

Hyper-HR for Mass Concrete

Overview

- Hyper-HR* is an advanced heat-sensible chemical agent that consists of phase change material (PCM) and other compounds (hydration heat reduction compound, stabilization compound, etc.) which have latent heat characteristics for the efficient control of cement hydration heat (or concrete hydration temperature).
- As its heat absorption capacity is high, and its mixing efficiency during concrete manufacturing is excellent, it can efficiently control concrete hydration temperature. In addition, as its alkalinity is high (\geq pH 12), it does not affect concrete quality before or after hardening.

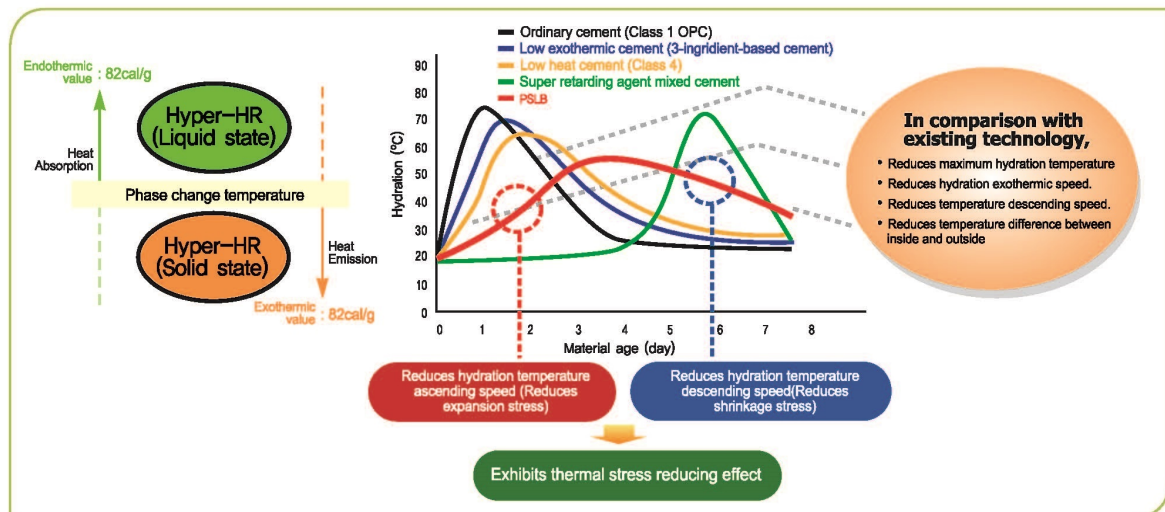
*Hyper-HR : High Performance Hydration heat Reducing agent



High-performance
Hydration Heat
Reducing Agent
(Hyper-HR)

Hydration Temperature Control Mechanism

- PCM, which is a major compound of Hyper-HR, has the characteristics of absorbing or emitting a large amount of heat reversibly through the phase change process of solid phase \leftrightarrow liquid phase.
- Based on such characteristics, it can effectively compensate for thermal stress, which is applied to concrete, by efficient control of the ascending and descending speed of concrete hydration temperature.



PSLB for Mass Concrete

Overview

- PSLB* is an ultra-low heat binder for mass concrete produced through a premixing process in which a 3-ingredient-based binder, which consists of cement (30~60wt%), fine particles of blast furnace slag (30~50wt%), and fly ash (10~30wt%), is mixed with a certain percentage of Hyper-HR.

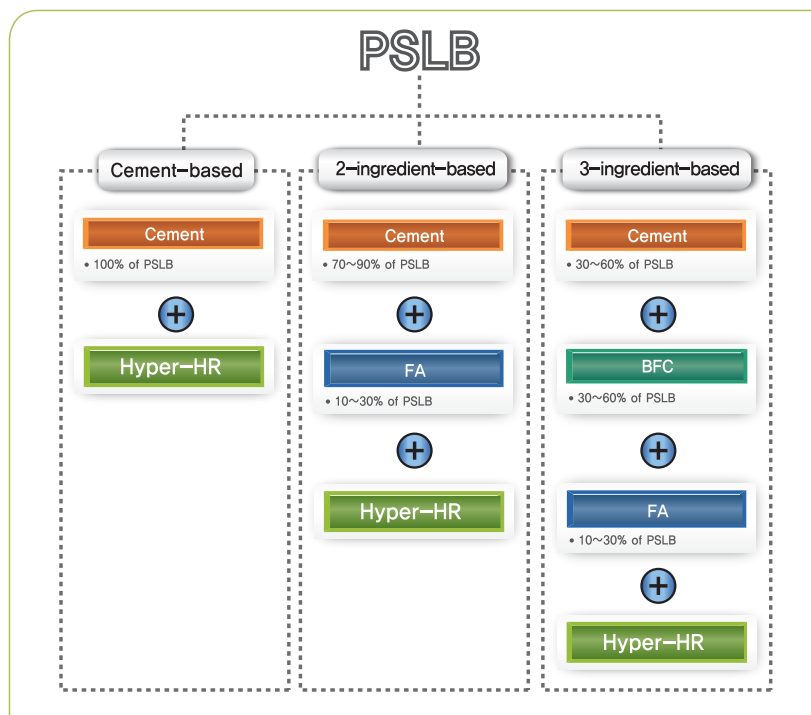
* PSLB : Premixed Substance of Latent heat Binder



PSLB

Material Composition

- It is possible to produce PSLB by mixing a certain percentage of Hyper-HR with 3-ingredient-based binder, which consists of Class 1 cement (OPC), fine particles of blast furnace slag (BFS), and fly ash (FA); or cement-based binder, which contains cement only; or 2-ingredient-based binder, which consists of cement and FA (or cement and BFS).
- Types of binder, composition ratio, and mixing percentage of Hyper-HR are subject to slight changes according to size of mass member, quantity of unit binder, level of hydration temperature control, placement method, construction condition, etc.



Major Performances

- Reduces maximum concrete hydration temperature. ————— Secures thermal crack resistance. [Increases thermal crack index]
- Controls ascending/descending speed of concrete hydration temperature.
- Improves salt damage and shrinkage resistance. (In the case of high-strength mass structure, self-contraction resistance is excellent.)
- Secures ease of construction through the whole placement of large mass concrete structure.

Major Usage

- Expressways, national highways, long-span bridges, subways, harbors, waterworks, light rails, water filtration plants, LNG tanks, power plants, railways, breakwaters, dam structures, and other civil engineering structures.
- Other large mass concrete structures for construction or civil engineering works.

Technical Certification Achievements

Category	Performance	Certificate/Registration No	Relevant Enterprise
New Technology Certification	Construction New Technology (NeT) by the Ministry of Land, Transport and Maritime Affairs	546	Daelim Industrial Co., Ltd., Kyeryong Construction and Industrial Co., Ltd., Tripod Co., Ltd.
Intellectual Property Right Registration	Domestic Patent Registration	10-0766803 10-0796534 10-0802988	
	Foreign Patent Registration	2013112100077010	
Agreement	Signed contract with Korea Water Resources Corporation (K-water) on a turn-key use	-	Hanil Cement Co., Ltd., Tongyang Cement & Energy Corp.
	Signed contract on the use of the Construction New Technology No. 546.	-	
Awards	Won the silver prize in the K-water 2012 New Technology Competition	12-133	Tripod Co., Ltd.
	Won the Technology Award of the Korea Concrete Institute	-	Tripod Co., Ltd.