Shell Building

R&R recommends adhering to the following technical tips for building a consistent shell in your foundry.

1. If the slurry is foamy or has entrapped air (which weakens the ceramic shell), make sure:
   a. the propeller mixer is not running at excessive speeds, causing a vortex;
   b. the propeller mixer is not running continually, entrapping air and causing slurry overheating (5 minutes on and 5 minutes off is often used); and
   c. that binder solids did not increase excessively. When binder solids are above the control range, defoaming characteristics are adversely affected, which can cause binder gelation and inconsistent viscosity, leading to casting defects.
2. It is best to maintain the slurry temperature within a 5°F (3°C) operating range and not more than 10°F (6°C) above ambient temperature, as with any conventional colloidal silica slurry.
3. Shell drying time can be reduced by lowering relative humidity up to 50% or increasing airflow (250-400 fpm, 1.3-2.0 m/s). Temperature should be held constant to avoid shell cracking caused by pattern expansion or contraction. In most cases, final dry times will be 12-16 hours.
4. When using a rainfall sander, stucco larger than 30 mesh on the first backup coat may adhere poorly.
5. R&R recommends maintaining a detailed slurry log of refractory, binder, water additions and other checks. Refer to the Slurry Control tech tip available at www.ransom-randolph.com.

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