

### BATCHING PLANTS

Batching plants are available in 3 categories :

1. Manual
2. Semiautomatic
3. Fully automatic

### TYPICAL BATCHING TOLERANCES

Ingredient	Individual batches and cumulative batches with a tare compensated control	Cumulative batchers without a tare compensated control
Cement and other Cementitious materials	$\pm 1\%$ of the required weight of materials being weighed or $\pm 0.3\%$ of scale capacity, whichever is greater.	$\pm 1\%$ of the required cumulative weight of materials being weighed or $\pm 0.3\%$ of scale capacity, whichever is greater.
Aggregates	$\pm 2\%$ of the required weight of material being weighed or $\pm 0.3\%$ of scale capacity, whichever is greater.	$\pm 1\%$ of the required cumulative weight of materials being weighed or $\pm 0.3\%$ of scale capacity, whichever is greater.
Water	$\pm 1\%$ of the required weight of material being weighed or $\pm 0.3\%$ of scale capacity, whichever is greater.	
Admixtures	$\pm 3\%$ of the required weight of material being weighed or $\pm 0.3\%$ of scale capacity, or $\pm$ the minimum dosage rate per 100 lb (45.4 kg) of cement, whichever is greater.	$\pm 3\%$ of the required cumulative weight of material being weighed or $\pm 0.3\%$ of scale capacity, or $\pm$ the minimum dosage rate per 100 lb (45.4 kg) of cement as it applies to each admixture, whichever is greater.

### MIXER

Machine used for the purpose is called concrete mixer which may be batch type or continuous type.

**Batch mixer** – mixes and discharges each load of materials separately.

**Continuous mixer** – produces concrete continuously without any break so long as it is in operation. It is not much in use.

- **Batch mixer may be**

- (i) Tilting type and
- (ii) Non-tilting type

- **Tilting Type Mixer**

Basic features of the tilting type mixer are as follows:

- (i) It is commonly used on large construction projects.
- (ii) It can be used for bigger sizes of particles even bigger than 7.5 cm.
- (iii) In this material is rolled down.
- (iv) It imparts more satisfactory results for dry concrete.

Basic features of this non-tilting type mixer are:

- (i) It is suitable for small works.
- (ii) It is recommended for use when material size is not greater than 7.5 cm.
- (iii) Materials are lifted, rolled and then dropped

- **Size of Tilting/Non-Tilting Mixer**

As per IS : 1791 – 1961, mixers have been designated as :

**Tilting type** – 100T, 140T, 200T

**Non-tilting type** – 140 NT, 200 NT, 280NT, 400NT, 800 NT

where T stands for tilting type, and

NT stands for non-tilting type

Number 100, 140, 200 indicates the nominal volume of mixed concrete in liters.

These mixers may be available in standard size of 0.375, 0.50, 1.50, 2.25 and 3 cum capacities.

## **COMPACTION EQUIPMENT**

- **Tamping**

Tamping is the process of compacting the concrete manually-A rod or hand tool is inserted to the full depth and moved up and down such that air bubbles go out of concrete. It is compacted in layer of 15 cm in case of RCC and 30 cm in case of mass concrete.

- **Vibrators**

- (a) Internal (Needle) vibrator

- It is known as needle immersion or poker vibrator and it consists of a power unit and long flexible tube at the end of which a vibrating head is attached.
- It is very effective for mass concreting.

- (b) External (Form) Vibrator

- It is used only when the section is thin and heavily reinforced where penetration of needle vibrator is not possible.

- (c) Surface Vibrator

- It is also called screed or pan vibrator.
- It vibrates the concrete from the surface at the time when striking off the concrete i.e. screeding is being carried out.
- It is effective only if the depth is up to 15 to 20 cm.

- (d) Vibrating Table

- It is used when stiff and harsh mix is used in prefabricated elements and for laboratory specimens only.

## **SPECIAL METHOD OF VIBRATIONS**

- (a) **Vibropressing**

- Compaction is done by applying external pressure on top and vibrating from bottom.
- It is useful in production of flag stone for paving and concrete road kerbs.

- (b) **Shock (Jolting)**

- Concrete in the mould is subjected to jolting action with the help of cams.
- It is useful for precast concrete products.

- (c) **Centrifugation**

- Concrete in the mould is being spun at very high speed which expels the water from the mix and compaction proceeds.
- Here the compaction is done by centrifugal forces, it results in very water tight structures like pipes for water supply and sewage disposal.

- (d) **Airjets**

- Air is driven out from concrete through air jets and the particles come closer and compaction is done.

## **FINISHING CONCRETE**

- **Screeding**

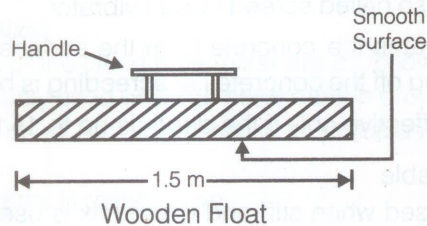
The process of striking off the excess concrete to bring the top surface up to proper grade is called screeding,



- **Floating**

Floating consists in removing the irregularities on the surface of concrete which are left after screeding.

This is done by a wooden float.



- **Trowelling**

It is final operation of finishing.

It should be done after all excess water has evaporated.

Troweling with steel float in conical shape gives a very smooth finish.

- **Curing of Concrete**

Curing is defined as the process of maintaining humidity and moisture at favourable temperature of freshly placed concrete during some definite period following placing, casting and finishing to attain full hydration of the cement.

- **Object of Curing**

The basic object of curing is to attain the maximum strength of concrete.

In addition to it, other benefits are listed below :

- (i) It increases durability and impermeability of concrete.
- (ii) It reduces shrinkage of concrete.
- (iii) It improves wear resisting and weather resisting qualities.

