

# Core Materials

## 50/50 Core Mix & C-1 Core Mix

Core materials designed for making preformed cores and for hand packing cores to be used with ceramic shell; used primarily by ferrous casters. C-1 Core Mix is the stronger of the two and is used for preformed cores, while 50/50 Core Mix is used to hand pack cores. Both can be used for either process, depending on the size and type of core needed.

### Application/Mixing Instructions

Mixing Ratio/Properties	50/50 Core Mix	C-1 Core Mix
Water/Powder Ratio by Weight	16-18/100	14/100
Working Time*	5 to 6 minutes	5 to 5-1/2 minutes
Setting Time	6-1/2 to 10 minutes	10 minutes maximum

\*By using cold water or a combination of cold water plus chilled core material you can lengthen the working time.

1. These core materials give off heat when setting; which, in most cases, prevents them from being used in direct contact with wax patterns. If you are making small cores, such as golf club hozzles, you can form the core against the wax pattern without damage to the wax.
2. To improve the strength of these core materials, replace a portion of the water with Core Hardener 2000™ binder. Flow characteristics are reduced when using higher percentages of the CORE HARDENER 2000 binder. It is recommended you use 2 parts water to 1 part CORE HARDENER 2000 binder by volume.
3. The powder should be added to the water in the proper proportions and mixed by hand or mechanically to make a smooth consistency. This should take 1 to 1-½ minutes. The mix can then be poured or vibrated into the ceramic shell, rubber or plastic mold.
4. These core materials will bond to most metallic objects unless their surfaces are heavily lubricated. Core material can be vacuumed after mixing to remove excess air. This process will help increase core strength.
5. After the preformed core molds are poured, they should be allowed to set until they have sufficient strength to permit separation. This time is best determined by experimentation and will vary depending on the size and type of the mold. Adding external heat will accelerate the hardening process.
6. Preformed cores should be air dried 3-4 hours, then baked at a minimum of 1200°F (650°C) for 3-4 hours before use. If a metal mold reaction occurs, the baking temperature should be increased until the reaction is eliminated. In some cases it may be necessary to bake the cores in a kiln at 2300°F-2500°F (1260°C-1271°C). In such cases, the cores should be supported so they don't sag or distort.
7. For cores hand packed into a ceramic shell mold, follow the same mixing instructions. After the core has been packed, allow 1 hour for the core material to set before proceeding with the remaining shell coating. Ceramic shells containing these core materials should be processed as normal. After autoclaving, dry for 4 hours. This allows the excess water to evaporate prior to firing, preventing the core from exploding.



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8. Where autoclave dewaxing is used to remove the pattern, the pressure must be released very slowly to prevent destruction of the core material.
9. When making preformed cores or coring directly into the wax, a core extension is needed. The shell is built around the core extension to hold the core in place. The core extension should be at least ¼" long or longer, depending on the core size. When hand packing cores, a core extension may be necessary depending on the core size and configuration. If making a core extension is not possible, a fused quartz tube can be inserted into the core material before it sets.

**Note:** date of manufacture is indicated by first 6 digits of lot number (MM/DD/YY). R&R recommends using 50/50 core mix and C-1 core mix within 6 months of manufacture date.

## Core Hardener 2000™ Binder

This water-based colloidal silica binder is used to strengthen the ceramic shell in small holes, slots, and hard-to-reach openings. It helps prevent metal penetration by strengthening the shell; which is usually thin in these areas. The product is easy to use following the seven step application process.

### Application Instructions

1. Apply usual primary coat of slurry and stucco, dry in the usual manner.
2. Apply CORE HARDENER 2000 binder by dipping, by syringe or by spraying. Allow to dry completely.
3. Apply CORE HARDENER 2000 binder instead of usual pre-wet and drain well.
4. Apply second coat of slurry and stucco and dry in usual manner.
5. Repeat step 2.
6. Repeat step 3.
7. Continue with the third and subsequential coats and dry in usual manner without further use of CORE HARDENER 2000 binder.

CORE HARDENER 2000 binder can also be used to strengthen R&R's ferrous (50/50 Core Mix and C-1 Core Mix) and nonferrous (910 investment) core materials.

**Note:** date of manufacture is indicated by first 6 digits of lot number (MM/DD/YY). R&R recommends using CORE HARDENER 2000 binder within 12 months.

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