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## Ultralite Graded Aggregate (UGA) - 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 Graded Aggregate:

Mantec Technical Ceramics manufactures and supplies **Ultralite Graded Aggregate (UGA)** to customers who prefer to utilise Ultralite as a lightweight microporous graded aggregate to manufacture their own lightweight refractory shapes.

Ultralite Graded Aggregate (UGA) is the graded version of Mantec's Ultralite Loose Fill (ULF) insulation material and is available in two main grades with maximum service temperatures ranging from 1050°C (1922°F) up to 1250°C (2282°F):

- **UGA-10** – Maximum service temperature of 1050°C/1922°F
- **UGA-12** – Maximum service temperature of 1250°C/2282°F

UGA products are available in the following standard grades:

- **0 to 1mm**
- **0 to 2mm**
- **0 to 3mm**

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Main Properties		Units	UGA-10-0-1	UGA-10-0-2	UGA-10-0-3
Recommended Maximum Service Temperature		°C (°F)	1050 (1922)	1050 (1922)	1050 (1922)
Determination of Refractoriness ASTM C24-09 (13)		PCE Value (°C / °F)	29 (1659°C / 3018°F)	29 (1659°C / 3018°F)	29 (1659°C / 3018°F)
Grain Size		mm	0 to 1	0 to 2	0 to 3
Powder Loose Bulk Density (Subject to settling in transit)		Kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	200 (12.49)	175 (10.92)	135 (8.43)
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)	0.11 (0.76)	0.11 (0.76)	0.11 (0.76)
	400°C (752°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.12 (0.83)	0.12 (0.83)	0.12 (0.83)
	800°C (1472°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.17 (1.18)	0.17 (1.18)	0.17 (1.18)
Specific Heat Capacity at 1000°C (1832°F)		kJ/kg K	1.15	1.15	1.15
Determination of Resistance to Carbon Monoxide (BS EN ISO 12676:2003) after 200 hours at 500°C (932°F)			Classification 1	Classification 1	Classification 1
Chemical Composition	Al <sub>2</sub> O <sub>3</sub>	%	31.34	31.34	31.34
	SiO <sub>2</sub>	%	53.47	53.47	53.47
	Fe <sub>2</sub> O <sub>3</sub>	%	0.84	0.84	0.84
	TiO <sub>2</sub>	%	1.21	1.21	1.21
	CaO	%	0.36	0.36	0.36
	MgO	%	0.56	0.56	0.56
	Na <sub>2</sub> O	%	0.36	0.36	0.36
	K <sub>2</sub> O	%	2.19	2.19	2.19
Alkalis	%	< 3.5	< 3.5	< 3.5	
Standard Packaging			20 litre sacks or 1m <sup>3</sup> Bulk Bags	20 litre sacks or 1m <sup>3</sup> Bulk Bags	20 litre sacks or 1m <sup>3</sup> Bulk Bags

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Main Properties		Units	UGA-12-0-1	UGA-12-0-2	UGA-12-0-3
Recommended Maximum Service Temperature		°C (°F)	1250 (2282)	1250 (2282)	1250 (2282)
Determination of Refractoriness ASTM C24-09 (13)		PCE Value (°C / °F)	29 (1659°C / 3018°F)	29 (1659°C / 3018°F)	29 (1659°C / 3018°F)
Grain Size		mm	0 to 1	0 to 2	0 to 3
Powder Loose Bulk Density (Subject to settling in transit)		Kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	350 (21.85)	305 (19.04)	195 (12.17)
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)	0.12 (0.83)	0.12 (0.83)	0.12 (0.83)
	400°C (752°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.13 (0.90)	0.13 (0.90)	0.13 (0.90)
	800°C (1472°F)	W/m K (BTU in/hr ft <sup>2</sup> °F)	0.17 (1.18)	0.17 (1.18)	0.17 (1.18)
Specific Heat Capacity at 1000°C (1832°F)		kJ/kg K	1.15	1.15	1.15
Determination of Resistance to Carbon Monoxide (BS EN ISO 12676:2003) after 200 hours at 500°C (932°F)			Classification 1	Classification 1	Classification 1
Chemical Composition	Al <sub>2</sub> O <sub>3</sub>	%	31.34	31.34	31.34
	SiO <sub>2</sub>	%	53.47	53.47	53.47
	Fe <sub>2</sub> O <sub>3</sub>	%	0.84	0.84	0.84
	TiO <sub>2</sub>	%	1.21	1.21	1.21
	CaO	%	0.36	0.36	0.36
	MgO	%	0.56	0.56	0.56
	Na <sub>2</sub> O	%	0.36	0.36	0.36
	K <sub>2</sub> O	%	2.19	2.19	2.19
	Alkalis	%	< 3.5	< 3.5	< 3.5
Standard Packaging			20 litre sacks or 1m <sup>3</sup> Bulk Bags	20 litre sacks or 1m <sup>3</sup> Bulk Bags	20 litre sacks or 1m <sup>3</sup> Bulk Bags

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