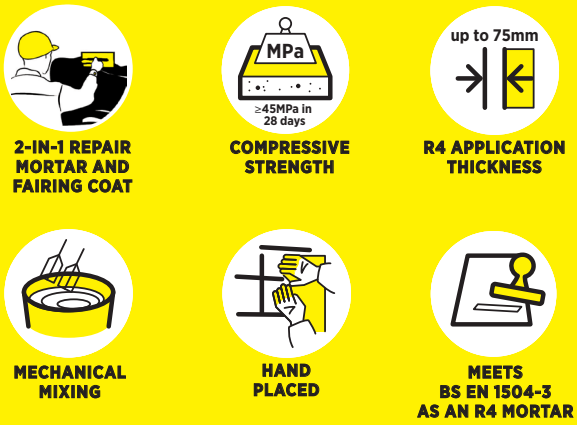
webercem R4 duo

2-in-1 R4 repair mortar and fairing coat

- Lightweight, high build mortar for overhead and vertical repairs
- Complies with BS EN 1504-3 as an R4 mortar or R3 fairing coat
- Excellent levelling properties when used as a fairing coat



About this product

webercem R4 duo is a single-component, polymer-modified, high build cementitious mortar, designed for structural concrete repairs. It requires only the addition of clean water to produce a low permeability, high strength mortar for both soffit and vertical repair situations as well as levelling solutions.

This product has been formulated to comply with the requirements of BS EN 1504-3 as an R4 mortar. Can also be used as a fairing coat tested to BS EN 1504-3, when appropriately prepared.

Features and benefits

- Dual purpose product that can be used as a repair mortar and/or fairing coat
- High build properties – up to 75mm vertically and 75mm in an overhead repair, without formwork when used as an R4 mortar
- Easy to apply, with excellent application properties
- When used as a fairing coat 3mm of coverage provides as much protection against CO_2 diffusion as 30mm of low permeability concrete or 300mm of high permeability concrete

Uses

- Structural concrete repairs, particularly where high, overhead repairs are required
- Repairs to concrete structures and members such as bridges and coastal assets
- As a smoothing treatment for concrete surfaces

webercem R4 duo
as a R4 repair mortar

When used as a R4 repair mortar

Preparation

Concrete

Concrete substrates must be adequately prepared by use of mechanical means, as appropriate. All forms of contaminants must be removed to provide a clean, sound and suitable substrate with a well prepared edge. Any contaminated concrete must be removed. All damaged concrete should be cut back to a sound surface and at least 15 - 20mm behind any exposed reinforcement, depending on cause of corrosion.

Saturate the concrete with clean water and remove excess. New concrete must be at least 14 days old.

Typically patch repairs are ideal for areas up to approximately 0.5m². In the event there are larger repairs to be carried out please contact Weber Technical Services as other methods of repair may be considered, such as flowable or sprayed repair mortars.

Steel substrates

These should be prepared in accordance to BS EN 1504-10. Contact Weber technical services for further guidance.

If **webercem R4 duo** is not to be applied within 4 hours exposed steel should be appropriately protected.

Bonding

Immediately prior to placing the **webercem R4 duo** apply a bonding slurry of **webercem bondcoat** to the prepared steel reinforcement and concrete substrate. For detailed application instructions, see separate **webercem bondcoat** data sheet.

Mixing

Mix 20kg **webercem R4 duo** with 2.3 – 2.5 litres of clean water to a uniform smooth mortar consistency.

Mixing should be carried out in a forced action pan mixer or an appropriate drill and paddle mixer no less than 250rpm and not exceeding 450rpm for 2 minutes Allow to stand for 2 minutes before remixing for 1 minute. Do not over-mix or hand mix.

Application

Apply the mixed mortar whilst the bonding slurry is still tacky and compact well into place.

Where sections greater than 75mm are required to be filled, multi-layer applications should be used to avoid slumping. Intermediate surfaces should be scratched to give a good mechanical key. **webercem bondcoat** is also required between each application. Always apply the mortar in uniformly thick layers; avoid feather edging.

Pack in by hand. Finish to profile with a wooden or plastic float and/or sponge to present a lightly textured surface.

Do not apply when temperatures are below 5°C or above 35°C, in direct sunlight or on hot or frozen surfaces.

Curing

Unless a coating or other system is to be applied to the surface, cure immediately after finishing with a suitable membrane. If further information is required, please consult Weber Technical Services.

If **webercote smooth** anti-carbonation coating is to be applied please refer to the product data sheet.

Packaging

webercem R4 duo is supplied in 20kg bags

Yield

Yield is approximately 12-13 litres per 20kg bag.

Storage and shelf-life

When stored unopened in a dry place at temperatures above 5°C, shelf life is 12 months from date of manufacture printed on the side of the bag.

Health and safety

For further information, please request the Material Safety Data Sheet for this product.

webercem R4 duo
as a fairing coat

When used as a fairing coat

Surface preparation

webercem R4 duo, when used as a fairing coat, is suitable for use on concrete and steel reinforced concrete.

All substrates must be sound, free of all contamination including laitance, paints, coatings, treatments (e.g. MCIs), oil, grease and dust.

Concrete surfaces must be adequately prepared by use of suitable mechanical means such as high pressure water jetting or needle gunning to produce a lightly textured surface to ensure a good key.

Contaminated concrete surfaces must be suitably prepared. New concrete must be cured for at least 14 days. Do not use a permanent curing membrane.

Defects such as honeycombing, leaks, pinholes, cracks etc. should be treated appropriately prior to the application of **webercem R4 duo**. Pinholes, blowholes, small voids and pores can be treated with **webercem R4 duo** as described below. Cure fresh repairs for at least 24 hours, dependent on site conditions. Thoroughly dampen the area to be treated with clean water and allow excess to drain off before application of **webercem R4 duo**.

Mixing

Mix 20kg of **webercem R4 duo** with 3.1-3.3 litres of clean water to a uniform smooth mortar consistency.

Mixing should be carried out in a forced action pan mixer or an appropriate drill and paddle mixer no less than 250rpm and not exceeding 450rpm for 2 minutes.

Allow to stand for 2 minutes before remixing for 1 minute.

Do not over-mix or hand mix.

For other applications such as pore filling, dubbing out etc. the water addition can be varied depending on the consistency required and the ambient temperature.

Useable time after mixing: > 45 minutes.

Application

Ensure all pores, surface voids etc. are filled first before applying **webercem R4 duo** as a levelling mortar.

For pore filling: Use a palette knife or similar tool to apply the mortar, pressing well into the pores. Alternatively, use a damp sponge to rub the mortar into the pores with a circular motion. Finish flush to the surface and rub off any excess mortar. It is best to allow the pore-filling mortar to harden first before re-wetting and applying the levelling coat.

For surface levelling: Apply with a steel float to a thickness of approximately 3mm pressing well into the damp substrate. If a thicker coat is needed to hide deeper surface imperfections, apply the second coat when the mortar has hardened sufficiently to support it.

Maximum thickness of application: 2-3mm per layer to a maximum of 5mm across both layers. At least 2 hours should be left between coats, depending on site conditions.

Finishing

Use a steel float to provide a smooth surface when the mortar has firmed up sufficiently.

Do not re-wet the surface before trowelling. This may cause some surface crazing.

Rub up with a sponge to produce a suitably smooth surface. Do not apply when temperatures are below 5°C or above 35°C, in direct sunlight or on hot or frozen surfaces.

Curing

For optimal protection **webercem R4 duo** can be over coated with **webercote smooth** anti-carbonation coating - please refer to the product data sheet. Overcoating times are dependent on weather conditions and are typically 48 hours at 20°C.

Packaging

webercem R4 duo is supplied in 20kg bags

Yield

Yield is approximately 12.5-14 litres per 20kg bag.

Storage and shelf-life

When stored unopened in a dry place at temperatures above 5°C, shelf life is 12 months from date of manufacture printed on the side of the bag.

Health and safety

For further information, please request the Material Safety Data Sheet for this product.

Technical data

When used as an R4 repair mortar				
Performance Characteristic	**Method**	**Requirement for BS EN 1504-3**	**Result**	
Compressive strength	EN 12190	≥45 MPa	49.8 MPa	Pass
Chloride ion content	EN 1015-17	≤0.05%	<0.01%	Pass
Adhesive bond	EN 1542	≥2.0 MPa	2.4 MPa	Pass
Carbonation resistance	EN 13295	dk ≤ control concrete	dk ≤ control	Pass
Elastic modulus	EN 13412	≥20 GPa	20.1 GPa	Pass
Thermal compatibility Part 1 freeze-thaw	EN 13687-1	Bond strength after 50 cycles ≥2.0 MPa	2.1 MPa	Pass
Capillary absorption	EN 13057	≤0.5 $kgm^{-2}h^{-0.5}$	0.1 $kgm^{-2}h^{-0.5}$	Pass
Coefficient of thermal expansion	EN 1770	N/A	30.0 x 10^{-6}/°C	
Fluxural strength	EN 12190	N/A	10.8 MPa	
Wet density	N/A	N/A	1800kg/m^3	
Dry density	N/A	N/A	1850kg/m^3	
Reaction to fire	EN 13501-1	Declared Value	A2-s1, d0	

Compressive strength	1 day	3 days	7 days	28 days
5°C	0 MPa	5.7 MPa	30.2 MPa	31.6 MPa
10°C	0 MPa	24.8 MPa	33.2 MPa	44.3 MPa
20°C	30.6 MPa	33.4 MPa	45 MPa	49.8 MPa

Results achieved are based upon average performance in laboratory conditions. Please contact Weber if test certification is required.

Technical data when used as a fairing coat				
Performance Characteristic	**Method**	**Requirement for BS EN 1504-3**	**Result**	
Compressive strength	EN 12190	≥25 MPa	45.0 MPa	Pass
Chloride ion content	EN 1015-17	≤ 0.05%	<0.01%	Pass
Adhesive bond	EN 1542	≥1.5 MPa	2.5 MPa	Pass
Carbonation resistance	EN 13295	dk ≤ control concrete	dk ≤ control	Pass
Elastic modulus	EN 13412	≥15 GPa	17.2 GPa	Pass
Thermal compatibility Part 1 Freeze-thaw	EN 13687-1	Bond strength after 50 cycles ≥1.5 MPa	2.2 MPa	Pass
Capillary absorption	EN 13057	≤0.5 $kgm^{-2}h^{-0.5}$	0.1 $kgm^{-2}h^{-0.5}$	Pass
Flexural strength	EN 12190	N/A	9.5 MPa	
Oxygen diffusion coefficient	EN 1062-6:200	N/A	1.80 x $10^{-8}m^2s^{-1}$	
Estimated carbon dioxide diffusion coefficient	EN 1062-6:200	N/A	5.69 x $10^{-9}m^2s^{-1}$	
Wet density	N/A	N/A	1760kg/m^3	
Dry density	N/A	N/A	1730kg/m^3	
Reaction to fire	EN 13501-1	Declared value	A2-s1, d0	

Results achieved are based upon average performance in laboratory conditions. Please contact Weber if test certification is required.
For oxygen diffusion test values for concrete please see Concrete Society Technical Report No. 31

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