MAPEI

Dynamon SP3

Superplasticizer based on acrylic modified polymer for precast concrete with low water/cement ratio and very high mechanical strengths at early age in winter time, without steam curing

DESCRIPTION

Dynamon SP3 is an admixture based on acrylic modified polymer specially designed for the precast concrete industry, belonging to the new revolutionary MAPEI **Dynamon SP** system.

The **Dynamon SP** system is based on the DPP (Designed Performance Polymer) technology, a new chemical process that can model the admixture's properties in relation to the specific performances required for concrete. This process is developed by means of a complete design and production of monomers (an exclusive MAPEI know-how).

WHERE TO USE

The precast concrete with **Dynamon SP3** has a high level of workability (consistency class S_4 or S_5, according to UNI EN 206-1), and is consequently easy to apply when fresh. At the same time it offers excellent mechanical performances when hardened.

Dynamon SP3 is clearly an admixture with superior performances in comparison with traditional naphthalene-sulphonate or melamine-sulphonate based superplasticizers and first generation acrylic admixtures in terms of water reduction and increase of strength at early ages.

Dynamon SP3 is especially suitable for precast concrete and wherever there is the need for a strong water reduction, along with relatively high mechanical strengths at early ages in different consistency classes.

The real news is that by using **Dynamon SP3** it is possible to completely eliminate the accelerated steam curing treatment, even at very low external temperatures.
As a matter of fact it is at the lowest temperatures (< 10°C) that **Dynamon SP3** promotes the mechanical strengths increase. It is thus possible to maintain a natural curing, also during winter and in any place. The advantages of this news consists in the reduction of the steam costs and in an improved use of the concrete caused by the elimination of the thermal treatment. This, as it is commonly known, could damage the internal micro structure of the concrete and reduce both the long term mechanical properties and the durability.

Its performances make it particularly suitable for manufacturing self compacting concrete since **Dynamon SP3** can ensure high workability and at the same time does not significantly slow down the development of mechanical strengths at early ages.
For self compacting concrete it is necessary to

Dynamon SP3

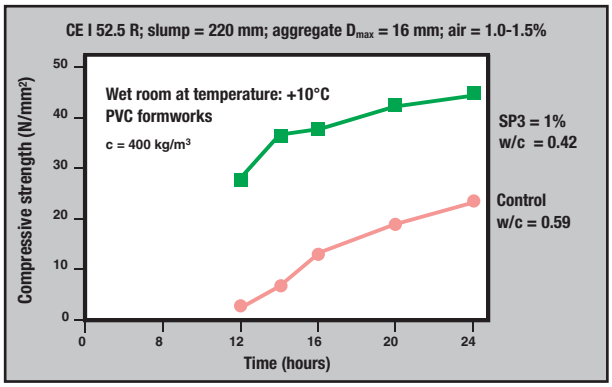

Figure 1 - ***Development of compressive strength at a temperature of +10°C from 12 hours to 1 day, for a reference concrete and for a concrete prepared with Dynamon SP3 at 1% of the cement volume.***

use **Viscofluid SCC**, a viscosity modifier admixture with **Dynamon SP3** in order to avoid the risk of segregation and ensure the mixture's homogeneity even with a very high slump-flow.

The main applications of **Dynamon SP2** for concrete are as follows:

- concrete for manufacturing precast reinforced beams with a high level of workability and a minimum compressive strength, R_{ckj}, to cut the prestressed tendons, equal to 35 N/mm²;
- for manufacturing prestressed reinforced concrete roofing slabs, with a high level of workability, and a minimum R_{ckj} equal to 35 N/mm² and with an excellent appearance;
- for manufacturing cladding panels with a high level of workability, a very refined surface and an excellent appearance;
- self compacting concrete for precasting. Together with the **Viscofluid SCC** viscosity modifier admixture, **Dynamon SP3** is suitable for manufacturing self compacting concrete which can be poured without vibrations. Its characteristics of fluidity and resistance to segregation are also suitable for a fast casting procedure.

TECHNICAL CHARACTERISTICS

Dynamon SP3 consists of a water solution containing 22% of new generation acrylic polymers, with no formaldehyde. The polymers can efficiently disperse the cement grains and they can facilitate a fast temperature increase within the concrete (see technical data table).

It is possible to use the dispersing action of **Dynamon SP3** in the following three advantageous ways:

a) to reduce the amount of water at the same workability;

b) to increase workability at the same water-cement ratio;

c) to reduce both the water and the cement at the same water-cement ratio and the same workability.

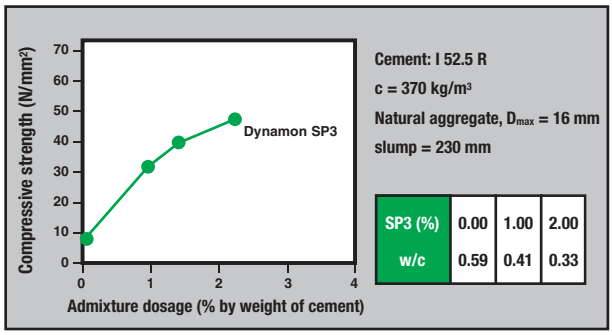

Figure 2 - ***Influence of Dynamon SP3 on the compressive strength after 16 hours for concretes cured at a temperature of +10°C.***

Figure 1 shows compressive strengths for concretes prepared with **Dynamon SP3** and for reference concrete cured at a temperature of +10°C.

Figure 2 shows the influence of **Dynamon SP3** dosage on the compressive strengths at very early age for concretes cured at a temperature of +10°C.

APPLICATION PROCEDURE

Dynamon SP3 develops maximum dispersing action when added after the other mixture ingredients (cement, aggregates, mineral addition or filler and at least 80% of the mixing water) and before **Viscofluid SCC**.

COMPATIBILITY WITH OTHER PRODUCTS

Dynamon SP3 admixture is compatible with other products for preparing special concretes, especially with:

- **Viscofluid SCC**, viscosity modifying admixture for manufacturing self compacting concretes;
- **Mapeplast SF**, silica fume based powder admixture for manufacturing "top-quality" concrete (strength, impermeability, durability);

TECHNICAL DATA (typical values)

PRODUCT IDENTITY			
Consistency:	liquid		
Colour:	amber		
Density (kg/l):	1.06 ± 0.02 at +20°C		
Dry content (%):	22		
Specification:	increase workability and/or reduction of mixing water and very strong acceleration of mechanical strengths at early ages and at temperatures < 10°C		
Classification:	highly efficient water reducer superplasticizer according to UNI EN 934-2		
Chlorides:	none		
Storage:	12 months, protect from frost		
Hazard classification according to EEC 88/379:	none		
Customs class:	3824 40 00		
PERFORMANCE DATA OF DYNAMON SP3 WITH CONCRETE			
Admixture dosage (% of volume by weight of cement):	0	1	1.5
w/c:	0.59	0.41	0.36
% of water reduction:	–	30	37
Initial slump (mm):	220	230	230
Slump after 30 minutes:	200	200	200
Average compressive strength (R_{cm}) after 14 hours (N/mm²) at: +10°C	8	35	39
1-day R_{cm} (N/mm²) at +10°C:	20	48	52
7-day R_{cm} (N/mm²) at +10°C:	35	65	68
28-day R_{cm} (N/mm²) at +10°C:	45	76	79
Water penetration under pressure according to EN 12390/8 (mm):	25	0	0
Durability (resistance to the environmental exposure classes according to EN 206):	X0, XC1 XC2	X0, XC1 XC2, XC3, XC4 XD1, XD2, XD3 XS1, XS2, XS3 XA1, XA2, XA3 XF1	X0, XC1 XC2, XC3, XC4 XD1, XD2, XD3 XS1 XS2, XS3 XA1, XA2, XA3 XF1

The above mentioned data refers to average values obtained in concretes prepared with type I 52.5 R cement (370 kg/m³) and natural aggregate with D_{max} and cured in a climatic room at T = 10°C.

Dynamon SP3

- **Expancrete**, expansive agent for manufacturing shrinkage compensated concrete;
- fly ash for manufacturing concrete with traditional and self compacting concrete;
- different types of limestone fillers for manufacturing self compacting concrete and any other type of concrete that requires these fillers;
- **"DMA 1000", "DMA 2000"** or **"DMA 3000" form-release agents**, for releasing concrete from formworks;
- **Mapecure E** and **Mapecure S** curing emulsions to protect form-released concrete structures from rapid water evaporation (floorings).

Our technical assistance department is available to evaluate which admixture is the most suitable to manufacture freeze/thaw cycles resistant concretes, depending on the type of cement used.

DOSAGE

Dosage by volume

For traditional systems - from 0.8 to 2.5 l per 100 kg of cement.

For self-compacting concrete - from 0.8 to 2.5 l per 100 kg of fine particles (max 0.1 mm diameter).

PACKAGING

Dynamon SP3 is available in bulk, 200 l drums, 1000 l tanks.

STORAGE

Store in sealed containers, protect from frost and direct exposure to sun light.

FOR PROFESSIONALS.

WARNING

Although the technical details and recommendations contained in this product report correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In any case the user alone is fully responsible for any consequences deriving from the use of the product.

All relevant references of the product are available upon request

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