R&R® Glass-Cast™

Application Instructions

R&R GLASS-CAST mold materials have been successfully used for pâte de verre, kiln-cast and crucible casting processes.

Mold Making

Mix 100 parts R&R GLASS-CAST powder to the appropriate parts water (see table below) by weight. Mix for two to three minutes. R&R recommends mechanical mixing to achieve the best mixing action. It is possible (but not required) to vacuum the mix until the investment rises and breaks to eliminate entrapped air before pouring around the pattern.

Pour the R&R GLASS-CAST powder down the side of the flask or mold frame until the patterns are covered to an appropriate depth. This depth will vary depending on the size of glass casting and the strength of the mold material you use. It is possible (but not required) to vibrate or vacuum the mold to remove air bubbles, which may adhere to the patterns. This operation normally takes 1-1 1/2 minutes. R&R recommends that the mold then sit a minimum of one hour after it has set, before moving on to pattern removal.

Pattern Removal

Re-usable patterns - After waiting a minimum of 1 hour, re-usable patterns can be physically removed from the mold.

Wax patterns - Two methods of wax removal are commonly used: dry dewax and steam dewax. For dry dewaxing, place the mold into a kiln or furnace at a temperature of 300-350°F and hold for 3 to 4 hours. For steam dewaxing, place the mold into the steam dewaxer. Steam dewax only for the time required to remove the wax and no longer. The amount of time required to dewax the molds will vary depending on the size of the mold. After steam dewaxing, it is recommended to immediately move to the curing of the mold.

Mold Curing

After the pattern is removed, place the mold into a kiln or furnace at a temperature of 300-350°F and hold until the water is removed from the mold. The temperature of the mold can then be raised to desired casting temperature at a rate of 150-200°F per hour.

Glass Application

Once the pattern has been removed, glass frit can be placed into the mold at any time during the process. The glass can then be heated at the same time as the mold. When crucible casting, it is important to have all water removed from the mold before casting. It is recommended that mold temperature be at least the desired annealing temperature of the glass.

	R&R Glass-Cast 910	R&R Glass-Cast 965	R&R Glass-Cast 400	R&R Glass-Cast 101	50/50 Mold-Mix
Water/Powder Ratio	28/100	28/100	34/100	40/100	50/100; adjust as needed
Pour Time	10-11 minutes	9-10 minutes	10-11 minutes	10-15 minutes	See box label
Set Time	14-17 minutes	11-13 minutes	< 20 minutes	< 25 minutes	See box label
Slump	4-4¼ inches	2¾ -3⅛inches	4½-5 inches	4-5 inches	
Green Compressive Strength	1000 psi	700 psi	680 psi	400 psi	
Post Fired Compressive Strength	160 psi	180 psi	100 psi	40 psi	
Mixed Density	1.88 g/ml	1.87 g/ml	1.82 g/ml	1.75 g/ml	
In^3/lb of dry powder	19	19	12	22	
Permeability (Darcy)	0.020	0.050	0.036	0.045	

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Frequently Asked Questions

Is the amount of water I use important to the result of my glass casting?
Yes, the amount of water used has great influence on the fluidity and working time of the mixed mold material and on the strength of the resulting mold. Deviating too much from the recommended water/ powder ratio can generate massive defects.

If too much water is used, the mold will be too weak to hold the molten glass. In this case, the glass can break through the mold and leak out onto the kiln. As casting size increases, this becomes even more important since the larger mass of molten glass places more stress on the mold material.

If too little water is used, the working time of the mold material will be too short which will not leave enough time to complete all of the mold making steps. This can result in loss of detail reproduction, trapped air and finning.

Will the temperature of my water affect the mold?
Not directly; however, temperature does affect the working time of the mold material and this can affect the mold indirectly. For every 10°F increase in temperature of the water & powder, the working time of the mold material decreases by approximately 1 minute. If the mold making steps are not completed within this shortened working time, the result will be a malformed mold.

Conversely, if the temperatures are lowered, the working time is increased and there is a possibility that the water can separate from the powder before the mold material sets. This results in water-marking on the casting. R&R Glass-Cast 910, 965 and 400 contain special chemicals to prohibit this separation.

Is a face coat necessary for using R&R Glass-Cast mold materials?
No, each of the R&R Glass-Cast mold materials can reproduce the finest detail without a face coat. During the mold making process, plaster rich water flows into the tiniest crevasses even though coarser refractory particles cannot. This plaster rich water will transform into gypsum and set hard. In a sense, a face coat is naturally formed during this process.

Rough castings can result if this plaster rich skin is somehow disturbed. A common mistake that leads to rough castings is excessive steam de-waxing, which erodes away this rich gypsum layer. Scrapping the inside of the mold also will remove the gypsum-rich layer, resulting in rough areas on the casting.

Can R&R Glass-Cast mold materials be used for more than one casting?
Although some artists have used R&R Glass-Cast materials successfully for more than one casting, the materials were designed for single use applications. We do not recommend multiple uses as the surface of the plaster will change from cast to cast, potentially resulting in poor reproduction of the original art.

For additional questions & answers, visit
www.glass-cast.com