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Castle Rapid Hardening Portland Cement technical specification

Castle Rapid Hardening Portland Cement (RHPC) is manufactured to comply with the requirements of BS EN 197-1 : 2000 type CEM I Portland cement strength class 52,5N.

Castle RHPC is chemically similar to Castle Ordinary Portland Cement (OPC) but is more finely ground to achieve higher early strengths.

Applications

Castle RHPC is suitable for use in concrete, mortars, or grouts in a wide variety of applications which call for the benefit of higher early strengths.

Quality

Castle RHPC is produced using carefully selected raw materials. Strict quality control throughout each stage of the manufacturing process ensures that a consistent final product is achieved.

Each Castle RHPC is licensed under the European Union system of conformity evaluation and carries the CE conformity mark which provides independent third party certification of product conformity. It confirms that in addition to applying a system of factory production control based on BS EN ISO 9002, independent sampling and testing of the cement has confirmed its compliance with all of the requirements of BS EN 197-1 (see Quality Assurance).

Technical information on the quality of Castle RHPC is available to customers on request from Castle's Technical Helpline on 0845 722 7853. Reports of tests providing data on fineness, setting times, soundness, chemical composition including alkali levels and compressive strengths of mortar prisms are available on a weekly basis.

Strength

Castle RHPC achieves higher earlier strengths than Castle OPC because it is more finely ground.

Castle RHPC is chemically similar to Castle OPC and as such concrete mixes should be designed with this in mind. In particular, optimum ultimate strength of concrete using Castle RHPC will depend, like Castle OPC, on careful attention to the water/cement ratio, consistent with ensuring satisfactory placing and compaction.

Generally however, the use of Castle RHPC affords a significant early strength advantage over Castle OPC of around 30 per cent in the first 24 hours after casting, reducing to some 10 per cent at 28 days. The durability, ultimate strength, Young's modulus, creep and shrinkage associated with concrete made from Castle RHPC are similar to those of concrete made from Castle OPC.

Castle RHPC helps to increase concrete production in the factory environment since forms can be struck and the units moved and put into use more quickly than with Castle OPC.

Concrete mix design

The general principles of concrete mix design using Castle RHPC are similar to those using Castle OPC. However, some modifications to mix design may be helpful to achieve the full benefit of its early strength properties.

The chemical resistance of products made from Castle RHPC is similar to those made from Castle OPC. Therefore the same general requirements to achieve durability should be applied, i.e. cement content, water/cement ratio, compaction and curing.

Admixtures and extenders

Admixtures such as air-entraining agents and workability aids, extenders such as ground granulated blastfurnace slag and Castle BS EN 450 Fly Ash, are compatible with Castle RHPC. It is recommended that trial mixes are carried out to determine optimum proportion.

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