PCI MIDWEST
A Chapter of Precast/Prestressed Concrete Institute

PRECAST FOCUS

WHAT'S THE DIFFERENCE BETWEEN CEMENT AND CONCRETE?

In everyday speech, people use the words "cement" and "concrete" interchangeably. But are they really the same? No, they are not.

CEMENT is the gray powder that holds concrete together. Cement is part of the mix that's used to make concrete. Cement is made by combining finely-ground limestone, clay, and sometimes other ingredients in a kiln and sintering them at a temperature of about 1450 °C (2640 °F). The material is allowed to cool, forming nodules called clinker. The clinker is finely ground with small amounts of gypsum and sometimes also grinding aids or limestone. On mixing with water, it hydrates, forming a hard solid that will not dissolve in water.

CONCRETE, on the other hand, is a mixture of water, cement, and fine- and coarse aggregates—usually sand and gravel, respectively.

Today we almost always use one or more admixtures to modify the properties of concrete. Admixtures may entrain air, make fresh concrete more fluid, make it set more quickly or slowly, or reduce the shrinkage.

We often include supplementary cementitious materials in addition to the cement. These are usually industrial byproducts such as fly ash or slag cement. Even so, using them properly can improve the performance of the concrete while reducing its carbon footprint.

You can make concrete in a wheelbarrow in your back yard, but concrete can be much more sophisticated than that. It can be made to be light enough to float in water, strong enough to support a skyscraper, or durable to stand up in even the harshest environments.

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