TECHNICAL INFORMATION

Many (but not all) of the performance characteristics that apply to Freefoam roofline and cladding products can be measured, which allows the creation of standards by which to judge those measurements. It should be noted that, in the main, most of these standards can only apply to the components, rather than the completed assembly.

Such characteristics include:

- Chemical stability
- Colour fastness
- Density durability
- Fire resistance
- Flame retardance
- Strength
- Thermal insulation
- Thermal movement
- Weather resistance
- Workability

GENERAL

Freefoam roofline and cladding profiles are made from cellular PVC-UE (unplasticised expanded cellular polyvinyl chloride) foam, co-extruded as a durable PVC-U skin with a rigid closed cell core. They contain no CFCs (chlorofluorocarbons) or lead and are therefore formulated to be completely non-hazardous to health. Freefoam fixings are manufactured from corrosion-resistant stainless steel.

STANDARDS

Freefoam roofline and cladding products are manufactured in accordance with two recognised standards:

The Foam Profiles

- ***British Standard specification BS 7619: 1993***
- Specification for extruded cellular unplasticised PVC profiles the fasteners
- ***British Standard specification BS 6105: 1981***
- Specification for corrosion-resistant stainless steel fasteners.

The Manufacturing Process

- the international standard for Quality Assurance ***BS EN ISO 9002: 1994 (BS 5750: Pt 2).***

DENSITY

The thickness of profiles varies, which affects the proportions of outer skin and inner core, so there can be no single value for density but, in general, profiles are between 450 and 600 kg/m3

STABILITY

Stability in this context is resistance to chemical and/or biological reaction. Cellular PVC-UE is not affected by liquids or other substances in everyday use, and is resistant to attack by acids and alkalis. It is generally described as being resistant to attack by wood-boring insects. It is not attacked by termites or woodworm.
It does not support the growth of fungus or bacteria.
It may be subject to damage by a range of chemicals, generically known as esters, ketones and solvents.

COLOUR FASTNESS

The methods of test for colour fastness contained in ***British Standard specification BS 1006: A03: 1978*** include gradings down to a minimum value for colour change of Grade 8 – Freefoam white profiles all achieve either Grade 7 or 8, meaning that any fading or change in whiteness over a minimum 20 years will be within an acceptable range. Freefoam white profiles have demonstrated, in test conditions, excellent resistance to discolouration, and also to a degradation known as "pinking", which is generally believed to be related to processes involving Titanium Dioxide and Lead stabilisers. Freefoam co-extrusions instead use Calcium Zinc which has superior resistance to discolouration.

Coloured profiles and associated products use organic pigments, chosen for their colourfast properties. Any fading experienced will be gradual and uniform – only detectable when compared with new materials.

DURABILITY

The denseness of the outer skin ensures adequate resistance to impact, thus ensuring a highly durable surface. Freefoam fixings are manufactured from Marine Grade stainless steel, the most corrosion-resistant material and thus not prone to rusting or, as a consequence, the staining of cellular profiles.

FIRE RESISTANCE

Resistance to the spread of fire can only apply to a completed assembly but not to its components.

Profiles have been tested for compliance with the Flame Retardance requirements of British Standard BS 476:

BS 476: Pt 5: 1979 Ignitability Test - self-extinguishing;
Pt 6: 1989 Resistance to Fire Propagation - Class 1;
Pt 7:1987 Resistance to Spread of Flame - Class 1Y.

STRENGTH

The strength of Freefoam profiles and associated products cannot be measured as such, because strength is a characteristic of an assembly. Thus the resistance to wind loads is entirely dependent on variable factors such as profile configuration/thickness and the spacing of fixings. When fixed in accordance at the recommended spacings, the roofline and cladding systems have adequate resistance to wind loadings. Up to two storeys height, fixing spacings should not exceed 600 mm centres, and from two storeys to a maximum of five storeys, 400 mm centres.

THERMAL INSULATION

Thermal resistivity is normally referred to in terms of a U-Value. Freefoam profiles, due to the composition of their cellular inner core, offer thermal performance far superior to timber or other natural building products. Due to the varying nature of the profiles in terms of configuration and thickness, thermal performance can only be generalised to between 0.06 and 0.1 W/mK.

THERMAL MOVEMENT

Expressed as the coefficient of linear expansion, Freefoam profiles vary between 5 and 6 x 10-5 per degree Celsius. When fixed in accordance with the manufacturer's recommendations, and in the British Isles, they perform satisfactorily. They should not be installed where ambient temperatures are likely to exceed 40 degrees, such as in close proximity to boiler flues. They should only be installed when the external air temperature is between 0 and 30 degrees. The thermal movement that occurs between day and night, sun and cloud, winter and summer should be allowed for as described in the installation recommendations.

WEATHER RESISTANCE

The external skin of Freefoam profiles is impermeable and cut ends, due to their closed cell structure, are non-absorbent.
The weather resistance of installed products (specifically their ability to exclude rainwater) depends on site workmanship. When the recommendations of the manual are followed, rainwater should be excluded up to 5 storeys in height.

WORKABILITY

Freefoam profiles are easily worked with conventional woodworking tools: they can be sawn, shaped, cut, drilled, routed, nailed, screwed and glued. Saws must have fine-toothed blades, and power saws should be set at their highest speed level, with carbide-tipped blades.

Fixing Guideline overleaf

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Choosing Your Products

The potential range of products available includes:

- **Fascia:** Available in a range of thicknesses and profile depending on taste. 18-25mm fascia boards are recommended for full replacement. Use the 10mm or less fascia boards for an installation with backing board or if capped over sound existing timber fascia.

- **Soffit:** Available in a range of PVC-UE cellular flat boards, PVC-UE cellular cladding profiles or in PVC-U hollow board. For the most robust installations the first two options (product codes GPB or FV/FC) are preferable.

- **Fixings & Accessories:** Choose appropriate accessories to match chosen fascia and soffit products.

Order of fixing

The ***recommended*** order of fixing is as follows:

1. Trims
2. Soffit
3. Fascia
4. Box End
5. Bargeboard
6. Joints and Corners

Preparation Before Fixing

1. Remove bottom 1-2 rows of tiles
2. Remove old fascias, soffits and bargeboards to prevent any moisture that remains from rotting the supporting timber. If you chose to leave these items in place, please ensure that any rotted timber is cut out and replaced with treated timber
3. Inspect the rafter felt and replace where necessary with felt or with eaves protector
4. Provide adequate support at the wall for the soffit

   a. Extend a noggin from the wall, *fig 1.1*, ***or***
   b. Fix a batten to the wall, *fig 1.2*, ***or***
   c. Use the rafters as support, *fig 1.3*


fig 1.1


fig 1.2


fig 1.3

1. Fixing Soffit

1. GPB board can be fixed directly to the noggin or batten with plaspins, *fig. 2.1*
2. For a super neat finish use J-trim in single or two-part form to hold and give a neat finish to the inside edge of the soffit at the wall
3. If cladding profile or hollow soffit is used, they can alternatively be used in short lengths from the wall to the fascia
4. At the gable end there are two main choices:

   a. The soffit continues all the way until it reaches the gable box end, *fig. 2.2*, ***or***

   b. The soffit terminates at an angle of 45 degrees to the corner of the wall and a H-trim is used to integrate with the soffit forming the base of the gable box, *fig. 2.3*


fig 2.1


fig 2.2


fig 2.3

Ventilation

Ventilation is provided at the eaves by means of purpose-made slotted soffit boards or by our overfascia ventilation

Fig. 2.1 above shows the typical pre-vented general purpose board
Fig. 3.1 shows the typical ventilation (F104V or F109) for the hollow soffit


fig 3.1

2. Fixing Fascia

1. The depth of the fascia used should be chosen so that the top edge of the fascia does not bear the weight of the tiles if 10mm or less thick.
2. Nail the first length of fascia into position, starting exactly in line with the centreline of the corner rafter, then at not more than 600 mm centres into the ends of the rafters. Remember that, when the fascia is in position, the rainwater gutter has to follow, so position your nails so as to be clear of the subsequent screw fixings. This will ensure that:

   a) the screws go in without problems ***and***

   b) the brackets won't rock from side to side because there is a projecting head of a nail behind them. Remember at the gable end cut back the fascia leg at a 45-degree angle, *fig. 4.1*

3. Cut the fascia to length, to ensure that its other end coincides with the centreline of a rafter. Ideally, the end should be just short of the rafter's centreline. Twice nail the fascia into the tail of every rafter, at not more than 600 mm centres. At the joint between each length of fascia board, a joiner is needed. Pre-drill and twice pin it into either the right or left hand fascia board (not both). In this procedure you should ensure that a minimum of 5mm spacing is left between board ends to allow for expansion, *fig. 4.2*
4. Start at the left-hand corner:

   a. *Without Bargeboards* – It couldn't be much simpler: fix the fascia boards along the front, with joints at rafter tails as necessary. The projecting eaves normally have a small box end, which is cut from a single piece of fascia board. If a separate fillet covering the tilting fillet is required, this additional triangle can easily be incorporated into the new box end. With fascia and box ends in place, fix end caps or corner trims to both ends with nails/pins; superglue and activator; or silicone in accordance with local custom. *Where superglue or silicone are being used, special care should be taken to ensure that surfaces are clean and dry before fixing begins.*

   b. *With Bargeboards* – Where bargeboards are involved, the procedure is slightly different, because the box ends have to be formed. Before cutting the corner trim, remember its height is not governed by the depth of the eaves fascia - it's the depth of the bargeboard that matters. A 225 mm deep bargeboard, when cut vertically at its end, has to be deeper because you're not cutting at right angles. If the pitch is 45 degrees, 225 becomes 318 mm and, at 22.5 degrees, it's 242 mm. A tilting fillet can add another 50 mm or so.

5. **Note:** The leg of the fascia will support the outside edge of the soffit.


fig. 4.1

3. Finishing the Gable End

1. *Fig 2.1, 2.2,* and *2.3* illustrate a typical box end support framework
2. *Fig 5.1* illustrates components required to dress, build or complete the box
3. *Fig 5.2* shows the completed box end

fig 5.1

fig 5.2

Final Fixings

Fix joiners and corner joiners to cover straight joints and corner joints; Use finials at the gable peak joint. Use plastops pins and/or nails to ensure colour compatibility and freedom from corrosion, *fig. 6*

fig 6

Final Step

Remove protective film from the fascia.

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4. Fixing Cellular Cladding Systems

1. Fix battens vertically with a breathable moisture barrier behind them, *fig.7*

fig 7
Showing moisture barrier and battens before the cladding begins

2. Fix starter trim at the bottom of the area to be clad, ensuring that the back lip of the cladding board is engaged in the lug of the starter trim, *fig.8*

fig 8
Showing starter trim and showing the use of the universal corner trim for external angles

3. Fix perimeter trims i.e. part 1 of 2-part corner trims and U-trims in place:

   a. Fix 'under part' to relevant corners, *fig 9.1*

fig 9.1
Showing female component of 2-part corner trim being applied once cladding is finished

   b. Fix part 2 of 2-part corner trim once the wall is fully clad, *fig 9.2*

fig 9.2
Showing the male component of 2-part corner trim being applied once cladding is finished

   c. Fix U-trim at the edge of the wall on the final batten, *fig 9.3*

fig 9.3
Showing how the cladding is capped by the U-trim

4. Continue to fit other boards as above using;

   a. A butt joint (FC209/FV209) to break the joint, *fig.10*

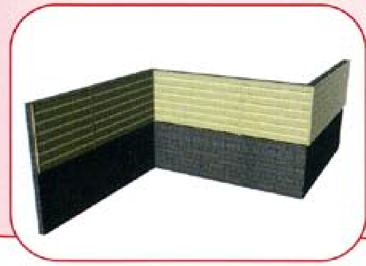
fig 10
Showing moisture barrier and battens before the cladding begins

   or

   b. A straight H-trim joiner for a continuous seam, *fig.11 (below)*

5. When fitting the top cladding board, use packing behind the board where necessary to ensure that the face of the cladding is aligned. Once the wall has been fully clad, fix part 2 of the universal U-trim along the top of the boards to give a neat finish, *fig.11*

fig 11
Showing moisture barrier and battens before the cladding begins



Fully clad wall