

PSC is more stable than PPC

- BF Slag is the by-product from controlled process of Iron Production, which results in a very uniform composition from source. Where as quality of Fly Ash collected from ESP's varied widely.
- GGBS is made by using the state-of-art Vertical Rollar Grinding Mill (VRM), the fineness and micro structure can be controlled, and therefore consistent quality is attainable.
- In addition to pozzolanic reaction, Slag reacts with water and produces C-S-H from its available supply of calcium oxide and Silica.

Where PSC can be used?

- All types of residential, commercial and industrial complexes.
- Dams and other mass concrete works.
- Water retaining structures.
- Concrete roads & flyovers.
- All civil structural works.
- Ideal for use in marine constructions.
- Pre-cast concrete products.
- Foundations and piles construction.
- Increased flexibility to meet individual requirements in RMC.

PSC - Sustainable Material

- Replacing the Portland cement by Slag helps in reducing CO₂ emissions and conserving non-renewable resources of lime stone.
- Use of Slag in concrete is recognised by LEED (Leadership in Energy and Environmental Design) and add points towards its certification.
- The high volume Slag concrete system is environment friendly and the concrete so produced also demonstrates the attributes of high performance concrete (HPC).

JSW Cement Limited

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Principle Oxides

Oxides		Fly Ash
CaO	40%	<2%
SiO ₂	35%	52%
Al ₂ O ₃	16%	30%
MgO	8%	<1%
Fe ₂ O ₃	0.5%	6%



Eastern Scheldt Barrier , built with blast furnace slag cement with a design service life of 200 years



King Fahad Causeway (Saudi Arabia-Bahrain Causeway)



Thermal power project , Chennai



Mumbai's Bandra Worli sea link

JSW Cement

Pao Mazbooti Zindagi Bhar ki

Portland Slag Cement (PSC)

Most Sustainable building material



Toll Free No: 1800 266 266 1

Banao Pyaar Se

JSW Group - A Unity in Diversity

JSW Cement is the new diversification of JSW Group, a part of USD 16 billion O.P Jindal Group. The group has grown into USD 11 billion conglomerate with interests across various core economic sectors- steel, Energy, Cement, Natural Resources, Maritime infrastructure and IT. It has plants located in various parts of the world.



JSW has an integrated cement plant at Bilakalguduru near Nandyal in Andhra Pradesh and a grinding unit at Thoranagallu near Bellary in Karnataka. The total installed capacity of JSW Cement Limited is 6 million MT per annum. JSW Cement offers eco friendly products such as Portland slag Cement (PSC), Ground Granulated Blasts furnace Slag (GGBS) and Granulated Blast Furnace Slag (GBS) to promote Sustainable construction. Apart from these eco friendly products, JSW Cement also offers ordinary Portland cement (OPC).



A Comparison with 43 Grade OPC

	Particulars	Properties of JSW PSC	Requirement of IS 455-PSC	Requirement of IS 8112-OPC43
	Physical Requirement			
1	Fineness M2/Kg	360-370	225 Min	225 Min
2	Setting Time (Minutes)			
a	Intital	170-190	30 Min	30 Min
b	Final	250-280	600 Max	600 Max
3	Soundness			
a	Le-Chat Expansion (mm)	0 - 1	10 Max	10 Max
b	Auto Clave (%)	0.3 - 0.07	0.8 Max	0.8 Max
4	Compressive Strength (Mpa)			
a	72+/- 1 hr	23 - 25	16.0 Min	23.0 Min
b	168+/- 2 hr	24 - 36	22.0 Min	33.0 Min
c	672+/- 4 hr	58 - 60	33.0 Min	43 - 58



Concrete with Slag has higher proportion of the strength enhancing Calcium Silicate Hydrates (C-S-H) than concrete made with portland cement.

Concrete made with Slag continues to gain strength and double its compressive strength over a period of time.

What is PSC?

PSC - Portland Slag Cement is a blended cement.

At JSW cement, we use superior quality Slag produced from our steel plant which conform to IS:12089 to produce PSC. Slag is a non metallic product consisting essentially of glass containing silicates and Alumino silicates of lime.

The slag contains more than 90% glass.

Enhanced Durability

Alkalis are consumed in the concrete with Slag during hydration process thus reducing Alkali Silica Reaction (ASR)

Improved resistance to Sulphate attack due to reduction of Ca (OH)₂ and lower C₃A content

Due to reduced diffusion of Chloride ions, resistance to corrosion is improved



Engineering Properties

The total shrinkage of concrete containing Slag was lower than 100% Portland cement.

Concrete made with Slag generally exhibit higher flexural strength for a given level of compressive strength.

Structural stiffness can be enhanced and load deflections minimised.

PSC holds promise for the future



Applications of PSC

Slag is used to make durable concrete structures in combination with Ordinary Portland Cement and/or other pozzolanic materials. To improve the durability of structures, usage of Slag along with OPC in concrete is recommended in BS 6699:1986, ASTM C989:1982, IS 456:2000 and Slag to OPC in the range of 25-70% shall be added to manufacture Portland Slag Cement as IS 455:1989.

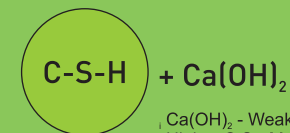
PSC- Advantages

- Reduction in heat of hydration and minimization of thermal cracks.
- Permeability and surplus lime liberated during the hydration of Portland cement are the root causes for deleterious effect on the concrete.
- Absorption of surplus lime released out of OPC to form in to secondary hydrated mineralogy.
- Pore refinement and grain refinement due to secondary hydrated mineralogy, thus contributing for impermeability and enrichment of Transition zones.
- Impermeability is the foremost mechanism for making the concrete more durable and is best achieved by using Slag cement.
- Since the specific gravity of PSC is less than OPC, more construction area can be covered per unit of cement consumption.
- IS 456:2000 recommends addition of more than 50% slag where chloride is encountered along with Sulphates in place of SRC.

Mechanism of Cement Hydration

OPC-43/53

+ WATER



Ca(OH)₂ - Weakest component
 Higher C₃S - More Ca (OH)₂
 C₃S Produce - 61 % CSH + 39% CH
 C₂S Produce - 82 % CSH + 18% CH
 Highly Early Strength - High C₃S
 High C₃S - High heat of Hydration

PSC + WATER

