

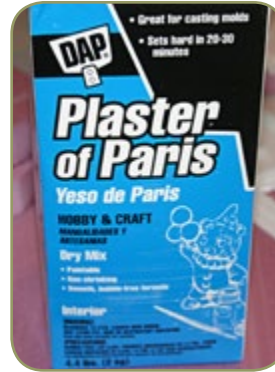
Demonstration: Plaster Primer for Creating Bases and Buildings

Ashley Abernathy

Plaster comes in many different formulas with different characteristics and uses for modeling. Ashley shared with us some of his experiences with the material and gave suggestions for its use. These notes are encapsulated from his demo.

- Mix up the plaster and pour it when it leaves a liquid state and starts to come together. Sculpt it with a spatula to the rough shape you want.
- Tap the plaster when wet to dislodge air bubbles.
- It paints up well with acrylic craft paints but takes hobby paints and weathering pigments too.
- Use leftover dried plaster in your mixing cup or bowl as city rubble. Crunch it up depending on the use you need.
- Pour onto plexiglas and when dry it will pop off and have a completely flat bottom, convenient for gluing to your display base.
- Create molds out of styrene strip to make windows, walls, doors or streets. Carve in details when dry using dental tools or needles.
- If you find a bubble inside, use more wet plaster to fill or just carve it to look like damage.
- Plaster can be used to replicate parts that come from a RTV mold.
- Always work down when carving a base. Think about it in layers, and carve the bottommost layer last.

- Thick peices of plaster can be edged with a belt sander to create super smooth contours.
- Dental plaster is many times harder than Plaster of Paris, which is useful for buildings or structures that need rigidity.



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Plaster Comparisons

Manufacturer	Product Names	Compression Strength	Price	Set time	Ratio Water/Powder	Purpose	Notes
Various	"Plaster of Paris" Many brands sold in home stores and craft shops.	~ 1,200 - 2,000 psi Varies slightly according to brand	DAP - \$4.00 for 4.4lbs at Ben Franklin "Modeling Plaster" - \$3.00 for 3lbs at Hobby Lobby	10-15 minutes	Usually 1 to 1 or add water until mix is a milk shake consistency	General casting and molding; suitable for a wide range of artistic applications and most large objects and impression work; also fibrous plasterwork, decorative moldings, panels, etc. Also used for casts for broken arms, legs - mostly been replaced by a resin like fiberglass material which is much lighter.	Decorative items, occasional moulds, impressions, models, etc. Large items may need a framework. Easy to find and very flexible when it comes to mixing ratios - i.e. it doesn't need to be exact.
USG International	Hydrocal	5,000 psi	\$9.80 for 7lbs at Plaster.com	25-35 minutes	45ml per 100g	Same as above	Material used by Dioramas plus in making their structures.
Heraeus	Mounting Stone, Model Plaster, Lab Plaster	~ 5,000 - 5,500 psi		Depending on the product times from 2 to 12 minutes	47 or 56ml per 100g	A lower grade professional dental plaster used mainly for mold making, orthodontic based and casting.	
Heraeus	Orthodontic Plaster	6,500 psi		12-14 minutes	35ml per 100g	Same as above	
Heraeus	Labstone	8,000 psi		8-10 minutes	30ml per 100g	Same as above	
Heraeus	Denstone	9,000 psi		8-10 minutes	30ml per 100g	Same as above	
Heraeus	StatStone	11,000 psi		2 minutes	23ml per 100g	At the 11K psi mark the plaster becomes a much more professional and higher grade plaster. A polished plaster mold looks very professional and actually resembles a hard plastic.	11k psi plasters and above used by most orthodontists/dental/medical groups for model and sample casting
Heraeus	Snow White 0-67	11,000 psi		9-11 minutes	26ml per 100g	Same as above	
Garreco	Merlin's Magic	14,000 psi	\$12.50 for 5.0lbs at Pacific Dental Products (shipping is about another \$8.00)	9-11 minutes	23ml per 100g	Same as above, really hard, heavy and durable easier to glue and paint.	Got to use a rubber mold. A hard mold will get used once.
Heraeus	Tru Stone	15,000 psi		9-11 minutes	24ml per 100g	Same as above	
Heraeus	Die-Stone	15,000 psi		10-13 minutes	22ml per 100g	Same as above	
Heraeus	Die-Keen	18,000 psi		7-9 minutes	20ml per 100g	Really hard stuff - like ceramic and hard to carve/shape	This is a resin reinforced plaster
Heraeus	Die-Keen	18,000 psi		10-13 minutes	21ml per 100g	Same as above	

Sources:

- <http://www.maragon.co.uk/arts-and-crafts.htm#init>
- <http://www.hirstarts.com/casting/dental.html>
- <http://hirstarts.yuku.com/topic/3465#:TqeEmnYuCh>
- <http://www.plaster.com/>
- <http://www.wisegeek.com/what-is-gypsum.htm>

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What is Plaster and how is it made?

This plaster is made by calcining gypsum, a process which involves exposing the gypsum to very high temperatures to create calcium sulfate and then grinding it into a fine white powder. When water is added to the powder to make a slurry, the slurry can be molded in a variety of ways, and as it sets, a firm matrix is created, creating a solid shape which is also very smooth. One advantage to plaster of Paris is that there is no (measurable) volume loss, so casts made with this plaster are true to the size of the mold.

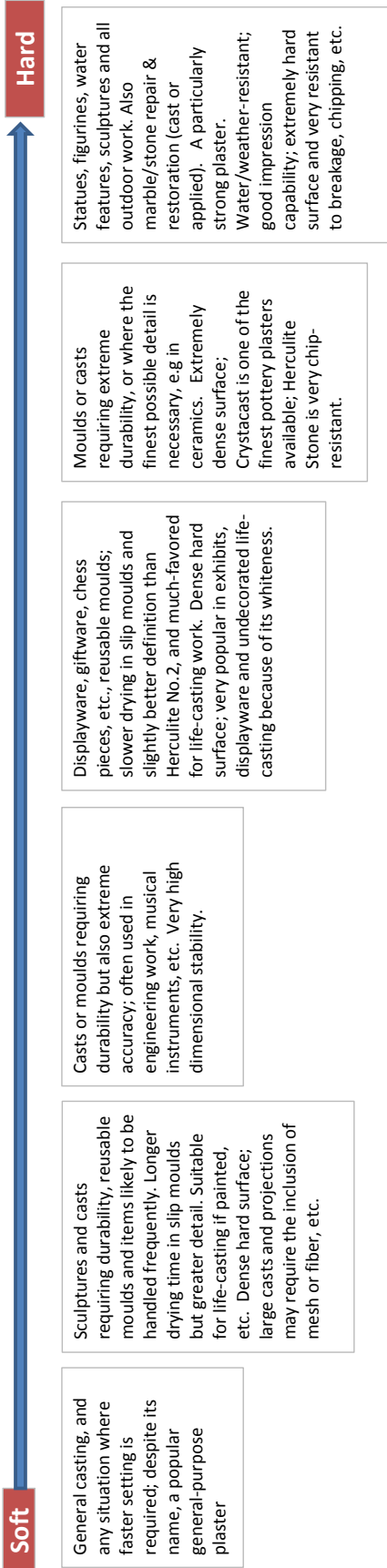
Gypsum is the more common name for a mineral compound called calcium sulphate dihydroxide, or sulphate of lime. Gypsum is generally found underground near deposits of limestone or other minerals formed by evaporation. One of the most common forms of raw gypsum is a pure white crystal called alabaster.

Because the calcium and sulphur molecules in gypsum are chemically bound to water, gypsum is routinely heated in order to remove 50% to 75% of its original moisture. The resulting powder is considered burnt gypsum, although its white or translucent color does not change. **Burnt gypsum is valued for its ability to solidify almost immediately after introduction to water.** Burnt gypsum is marketed as the molding agent Plaster of Paris. Ordinary schoolroom chalk is also a form of burnt gypsum.



Calcining, also called calcination, is an industrial process that uses very high temperatures, often between 1,400-1,800 degrees Fahrenheit or higher, to change the physical and chemical properties of various solid materials, such as minerals, metals, and ore. The origin of the term comes from one of the oldest and most common calcining processes: turning limestone, also known as calcium carbonate, into lime, or calcium oxide. Calcining is commonly used to remove volatile substances in a material, to improve its electrical conductivity, or to remove water, or certain impurities. The process is used in various industrial settings, for example in oil refineries, in some recycling plants, and it is also part of the pulping process when making kraft paper products. Processing facilities fired by oil or gas are commonly used to achieve the high temperatures needed for calcination, and these facilities are usually called furnaces, reactors, or kilns.

What is Plaster used for and does hardness make a difference?



Sources

- <http://www.maragon.co.uk/arts-and-crafts.html#init>
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- <http://hirstarts.yuku.com/topic/3465#.TqeEmnYUcH>
- <http://www.plaster.com/>
- <http://www.wisegeek.com/what-is-gypsum.htm>