

MANUFACTURING OF CEMENT

Raw materials used

- ✓ Calcareous
- ✓ Argillaceous

Calcareous materials used are

- ✓ Cement rock
- ✓ Lime stone
- ✓ Marl
- ✓ Chalk
- ✓ Marine shell

Argillaceous materials used are

- ✓ Clay
- ✓ shale
- ✓ slate
- ✓ blast furnace slag

Process manufacturing cement

- ✓ Dry process
- ✓ Wet process

Dry process

General

Adopted when the raw materials are quite hard

The process is slow and the product is costly

Process

Lime stone and clay are ground to fine powder separately and are mixed together

Water is added to make a thick paste which contains 14% of moisture

The paste formed is dried and then charged into a rotary kiln

The product obtained after calcination in rotary kiln

The clinker is obtained as a result of incipient fusion and sintering at a temp about 1400°C to 1500°C

The clinker is cooled to preserve the meta stable compounds and their solid solutions

Dispersion of one solid with another solid which made the clinker again heated

Clinker is again cooled and grounded in tube mills where 2-3% gypsum is added

The purpose of adding gypsum is to coat the cement particle by interfering the process of hydration of cement particles

The flow diagram of dry process

Wet process

The operations are

- Mixing
- Burning
- Grinding

Process

The crushed raw materials are fed in to a ball mill and a little water is added

The steel balls in the ball mill pulverized the raw material which form a slurry with water

The slurry is passed through storage tanks where the proportioning of compound is adjusted to ensure desired chemical composition

The corrected slurry having moisture about 40%, is then fed into rotary kiln where it loses moisture and forms lumps

These are finally burned at 1500°C to 1600°C

It becomes clinker at this stage, the clinker is cooled and then grounded in tube mills

While grinding the clinker 3% gypsum is added this is stored in silos and packed