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**Agrément
Certificate
No 94/3062**

Designated by Government
to issue
European Technical
Approvals

CHESTERFELT ROOF WATERPROOFING SYSTEMS

Système d'étanchéité
Dachabdichtungen

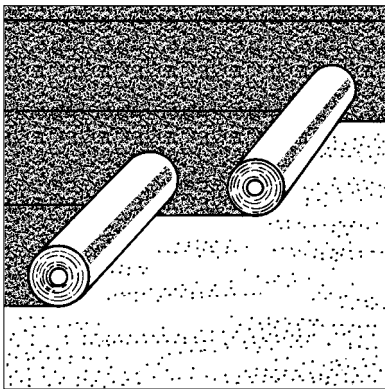
Product

• *THIS CERTIFICATE RELATES TO CHESTERFELT ROOF WATERPROOFING SYSTEMS, A RANGE OF REINFORCED BITUMEN MEMBRANES.*

• *The membranes are available with either mineral or sand surface finishes.*


• *The products are manufactured by Chesterfelt Ltd.*

These Front Sheets must be read in conjunction with the accompanying Detail Sheets, which provide information specific to particular systems.




Building Regulations — Detail Sheet 1

1 The Building Regulations 1991 (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 membranes with the Building Regulations. In the opinion of the BBA, Chesterfelt Roof Waterproofing Systems, if used in accordance with the provisions of this Certificate, will meet the relevant requirements.

Requirement: B4(2)	External fire spread
Comment:	On flat roofs and with one of the surface finishes prescribed in Part iii of Table A5 of the Approved Document the roof shall be deemed to be of designation AA. For other situations see section 3 of the appropriate Detail Sheet.
Requirement: C4	Resistance to weather and ground moisture
Comment:	Data examined for water resistance of the membranes indicate that the material meets this Requirement. See section 5.1 of these Front Sheets.
Requirement: Regulation 7	Materials and workmanship
Comment:	Chesterfelt systems comprise acceptable materials. See section 9.1 of these Front Sheets.

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

 In the opinion of the BBA, Chesterfelt Roof Waterproofing Systems, 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	Selection and use of materials, fittings, components and other manufactured products
Comment:	Chesterfelt Roof Waterproofing Systems comply with the Standard.
Regulation: 12	Structural fire precautions
Standard: D2.5	Separation of roofs and rooflights from boundaries
Standard: D3.6	Roofs and rooflights of buildings ancillary to dwellings
Comment:	Test data to BS 476 : Part 3 : 1958 indicate that on suitable substructures the use of Chesterfelt systems will be unrestricted by the requirements of these Standards. See section 3 of the appropriate Detail Sheet.
Regulation: 17	Preparation of sites and resistance to moisture
Standard: G3.1	Resistance to precipitation
Comment:	Test data examined for water resistance on the membranes indicate that the use of Chesterfelt systems can enable a roof to satisfy the requirements of this Standard. See section 5.2 of these Front Sheets.

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3 The Building Regulations (Northern Ireland) 1994*



In the opinion of the BBA, Chesterfelt Roof Waterproofing Systems, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		Chesterfelt Roof Waterproofing Systems comprise acceptable materials. See section 9.1 of these Front Sheets.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		Data examined for water resistance of the membranes indicate that the use of Chesterfelt systems can enable a roof to satisfy the requirements of this Regulation. See section 5.2 of these Front Sheets.
Regulation:	E8	External fire spread
Comment:		Data obtained from tests to BS 476 : Part 3 : 1958 indicate that on suitable substructures the use of Chesterfelt systems will enable a roof to be unrestricted under the requirements of these Regulations. See section 3 of the appropriate Detail Sheet.

*These Regulations are effective from 28th November 1994 — prior to this the Building Regulations (Northern Ireland) 1990 (as amended 1991 and 1993) will apply.

Design Data

4 General

4.1 Chesterfelt Roof Waterproofing Systems, when installed in accordance with this Certificate, are suitable as fully or partially bonded waterproofing for flat or pitched roofs with limited access, as part of a built-up specification and where necessary in conjunction with appropriate roofing felts to BS 747 : 1994.

4.2 The mineral finished membranes are suitable for use, where appropriate, as an exposed cap sheet or in detail work.

4.3 Limited access roofs are defined for the purpose of this Certificate as those roofs 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.

4.4 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.

4.5 Decks to which the products are to be applied must comply with the relevant requirements of BS 6229 : 1982, BS 8217 : 1994 and, where appropriate, NHBC Standards, Chapter 7.1 or the Zurich Building Guarantees *Technical Manual*, Section 5, clause 5.9.3.14.

4.6 Insulation materials used in conjunction with the product must be:

(a) as described in the relevant clauses of 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.

5 Weathertightness



5.1 Data examined 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 Section 5.1 of Approved Document C4 of the Building Regulations 1991 (England and Wales).



5.2 Data examined confirm that the membranes, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building and will satisfy the requirements of Regulation 17 Standard G3.1 for compliance with the Building Standards (Scotland) Regulations 1990 (as amended) and Regulation C5 of the Building Regulations (Northern Ireland) 1994.

5.3 The product is impervious to water and, when used in the systems described, will give a weathertight roofing capable of accepting minor structural movements without damage.

6 Resistance to wind uplift

Data examined indicate that the adhesion of the bonded systems to the decking, or to bituminous felt, is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice.

7 Resistance to foot traffic

The systems can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Where traffic in excess of this is envisaged, additional protection to the membrane in accordance with the manufacturer's instructions must be provided. However, reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

8 Maintenance

In the event of damage the sheets can be effectively repaired, after cleaning, by bonding pieces of the appropriate membrane to the damaged area.

9 Durability



9.1 Chesterfelt Roof Waterproofing Systems, when subjected to normal conditions of exposure and use, will retain their integrity for a period of at least 20 years.

9.2 With the mineral surfaced products, after some years, some localised loss of the mineral surfacing may occur in areas where complex detailing of the roof design is incorporated.

10 General

10.1 Deck surfaces must be dry, clean and free from sharp projections such as nail heads, concrete nibs, etc.

10.2 Installation of these products is carried out using traditional methods for laying bituminous felts, in accordance with the manufacturer's instructions, the relevant clauses of BS 6229 : 1982, BS 8000 : Part 4 : 1989, BS 8217 : 1994 and, where appropriate, NHBC Standards Chapter 7.1 or the Zurich Building Guarantees *Technical Manual*, Section 5, clause 5.9.3.14.

10.3 The products should not be laid in rain, snow or heavy fog. When installing the membranes below 5°C precautions should be taken against the formation of condensation on the substrate.

10.4 At falls in excess of 1:6, the normal precautions against slippage and the provision for mechanical fixings as required by BS 8217 : 1994 should be observed.

10.5 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must meet the requirements of the relevant clauses of BS 8217 : 1994, and one of the surface finishes described in clause 9.17.3 or 9.17.4 of the code must be used to prevent damage to the roof covering.

10.6 On completion of the roof, the sanded top layers shall have a surface finish applied in accordance with BS 8217 : 1994, clauses 8.11 and 9.17. Surface finishes in the code include:
stone aggregate in dressing compound
pre-cast concrete paving flags
proprietary tiles in bonding compound.

10.7 When used for remedial work, existing waterproofing layers must be made sound and existing surface finishes (eg surface dressing, etc) must be removed and then primed.

10.8 Chesterfelt roof waterproofing membranes with a mineral finish, when used on roofs with limited access, require no further surface protection.

Bibliography

- BS 747 : 1994 *Specification for roofing felts*
BS 6229 : 1982 *Code of practice for flat roofs with continuously supported coverings*
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*

Conditions of Certification

11 Conditions

11.1 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided that:

- (a) the specification of the products is unchanged, and
- (b) the manufacturer continues to have the products checked by the BBA.

11.2 Where reference is made in this Certificate to any Act of Parliament, Regulation made

thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

11.3 In granting this Certificate, the BBA makes no representation as to the presence or absence of patent rights subsisting in the products and/or as to the legal right of Chesterfelt Ltd to market, install or maintain the products.

11.4 It should be noted that any recommendations relating to the safe use of these products which are contained or referred to in this Certificate are the minimum standards required to be met when the products are used. They do not purport in any way to re-state the requirements of the Health and Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which may in the future exist; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any other present or future statutory or Common Law duties of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage incurred in respect of personal injury arising as a direct or indirect result of the use of these products.



In the opinion of the British Board of Agrément, Chesterfelt Roof Waterproofing Systems are fit for their intended use if used as set out in this Certificate. Certificate No 94/3062 is accordingly awarded to Chesterfelt Ltd.

On behalf of the British Board of Agrément

Date of issue: 9th November 1994

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Director

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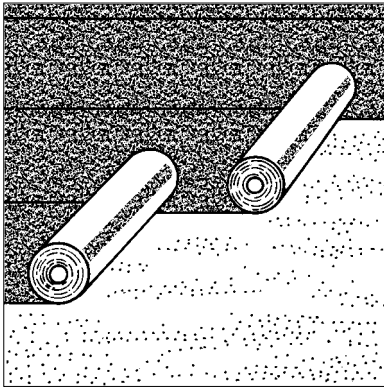
Chesterfelt Ltd

CHESTERFLEX ROOF WATERPROOFING MEMBRANES

Certificate No 94/3062

DETAIL SHEET 2

Product



• THIS DETAIL SHEET RELATES TO CHESTERFLEX ROOF WATERPROOFING MEMBRANES, POLYESTER REINFORCED OXIDISED BITUMEN SHEETING.

• Chesterflex membranes are suitable for use in a fully or partially bonded roof waterproofing system on flat or pitched roofs with limited access.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the products' position regarding the Building Regulations, general information relating to the products and the Conditions of Certification, respectively.

Technical Specification

1 Description

1.1 The Chesterflex Roof Waterproofing Membranes range consists of the following:

Chesterflex 125 — BS 747 type 5U felt, with a polyester reinforcement (125 gm^{-2}) and a sand finish on both sides, for use as a first layer.

Chesterflex 180 — oxidised bitumen felt with a polyester reinforcement (180 gm^{-2}) and a sand finish on both sides, for use as a first layer or top layer with additional protection.

Chesterflex 250 (sanded) — oxidised bitumen felt with a polyester reinforcement (250 gm^{-2}) and a sand finish on both sides, for use as a first layer or top layer with additional protection.

Chesterflex 250 (mineral) — as for 250 (sanded), but with a mineral finish on the upper surface, for use as a cap sheet.

Chesterflex 350 (sanded) — BS 747 type 5B felt with a polyester reinforcement (350 gm^{-2}) and a sand finish on both sides, for use as a top layer with additional protection.

Chesterflex 350 (mineral) — BS 747 type 5E felt, as for 350 (sanded), but with a mineral finish on the upper surface, for use as a cap sheet.

1.2 The products are manufactured to the nominal dimensions given in Table 1.

Table 1 Nominal dimensions

Dimensions	15	180	250S	250M	350S	350M
thickness (mm)	1.7	1.8	2.0	2.8	3.5	3.8
width (m)	1	1	1	1*	1	1*
length (m)	16	20	20	10	8	8
weight (kgm^{-2})	1.80	1.90	2.00	3.90	4.25	4.75
roll weight (kg)	29	38	40	39	34	38

*includes 75 mm selvedge

4.3 Ancillary items for use with Chesterflex membranes are as follows:

Oxidised bitumen grades 95/25 and 115/5 — for bonding to substrate.

Chesterplus 3G Venting — a BS 747 type 3G venting layer for use as a first layer on a three-layer system.

Chesterplus Perforated — for use in partially bonded built-up systems.

Chesterstop — a vapour control layer for use in built-up systems.

Chestertech — a glass/polyester reinforcement nailing layer.

1.4 Quality control checks are carried out on the raw materials. Checks on the final product include:

weight per unit area
width
tensile strength/elongation
Mullen burst
resistance to tear.

2 Delivery and site handling

2.1 Chesterflex membranes are delivered to site wrapped in paper. The wrappers bear the product name, manufacturer's name, dimensions (excluding thickness), where appropriate BS 747 : 1994, and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls must be stored in an upright position on a clean, level surface and kept dry.

Design Data

3 Properties in relation to fire



3.1 When tested in accordance with BS 476 : Part 3 : 1958:

(a) A system comprising 18 mm thick plywood, 50 mm of insulation, one layer of Chesterflex 125 (type 5U) and one layer of Chesterflex 350 mineral (type 5E), fully bonded in bitumen, achieved EXT.F.AB rating.

(b) A system comprising 18 mm thick plywood, 50 mm of insulation, one layer of Chesterflex 180, and one layer of Chesterflex 250 mineral, fully bonded in bitumen, achieved EXT.F.AC rating.



3.2 When used for flat roofs with one of the surface finishes defined in Part iii of Table A5 of Appendix A of Approved Document B of the Building Regulations 1991 (England and Wales) (and listed below), the roof is deemed to be of designation AA.

Surface finishes:

- (a) bitumen bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm;
- (b) bitumen bedded tiles of a non-combustible material;
- (c) sand and cement screed; or
- (d) macadam.

3.3 The designation of other specifications should be confirmed by test or assessment in accordance with Clause A1 of Approved Document B of the Building Regulations 1991 (England and Wales).



3.4 The designation of specifications, other than those in section 3.1, must be confirmed by testing to ensure conformity with Standards D2.5 and D3.6 for compliance with the Building Standards (Scotland) Regulations 1990 (as amended).



3.5 When used for flat roofs with one of the surface finishes given in Technical Booklet E, Table 4.6, Part IV of the Building Regulations (Northern Ireland) 1994, the roof should be considered to be of designation AA.

3.6 The designation for other specifications, for example when the system is used on combustible substrates, should be confirmed either by testing or by assessment by a NAMAS laboratory, BRE or an independent consultant with appropriate experience.

Installation

Fully bonded applications

4.1 A first layer of waterproofing should be bonded to the substrate with hot bitumen, using traditional pour and roll techniques. Lap joints should be a minimum of 50 mm for side and 75 mm for end.

4.2 Top layer and cap sheets are fully bonded onto the other layers by pour and roll. Lap joints should be a minimum of 75 mm for side and 100 mm for end. The laps should be offset in relation to the previous layer, as recommended in BS 8217 : 1994.

Partially bonded applications

4.3 A layer of either Chesterplus Perforated or type 3G felt to BS 747 : 1994 should be loose laid edge to edge over the substrate, with side laps of 50 mm. It should be fully bonded with hot bitumen for a minimum of 500 mm around the perimeter and all upstands.

4.4 The subsequent layers are bonded as described in sections 4.1 and 4.2 onto the perforated layer.

Technical Investigations

The following is a summary of the technical investigations carried out on the Chesterflex membranes.

Samples of the membranes were obtained from the manufacturer for testing. A summary of tests showing typical values from the materials are detailed in Tables 2 to 5.

Table 2 Physical properties — directional

Test (units)	Method*	Mean results ⁽¹⁾			
		125	180	250S	350S
Tensile strength (N 50 mm ⁻¹)	BS 2782 : 320A ⁽²⁾				
control					
long ⁽³⁾		578	669	845	996
trans ⁽⁴⁾		533	576	622	566
Heat aged ⁽⁵⁾					
long ⁽³⁾		480	521	—	1142
trans ⁽⁴⁾		441	445	—	854
Elongation at break (%)	BS 2782 : 320A				
control					
long ⁽³⁾		30	34	40	40
trans ⁽⁴⁾		40	35	42	70
Heat aged ⁽⁵⁾					
long ⁽³⁾		30	14	—	30
trans ⁽⁴⁾		40	14	—	40
Dimensional stability (free) (%)	MOAT 27 : 5.1.16				
long ⁽³⁾		0.13	—	—	-0.07
trans ⁽⁴⁾		-0.27	—	—	-0.43
Low temperature flexibility (°C)	MOAT 27 : 5.4.2				
long ⁽³⁾		—	-5	-5	—
trans ⁽⁴⁾		—	-5	-5	—
Resistance to tear (nail tear) (N)	MOAT 27 : 5.4.2				
long ⁽³⁾		—	312	374	—
trans ⁽⁴⁾		—	309	325	—

(1) all results are for sanded membranes only

(2) test speeds — for 130 and 250 membranes 100 mm min⁻¹, for 125 and 350 500 mm min⁻¹

(3) longitudinal direction

(4) transverse direction

(5) heat aged for 56 days at 80°C

— = not tested, assessed on results of testing on the other membranes.

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

Table 3 Physical properties — general

Test (units)	Method*	Mean results					
		125	180	250S ⁽¹⁾	250M ⁽²⁾	350S ⁽¹⁾	350M ⁽²⁾
Ash content (%)	BS 2782 : 454A	51	38	—	—	35	44
Water vapour permeability (gm ⁻² d ⁻¹)	BS 3177 : 1959 (25°C/75% RH)	0.46	0.43	—	—	—	0.69
Water vapour resistance (MNsg ⁻¹)	BS 3177 : 1959 (25°C/75%)	446	477	—	—	—	297
Moisture absorption (%)	BS 2782 : 430A	—	1.29	1.07	0.99	—	—

(1) sand finish

(2) mineral finish

— = not tested, assessed on results of testing on the other membranes.

*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

Test (units)	Method*	Mean results					
		125	180	250S ⁽¹⁾	250M ⁽²⁾	350S ⁽¹⁾	350M ⁽²⁾
Water pressure	MOAT 27 : 5.1.4	satisfactory					
Static indentation substrate	MOAT 27 : 5.1.9						
hard		—	—	—	L ₄	L ₄ ⁽³⁾	L ₄ ⁽³⁾
soft		—	—	—	L ₄	L ₄ ⁽³⁾	L ₄ ⁽³⁾
Dynamic indentation substrate	MOAT 27 : 5.1.10						
perlite		—	I ₂	—	I ₃	I ₃ ⁽³⁾	I ₃ ⁽³⁾
EPS		—	I ₃	—	I ₃	I ₃ ⁽³⁾	I ₃ ⁽³⁾
Fatigue cycling control	MOAT 27 : 5.1.5	satisfactory					
heat aged ⁽⁴⁾		satisfactory					
Wind uplift	MOAT 27 : 5.1.2	satisfactory					
Thermal shock	MOAT 27 : 5.1.5	satisfactory					
Unrolling at low temperatures	MOAT 27 : 5.4.3	satisfactory					
Resistance to peel (N)							
control							
concrete		74	27	—	—	—	—
chipboard		59	27	—	—	—	—
felt		—	—	—	58	—	—
Heat aged ⁽⁴⁾							
concrete		33	—	—	—	—	—
chipboard		—	—	—	—	—	—
Heat aged ⁽⁵⁾							
concrete		—	50	—	—	—	—
chipboard		—	41	—	—	—	—
felt		—	—	—	87	—	—

(1) sand finish

(2) mineral finish

(3) tested with Chesterflex 125 as underlay

(4) heat aged for 28 days at 80°C

(5) heat aged for 56 days at 80°C

— = not tested, assessed on results of testing on the other membranes.

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

Table 5 Joint testing

Test (units)	Method*	Mean results			
		125	180	350S ⁽¹⁾	350M ⁽²⁾
Air pressure	MOAT 27 : 5.2.1	satisfactory			
Tensile strength (N)	MOAT 27 : 5.2.2				
control					
long ⁽³⁾		479	558	839	624
trans ⁽⁴⁾		450	—	719	491
Heat aged ⁽⁵⁾					
long ⁽³⁾		427	578	504	366
trans ⁽⁴⁾		377	—	357	252
Water soak ⁽⁶⁾					
long ⁽³⁾		417	576	876	698
trans ⁽⁴⁾		380	—	654	417

(1) sand finish

(2) mineral finish

(3) longitudinal direction

(4) transverse direction

(5) heat aged for 28 days at 80°C

(6) water soak for 7 days at 60°C

— = not tested, assessed on results of testing on the other membranes.

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

6 Other investigations

6.1 A survey of users was carried out to assess the performance in use of the products.

6.2 A factory visit was made to examine the manufacturing practice and quality control procedures employed in the manufacture of the Chesterflex membranes.

6.3 A reassessment was made of data from a previous assessment which led to the issue of Certificate No 82/1005.

Bibliography

BS 476 *Fire tests on building materials and structures*

Part 3 : 1958 *External fire exposure roof test*

BS 747 : 1994 *Specification for roofing felts*

BS 2782 *Methods of testing plastics*

Part 3 *Mechanical properties*

Methods 320A to 320F : 1976(1986) *Tensile strength, elongation and elastic modulus*

Part 4 *Chemical properties*

Methods 430A to 430D : 1983 *Determination of water absorption at 23°C. Determination of water absorption at 23°C with allowance for water-soluble matter. Determination of boiling water absorption with allowance for water-soluble matter*

Methods 454A and 454B : 1978 *Determination of ash. Determination of sulphated ash*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 8217 : 1994 *Code of practice for built-up felt roofing*

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



On behalf of the British Board of Agrément

Date of issue: 9th November 1994

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Director

Electronic Copy





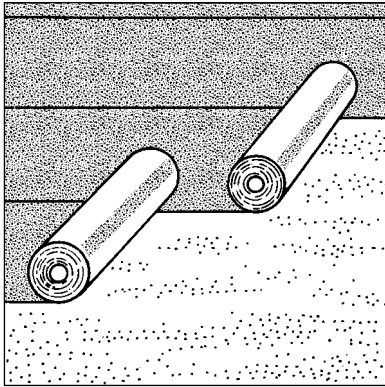
Chesterfelt Ltd

Certificate No 94/3062

CHESTERMERIC ROOF WATERPROOFING MEMBRANES

DETAIL SHEET 3

Product



• THIS DETAIL SHEET RELATES TO CHESTERMERIC ROOF WATERPROOFING MEMBRANES, POLYESTER REINFORCED POLYMER MODIFIED BITUMEN SHEETING.

• Chestermeric membranes are suitable for use in a fully or partially bonded roof waterproofing system on flat or pitched roofs with limited access.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the products, and the Conditions of Certification, respectively.

Technical Specification

1 Description

1.1 The Chestermeric Roof Waterproofing Membranes range consists of the following:

Chestermeric 180 — an SBS modified bitumen felt, reinforced with a polyester reinforcement (180 gm^{-2}) and a sand finish on both sides, for use as a first layer.

Chestermeric 250 (sanded) — an SBS modified bitumen felt, reinforced with a polyester reinforcement (250 gm^{-2}) and a sand finish on both sides, for use as a first layer or top layer with additional protection.

Chestermeric 250 (mineral) — as for 250 (sanded), but with a mineral finish on the upper surface, for use as a cap sheet.

Chestermeric 350 (sanded) — an SBS modified bitumen felt, reinforced with a polyester reinforcement (350 gm^{-2}) and a sand finish on both sides, for use as a top layer with additional protection.

Chestermeric 350 (mineral) — as for 350 (sanded), but with a mineral finish on the upper surface, for use as a cap sheet.

1.2 The products are manufactured to the nominal dimensions given in Table 1.

Table 1 Nominal dimensions

Dimensions	180	250S	250M	350S	350M
thickness (mm)	1.8	2.4	2.8	3.3	3.8
width (m)	1.0	1.0	1.0*	1.0	1.0*
length (m)	20.0	16.0	8.0	8.0	8.0
weight (kgm^{-2})	1.80	2.50	3.75	4.00	4.75
roll weight (kg)	36	40	30	32	38

*includes 75 mm selvedge.

1.3 Ancillary items for use with Chesterflex membranes are:

Oxidised bitumen grades 95/25 and 115/15 — for bonding to substrate.

Chesterplus 3G venting — a BS 747 Type 3G venting layer for use as a first layer in a three-layer system.

Chesterplus Perforated — for use in partially bonded built-up systems.

Chesterstop — a vapour control layer for use in built-up systems.

Chestertech — a glass/polyester reinforcement nailing layer.

1.4 Quality control checks are carried out on the raw materials. Checks on the final product include:

weight per unit area

width

tensile strength/elongation

Mullen burst

resistance to tear.

2 Delivery and site handling

2.1 Chestermeric membranes are delivered to site wrapped in paper. The wrappers bear the product name, manufacturer's name, dimensions (excluding thickness), and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls must be stored in an upright position on a clean, level surface and kept dry.

Design Data

3 Properties in relation to fire



3.1 When tested in accordance with BS 476 : Part 3 : 1958:

(a) A system comprising 18 mm thick plywood, 50 mm of phenolic insulation, one layer of Chestermeric 180 and one layer of Chestermeric 350 mineral, fully bonded in bitumen, achieved EXT.F.AA rating.

(b) A system comprising 18 mm thick plywood, 50 mm of phenolic insulation, one layer of Chestermeric 180, and one layer of Chestermeric 250 mineral, fully bonded in bitumen, achieved EXT.F.AC rating.



3.2 When used for flat roofs with one of the surface finishes defined in Part iii of Table A5 of Appendix A of Approved Document B of the Building Regulations 1991 (as amended 1994) (England and Wales) (and listed below), the roof is deemed to be of designation AA.

Surface finishes:

- (a) bitumen bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- (b) bitumen bedded tiles of a non-combustible material
- (c) sand and cement screed, or
- (d) macadam.

3.3 The designation of other specifications should be confirmed by test or assessment in accordance with Clause A1 of Approved Document B of the Building Regulations 1991 (as amended 1994) (England and Wales).



3.4 The designation of specifications, other than those in section 3.1, must be confirmed by testing to ensure conformity with Standards D2.5 and D3.6 for compliance with the Building Standards (Scotland) Regulations 1990 (as amended).



3.5 When used for flat roofs with one of the surface finishes given in Technical Booklet E, Table 4.6, Part IV of the Building Regulations (Northern Ireland) 1994, the roof should be considered to be of designation AA.

3.6 The designation for other specifications, for example when the system is used on combustible substrates, should be confirmed either by testing or by assessment by a NAMAS accredited laboratory, BRE or an independent consultant with appropriate experience.

Installation

4 Procedure

Fully bonded applications

4.1 A first layer of waterproofing should be bonded to the substrate with hot bitumen, using traditional pour and roll techniques. Lap joints should be a minimum of 50 mm for side and 75 mm for end.

4.2 Top layer and cap sheets are fully bonded onto the other layers by pour and roll. Lap joints should be a minimum of 75 mm for side and 100 mm for end. The laps should be offset in relation to the previous layer, as recommended in BS 8217 : 1994.

Partially bonded applications

4.3 A layer of either Chesterplus Perforated or Type 3G felt to BS 747 : 1994 should be loose laid edge to edge over the substrate, with side laps of 50 mm. It should be fully bonded with hot bitumen for a minimum of 500 mm around the perimeter and all upstands.

4.4 The subsequent layers are bonded as described in sections 4.1 and 4.2 onto the perforated layer.

Technical Investigations

The following is a summary of the technical investigations carried out on the Chestermeric membranes.

5 Tests

Samples of the membranes were obtained from the manufacturer for testing. A summary of tests showing typical values from the materials is detailed in Tables 2 to 4.

Table 2 Physical properties — polyester scrim

Test (units)	Method*	Mean results			
		180	250	350	
Mass per unit area (gm ⁻²)	MOAT 31 : 6B	179	273	400	
Tensile strength (N 50 mm ⁻¹)	MOAT 31 : 6C	long ⁽¹⁾	443	752	1113
		trans ⁽²⁾	485	667	647
Elongation (%)	MOAT 31 : 6C	long ⁽¹⁾	24	42	25
		trans ⁽²⁾	30	43	66

(1) Longitudinal direction.

(2) Transverse direction.

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

Table 3 Physical properties — directional

Test (units)	Method*	Mean results			
		180	250S	350S	
Low temperature flexibility (°C)	MOAT 31 : 6D	Long ⁽¹⁾			
		unaged	≤-21	≤-21	≤-21
		heat aged ⁽²⁾	-15	—	-5
		water soak ⁽³⁾	—	—	≤-21
Trans ⁽⁴⁾		unaged	≤-21	≤-21	≤-21
		heat aged ⁽²⁾	≤-21	—	-5
		water soak ⁽³⁾	—	—	≤-21
		Dimensional stability %			
Long ⁽¹⁾	MOAT 27 : 5.1.6.1		-0.48	-0.12	-0.11
		Trans ⁽⁴⁾	0.23	0.06	0.04
Tensile strength (N 50 mm ⁻¹)	BS 2782 : Part 3 : 320A (100 mm min ⁻¹)	Long ⁽¹⁾			
		unaged	703	994	1318
Trans ⁽⁴⁾		heat aged ⁽⁵⁾	689	949	1320
		unaged	684	987	667
Elongation at break (%)	BS 2782 : Part 3 : 320A (100 mm min ⁻¹)	heat aged ⁽⁵⁾	739	935	687
		Long ⁽¹⁾			
unaged			39	48	27
		heat aged ⁽⁵⁾	38	42	24
Trans ⁽⁴⁾		unaged	44	48	70
		heat aged ⁽⁵⁾	42	43	41

(1) Longitudinal direction.

(2) Heat aged for 180 days at 70°C.

(3) Water soak for 7 days at 60°C.

(4) Transverse direction.

(5) Heat aged for 56 days at 70°C.

— not tested

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

Table 4 Service performance

Test (units)	Method*	Mean results
Unrolling at low temperature	MOAT 27 : 5.4.3	satisfactory
Resistance to water pressure (6 m head of water)	MOAT 27 : 5.1.4	no leaks
Static indentation 180	MOAT 27 : 5.1.9	
Substrate rigid		L ₄
compressive		L ₄
3.50S		
Substrate rigid		L ₄
compressive		L ₄
Dynamic indentation 180	MOAT 27 : 5.1.10	
Substrate perlite cellulose		L ₃
EPS		L ₂
250M		
Substrate perlite cellulose		L ₃
EPS		L ₃
350M		
Substrate perlite cellulose		L ₃
EPS		L ₃
Water vapour permeability (gm ⁻² d ⁻¹)	BS 3177 (25°C/75% RH)	0.49
Water vapour resistance (MNsg ⁻¹)	BS 3177 (25°C/75% RH)	419
Resistance to cyclic movements unaged	MOAT 31 : 6K	satisfactory
heat aged ⁽¹⁾		satisfactory
Resistance to leakage at joints	MOAT 27 : 5.2.1.	no leaks
Tensile strength of joints (N) ⁽²⁾ unaged	MOAT 27 : 5.2.2/3/4	404
heat aged ⁽¹⁾		469
water soak ⁽³⁾		415
Peel test (N) 180	MOAT 31 : 6I	
primed concrete unaged		20
heat aged ⁽¹⁾		23
primed chipboard unaged		23
heat aged ⁽¹⁾		27
250M primed concrete unaged		51
heat aged ⁽¹⁾		63

(1) Heat aged 28 days at 70°C.

(2) 180 membrane tested.

(3) Water soak 7 days at 60°C.

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

6 Other investigations

6.1 A survey of users was carried out to assess the performance in use of the products.

6.2 A factory visit was made to examine the manufacturing practice and quality control procedures employed in the manufacture of the Chestermeric membrane.

Bibliography

BS 476 *Fire tests on building materials and structures*

Part 3 : 1958 *External fire exposure roof test*

BS 747 : 1994 *Specification for roofing felts*

BS 2782 *Methods of testing plastics*

Part 3 *Mechanical properties*

Methods 320A to 320F : 1976(1986) *Tensile strength, elongation and elastic modulus*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

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

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

MOAT No 31 : 1984 *Special Directives for the Assessment of Reinforced Homogeneous Waterproof Coverings of Styrene-Butadiene-Styrene (SBS) Elastomer Bitumen*



On behalf of the British Board of Agrément

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