



## THERMBOND®

### MIXING GUIDELINES FOR FORMULA 12-L

#### **1.) General:**

This Guideline represents the best practices for mixing and installing Thermbond® Formula 12-L by ramming or hand packing. Due to the limited working times of Thermbond® products it is highly recommended that a complete review of the job set-up and procedure is done before mixing and placing Thermbond® Materials. Deviations from these guidelines should be discussed with your Thermbond® Products representative.

#### **2.) Equipment and Tools:**

Thermbond® Formula 12-L Refractories should be mixed using a Hobart-type mixer. The mixing blade and mixing bowl must be made of stainless steel.

#### **3.) Preparation:**

- A. All mixing containers must be free of contaminants prior to using Thermbond® products.
- B. The surface to which the refractory lining is to be installed should be dry and clean.
- C. For best results install Thermbond Formula 12-L at an ambient temperature range of 40-90°F (5-32°C). Mix only as much material as you can place. The working time decreases as ambient temperature increases.
- D. When Activator is mixed with the dry formulation, a chemical reaction (exothermic) occurs which elevates the mix temperature. The acceptable mix temperature should be 40-90°F (5-32°C) for Thermbond® Formula 12-L Refractory when being installed.
- E. Do not use damaged open bags or bags that have been affected by moisture.

#### **4.) Packaging:**

Thermbond® Formula 12-L is packaged in "unit" quantities. A unit comprises of two bags of dry material and one jug of activator. Mixing less than full units is common for most hex-mesh applications. If mixing less than full units, be sure to mix the dry component before adding the Activator.

#### **5.) Determining the correct wet to dry ratio:**

The correct way to determine the wet to dry ratio is:

- a. Determine the weight of the pre-mixed dry formulation required.
- b. Multiply the weight of the dry formulation by the WET TO DRY RATIO.
- c. This number is the amount, by weight, of Liquid Activator required.

## **6.) Mixing:**

- A. For Mixing use planetary bowl type mixers (Hobart type)
- B. Pour Activator in mixing bowl.
- C. Pour all the dry material in the mixer bowl.
- D. Immediately start mixing at low speed. Let the mixer run until the material "folds" upon itself and looks homogeneous. Mixing time can vary from 90 to 150 seconds depending on ambient temperature, material temperature, amount being mixed, variation in material and liquid temperature.
- E. Make sure that all material is mixed and no dry material is left at the bottom of the mixing bowl. This ensures the proper wet to dry ratio in the mixed material.
- F. When mixing multiple batches of Thermbond® Formula 12-L, it is important to immediately load the mixer with the required amount of Liquid Activator for the next subsequent batch. This will prevent left over material from the previous load from hardening in the mixer.

## **7.) Best Practices:**

- A. Thermbond® Formula 12-L Wet to Dry Ratio may vary from 7.4% - 7.9%. Please contact your Thermbond® products representative for the correct wet to dry ratio of the specific batch number being used. The batch number is printed at the bottom of the bag.
- B. To extend working time of mixed material, cool liquid activator and/or dry material to below 40° F (Refrigerated truck, air conditioned room, large cooler, etc.).
- C. Mixing too long in the mixer will cause the material to begin to set, significantly decreasing the time available to properly place the material.

## **8.) Installation:**

- A. Press sufficient Thermbond® Formula 12-L material into place to overfill the hex-mesh anchoring system.
- B. Do not press more material into place than can be compacted before the working period of the refractory expires or set-up begins.
- C. Thoroughly and uniformly, distribute and compact the refractory to eliminate voids, laminations, pockets, etc. and fill under and around all lances to form a uniform, homogeneous lining. Move the rammer forward and back and vary the angle of impact to aid in accomplishing uniform compaction. When using hex-mesh systems, ensure that new refractory is compacted into neighboring, previously placed material.
- D. Refractory installation in hex mesh systems shall be installed continuous and uninterrupted to avoid the creation of joints in the refractory system.
- E. Immediately after completion of placement and compaction and before the refractory begins to setup, strike off the lining flush with the surface of the anchors using either a trowel, a hard wood or hard plastic block, discarding any surplus! Take care not to remove too much material, resulting in an under cut, or pulling refractory from the shell. Trimming shall continue as installation work progresses.

**NEVER USE WATER WITH THERMBOND® FORMULA SERIES PRODUCTS. WATER IN THE MIX CAN CAUSE CATASTROPHIC FAILURE, INCLUDING EXPLOSIVE SPALLING. DO NOT MIX LARGER BATCHES THAN CAN BE PLACED AND FINISHED WITHIN THE MATERIAL PLACEMENT TIME FOR THE THERMBOND® REFRACTORY. FAILURE TO DO THIS CAN RESULT IN VOIDS OR AIR POCKETS, CAUSING EARLY FAILURE.**

**If you have any questions or concern please contact your Thermbond® Representative.**

