



# 13 Types of Cement [PDF]: Properties, and Applications Concrete Construction

[Home](#) / [Building Technology Guide](#) / [Building Materials](#)

🕒 Reading time: 1 minute

There are various types of cement used in concrete construction. Each type of cement has its properties, uses, and advantages based on the composition materials used during its manufacture.

## 13 Types of Cement and their Uses

1. Ordinary Portland Cement (OPC)
2. Portland Pozzolana Cement (PPC)
3. Rapid Hardening Cement
4. Quick setting cement
5. Low Heat Cement
6. Sulfates resisting cement
7. Blast Furnace Slag Cement
8. High Alumina Cement
9. White Cement
10. Colored cement
11. Air Entraining Cement
12. Expansive cement
13. Hydrographic cement

Fig. 1:  
Cement

### 1. Ordinary Portland Cement (OPC)

**Ordinary Portland cement** is the most widely used type of cement, which is suitable for all general concrete construction. It is the commonly produced and used type of cement around the world, with annual global production of around 3.8 billion cubic meters per year. This cement is suitable for all kinds of concrete construction.

### 2. Portland Pozzolana Cement (PPC)

**Portland pozzolana cement** is prepared by grinding pozzolanic clinker with Portland cement. It is also produced by adding pozzolana with the addition of gypsum or calcium sulfate or by intimately and uniformly blending Portland cement and fine pozzolana.



This cement has a high resistance to various chemical attacks on concrete compared with ordinary portland cement, and thus, it is widely used. It is used in marine structures, sewage works, and for laying concrete underwater, such as bridges, dams, and mass concrete works, etc.

### 3. Rapid Hardening Cement

Rapid hardening cement attains high strength in the early days; it is used in concrete where formworks are removed at an early age and are similar to ordinary portland cement (OPC). This cement has increased lime content and contains higher C<sub>3</sub>S content and finer grinding, which gives higher strength development than OPC at an early stage.

The strength of rapid hardening cement at the three days is similar to 7 days strength of OPC with the same water-cement ratio. The advantage of this cement is that formwork can be removed earlier, which increases the rate of construction and decreases the cost of construction by saving formwork cost.

Rapid hardening cement is used in prefabricated concrete construction, road works, etc.

### 4. Quick setting cement

The difference between the quick setting cement and rapid hardening cement is that quick-setting cement sets earlier. At the same time, the rate of gain of strength is similar to Ordinary Portland Cement, while quick hardening cement gains strength quickly. Formworks in both cases can be removed earlier.

Quick setting cement is used where work is to be completed in very short period and for concreting in static or running water.

### 5. Low Heat Cement

Low heat cement is produced by maintaining the percentage of tricalcium aluminate below 6% by increasing the proportion of C<sub>2</sub>S. A small quantity of tricalcium aluminate makes the concrete to produce low heat of hydration. Low heat cement is suitable for mass concrete construction like gravity dams, as the low heat of hydration, prevents the cracking of concrete due to heat.

This cement has increased resistance against sulphates and is less reactive and initial setting time is greater than OPC.

### 6. Sulfates Resisting Cement

Sulfate resisting cement is used to reduce the risk of sulfate attack on concrete and thus is used in the construction of foundations where the soil has high sulfate content. This cement has reduced the contents of C<sub>3</sub>A and C<sub>4</sub>A.F.

Sulfate resisting cement is used in construction exposed to severe sulfate action by water and soil in places like canals linings, cut retaining walls, siphons, etc.

### 7. Blast Furnace Slag Cement

Blast furnace slag cement is obtained by grinding the clinkers with about 60% slag and resembles more or less in properties of OPC cement. It can be used for works where economic considerations are predominant.

### 8. High Alumina Cement

High alumina cement is obtained by melting a mixture of bauxite and lime and grinding with the clinker. It is a rapid hardening cement with initial and final setting time of about 3.5 and 5 hours, respectively.

The compressive strength of this cement is very high and more workable than ordinary portland cement and is used in works where concrete is subjected to high temperatures, frost, and acidic action.

### 9. White Cement

It is prepared from raw materials free from Iron oxide and is a type of ordinary portland cement, which is white. It is costlier and used for architectural purposes such as precast curtain wall and facing panels, terrazzo surface, etc. and for interior and exterior decorative work like external renderings of buildings, facing slabs, floorings, ornamental concrete products, paths of gardens, swimming pools, etc.

## 10. Colored cement

It is produced by mixing 5- 10% mineral pigments with ordinary cement. They are widely used for decorative works on floors.

## 11. Air Entraining Cement

Air entraining cement is produced by adding indigenous air-entraining agents such as resins, glues, sodium salts of sulfates, etc. the grinding of clinker.

This type of cement is especially suited to improve the workability with a smaller water-cement ratio and to improve frost resistant concrete.

## 12. Expansive Cement

Expansive cement expands slightly with time and does not shrink during and after the time of hardening. This cement is mainly for grouting anchor bolts and prestressed concrete ducts.

## 13. Hydrographic cement

Hydrographic cement is prepared by mixing water-repelling chemicals and has high workability and strength. It has the property of repelling water and is unaffected during monsoon or rains.

Hydrophobic cement is mainly used for the construction of water structures such as dams, water tanks, spillways, water retaining structures, etc.

## FAQs on different types of Cement

?What are the types of cement?

Ordinary Portland cement (OPC), portland pozzolana cement (PPC), rapid hardening cement, quick-setting cement, low heat cement, sulfates resisting cement, blast furnace slag cement, high alumina cement, white cement, colored cement, air-entraining cement, expansive cement, and hydrographic cement.

?Which type of Portland cement is most commonly used?

Ordinary Portland cement is most commonly used type of cement.

?What are the applications of ordinary Portland cement?

Ordinary Portland cement is the most widely used type of cement, which is suitable for all general concrete construction.

?What are the applications of Portland pozzolana cement?

It is used in marine structures, foundations, sewage works, and for laying concrete underwater, such as bridges, dams, and mass concrete works, etc.

?Where is hydrophobic cement used?

It is used in the construction of dams, spillways, water tanks, water retaining structures, underwater constructions.

**Read More:**

[Applications of Different Cement Types for Concrete Construction](#)

[Tests on Cement at Construction Site To Check Quality of Cement](#)

[Share This Article](#) [f | Facebook](#) [t](#) [in](#) [o](#)

[DEFLECTIONS IN DETERMINATE TRUSSES](#)

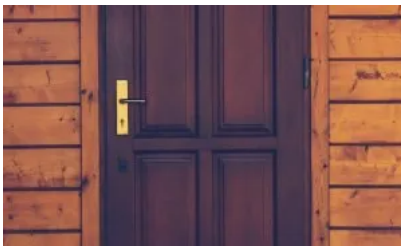
Next a

[Statistical Concepts of Mix Design as per IS](#)



**Gopal Mishra** ✓

Related Posts



**Flush Doors: A Practical And Stylish Choice For Your Home**



**Maximizing Your Space with a Sloping Roof**

Popular Articles

- [Types of Foundation for Buildings and their Uses \[PDF\]](#)
- [Compressive Strength of Concrete -Cube Test \[PDF\], Procedure, Results](#)
- [16 Types of Heavy Equipment Used in Construction](#)
- [Methods of Rainwater Harvesting \[PDF\]: Components, Transportation, and Storage](#)
- [Calculate Quantities of Materials for Concrete -Cement, Sand, Aggregates](#)


Recent Articles

- [Home Decor Trend Alert - Top Wall Texture Ideas](#)
- [Flush Doors: A Practical And Stylish Choice For Your Home](#)
- [Maximizing Your Space with a Sloping Roof](#)
- [Exploring the Different Types of Clamps and Their Uses](#)
- [How to Achieve the Perfect Window Height from Floor](#)


Recent Questions

 Which is the code used for the design of the RCC Bridge?

 1 Answer

 What is the tolerance for compression test results of concrete, according to the standards?


 1 Answer

 What must be the maximum dry density of Granular Sub Base & Wet Mix Macadam used ...













 1 Answer

 What is the Safe Bearing Capacity values for Different Soils?

 1 Answer

 What are the different types of handrails used in bridges?

 1 Answer

-  [Home](#)
-  [About Us](#)
-  [Contact Us](#)
-  [Privacy Policy](#)
-  [Terms & Conditions](#)
  
-  [Ask Questions](#)
-  [Write for us](#)
-  [Popular Questions](#)
-  [Facebook](#)
-  [Instagram](#)
-  [Twitter](#)
-  [Telegram](#)

Search ...

Articles

Search

