

Plaster 101: MIXING

Water Purity	<p>Water used to mix plaster should be pure as possible. If you can drink it, the water is suitable for mixing. Sometimes water is taken from contaminated sources as is done in industrial uses. Consequently, the water could be high in organic impurities that will lengthen the setting time and/or result in efflorescence; hard spots on cast surfaces that result in variable absorption properties in finishing casts.</p>
Water Temperature	<p>Gypsum has maximum solubility between 70 and 100 degrees F. Variations in water temperature affect setting time and cause difficulty in control of mix times. Hotter water can accelerate a mix whereas cooler water may actually slow the set time. IGC Technologies strongly suggest using room temperature water.</p>
Water-to-Plaster Ratio	<p>Water-to-plaster rate (a.k.a. consistency) is the amount of water used with a definite amount of plaster. For example, a 60 consistency mix would mean 60 parts of WATER per 100 parts of PLASTER. Consistency is always specified by weight. (70 lbs water/100 lbs plaster). Using less plaster than the manufacturer suggested usage will increase setting time, decrease fluidity of the plaster, and may cause bubbles in the cast pieces. Density, hardness, strength and durability of plaster casts are related to the quantity of water used in the mix. Therefore, IT IS EXTREMELY IMPORTANT to use the manufacturer RECOMMENDED water-to-plaster ratio for best results. “Eye-balling” the plaster and water mix is not recommended!</p>
Soaking	<p>Always add the plaster to the water (not water to plaster) to avoid excessive air entrapment. Soaking allows each plaster particle to be saturated with water making it easier to disperse during mixing. Plaster with good soaking properties will sink slowly into the water and become almost completely wetted after 3-4 minutes. Shortcuts in soaking adversely affect the quality of plaster casts.</p>
Mixing	<p>To mix plaster properly for uniform casts, follow these steps:</p> <ul style="list-style-type: none"> ✓ Weigh plaster and water accurately for each mix ✓ Follow times soaking and mixing cycles. Use an interval timer ✓ Use a mechanical mixer and mixing bucket of proper size and design <p style="text-align: center;">ALWAYS Add Plaster to Water...NEVER the reverse!</p> <p>Sift or strew plaster into water slowly and evenly. Don't drop handfuls of plaster directly into water. ALLOW PLASTER TO SOAK for 2-4 minutes, then mix as required for another 3-5 minutes to obtain a creamy slurry. Hand mixing is acceptable for small batches up to 5 lbs. But because the optimum physical properties are in direct relation to energy input while mixing, hand mixing will not result in a plaster cast with the best of properties.</p>
Motor & Mixing Blades	<ul style="list-style-type: none"> ✓ SMALL BATCH (up to 50 lbs): ¼ or 1/3 hp direct drive 1,750 rpm motor; 3-in., 3-blade, 25 degree pitch on the propeller. ✓ MEDIUM BATCH (50-100 lbs slurry): ½ hp direct drive 1,750 rpm, motor; 4 or 5 in; 3-blade, 25 degree pitch on the propeller. ✓ LARGE BATCH (100-200 lbs slurry): ¾ hp direct drive 1750 rpm motor; 4 or 5in., 3-blade, 25 degree pitch to the propeller.
Additives	<p>Accelerators and retarders may be used to control setting times of plasters and gypsum cements. Recommended accelerators include Terra Alba ground gypsum and potassium sulfate. Recommended retarders include Sodate Retarder. Keep in mind that all retarders, when used in excess reduce strength of the plaster casting and should be used sparingly.</p>