Low Heat Cement

CEMENT AUSTRALIA

Ideal in dams where the rate of temperature is critical

Minimise thermal cracking in mass concrete footings

Extra thick (1.5m) walls required for the hospital's radiation unit

Low Heat Cement

Low Heat Cement is specially blended to provide a lower heat of hydration in concrete. This unique attribute makes it ideal for mass concrete pours where the rate of temperature rise and the maximum temperature achieved must be controlled in order to reduce the risk of thermal cracking.

This technology delivers improved later-age concrete strength. When Low Heat Cement is used in concrete significant strength development after 28 days may be achieved. The performance of this type of cement has been proven over many years in critical and complex engineering projects.

Low Heat Cement is manufactured to comply with the requirements specified in Australian Standard AS3972, for Type LH Cement. It also complies with AS3972 requirements for Type SR (Sulfate Resisting Cement).

Benefits of Low Heat Cement

- Assists in minimising the potential for thermal cracking in thick concrete sections
- Significantly improved later-age concrete strengths
- Improved durability performance
- Increased workability and pumpability with large pours

Product applications

Low Heat Cement is ideal for mass concrete applications, including:

- Constructing dams
- Large footings, large raft slabs, wind turbine plinths
- Very high strength concrete

Low Heat Cement is ideal for use in mass concrete structures where rate of temperature rise and maximum temperature achieved is controlled to reduce the risk of thermal cracking.

Where specific properties such as high early strength or rapid setting are of primary importance an alternative cement should be used.

Low Heat Cement Properties

The following table details the relevant specified requirements of AS3972 and the typical values achieved by Low Heat Cement.

Property		AS3972	Indicative Low Heat
Setting Time	Min	45min	125-200 min
	Max	10 hrs	3-5 hrs
Soundness	Max	5 mm	< 1mm
SO_3	Max	3.50%	< 2.0%
ISO Mortar Compressive Strength	3 Day (min)	–	13-20 MPa
	7 Day (min)	10 MPa	23-30 MPa
	28 Day (min)	30 MPa	40-55 MPa
Peak Temperature		23°C	< 21°C

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

Low Heat Cement also meets the requirements of AS3972 for classification as a Sulfate Resisting (Type SR) cement. However use of this product does not guarantee sulfate resistant concrete as there are other factors which may influence concrete performance including cementitious content, water to cement ratio, compaction and curing as well as aggregate type. Further advice should be sought on the use of this product where high performance requirements exist.

Compatibilities

Low Heat Cement is compatible with:

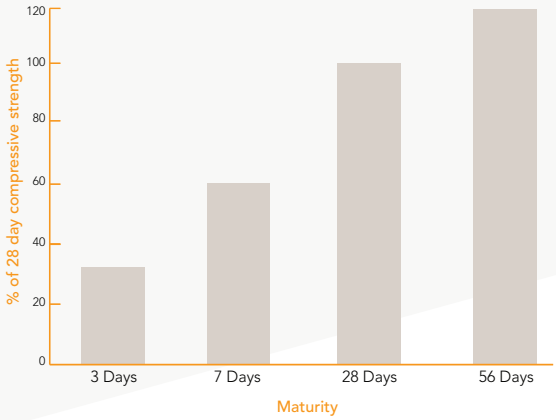
- Admixtures that comply with **AS 1478 – Chemical Admixtures for Concrete**.
- Fly ashes complying with **AS 3582.1 – Supplementary Cementitious Materials for Use with Portland cement: Fly ash**.
- Ground granulated blast furnace slags complying with AS3582.2 - **Supplementary cementitious materials 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.**

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

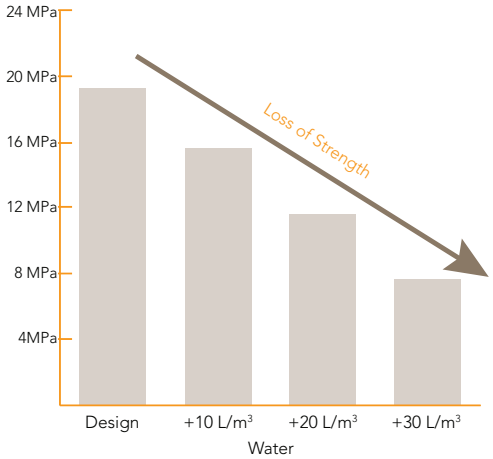
Concrete Properties

Concrete 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 cement ratio, admixtures, curing and environmental conditions. The following graph depicts indicative compressive strength development for Low Heat Cement.



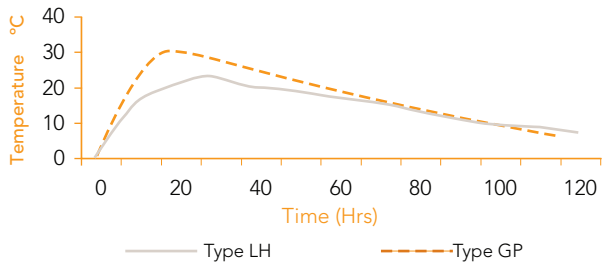
Effect of Excess Water Addition on Concrete Compressive Strength



Temperature Profile

The following graph compares the temperature profiles of Type LH and Type GP cements.

Semi Adiabatic Temperature Rise Comparison



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.

Workability/Setting Times

Concrete produced with Low Heat Cement may require less water to achieve a specified level of workability when compared to a concrete produced with a GP cement. Setting times may be significantly extended when using a Type LH cement.

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

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