The CO_2 generated during the production of cement is reduced by more than 40%.

Granulated blast furnace slag for portland blast furnace slag cement

Features

- By reducing the limestone and fuel used for the production of cement, the CO_2 generation is reduced by 320 Kg per 1 ton of cement.
- Portland blast furnace slag cement features excellent durability, with greatly enhanced long-term strength and less chloride migration.
- Portland blast furnace slag cement suppresses alkali-aggregate reactivity and can be used with recycled aggregates.

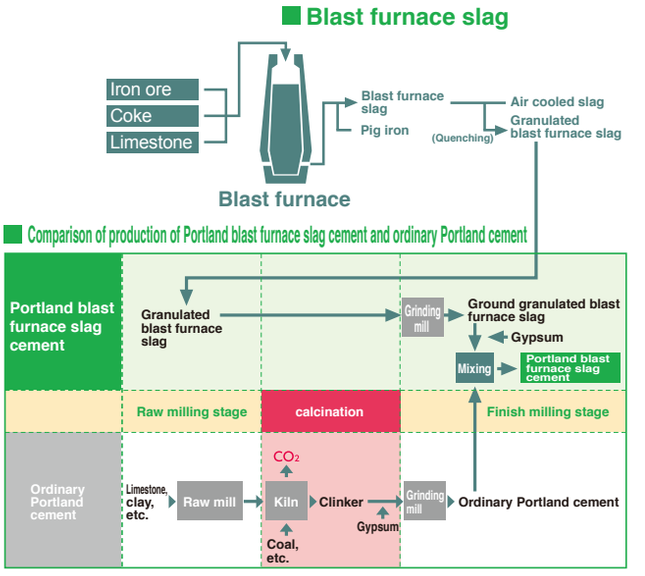
Overview (Technical principles, actions, etc.)

Ground granulated blast furnace slag is made by grinding granulated blast furnace slag, a byproduct of pig iron manufacturing, and features a high latent hydraulic property. Taking advantage of the property, ground granulated blast furnace slag is used as an admixture in Portland blast furnace slag cement at 40 to 45%. The slag can also be added to ordinary Portland cement at 5%, or used as an admixture in concrete products. By using the slag, the limestone and coal used in the production of ordinary Portland cement are reduced, and the CO_2 emitted by the decarboxylation of limestone or the incineration of coal is also reduced.

Introductory Track Record

The high-quality granulated blast furnace slag made in Japan has been used in the countries listed below.
South Korea, Taiwan, Vietnam, Thailand, Singapore, Malaysia, the Philippines, Bangladesh, Kuwait, Qatar, Saudi Arabia, UAE, USA, Columbia, Peru, Chile, Brazil, Ivory Coast, Kenya, Tanzania, Mozambique, Australia, etc.

Blast furnace slag and Portland blast furnace slag cement



Ground granulated blast furnace slag does not require calcination.

CO_2 emissions per 1 ton of cement (unit: kg)

CO_2 emissions source	Portland cement (i) CO_2 emissions	Blast furnace cement (ii) CO_2 emissions	Reduced CO_2 emissions (i) – (ii)	Reduction rate of CO_2 emissions (%)
Limestone	468	268	200	43
Electric power/energy	296	176	120	41
Total	764	444	320	42

(Data released in 2013)

The annual reduction of CO_2 emissions by portland blast furnace slag cement production in Japan is approximately 4,000,000 tons.

Types of blast furnace cement	JIS R 5211	Slag content	
	Type A	5~30%	Generally, the slag content for commercially available blast furnace cement is 40 to 45%.
	Type B	30~60%	
	Type C	60~70%	Low heat blast furnace cement is also commercially available.

Effects

Portland blast furnace slag cement has the following advantages over ordinary Portland cement:
(i) The long-term strength is more enhanced.
(ii) The higher resistance to seawater/chemicals and the smaller diffusion coefficient of chloride ions make the cement suitable for offshore structures.
(iii) Alkali-aggregate reactivity is suppressed and the cement can be used with recycled aggregates.
(iv) The lower heat release rate suppresses thermal cracking effectively.
(v) When used in soil stabilization, hexavalent chromium is suppressed effectively.

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