Slag is by-product from steel plant, which is obtained from blast furnace, during the separation of iron from iron ore. The process of granulating of the slag involves, cooling of molten slag through high-pressure water jets. This rapidly quenches the slag and forms granular particles. The resulting granular material comprises around 95%, non-crystalline calcium-alumino silicates. The granulat-ed slag is further processed by drying and then grinding in a vertical roller mill or rotating ball mill or roller press to a very fine powder, which is called GGBS. It conforms to BS 6699 & IS 12089.

ABOUT JSW Cement

JSW Cement is India's leading 'Green Cement' manufacturer and is part of the JSW Group. We have a strong commitment towards innovation in sustainability & technology to offer eco-friendly construction & building solutions to our customers. Growing exponentially since our inception in 2009, we have reached a production capacity of 19 MTPA (Million Tonnes Per Annum).

We envision a self-reliant India by boosting our colossal infrastructure and fast-growing economy through benchmark projects.

We cater to 11 major states in India across the eastern, western, and southern parts of the country.

JSW Cement emerged in the market as a leader in environmentally friendly product Pozzolona Slag Cement (PSC). Since then, we have expanded our cement range to Concreel HD (CHD), Comp Cem (Composite Cement – PCC)

JSW Cement also extends its services through its construction products in categories like and Ground Granulated Blast Furnace Slag (GGBS) and Slag Sand for the use in concrete and other civil works. The latest introduction to this is the wide range of Construction Chemical products such as Tile Adhesive, Grout & Cleaner, Precision Steel Grouts, Mortar and Waterproofing Range

JSW is now being recognized as a holistic group for construction with Steel, Cement, Paints, and Construction Chemicals foray to the Indian market.

ADVANTAGES OF GGBS

Green product

Incomparable long-term strength

Longer Llife

Resistant to chemical attack

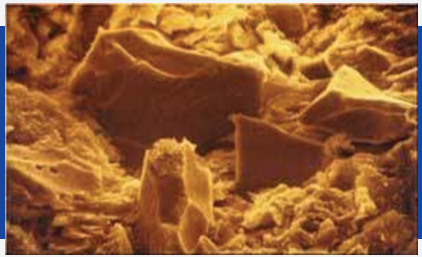
Less heat of hydration & reduced thermal cracks

COLLECTED SLAG

CONVERTED TO GGBS AT THE MILL

MIXED WITH CEMENT TO INCREASE DURABILITY

CHEMICAL COMPOSITION OF GGBS



Microscopic examination reveals the glassy nature of GGBS particles.
Ground granulated blast furnace slag consists essentially of silicates and alumino silicate of lime.

GGBS A SUSTAINABLE MATERIAL FOR GREEN BUILDING CONSTRUCTION

Replacing the Portland cement by GGBS helps in reducing CO_2 emissions and in conserving non-renewable resources of lime stone. Use of GGBS in concrete is recognized by LEED (Leadership in Energy and Environmental Design), CII (Confederation of Indian Industry), IGBC (Indian Green Building Council) and adds points towards certification of a structure as green building.

ADVANTAGES OF GGBS

- Reduced thermal cracks due to lower heat of hydration
- Reduced shrinkage cracks
- Improved workability and smooth finish
- Improved cohesion
- Better resistance against chemicals, such as chlorides, sulphates and carbon dioxide
- Higher long term strength
- Higher flexural strength
- Improved durability
- Concrete made with GGBS has particle packing due to particle shape and improved hydration

USE OF GGBS IN COSTAL REGION

Where chloride is encountered with sulphate in soil or ground water, IS 456 recommends usages of cement with GGBS for stronger and durable construction.

COMPARISON OF GGBS V/S FLYASH*

GGBS	FLYASH
Uniform composition depending on a particular source.	Composition varies from source to source.
Chemical composition is very similar to OPC/clinker.	Most of the Chemical composition not similar to OPC/clinker.
Has got both Hydraulic and pozzolonic property	Has got negligible Hydraulic and only pozzolonic property
It is highly reactive when it is mixed with OPC.	It is moderately reactive when mixed with OPC.
Normally being replaced with 50% and up to 70% in special applications.	It can be replaced between 20 % to 30%.

Observations based on internal plant test data

COUNTRIES USING SLAG WORLD OVER

USA | Europe | China | India | Australia | Japan

INDIAN PROJECTS USING SLAG BASED PRODUCTS

- Lodha world one- Mumbai
- Sardar sarovar Narmada Nigam Dam – Navagam, Gujrat
- LNG Petronet, Dahej, Gujrat
- Naval Dockyard & jetty Project – Colaba, Mumbai

GLOBAL PROJECTS USING SLAG BASED PRODUCTS

- Burj Khalifa, Dubai
- King Fahd Causeway-Saudi Arabia
- Atlantic Ocean Road, Norway
- Charleston Canal Bridge Louisiana

CONCLUSION

GGBS blended concrete has been used successfully in concrete for many years, in many countries throughout the world. From all the available technical literature it is suggested that, there are potentially many technical benefits to be gained from using GGBS. When structures have to be designed for durability requirements in very aggressive environment, GGBS blend mixes are recommended in standards of most developed and developing countries. Many countries have accepted the benefits and have recommended its use in their national standards. Once the user is made aware of the properties of the material and has understood the benefits to be gained, there is no reason why it should not continue to be used successfully in existing and future projects.