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**ROMAN**

Construction Products Ltd.

The Granary Malt Kiln Farm  
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## Description:

In 1796 the Reverend James Parker Patented Roman Cement and it became highly desirable for its long term durability. After 1824 Roman cement declined due to the introduction of Portland cement which in the present day, as an Ordinary Portland Cement (OPC), is burnt at fusion temperatures and can have some undesirable effects on historic buildings.

Natural Roman Cement (NRC) is now available to blend with hydrated limes for a reliable set.

**NRC** has a better compatible strength with historic masonry and renders due to the special processing of the gault stone and the lower kiln temperatures used.

**NRC** is suitable for conservation and new build projects where characteristics such as breathability, flexibility and colour are important. The lower shrink rate avoids cracking.

**NRC** can be blended with up to 2 parts lime; when mixed with the right aggregate it will produce a more flexible material with a vapour open quality which is similar to air lime.

**NRC** has a unique buff colour which, unlike other cements, does not produce any grey tones.

**NRC** is unique because it is cement without mineral or chemical additives to control the speed of set.

**NRC** has excellent shelf life, 28 day, 90 day and 12 month test results show no significant loss of strength on cement 21 months old when properly stored. A particular advantage when formulating pre-mixed mortars.

**Natural Roman Cement is available in 20kg bags**

## Using Natural Roman Cement

NRC can be used in almost any situation where OPC or limes are used.

**Typical blends: NRC-lime-well graded sharp aggregate**

			Typical 28 day strength
1	0	3	3.5 Newtons
2	1	9	3 Newtons
1	1	6	2.5 Newtons
1	2	9	2 Newtons

**Check sand void ratio and alter accordingly. 1:3 binder ratio assumed although sands vary.**

Workable life of fresh mortar 60 minutes variable according to temperature.

**Other blends:** Seek advice from Technical to check the suitability of NRC before specifying. Tel. (UK) 01760 337994

Set	Time to set	Details	Typical Strength
Set 1	1-12 hours	Firm to touch	Nominal
Set 2	2-3 weeks	Dormant for up to 3 weeks during which it can still be crumbled between the fingers	3 N/mm <sup>2</sup>
Set 3	1 year	Full the potential for the task	10 N/mm <sup>2</sup>
Set 4	Final set	Undermined period for the final strength	ND

**Store in a dry area and do not use in extremes of temperature**

Natural Roman Cement , NRC and Rocem (TM) are trading names of Roman Construction Products Ltd.

## Technical information

**All results below are typical values according to BS EN 1015-19:1999, results are taken from 2 independent test facilities**

**Roman cement can be mixed with a Pozolanic material or Lime to make formulated mortars:**

When mixed with lime hydrate NRC creates a Hydraulic Lime. These Hydraulic Limes can be tailored to each individual task with reliable results. The table below also shows how NRC can be mixed with a Pozolanic material (GGBS in this case) for a wide range of uses. We recommend up to 25% Pozolanic material for optimum results. The table below also shows how binders in general might continue to strengthen beyond the recognised 28 day bench mark. Soft cement lumps in the bag are a natural feature of this product and will not affect its performance.

**Typical compressive strengths using Natural Roman Cement (NRC) and Singleton Birch hydrated lime or GGBS.**

Sample values by weight	Typical 28 day strength (N/mm <sup>2</sup> )	Typical 90 day strength (N/mm <sup>2</sup> )	Typical 365 day strength (N/mm <sup>2</sup> )
Roman Cement + 25% GGBS	10.61	-	-
Roman Cement + 10% GGBS	6.17	-	-
Roman Cement	<b>3.47</b>	<b>6.06</b>	<b>11.52</b>
Roman Cement + 25% Hydrate	3.32	5.29	8.81
Roman Cement + 50% Hydrate	2.62	4.11	6.29
Roman Cement + 75% Hydrate	1.74	2.99	3.86

The following table gives further test results and typical values in accordance with BS EN 1015-19:1999.

Test type	28 days	1 YEAR
Flexural Strength	1.58 MPa	3.14 MPa
Compressive Strength	3.47 MPa	11.52 MPa
Compressive strength retained after 10 freeze-thaw cycles*	54%	65%
Water absorption coefficient (28 days)	7.70 kg/m <sup>2</sup> /hr <sup>0.5</sup>	
Vapour permeability (28 days)	0.96E-11, kg·m <sup>-1</sup> ·s <sup>-1</sup> ·Pa <sup>-1</sup> (V1 High)	
Percentage clay content	21.8-26.7%	
Thermal conductivity of NRC as Hempcrete	0.0465 W/mK	

\*Compressive strength of the sample after 10 freeze-thaw cycles expressed as percentage of the strength of the control sample

Specific qualities are determined by both aggregate and binder combination, seek advice from RCP Ltd Technical.

# Further information

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Some clarifications about the differences and similarities between the Natural hydraulic lime and cement Natural are listed below:

Naturally Retarded Natural Cement is obtained by crushing, heating and reducing marl stone powder. Both Natural Hydraulic Lime and Natural Cement are obtained by calcining rocks which are essentially composed of limestone with varying amounts of silica clay. Also found in this composition, in small quantities is: alumina, iron oxide, magnesia and sulfuric acid. Both products have hydraulic properties (provided by the clay content); by consequence they can set and harden under the influence of air and water.

Hydraulic lime is so called when the percentage of clay stone is higher than 5% and always less than 17% -20%. By the amount of clay we can determine the classification (hydraulic, moderately hydraulic, hydraulic limes and eminently hydraulic). Thus, they are able to set in an environment saturated with moisture thanks to the proportion of silicates and calcium aluminates, but at the same time retaining an air phase which allows the lime to reabsorb CO<sub>2</sub> from the atmosphere. This combined behaviour brings about a reduction in the setting time which is particularly useful for unsettled weather and winter working projects.

Unlike natural hydraulic limes, the percentage of clay limestone in natural cement is more than 17%.

## Safety information:

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Please see the links to access our safety and technical data sheets.

### IMPORTANT SAFETY INFORMATION:

- WEAR YOUR EYE PROTECTION – IT COULD SAVE YOUR SIGHT
- Ensure eye protection is provided to all staff and apprentices
- If you get mortar in your eye, flush eyes continuously with clean running water and get somebody to call for medical advice.
- Make sure that the gloves and glasses you are wearing are suitable for the task.
- Tell your instructor, supervisor or PMO if you do not have the correct PPE. You should have at least two types of glove, one pair trade specific and the other for manual handling/labouring.
- Never underestimate the damage that mortar can cause. Wear protective clothing at all times.
- It does not matter if the site you are on do not have a PPE policy, you must wear yours at all times when working.



#### Risk Phrases

- R36/37/38 Irritating to eyes, respiratory system and skin
- R66 Repeated exposure may cause skin dryness or cracking
- R43 May cause sensitisation by skin contact

**Xi Irritant**

#### Safety phrases

- S22 Do not breathe dust
  - S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
  - S24/25 Avoid contact with skin and eyes
  - S36 Wear suitable protective clothing
- Note: Contains salts at a rate of 6 parts per thousand