Rapid Hardening Portland Cement

I.S. EN 197-1: 2001 CEM I Portland Cement Class 42,5R

Rapid Hardening Portland Cement (RHPC) is a special purpose cement used in concrete to achieve a higher rate of early strength development, compared to using Normal Cement. The improved early performance of RHPC is achieved principally through increased product fineness.

The quality of all RHPC produced by the company is guaranteed to meet in full the requirements of Irish Standard I.S. EN 197-1 'Cement Part 1: Composition, Specifications and Conformity Criteria for Common Cements' and the product is independently certified by the National Standards Authority of Ireland and is CE marked.

Cement clinker is made by fusing together at high temperatures a precisely controlled blend of very finely ground limestone and shale. A small quantity of gypsum is added to this clinker before grinding to produce the final, very fine powder – Rapid Hardening Portland Cement. RHPC is manufactured in modern dry process works at Castlemungret Co. Limerick and Platin Co. Meath and is supplied either in bulk or in bag.

Applications

Typical applications of RHPC include precast concrete production, concrete masonry, urgent repair work and cold weather concreting.

Product Data

Regular information is available on the performance aspects of RHPC which are of direct interest to specifiers and users.

The requirements of Irish Standard I.S. EN 197-1 : 2001 for CEMI Portland cement are compared hereunder to typical performance data for Rapid Hardening Portland Cement class 42,5R.

Setting time

I.S. EN 197-1 requires a minimum initial setting time of 60 minutes for class 42,5R cement. Initial set for RHPC typically exceeds 75 minutes.

Strength

Minimum compressive strengths for standard mortar prisms of 20MPa at 2 days and 42,5MPa at 28 days are stipulated in I.S. EN 197-1 for cement class 42,5R, in accordance with particular compliance rules.

Class 42,5R typical mortar prism strengths are in the range 28-32 MPa at 2 days and 50-60MPa at 28 days for RHPC from both works.

Users are particularly interested in early strength development and durability in concrete. Strength is significantly affected by mix constituents and proportions, ambient temperature and the efficiency of curing. A durable concrete requires an adequate cement content and a low water/cement ratio. Guidance is available in Irish Standards for concrete and concrete products and, for all applications, directly from Irish Cement's Technical Marketing Department.

Chemical Composition

Portland cement clinker consists predominantly of compounds formed from calcium, silica, alumina and iron. Calcium sulfate is present in cement due to the gypsum addition to control setting time and up to 5% of minor additional constituents may be added for CEMI Portland cement in accordance with I.S. EN 197-1 (e.g. Limestone, Pfa, Raw meal).

Specific chemical data (e.g. alkalis and chlorides) are provided regularly on test certificates.

Detailed information on chemical and compound composition is available on request.

Test Certificates

Routine product test data covering the key physical and chemical parameters is made available on a weekly basis on request.

Quality Assurance and Certification

In addition to the company's own guarantee, RHPC is CE marked in accordance with the requirements of the EU Construction Products Directive. The CE mark has been awarded by National Standards Authority of Ireland (NSAI).

Irish Cement Ltd holds Quality Systems Certification to I.S. EN ISO 9001: 2008 and Environmental System Certification to I.S. EN ISO 14001: 2004 from NSAI.

Storage

Cement should be stored dry, otherwise its quality will deteriorate through premature hydration and carbonation. Moisture from the air can be as harmful as direct moisture. Cement stored in bulk in a well-maintained silo should maintain its quality for some months. RHPC is supplied in moisture resistant paper bags to give improved storage life.

Health & Safety

Cement is irritating to eyes, respiratory system and skin. Keep out of the reach of children. Avoid contact with the skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Wear suitable protective clothing. A chromium VI reducing agent has been added and is effective for 2 months (Bulk cement) from the date of despatch and 3 months from the date of packing (marked on bag) if stored in dry conditions. A detailed Safety Data sheet is available from Irish cement Limited (Tel. 041 987 6000).

Advice and Information

As part of its ongoing commitment to the quality of design and construction in concrete, Irish Cement provides a comprehensive technical advisory service on the use of cement and concrete.

This technical support is provided by a team of civil engineers, with wide experience of cement and concrete technology, who are available to answer queries and give advice.

They can be contacted at: Technical Marketing Department, Irish Cement Ltd, Platin, Drogheda, Co Louth.

Tel: 041 987 6464 Fax: 041 987 6400
Email: info@irishcement.ie Web: www.irishcement.ie

Other Cements

Irish Cement Limited also manufactures Normal Cement (Bulk), Normal Cement (Bagged), and Sulfate Resisting Portland Cement. Similar data sheets on each of these products are available on request.

December 2010