resin.

Image 3. Aliens pigmented with 20 drops each of Translucent Tinting Pigment - 10 pack from Easy Composites.

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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