PRACTICAL GUIDELINES FOR SITE PERSONNEL

FIBRES

There are various types of fibre's that can be used in concrete, each with its own unique properties and applications. Here are some of the most commonly used fibres in concrete:

1. Steel Fibres: Steel fibres are made from high-strength steel and are used to reinforce concrete against cracking and improve its structural integrity. They are commonly used in industrial flooring, precast concrete products, and shotcrete.
2. Glass Fibres: Glass fibres are made from fine glass strands and are used to improve the durability and toughness of concrete. They are commonly used in decorative concrete, precast concrete products, and concrete countertops.
3. Synthetic Fibres: Synthetic fibres are made from materials such as polypropylene, polyester, and nylon. They are used to reduce cracking and improve the overall strength of concrete. They are commonly used in residential and commercial concrete applications.
4. Carbon Fibres: Carbon fibres are made from carbon strands and are used to improve the strength and durability of concrete. They are commonly used in high-performance concrete applications such as bridges, parking structures, and industrial flooring.
5. Natural Fibres: Natural fibres such as jute, hemp, and coconut are used to improve the tensile strength of concrete. They are commonly used in low-cost housing and rural infrastructure projects.

The choice of fibres type and dosage depends on the specific application and the desired properties of the concrete. It is important to consult with a qualified engineer or concrete expert to determine the appropriate fibres type and dosage for your project.

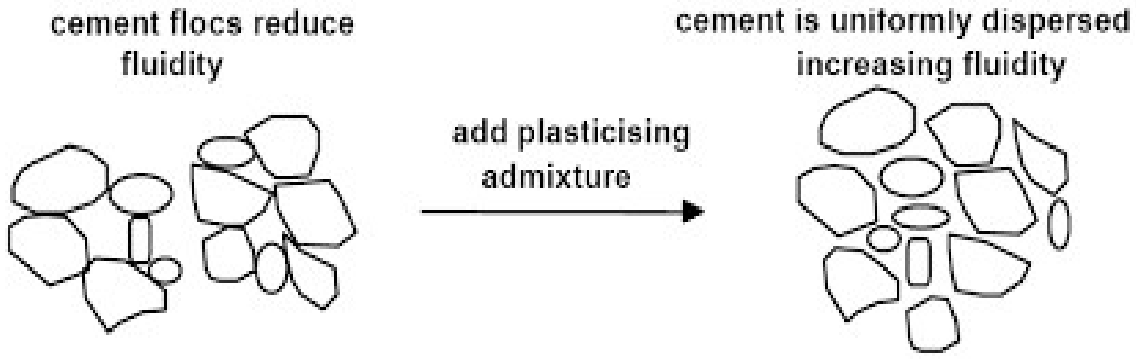
steel fibres end hooked (DE 50/1N (N50)), multifilament Polypropylene, plastic polypropylene

ADMIXTURES

Admixtures are ingredients that are added to concrete before or during mixing to enhance its properties or to achieve certain characteristics. There are various types of admixtures available in the market, each having a specific purpose and application. Some of the most common admixtures used in concrete are:

1. Water-reducing admixtures: These admixtures reduce the amount of water needed in the concrete mix, which increases the strength of the concrete while also making it more workable.
2. Retarding admixtures: These admixtures are used to slow down the setting time of concrete. This is useful in situations where the concrete needs to be transported a long distance or where the weather conditions are hot and dry.
3. Accelerating admixtures: These admixtures are used to speed up the setting time of concrete. This is useful in situations where the concrete needs to be used quickly or where the weather conditions are cold and wet.
4. Air-entraining admixtures: These admixtures introduce small air bubbles into the concrete, which increases its durability and resistance to freeze-thaw cycles.
5. Superplasticizers: These admixtures are used to increase the workability of the concrete without increasing the water content. This is useful in situations where the concrete needs to be poured into tight spaces or where a smooth finish is required.
6. Pozzolanic admixtures: These admixtures are made from natural or artificial materials that react with calcium hydroxide in the concrete to form compounds that increase the strength and durability of the concrete.
7. Corrosion inhibitors: These admixtures are used to protect the reinforcing steel in the concrete from corrosion, which can cause the concrete to crack and weaken over time.
8. Colouring admixtures: These admixtures are used to add colour to the concrete, which is useful in situations where a decorative finish is required.

Each admixture has its own unique set of benefits and applications. The selection of admixture depends on the specific needs and requirements of the project.



DIFFERENT TYPES OF CEMENT

There are several types of cement used in the construction industry, each with its own unique properties and applications. Some of the most common types of cement are:

1. Portland cement: This is the most widely used type of cement and is the basic ingredient in concrete. It is made from a combination of limestone, clay, and gypsum and is used in a variety of construction applications, including residential and commercial buildings, bridges, and roads.
2. Rapid hardening cement: This type of cement has a higher percentage of C3S (tricalcium silicate) and is used in applications where early strength gain is required, such as in precast concrete, repair work, and fast-track construction projects.
3. Low heat cement: This type of cement produces less heat during the hydration process and is used in large concrete structures such as dams, where temperature rise due to hydration can cause cracking.
4. Sulphate-resisting cement: This type of cement is resistant to sulphate attack and is commonly used in marine structures, sewage treatment plants, and other structures where sulphate exposure is high.
5. White cement: This type of cement is made from raw materials that contain very little iron and is used in architectural applications where a white or light-coloured finish is desired, such as in precast panels, decorative concrete, and terrazzo flooring.
6. Oil well cement: This type of cement is specially formulated to withstand high temperatures and pressures encountered in oil and gas wells. It is used in the construction of oil and gas wells, as well as in geothermal and underground construction applications.
7. Masonry cement: This type of cement is used to bond bricks, concrete blocks, and other masonry units in construction applications such as walls, chimneys, and fireplaces.

The selection of cement type depends on the specific needs and requirements of the project, including the type of construction, environmental factors, and expected performance of the finished product.

EN 197-1:2000

Table 1- The 27 products in the family of common cements

Main types	Notation of the 27 products (types of common cement)		Composition [proportion by mass [1)]]										
			Main constituents										Minor additional constituents
			Clinker	Blastfurnace slag	Silica fume	Pozzolana		Fly ash		Burnt shale	Limestone*		
						natural	natural calcined	siliceous	calcareous				
			K	S	D [2)]	P	Q	V	W	T	L	LL	
CEM I	Portland cement	CEM I	95-100	-	-	-	-	-	-	-	-	-	0-5
CEM II	Portland-slag cement	CEM II/A-S	80-94	6-20	-	-	-	-	-	-	-	-	0-5
		CEM II/B-S	65-79	21-35	-	-	-	-	-	-	-	-	0-5
	Portland-silica fume cement	CEM II/A-D	90-94	-	6-10	-	-	-	-	-	-	-	0-5
	Portland-pozzolana cement	CEM II/A-P	80-94	-	-	6-20	-	-	-	-	-	-	0-5
		CEM II/B-P	65-79	-	-	21-35	-	-	-	-	-	-	0-5
		CEM II/A-Q	80-94	-	-	-	6-20	-	-	-	-	-	0-5
		CEM II/B-Q	65-79	-	-	-	21-35	-	-	-	-	-	0-5
	Portland-fly ash cement	CEM II/A-V	80-94	-	-	-	-	6-20	-	-	-	-	0-5
		CEM II/B-V	65-79	-	-	-	-	21-35	-	-	-	-	0-5
		CEM II/A-W	80-94	-	-	-	-	-	6-20	-	-	-	0-5
		CEM II/B-W	65-79	-	-	-	-	-	21-35	-	-	-	0-5
	Portland-burnt shale cement	CEM II/A-T	80-94	-	-	-	-	-	-	6-20	-	-	0-5
		CEM II/B-T	65-79	-	-	-	-	-	-	21-35	-	-	0-5
	Portland-limestone cement	CEM II/A-L	80-94	-	-	-	-	-	-	-	6-20	-	0-5
		CEM II/B-L	65-79	-	-	-	-	-	-	-	21-35	-	0-5
		CEM II/A-LL	80-94	-	-	-	-	-	-	-	-	6-20	0-5
		CEM II/B-LL	65-79	-	-	-	-	-	-	-	-	21-35	0-5
	Portland-composite cement [3)]	CEM II/A-M	80-94	<---------- 6-20 ----------									0-5
		CEM II/B-M	65-79	<---------- 21-35 ----------									0-5
CEM III	Blastfurnace cement	CEM III/A	35-64	36-65	-	-	-	-	-	-	-	-	0-5
		CEM III/B	20-34	66-80	-	-	-	-	-	-	-	-	0-5
		CEM III/C	5-19	81-95	-	-	-	-	-	-	-	-	0-5
CEM IV	Pozzolanic cement [3)]	CEM IV/A	65-89	-	<---------- 11-35 ---------->					-	-	-	0-5
		CEM IV/B	45-64	-	<---------- 36-55 ---------->					-	-	-	0-5
CEM V	Composite cement [3)]	CEM V/A	40-64	18-30	-	<---------- 18-30 ---------->				-	-	-	0-5
		CEM V/B	20-38	31-50	-	<---------- 31-50 ---------->				-	-	-	0-5

1) The values in the table refer to the sum of the main and minor additional constituents. 2) The proportion of silica fume is limited to 10%.
3) In Portland-composite cements CEM II/A-M and CEM II/B-M, in Pozzolanic cements CEM IV/A and CEM IV/B and in Composite cements CEM V/A and CEM V/B the main constituents besides clinker shall be declared by designation of the cement.
* L : total organic carbon (TOC) shall not exceed 0.5% by mass; LL: TOC shall not exceed 0.20% by mass.

CMI Types of cement EN 197 table X Close

OMV READY MIX FUN FACT

- DID YOU KNOW!!
- the Three Gorges Dam
- China is already home to the largest concrete structure in the world – the Three Gorges Dam across the Yangtze River. Sometimes touted as China's “new Great Wall”, the dam includes 27.2m cubic metres of concrete and its hydroelectric power station is the world's largest power station in terms of capacity