SlagCem AFRICA
BUILDING A STRONGER, GREENER AFRICA

GGBS

Ground Granulated Blast-furnace Slag (GGBS) a byproduct from ArcelorMittal's Vanderbijlpark operation and beneficiated at Afrimat's Randfontein grinding station.

While GGBS does not possess immediate hydraulic properties when mixed solely with water, its reactive potential is unlocked in the presence of a well proportioned cement or clinker.

Standard compliance

- GGBS produced as a ground powder conforms to SANS 55167 for GGBS utilisation in construction.
- The chemical composition also conforms to the requirements SANS 50197-1 & 5 as a input raw material for cement manufacturing.

Chemical composition & consistency

- GGBS is characterised by a chemical profile that closely aligns with cement clinker, though the specific ratios of its components are distinct.
- The material features intricate mineralogical structures that provide its unique properties.
- Because the iron manufacturing process and slag quality are intrinsically linked, the composition of our GGBS remains stable.

Primary applications

Readymix concrete

- GGBS is suitable for readymixed concrete production.
- It is frequently utilised as a supplementary cementitious material alongside traditional cement.
- Our logistics network delivers bulk slag via specialised tankers directly to plant silos.
- Typical 30% to 50% replacement of cement.

Mining sector

- In mining operations, GGBS serves as an effective binding agent for backfilling.
- It is particularly well-suited for room-and-pillar or cut-and-fill techniques.
- It provides a reliable solution for stabilising voids in scenarios where rapid early-stage strength gain is not the primary requirement.

Sulphate and Chloride resistance

- In aggressive environments 50% or higher replacements can be considered to protect against sulphate or chloride attack.
- Guidelines in Fulton's are recommended for South African conditions.

Third party cement manufacturers

- Assist with the reduction in cement and in activation of fly ash in CEM II, V and VI classes of cement.

Table: Physical characteristics & performance

Performance characteristic	Unit	Typical performance	SANS 55167 requirement
Relative density	g/ml	2.88	
Loose bulk density after consolidation	Kg/m^3	1000	
Compact bulk density	Kg/m^3	1200	
Fineness (Blaine)	cm^2/g	>3000	>2750
Absorption		Not hygroscopic	
Glass content	%	>85	>67
7D Reactivity	%	>50	>45
28D Reactivity	%	>75	>70

Table: Chemical characteristics

Chemical component		Value (%)
Silicon dioxide	SiO_2	33.51
Aluminium oxide	Al_2O_3	16.37
Calcium oxide	CaO	32.56
Iron oxide	Fe_2O_3	0.93
Magnesium oxide	MgO	8.60
Titanium dioxide	TiO_2	0.71
Manganese oxide	Mn_2O_3	1.48
Sodium oxide	Na_2O	0.37
Potassium oxide	K_2O	1.31
Sulfur oxide	SO_3	1.24