

Profiled Sheeting Description, properties and performance

TECHNICAL
NOTE
Et-01/08/en/v1

Identification

Eternit offers a comprehensive range of products fabricated from a man-made fibre formulation, including profiled sheets and fittings. The range of profiled sheeting products allows design flexibility and speedy construction with overall economy for the roofing and vertical profiled sheeting of all types of buildings, including industrial, commercial, and agricultural. It is a material that will comply with the Building Regulations and the Building Standards (Scotland) Regulations.

Quality

Profiled sheeting is manufactured in accordance with a quality system registered under BS EN ISO 9001 and to the European BS EN 494 product specification for Class 1X sheets. Eternit also operates in accordance with Environmental Management System BS EN ISO 14001.

Description

Profiled sheeting is manufactured from Portland cement and water, reinforced with natural and synthetic fibres.

Thickness tolerance

Profiled sheeting thickness tolerance is $\pm 10\%$, but not exceeding 0.6mm, as laid down in BS EN 494.

Impact resistance

The Test for Non-Fragility of Large Element Roofing Assemblies, ACR(M)001, consists of a 45kg bag being dropped from a height of 1200mm onto a fixed sample of roofing. It is intended to provide information about whether the roof can support the instantaneous loads imposed on it by persons stumbling or falling onto it. A roof is classified as fragile if the bag passes through the roof assembly. If the bag is retained on the test assembly and no other drop tests are carried out, the assembly shall be classified as Class C non-fragile assembly. Profile 6 sheets meet this requirement. The reinforcing strips within Profile 6 only become effective when the sheet is fully fixed.

Sound insulation

The average sound reduction index over the usual measurement frequency range of 100 to 3150Hz has been calculated to be:

- Profile 6 single skin – 28 decibels
- Profile 3 single skin – 27 decibels

Breaking strength

The minimum breaking strength for profiled sheeting is defined under BS EN 494. The minimum against grain breaking load (purlin to purlin) for Profile 6 is 4250N/m. The minimum with grain bending moment at rupture (ridge to ridge) for Profile 6 is 55Nm/m.

The minimum against grain breaking load (purlin to purlin) for Profile 3 is 1400N/m. The minimum with grain bending moment at rupture (ridge to ridge) for Profile 3 is 40Nm/m.

Installed weight

The approximate installed dry weight of single skin profiled sheeting with fixings and the required side and end laps is as follows:

- Profile 6 single skin – 17.0kg/m²
- Profile 3 single skin – 14.5kg/m²

Fire

Fibre cement sheets are designated SAA rating for roof coverings and Class O for wall and ceiling linings in accordance with the Building Regulations. Under the European Fire Test Standards, Eternit fibre cement profiled sheets are classified A2 to BS EN 13501-1:2002 and are considered to fulfil all requirements for external fire performance of roof coverings without the need for testing, in accordance with Commission Decision 2000/553/EEC. Fibre cement profiled sheeting can be classified as non-combustible under the Building Standards (Scotland) Regulations.

Moisture content

When new, fibre cement sheeting has a relatively high moisture content. If humid conditions prevail, damp patches (without formulation of droplets) may appear on the underside of the sheets. This phenomenon is in no way detrimental to performance and will disappear within 12 months, during natural exposure. There are two types of fibre cement: fully compressed and semi compressed. While both meet the same strength requirements, semi-compressed is more suitable for livestock buildings due to its ability to absorb 40% more moisture than fully compressed.

Condensation control

Whilst Profile 6 and Profile 3 are watertight, the sheets have the ability to absorb up to 25% of their dry weight in moisture and dissipate it in more favourable conditions. This material characteristic has a significant effect in reducing condensation occurrence.

Effects of chemicals

Over the years chemical and industrial atmospheric pollution will cause a slight softening of the surface of natural finish fibre cement sheets. The acrylic paint finish provides added protection against many acids, alkalis and solvents normally found in the atmosphere. Where fibre cement is to be used in particularly aggressive atmospheres, with higher than normal concentrations of acids, alkalis, fats or salts, please contact the Eternit Technical department for advice.

Biological

Profiled sheeting is vermin and rot-resistant, but lichen may grow on the outer surface. For advice on removal, please contact the Eternit Technical department.

Light reflectance

Mean results for natural grey sheets are 40% dry and 16% wet, using magnesium carbonate as 100%.

Effects of low and high temperature

Profiled sheeting is designed to be minimally affected by frost or climatic temperature changes. For buildings in which higher than normal temperatures occur, or in areas which are expected to be subjected to sudden changes in temperature, special considerations may be necessary. (Consult the Eternit Technical department for recommendations).

Thermal and other movements

The amount of movement is negligible, but it is necessary to provide movement joints in association with the structural framework. (For details of movement joints, see pages 66-67 of the design guide). The co-efficient of linear expansion for profiled sheeting is $8 \times 10^{-6} \text{m/mK}$.

Thermal conductivity

Profiled sheeting has only low thermal conductivity when compared with other sheet roofing products. This serves to reduce heat build-up in summer and heat loss in winter. Thermal conductivity = 0.48 W/mK .

Durability

In normal atmospheric conditions, profiled sheeting may be regarded as having a normal life of at least 50 years, but the durability of the fixing accessories should be considered.

Atmospheric pollution is not normally sufficiently concentrated to be harmful. Measures should be taken to prevent corrosion of the fixing accessories, e.g. using plastic washers and caps. Profiled sheeting is resistant to most forms of atmospheric attack but, with age, becomes less elastic and a small deflection will be experienced, which may make it less resistant to impact. Its transverse strength, however, is maintained.

Maintenance

Profiled sheeting in natural grey finish requires no routine maintenance. Decorative or preservative treatment should be renewed or treated, as necessary.

Fixings and washers may, however, deteriorate and should be inspected at intervals according to the type of fixing and degree of exposure.

Appearance

When a painted finish is applied, the colour intensity will reduce due to weathering, but when the roof is viewed from a reasonable distance the colour intensity will appear harmonious.

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