ECO-CEM 250

High Performance, Low Carbon

PRODUCT DATA SHEET

GENERAL BLENDED (GB) CEMENT

ECO-CEM 250 is a new generation General Blended (GB) cement containing a nominal 25% natural pozzolan complying with NZS 3122 and NZS 3123.

COMPOSITION & MATERIALS

The primary ingredients of HR Cement **ECO-CEM 250** are a calcium silicate based clinker, gypsum and a natural pozzolan ground to a fine powder.

HR Cement Ltd. manufactures **ECO-CEM 250** by intergrinding Portland cement clinker with a natural pozzolan mined and supplied in accordance with NZS 3123. This natural pozzolan is added during the grinding process to ensure that the components are intimately mixed. Admixtures, are used to maximise the benefits of the natural pozzolan.

When mixed with water **ECO-CEM 250** sets and hardens into a solid monolithic mass. The hydration of calcium silicates forms a gel-like material called calcium silicate hydrate.

All HR Cement manufacturing is quality controlled to ensure product performance and uniformity.

BASIC USE

ECO-CEM 250 cement can be used in concrete, precast, and masonry products for a multitude of construction projects including high-rise office buildings, roadway bridges and pavements, residential foundations and driveways, water collection and treatment facilities, and other structures.

ECO-CEM 250 is manufactured to provide a consistent strength, durability, workability and finished appearance.

CARBON REDUCTION

Producing a tonne of cement releases around 900kg of carbon dioxide into the atmosphere.

ECO-CEM 250 contains 25% naturally occurring pozzolan. The cement this material replaces in the concrete mix enables a significant reduction in carbon emissions.

FOR EXAMPLE: If all cement produced in New Zealand (1.5 MT pa) was replaced with **ECO-CEM 250** at a minimum of 25% natural pozzolan this would result in a reduction in carbon emissions of 225,000 tonnes per annum.

BENEFITS

ECO-CEM is also an ideal choice where a blended cement is required due to workability or durability requirements.

The natural pozzolan in **ECO-CEM 250** imparts the following short-term benefits to the concrete mix:

- Improved workability and pumpability
- Reduced water demand and bleeding
- Improved shrinkage resistance
- Reduced potential for Alkali-Silica Reaction (ASR)
- Improved later-age strength workability

The natural pozzolan in **ECO-CEM 250** imparts the following long-term benefits to the concrete:

- Improved durability performance of concrete.
- Improved resistance to sulphate and chloride attack

PRODUCT DATA SHEET

CEMENT PROPERTIES

The table below shows the relevant specified requirements of NZS 3122-2009 (where applicable) and typical values achieved by GB Cement.

Property		NZS 3122-2009 TYPE GB	Typical ECO-CEM 250
Fineness	m^2/kg	N/A	370
Setting Time	min	45 min	120 min
	max	10 hrs	3.4 hrs
Soundness	max	5mm	1.3mm
Na_2O Eq.	Max	N/A	
SO_3	max	3.5%	1.9%
ISO Mortar Compressive Strength	7 day min	20 MPa	35-45 MPa
	28 day min	35 MPa	50-60 MPa
Loss on ignition	%	N/A	1.3

		NZS 3122-2009 TYPE GB	Typical ECO-CEM 250
Portland clinker	%	N/A	70
Gypsum	%	N/A	5
Natural pozzolan	%	10 – 35	25

STANDARDS

ECO-CEM 250 complies with requirements specified in New Zealand Standard 3122-2009 "Specification for Portland and blended cements (General and special purpose)" and the natural pozzolan component complies fully with NZS 3123.

AGGREGATES

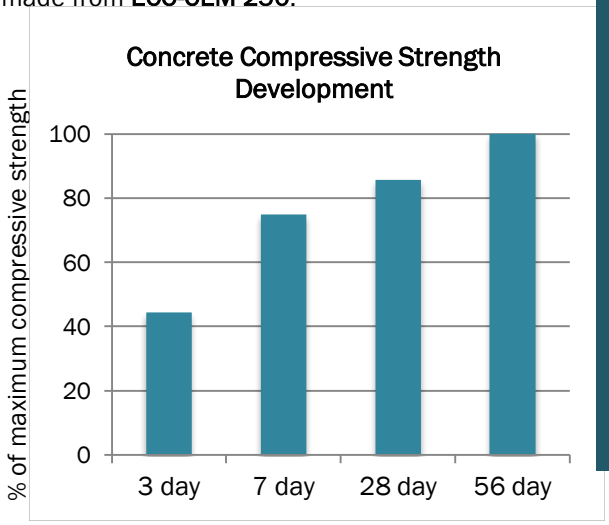
If the aggregates to be used with **ECO-CEM 250** are potentially alkali reactive please contact us for further information.

SIZES

HR Cement **ECO-CEM 250** can be supplied in bulk quantities (tonnes) or in one tonnes bulk bags, 20 and 40kg multiwall paper bags.

CONCRETE PROPERTIES

The strength development of 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 shows compressive strength development over time of a typical concrete made from **ECO-CEM 250**.



ECO-CEM 250 will develop 80% compressive strength after 28 days and close to full compressive strength after approximately 56 days.

STORAGE, HANDLING AND SAFETY

For comprehensive safety, storage, handling and disposal information please consult the **HR Cement - Material Safety Data Sheet for ECO-CEM 250.**

COMPATIBILITIES

ECO-CEM 250 is compatible with:

Admixtures that comply with NZS 3113 and AS 1478.

Fly ashes complying with AS 3582.1

Ground granulated blast furnace slags complying with AS3582.2.

Amorphous silica complying with AS3582.3 or NZS 3123

Other cements complying with NZS3122.

TECHNICAL SERVICES

Technical services are available by contacting the HR Cement office (see next page).

CONCRETING PRACTICES

The character of structural concrete is largely determined by the water-cement ratio. The amount of cement in relation to the amount of aggregate is especially critical for a durable, strong concrete.

Good concreting practices are required for proper, durable and strong concrete. Proper proportioning, batching, mixing, placing, consolidating, finishing and curing, as well as proper subgrade preparation, formwork, uniform slump and other special techniques, are critical to achieving the desired results.

A minimum curing period of seven days is recommended for all uses of GP cement. The concrete should be maintained in a continually moist condition when this is practical during this time. 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 manufacturer's 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.

MIX DESIGN

Mix design is influenced by many different factors. It is recommended that trials be conducted to determine the optimum cement contents for specific classes of concrete. For further information consult: **NZS 3101 – Concrete Structures Standard.**

CERTIFICATION

Upon request HR Cement, can provide technical reports demonstrating that **ECO-CEM 250** meets or exceeds applicable NZ Standards.

PRODUCT DISCLAIMER

The information contained in this product data sheet is for general guidance only and should not be relied upon for specific projects. Cement performance results quoted are indicative only of this product. A wide range of variable factors influences actual cement performance. **End users should** seek professional advice for their project. To the extent permissible by the law of New Zealand, **HR Cement Ltd** will not be liable for any losses due to reliance on the information contained in this sheet or for losses due to inappropriate use of these products.

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