

**CALSITHERM**



**Technical Information**

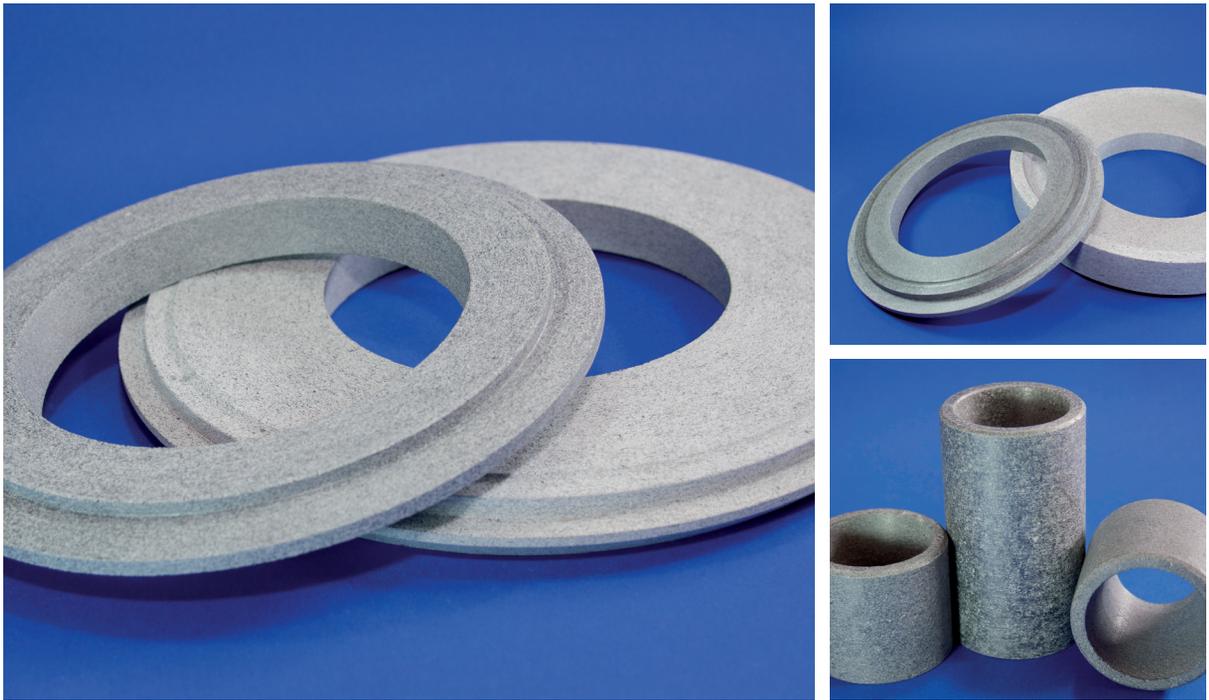
CALCAST™ GRAPHITE COMPOUND  
CC155 G4, CC155 G8, CC155 G16

**Your Refractory Experts**



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# CALSTITHERM



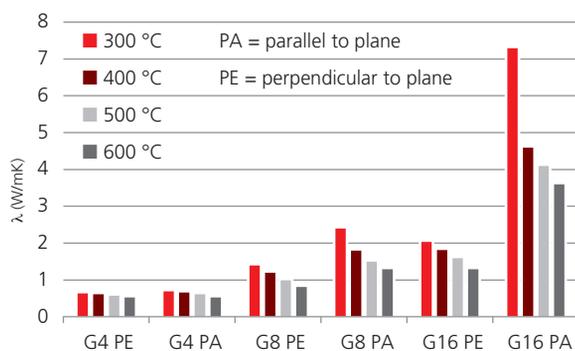
CALCAST™ GRAPHITE COMPOUNDS combine the mechanical and physical properties of Calcium Silicate and Graphite. This results in a material with superior properties in regard to several high temperature applications, especially for use in non-ferrous-metal casting processes. Uniform temperature distribution and shock behavior are significantly improved over standard Calcium Silicates.

The properties are determined by the amount of Graphite added to the Calcium Silicate system. In particular the thermo-physical and expansion properties of the compound are influenced by the anisotropic Graphite crystals.

## THERMAL CONDUCTIVITY

The thermal conductivity increases with increasing Graphite amounts. Due to the Graphite lattice and lattice orientation parallel to the board plane the conductivity behaves anisotropically. Parallel to the Graphite layers (PA) one observes significantly higher  $\lambda$ -values. The conductivity reduces with increasing temperature as the Graphite starts to decompose. This decomposition is slow in metal contact applications.

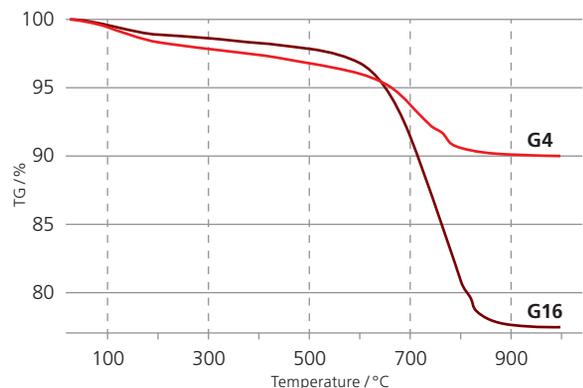
**Thermal conductivity versus Graphite content at various temperatures**



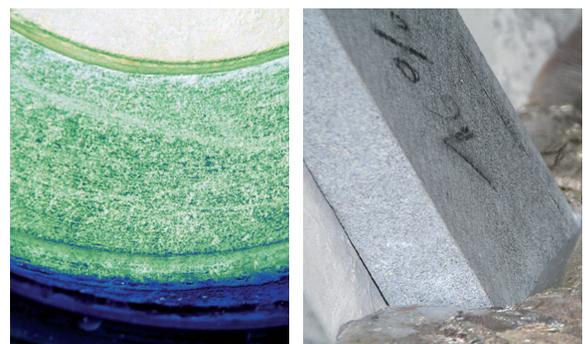
## OXIDATION BEHAVIOUR

Significant oxidation of the Graphite starts around 660 °C in air.

**Weight loss of CALCAST™ CC155 G4 and G16 versus Temperature**



When covered with liquid metal no significant changes of the surface structure are observed due to the high oxidation resistance even after long operation times at casting temperature. The material stays self lubricating, non wetting and resistant to oil absorption.



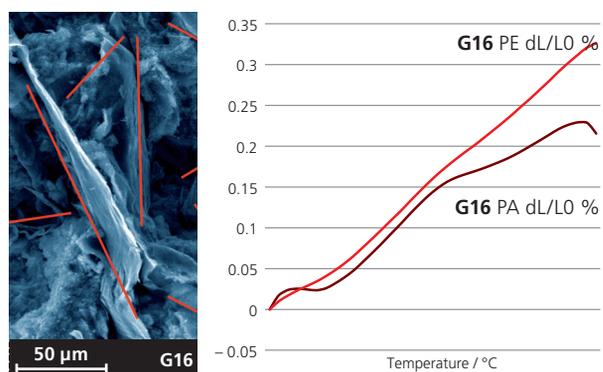
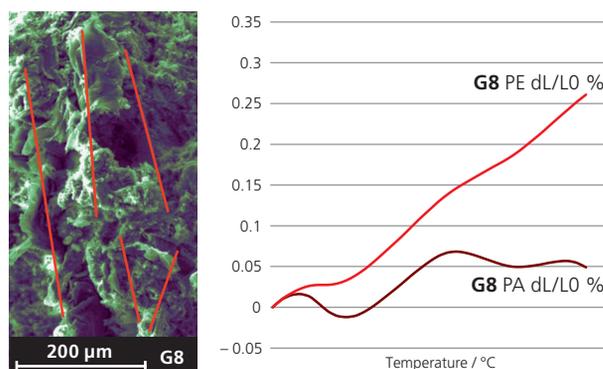
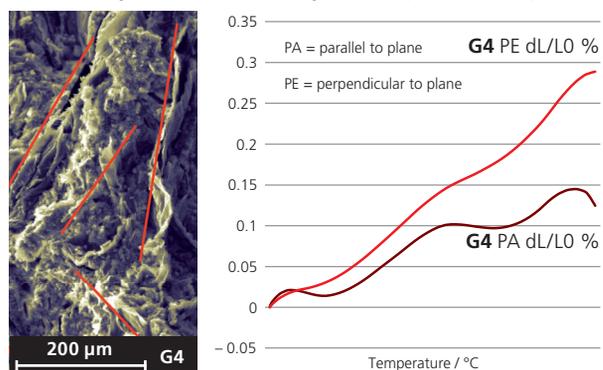
Hot face after > 100 drops

Wetting in liquid Aluminium

## THERMAL EXPANSION

Parallel to the plane of the boards and of the Graphite crystals (PA) the expansion is significantly lower than in the perpendicular direction (PE). The lowest expansion is seen in the grade CC155 G8. G16 has a less anisotropic expansion, as the Graphite is distributed more randomly (schematic lines in SEMs).

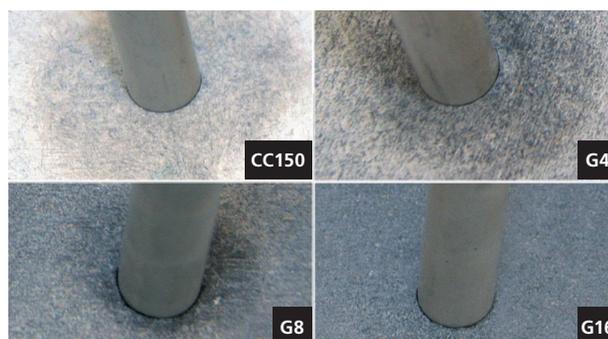
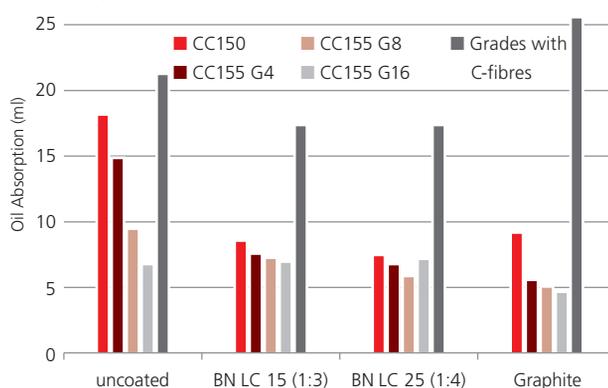
**Thermal expansion versus temperature (20 to 720 °C)**



## OIL ABSORPTION & SELF LUBRICATION

Increasing Graphite content reduces the oil uptake significantly in comparison to CALCAST™ CC150 and other standard Calcium Silicate grades containing C-fibres. Surface coatings, such as diluted BN suspensions (LC 15 and LC 25) or a Graphite suspension, further increase resistance to oil absorption.

**Oil absorption after 144 h at room temperature (coated and uncoated)**



**Oil traces on the surface after 144 h at room temperature**



**CC155 G8 surface with self lubricating Graphite particles**

## MECHANICAL PROPERTIES

			CC155 G4	CC155 G8	CC155 G16
Bulk density (± 10 %)	(EN 1094-4)	kg/m <sup>3</sup>	1,150	1,100	1,050
		lbs/cu.ft.	72	69	66
Open porosity	(in acc. to EN 1094-4)	%	55	55	60
Compressive strength	(EN 1094-5)	MPa	24	22	18
		lbs/sq.in.	3,480	3,190	2,610
Flexural strength	(EN 12089)	MPa	11	10	9
		lbs/sq.in.	1,595	1,450	1,305
Hardness	(DIN 53505)	Shore D	70	65	60

The properties indicated in this brochure are typical values obtained in serial testing and determined by acknowledged test methods. Product-specific variations have to be taken into account. The information provided in this data sheet does not present guaranteed properties and cannot be used for any warranty claims.

# CALSITHERM

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