



Technical Manual – Section 12 Lytag Refractory Grade Aggregates

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Introduction

Lyttag is a suitable ingredient for lightweight and medium weight refractory castables as used in the petrochemical and steel industries, kiln sub-floor concretes, kiln car base concretes, general backing concretes and cavity fill mixes. It has also been used to construct concrete pads for VTOL aircraft.

Lyttag aggregates have low densities and high strength and these properties combined with inherent fire resistance and insulating characteristics make them ideal for use in refractory concrete.

Properties

Density

Size	Typical Dry Loose Bulk Density (kg/m ₃)
4/14mm	725
4/8mm	725
0/4mm	900

Thermal Conductivity

Concrete made with Lyttag aggregate has excellent thermal insulating properties. In common with other insulating materials the thermal conductivity value tends to rise with increases in temperature. Messrs. Lafarge measured the following values:-

Temperature °C	Thermal conductivity W/mK
500	0.35
1000	0.58



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Standard mix details

Lyttag concrete made with high alumina cement.

Tests were carried out on 100mm cubes cast from a mix* with the following proportions:

Cement / Fines / Granular	1:2:2 by volume
Cement content (approx.)	420 kg/m ₃
Total water cement ratio	0.64

The following results were obtained:-

Cold Strength	31.0 N/mm ₂ at 24 hours
Wet Density	1810 kg/m ₃ at 24 hours
Fired Cubes	All cubes are dried before firing for 3-5 days

Firing conditions	Density before firing kg/m₃	Density after firing kg/m₃	Crushing strength N/mm₂	Mean shrinkage %
800oC	1773	1528	17.6	0.20
1000oC	1714	1521	13.8	0.55
1100oC	1714	1554	16.2	1.20

The test report stated:

The concrete has a useful cold strength of 31.0 N/mm₂ at 24 hours and also a good fired strength for the range of temperatures at which it was tested.

It would be advisable to recommend its service temperature limit at 1000oC or at the most 1050oC.

* The mix design shown is for guidance purpose only. Trial mixes should be undertaken to determine performance data for each particular application.

LRG aggregate – ordering and supply

Lyttag is available for delivery to anywhere in the UK or abroad in bulk tippers, pressurised tankers or 1 tonne bulk bags.



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