Betonpav Expan

Concretes with guaranteed performance
For shrinkage-compensated floors
Compliant with standards UNI EN 206 and UNI 11104 and CNR DT 211:2014

DESCRIPTION

Controlled expansion and shrinkage compensation concrete specifically for indoor and outdoor flooring that has to withstand static and dynamic loads, with a minimum compressive strength class of C25/30:

- industrial and artisanal workshop floors;
- floors for goods storage and handling areas;
- floors with high traffic flow (shopping malls, garages, car parks, ...)

Betonpav Expan is a concrete specially formulated for making concrete floors laid both manually and mechanically with a wear layer applied green on green using 'topped' or 'finished' techniques in situations in which there is a need to reduce the consequences of hygrometric shrinkage of the concrete.

In the first few days after installation, **Betonpav Expan**, undergoes an expansion in volume which, if adequately counteracted by a metal reinforcement correctly positioned inside the slab, produces a compressive force capable of eliminating or, at any rate, reducing the tensile stresses resulting from the subsequent hygrometric shrinkage of the concrete.

With careful design, installation, curing and the presence of appropriate compensating reinforcement, **Betonpav Expan** enables the creation of large paved surfaces without contraction joints.

Betonpav Expan offers greater control over the extent of any cracks in the following versions:

- **Betonpav Expan SF** (Steel Fiber);
- **Betonpav Expan PF** (Polymeric Fiber).

Betonpav Expan SF and **PF** can be used in flooring with a thickness greater than or equal to 12 cm. For flooring less than 12 cm thick, we recommend **Betonpav Zerojoint.**

Betonpav Expan must cure for at least 7 days under saturated conditions in order to perform its shrinkage compensation function properly. It is therefore recommended that the paved surface be protected as soon as possible with wet non-woven mats protected by polythene sheets in order to prevent the evaporation of water from the mix.

Betonpav Expan has the following additional characteristics due to its special composition:

- easier laying and compaction;
- reduced setting times compared to concrete of the same strength class but not specifically for floors;
- eduction, under normal conditions of temperature, radiation and wind, of the "crust" effect linked to the premature evaporation of water from the cortical layer of the pavement during the waiting period between pouring and finishing. (In the event of conditions of unusually high temperature, radiation and/or wind, adequate protection should in any case be provided for the poured material in the phase preceding finishing, or laying of the floor should be postponed).

Betonpav Expan enables the wear layer to be produced quickly even at relatively low ambient temperatures. For example, at a temperature of 10°C, it is generally possible to start the trowelling process after about 6 to 8 hours, depending on the strength class of the mix. Generally, by using **Betonpav Expan**, he construction site can be organised in such a way as to start the pouring in the early morning hours, and then finishing operations can be completed within the working day even in relatively cold climates, resulting in considerable financial savings.

Table 1 shows the finishing times of **Betonpav Expan** in standard conditions compared to those of concrete of the same strength class but not specifically for flooring.

Table 1:
Approximate finishing times of **Betonpav Expan C25/30** depending on temperature

FINISHING OPERATIONS	START		END	
	10°C	20°C	10°C	20°C
Betonpav Expan C25/30	8 h	6 h	10 h	8 h
Normal C25/30 concrete	12 h	9 h	15 h	11 h

As you can see, thanks to using **Betonpav Expan**, the finishing times can be reduced, on average, by about 3-5 hours.

Betonpav Expan is available in a wide range of strength and exposure classes for ensuring durability in accord with the environmental context. **Betonpav Expan** is also available in consistency classes S3, S4 and S5. We strongly recommend the use of consistency class S5 when laying concrete by hand.

The following table can help to define the **Betonpav** characteristics that should be included in the specifications.

Parameters to be defined when specifying BETONPAV EXPAN	STRENGTH CLASS	CONSISTENCY CLASS	EXPOSURE CLASS	MAXIMUM DIAMETER	FIBRE REINFORCED
	from C25/30 to C35/45	S3, S4, S5	XC, XD, XA, XF	16, 32	SP, SF

Table 2:
Guideline compressive strengths of **Betonpav Expan C25/30** depending on temperature

TIME (DAYS)	COMPRESSIVE STRENGTH (MPA) 20°C	10°C
3	15	10
7	25	21
28	37	38

Note: The values were obtained with wet curing (R.H. = 95%) in the laboratory and on specimens compacted to minimise trapped air content. The values actually obtainable on site depend on the temperature and relative humidity conditions to which the structure is exposed, as well as the degree of compaction of the structure.

Attention: given the variability of the environmental conditions to which the paving may be subjected, do not rely on these data alone to establish when the paving can be walked on or entered into service.

Table 3:
Principal characteristics of **Betonpav C25/30** (guideline values)

NORMAL STRENGTH	PROCTOR SETTING TIME START AT 20°C	PROCTOR SETTING TIME END AT 20°C	COUNTERACTED EXPANSION IN ACCORD WITH UNI 8148 METHOD B AFTER 2 DAYS	COUNTERACTED EXPANSION IN ACCORD WITH UNI 8148 METHOD B AFTER 28 DAYS	SECANT ELASTIC MODULUS AT 28 DAYS (AT 20°C AND RH>95%)
MPa	**min**	**min**	**µm/m**	**µm/m**	**MPa**
30	390	500	400	50	30000