

Multibeton® XA

Concretes with guaranteed performance
Exposure class XA: Chemical attack

Multibeton® XA is a durable concrete for the construction of works exposed to chemical attack from the soil and/ or corrosive water.

Multibeton® XA high performance concretes comply with the provisions of UNI EN 206 and UNI 11104 standards as laid down in the current "Technical Standards for Construction" issued by the Italian Ministry of Infrastructure and Transport and have characteristics that may vary within a wide range depending on the

mechanical resistance required, the environment in which the construction takes place and the complexity of the pour.

The UNI EN 206 and UNI 11104 standards provide for exposure classes XA1, XA2 and XA3 for the risk of degradation by chemical attack, depending on the type of chemical corrosion present and the level of corrosiveness. The correct exposure class must be specified at the time of order in accordance with the design requirements.

TYPES OF ENVIRONMENT		EXAMPLES OF USAGE	MAXIMUM W/C	MINIMUM RCK
XA1	Weak chemically corrosive environment	Concrete exposed to natural soil and ground water with the chemical characteristics set out in Table 2 of UNI EN 206	0,55	C30/37
XA2	Moderately chemically corrosive environment	Concrete exposed to natural soil and ground water with the chemical characteristics set out in Table 2 of UNI EN 206	0,50	C32/40
XA3	Highly chemically corrosive environment	Concrete exposed to natural soil and ground water with the chemical characteristics set out in Table 2 of UNI EN 206	0,45	C35/45

Multibeton® XA is available in four versions with differing consistencies: S3, S4, S5 and SCC (self-compacting concrete) and with a minimum strength class dependent on the specific exposure class.

The consistency class and the strength class must be specified at the time of order in accordance with the design requirements. The choice of consistency class is of fundamental importance to avoid internal/external cavities and depends on the difficulty of execution and the reliability of the workforce on site.



**MULTIBETON®
XA-S3**



**MULTIBETON®
XA-S4**



**MULTIBETON®
XA-S5**



**SCC-MULTIBETON®
XA-SCC**

The **Multibeton® XA** range includes concretes made with **cements of an appropriate sulphate resistance class** (in accord with UNI 9156) based on the matching criteria set out in UNI 11417-1, if provided for based on the type of chemical attack by the environment.

Table 1:

The development over time of the compressive strength of **Multibeton® XA** under laboratory conditions (20°C) and in a cold (5-10°C) or hot (30-35°C) climate.

TIME (DAYS)		COMPRESSIVE STRENGTH (MPA)		
		20°C	5-10°C	30-35°C
3	XA1 C30/37	20	7	21
	XA2 C32/40	25	8	27
	XA3 C35/45	25	8	27
7	XA1 C30/37	32	20	32
	XA2 C32/40	35	21	35
	XA3 C35/45	40	24	40
28	XA1 C30/37	42	40	39
	XA2 C32/40	45	43	42
	XA3 C35/45	50	48	48

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: do not rely on these data alone to establish the formwork striking time

Table 2:

Main physical and mechanical characteristics of **Multibeton® XA**

CE	CR	CC	STANDARD HYGROMETRIC SHRINKAGE (WITH R.H.+50%) AFTER 6 MONTHS	DYNAMIC ELASTIC MODULUS AT 28 DAYS	INFINITE VISCOUS DEFORMATION (PER 1 MPA UNIT OF COMPRESSIVE STRENGTH)	PERMEABILITY AT 28 DAYS, PENETRATION OF WATER UNDER PRESSURE (5 ATM) IN ACCORD WITH UNI 12390-8	HEATING UNDER ADIABATIC CONDITIONS
			µm/m	MPa	µm/m	mm	°C
XA1	C30/37	S3, S4, S5	400	33000	80	15	32
		SCC	420	32000	90	15	36
XA2	C32/40	S3, S4, S5	300	36000	70	10	33
		SCC	320	35000	80	10	38
XA3	C40/45	S3, S4, S5	400	38000	65	5	38
		SCC	430	37000	75	5	40