

## ORDINARY PORTLAND CEMENT

### BASIC USE

HR Cement Xtra-Cem 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.

HR Cement Xtra-Cem is manufactured to provide a consistent strength, durability, workability and finished appearance.

### COMPOSITION & MATERIALS

The primary ingredients of HR Cement Xtra-Cem are a calcium silicate based clinker and gypsum ground to a fine powder. When mixed with water Xtra-Cem 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 products are manufactured according to strict quality control levels to ensure product performance and uniformity.

### CEMENT PROPERTIES

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

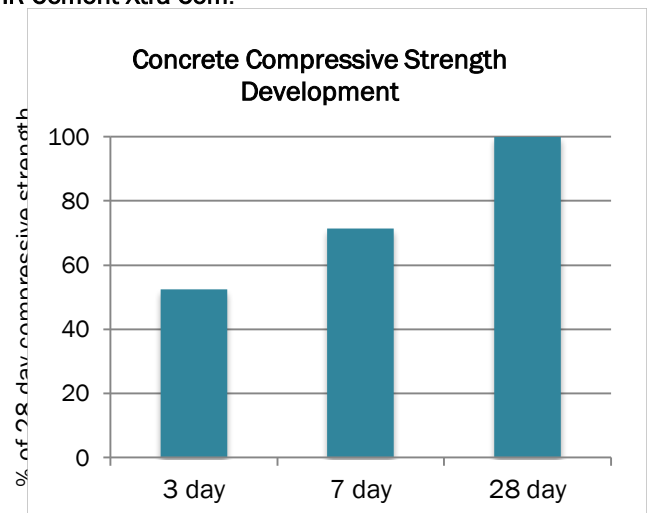
Property		NZS 3122-2009 TYPE GP	Typical Xtra-Cem
Fineness	m <sup>2</sup> /kg	N/A	340
Setting Time	min	45 min	85 min
	max	6 hrs	2.8 hrs
Soundness	max	5mm	1.2 mm
Na <sub>2</sub> O Eq.	Max	N/A	0.5%
SO <sub>3</sub>	max	3.5%	2.4%
ISO Mortar Compressive Strength	7 day min	35 MPa	50 MPa
	28 day min	45 MPa	70 MPa
Loss on ignition	%	N/A	1.0

Property		NZS 3122-2009 TYPE GP	Typical Xtra-Cem
Portland clinker	%	N/A	95
Gypsum	%	N/A	5

SiO <sub>2</sub>	%	20.4
Al <sub>2</sub> O <sub>3</sub>	%	5.1
Fe <sub>2</sub> O <sub>3</sub>	%	3.5
CaO	%	64.9
MgO	%	1.3
Na <sub>2</sub> O	%	0.4
K <sub>2</sub> O	%	0.2
C <sub>3</sub> S	%	62.9
C <sub>2</sub> S	%	11.0
C <sub>3</sub> A	%	7.5
C <sub>4</sub> AF	%	10.7

### 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 HR Cement Xtra-Cem.



## STANDARDS

HR Cement Xtra-Cem complies with requirements specified in New Zealand Standard NZ3122-2009 "Specification for Portland and blended cements (General and special purpose)"

## COMPATIBILITIES

*HR Cement Xtra-Cem 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.

## SIZES

HR Cement Xtra-Cem can be supplied in bulk quantities (tonnes) or in one tonnes bulk bags, 20 and 40kg multiwall paper bags.

## 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 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.



## 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.**

## AVAILABILITY & COST

HR Cement Xtra-Cem is available for delivery throughout New Zealand.

Please contact the HR Cement Office (see below) for pricing information.

## CERTIFICATION

Upon request HR Cement can provide technical reports demonstrating that **Xtra-Cem** meets or exceeds applicable NZ Standards.

## TECHNICAL SERVICES

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

## STORAGE, HANDLING AND SAFETY

For comprehensive safety, storage, handling and disposal information please consult the **HR Cement - Material Safety Data Sheet for Xtra-Cem**

## 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 particular 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.

### *For further information*

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