

Heidelberg Materials evoBuild low carbon GGBS

Technical data sheet

Heidelberg Materials evoBuild low carbon Ground Granulated Blastfurnace Slag (GGBS) is manufactured to comply with the requirements of BS EN 15167. evoBuild low carbon GGBS is a Type II addition which is manufactured from slag, a by-product of the iron-making industry. evoBuild low carbon GGBS helps reduce embodied CO₂ and increases durability of concrete.

Heidelberg Materials evoBuild low carbon GGBS is suitable for use in concrete, mortar and grouting applications. Examples of applications are ready mixed concrete, soil stabilisation, mortar, precast concrete, paving, street furniture and other specialist applications.

Quality

- Heidelberg Materials evoBuild low carbon GGBS is produced using carefully selected raw materials. Strict quality control throughout the manufacturing process ensures that a consistent final product is achieved.
- Heidelberg Materials evoBuild low carbon GGBS is UKCA marked in accordance with the Construction Products Regulation (Amendment etc.) (EU Exit) Regulations 2020, which provides independent third-party certification of product conformity. Individual declarations of Performance for the products of each of the three production sites can be found at www.heidelbergmaterials.co.uk
- Continual statistical quality control of evoBuild low carbon GGBS is based on the testing of autocontrol samples taken regularly at each of the GGBS manufacturing works.
- Heidelberg Materials evoBuild low carbon GGBS is suitable for use in combination with cements such as CEM I and CEM II/A-LL and a wide range of additives or admixtures can be used to extend or enhance the properties and uses of concretes and grouts.

Data and certification

Heidelberg Materials Technical Services provide current data and routine certification of test results for all essential characteristics including compressive strength of mortar prisms, fineness, setting times, soundness, and chemical composition. These certificates are available online at www.heidelbergmaterials.co.uk.

Setting and strength

Heidelberg Materials evoBuild low carbon GGBS is a latent hydraulic binder which requires the alkali environment provided by cement when water is added to the mix for its activation. A slower reaction results in an extended setting time and lower compressive strength at 1, 3, and 7 days but typically can achieve parity at 50% replacement levels when compared to an equivalent CEM I concrete.

It is recommended that trial mixes are carried out to determine optimum proportions whilst adhering to the requirements of BS EN 206 and BS 8500 to ensure that correct maximum replacement levels are used for the appropriate design chemical class, exposure condition and strength requirement.

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Setting and strength continued

Optimum performance in terms of strength and durability is achieved in concrete when the water/cement ratio is kept as low as possible, together with ensuring satisfactory placing and thorough compaction. Other factors affecting strength include conditions of curing as well as the individual properties of the constituent materials and their proportions in the mix.

In hot weather and mass concrete pours evoBuild low carbon GGBS reduces the heat of hydration helping to reduce the occurrence of early age thermal cracking if good practices are followed.

Environmental Performance

Heidelberg Materials UK has an Environmental Product Declaration available (EPD) for its cement replacement product www.heidelbergmaterials.co.uk

Heidelberg Materials UK evoBUILD Low Carbon GGBS remains the best available cement replacement for delivering carbon reduction with a Global Warming Potential (GWP) figure of 155 kg CO₂e/t.

Concrete mix design

Concrete mix designs need to be adapted to suit individual circumstances. It is strongly recommended that trial mixes are carried out prior to commencement of work to ensure that the mix design and material combinations meet the requirements of the specification and method of use.

Please refer to current standards and recommendations for the manufacture of concretes, mortars and grouts.

The general principles of concrete mix design using Heidelberg Materials evoBuild low carbon GGBS are similar to those when using CEM I cement only. However, some modifications to mix design may be helpful to achieve the full benefit of its properties.

While the chemical resistance of products incorporating Heidelberg Materials evoBuild low carbon GGBS is enhanced, the same general considerations for a CEM I mix to achieve good durability still apply, i.e. water/cement ratio, total cementitious powder content, supplementary additions like Silica Fume, compaction and curing.

Curing methods

The term curing refers to methods to prevent loss of moisture from exposed surfaces of concrete in the first seven days after casting. The following are the most common methods:

- Covering with impermeable sheeting ensuring that the edges are held down
- Covering with wet sacking (this must be kept wet by spraying with clean water)
- Ponding with clean water
- Spraying with a proprietary curing membrane preferably pigmented to ensure full coverage.

Admixtures

Admixtures such as air-entraining agents and workability aids are compatible with Heidelberg Materials evoBuild low carbon GGBS and cement, although reference should be made to BS 8500. It is recommended that trial mixes are carried out to verify performance of any admixtures.

Availability

Heidelberg Materials evoBuild low carbon GGBS is available nationwide, with production sites at Purfleet, Port Talbot, and Teesside along with distribution depots at Glasgow and Teignmouth.

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Conditions of use

- Methods to prevent loss of moisture from exposed surfaces of concrete, known as curing, should be employed for at least the first seven days after casting.
- As a general rule, concrete should be placed within the range of 5°C to 30°C.
- In cold weather, freshly poured concrete should be protected against frost to avoid damage.
- In hot weather and mass concrete pours there is increased risk of loss of water by evaporation, cracking caused by thermal stresses and reduced ultimate strength.
- Heidelberg Materials UK cannot be held responsible for poor workmanship.
- Although a lighter colour will be produced with the use of GGBS, due to the nature of raw materials colour cannot be guaranteed

Health and safety

Cementitious materials cause skin, eye and respiratory irritation, severe burns and dermatitis. Always wear suitable personal protective equipment (PPE) and refer to the full Material Safety Data Sheet for further information.

Technical support and further information

Please refer to the Material Safety Data Sheet for full health and safety information.

For further advice please contact Heidelberg Materials cement technical support on **0330 123 4525** or **cement@uk.heidelbergmaterials.com**

Further copies of this technical data sheet may be obtained from www.heidelbergmaterials.co.uk