## Cement

Cement is defined as a binding agent that is used to bind various construction materials. Given its adhesive and cohesive properties, it is an essential ingredient of concrete and mortar. Cement is mixed with water to form a paste that binds aggregates like sand or crushed rocks. Calcium, silicon, iron and aluminium compounds are closely ground to form a fine powdered product.

# Manufacturing of Portland cement:

**Definition:** An exactly finely ground product obtained by calcinating together at about 1500$^{o}$C, an intimate and property proportional mixture of argillaceous and calcarious raw materials, without the addition of anything subsequent to calcinations, excepting the retarded cement.

Methods of Portland cement manufacturing:

**Dry process:**

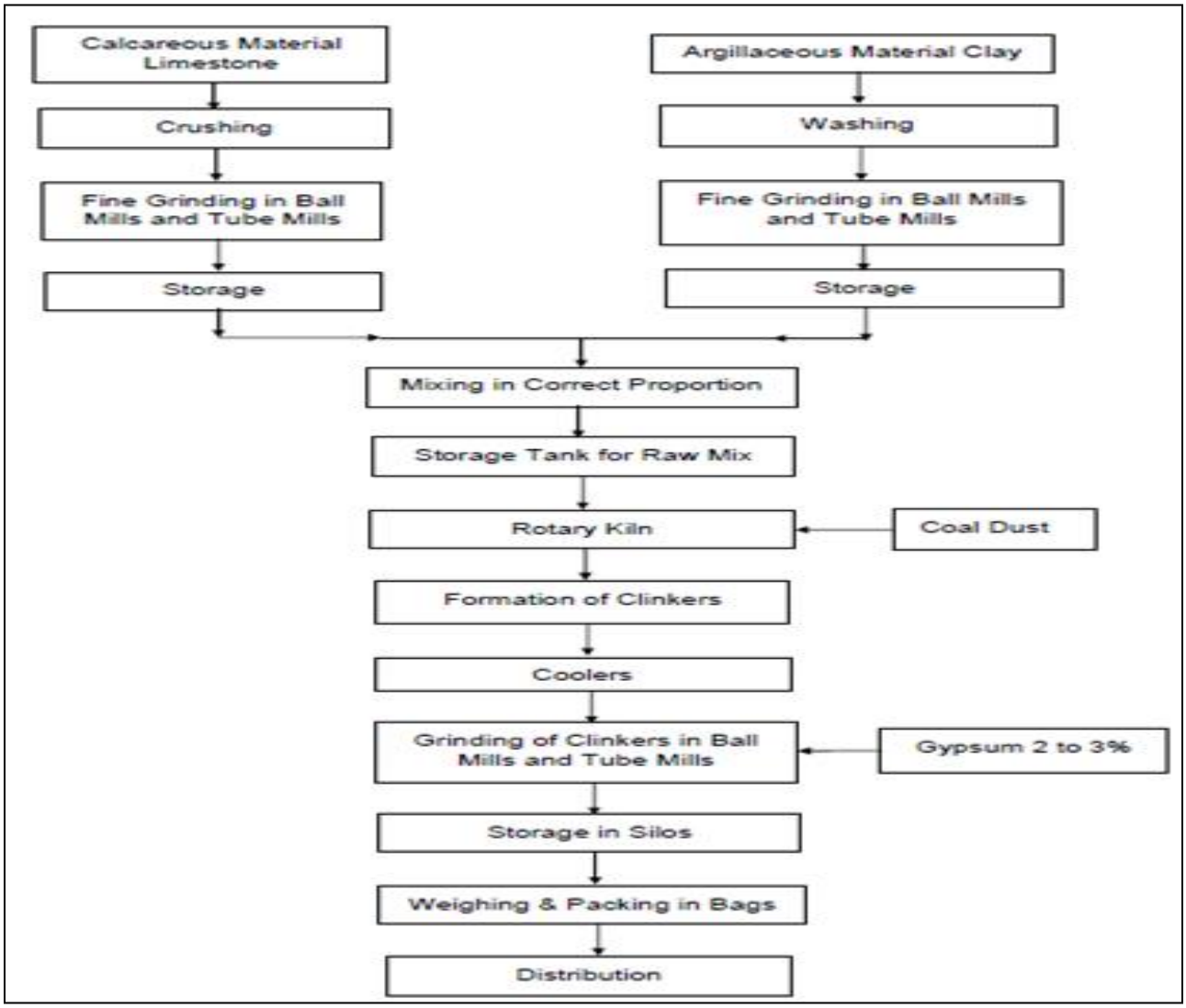
- Do not involve mixing of water with raw materials
- When raw materials quite hard
- Fuel consumption is low
- It is slow process
- Production cost is low
- Inferior quality cement is produced
- On the whole the process is costly

**Wet process:**

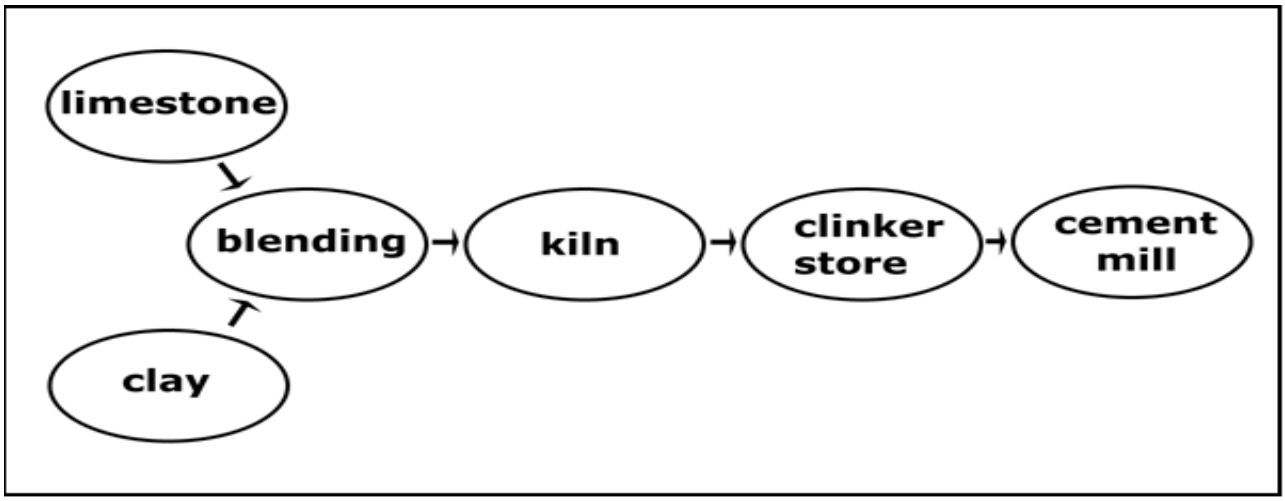
- Involve mixing of water with raw materials
- Used any type of raw materials quite hard
- Fuel consumption is high
- It is fast process
- Production cost is high
- Superior quality cement is produced
- On the whole the process is cheaper

**How is Portland Cement manufactured?**

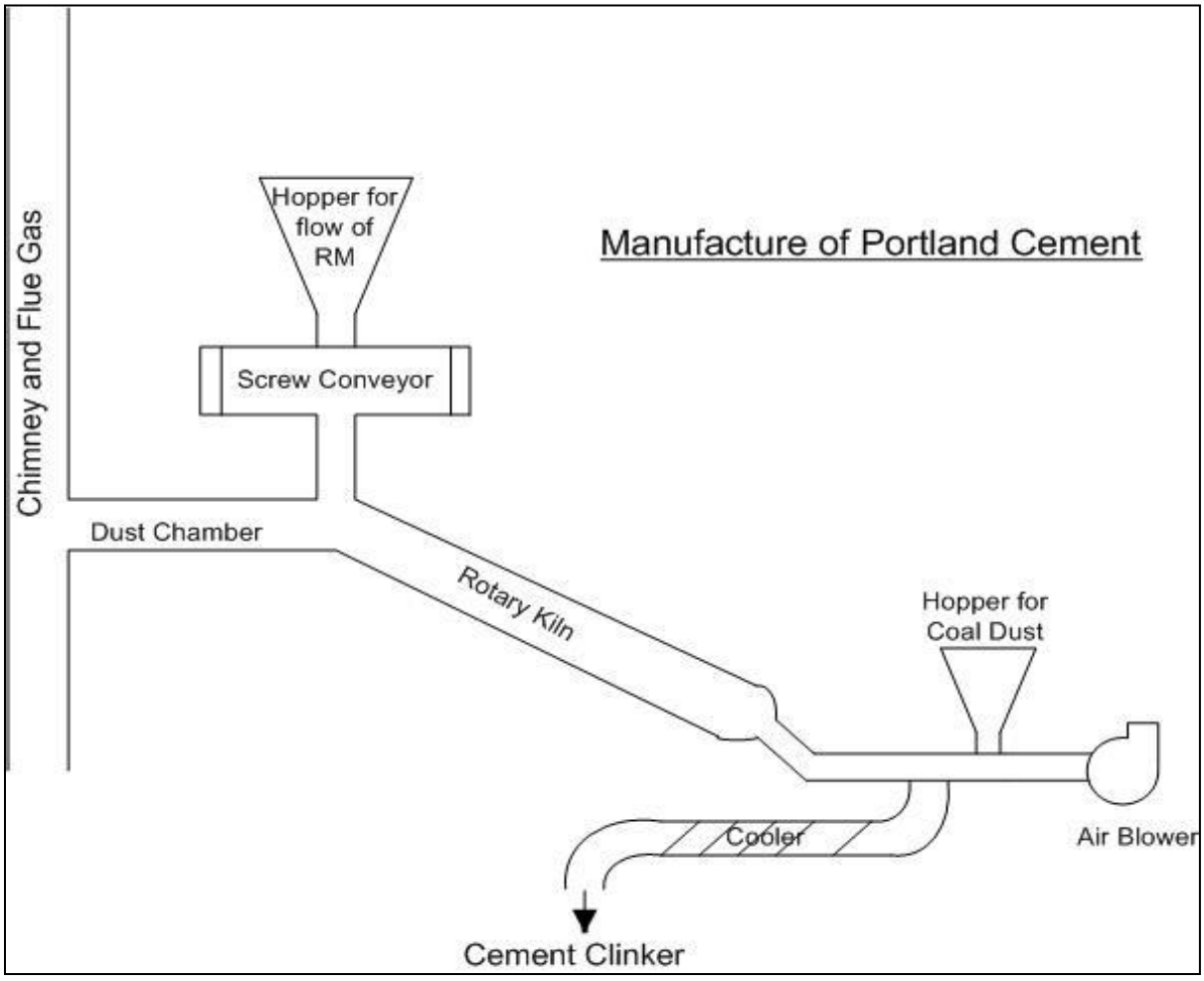
## FLOW CHART FOR PORTLAND CEMENT MANUFACTURING:


Calcareous Material Limestone
Crushing
Fine Grinding in Ball Mills and Tube Mills
Storage
Argillaceous Material Clay
Washing
Fine Grinding in Ball Mills and Tube Mills
Storage
Mixing in Correct Proportion
Storage Tank for Raw Mix
Rotary Kiln
Coal Dust
Formation of Clinkers
Coolers
Grinding of Clinkers in Ball Mills and Tube Mills
Gypsum 2 to 3%
Storage in Silos
Weighing & Packing in Bags
Distribution

**BLOCK DIAGRAM**




DIAGRAM


Manufacture of Portland Cement
Chimney and Flue Gas
Hopper for flow of RM
Screw Conveyor
Dust Chamber
Rotary Kiln
Hopper for Coal Dust
Cooler
Air Blower
Cement Clinker