



Plaster:

Plaster:

The oldest casting product? Used since the times of ancient Egypt and probably before, to make complicated cast structures such as sarcophagus and sculptures.

Plaster should however be avoided when casting molten metals because of the moisture content (although some specialists do still use it with great effect) especially when mixed with silica sand, plaster is often used for lost wax investment casting.

Simple and cost effective it is still an ideal modelling material for a variety of casting applications, plaster is made of a variety of materials including clay, gypsum and cement.

Clay Plasters: Probably the oldest known form of plaster – a mixture of clay, sand and plant extracts, mixed into a slurry and usually applied over a wood lath (also known as wattle and daub), however it was also used as a smooth coating over internal walls.

Clay plasters can be coloured and painted on, but they are not very robust and inclined to cracking over even a short period of time.

Gypsum Plasters: Made from gypsum which has been heated to around 150 degrees C, the gypsum is then pulverised and filtered according to specification.

Finer particles make the harder plasters, the larger particles make up the softest plasters, although there are specialist clay and gypsum based plasters too.

Usually offered in two types Alpha and Beta plaster, this derivation covers the way that the gypsum is milled and filtered.

With Beta plasters the crystals are typically ground to a rod shape and less finely milled.

With Alpha plasters the crystals are finer and more geometric in formation, plus these are milled much finer, the finer the milling the harder the plaster sets.

Cement Plasters: Often called Lime Plaster but this is a bit too generic.

Lime plaster is one of the cement based plaster materials and it is made from slaked lime. Most typically used in the renovation of historic buildings.

Most cement plasters are made from a mixture of Portland Cement and sand, this group of plasters is most common in the building industry.

Strong, flexible and reasonably flameproof it is an ideal material for house building.

Silica plasters are a specialist casting medium using ground silica added to the gypsum base product to improve the plasters ability to withstand heat and thermal expansion.

Plaster Of Paris:

Pretty much a generic cover all name for a rather misunderstood range of products.

Plaster of Paris is a gypsum based product – basically a refined calcium sulphate (chalk), this material is quarried, ground, heated to around 150 degrees C, reground, filtered and blended according to customer specification.



Plaster:

At Alec Tiranti Ltd. we sell 6 different blends of plaster of which 5 are gypsum based and one of them clay.

We don't stock or sell any of the specialist Lime plasters or a building grade cement plasters.

Prestia Casting Plaster (also known as Fine Casting):

This is the softest grade of plaster that we sell.

A fine grained Beta plaster, easy to mix and sets quickly (15-30 mins), it is however very soft indeed and can crumble easily.

Ideal for quick casting of uncomplicated structures.

Prestia Classic (also known as Herculite or Dental Plaster):

Slightly harder grade of Beta plaster developed for the fine modelling of more complicated structures, often used in the dental industry (hence the name) and also in the pathology and forensic world for making casts at scene of crime.

Sets in 8-20 minutes and is ideal for carving and model making.

Basic Alpha (also known as Crystacal):

Really fine grade Alpha casting plaster this plaster sets to a very hard outer coating, can be used for outdoor applications when used with Plaster Polymer.

The finished casting can be polished to a high lustre (especially so with plaster polymer) so that it resembles fine marble.

Modell (Crystacast):

Ultra hard setting fine Alpha plaster, Modell is the hardest of the true "Gypsum" plasters. Produces very fine detailed castings, less likely to trap air than other plasters but inclined to be heavier because the particle structure is so fine and the resulting cast is very dense.

Ceram N1:

A blend of gypsum and china clay, this plaster was developed for the tableware market, excellent wear properties, produces very fine castings which are ideal for porcelain and pottery moulds.

Although often considered to be an Alpha Plaster, Ceram is actually a Beta Plaster but has many of the advantages of both Beta and Alpha.

Most commonly used for making slip moulds – this is because it cures to a hard overall finish and gives great detail, but will allow a decent amount of porosity and the clay slip will dry out really quickly.

Terracotta Cast with Iron:

Extremely hard terracotta clay and plaster blend which resembles fired terracotta clay but has similar properties to Alpha plaster and sets at room temperature.



Plaster:

The iron content allows the finished material to “rust” over time.

Too much water can cause the mixture to separate and the iron to settle towards the bottom of the mould, this can give an uneven finish.

Always use a drier mix than with conventional plasters.

Mixing Plaster:

Always mix more than you need – pour water into your mould and pour this water into your mixing bowl for the most accurate measure. Then add plaster into the mixing bowl until a peak of plaster forms above the surface of the water, allow the plaster to sink back into the water and mix through your fingers to a creamy consistency. Knock out the air bubbles by tapping the mixing bowl on the bench before starting to pour.

Basic mix ratio for Prestia plaster is 1.3 kg plaster to 1 litre of water.

Prestia Classic plaster is 1.45 kg plaster to 1 litre of water.

Alpha plaster is 2.8 kg plaster to 1 litre of water.

Modell plaster is 3.57 kg plaster to 1 litre of water.

Ceram and Terracotta are both very much dependant on conditions and the individual bag of plaster, because they are compound mixes, ingredients differ slightly between batches.

Plaster Polymer:

An acrylic based hardener which when added to Alpha plaster will produce a strong water resistant structure which can be polished or coloured. Often confused with Jesmonite.

Tri Sodium Citrate:

Slows the rate at which water reacts with the plaster, gives the user more time to work with the “slack” mixture – ideal for surface coating into moulds especially when using plaster polymer.

Plaster can also be used to build a structural assembly for a range of applications using, glass-fibre, scrim or canvas. The only drawback of using plaster for this is weight, plaster is a good deal heavier than other resins for this purpose.

Alginate:

Not strictly speaking a plaster, Alginate is actually an organic compound manufactured from seaweed and calcium carbonate.

Developed for the medical industry as an alternative to plaster (which is not ideal for use direct on the skin and particularly for dentistry), it is most commonly used for making dentistry impressions of patients teeth and gums.

Very high definition, quick setting times and very easy to use, not toxic and it has no odour or taste – indeed it can be flavoured.



Plaster:

Also ideal for modelling applications because of its quick setting and high definition, particularly good for body casting, facial detailing, hand casting and models with complicated undercuts or ultra fine detail.

Alginate is inclined to be rather brittle and can be easily damaged, but if handled with care it is a rewarding and cost effective modelling compound.

Jesmonite:

Often mistaken for Plaster Polymer

Jesmonite AC 100/300 is an acrylic gypsum/water based resin product used as an effective replacement for polyester and polyurethane resins especially when the finished weight of the piece is unimportant.

Considerably lighter than plaster, the product is much heavier than the “plastic based” resins such as polyester or polyurethane, but it is also quite a bit more economical too. It is however a viable and suitable alternative, especially when used in conjunction with Quadaxial glass reinforcement.

Jesmonite AC100 is particularly effective when cast with synthetic onyx or marble filler powders, the white finish takes these stone fillers particularly well.

There are a range of specialist fillers and pigments available for Jesmonite.

See separate information on Jesmonite.

How to select a plaster for an application.

The selection of a particular plaster for a given project is very much a personal choice, however there are a few “rules of thumb” which help you choose the right plaster.

Beta plasters are ideal for projects which require fast setting – body casting, simple block castings and also for sculpting.

The soft nature of the plaster makes the block easy to shape and model using tools.

Finer castings with more detail would normally require a harder plaster like Basic Alpha. Alpha Plasters are particularly suitable for coving and decorative mouldings because they are not only stronger, but also tend to be lighter once fully cured.

For ultra fine detail it is best to use Plaster Polymer – this allows the plaster to cure much harder, a little lighter and also adds an element of waterproofing to the set casting.

However polymer does also give the cured plaster a plasticised sheen which is sometimes considered undesirable by some.

For slip moulds we recommend using Ceram N1, this Beta Plaster also has some properties of Alpha, giving a stronger structure and more resilience than Casting Plaster, but still retains the ability to disperse water from the slip and allow the slip to dry out.



Plaster:

When building structures using plaster it is wise to laminate them to improve the structural integrity of the casting.

Structures such as picture or mirror frames are typically laminated using glass fibre or even a stainless steel wire loops set into the casting.

Using Plaster Polymer and either Basic Alpha or Modell will give a strong casting with great detail – the Polymer and glassfibre will improve the structural rigidity by around 40%.

Alec Tiranti Ltd. are always happy to offer help and advice to customers on the products we sell, our staff at both Thatcham and Warren St (London) have very good technical knowledge.