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Agrément Certificate

10/4808

Product Sheet 1 Issue 4

RENOLIT ROOF WATERPROOFING MEMBRANES

RENOLIT ALKORPLAN ROOF WATERPROOFING MEMBRANES

This Agrément Certificate Product Sheet⁽¹⁾ relates to Renolit Alkorplan Roof Waterproofing Membranes, a range of single-layer PVC membranes for use as mechanically fastened, fully adhered and green roof waterproofing on flat or pitched roofs, or as loose-laid and ballasted, and roof garden waterproofing on flat roofs with limited access.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Fourth issue: 10 November 2023
Originally certificated on 15 February 2011

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Renolit Alkorplan Roof Waterproofing Membranes, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	B4(1)	External fire spread
Comment:		The products are restricted by Requirement in some circumstances. See section 2 of this Certificate.
Requirement:	B4(2)	External fire spread
Comment:		On a suitable substructure, the use of the products may enable a roof to be unrestricted under this Requirement. See section 2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The products, including joints, will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
Regulation:	7(1)	Materials and workmanship.
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		Use of the products satisfies the requirements of this Regulation. See sections 8 and 9 of this Certificate.
Regulation:	9	Building standards - construction
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The products are restricted under clauses 2.6.4 ⁽¹⁾⁽²⁾ and 2.7.1 ⁽¹⁾⁽²⁾ of these Standards in some circumstances. See section 2 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		On suitable substructures, the use of the products may enable a roof to be unrestricted under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Use of the products, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.

Regulation:	12	Building standards - conversions
Comment:	Comments in relation to the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .	
	(1) Technical Handbook (Domestic).	
	(2) Technical Handbook (Non-Domestic).	



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(1)(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The products will enable a roof to satisfy the requirements of this Regulation. See section 3 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The products are restricted by this Regulation in some circumstances. See section 2 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On suitable substructures, the use of the products may enable a roof to be unrestricted by this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2023

In the opinion of the BBA, Renolit Alkorplan Roof Waterproofing Membranes, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.1, *Flat roofs, terraces and balconies*.

In addition, in the opinion of the BBA, the products, when installed and used in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account other relevant guidance within the Chapter and the suitability of the substrate to receive the products.

The *NHBC Standards* do not cover the refurbishment of existing roofs.

Fulfilment of Requirements

The BBA has judged Renolit Alkorplan Roof Waterproofing Membranes to be satisfactory for use as described in this Certificate. The products have been assessed as mechanically fastened, fully adhered and green roof waterproofing on flat or pitched roofs, or as loose-laid and ballasted, and roof garden waterproofing on flat roofs, with limited access.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the products under assessment. Renolit Alkorplan Roof Waterproofing Membranes consist of:

- Renolit Alkorplan F — polyester reinforced, polyvinyl chloride (PVC) membranes for mechanically fastened systems (35176/35276)
- Renolit Alkorplan L — glass fibre fleece reinforced, PVC membranes for ballasted systems, green roofs and roof gardens either loose laid (35177) or fully adhered (35177A, 35177 fleece backed version)
- Renolit Alkorplan A — non-reinforced PVC membranes, backed with a polyester fleece for fully adhered systems (35179/35279).

The products have the nominal characteristics given in Tables 1 to 3.

Table 1 Nominal characteristics of Renolit Alkorplan F

Characteristic (unit)	35176/35276			35276					
Thickness (mm)		1.5			1.8			2.0	
Roll width (m)	1.05	1.60	2.10	1.05	1.60	2.10	1.05	1.60	2.10
Roll length (m)	20	15	15	20	15	15	15	15	10
Mass per unit area (kg·m ⁻²)		1.85			2.20			2.50	
Colours	35176: Light grey 35276: Light grey, lead grey, charcoal, copper green, terracotta, bright white, cool ivory, silver metallic, and other colours available to order								

Table 2 Nominal characteristics of Renolit Alkorplan L

Characteristic (unit)	35177			35177A
Thickness (mm)	1.5	1.8	2.0	1.5
Roll width (m)	2.15	2.15	2.15	2.15
Roll length (m)	15	15	10	15
Mass per unit area (kg·m ⁻²)	1.80	2.15	2.45	2.15
Colours	Light grey			

Table 3 Nominal characteristics of Renolit Alkorplan A

Characteristic (unit)	31579/35279	35279	
Thickness (mm)	1.5	1.8	2.0
Roll width (m)	2.10	2.10	2.10
Roll length (m)	15	15	15
Mass per unit area (kg·m ⁻²)	2.15	2.50	2.80
Colours	35179: Light Grey 35279: Light grey, lead grey, charcoal, bright white, and other colours available to order		

Ancillary Items

The Certificate holder recommends the following ancillary items for use with the products, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- Renolit Alkorplan D 35x70 — 1.5 mm non-reinforced PVC membrane for detailing work in various colours
- Renolit Alkorplan D 35x76 — 1.5 mm polyester-reinforced PVC membrane for delineating maintenance, access and emergency routes
- Renolit Alkorplan 81170 — galvanised steel sheet laminated with PVC foil (2 x 1 m)
- Renolit Alkorplan 81171 — galvanised steel sheet laminated with PVC foil (3 x 1 m)
- Renolit Alkorplan 81060 — preformed internal corner in PVC membrane
- Renolit Alkorplan 81061 — preformed external corner in PVC membrane
- Renolit Alkorplan 81503 — standing seam profile, X-large
- Renolit Alkorplan 81504 — standing seam profile, large
- Renolit Alkorplan 81600 — carrier profile
- Renolit Alkorplan 81038 — seam sealer (liquid PVC)
- Renolit Alkorplan 81114 — PVC walkway protection layer for trafficked areas
- Renolit Alkorplan 81088 — rainwater outlet
- Renolit Alkorplan 81107 — lightning conductor pad
- Renolit Alkorplus 81040 — synthetic rubber-based contact adhesive
- Renolit Alkorplus 81140 — contact spray (PU) adhesive
- Renolit Alkorplus 81065 — foam polyurethane (PU) adhesive
- Renolit Alkorplus 81068 — liquid PU adhesive
- Renolit Alkorplus 81168 — solvent free, liquid PU adhesive
- Renolit Alkorplus 81044 — ethyl acetate cleaner
- Renolit Alkorplus 81141 — bituminous primer
- Renolit Alkorplus 81001 — 120 g·m⁻² glass fibre fleece separation layer
- Renolit Alkorplus 81005 — 300 g·m⁻² synthetic protection layer
- Renolit Alkorplus 81008 — 180 g·m⁻² synthetic separation layer
- Renolit Alkorplus 35121 — protective PVC membrane with polyester fleece
- Renolit Alkorplus 81012 — low density polyethylene (LDPE) vapour control layer (VCL)
- Renolit Alkorplus 81018 — reinforced aluminium acrylate self-adhesive VCL
- Renolit Alkorplus 81002 — reinforced aluminium bituminous self-adhesive VCL
- Renolit Alkorplus 81057 — double-sided seam tape for LDPE VCL
- Renolit Alkorplus 81014 — vapour permeable layer
- Renolit Alkorplus 81015 — drainage and filter layer
- Renolit Alkorplus 81016 — water retention layer
- Renolit Alkorplus 81058 — compressive foam strip for wind-tight laminated metal connections
- Renolit Alkorplus 81192 — aluminium tape for flexible laminated metal connections
- Renolit Alkorplus 81601 — aluminium insert for Renolit Alkorplan 81600 carrier profile
- Renolit Alkorplus 81602 — self tapping stainless steel fastener in conjunction with Renolit Alkorplus 81602 aluminium insert and Renolit Alkorplan carrier profile.

Applications

The products are intended for use in the following situations:

- Renolit Alkorplan F membranes (35176/35276) are for use as mechanically fastened waterproofing on flat roofs with limited access
- Renolit Alkorplan F membranes (35276 excluding light grey, bright white and cool ivory) are for use as mechanically fastened waterproofing on pitched roofs with limited access
- Renolit Alkorplan L membranes (35177) are for use as a loose-laid and ballasted waterproofing layer on flat roofs with limited access or roof garden applications, and as a green roof waterproofing layer on flat roofs with limited access
- Renolit Alkorplan L membrane (35177A) is for use as a loose-laid, ballasted or fully bonded waterproofing layer on flat roofs with limited access or roof garden applications, and when fully bonded as a green roof waterproofing layer on flat and pitched roofs with limited access
- Renolit Alkorplan A membranes (35179/35279) are for use as fully bonded waterproofing layers on flat roofs with limited access.

Definitions for products and applications inspected

The following terms are defined for the purpose of this Certificate as:

- limited access roofs — a roof subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc
- flat roofs — a roof having a minimum finished fall of 1:80
- pitched roofs — a roof having falls greater than 1:6
- green roof (extensive) — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wildflower species
- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees, generally accessible to pedestrians.

Product assessment – key factors

The products were assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Not applicable.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 External fire spread

2.1.1 When tested to DD CEN/TS 1187 : 2012, Test 4 and classified to BS EN 13501-5 : 2016, the systems given in Table 4 of this Certificate achieved B_{ROOF}(t4).

Table 4 Results of external fire spread tests

Substrate	Air and vapour control layer (AVCL)	Insulation	Waterproofing membrane	For slopes of:
18 mm OSB ⁽¹⁾	Renolit Alkorplus 81012 ⁽⁶⁾ , loose laid	120 mm Celotex Crown bond ⁽⁶⁾ , mechanically fastened	1.5 mm Renolit Alkorplan F (35176), mechanically fastened	≤ 10°
18 mm OSB ⁽²⁾	Renolit Alkorplus 81012 ⁽⁶⁾ , loose laid	≥ 80 mm foil faced polyisocyanurate (PIR) ⁽⁶⁾ , mechanically fastened	1.5 – 2.0 mm Renolit Alkorplan F (35276), mechanically fastened	All inclinations
18 mm plywood ⁽³⁾	Renolit Alkorplus 81012 ⁽⁶⁾ , loose laid	250 mm Hardrock Multi-Fix DD ⁽⁶⁾ , mechanically fastened	1.5 mm Renolit Alkorplan F (35276), mechanically fastened	≤ 10°
18 mm OSB ⁽⁴⁾	Renolit Alkorplus 81002 ⁽⁶⁾ , fully bonded	120 mm Celotex Crown Bond ⁽⁶⁾ , fully bonded	1.5 mm Renolit A (35179), fully bonded (Alkorplus 81065 ⁽⁶⁾)	≤ 10°
18 mm plywood ⁽⁵⁾	Renolit Alkorplus 81012 ⁽⁶⁾ , loose laid	200 mm Therma TR27 ⁽⁶⁾ , mechanically fastened	1.5 mm Alkorplan A (35279), fully bonded (Alkorplus 81068 ⁽⁶⁾)	≤ 10°

(1) Classification report WF379861, issued by Exova Warringtonfire. Copies of the report are available from the Certificate holder on request.

(2) Extended application classification reports, 21636E, 21636J and 21636N, issued by Warringtonfire, and test report 266155, issued by BRE Global. Copies of the reports are available from the Certificate holder on request.

(3) Classification report P122530-1001, issued by BRE Global. Copies of the report are available from the Certificate holder on request.

(4) Classification report WF379858, issued by Exova Warringtonfire. Copies of the report are available from the Certificate holder on request.

(5) Classification report 20283C, issued by Warringtonfire. Copies of the report are available from the Certificate holder on request.

(6) These components are outside the scope of this Certificate.

2.1.2 When tested to BS 476-3 : 2004, the systems given in Table 5 of this Certificate achieved the rating of EXT.S.AB when tested in the sloping position.

Table 5 Results of external fire spread tests

Substrate	AVCL	Insulation	Waterproofing membrane
18 mm OSB ⁽¹⁾	Renolit Alkorplus 81012, loose laid	170 mm Rockwool Duorock, mechanically fastened	1.5 mm Renolit Alkorplan F (35176), mechanically fastened

(1) Test report 266156 issued by BRE Global. Copies of the report are available from the Certificate holder on request.

2.1.3 On the basis of data assessed, the constructions given in Tables 4 and 5 will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a boundary. Restrictions may apply at junctions with competent walls.

2.1.4 A roof incorporating Renolit Alkorplan L (35177/35177A) will also be unrestricted with respect to proximity to a boundary under the national Building Regulations in the following circumstances:

- when used in protected specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC
- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick
- irrigated roof gardens and green roofs.

2.1.5 The classification and permissible areas of use of other specifications must be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

2.1.6 If allowed to dry, the plants used may allow flame-spread across the roof. This must be taken into consideration when selecting suitable plants for the roof. Appropriate planting, irrigation and/or protection must be applied to ensure the overall fire-rating of the roof is not compromised.

2.2 Reaction to fire

2.2.1 The Certificate holder has declared a reaction to fire classification of Class E to BS EN 13501-1 : 2018 for the products.

2.2.2 On the basis of data assessed, the products will be restricted in use under the documents supporting the national Building Regulations in some cases.

2.2.3 In England, the products, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a boundary, or on residential buildings more than 11 m in height or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.4 In Wales, the products, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a boundary, or on buildings more than 18 m in height or in some cases, on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.5 In Scotland and Northern Ireland, when used in pitches greater than 70°, excluding upstands, the products achieving Class E reaction to fire classification to BS EN 13501-1 : 2018 must not be used on buildings less than 1 m from a boundary nor with a storey 11 m or more above the ground level or on some entertainment, assembly, hospital and residential care buildings. These constructions must also be included in calculations of unprotected area.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertightness

3.1.1 Results of weathertightness tests are given in Table 6.

Table 6 Results of weathertightness tests

Product assessed	Assessment method	Requirement	Result
Alkorplan F (35176 and 35276)	Watertightness to NBN EN 1928 : 2000	No leakage at 10 kPa	Pass
Alkorplan L (35177)	Watertightness to NBN EN 1928 : 2000	No leakage at 10 kPa	Pass
Alkorplan A (35179 and 35279)	Watertightness to NBN EN 1928 : 2000	No leakage at 10 kPa	Pass
Alkorplan A (35179 and 35279)	Interlaminar adhesion to MOAT 65 : 4.3.16 : 2001	$\geq 50 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass
Alkorplan A (35179 bonded with Renolit Alkorplus 81065)	Resistance to peel from the support to MOAT 65 : 4.3.3 : 2001	$\geq 25 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass

Table 6 Results of weathertightness tests (continued)

Alkorplan A (35179 bonded with Renolit Alkorplus 81068)	Resistance to peel from the support to MOAT 65 : 4.3.3 : 2001	$\geq 25 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass
Alkorplan F (35176, 1.2 mm), fixed with SFS Isofast IR2-S screws and SFS Isofast IR 82x40 pressure plates on 100 mm mineral wool insulation on a profiled steel deck	Dynamic wind uplift to ETAG 006 : 2000 ⁽¹⁾	Design value ⁽²⁾	Permissible load 697 N per fastener
Alkorplan F (35176, 1.2 mm), fixed with LR Etanco EHB DF 2C screws and LR Etanco 82x40 R DF pressure plates on 100 mm mineral wool insulation on a profiled steel deck			Permissible load 697 N per fastener ⁽³⁾
Alkorplan F (35176, 1.2 mm), fixed with SFS Isotak PS-48 screws and SFS Isotak Twin peak Plus sleeves on 100 mm mineral wool insulation on a profiled steel deck			Permissible load 840 N per fastener
Alkorplan F (35176, 1.2 mm), fixed VRF Europe EDS B screws and VRF Eurofast TRP45 sleeves on 100 mm mineral wool insulation on a profiled steel deck			Permissible load 697 N per fastener ⁽³⁾
Alkorplan F (35176, 1.2 mm), fixed with VRF Eurofast EDS B screws and VRF Eurofast BTRP45 sleeves on 100 mm mineral wool insulation on a profiled steel deck	Dynamic wind load to NBN EN 16002 : 2018	Design value ⁽²⁾	Permissible load 882 N per fastener
Alkorplan F (35176, 1.2 mm), fixed with Ejot Dabo TKR-4.8 and Ejot Ecotek T 50 sleeves on 100 mm mineral wool insulation on a profiled steel deck			Permissible load 677 N per fastener
Alkorplan F (35176, 1.2 mm), fixed with Afast Guardian BS 48 screws and Afast Guardian RB 48 sleeves on 100 mm mineral wool insulation on a profiled steel deck			Permissible load 780 N per fastener

(1) Test carried out before the publication of harmonised European Standard EN 13956 : 2012.

(2) The value for a specific building must be calculated by a suitably competent and experienced individual in accordance with the principles of BS EN 1991-1-4 : 2005 and its UK National Annex.

(3) This value has been limited by the manufacturer.

3.1.2 On the basis of data assessed, the products, including joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of a building and so satisfy the requirements of the national Building Regulations.

3.1.3 Alkorplan F membranes, when mechanically fastened, will sufficiently resist the effects of wind suction likely to be experienced in the UK.

3.1.4 When Renolit Alkorplan A membranes (35179/35279) are bonded to a decking, or a reinforced bituminous membrane, they will sufficiently resist the effect of wind suction, thermal cycling or other minor structural movements likely to occur in service.

3.1.5 When Renolit Alkorplan A membranes (35179/35279) are bonded to insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which the insulation is secured to the roof deck. This must be taken into account when selecting suitable insulation material.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 7.

<i>Table 7 Results of resistance to mechanical damage tests</i>			
Product assessed	Assessment method	Requirement	Result
Alkorplan F (35176 and 35276)	Tensile strength to	Value achieved	
1.5 mm	NBN EN 12311-2 : 2000		
1.8 mm	Machine & Cross directions		
2.0 mm			
Alkorplan F (35176 and 35276)	Elongation to	Value achieved	
1.5 mm	NBN EN 12311-2 : 2000		
1.8 mm	Machine & Cross directions		
2.0 mm			
Alkorplan F (35176 and 35276)	Resistance to tearing	Value achieved	
1.5 mm	(nail shank) to		
1.8 mm	NBN EN 12310-1 : 2000		
2.0 mm	Machine & Cross directions		
Alkorplan F (35176 and 35276)	Low temperature foldability to NBN EN 495-5 : 2001	Declared value $\leq -25^{\circ}\text{C}$	Pass
Alkorplan F (35176 and 35276)	Resistance to static loading to NBN EN 12730 : 2001	Value achieved	
	On hard substrate		
	On soft substrate		
Alkorplan F (35176 and 35276)	Resistance to impact to NBN EN 12691 : 2001	Value achieved	
1.50 mm	On hard substrate		
1.8 mm			
2.0 mm			
All thickness	On soft substrate		
Alkorplan F (35176 and 35276)	Peel resistance of joints to NBN EN 12316-2 : 2000	Value achieved	
1.5 mm			
1.8 mm			
2.0 mm			
Alkorplan L (35177)	Tensile strength to	Value achieved	
1.5 mm	NBN EN 12311-2 : 2000		
1.8 mm	Machine & Cross directions		
2.0 mm			
Alkorplan L (35177)	Elongation to	Value achieved	
1.5 mm	NBN EN 12311-2 : 2000		
1.8 mm	Machine & Cross directions		
2.0 mm			

Table 7 Results of resistance to mechanical damage tests (continued)

Alkorplan L (35177)	Resistance to tearing (nail shank) to NBN EN 12310-1 : 2000 Machine & Cross directions	Value achieved	≥ 325 N ≥ 350 N ≥ 350 N
Alkorplan L (35177)	Low temperature foldability to NBN EN 495-5 : 2001	Declared value ≤ -25°C	Pass
Alkorplan L (35177)	Resistance to static loading to NBN EN 12730 : 2001 On hard substrate On soft substrate	Value achieved	≥ 20 kg ≥ 20 kg
Alkorplan L (35177)	Resistance to impact to NBN EN 12691 : 2001 On hard substrate On soft substrate	Value achieved	≥ 600 mm ≥ 700 mm ≥ 800 mm ≥ 2000 mm
Alkorplan L (35177)	Peel resistance of joints to NBN EN 12316-2 : 2000	Value achieved	≥ 200 N·(50 mm) ⁻¹
Alkorplan A (35179 and 35279)	Tensile strength to NBN EN 12311-2 : 2000 Machine & Cross directions	Value achieved	≥ 850 N·(50 mm) ⁻¹ ≥ 875 N·(50 mm) ⁻¹ ≥ 900 N·(50 mm) ⁻¹
Alkorplan A (35179 and 35279)	Elongation to NBN EN 12311-2 : 2000 Machine & Cross directions	Value achieved	≥ 55% ≥ 60% ≥ 60%
Alkorplan A (35179 and 35279)	Resistance to tearing (nail shank) to NBN EN 12310-1 : 2000 Machine & Cross directions	Value achieved	≥ 625 N ≥ 700 N ≥ 775 N
Alkorplan A (35179 and 35279)	Low temperature foldability to NBN EN 495-5 : 2001	Declared value ≤ -25°C	Pass
Alkorplan A (35179 and 35279)	Resistance to static loading to NBN EN 12730 : 2001 On hard substrate On soft substrate	Value achieved	≥ 20 kg ≥ 20 kg
Alkorplan A (35179 and 35279)	Resistance to impact to NBN EN 12691 : 2001 On hard substrate On soft substrate	Value achieved	≥ 600 mm ≥ 700 mm ≥ 900 mm ≥ 2000 mm
Alkorplan A (35179 and 35279)	Peel resistance of joints to NBN EN 12316-2 : 2000	Value achieved	≥ 225 N·(50 mm) ⁻¹ ≥ 250 N·(50 mm) ⁻¹ ≥ 275 N·(50 mm) ⁻¹

3.2.2 On the basis of data assessed, the products can accept the limited foot traffic and light concentrated loads associated with installation and maintenance while remaining weathertight. Care must be taken to avoid puncture by sharp objects or concentrated loads.

3.2.3 Where regular traffic is envisaged, such as for maintenance of lift equipment, a walkway must be provided, eg using concrete slabs supported on bearing pads or a suitable walkway. The Certificate holder can advise on suitable materials but such advice and materials are outside of the scope of this Certificate.

3.2.4 The products are capable of accepting minor structural movement while remaining weathertight.

3.3 Resistance to root penetration

3.3.1 Results of resistance to root penetration tests are given in Table 8.

Table 8 Results of resistance to root penetration tests

Product assessed	Assessment method	Requirement	Result
Alkorplan L (35177) 1.5 mm	Resistance to root penetration to EN 13948 : 2007	No root penetration after 2 years	Pass

3.3.2 On the basis of data assessed, Renolit Alkorplan L membranes (35177/35177A) will adequately resist penetration by plant roots.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

The products comprise polyvinyl chloride, polyester and glass, which can be recycled.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the products were assessed.

8.2 Results of durability tests are given in Table 9.

Table 9 Results of durability tests

Product assessed	Assessment method	Requirement	Result
Alkorplan F (35176 and 35276)	Low temperature foldability to NBN EN 495-5 : 2001 after 168 days at 70°C	Declared value ≤ -25°C	Pass
Alkorplan F (35176 and 35276)	Dimensional stability to NBN EN 1107-2 : 2001 Machine direction Cross direction	Declared value ≤ 0.3%	Pass Pass
Alkorplan L (31577)	Low temperature foldability to NBN EN 495-5 : 2001 after 168 days at 70°C	Declared value ≤ -25°C	Pass
Alkorplan L (31577)	Dimensional stability to NBN EN 1107-2 : 2001 Machine direction: Cross direction:	Declared value ≤ 0.1%	Pass Pass
Alkorplan A (35179 and 35279)	Low temperature foldability to NBN EN 495-5 : 2001 after 168 days at 70°C	Declared value ≤ -25°C	Pass
Alkorplan A (35179 and 35279)	Dimensional stability to NBN EN 1107-2 : 2001 Machine direction Cross direction	Declared value ≤ 0.5%	Pass Pass
Alkorplan A (35179 bonded with Renolit Alkorplus 81065)	Resistance to peel from the support to MOAT 65 : 4.3.3 : 2001 after 28 days at 80°C	≥ 25 N·(50 mm) ⁻¹	Pass
Alkorplan A (35179 bonded with Renolit Alkorplus 81068)	Resistance to peel from the support to MOAT 65 : 4.3.3 : 2001 after 28 days at 80°C	≥ 25 N·(50 mm) ⁻¹	Pass

8.3 Service life

8.3.1 Under normal service conditions, the products will have a life of at least 35 years, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.3.2 A life in excess of 40 years can be achieved with periodic maintenance, as described in section 9.4.5.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 For design purposes, twice the minimum finished fall must be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc.

9.1.3 Decks to which the membranes are to be applied must comply with the relevant requirements of either BS 6229 : 2018 or BS 8217 : 2005 and, where appropriate, *NHBC Standards 2023*, Chapter 7.1.

9.1.4 For loose-laid and ballasted, green roofs and roof gardens, structural decks to which Renolit Alkorplan L (35177) is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance needs to be made for loading deflections to ensure that the free drainage of water is maintained.

9.1.5 The resistance to wind uplift of a mechanically fastened waterproofing layer is provided by the fasteners passing through the membranes into the substrate. The number and position of fixings will depend on a number of factors including:

- wind uplift forces to be restrained
- pull-out strength of the fasteners
- tensile properties of the membranes
- appropriate calculation of safety factors.

9.1.6 The wind uplift forces must be calculated by a suitably competent and experienced individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. On this basis, the number of fixings required must be established using a maximum permissible load of 0.7 kN for Renolit Alkorplan F membranes (35176/35276) with hot-air welded joints.

9.1.7 The ballast requirements for loose-laid systems using Renolit Alkorplan L membranes (35177/35177A) must be calculated by a suitably competent and experienced individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The membranes must always be ballasted with a minimum depth of 50 mm of aggregate. In areas of high-wind exposure, the advice of the Certificate holder must be sought. Alternatively, concrete slabs on suitable supports can be used.

9.1.8 Imposed loads, dead loading and wind loads for green roof and roof garden specifications must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003, BS EN 1991-1-4 : 2005 and their UK National Annexes.

9.1.9 The drainage system for inverted roofs, green roofs or roof gardens must be correctly designed, and the following points must be addressed:

- provision made for access for maintenance purposes
- dead loads for green roof and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer
- additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs drainage and U value corrections*.

9.1.10 The soil used in roof gardens must not be of a type that will be removed, or become delocalised due to wind scour experienced on the roof.

9.1.11 It must be recognised that the type of plants used in roof gardens could significantly affect the expected wind loads experienced in service.

9.1.12 For green roofs and roof gardens, invasive non-native alien plant species as defined by UK Government guidance must not be used.

9.1.13 Insulation materials used in conjunction with the membranes must be in accordance with the manufacturer's instructions and be either:

- as described in the relevant clauses of BS 6229 : 2018, or
- the subject of a current BBA Certificate and be used in accordance with, and within the scope of, that Certificate.

9.1.14 Contact with bituminous and oil-based products must be avoided as the membranes are not compatible with lower grades of bitumen. If contact with such products is likely, a separating layer must be interposed before installing the waterproofing sheet. Where doubt arises, the advice of the Certificate holder must be sought, but such advice outside the scope of the Certificate.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance are provided in Annex A of this Certificate.

9.2.3 Installation of Renolit Alkorplan Roof Waterproofing Membranes must be carried out in accordance with the relevant clauses of the Certificate holder's instructions, BS 8000-0 : 2014, BS 8000-4 : 1989 and this Certificate.

9.2.4 Substrates to which the products are applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs. When used over a rough substrate, a suitable protection layer must be placed over the substrate.

9.2.5 Installation must not be carried out during inclement weather (eg rain, fog or snow). When the temperature is below 5°C, suitable precautions against surface condensation must be taken.

9.2.6 The products must not come into contact with unfaced polyurethane or polystyrene insulation boards. A suitable separation layer must be used if either of these types of boards are used.

9.2.7 Soil or other bulk material must not be stored on one area of the roof prior to installation, to ensure localised overloading does not occur.

9.2.8 Detailing must be formed in accordance with the Certificate holder's instructions.

9.2.9 Installation of Renolit Alkorplan F (35176/35276) must include the following:

9.2.9.1 The products must be secured by corrosion-resistant plates and mechanical fixings manufactured by SFS Intec, LR Etanco, VRF Europe, Ejot or Guardian. Other mechanical fasteners and washers/plates used in conjunction with the fastened systems must be the subject of a valid ETA and have had a full scale wind uplift test to EN 16002 : 2018.

9.2.9.2 The products are unrolled onto the substrate, without folds or ripples, with at least 100 mm overlap. Flashing and lap jointing must be carried out as described in section 9.2.13.

9.2.9.3 The products are fixed to the deck (through insulation boards, where appropriate) in the joint overlaps positioned 10 mm from the edge (edge plate to edge membrane), prior to welding of the joint, in accordance with the Certificate holder's instructions. The fixings must be installed at centres calculated from the average wind force in that location.

9.2.9.4 A minimum distance of 150 mm between fasteners must be observed at all times. This may require the use of narrower membranes to obtain the correct number of fasteners per square metre.

9.2.10 Installation of Renolit Alkorplan L (35177/35177A) must include the following:

9.2.10.1 The products are unrolled onto the substrate without folds or ripples, with at least a 50 mm overlap, and mechanically fixed and fully adhered at details and perimeters. Flashing and lap jointing must be carried out as described in section 9.2.13.

9.2.10.2 A suitable protection layer, such as Renolit Alkorplus 35121, must be laid over the membrane prior to the application of the ballast.

9.2.10.3 When used in an inverted roof specification, a filter layer of Renolit Alkorplus 81008 must be installed on top of the insulation.

9.2.10.4 Loose-laid applications must be covered by at least a 50 mm depth of well-rounded gravel. In areas of high wind exposure, paving slabs set on a suitable support may be considered (eg pads).

9.2.10.5 In green roof and roof garden specifications, subsequent layers (eg separation layers, drainage layers or growing medium) must be installed in accordance with the Certificate holder's installation instructions.

9.2.11 Installation of Renolit Alkorplan A (35179/35279) must include the following:

9.2.11.1 The products are unrolled onto the substrate without folds or ripples, with at least 80 mm overlap. Flashing and lap jointing must be carried out as described in section 9.2.13. The products are then folded in half its length.

9.2.11.2 Adhesive is applied to the substrate in accordance with the Certificate holder's instructions. Any concentration of adhesive must be avoided.

9.2.11.3 Immediately following the application of the adhesive, the products are rolled into the adhesive and suitable pressure applied to ensure satisfactory bonding of the fleece.

9.2.11.4 The procedure is repeated for the second half of the roll and subsequent rolls.

9.2.11.5 Overlaps in the membrane must remain free of adhesive. The adjoining transverse seams of the roofing product must be butt jointed. The butt joint is covered by a 50 mm wide strip of Renolit Alkorplus 81192, with a 200 mm wide strip of Renolit Alkorplan D (35x70) welded onto the products.

9.2.12 Installation of joints and flashings must include the following:

9.2.12.1 Joints are made using hot-air welding techniques in accordance with the Certificate holder's instructions.

9.2.12.2 If the lap area is contaminated, the lap joint area on both sheets must be cleaned using Renolit Alkorplus 81044 cleaner.

9.2.12.3 Hot-air welding is conducted by using an automatic or hand-operated machine, with welding parameters set in accordance with the Certificate holder's instructions.

9.2.12.4 The lap joint must be a minimum width of 20 mm for an automatic machine, and 30 mm for a hand-held machine.

9.2.12.5 The seam is then tested and sealed in accordance with the Certificate holder's instructions.

9.2.12.6 Flashings are formed in accordance with the Certificate holder's instructions.

9.3 Workmanship

Practicability of installation was assessed by the BBA and on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the products must be carried out by installers trained and approved by the Certificate holder.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the products in use requires that it is suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2 The products must be the subject of six-monthly inspections and maintenance in accordance with the recommendations made in BS 6229 : 2018, Chapter 7 and the Certificate holder's own maintenance requirements, where relevant, to ensure continued satisfactory performance. Any exposed membrane must be free from the build-up of silt and other debris, and unwanted vegetation must be cleared.

9.4.3 In the event of accidental damage, repairs are carried out by cleaning the area around the damage and applying a patch of the appropriate Renolit Alkorplan membrane as described in section 9.2.

9.4.4 Green roofs and roof gardens must be regularly inspected, particularly in autumn after leaf fall and in spring, to ensure unwanted vegetation and other debris are cleared from the roof and drainage outlets.

9.4.5 A planned maintenance cycle, including inspections by the Certificate holder at minimum intervals of every five years, must be introduced if an extended service life is required. The Certificate holder can advise on methods of extending the service life, but such advice is outside the scope of this Certificate.

10 Manufacture

10.1 The production processes for the products have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

11 Delivery and site handling

11.1 The Certificate holder stated that the products are delivered to site in wrapped rolls packaged on pallets or in boxes. The labels bear the Certificate holder's name, product identification, batch number and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Rolls must be stored on their side, on a clean, level surface, and kept under cover.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the products but has not formed part of the material assessed for the Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

CLP Regulations

The Certificate holder has taken the responsibility of classifying and labelling the products under the *GB CLP Regulation* and *CLP Regulation (EC) No 1272/2008 - classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the products in accordance with Designated Standard EN 13956 : 2012.

CE marking

The Certificate holder has taken the responsibility of CE marking the products, in accordance with harmonised European Standard EN 13956 : 2012.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Bureau Veritas Certification (Certificate ES115373-1).

Additional Guidance

A.1 Guidance on the design, maintenance and repair of green roofs and roof gardens is available within *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

A.2 The Certificate holder can advise on methods of extending the service life, but such advice is outside of the scope of this Certificate.

A.3 In environments where the membranes are in contact with organic solvents, the life expectancy of the membranes may be reduced. In cases of doubt, the advice of the Certificate holder must be sought.

Bibliography

- BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*
- BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproofing coverings — Code of practice*
- BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
- BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*
- BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*
- BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
- NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
- BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
- NA + A2 : 18 to BS EN 1991-1-3 : 2003 + A1 : 2015 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Snow loads*
- BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*
- BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
- BS EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- DD CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*
- EN 16002 : 2018 *Flexible sheets for waterproofing — Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing*
- EN 13948 : 2007 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to root penetration*
- EN 13956 : 2012 *Flexible sheet for waterproofing — Plastic and rubber sheets for roof waterproofing — Definitions and characteristics*
- ETAG 006 : 2000 *Guideline for European Technical Approval of Systems of Mechanically Fastened Flexible Roof Waterproofing Membranes*
- MOAT 65 : 2001 *UEAtc Technical Guide for the Assessment of Non-Reinforced, Reinforced and/or Backed Roof Waterproofing Systems made of PVC*
- NBN EN 495-5 : 2001 *Flexible sheets for waterproofing — Determination of foldability at low temperature — Plastic and rubber sheets for roof waterproofing*
- NBN EN 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimensional stability — Plastic and rubber sheets for roof waterproofing*
- NBN EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*
- NBN EN 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) — Bitumen sheets for roof waterproofing*
- NBN EN 12311-2 : 2000 *Flexible sheets for waterproofing — Determination of tensile properties — Plastic and rubber sheets for roof waterproofing*
- NBN EN 12316-2 : 2000 *Flexible sheets for waterproofing — Determination of peel resistance of joints — Plastic and rubber sheets for roof waterproofing*

NEN EN 12691 : 2001 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to impact*

NBN EN 12730 : 2001 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to static loading*

NBN EN 16002 : 2018 *Flexible sheets for waterproofing — Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

British Board of Agrément

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