Ultralite Cavity Fill Castable (UCF)
Recommended Best Practice

Mantec Technical Ceramics has a complete range of innovative and energy efficient Ultralite Thermal Insulation Products for a wide variety of high temperature applications.

Ultralite Cavity Fill (UCF) is used to reduce the cool face temperature of the outer wall of a kiln/furnace or the door of industrial boilers and is offered by Mantec Technical Ceramics as an alternative material for kiln/furnace or boiler manufacturers and maintenance teams.

This exceptional Ultralite Cavity Fill castable exhibits all the same characteristics as the highly successful Ultralite Loose Fill (ULF) insulation material as it is manufactured from the same material and blended together with high grade refractory aggregates and cements creating the following products:

- UCF-950 – Standard Cavity Fill castable. Maximum service temperature of 950°C/1742°F
- • UCF-10HS – A reinforced high strength version that is ideal for producing ultra-lightweight cast refractory shapes for industrial boiler applications and an excellent alternative to traditional refractory ceramic/bio- soluble fibre products. Maximum service temperature of 1050°C/1922°F
- • UCF-12HS – A reinforced high strength version similar to UCF-10HS but with a maximum service temperature of 1250°C/2282°F

Recommended Best Practice

1) Ensure that sufficient material is mixed in one batch, where possible, to complete the job in hand.

2) Try to ensure that the dry material and the water to be added are at ambient temperature, ideally between 15-25˚C or thereabouts.
The Ultralite Cavity Fill (UCF) should not be prepared in excessively cold or hot conditions. Less than 10˚C or more than 40˚C.

3) The UCF product is a “ready-mix”, however if using small quantities, (less than a full 20 litre bag) it is advisable to empty the contents of the bag and mix thoroughly in case any migration of fines has occurred during transportation or storage. Put the unused material back into the bag and reseal tightly to store.

4) If more than one bag of material is required to complete the job, no premixing should be required, as this will be done quite naturally during the adding of and mixing with water.

5) It is normal practice to use a mechanical (mortar) type mixer for the preparation of the ready-mix UCF. The amount of water to be added would ideally be determined by trial in order to suit the application, but do remember, too little or too much water may reduce the dry/cured strength.

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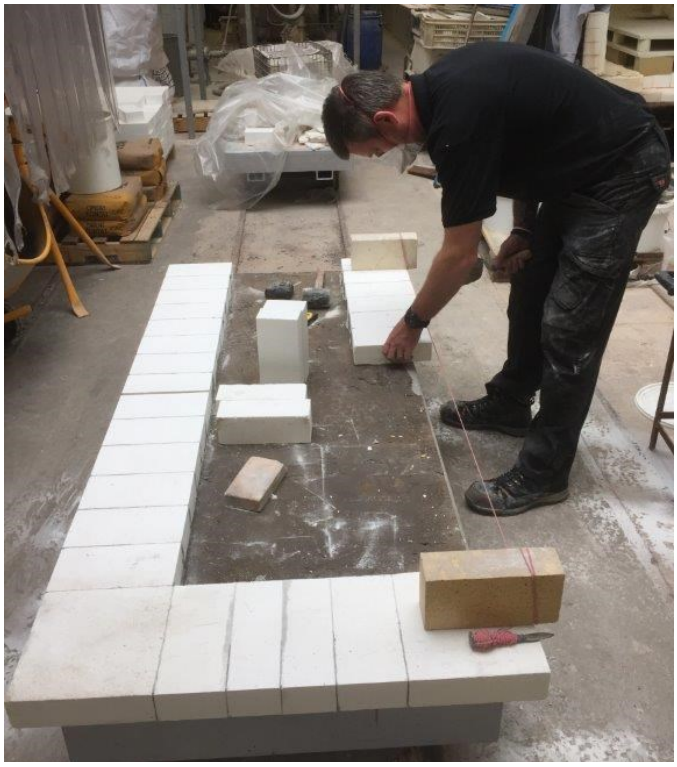
6) As a general indication, a suitable ratio to begin trials would be around 3 parts UCF to 1 part or less water, by volume, not weight.

Once the castable/water ratio is determined, add half the required amount of water to the mixer before putting in the dry UCF. This helps to reduce the amount of dust generated.

Add all the remainder of the dry UCF and the remainder of the water a little at a time and mix for 3 - 5 minutes until it has the appropriate consistency for the application.

Select a mixer speed that provides a good cascading effect without throwing the UCF out of the mixer.

7) Fill the cavity, gently vibrating where practicable or trowel into place as required, completing the operation in as short a time as is practical, ideally no more than 30 minutes. Once filled or trowelled into place cover the UCF with an impervious sheet (plastic/polythene etc) to prevent the UCF from drying out before it has cured. The cover should be kept in place ideally for a minimum of 24 hours to allow the UCF to cure.



8) After curing, the cover should be removed and the UCF allowed to air dry. If possible, dry at 105˚C in order to gain maximum dry strength, although this is not essential.

9) Now the castable surface is hard, it is possible to lay refractory bricks directly onto it without the need for pre-firing.

10) The item can be fired up to its maximum service temperature in situ, ensuring that for the initial firing the slowest ramp rate achievable is used, typically 50˚/ hour or below to drive off any retained moisture.

11) The UCF can be used for kiln side walls and backing insulation on kiln roofs, where it will generally cure and develop its strength as the kiln is gradually heated.

For more information on Mantec's range of Ultralite Refractory Castables please contact our sales office or visit our website.