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**Agrément
Certificate
No 06/4301**

Designated by Government
to issue
European Technical
Approvals

ASHZIP STANDING SEAM ROOF SYSTEMS

Système de couverture
Dacheindeckungen

Product



• THIS CERTIFICATE RELATES TO ASHZIP STANDING SEAM ROOF SYSTEMS, FOR FIXING TO STEEL OR TIMBER SUBSTRUCTURES.

• The systems are suitable for buildings used for industrial, commercial, retail and leisure purposes as well as residential and non-residential buildings such as schools and hospitals.

• The systems are for use as structural roofs where access is available for maintenance and repair only.

• The product is weathertight and structurally stable within the limits set out in this Certificate, and in general, is intended to be fixed to steel or timber purlins and rafters.

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

Regulations — Detail Sheet 1

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément aspects of performance to be used by the BBA in assessing the compliance of roof decks and waterproofing with the Building Regulations. In the opinion of the BBA, Ashzip Standing Seam Roof Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: A1

Comment:

Loading

The systems have sufficient strength and stiffness to sustain and transmit the design load in accordance with the *Structural performance* section of the accompanying Detail Sheets.

Requirement: B2(1)

Comment:

Internal fire spread (linings)

The exposed surfaces (seen from the inside of the building) of the system have been assessed as having the surface rating class given in the tinted areas in the *Performance in relation to fire* section of the accompanying Detail Sheets.

Requirement: B4(2)

Comment:

External fire spread

The external surface of the sheets can be taken to have a notional AA designation when tested in accordance with BS 476-3 : 1958 and therefore is not subject to the limitations of a minimum distance from any point on a boundary. See the tinted areas in the *Performance in relation to fire* section of the accompanying Detail Sheets.

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Requirement:	C2	Resistance to moisture
Comment:		When subjected to the maximum design load given in this Certificate, the systems will resist passage of moisture to the inside of the building. See the tinted areas in the <i>Weathertightness</i> section of the accompanying Detail Sheets.
Requirement:	F2	Condensation in roofs
Comment:		A roof construction incorporating the system can be designed to satisfy this requirement. See the tinted areas of the <i>Condensation risk</i> section of the accompanying Detail Sheets.
Requirement:	L1(a)(i)	Dwellings
Requirement:	L2(a)	Buildings other than dwellings
Comment:		The thermal transmittance (U value) of the roof system is dependent on the performances (thermal conductivity) and the thickness of the insulation and the purlin and bracket spacing used. Example U values are given in the tinted area of the <i>Thermal insulation</i> section of the accompanying Detail Sheets. Provided the U value is equal to or less than the relevant Standard U value, given in Table 1 of Approved Document L1 and L2, the Elemental Method of showing compliance can be used. Alternatively, the example Standard U values can be used when a 'trade-off' between construction elements is used or with the Target U value or Carbon Index methods or with the Whole-building or Carbon Emissions Calculation Methods. The system also limits extraneous air paths as far as is reasonably practical and, therefore, will contribute to the building complying with these Requirements. See the tinted areas of the <i>Thermal insulation</i> and <i>Air leakage</i> sections of the accompanying Detail Sheets.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The systems are acceptable. See the tinted areas in the <i>Durability</i> section of the accompanying Detail Sheets.

2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Ashzip Standing Seam Roof Systems, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The systems can contribute to a construction satisfying this Regulation. See the tinted areas in the <i>Durability</i> section of the accompanying Detail Sheets, and the <i>Installation</i> part of the accompanying Detail Sheets.
Regulation:	9	Building standards — construction
Standard:	1.1(a)(b)	Structure
Comment:		The systems have sufficient strength and stiffness to transmit the design load, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ , in accordance with the <i>Structural performance</i> section of the accompanying Detail Sheets.
Standard:	2.5	Internal linings
Comment:		The exposed surfaces (seen from the inside of the building) of the system, with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ , have been assessed as having the risk classification given in the <i>Performance in relation to fire</i> section of the accompanying Detail Sheets.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The sheets have a low vulnerability classification and satisfy this Standard, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See the <i>Performance in relation to fire</i> section of the accompanying Detail Sheets.
Standard:	3.10	Precipitation
Comment:		When subjected to the maximum design load given in this Certificate, the systems will resist the passage of moisture to the inside of the building, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ . See the <i>Weathertightness</i> section of the accompanying Detail Sheets.
Standard:	3.15	Condensation
Comment:		The system will have a minimal risk of surface condensation or of damage due to interstitial condensation, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.2 ⁽¹⁾ , 3.15.3 ⁽¹⁾ and 3.15.4 ⁽¹⁾ . See the tinted area of the <i>Condensation risk</i> section of the accompanying Detail Sheets.

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Standard: 6.2

Building insulation envelope

Comment:

With regard to clause 6.0.4⁽¹⁾⁽²⁾, the calculated example thermal transmittance (U values) of the roof system given in the tinted areas of the *Thermal insulation* section of the accompanying Detail Sheets may be used. Roofs with a U value equal to, or less than, the maximum U value shown in Table 1 to clause 6.2.1⁽¹⁾⁽²⁾, will satisfy the Elemental Method of compliance. Alternatively, the example U values can be used to satisfy the alternative methods of compliance described in clauses 6.2.2⁽¹⁾⁽²⁾ and 6.2.3⁽¹⁾⁽²⁾. Details around any openings in the roof and at junctions between the roof and other elements must satisfy clause 6.2.4⁽¹⁾⁽²⁾. The system limits extraneous air paths as far as is reasonably practical and the roof will therefore contribute to the building satisfying clause 6.2.5⁽¹⁾⁽²⁾. See the tinted areas of the *Air leakage* section of the accompanying Detail Sheets.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Ashzip Standing Seam Roof Systems, 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 product is acceptable. See the tinted areas in the *Durability* section of the accompanying Detail Sheets.

Regulation: C4

Resistance to ground moisture and weather

Comment:

When subjected to the maximum design load given in this Certificate, the systems will resist the passage of moisture to the inside of the building. See the *Weathertightness* section of the accompanying Detail Sheets.

Regulation: C5

Condensation

Comment:

The risk of harmful effects on the building due to interstitial condensation within the system will be minimal. See the tinted area of the *Condensation risk* section of the accompanying Detail Sheets.

Regulation: D1

Stability

Comment:

The systems have sufficient strength and stiffness to sustain and transmit the design load in accordance with the *Structural performance* section of the accompanying Detail Sheets.

Regulation: E3

Internal fire spread — Linings

Regulation: E4

Internal fire spread — Structure

Comment:

The exposed surfaces (seen from the inside of the building) of the system have been assessed as having the class surface as given in the *Performance in relation to fire* section of the accompanying Detail Sheets.

Regulation: E5

External fire spread

Comment:

The external surface of the sheets can be taken to have a notional AA designation as defined by BS 476-3 : 1958 and therefore is not subject to the limitation of a minimum distance from any point on a boundary. See the *Performance in relation to fire* section of the accompanying Detail Sheets.

Regulation: F2

Building fabric

Comment:

The thermal transmittance (U value) of the roof system is dependent on the purlin spacing used. Example U values are given in the tinted area of the *Thermal insulation* section of the accompanying Detail Sheets. Provided the U value is equal to or less than the relevant Maximum U value given in Table 1.2 or 1.4 of Technical Booklet F, an Elemental Method of showing compliance can be used. Alternatively, the example U values can be used with the Target U value Method or Calculation Method or Energy Use Method.

The system also limits extraneous air paths as far as is reasonably practical and will therefore contribute to the building complying with this Regulation. See the tinted areas of the *Air leakage* section of the accompanying Detail Sheets.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

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

See section:

2 *Delivery and site handling* (2.1 and 2.2) and *Installation (General)* (12.2 and 12.4) of the accompanying Detail Sheets.

Bibliography

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

Conditions of Certification

5 Conditions

5.1 This Certificate:

- (a) relates only to the product that is named, 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) is valid only within the UK;
- (d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (e) is copyright of the BBA;
- (f) is subject to English law.

5.2 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, are references to such publication in the form in which it was current at the date of this Certificate.

5.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes thereof:

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

(b) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

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

5.4 In granting this Certificate, the BBA is not responsible for:

- (a) the presence or absence of any patent, intellectual property 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 actual works in which the product is installed, used and maintained, including the nature, design, methods and workmanship of such works.

5.5 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.



In the opinion of the British Board of Agrément, Ashzip Standing Seam Roof Systems are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 06/4301 is accordingly awarded to Ash & Lacy Building Systems Ltd.

On behalf of the British Board of Agrément

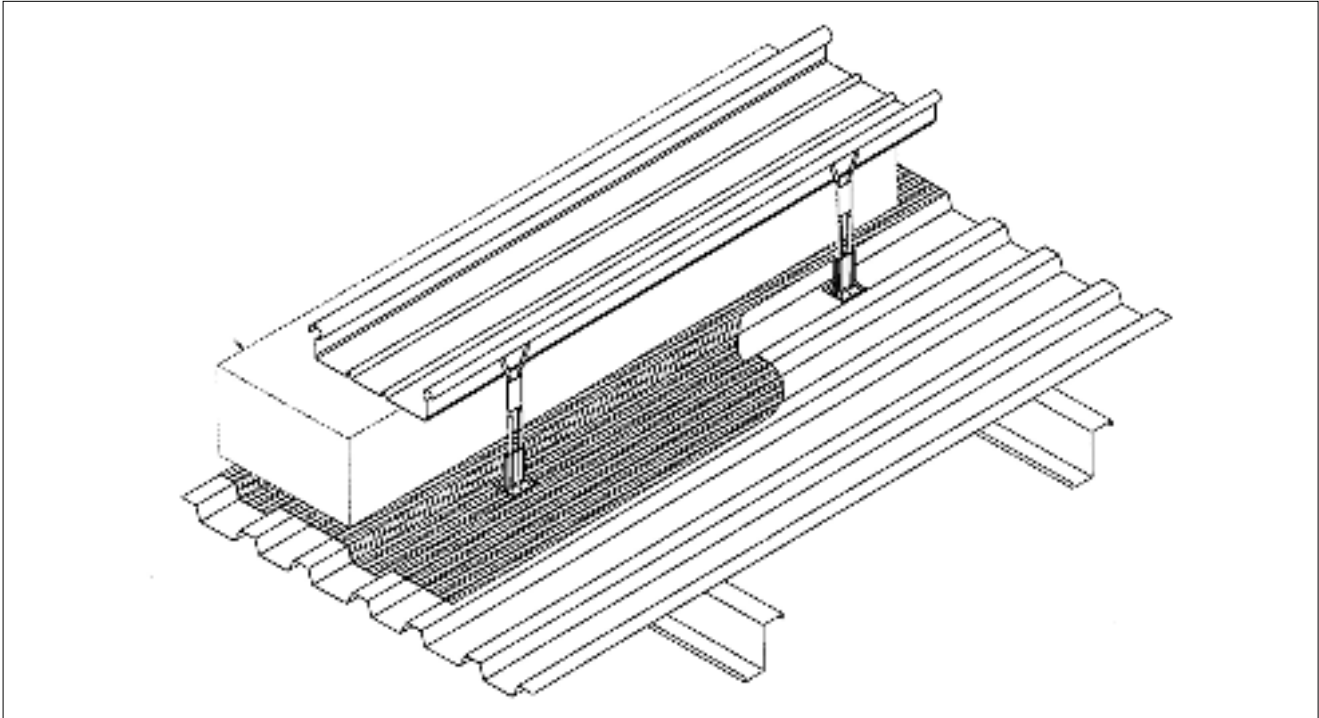
Date of issue: 3rd March 2006

Chief Executive



Ash & Lacy Building Systems Ltd

Certificate No 06/4301

ASHZIP 300 AND ASHZIP 400 DOUBLE-SKIN ROOF SYSTEMS**DETAIL SHEET 2****Product**

• THIS DETAIL SHEET RELATES TO THE ASHZIP 300 AND ASHZIP 400 DOUBLE-SKIN ROOF SYSTEMS, COMPRISING PROFILED COATED OR UNCOATED ALUMINIUM ALLOY AND COATED STEEL OUTER SHEETS, STAINLESS STEEL HALTERS, INTERNAL WALKABLE PROFILED COATED STEEL LINERS WITH INSULATION, VAPOUR CONTROL LAYERS AND ACCESSORIES FOR FIXING TO SUBSTRUCTURES.

- The systems are suitable for buildings used for industrial, commercial, retail and leisure purposes as well as residential and non-residential buildings such as schools and hospitals.
- The systems are for use as structural roofing with a minimum pitch of 1.5°, where access is available for maintenance and repair only.
- The systems are weathertight and structurally stable within the limits set out in this Detail Sheet and are intended to be fixed to steel or timber purlins and structural steel decking.

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

Technical Specification**1 Description**

1.1 The Ashzip 300 and Ashzip 400 Double-Skin Roof Systems comprise a covering sheet (Ashzip) attached to the roof substructure by halters. The seams of adjacent sheets are mechanically zipped together over the halter heads to secure the sheets to the support system without penetrating the covering sheet. The halters are screwed to the substructure through the internal profiled coated steel liner sheet (Ashliner). The void formed between the sheets is filled with glass wool or rockfibre insulation.

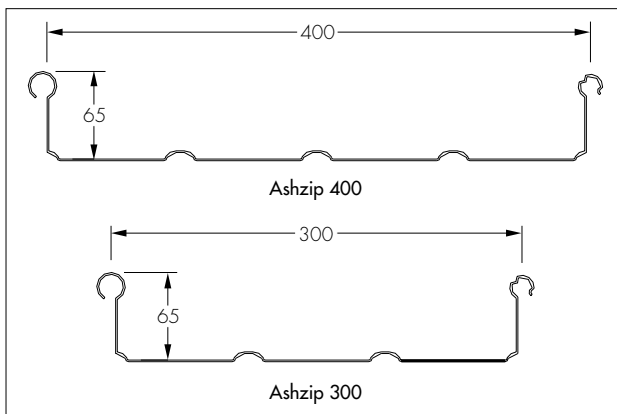
1.2 Ashzip 300 and Ashzip 400 profiles are roll formed to the profile shown in Figure 1 and to the specifications given in Table 1. The profiles are formed from 0.9 mm aluminium alloy. In addition, Ashzip is also available formed from 0.7 mm thick steel sheets.

1.3 Ashzip sheets are roll formed to the length of the roof eliminating the need for end laps. Sheet lengths in excess of 22 m are generally rolled on site.

Table 1 Facing sheet types and properties

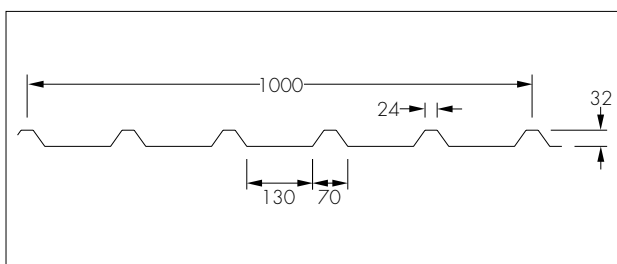
Sheet/coating	Sheet thickness (mm)	Sheet Designation/ BBA Certificate No
Aluminium	0.9	EN-AW 3005 H27 (BS EN 573-3)
– mill /Stucco finish		87/1964 (Detail Sheet 2), 93/2922 (Detail Sheet 3), 93/2918 (Detail Sheet 3)
– PVF ₂ coated		
– ARS coated		93/2922 (Detail Sheet 4)
– PRA coated		87/1964 (Detail Sheet 3)
– Textured 800 coated		93/2918 (Detail Sheet 4)
Steel	0.7	
– zinc /aluminium alloy coated HPS 200		91/2717 (Detail Sheet 7)

Figure 1 Ashzip profiles (dimensions in mm)



1.4 The Ashliner sheet is roll formed to the profile shown in Figure 2 from 0.7 mm thick steel to BS EN 10147 : 2000, grade Fe 220 G Z275. The reverse surface is finished with a 10 µm thick white polyester, and the visible external surface with a light brown 22 µm thick polyester.

Figure 2 Typical Ashliner profile (dimensions in mm)



1.5 Halters are made from grade 304 annealed stainless steel with an aluminium head and a galvanized steel base. They are provided in a depth of 245 mm and screw-fixed through the liner into the purlins (see Figure 3). In addition, verge tie bars of 2 mm galvanized steel are used between pairs of halters at each gable end.

1.6 Insulation is non-combustible mineral wool or glass fibre in accordance with BS 476-4 : 1970. The uncompressed thickness is dependent on the halter length (see Table 1) and has a declared thermal conductivity ($\lambda_{90/90}$ value)⁽¹⁾ of 0.040 Wm⁻¹K⁻¹ or lower.

(1) In accordance with BS EN 13162 : 2001.

Figure 3 Ashzip halter

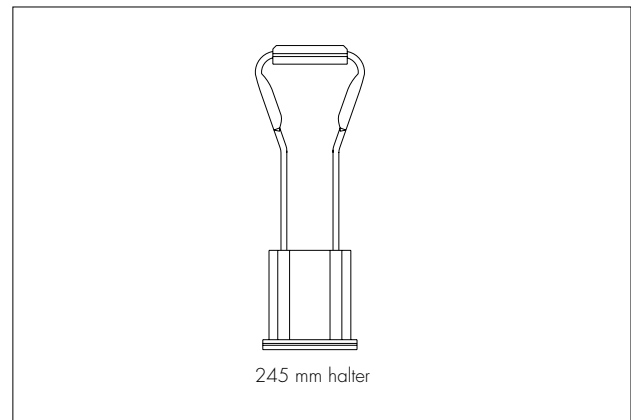


Table 1 Insulation thickness

Halter length (mm)	Uncompressed insulation thickness (mm)
245	200

1.7 Accessories included with the system include:

- Ashliner sealant — two lines of butyl mastic (HP500 cross linked), 6 mm wide by 5 mm thick bead sealant positioned 15 mm from each end of the end lap
- Polyband sealing strip — 50 mm wide by 1 mm thick, to side laps of liner sheet
- foam fillers for the Ashzip sheets — from polyethylene coated with EPDM
- flashings — either coated aluminium (grade EN AW 1050A) or coated steel
- ridge tie, verge extrusion, verge clip, and flashing clips — all of aluminium
- vented eaves and ridge closure pieces — polyethylene foam to allow ventilation
- fasteners — self-drilling, self-tapping austenitic stainless steel screws with diameter shown below and length to suit:

- Ashliner to purlins — 5.5 mm⁽¹⁾
- Ashliner side laps — 6.3 mm
- Halters to purlins — 5.5 mm⁽²⁾

(1) Length of screw to suit purlin material (see section 3.3).

(2) With two bonded washers.

— Flashings are secured with sealed rivets or screws of compatible material

- halter — setting-out template
- zipping apparatus
- halter stabiliser strap.

1.8 Other accessories outside the scope of this Certificate include:

- Ashflex LC vapour control layer — can be specified where low- to medium-risk levels of moisture are present
- Ashflex HC vapour control layer — can be specified where a high risk level of moisture is present

- GRP or polycarbonate rooflights (including openings) — can be incorporated in the roof system
- gutters
- gutter support brackets.

1.9 Quality control checks include:

- dimensions
- chemical composition
- mechanical properties
- coating thickness
- panel dimensions.

2 Delivery and site handling

2.1 Factory produced sheets are delivered in banded bundles carrying a label bearing the BBA identification mark including the number of this Certificate.

2.2 Coils for site rolling are delivered in rolls carrying a label bearing the BBA identification mark incorporating the number of this Certificate.

2.3 Bundled sheets should be handled using lifting equipment with a spreader beam with slings set at every lifting point on the spreader beam⁽¹⁾ (nominally 2.5 m apart).

(1) The spreader beam can be supplied by the Certificate holder.

2.4 If storing on site, the sheets or coils should be kept clear of the ground, protected from the weather and supported at 2 m intervals and stacked with a slight fall to shed rainwater. The coils should be laid on pallets or other suitable supports.

2.5 The performance of the roof system is dependent upon the integrity of the insulation and vapour control layer and/or the sealed liner system. Care must be taken to handle and store them in accordance with the recommendations:

- vapour control layers — rolls must be handled carefully to avoid puncturing and must not be stored on end. For long-term storage the rolls should be dry during installation
- glass- or rock-fibre wool quilt — should be stored indoors or under a waterproof covering and kept dry during installation.

Design Data

3 General

3.1 The Ashzip 300 and Ashzip 400 Double-Skin Roof Systems are satisfactory for use as a structural roof system, for steel and timber substructures, with slopes down to 1.5°, where access is available for maintenance and repair only.

3.2 If architectural features, through fittings or rooflights are required on the roof, special care and attention is necessary to ensure that, in

common with all metal roofs, these features have been correctly detailed and fitted.

3.3 The system can be fixed to steel or timber purlins. However, the design information given in this Certificate is relevant only to fixing to mild steel purlins. The adequacy of fasteners to timber purlins must be checked against the requirements of BS 5268-2 : 2002 by a chartered structural engineer or suitably qualified person. Advice from the Certificate holder should be sought to determine the type of fasteners and design data required.

4 Structural performance



4.1 The sheets have adequate strength and stiffness to sustain specified loads. Load/span values are given in Tables 2 and 3.

Table 2 Maximum permissible snow and wind load for 0.9 mm aluminium (self-weight 3.5 kgm⁻²)

Span (m)	Download (kNm ⁻²)	Uplift (kNm ⁻²)
	Halter height (mm)	Halter height (mm)
	245	245
1.00	6.00	5.60
1.25	5.50	3.73
1.50	5.00	1.85
1.80	4.18	1.39
2.00	3.63	1.09
2.50	2.79	0.90
3.00	1.95	0.71

Table 3 Maximum permissible snow and wind loads for 0.7 mm steel (self-weight 7.75 kgm⁻²)

Span (m)	Download (kNm ⁻²)	Uplift (kNm ⁻²)
	Halter height (mm)	Halter height (mm)
	245	245
1.00	5.04	6.00
1.25	4.87	4.35
1.50	4.69	2.70
1.80	3.94	2.26
2.00	3.44	1.96
2.50	2.81	1.44
3.00	2.18	0.91

General notes:

- All loads are characteristic working loads (kNm⁻²) based on four or more spans.
- The values are based on test data with a factor of safety of 1.4 applied for wind loading, 1.6 for snow loading and 2.0 for halter detachment.
- Download figures are based on a deflection limit of span/200.
- Wind uplift figures are based on a deflection limit of span/120.

4.2 When evaluating the design loads, the wind loads must be calculated in accordance with the recommendations of BS 6399-2 : 1997, and the imposed snow loads must be checked in accordance with the recommendations of BS 6399-3 : 1988.

4.3 The profiled sheets are capable of withstanding impacts associated with normal handling, installation and service.

5 Condensation risk

5.1 In common with all metal roof constructions, there is a risk of condensation; this can arise as either interstitial condensation within the roof construction or surface condensation at thermal bridges.

Surface condensation

5.2 The internal temperature at which surface condensation will occur on the internal surfaces of the roof is dependent on both the internal relative humidity and the external temperature. It has been shown by computer modelling that the risk of condensation occurring on the internal surfaces (including those below the thermal bridges formed by the Ashzip halter) is negligible.

5.3 In buildings likely to experience high internal relative humidities (eg Building internal humidity class 5) there is a minimal risk of intermittent condensation forming on the fixing screws penetrating the purlin. The designer should anticipate the areas of the structure that could be at risk from sustained sources of humidity and take the necessary measures to prevent any such problems (see section 5.6).

Interstitial condensation



5.4 The system has been assessed by computer modelling for the risk of damage and harmful effects on the building due to interstitial condensation. The modelling predicts that for buildings in internal humidity classes 1 to 4 (see Table 4), under the normal climatic conditions experienced in the UK, interstitial condensation is unlikely to be a significant problem and, therefore, the risk of reducing the thermal and structural performance of the roof system due to interstitial condensation will be limited. This assessment is only valid provided the following details are carried out in accordance with the Certificate holder's instructions and this Certificate:

- the vapour control layer remains undamaged, is continuous over ridges and hips, and is sealed at penetrations/abutments
- vapour control layer laps are adequately sealed
- for installations without the separate vapour control layer (Building internal humidity classes 1 and 2 only), the liner panel laps are adequately sealed
- the ribs of the profile are ventilated by air passing along them from and to open areas at the eaves and the ridge.

Table 4 Building internal humidity classes

Humidity class ⁽¹⁾	Building type
1	Storage areas
2	Offices, shops
3	Dwellings with low occupancy
4	Dwellings with high occupancy, sports halls, kitchens, canteens, buildings heated with unflued gas heaters
5	Special buildings, eg laundries, breweries, swimming pools

(1) As referenced in ISO 13788 : 2001 and BS 5250 : 2002.

5.5 For buildings in internal humidity class 5 and in buildings or areas of a building with special internal design conditions, a hygrothermal assessment of the proposed roof system should be undertaken using the guidance given in BS 5250 : 2002, BS 5720 : 1979, BS 5925 : 1991 and BS 6229 : 2003, to establish whether special provisions are required.

5.6 For those conditions that apply in section 5.5, a breather membrane might be required within the roof system, and/or additional ventilation or air-conditioning within the building may be required to maintain the internal conditions within acceptable limits. Advice should be sought from the Certificate holder's technical department.

5.7 For domestic situations, a separate vapour control layer is required.

6 Thermal insulation



6.1 The thermal transmittance (U values) for example constructions are given in Table 5. These have been calculated using an insulation thermal conductivity ($\lambda_{90/90}$ value) of $0.040 \text{ Wm}^{-1}\text{K}^{-1}$ with Ashzip 400.

Table 5 U values for Ashzip ($\text{Wm}^{-2}\text{K}^{-1}$)

System type		Purlin spacing (m)						
Ashzip Halter		1.0	1.25	1.5	1.8	2.0	2.5	3.0
300	245	0.26	0.25	0.25	0.25	0.25	0.25	0.24
400	245	0.25	0.25	0.25	0.25	0.25	0.24	0.24

6.2 Thermal bridging at the junctions of the system and the external wall and around openings such as rooflights must be limited. The performance of the junction will be dependent on building elements not covered by this Certificate and a suitable assessment of all junction details should be carried out.

7 Air leakage



7.1 The airtightness of the system is reliant on the careful sealing of the liner or vapour control layer. The airtightness of a roof system is dependent on maintaining the integrity of seal throughout. In addition to sealing at all joints, the liner or vapour control layer must be suitably sealed at the perimeter and all penetrations. Details of sealing at eaves, ridges, hips, valleys and penetrations must be in accordance with the Certificate holder's instructions and this Certificate.

7.2 The airtightness of the building will also be dependent on the performance of the other building elements. Provided these also incorporate appropriate design details and building techniques, air infiltration through the building fabric should be minimal and the building reasonably airtight.



7.3 For non-domestic buildings of 1000 m² gross floor area or more, air leakage tests in accordance with CIBSE TM 23 : 2000⁽¹⁾ should be carried out to confirm an acceptable airtightness.

(1) CIBSE TM 23 : 2000 *Testing buildings for air leakage*.

8 Weathertightness



8.1 When installed in accordance with the Certificate holder's instructions, the system is weathertight when used on roofs with finished fall down to 1.5° and within exposure conditions related to recommended maximum design wind pressures.

8.2 The weathertightness of the product will not be adversely affected by normal service deflections.

9 Performance in relation to fire



The sheets have a notional AA designation as defined by BS 476-3 : 1958 provided the blanket insulation installed has a 'non-combustible' classification when tested in accordance with BS 476-4 : 1970.

10 Maintenance

10.1 The system should be inspected regularly (at least once a year) for accidental damage to the roof sheets and their coatings, and also for any build-up of dirt and debris. Damage must be repaired and accumulated dirt and debris removed. The frequency of inspections will depend on the environment and use of the building.

10.2 In industrial and coastal areas it may be necessary to clean the installation periodically by hosing with water and a neutral detergent to restore its appearance and to remove corrosive deposits. It may be necessary to clean soffits in any environment.

10.3 Damaged sheets can be removed and replaced. The Certificate holder should be contacted for details.

11 Durability



11.1 The durability of the sheets will depend upon the coating material, the immediate environment, aspect faced and use.

11.2 Maintenance painting may be necessary to restore the appearance of coated sheets or to extend their design life, and should be considered at the intervals given in Table 6. The Certificate holder can recommend a suitable system for maintenance painting.

Table 6 Service life

Sheet material	Minimum service life (years) ⁽¹⁾	
	Environment	
	Rural or suburban	Industrial or coastal
Aluminium stucco embossed and plain mill finish	40	25
PVF ₂ /PVDF ₂ coated aluminum ⁽²⁾	20	15
ARS-coated aluminum ⁽²⁾	20	15
Colorcoat HPS 200 coated steel ⁽³⁾	18 to 25	15 to 21 ⁽⁴⁾

(1) Minimum service life is that when first maintenance painting is required.

(2) Full details of coated materials are given in BBA Certificates Nos 93/2918, 93/2922 and 87/1964.

(3) Full details of coated materials are given in BBA Certificate No 91/2717.

(4) This value is not given in the BBA Certificates, but has been individually assessed.

11.3 For coated sheets, if the building has an exposed eaves detail and is in an aggressive environment, or if there are corrosive conditions inside, a more durable specification of the reverse-side coating should be used. Details can be obtained from the Certificate holder.

11.4 Colour changes will be slight and uniform on any one elevation.

Installation

12 General

12.1 Installation of the Ashzip 300 and Ashzip 400 Double-Skin Roof Systems is carried out in accordance with the Certificate holder's instructions, by experienced roofing contractors. Guidance can be provided by the Certificate holder for contractors who are unfamiliar with the system.

12.2 The Ashzip aluminium external sheet should be treated with care. Protective boarding should be used in any area where work is carried out. Regular access areas should be protected by boarding.

12.3 Locating and setting out halters should be in strict accordance with Certificate holder's specified tolerances to allow free movement and avoid damage being caused to roof sheets through thermal movement.

12.4 Roof surfaces can be slippery when wet and the designer, contractors and others should consider these characteristics when they prepare the Health and Safety Plan for the contract.

13 Procedure

Roof liner and spacer system

13.1 The liner panels are positioned with all joints lapped, and fixed to the roof purlins with screws in every pan at sheet ends and alternate pans at intermediate purlins. Air seal solid filler blocks (50 mm) are located beneath the profile at details such as eaves, ridges, hips and valleys and secured in place by at least two screws per pan. The panels are sealed at side laps and junctions with 50 mm wide polyband and with 6 mm by 5 mm butyl bead at end laps. The panel side laps are screw fixed at 450 mm centres. Any swarf or debris should be removed from the panels as work proceeds.

13.2 Ashzip halters are fixed through the liner panels to the roof purlins using two diagonally opposed, self-drilling and tapping screws per halter. Verges tie bars are push-fitted on pairs of halters positioned at the gable ends. The mineral wool insulation is packed tightly around the Ashzip halter ensuring no gaps.

13.3 Only sufficient insulation to be covered by one external sheet should be laid at a time.

13.4 The full insulation should be continued over ridges and hips. Any gaps or omissions should be avoided. Special attention should be paid to airtightness and sealing at perimeters and penetrations.

Ashzip Standing Seam Profile

13.5 The first line of halters are fastened at the verge of a roof. The dimension from the edge of the structure for the first rib is established and a straight line square to the eaves is determined. All halters are aligned using a string line or the side of an Ashzip panel. The roof should be measured to establish the position of the final sheet or other critical points such as roof openings. The position of the halter bracket nearest the eaves must be set to allow for thermal expansion and allow space for the foam filler.

13.6 The first sheet is engaged onto the first two rows of halter brackets. The large roll of the first sheet is tightened over the first line of halters using the seaming machine to allow the gable channel to fit over the seam. The gable channel is pushed onto the upstand seam of the first sheet.

13.7 The gable hook is fitted over the gable channel and secured by the halter screw.

13.8 The second sheet is engaged over the first fixed sheet and next row of halter brackets. The interlocking rolls are seamed together using the seaming machine. The process is repeated across

the roof area. Typical details at eaves and ridge in Figures 5 and 6.

Figure 4 Verge detail

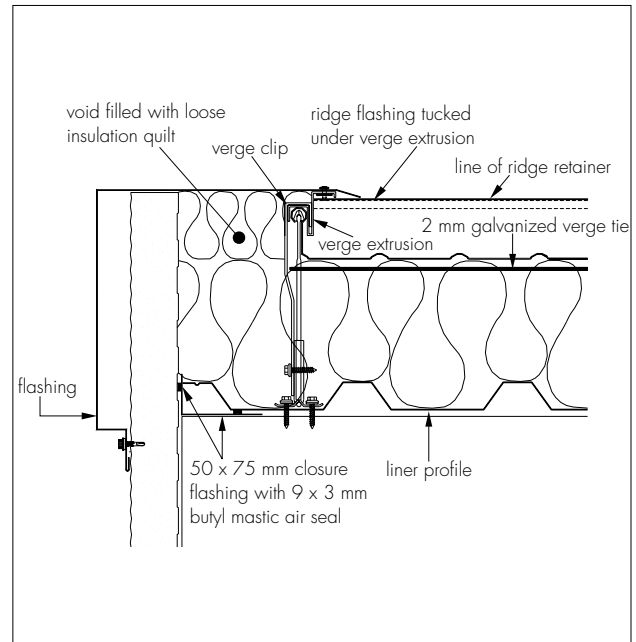
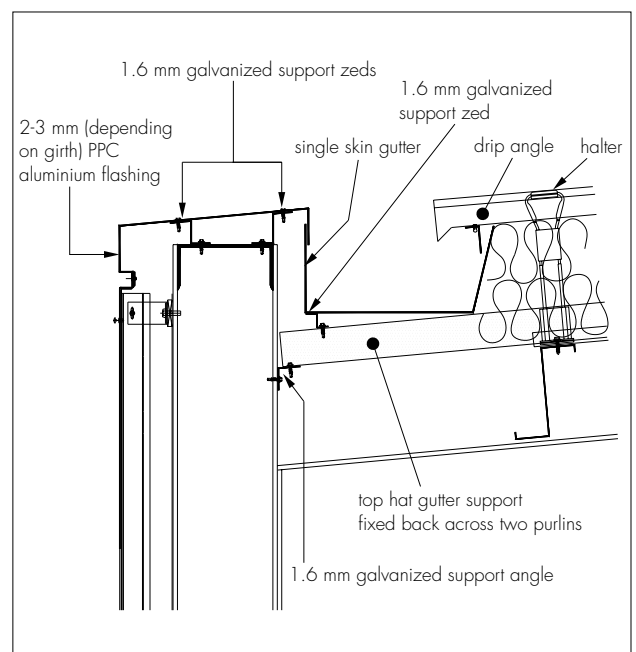


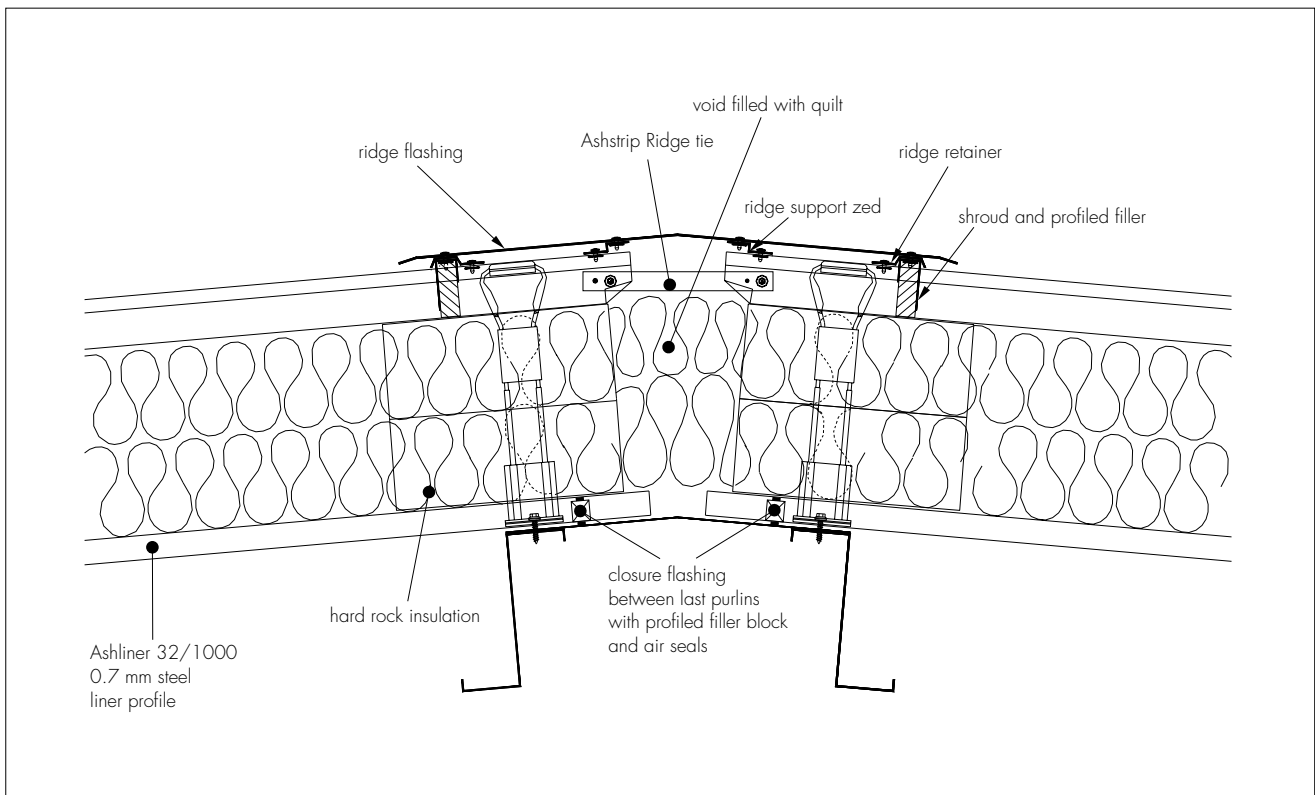
Figure 5 Typical eaves detail



13.9 The full insulation and membrane construction should be continued over ridges and hips. Any gaps or omissions should be avoided. Hard rock insulation is used between halters at ridge/hip detail to prevent dishing of the sheet profile when the end of sheet is turned up.

13.10 The ridge/hip end of a sheet is turned up using the correct end of the tool supplied and following the method described in the *Ashzip Fixing and Handling Guide*.

Figure 6 Typical ridge detail



Technical Investigations

The following is a summary of the technical investigations carried out on the Ashzip 300 and Ashzip 400 Double-Skin Roof Systems.

14 Tests

Tests were carried out on the product to establish:

- resistance to dead and imposed (snow) loading
- resistance to wind loading
- loading
- behaviour of fixings and profile under static and cyclic loading
- resistance to impact
- behaviour under concentrated loads
- sound absorption and sound transmission performance
- airtightness of liner.

15 Investigations

15.1 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained relating to the quality and composition of the materials used.

15.2 An assessment was made of:

- fire resistance
- practicability of installation
- condensation risk
- thermal transmittance
- weathertightness of fixed cladding and details.

15.3 Existing information, relating to the durability of the system, performance in fire and compatibility of materials in contact, has been examined.

15.4 A visit was made to a site to assess the practicability of installation.

Bibliography

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BS 476-4 : 1970 *Fire tests on building materials and structures — Non-combustibility test for materials*

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BS 5268-2 : 2002 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*

BS 5720 : 1979 *Code of practice for mechanical ventilation and air conditioning in buildings*

BS 5925 : 1991 *Code of practice for ventilation principles and designing for natural ventilation*

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

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

BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*

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On behalf of the British Board of Agrément

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Chief Executive