



## POINTS TO REMEMBER WHEN USING CASTABLES

1. Always store castables in a cool dry area. Use the oldest castables first.
2. Mixers and tools must be clean and free of any old castable, cement or foreign material that may contaminate the mix. Any material of this nature will affect the set time and/or the ultimate strength of the castable.
3. Use only clean drinkable water for mixing castables. In cold weather, warm water can be used to raise the temperature of the mix to between 60-75°F. In hot weather, the water or castable should be cooled so the temperature does not exceed 80°F at the mixer. Cold water can retard setting time. Warm water accelerates the set. Avoid excess water when mixing any castable; too much water dilutes the binder and weakens the mix.
4. When mixing castables pour  $\frac{1}{2}$  to  $\frac{3}{4}$  of the total amount of the required water per batch, add the dry castable, and let it mix to a uniform color; then add the balance of the water required in small increments. Mix the castable only long enough to produce a uniform mix (approximately 2-3 minutes). Too much mixing generates heat and speeds up the setting time. When a castable has been mixed to the desired consistency place it into the forms as rapidly as possible. The recommended consistency for cast installations is the ball and hand test. Tossed 6-12 inches, a ball of properly mixed castable should adapt to the shape of the hand when caught, but should not flow through the fingers.
5. When forms are used, they should be coated with oil or grease to prevent moisture loss from the castable and/or to aid in the removal of forms. After placing the castable, an internal vibrator of 10,000 to 12,000 v.p.m. rating should be used to remove air pockets and air bubbles and to increase the density of the castable. Caution must be used as not to over vibrate causing segregation of the components and weakening the castable. When casting forehearth, ladles, etc... it is important that the outer casing be drilled (weep holes) to aid in dissipation of moisture during the drying and firing process.
6. After placement and vibrating the castable should be cured for 18 to 24 hours. All calcium aluminate bonded castables generate heat while curing. They should be covered with polyethylene sheets, damp sacks, or sprayed with cold water periodically to maintain moisture and promote uniform curing. After the above procedure is complete, uncover and let air dry 12 to 24 hours. At no time during the casting, curing, or drying process should the castable reach freezing temperatures. In addition, at no time during the curing process should the casting be moved or shaken; vibration will interrupt the bonding process thus greatly reducing the ultimate strength of the casting.
7. After air drying is completed, start raising the temperature 100°F per hour from room temperature to 1600°F. Should any steaming develop during heat up, hold

the temperature at that level until all steam dissipates. Heat will remove the free water as steam at around 212°F while the water of hydration will be driven off between 400°F and 1600°F. Hold temperatures at 400°F to 450°F and again at 1000°F to 1100°F for as many hours as inches thick of the cast piece.

**AVOID DIRECT FLAME IMPINGEMENT ON REFRACTORY!**