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BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

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Agrément Certificate No 91/2728/C
*Third issue**

Designated by Government to issue European Technical Approvals

HERTALAN EPDM ROOF WATERPROOFING SYSTEM

Système d'étanchéité
Dachabdichtungen

Product

- *THIS CERTIFICATE OF CONFIRMATION RELATES TO HERTALAN EPDM ROOF WATERPROOFING SYSTEM, A SINGLE LAYER MEMBRANE FOR USE ON LIMITED ACCESS ROOFS.*
- *The product is suitable for use as:*

(1) A loose-laid and ballasted waterproofing layer for flat roofs.

(2) A loose-laid waterproofing layer in flat roof specifications to the inverted roof concept.

(3) A fully adhered waterproofing layer on flat and pitched roofs.

- *Installation is carried out only by installers whose operatives have been trained and approved by the manufacturer.*

continued

Regulations

1 The Building Regulations 1991 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof waterproofing systems with the Building Regulations. In the opinion of the BBA, Hertalan EPDM Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	**B4(2)**	External fire spread
Comment:		Data to BS 476 : Part 3 : 1958 indicate that the use of the system will be unrestricted by this Requirement. On flat roofs, when ballasted with a minimum of 50 mm of aggregate, the roof shall be deemed to be of designation AA. See sections 11.1, 11.2 and 11.3 of this Certificate.
Requirement:	**C4**	Resistance to weather and ground moisture
Comment:		Data examined for water resistance on the membrane, including joints, indicate that the material meets this Requirement. See section 8.1 of this Certificate.
Requirement:	**Regulation 7**	Materials and workmanship
Comment:		The system comprises acceptable materials. See section 13 of this Certificate.

continued

• *Hertalan is manufactured by Hertel BV in The Netherlands, and is the Confirmation of a Dutch Agrément issued by KIWA BV, Sir Winston Churchill-laan 273, Postbus 70, 2280 AB Rijswijk in the Netherlands, to Hertel BV Industrieweg 16, 8263 AD Kampen, The Netherlands.*

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Hertalan EPDM Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	**10**	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The system complies with this Standard. See section 13 of this Certificate.
Regulation:	**12**	Structural fire precautions
Standard:	D6.7	Distances of sides of buildings from boundaries — Roofs and rooflights
Comment:		Data to BS 476 : Part 3 : 1958 indicate that on suitable substructures the use of the system will be unrestricted by the requirements of these Standards. See sections 11.1, 11.2 and 11.3 of this Certificate.
Regulation:	**17**	Preparation of sites and resistance to moisture
Standard:	G3.1	Resistance to precipitation
Comment:		Data examined for water resistance on the membrane, including joints, indicate that the use of the system can enable a roof to satisfy the requirements of this Standard. See section 8.1 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994 (as amended)

In the opinion of the BBA, Hertalan EPDM Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	**B2**	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 13 of this Certificate.
Regulation:	**C5**	Resistance to ground moisture and weather
Comment:		Data examined for water resistance on the membrane, including joints, indicate that the use of the system can enable a roof to satisfy the requirements of this Regulation. See section 8.1 of this Certificate.
Regulation:	**E8**	External fire spread
Comment:		Data to BS 476 : Part 3 : 1958 indicate that on suitable substructures the use of the system will be unrestricted by the requirements of this Regulation. See sections 11.1, 11.2 and 11.3 of this Certificate.

4 Construction (Design and Management) Regulations 1994

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: *5 Description* (5.2).

Technical Specification

5 Description

5.1 Hertalan is manufactured by blending ethylene-propylene-diene monomer (EPDM), processing oils, fillers and other additives. The sheets are produced by feeding the mix through a rollerhead extruder before vulcanisation.

5.2 Hertalan is manufactured to the nominal parameters given in Table 1.

Table 1 Nominal parameters

thickness (mm)	1.2, 1.3, 1.5
width (m)	1.4
length* (m)	25
weight per unit area (kgm^{-2})	1.48, 1.6, 1.85
Shore hardness A (°)	65

*Other prefabricated membranes up to 300 m^2 are available.

5.3 Other materials used with Hertalan include:

Hertalan adhesive KS 137 — for lap jointing EPDM membranes and/or flashings.

Hertalan adhesive KS 143 — for adhering Hertalan to other substrates, eg concrete, wood, polyurethane insulation, polystyrene insulation and bitumen sheeting.

Hertalan sealant (cement) KS 87 — an EPDM based paste lap sealant, applied by caulking gun, used for extra sealing of overlaps made at T-crossings, finishing difficult overlaps in corners, etc or for finishing splices.

Hertalan flashing — a non-vulcanised EPDM strip material that can be moulded in place with hot air and bonded with adhesive KS 137 for non-standard applications. The flashing cures slowly under atmospheric conditions.

Hertaflux KS 2000 — a quick acting adhesive for making joints.

5.4 Quality control checks are carried out during production and on the final product. Checks on the final product include thickness, tensile strength, elongation, tear resistance, hardness and factory seam strength.

6 Delivery and site handling

6.1 Hertalan is delivered to site either in rolls shrink-wrapped in polythene on a pallet, or prefabricated sheets are packed in polyester matting, stacked on a pallet, and then shrink-wrapped in polythene. Rolls and sheets carry labels bearing the product's name, dimensions, manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

6.2 EPDM membranes do not require any particular storage conditions, but Hertalan flashing should be stored in a clean, dry area and in temperatures between 5°C and 20°C. It cures gradually and therefore should not be stored for more than six to nine months. With curing, the flexibility reduces and, though the waterproofing characteristics are retained, forming details becomes progressively more difficult.

6.3 Sealants and adhesives should be stored in a dry, ventilated area in temperatures between 5°C and 25°C and isolated from potential ignition sources. Site storage of these products should not exceed six months.

Design Data

7 General

7.1 Hertalan is satisfactory for use as:

(a) a loose-laid and ballasted waterproofing layer, mechanically fixed at perimeters and upstands, on flat roofs with limited access

(b) a fully adhered waterproofing layer, mechanically fixed at edges and upstands, on flat and pitched roofs with limited access

(c) a loose-laid system to the inverted roof concept, on flat roofs with limited access.

7.2 Limited access roofs are defined for the purpose of this Certificate as those roofs that are subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, special precautions, such as additional protection to the membrane, must be taken.

7.3 When designing flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Pitched roofs are defined as those having falls in excess of 1:6.

7.4 Decks to which the product is to be applied must comply with the relevant requirements of BS 6229 : 1982 and BS 8217 : 1994 and, where appropriate, NHBC Standards Chapter 7.1 or the Zurich Building Guarantees Technical Standards, Section 5, clause 5.9.3.19.

7.5 Insulation systems or materials used in conjunction with the product must be approved by the manufacturer or marketing company and must be:

(a) as described in BS 8217 : 1994, or

(b) the subject of a current BBA Certificate and be used in accordance with, and within the limitations of, that Certificate.

7.6 Contact between certain insulation materials and Hertalan adhesive KS 143 must be avoided. The manufacturer or marketing company should be consulted for detailed information.

7.7 Contact with certain bituminous, coal tar and oil based products must be avoided as the membrane is not compatible with lower grades of bitumen. If contact with such products is likely, a separating layer should be interposed before installing the waterproofing sheet. Where doubt arises, the advice of the manufacturer or marketing company should be sought.

8 Weathertightness

8.1 Tests confirm that the membranes, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building and so meet the requirements of the national Building Regulations:

England and Wales

Approved Document C4, Section 5.1.

Scotland

Regulation 17, Standard G3.1.

Northern Ireland

Regulation C5.

8.2 The product is impervious to water and, when used in one of the systems described in this Certificate, will give a weathertight roof capable of accepting minor structural movement without damage.

9 Resistance to wind uplift

9.1 When used in a loose-laid and ballasted system the precise ballast requirements should be calculated in accordance with the relevant parts of either CP 3 : Chapter V : Part 2 : 1972 or BS 6399 : Part 2 : 1997. The use of concrete slabs, etc on suitable supports should be considered in areas of high wind exposure and the advice of the manufacturer should be sought. The membrane should always be ballasted with a minimum depth of 50 mm of aggregate.

9.2 Test data on the wind uplift force of a fully adhered Hertalan system shows a maximum force of 1.5 kPa can be exerted without failure of the

membrane. In any roof area where the calculated average wind force is above this figure the roof should be adequately ballasted.

10 Resistance to foot traffic

Test data indicate that the membranes can withstand, without damage, the limited foot traffic and light concentrated loads associated with the installation and maintenance operations. Reasonable care should be taken, however, to avoid sharp objects or concentrated loads. Anywhere regular traffic is envisaged, ie maintenance of lift equipment, etc, a walkway should be provided using concrete slabs supported on bearing pads.

11 Properties in relation to fire

11.1 An analysis of test data supplied indicates that Hertalan EPDM membranes, fully adhered to a plywood substrate, would achieve a rating of EXT.F.AC when tested in accordance with BS 476 : Part 3 : 1958.

11.2 When used in a loose-laid and ballasted specification, including a minimum surface finish of 50 mm of aggregate, the membrane shall be deemed to satisfy BS 476 : Part 3 : 1958 designation EXT.F.AA.

11.3 The designation of other specifications should be confirmed by:

England and Wales

test and assessment in accordance with Approved Document B, Appendix A, Clause A1

Scotland

test to conform with Standard D6.7

Northern Ireland

test or assessment by a UKAS accredited laboratory, BRE or an independent consultant with appropriate experience.

12 Maintenance

12.1 Roofs covered with Hertalan should be the subject of annual inspections, as is good practice with single-layer waterproofing systems, to ensure continued security and performance, especially those roofs without ballast.

12.2 In the event of accidental damage, repairs can be carried out by cleaning the area around the damage and applying a patch of Hertalan in the manner described in sections 15.1 and 15.2 of this Certificate.

13 Durability

Accelerated weathering tests confirm that satisfactory retention of physical properties is achieved. Available evidence indicates that the Hertalan EPDM Roof Waterproofing System should have a life of at least 20 years.

Installation

14 General

14.1 The installation of Hertalan EPDM Roof Waterproofing System must be carried out in accordance with the relevant clauses of the manufacturer's instructions, BS 8000 : Part 4 : 1989 and this Certificate.

14.2 Conditions on site should be those for normal roof waterproofing work. Deck surfaces must be dry, clean, and free from sharp projections such as nail heads, concrete nibs, etc.

14.3 Installation should not be carried out during wet weather (eg rain, fog, snow, etc) nor when the temperature is below 0°C. The fully adhered system must not be installed at temperatures below 5°C because of the risk of condensation contaminating the bonding adhesive.

14.4 Where contact with coal tar or oil based products is likely, an isolating layer must be interposed between the product and the substrate. Where contact with bituminous products is likely, consideration should be given to the use of an isolating layer, and the advice of the manufacturer should be sought.

14.5 Sheets may be prefabricated prior to application to reduce the amount of on-site lap jointing. This technique is only suitable for loose-laid and ballasted applications.

15 Procedure

Loose-laid and ballasted applications

15.1 The membrane is unrolled onto the substrate and fully adhered at perimeters. Flashing and lap jointing must be carried out in the manner described in section 15.

15.2 Loose-laid applications should be covered by at least 50 mm of well rounded gravel (15/30 grade minimum). When rounded gravel is used, all edges and corners should be ballasted with concrete tiles, minimum thickness 60 mm, on bearing pads, to a distance of 2 m from the perimeter to avoid damage to the membrane due to wind uplift.

15.3 Alternatively, concrete paving, minimum thickness of 40 mm, on bearing pads can be used as a ballast.

15.4 When using a loose-laid application, normal account should be taken in the design of the deck of the extra dead loading due to the weight of the aggregate and/or paving.

Fully adhered applications

15.5 The fully bonded application may not be used directly onto insulation materials that will be adversely affected by the solvent in the adhesive.

Where doubt arises about compatibility, the advice of the manufacturer or marketing company should be sought.

15.6 The layer of bonding adhesive, type KS 143, should be applied by roller evenly to the substrate at a rate of between 250 gm^{-2} and 400 gm^{-2} (the exact rate dependent on the porosity of the substrate). The adhesive should be allowed to dry for between 5 and 20 minutes, depending on weather conditions, before application of the membrane.

15.7 The membrane should be applied to the substrate by unrolling to ensure a full bond, no wrinkling occurs in the laid membrane, and that no air has been trapped beneath it. For a satisfactory application, at least 90% to 95% of the total area of membrane must be bonded to the substrate.

15.8 The laps must then be sealed and the flashing installed in the manner described in section 15.

16 Details

Standard seaming procedure

16.1 At laps, the top sheet should be folded back by about 200 mm, both surfaces of the lap must be clean and dry, and if necessary surfaces should be cleaned using Hertalan solvent. Splicing adhesive type KS 137 should be applied to both sides over a width of 80 mm, by brush to give an even coverage, and allowed to dry to the touch (5 to 10 minutes). The top sheet should then be allowed to fall freely onto the bottom sheet, avoiding stretching and wrinkling. The width of the lap joint should be a minimum of 100 mm.

16.2 The lap should then be rolled with a steel roller parallel to the splice to consolidate the joint. After checking that a good seal has been achieved, the remaining 20 mm should be filled with a continuous bead of Hertalan sealant KS 87. This bead should be rolled down, making it flush with the lap joint.

Alternative seaming procedure — Hertaflux KS 2000

16.3 The lap joint area should be cleaned using Hertalan solvent. The minimum width of the lap joint should be 50 mm. The two layers are spot welded every 200 mm with Hertaflux adhesive KS 2000 at the edge of the bottom of the two sheets. Hertaflux adhesive KS 2000 is then applied to the outer 20 mm of the overlap and rolled down.

16.4 The seam should be sealed with Hertalan sealant KS 87 and the bead rolled down, making it flush with the lap joint.

Flashing

16.5 Concurrently with the installation of the EPDM membrane, the EPDM flashing should be applied. It should first be bonded to the horizontal EPDM membrane and lapped in the manner described in sections 15.1 to 15.2, with a minimum lap of 100 mm.

16.6 The flashing should be bonded with Hertalan adhesive KS 137 to the vertical surface of the wall.

16.7 For specific flashing requirements Hertalan flashing can be used. The flashing (non-vulcanised) can be moulded in place using hot air, and bonded with adhesive KS 137. The flashing cures slowly over a period of time under atmospheric conditions.

Technical Investigations

The following is a summary of the technical investigations carried out on Hertalan EPDM Roof Waterproofing System.

17 Tests

The results of tests on Hertalan assessed by KIWA BV are given in Tables 2 to 5.

Table 2 Physical properties — general

Test (units)	Method*	Mean result
Water absorption (%)	ISO 1817	+1.3
Ozone resistance	ISO 1431/1	zero rated

*The test documents are detailed in the *Bibliography*. Numbers in the table refer to the sections/parts of the various documents.

Table 3 Physical properties — directional

Test (units)	Method*	Mean results	
		Long[1]	Trans[2]
Tensile strength (Nmm^{-2})	ISO 37		
control		10.1	9.6
heat aged 14 days at 100°C		11.0	10.2
heat aged 91 days at 80°C		10.6	10.1
UV aged (3000 hours Xenotest)		10.4	10.0
Elongation at break (%)	ISO 37		
control		390	410
heat aged 14 days at 100°C		285	305
heat aged 91 days at 80°C		290	315
UV aged (3000 hours Xenotest)		360	380
Resistance to folding after 48 hours at −30°C	DIN 53-361		
control		—	—
heat aged 14 days at 100°C		—	—
UV aged (3000 hours Xenotest)		—	—
Tear strength (Nmm^{-1})	MOAT 46 : 6M	45	50
Dimensional change (%)	MOAT 27 : 5.1.6.1	−0.55	+0.15

(1) Longitudinal direction.

(2) Transverse direction.

— = no cracks

*The test documents are detailed in the *Bibliography*. Numbers in the table refer to the sections/parts of the various documents.

Table 4 Service performance — general

Test (units)	Method*	Mean result
Dynamic indentation	MOAT 27 : 5.1.10	I_4
Static indentation	MOAT 27 : 5.1.9	L_3
Resistance to cyclic movement	MOAT 27 : 5.1.8	satisfactory

*The test document is detailed in the *Bibliography*. Numbers in the table refer to the sections of the document.

Table 5 Jointing systems

Test (units)		Method*	Mean results	
			A(1)	B(2)
Joint tensile strength (N)		MOAT 46 : 6.0		
control	at 23°C		300	330
	at 80°C		190	150
	at −20°C		420	400
heat aged 28 days	at 23°C		350	380
	at 80°C		180	180
	at −20°C		460	490

(1) System A — joint adhered with KS 2000 and sealant KS 87.

(2) System B — joint adhered with KS 137 and sealant KS 87.

*The test document is detailed in the *Bibliography*. Numbers in the table refer to the sections of the document.

18 Other investigations

18.1 The manufacturing processes were examined, including methods of quality control. Details were also obtained of the quality and composition of the materials used.

18.2 Existing data on fire performance to BS 476 : Part 3 : 1958 of the product were examined.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 3 : 1958 *External fire exposure roof test*

BS 6229 : 1982 *Code of practice for flat roofs with continuously supported coverings*

BS 6399 *Loading for buildings*
Part 2 : 1997 *Code of practice for wind loads*

BS 8000 *Workmanship on building sites*
Part 4 : 1989 *Code of practice for waterproofing*

BS 8217 : 1994 *Code of practice for built-up felt roofing* (supersedes CP 144 : Part 3)

CP 3 *Code of basic data for the design of buildings*
Chapter V *Loading*
Part 2 : 1972 *Wind loads*

DIN 53-361 : 1982 *Testing synthetic leather and similar surface structures. Determining the flexing behaviour under cold conditions*

ISO 37 : 1977 *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 1431/1 : 1980 *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking*
Part 1 *Static strain test*

ISO 1817 : 1975 *Rubber, vulcanized — Determination of the effect of liquids*

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

MOAT No 46 : 1988 *Special Directives for the Assessment of Roof Waterproofing Systems with Non-reinforced Vulcanized EPDM*

Conditions of Certification

19 Conditions

19.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(d) is copyright of the BBA.

19.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) remain covered by a valid Dutch Agrément; and

(c) are reviewed by the BBA as and when it considers appropriate.

19.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

19.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Hertalan EPDM Roof Waterproofing System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 91/2728/C is accordingly awarded to Hertalan (UK) Ltd.

On behalf of the British Board of Agrément

Date of Third issue: 28th July 1999

Chief Executive

**The original Certificate was issued on 26th November 1991. This amended version includes reference to the change of Certificate holder's name, address, and telephone and facsimile numbers, revised national Building Regulations and associated text, inclusion of the CDM Regulations and new* Conditions of Certification.

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