



## INSTRUCTIONS

### FastPour™

**NOTE: CONTENTS SETTLE DURING SHIPPING**

**Mix FastPour™ thoroughly before each use & before beginning Step 1 and remove Desiccant Bags (5Gal Bucket contents 1 bag and 55 Gal drum contents 5 bags)**

FastPour™ must be adequately mixed after shipping to allow for even distribution of the materials that settle somewhat during shipment. If you have a drum roller, place the drum on the roller and allow it to mix approximately 10 – 15 minutes. If you do not have a drum roller, two people will have to roll the drum back and forth over an area at least 10 feet in length. Place the drum on its side and roll the drum back and forth over the 10 foot length about 20 times. Flip the drum over (end-over-end) and then lay the drum down again and repeat the rolling process.

1. Prep mold. We recommend a Lecithin based mold release. (e.g. Eject-it #25, or Pam)
2. Weigh out FastPour™ powder. Determine the amount of water required. The exact amount used may vary slightly based on application needs. A water factor (WF) is defined as:  
**Water Amount = WF x powder mass**  
A value of WF=0.8929 was used in all lab testing. This produced a thick, vibratable liquid. In the field, a larger WF=1.18 may be necessary to reduce viscosity. We recommend trying a WF=1.18).  
This may be adjusted slightly upwards or downwards to adjust viscosity.  
\*Higher WF is associated with: lower viscosities and lower strength  
\*Smaller WF is associated with: higher viscosities, higher strength, trapped bubbles, and slower washout
3. Combine FastPour™ with water. Stir until uniform and then cast. (Note: FastPour sets up very fast). Be ready to mix and pour.
  - Plan on 2-3 minutes of maximum mixing time. Working time is ~2-3 minutes.
  - Material will set up semi firm to firm in approximately 10-15 minutes. This is the green cured stage.
  - When set, the material will be firm to the touch but not completely rigid.
    - Note: Leaving the part in the mold for too long (1-2 days) may result in softening of the part.
4. Remove mandrel from the mold or split the mold to dry the part. Significant surface area must be exposed during the drying process.
5. Dry and activate in a convection oven.
  - We recommend the material be dried at 85°C (185°F) and then at 110°C (230°F).
  - The material can also be dried at higher or lower temperatures. However, it is recommended that some of initial drying is performed below boiling point and finished above boiling point. FastPour™ is thermally stable and can withstand temperatures up to ~800°C (~750°F).
  - Drying times for FastPour™ vary according to the part geometry, surface area, and oven kinetics. The more surface area that is exposed the shorter the drying time.
  - Drying times will increase exponentially as the part geometry increases. See technical memo #1 for an example.
  - Activate mandrel by heating to the range of 260-371°C (500-700°F) are recommended to activate the water breakdown behavior. Temperatures as low as 230°C (446°F) have been verified to work though. The center of the mandrel should reach the target temperature. If it does not, the center will not break down easily in water.
  - Breakdown behavior is noticeably faster at the high temperature extremes.
6. Remove mandrel from oven.
  - To avoid cracking, we recommend turning the oven off with the mandrel inside and letting the mandrel cool in the oven. This prevents thermal shock.
  - If surface repair is necessary, we recommend mixing a small portion of FastPour powder to make paste and filling in the defect.

Seal the mandrel. We recommend using a PTFE release tape for most applications.
7. Lay-up on sealed mandrel to make finished part.
8. Wash away FastPour™ from finished part.
  - It is recommended to soak the mandrel allow the mandrel sufficient time to absorb water.
  - During the soak, a significant portion of the mandrel should collapse and the remainder can be washed out.
  - FastPour™ solids can be disposed of with normal waste.

For additional assistance, please contact Advanced Ceramics Manufacturing at 520.547.0850.

