P4246 and P4246S

High performance Eco-Friendly Cement – *Complying with SS EN 197-1: 2014*

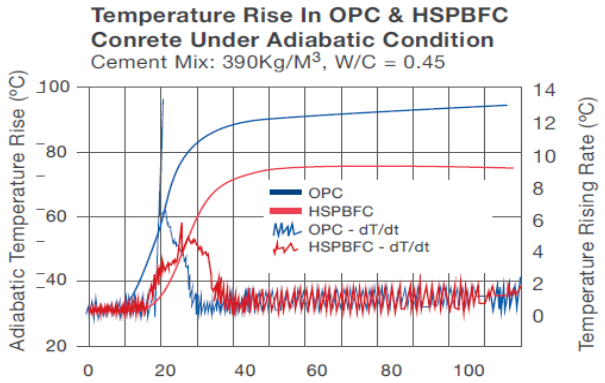
Our high performance cement P4246 & P4246S, high slag blastfurnace cement (HSPBFC), a homogenous blend of ordinary portland cement (OPC) and ground granulated blastfurnace slag (GGBS) complying with SS EN 197-1 are well-established in producing durable concrete for the construction industry's stringent requirements. Our quality cement is designed to ensure consistent slag content and to enhance concrete performance.

Granulated blastfurnace slag is a co-product, which is specially prepared via rapid quenching from the iron manufacturing process and is carefully grounded using state-of-the-art grinding process with sophisticated high-pressure roller press and high performance multi-stage classifiers. GGBS has been widely used in Europe, the United States and also in Asia, particularly Japan and Singapore for its superiority in improving concrete durability and extending the service life of concrete.

BENEFITS OF HSPBFC

ONE: REDUCE THERMAL CRACKING

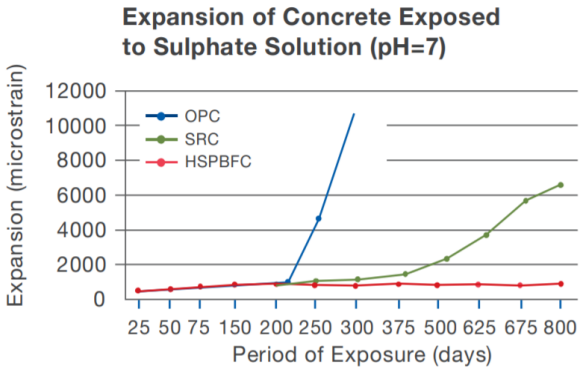
Presence of GGBS in the HSPBFC concrete evolves less heat, does not develop heat rapidly and has lower peak temperature than OPC. The reduction in the critical temperature differential can minimise the risk of early-age thermal cracking especially in the mass concreting.



TWO: RESISTANCE TO SULPHATE ATTACK

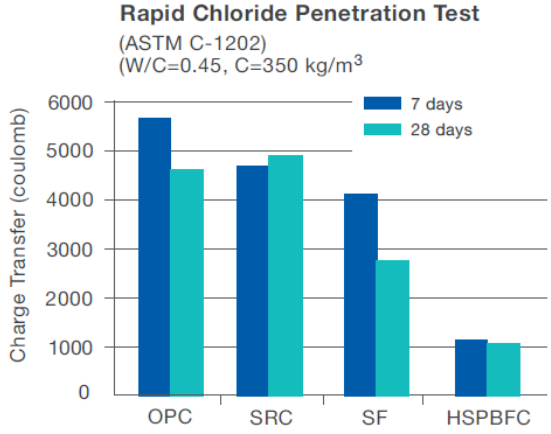
Sulphate in ground water can attack concrete, in particular the tri-calcium to aluminate hydrates, which in turn causes expansion and subsequent cracks and disintegration in the concrete.

Presence of GGBS in the HSPBFC concrete reduces the total alumina compounds in the cement and the calcium hydroxide in the concrete, which are elements conducive for sulphate attacks. In additions, the use of GGBS lends to significant reduction of permeability in HSPBFC concrete and thus minimizes the penetration of sulphates.



THREE: RESISTANCE TO CHLORIDE ATTACK

The steel reinforcements in concrete is protected against corrosion by alkalinity of hardened cement paste. In a marine and other salt-laden environment, significant amount of chloride is present. The ingress of chlorides reduces the important protection layers of rebars and in the presence of oxygen and moisture, corrosion takes place easily. Presence of GGBS in the HSPBFC concrete provides more residence to chloride diffusion than OPC concrete and sulphate-resisting cement (SRC), concrete; both are highly permeable and offer low resistance to chloride attack.



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022-003-0207
Eco Friendly Building Material

P4246 and P4246S

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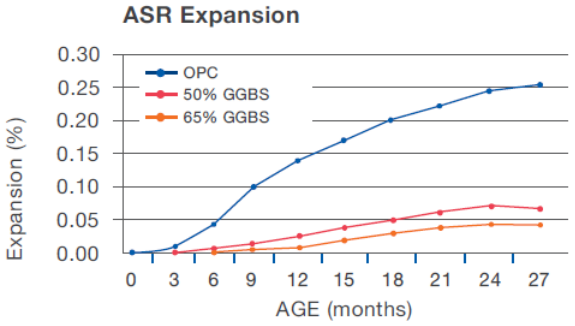
FOUR: RESISTANCE TO ALKALI-SILICA REACTION

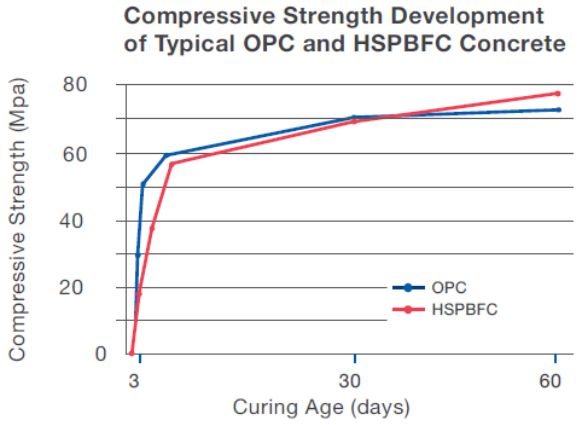
The alkali-silica reaction (ASR) occurs between the alkalis of cement and certain types of reactive silica present in some aggregates to form gel. In moist conditions, this gel absorbs water and increases in volume. As a result, the gel generates sufficient internal pressure to cause expansion and cracking in concrete.

Presence of GGBS in the HSPBFC concrete is widely accepted as an effective way of minimising the risk of ASR, it reduces the total content of alkalis in the cement and increases the compactness of hardened cement paste thus preventing reaction between alkalis and reactive aggregates.



FIVE: LONG TERM STRENGTH DEVELOPMENT

In general, HSPBFC concrete has low early strength as compared to OPC. Good quality and properly cured HSPBFC concrete overtakes OPC concrete strength after 28 days.



The correct fineness of the OPC and GGBS particles is necessary for the concrete strength development.

SIX: OTHER BENEFITS

HSPBFC possesses other features such as good workability, prolonged slump retention, higher ultimate compressive strength and higher flexural strength. The more aesthetically pleasing appearance of lighter colour in HSPBFC concrete can soften the visual impact of large structures. HSPBFC gives a higher volume in concrete as compared to OPC with the same content. (S.G. of HSPBFC: 2.96 vs 3.15 S.G. of OPC)

TYPICAL USES OF HSPBFC

With the superior characteristics over OPC and SRC, HSPBFC is highly recommended for use in the following areas

- Basement or sub-structure works
- Marine Structures
- Dams, reservoirs and hydroelectric projects
- Sewerage treatment plant
- Underground precast / in-situ placing concrete structures such as tunnels
- Foundation such as piles in soils containing sulphates/chlorides
- Bigger concrete structure such as transfer beams
- Precast sewerage pipes

RECOMMENDED

GGBS / CEMENT CONTENT FOR USES IN PBFC CONCRETE

Products (GGBS content, %)		Recommended replacement level of GGBS in HSPBFC Concrete (%)
P4246 (60-65)	**P4246S** (70-75)	**Sulphate / Chloride Resistance** ≥ 65
P4246 (60-65)	**P4246S** (70-75)	**Low Heat of Hydration** 60-75
P4246 (60-65)	**P4246S** (70-75)	**ASR Resistance** 50-70

STORAGE

P4246 & P4246S are sensitive to moisture and should be stored in a dry place. The products may be stored for up to 12 months with proper storage and protected from moisture.

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