



Dynamon

SP2



Superplasticizer based on modified acrylic polymer for precast concrete with low water/cement ratio and very high mechanical strengths at early age, also at low environmental temperatures

DESCRIPTION

Dynamon SP2 is an admixture based on modified acrylic polymer specially designed for the precast concrete industry, belonging to the new revolutionary MAPEI **Dynamon SP** system. The **Dynamon SP** system is based on 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 (exclusive to MAPEI know-how).

WHERE TO USE

Concrete with **Dynamon SP2** has a high level of workability (consistency class S4 or S5 according to EN 206-1), and is consequently easy to apply when fresh. At the same time it offers excellent mechanical performances when hardened.

Dynamon SP2 is clearly an admixture with superior performance 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 age). This is even at low temperatures.

Dynamon SP2 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 age in different consistency classes at curing temperatures lower than 15°C.

Dynamon SP2 enables the reduction of the maximum temperature and/or the time of the steam treatment due to its high level of acceleration of the cement hydration.

Its performances make it particularly suitable for manufacturing self-compacting concrete since **Dynamon SP2** can ensure high workability and at the same time does not significantly slow down the development of mechanical strengths at early age.

For self-compacting concrete it is necessary to use **Viscofluid SCC** or **Viscofluid SCC/10**, viscosity modifying admixtures with **Dynamon SP2** 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** are the production of concrete for:

- manufacturing precast reinforced beams with a high level of workability and a minimum compressive strength, R_{ck} , to cut the prestressed tendons, equal to 35 N/mm²;

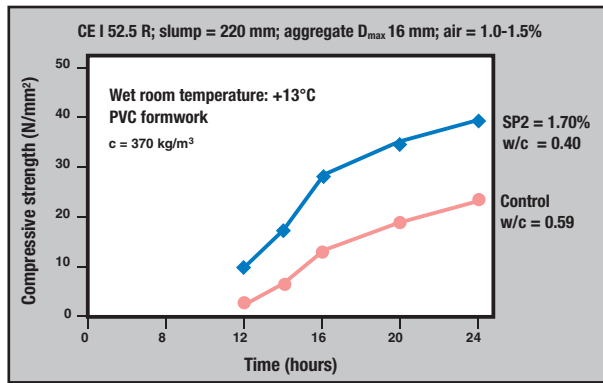


Figure 1 - Compressive strength vs. time of superplasticized concrete with Dynamon SP2

- manufacturing prestressed reinforced concrete roofing slabs, with a high level of workability, and a minimum compressive strength, R_{ckj} , to cut the prestressed tendons, equal to 35 N/mm² and with an excellent appearance;
- 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** or **Viscofluid SCC/10** viscosity modifying admixtures, **Dynamon SP2** 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 SP2 consists of a water solution containing 49% of acrylic polymers (with no formaldehyde) and cement hydration catalysers. The polymers can efficiently disperse the cement grains and they can facilitate a fast temperature increase within the concrete.

It is possible to use the dispersing action of **Dynamon SP2** in the following three advantageous ways:

- to reduce the amount of water at the same workability;
- to increase workability at the same water-cement ratio;
- to reduce both water and cement, at the same water-cement ratio and the same workability.

Figure 1 shows the development of the compressive strength at a room

temperature of +13°C, from 12 hours to 1 day, for a reference concrete and a concrete of equal composition, with the addition of **Dynamon SP2** (1.7 % in volume by weight of cement).

Figure 2 represents the influence of the amount of **Dynamon SP2** on the compressive strength at very early age (16 hours) and at a room temperature of +13°C.

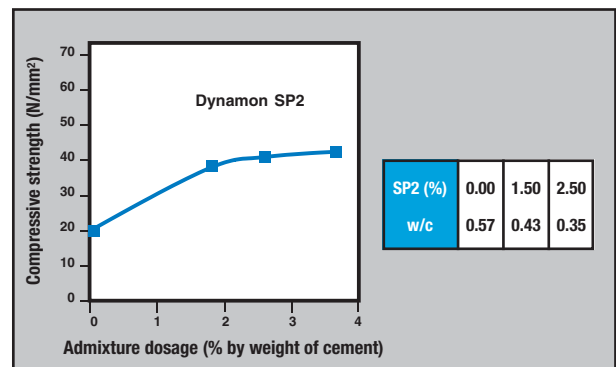


Figure 2 - Influence of Dynamon SP2 on compressive strength after 16 hours and at +13°C

APPLICATION PROCEDURE

Dynamon SP2 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** or **Viscofluid SCC/10**.

COMPATIBILITY WITH OTHER PRODUCTS

Dynamon SP2 admixture is compatible with other products for preparing special concretes, especially with:

- **Viscofluid SCC** or **Viscofluid SCC/10**, viscosity modifying admixtures for manufacturing self-compacting concretes;
- **Mapeplast SF**, silica fume based powder admixture for manufacturing "top-quality" concrete (strength, impermeability, durability);
- **Expancrete**, expansive agent for manufacturing shrinkage compensated concrete;
- fly ash for manufacturing standard and self-compacting concrete;

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Consistency:	liquid
Colour:	amber
Density according to ISO 758 (g/cm³):	1.30 ± 0.03 at +20°C
Dry content according to EN 480-8 (%):	49 ± 2.5
Specific action:	increase workability and/or reduction of mixing water and rapid development of mechanical strengths at early age and at T < 15°C
Classification according to EN 934-2:	high range water reducing, hardening accelerating, superplasticizer, tables 3.1-3.2-7
Chlorides soluble in water according to EN 480-10 (%):	< 0.1 (absent according to EN 934-2)
Alkali content (Na₂O equivalent) according to EN 480-12 (%):	< 2.5
Storage:	12 months, protect from frost
Hazard classification according to EC 99/45:	none. Before using refer to the "Safety instructions for the preparation and application" paragraph and the information on the packing and Safety Data Sheet
Customs class:	3824 40 00

PERFORMANCE DATA OF DYNAMON SP2 WITH CONCRETE *

Admixture dosage (% in volume by weight of cement):	0	1.5	2
w/c:	0.59	0.43	0.37
Water reduction (%):	–	27	37
Initial slump (mm):	220	230	230
Slump after 30' (mm):	200	190	190
16 hours Rcm (N/mm²):			
• 13°C:	14	32	35
• steam treatment:	22	49	53
1-day Rcm (N/mm²):			
• 13°C:	23	41	47
• Steam cured concrete:	27	54	58
7-day Rcm (N/mm²):			
• 13°C:	38	58	65
• Steam cured concrete:	35	57	60
28-day Rcm (N/mm²):			
• 13°C:	52	75	83
• Steam cured concrete:	41	60	81
Water penetration under pressure according to EN 12390/8 (mm):	25	3	0
Durability (resistance to the environmental exposure classes according to EN 206-1):	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 refer to average values obtained in concretes prepared with type I 52.5 R cement (370 kg/m³) and natural aggregates with D_{max} 16 mm cured in a climatic room at T = 13°C or steam treated. The steam curing treatment consists of 2 hours of pre-curing at 20°C, 3 hours of temperature increase and 5 hours in the steady condition at 65°C.

Dynamon SP2

- 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 mixtures - from 1.5 to 2.5 l per 100 kg of cement.

For self-compacting concrete - from 1.5 to 2.5 l per 100 kg of fine particles (max 0.1 mm diameter).

PACKAGING

Dynamon SP2 is available in bulk, 200 l drums, 1000 l tanks.

STORAGE

Store in sealed containers and protect from frost.
Exposure to direct sunlight can provoke variations of the colour tone without

altering in any way the performances of the product.

SAFETY INSTRUCTIONS FOR THE PREPARATION AND APPLICATION

Dynamon SP2 is not hazardous according to the ruling norms on the classification of preparation. It is recommended to take the usual precautions for handling chemical products.
The Safety Data Sheet is available on request for professional users.

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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