



# PRODUCT DATA SHEET

## Cement Grade Granulate

Product Code: GBF 006

### Definition:

Blast furnace slag is the non-metallic product consisting essentially of silicates and aluminosilicates of calcium and other bases, that is developed in a molten condition simultaneously with iron in a blast furnace.

Granulated blast furnace (GBF) slag is a glassy, granular material.

### Advantages:

- ◆ Cementitious properties
- ◆ Good grindability
- ◆ Low iron levels
- ◆ High glass content
- ◆ Bright colour
- ◆ Low chloride content
- ◆ Dependable quality

### Process:

Molten slag is passed through high volume water sprays, breaking the slag stream up into small droplets and cooling them so quickly that crystallisation is suppressed.

### Advantages in Concrete:

- ◆ Better workability and placeability
- ◆ Better pumpability
- ◆ Less bleeding
- ◆ Higher ultimate strength
- ◆ Lower hydration temperature
- ◆ Reduces aggregate alkali reaction
- ◆ Significantly improves resistance to sulphate attack
- ◆ Reduces chloride penetration
- ◆ Enhances durability
- ◆ Reduces efflorescence
- ◆ Lighter colour

### Description:

Cement Grade Granulate is a coarse sand-like material with a porous, amorphous structure and ranging from white to golden brown in colour.

### Applications:

- ◆ Part replacement for portland cement

In the manufacturing process the slag is dried and either interground with portland cement clinker or separately ground and post blended with portland cement at the cement plant or concrete batching plant.

### Environmental Value:

- ◆ Effective utilisation of an industrial by-product
- ◆ Conserves natural resources and preserves natural landscape
- ◆ Reduces the need for landfill sites
- ◆ Reduces greenhouse gas emissions
- ◆ Reduces energy consumption

**Chemical Properties:**

Blast furnace slag is composed of silicates and aluminosilicates, but for ease of reporting oxide equivalents are used and fall within the relatively narrow limits given below:

CONSTITUENT	SYMBOL	%
Iron Oxide	FeO	<1.3
Calcium Oxide	CaO	38 – 43
Silicon Dioxide	SiO <sub>2</sub>	32 – 37
Aluminium Oxide	Al <sub>2</sub> O <sub>3</sub>	13 – 16
Magnesium Oxide	MgO	5 – 8
Titanium Dioxide	TiO <sub>2</sub>	<1.5
Manganese Oxide	MnO	<1.0
Potassium Oxide	K <sub>2</sub> O	<1.0
Sulphur	S	<1.0
Sodium Oxide	Na <sub>2</sub> O	<0.5
Basicity Ratio	$\frac{\text{CaO}+\text{MgO}}{\text{SiO}_2+\text{Al}_2\text{O}_3}$	0.9-1.1
Lime/Silica Ratio	$\frac{\text{CaO}}{\text{SiO}_2}$	1.1-1.3
Hydraulic Index	$\frac{\text{CaO}+\text{MgO}+\text{Al}_2\text{O}_3}{\text{SiO}_2}$	1.7-1.9
Chloride Ion	Cl	<250ppm

**Typical Grading:**

SIEVE	% PASSING
4.75mm	100
2.36	97-100
1.18	70-85
600um	30-45
425	15-25
300	8-14
150	3-7
75	1-3
45	0-2

**Typical Physical Properties:**

Bulk Density (Loose)	0.85-1.05 t/m <sup>3</sup>
Glass Content	>95%
Angle of Repose	Approx. 35°

**Technical Services & Customer Enquiries:**

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