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## Ultralite Refractory Castable (URC) - *Technical Data Sheet*

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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 Refractory Castable:**

Mantec Technical Ceramics manufactures **Ultralite Refractory Castable (URC)** by blending its highly successful Ultralite Loose Fill (ULF) insulation material with high grade refractory aggregates and cements, which results in an exceptional castable product.

This flexible material allows a variety of applications to be handled, from the creation of cast shapes that are lightweight with exceptional heat insulating properties to cement for refractory linings.

Ultralite Refractory Castable (URC) is available in three main grades with maximum service temperatures ranging from 1100°C (2012°F) up to 1300°C (2372°F):

- **URC-11** – Maximum service temperature of 1100°C/2012°F
- **URC-12** – Maximum service temperature of 1200°C/2192°F
- **URC-13** – Maximum service temperature of 1300°C/2372°F

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Note: The information and technical data contained herein are correct at the date of issue and represent typical values obtained in accordance with normal manufacturing tolerances. Mantec Technical Ceramics reserves the right however to change this information and technical data at any time without notice. Contact Mantec Technical Ceramics for the most current information.

Main Properties		Units	URC-11	URC-12	URC-13
Recommended Maximum Service Temperature		°C (°F)	1100 (2012)	1200 (2192)	1300 (2372)
Powder Loose Bulk Density (Subject to settling in transit)		Kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	Approx. 420 - 460 (26.21– 28.72)	Approx. 420 - 460 (26.21– 28.72)	Approx. 550 - 600 (34.34 - 37.46)
Bulk Density (Dried & Cured at 105°C)		Kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	Approx. 540 - 620 (33.71– 38.71)	Approx. 620 - 670 (38.71– 41.83)	Approx. 580 - 620 (36.21– 38.71)
Bulk Density (Fired)		Kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	Approx. 590 (36.83) Fired at 1100°C	Approx. 620 (38.71) Fired at 1200°C	Approx. 520 - 550 (32.46– 34.34) Fired at 1300°C
Approx. Net Material Required to make 1m <sup>3</sup> of Castable		m <sup>3</sup> (Kgs)	1.3m <sup>3</sup> (546 to 598Kgs)	1.3m <sup>3</sup> (546 to 598Kgs)	1.3m <sup>3</sup> (715 to 780Kgs)
Modulus of Rupture (ASTM C133-97 & C865. Dried & Cured at 105°C)		MPa (psi)	0.73 (106)	1.36 (197)	1.32 (191)
Cold Crushing Strength (ASTM C133-97 & C865. Dried & Cured at 105°C)		MPa (psi)	1.50 (218)	2.91 (422)	3.7 (537)
Permanent Linear Change (ASTM C133 & C865)		%	- 1.50 (Heated to 1100°C & then cooled)	- 1.45 (Heated to 1200°C & then cooled)	- 1.10 (Heated to 1300°C & then cooled)
Thermal Conductivity (ASTM C201/182)  N.B. All temperatures are <b>MEAN</b> temperatures	200°C (392°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.13 (0.90)	0.22 (1.53)	0.21 (1.46)
	400°C (752°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.16 (1.11)	0.24 (1.67)	0.22 (1.53)
	800°C (1472°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.22 (1.53)	0.20 (1.39)	0.25 (1.74)
Chemical Composition	Al <sub>2</sub> O <sub>3</sub>	%	38.75	39.56	54.51
	SiO <sub>2</sub>	%	27.77	29.33	27.62
	Fe <sub>2</sub> O <sub>3</sub>	%	9.23	8.71	0.76
	TiO <sub>2</sub>	%	-	-	-
	CaO	%	19.54	18.48	14.64
	MgO	%	-	-	-
	Na <sub>2</sub> O	%	0.40	0.28	0.28
	K <sub>2</sub> O	%	1.05	0.79	0.45
	Alkalis	%	< 2.0	< 1.5	< 1.0
Approx. Mixing Ratio (By Volume)		Litres Water : Litres URC	40 : 100	34 : 100	30 : 100
Approx. Mixing Ratio (By Weight)		Kgs Water : Kgs URC	90 : 100	77 : 100	52 : 100
Standard Packaging			20 litre sacks	20 litre sacks	20 litre sacks

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