Prefabricated Brick Arches

Data Sheet

POWERED BY RIJSWAARD BAKSTEEN

Prefabricated Brick Arches

This product datasheet relates to lightweight prefabricated brick arches sometimes referred to as 'headers' (both flat gauge and segmental) to be used in new build, domestic and non-domestic buildings as part of the outer brickwork leaf of a masonry cavity wall.

They are a decorative feature, have been tested by a third party to determine their suitability to carry the weight of masonry acting above it (as detailed within this document) and are to be used only in conjunction with a structural steel cavity lintel as load bearing support.

DESCRIPTION

The prefabricated arch products consist of fired clay brick slips, attached with epoxy resin to insulated panels which are themselves comprised of either an expanded polystyrene (EPS) or a polyisocyanurate (PIR) foam core, faced on both sides with cement bonded particleboard. The brick slips can be installed in a variety of bond patterns and joint thicknesses to suit the projects design.

FIT FOR PURPOSE STATEMENT

Lightweight pre-fabricated arches are no longer considered unproven or unusual modern methods of construction. Our arches are produced using components and materials in accordance with well-established and long accepted custom and practice as documented and approved by numerous Agrément certificates in circulation.

It is therefore the view of AAB Ltd that the product, in line with the 3rd party testing detailed within this document, is safe and fit for its intended purpose providing it is specified and installed by competent persons, in accordance with this datasheet and all prevailing Building Regulations, standards and legislation.

Jonathan Plews
Date – 7th July 2025
Managing Director

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PRODUCT COMPONENTS

The maximum width ie the longest continuous length of the product is 2400mm X 1200mm. With a span of single unit up to 1033mm and a thickness of 76mm. The brick slips will be a nominal 26mm, maximum 34mm thickness therefore the overall product maximum thickness is 110mm (ie 76mm + 36mm). The following components and materials are used to form the arch products:

Bricks Slips –

Nominal 26mm, Max 36mm deep and cut from bricks manufactured in accordance with BS EN 771-1:2011 and BS4729:2005

Adhesive -

Metolux Metaffix 3-1 and Metofix GRP, solvent free, two component epoxy adhesive (subject of BBA Certificate 12/4893).

Composite Board -

Cement particle/fibre particle board – combination of 10mm thick external and 6mm thick inner cement particle board and a polyisocyanurate (PIR) foam core or an expanded polystyrene (EPS) core (customer preference) both CE marked in accordance with harmonised standard EN 13986:2004

Ancillary Components -

PVC Trims & masonry support system or lintel (both beyond the scope of our testing).

PRODUCT TESTING

Test Summary:

Tests were commissioned to determine:

- Compressive Strength
- Bond Strength after accelerated ageing
- Flexural resistance
- Soft and hard body impacts

Test Detail
3rd Party Testing:

Lightweight Arches manufactured by AAB Ltd in accordance with this datasheet were sent for testing at Lucideon Ltd (www.lucideon.com).

Four brick slip lintels – 2 with EPS cores and 2 with polyisocyanurate (PIR) cores, each with 3 brick types per arch bonded to the external face with one adhesive type were sent for testing. The brick slips consisted of a high, medium and low water absorption brick in order to understand the long-term performance of the lintel when using various brick types which would be expected in practice. Lucideon Ltd carried out the following agreed test programme on one lintel and the second lintel served as a control sample.

The lintel provided was the longest span (ie 1033mm) and the shortest profile produced.

1. One lintel underwent an accelerated weathering programme incorporating heat rain and wet freeze cycles from EAD 040287-00-0404. The full cycles took 40 days to complete.

2. On completion of the weathering, the lintel was then fully supported, and a serviceability compressive load was applied to the full length of the lintel representing the triangular loading of the self-weight of the masonry acting above the lintel. The load was held for 15 minutes, and the lintel was examined to check the appearance of the bond of the brick slips to the backing board before releasing the load. A load deflection relationship was established. Loading was generally in accordance with BS EN 772-1

3. The lintel then underwent flexural loading when supported on 150mm bearers to a serviceability load as per point 2 above. A load deflection relationship was established, and the lintel was examined for any signs of distress. Testing was carried out in accordance with BS EN 846-9.

4. A hard body impact test was carried out on each brick slip type on the weathered sample in accordance with EAD 040287-00-0404

5. The bond strength of each brick slip type to the board substrate was carried out on both the weathered sample and the control sample in order to understand any deterioration of the bond caused by the weathering and to establish the resistance of the brick slip to negative wind pressures. Testing was in accordance with EAD 040287-00-0404

6. A 60-year desk stop study was carried out based on the performance of the lintel and on the individual lintel components.

PRODUCT TESTING

Test Results:

1. Accelerated Weathering

Hygrothermal and Freeze Thaw Results

"All About Bricks Ltd's prefab brick arches (EPS and PUR) underwent hygrothermal testing, in accordance with EAD 040287-00-0404:2018, were inspected and assessed prior to, during and post testing and were found to have no defects, as are outlined within Clause 2.2.5.1 of EAD 040287-00-0404:2018.

All hygrothermal testing has a direct correlation to the assessment of life expectancy of All About Bricks Ltd's prefab brick arches. Generally, as previously stated, this testing is performed with a view to establishing a life expectancy of the system of a minimum of 25 years, following successful assessment.

When the system is fully built-up and installed, the only products, which would be subjected to anything like 'normal conditions', would be the facing brick slips. Bricks have a life expectancy in excess of 100 years. As the brick slips would be the only component subjected to normal conditions once the brick arch was installed, the life expectancy can be increased to be more in line with the life expectancy of the brick elements."

2. Compressive Testing

"The maximum amount of compression of the prefab brick arch with the EPS core recorded during testing, was 0.13 mm with a residual compression of 0.02 mm. The maximum amount of compression of the prefab brick arch with the PUR core recorded during testing, was 0.08 mm with a residual compression of 0.01 mm. No creeping was recorded during the 15 minutes the load was held for."

3. Flexural Testing

"The maximum amount of flexural deflection of the prefab brick arch with the EPS Core recorded during testing, was 2.84 mm with a residual deflection of 0.01 mm. The maximum amount of flexural deflection of the prefab brick arch with the PUR Core recorded during testing, was 3.01 mm with a residual deflection of 0.00 mm. No creeping was recorded during the 15 minutes the load was held for."

PRODUCT TESTING

4. Hard Body Impact Testing

Table 2 - Results of the Hard Body Impact Tests EPS Core

Brick Type	Location	Indent Diameter - 10 Joules Impact Energy (mm)	Cracking
Celina Klinker Grenoble Metallic	1	Small 1 mm indentation, superficial	None
	2		
	3		
Rijswaard Baksteen DR3B Buff	1		None
	2		
	3		
Rijswaard Baksteen DR12B Redburn Multistock	1		None
	2		
	3		

Table 3 - Results of the Hard Body Impact Tests PUR Core

Brick Type	Location	Indent Diameter - 10 Joules Impact Energy (mm)	Cracking
Celina Klinker Grenoble Metallic	1	Small 1 mm indentation, superficial	None
	2		
	3		
Rijswaard Baksteen DR3B Buff	1		None
	2		
	3		
Rijswaard Baksteen DR12B Redburn Multistock	1		None
	2		
	3		

PRODUCT TESTING

5. Bond Strengths

Table 5 - Results of Bond Strength Tests Following Hygrothermal Testing - EPS Core

Brick Water Absorption Level	Brick Type	Test No.	Pull-Off Strength (N/mm²)	Mode of Failure
High	Rijswaard Baksteen DR12B Redburn Multistock	1	0.13	Failure within backer board/ insulation
		2	0.12	
		3	0.12	
		Mean	**0.12**	
Medium	Rijswaard Baksteen DR3B Buff	1	0.19	
		2	0.20	
		3	0.19	
		Mean	**0.19**	
Low	Celina Klinker Grenoble Metallic	1	0.19	
		2	0.16	
		3	0.16	
		Mean	**0.17**	

Table 7 - Results of Bond Strength Tests Following Hygrothermal Testing - PUR Core

Brick Water Absorption Level	Brick Type	Test No.	Pull-Off Strength (N/mm²)	Mode of Failure
High	Rijswaard Baksteen DR12B Redburn Multistock	1	0.12	Failure within backer board/ insulation
		2	0.13	
		3	0.11	
		Mean	**0.12**	
Medium	Rijswaard Baksteen DR3B Buff	1	0.18	
		2	0.17	
		3	0.18	
		Mean	**0.17**	
Low	Celina Klinker Grenoble Metallic	1	0.18	
		2	0.18	
		3	0.17	
		Mean	**0.18**	

PRODUCT TESTING

6. 60 year desktop study.
"When the system is fully built up and installed, the only products which would be subjected to anything like normal conditions, would be the facing brick slips.All other components and consumables would be sheltered from the elements with very little moisture or sunlight affecting them. Based upon this, the expected life span of said product should increase.

Taking these considerations into account, along with the information gained by way of data sheets provided by All About Bricks Ltd, research and the results obtained from the extensive testing the prefab brick arches have undergone, it is Lucideon's view that All About Bricks Ltd's prefab brick arches shall have a life expectancy of 60 years.

PRODUCT INSTALLATION

Designed to be installed by contractors, general builders and competent persons who have experience with this type of arch product.

As a non structural decorative item, these lightweight arches must be supported by a steel cavity lintel. They are tested to ensure they have sufficient compressive strength to transfer the load of the brickwork above the arch to the lintel below it.

Lintels are to be installed in line with the respective manufacturers guidelines and the arch is to be laid so as to be carried by the lintel, situated centrally in respect of the window opening and on a full bed of mortar.

The arch product should be installed before the surrounding adjacent brickwork is then completed around the product allowing for blending of mortar joint thicknesses and gauging of brickwork 'setting out' around and up to the product to ensure a seamless installation when viewing the finished façade.

The requirement for cavity trays above openings is stipulated by Building Regulations Part C2(c) and NHBC Standards and as such, cavity trays should be installed in order to maintain compliance with all prevailing legislation and standards and the quality of workmanship should be in accordance with BS 8000-3:2000

A dpc or cavity tray with stop ends must therefore be installed above the product over all openings in external cavity walls and should be in accordance with BS EN 1996-2 : 2006 and PD 6697 : 2019. Where the lintel does not require a dpc, it should have a suitable profile, durability, and proprietary stop ends adhered to the surface of the lintel in accordance with the lintel manufacturers recommendations.

Weep holes must be provided in the outer leaf above the product to drain moisture from the cavity. A minimum of two weep holes should be provided per unit. For fair-faced masonry, weep holes should be provided at each end, and every 450 mm if applicable. Stop ends should be included on the supporting lintel and weep holes in the infill brickwork adjacent to the product.

The brick slips on the arch product should be pointed using the same mortar as the rest of the brickwork in the façade.

LIGHTWEIGHT ARCH IN APPLICATION

Diagram 1 – Section of typical installation, cavity wall with cavity tray above product.

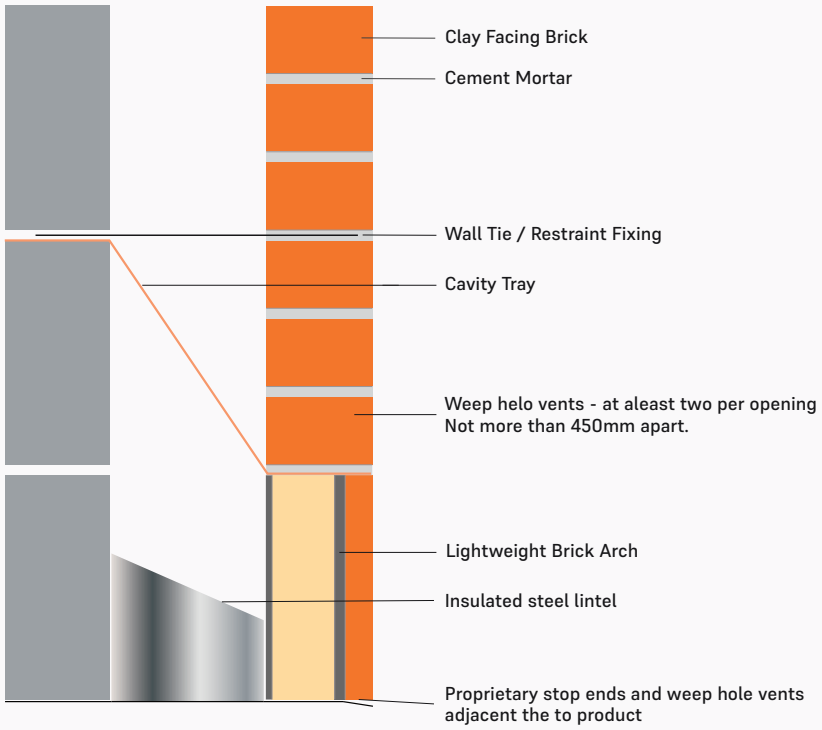
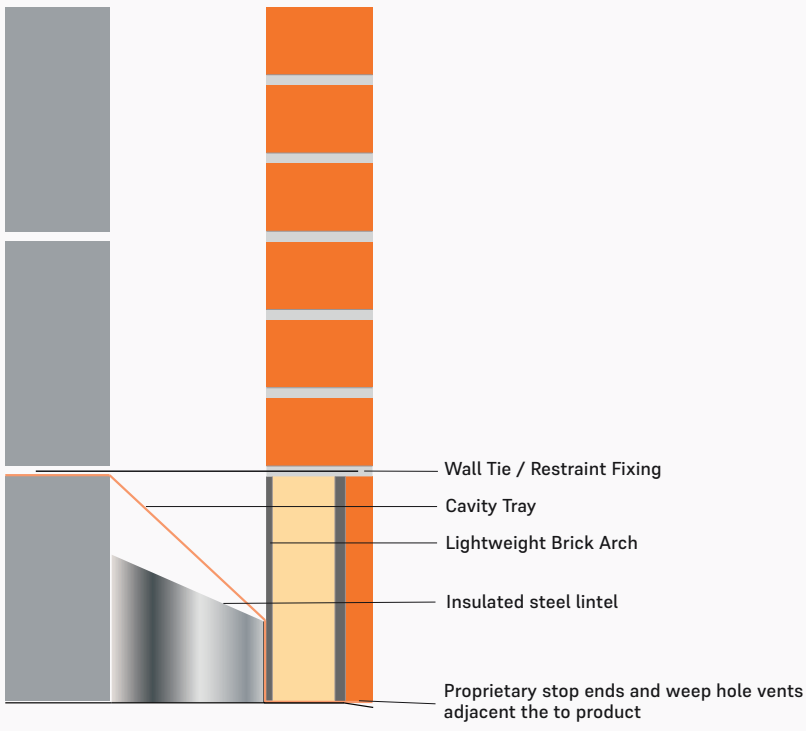


Diagram 2 – Section of typical installation, cavity wall with cavity tray below the product.



STORAGE

The finished panels are delivered palletised and shrink wrapped, with card separators at brick face and rear of panel interface. This packaging is to facilitate transit and temporary protection.

Panels should be stored flat and stacked no more that 11 high, bearer centres should be no greater than 600mm and not nearer than 150mm of panel ends.

Dry and sheltered conditions should be provided with panels stored a minimum of 150mm from the ground, covered with opaque polythene of tarpaulin until the panel is used in construction.

Panels can withstand normal loads associated with site handling and installation, care should be taken to isolate panels from direct interaction with mechanical handling means, such as forklift tines. Damaged panels should not be used in construction.

CONDITIONS & WARRANTIES

Installation guidance within this document is strictly a guideline and all installations must fully comply with prevailing Building regulations and the requirements of the Health & Safety at Work Act 1974.

Given the extensive independent testing carried out by Lucideon and the use of BBA tested and approved resin for the bonding element, All About Bricks Ltd guarantee their lightweight brick arches for a period of 30 years against material faults and workmanship defects.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