



High Early Strength Cement



Ideal for jump/slip form construction



High Early Cement is ideal in pre-cast applications



High Early Strength Cement

High Early Strength Cement is a special-purpose cement for concrete applications requiring increased early strength development. It is ideal when early stripping is required or when the structure must be put into service quickly.

Where there are tight deadlines High Early Strength Cement can improve construction turnaround times, minimise labour costs and overheads. In addition, its early strength capability can assist in cold weather environments.

High Early Strength Cement significantly exceeds the minimum requirements specified in Australian Standard AS3972, for Type HE cement.

Construction benefits

- Permits early stripping and faster turnaround times
- Increased early strengths promoting speed of construction
- Allows early use of concrete applications in load bearing situations and in cold weather environments
- Potential reduction in labour costs, overheads and building cycle times

Product applications

- Suspended slabs – pre-stressed concrete to allow for early stressing
- Precast and tilt-up operations – buildings, walls
- Cast-in place construction

High Early Strength Cement is a special-purpose cement for concrete applications requiring increased early strength development.

Caution should be taken when specifying Type HE cements for use in mass concrete elements as peak temperatures and heat generation can be greater than that achieved with either Type GP or GB cements.

High Early Strength Cement Properties

The following table details the relevant specified requirements of AS3972 and the indicative values achieved by High Early Strength Cement.

		AS3972 Type HE	Indicative Type HE
Setting Time	Min	45min	55-135 min
	Max	6 hrs	2.0 - 3.0 hrs
Soundness	Max	5 mm	< 2mm
SO ₃ Content	Max	3.50%	< 3.0%
ISO Mortar Compressive Strength	3 Day (min)	25 MPa	35-45 MPa
	7 Day (min)	35 MPa	46-51 MPa
	28 Day (min)	–	56-67 MPa

All testing is conducted in accordance with the relevant Australian Standard test methods, at a NATA registered laboratory.

Compatibilities

High Early Strength Cement is compatible with:

- Admixtures that comply with AS 1478 – Chemical Admixtures for Concrete.
- Fly ashes complying with AS 3582.1 – Supplementary Cementitious Materials for Use with Portland cement: Fly ash.
- Ground granulated blast furnace slags complying with AS3582.2 - Supplementary cementitious materials for use with Portland cement: Slag - ground granulated Iron blast-furnace.
- Amorphous Silica complying with AS3582.3 - Supplementary cementitious materials for use with Portland cement: Amorphous silica.
- Other cements complying with AS3972 - Portland and blended cements.

Note: High Early Strength Cement is compatible with both fly ash and granulated blast furnace slag. However it should be recognised that their incorporation can slow early strength development.

Caution: High Early Strength Cement must not be mixed with high alumina cement as this may result in uncontrollable expansion and setting times.

Mix Design

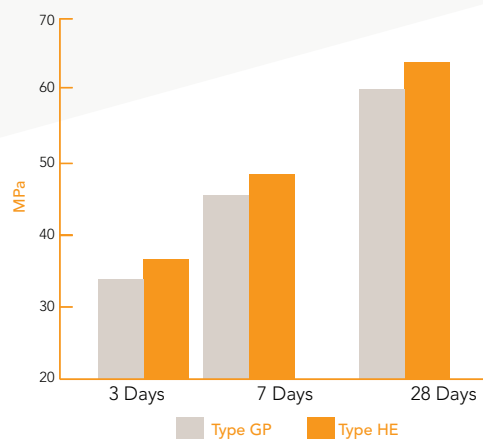
The proportioning of constituent materials in a concrete mix is a complicated matter which can be influenced by many factors. We recommend that trials be conducted with the available materials, to ascertain optimum cement contents for specific classes of concrete. For further guidance on this issue please refer to AS1379 – The specification and manufacture of concrete and AS3600 – Concrete structures.

Concrete Properties

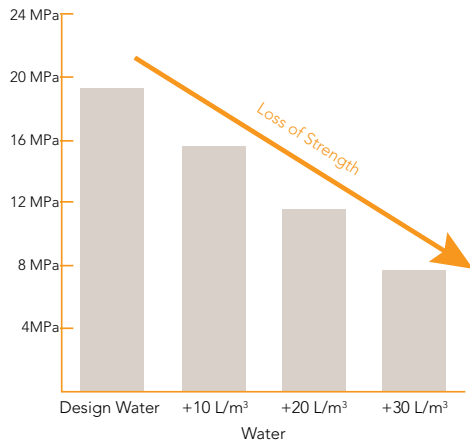
Compressive strength development

Strength development in Portland cement concrete is affected by a number of factors such as the physical and chemical properties of the cement, water to cement ratio, admixtures, curing and environmental conditions. The following graph compares the indicative mortar bar compressive strength development of Type HE cement to Type GP cement. AS3972 differentiates Types GP and HE on the basis of ISO Mortar strength. The significant difference in mortar strength performance may not be fully reflected in concrete.

Compressive Strength Comparison (ISO Mortar Bar Results)



Effect of Excess Water Addition on Concrete Compressive Strength



Workability/Setting Times

Concrete produced with Type HE cements may lose workability at a faster rate than concrete produced with Type GP or GB cements. Consequently consideration must be given to transportation distances, placing methods and ambient conditions.

Curing

A minimum curing period of seven days is recommended for all exposure classifications. Concrete should be maintained in a continually moist condition wherever practicable. Water sprays, wet sand or moisture retaining techniques, such as clear polyethylene sheets or curing compounds are recommended. Curing should begin upon the completion of surface finishing or in accordance with manufacturers instructions where proprietary curing compounds are used.

For normal class concrete, curing can produce a compressive strength up to 100% greater than concrete not subjected to curing. Water application or moisture retaining curing is more effective for lower grades of concrete. Curing will also beneficially affect other concrete properties including:

- Reduction in the potential for plastic cracking.
- Improvements in surface quality, durability and impermeability.
- Improvement in abrasion resistance.
- Reduction in the carbonation rate.

For further information

Please contact Cement Australia's Customer Support Services:

Tel: 1300 236 368

Fax: 1800 236 329

Email: 1300cement@cemaust.com.au

Storage, Handling and Safety

The 'shelf life' of Portland cement products is dependent on the storage conditions. It is recommended that Portland cement products be re-tested prior to use if the age of the cement exceeds three months.

Portland cement products are highly alkaline materials and are significantly affected by exposure to water. Full Safety, Storage, Handling and Disposal information is available in the specific product Material Safety Data Sheet available on www.cemaust.com.au

Product Disclaimer

The information contained in this sheet is for general guidance only and should not be relied upon in specific instances. Cement performance results quoted are indicative as cement performance can be heavily influenced by a wide range of factors beyond our control. Users should rely on professional advice according to their particular circumstances. To the extent permissible by law Cement Australia will not be liable for any losses due to reliance on the information in this sheet or for losses due to the misuse of its products.

Cement Australia Pty Limited

ABN 99 001 085 561

12 Station Avenue

Darra Queensland 4076

Tel: 1300 CEMENT (1300 236 368)

www.cementaustralia.com.au