



Key benefits/features™

Heidelberg Materials Slag Cement conforms to ASTM C989/AASHTO M 302 standard specifications for "Slag Cement as a Constituent in Concrete and Mortars" and CSA A3001 "Cementitious Material for Use in Concrete." Slag has cementitious properties similar to portland cement. It is typically used with portland cement at dosages between 25–80 percent, depending on the engineering parameters. The primary raw material of slag cement is a byproduct from the iron blast furnace process. It is a recycled, environmentally friendly product.

Heidelberg Materials Slag Cement is featured in a wide range of concrete and geotechnical applications including: ready mixed concrete, pre-cast, tilt-up, bridges, pavements, subbase, pre-stressed concrete members, concrete masonry units, architectural and concrete products, soil stabilization and solidification. Most standard specifications allow for the use of slag cement, including the FAA, USACE, individual state DOTs and Canada National Build Code and provincial transportation ministries. Contact local specifying agencies or a Heidelberg Materials Cement Company representative for details.

► Properties and Advantages

Heidelberg Materials Slag Cement and portland cement are both hydraulic cements that harden by chemically reacting with water to produce calcium-silicate hydrates (CSH), the primary binding agent in concrete.

Heidelberg Materials Slag Cement reduces excess calcium hydroxide $[Ca(OH)_2]$ by producing more CSH. Properly proportioned concrete mixtures made with Heidelberg Materials Slag Cement and portland cement exhibit higher strengths (flexural and compressive), reduced permeability and increased durability compared to portland cement concrete mixes.

Heidelberg Materials Slag Cement does not affect air entrainment and improves slump retention in properly engineered concrete mixes. It is often used in mass concrete, at high replacement levels, to control heat of hydration. It can also be used to control ASR, sulfate and chemical attacks.

The lighter color of concrete containing Heidelberg Materials Slag Cement leads to improved solar reflectivity designed to lower the urban heat island effect.

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Heidelberg Materials Slag Cement concretes may be proportioned by the same methods as portland cement concretes. When developing and/or selecting a concrete mixture, make certain that it meets the job requirements and applicable documents.

Optimum dosage rates may vary with the application, specific material, and other placing conditions. Concrete producers find two or three general-purpose mixes with Heidelberg Materials Slag Cement usually cover a variety of needs. Sometimes higher dosages of slag cement are required, especially in marine environments or mass concretes, when reducing either permeability or heat hydration is important.

The fresh and hardened properties of slag cement concrete may vary with different materials, placing conditions and finishing practices. Trial batches should be made to determine the concrete capabilities for a specific situation. This also helps in evaluating and selecting the appropriate dosage rate needed for the application. Typical rates of slag in concrete in the U.S. are between 35% and 50% slag. Mixtures with a slag content of 35% or greater have a significantly lower environmental footprint.

All concrete should be mixed thoroughly until it is uniform in appearance and all ingredients are evenly distributed. The same factors affect the set time of concretes made with slag cement as with ordinary portland cement. Generally, the higher the slag cement dosage, the slower the set time. This provides some advantages during hot weather concreting. Retarding admixtures and cold weather tend to slow set times for slag cement concretes. In addition, early strength with slag mixes can be improved by lowering w/c ratio, increasing total cementitious or using an accelerating admixture. As with all concrete, best placing and finishing practices must be followed.

Heidelberg Materials Slag Cement is typically white. Generally, higher dosage rates in a mix design will provide a lighter, cooler,

