Ultralite Cavity Fill (UCF) -
Technical Data Sheet

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

Uniquely available from Mantec, Ultralite is a lightweight, microporous refractory material developed and manufactured in the UK. Mantec's smart processing of largely traditional materials has resulted in a range of Ultralite products which have exceptional thermal insulation properties.

The superior thermal performance of Ultralite means it is becoming invaluable across a wide range of industries including global heavy clay, sanitaryware, tableware, refractories, iron and steel and glass production industries – reducing energy consumption and saving manufacturers significant costs associated with the overall kiln and furnace operations .

The unique, patent pending Ultralite technology has been developed by Mantec's in-house ceramic experts and is manufactured in its factory in Stoke-on-Trent in the heart of the UK ceramics region. It is designed to be a modern substitute for more traditional materials across a number of quite distinct applications.

The special refractory formulation that is used to produce Ultralite has given it a technological and performance advantage over other refractory materials and as such offers a suite of benefits such as:

- High open porosity
- Low thermal mass
- Low permeability
- Low thermal conductivity
- Low bulk density
- Lightweight

Ultralite Cavity Fill:

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

www.mantectechnicalceramics.com / email: ultralite@mantectc.com

Mantec Technical Ceramics

Ultralite™ Advanced Solutions

Main Properties		Units	UCF-950	UCF-10HS	UCF-12HS
Recommended Maximum Service Temperature		°C (°F)	950 (1742)	1050 (1922)	1250 (2282)
Powder Loose Bulk Density (Subject to settling in transit)		Kg/m³ (lb/ft³)	Approx. 220 - 240 (13.73 – 14.98)	Approx. 220 - 240 (13.73 – 14.98)	Approx. 380 (23.72)
Bulk Density (Dried & Cured at 105°C)		Kg/m³ (lb/ft³)	Approx. 300 - 350 (18.72 – 21.84)	Approx. 370 (23.10)	Approx. 480 (29.97)
Bulk Density (Fired)		Kg/m³ (lb/ft³)	Approx. 280 - 340 (17.47 - 21.22) Fired at 950°C	Approx. 410 (25.60) Fired at 1000°C	Approx. 460 (28.72) Fired at 1200°C
Approx. Net Material Required to make 1m³ of Cavity Fill Castable		m³	1.3m³ (286 to 312Kgs)	1.75m³ (385 to 420Kgs)	1.75m³ (665Kgs)
Cold Crushing Strength (ASTM C133-97 & C865. Dried & Cured at 105°C)		MPa (psi)	0.6 (87)	>1.00 (145)	>1.00 (145)
Permanent Linear Change (ASTM C133 & C865)		%	- 1.48 (Heated to 950°C & then cooled)	To Be Confirmed	To Be Confirmed
Thermal Conductivity (ASTM C201/182) N.B. All temperatures are **MEAN** temperatures	200°C (392°F)	W/m K (BTU in/hr ft² °F)	0.14 (0.97)	To Be Confirmed	To Be Confirmed
	400°C (752°F)	W/m K (BTU in/hr ft² °F)	0.17 (1.18)	To Be Confirmed	To Be Confirmed
	800°C (1472°F)	W/m K (BTU in/hr ft² °F)	0.19 (1.32)	To Be Confirmed	To Be Confirmed
Chemical Composition	Al_2O_3	%	34.44	44.20	44.20
	SiO_2	%	36.53	35.25	35.25
	Fe_2O_3	%	5.74	0.69	0.69
	TiO_2	%	1.48	0.80	0.80
	CaO	%	13.38	10.96	10.96
	MgO	%	0.37	0.54	0.54
	Na_2O	%	0.25	0.34	0.34
	K_2O	%	1.46	1.50	1.50
	Alkalis	%	< 2.5	< 2.0	< 2.0
Approx. Mixing Ratio (By Volume)		Litres Water : Litres UCF	32 : 100	32 : 100	32 : 100
Approx. Mixing Ratio (By Weight)		Kgs Water : Kgs UCF	140 : 100	140 : 100	140 : 100
Standard Packaging			20 litre sacks	20 litre sacks	20 litre sacks

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