

# TECHNICAL INFORMATION

## GGBS

### Ground Granulated Blastfurnace Slag BS EN 15167-1

A ground granulated blastfurnace slag suitable for use in combination with Portland cement in concrete. Particular uses include:

- Concrete containing reactive aggregates.
- Large pours to reduce the risk of early-age thermal cracking.
- Concrete exposed to sulfates or aggressive ground.
- Concrete exposed to chlorides.

Ggbs is quality-assured ground granulated blastfurnace slag that conforms to BS EN 15167-1. It is suitable for use in mixer combinations with Portland cement as defined in BS 8500: Concrete - Complementary British Standard to BS EN 206.

### APPLICATIONS

Ggbs is normally combined with Portland cement in the concrete mixer. Guidance on the appropriate combination for different applications is available in BS 8500: Concrete - Complementary British Standard to BS EN 206 and from the contacts overleaf. Combinations of ggbs and Portland cement are recommended for many applications including:

- Large concrete pours: Combinations of Portland cement with high proportions of ggbs (typically around 70%) can significantly reduce the temperature rise in large concrete pours and hence reduce the risk of early-age thermal cracking
- Concrete exposed to the ground: BRE Special Digest 1: Concrete in aggressive ground, indicates that combinations of Portland cement with 66% or more of ggbs demonstrate comparable sulfate resistance to Sulfate Resisting Portland cement in practically all situations. Tarmac ggbs has an Alumina content of less than 14%, qualifying it for use in +SR combinations with all Portland cements.
- To improve the resistance of concrete to reinforcement corrosion when exposed to chlorides from sea-water or other sources.



- To minimise the risk of alkali-silica reaction in concrete: BS 8500 states that for combinations of Portland cement with >40% ggbs, the alkali content of the ggbs does not need to be taken into account when calculating the total alkali content of the concrete.

### PROPERTIES

- The properties of concrete containing ggbs combined with Portland cement will depend on the proportion of ggbs. When compared with Portland cement concrete at the same cement content, the following differences may be noticed:
  - Slower early strength development and potentially higher long-term strength.
  - Extended setting times, particularly in cold weather.
  - Improved workability retention.
  - Extra care is required with curing concrete in order to realise the full potential strength and durability of the concrete.
  - Lighter in colour. Freshly exposed concrete may exhibit a bluegreen tinge. This is not uncommon and will fade and disappear with exposure to the atmosphere, leaving the light colour associated with ggbs concrete. The original discolouration will not recur.

### AVAILABILITY

Ggbs is available in bulk in the UK. Details of availability can be obtained from the contacts listed on this page.

### TECHNICAL SUPPORT

Further information or specification advice on ggbs and the full range of Tarmac cements can be obtained through the contacts listed on this page.

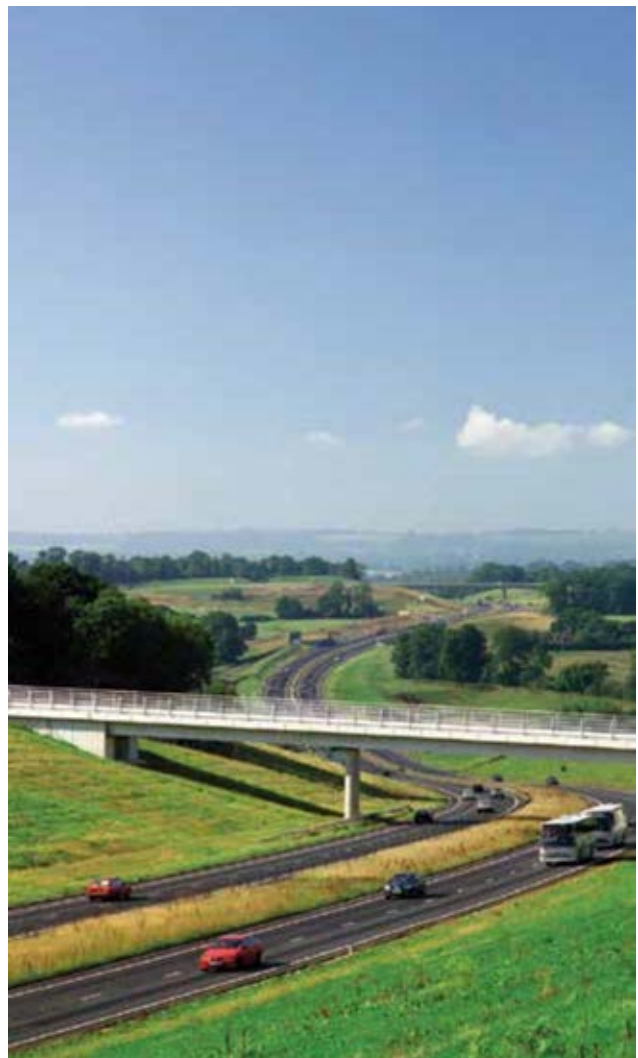
### HEALTH AND SAFETY

Direct contact with ggbs may cause irritation of eyes, skin or the respiratory system. When mixed with water the resultant liquid will be alkaline.

For further information, including control of soluble hexavalent chromium, refer to the appropriate Tarmac Cement Health and Safety Information Sheets.

### DESIGNATION OF MIXER COMBINATIONS

BS 8500 Designation	Proportion of ggbs (%)	Equivalent Cement
CII/A-S	6-20	BS EN 197-1
CII/B-S	21-35	BS EN 197-1
CIII/A	36-65	BS EN 197-1 CEM III/A
CIII/B	66-80	BS EN 197-1 CEM III/B



#### For further information

**Technical helpdesk**

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**Customer services & sales**

**Tel: 0845 812 6300**

**E-mail: [customerservice@tarmac.com](mailto:customerservice@tarmac.com)**

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