

As a consequence of the different cutting processes used at different factories, some H+H Celcon blocks are manufactured with scratched surfaces whilst most are plain faced. The scratched surface is not produced to provide a key for render and is normally inadequate for that purpose. Apart from appearance, blocks supplied from different factories will have identical physical properties. These recommendations, therefore, apply equally to all H+H aircrete products, whether plain faced or scratched.

Externally rendered H+H aircrete as an outer leaf of a cavity wall - or as a solid wall where exposure conditions allow - are recommended constructions. The choice of grade of aircrete and render specification should reflect the exposure conditions and whether the cavity contains insulation or not (see table below). Work should comply with BS EN13914 "Design, preparation and application of external rendering and internal plastering" Part 1: External Rendering.

External product grade	Exposure conditions (up to and including)	CAVITY WALL		SOLID WALL
		clear or partially filled cavity	fully filled cavity	
Solar	Sheltered/Moderate	*	*	✓
	Severe	*	*	*
	Very Severe	*	*	PD6697 recommends impervious cladding to solid walls in severe exposures
Standard, High or Super Strength	Sheltered/Moderate	✓	✓	✓
	Severe	✓	*	*
	Very Severe	*	*	PD6697 recommends impervious cladding to solid walls in severe exposures

✓ Directly bonded render suitable

NOTE: Where provision for movement has NOT been made in the aircrete wall (i.e. vertical movement joints and/or bed joint reinforcement), consideration should be given to the use of a reinforced render system as detailed below.

* Traditional renders should be applied via metal lathing as a reinforced render system. Some proprietary renders may be suitable for direct application subject to confirmation by manufacturer.

Blockwork

Movement Joints: PD6697- Recommendations for the design of masonry structures to BS EN 1996 -1-1 and BS EN 1996-2 advises that for all masonry work, movement joints may need to be provided. The general requirement for concrete blocks is that a movement joint should be provided within 3m from corners and at 6m centres thereafter. In addition, it is advisable for a rendered wall that bed joint reinforcement is incorporated above and below openings. Specific recommendations will depend on the circumstances, and each situation should be assessed on its own merits, please consult our Technical Services Department for further guidance if required.

Mortar: The use of over-strong mortars should be avoided as lower mortar strengths enhance the ability of the wall to accommodate movement. Recommended mortar mixes are as given for render mixes below. Generally, lime based mixes are preferable as these give a better bond than can be obtained with air-entrained mortars of similar compressive strength. In external situations, lime based mortars can also give higher resistance to rain penetration. For thin joint constructions, H+H recommends that only H+H Celfix mortar is used in conjunction with our products.

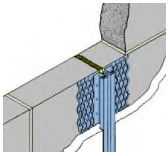
Site Practice: All blocks (as with other materials) should be protected. Keeping the blocks dry will ensure minimal drying out movement.

Render

The following guidance covers the application of traditional renders when applied direct to the aircrete walls.

Where H+H aircrete is used for a solid wall, or for the external leaf of a cavity wall, the external render should be terminated at DPC level, unless a proprietary render approved for such an application is used. A bituminous paint suitable for external use, or similar surface coating, applied to exposed aircrete from 150mm below soil level up to DPC is good practice.





Any movement joints present in the wall should be continued through the render finish. Proprietary types of external-grade stop bead incorporating a cover strip are available for this purpose. Alternatively, two stop beads can be placed back to back with a flexible sealant applied between the two.

Traditional sand: cement mixes should not be stronger than the backgrounds onto which they are applied. Similarly, each coat of render should be weaker than the preceding one. This requirement is normally met by using the same mix proportions for each coat and ensuring that successive coats are significantly thinner. A designation (iii), or equivalent, is the strongest mix recommended for use for direct application on to aircrete walls. Recommended mix proportions (by volume) are as follows:

Cement : lime : sand	1:1:6	Designation (iii) M4
Cement : sand with plasticiser	1:6	Designation (iii) M4
Masonry cement : sand	1:5	Designation (iii) M4

Sand used for rendering should be clean, sharp, well graded and comply with the requirements of BS EN 13139:2002 "Aggregates for mortar". Traditionally, the coarsest and sharpest sand that can be conveniently handled should be used for undercoats. Sand normally used for brick/block laying mortar is unlikely to be suitable due to the high proportion of finer material.

Number and thickness of coats will depend on exposure and method of application. Generally two-coat work is suitable for 'sheltered' and 'moderate' exposure conditions with the final coat being about half the thickness of the undercoat.

Three coats are recommended for 'severe' and 'very severe' exposure conditions (and for renders applied over metal lathing or mesh).

Single coat work should be restricted to proprietary systems designed to be used in this way.

Surface preparation

The background should be adequately prepared. The wall should be cleaned of any dust, loose particles and contamination, which may have occurred during construction. In extreme cases of bad site storage or wet conditions where fungi or algae may have formed on the wall, the surface must first be treated with a fungicide, applied in accordance with the manufacturer's instructions.

As recommended in BS8000 Part 3, we would suggest that mortar joints should be raked by 15mm as work proceeds on all masonry to be rendered in order to provide a good key. For walls built with thin layer mortar joints (which cannot be raked), we would suggest the use of a surface treatment, as detailed below for high suction situations, to improve the key for rendering. Alternatively a reinforced render system may be used.

In order to control high suction, which may exist particularly during warmer weather, and to improve the key for subsequent coats, BS EN13914 Part 1 suggests the use of a surface treatment such as a 'stipple' coat or 'spatterdash'. Alternatively, a proprietary surface treatment, such as Weber Rend-Aid, may be used and applied in accordance with the manufacturers recommendations.

The stipple or spatterdash should consist of 1 part cement to 2 parts sharp sand mixed to a thick creamy consistency with water and a bonding agent suitable for external use (eg SBR, EVA or an acrylic emulsion).



For a stipple coat, the slurry should be vigorously brushed onto the wall to wet the surface thoroughly and then immediately stippled with a freshly loaded brush to provide a stipple texture. Alternatively, spatterdash is applied by throwing the mixture onto the wall to give a rough texture similar to the stipple effect shown. The treated surface should be protected from drying out for the first day and then allowed to dry and harden for another day or two before the rendering undercoat is applied. Any applied surface treatment should be checked to ensure that it is firmly bonded to the background before the undercoat is applied.

The use of a "scratch coat" (normally consisting of a 3-4mm, heavily scratched first coat of the same mix proportions as subsequent coats) to control suction is not recommended for external renders as subsequent coats will invariably be thicker, and therefore stronger.

Application

Undercoats should be a nominal 12mm (± 4 mm to allow for variations in the wall surface) and should be combed or scratched. This not only provides a key for the following coat but also helps to reduce the development of the 'sheet' strength of the render. Scratching or combing should be in wavy lines and not straight, horizontal lines (which can concentrate stresses in one direction leading to subsequent vertical cracking).



Newly applied rendering should be kept damp for the first day or two and the next coat should not be applied until the undercoat has adequately dried for a further two or three days. It is necessary for the drying to take place to provide suction for the next coat. For three-coat work, the second coat should be approximately 9mm.

Final Coats should normally be approximately 6mm thick. Where a proprietary type of finish is used, it should be applied strictly in accordance with the manufacturer's instructions. Otherwise, the render should be finished with a wooden float (the use of steel trowel or float will result in a smooth dense surface which is liable to crazing) to produce the characteristic sandpaper texture, or textured as required.

Dry dash and roughcast finishes traditionally require a strong render mix and are therefore not deemed to be suitable for application on to aircrete. However, such finishes may be used provided a 1:1:6 (or equivalent strength) mix is not exceeded or a reinforced render system is adopted.

Decorative finishes should not be applied until the top coat has dried out, but dry dash and roughcast is part of the top coat and should be applied whilst the top coat is in a suitable state to receive the aggregate to allow adequate embedment.

Admixtures

Providing the work and materials comply as above, the use of additives should not be necessary. Some tradesmen, based on local practice and experience, add water-retaining admixtures (to prevent rendering from losing water too quickly) or waterproofing admixtures (to reduce suction) in undercoats. However, BS EN13914 advises that certain types of admixture may have an adverse effect on adhesion between subsequent render layers and paint, we would therefore advise caution on their use.

Proprietary systems

Proprietary renders should be applied strictly in accordance with the manufacturers' recommendations with regards to suitability and preparation of backgrounds on to which they are applied.

Depending on the supplier, some use only approved installers whilst others will also supply their materials for others to apply and offer a site advice service.

Reinforced render systems incorporating metal lathing or proprietary meshes (e.g. BRC Rendalath, Expamet) should be installed in accordance with the manufacturers' recommendations. This should include guidance on fixings, laps, provision of movement joints and suitable mixes (which may need to be stronger than that previously discussed).

External wall insulation systems are becoming more popular to either improve the thermal performance of existing buildings or to provide high levels of thermal performance to new build. Many such systems exist and these have been successfully applied H+H solid wall products to obtain a U value of $0.15\text{W/m}^2\text{K}$ or less in a cost effective construction. The manufacturer of the system should be consulted for application guidance and it is recommended that the performance of the system is covered by independent certification. The system usually consists of a rigid insulation board fixing mechanically to the aircrete and finished with a render onto a mesh.