

Portland cement was first developed in England from natural cements. A builder from Leeds in England, was the first to make cement. He combined clay with limestone by heating the mixture. A similar process is used to make cement today, but more sophisticated and this helps to produce tons of cement. Concrete is produced by mixing cement, water, sand and stones (or rocks) into a paste. Portland cement is the basis of concrete – the substance that, together with water, holds sand and stones together. This occurs when the cement dries and hardens.

Cement hardens because of a chemical reaction. Cement is able to harden due to the water that is added in its mixture. The water causes bonds to form between it and the cement which eventually harden to its more functional form. The amount of water added is also a key factor to how strong cement will be. Cement used in construction can be characterised as being either hydraulic or non-hydraulic. Hydraulic cement (e.g. Portland cement) hardens because of a process called hydration. Hydration is a chemical reaction between the dry cement powder and water. The chemistry ruling the action of the hydraulic cement is the addition of water. Hydraulic cement (such as the Portland cement) is made of a mixture of silicates and oxides, with four main components. Non-hydraulic cement hardens by a process called carbonation. Carbonation is a chemical reaction between the calcium containing compounds in cement and carbon dioxide present in air.