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FILON®

FILON CITADEL

Profiled Sheeting for Chemical and Harsh Environments

Keywords : - Roof Structures - Overlapping Sheets - Reinforced Plastics

Introduction

FILON CITADEL profiled Glassfibre Reinforced Polyester sheets (GRP) provide a roof and walling system particularly suitable for use in chemical, marine and exposed environments.

FILON CITADEL sheets enhance the chemical resistant properties of GRP sheeting by the application of a 'UV' light stabilised coating on the external weather surface.

To improve the load bearing and pull through properties when used for roofs and walls sited in very exposed locations, additional glass reinforcement is incorporated into the sheets.

For extreme harsh chemical and temperature environments, sheets manufactured using a vinyl ester resin are available.

FILON CITADEL sheets are manufactured in translucent and opaque colours in various weights and fire resistant grades to meet Statutory Building Regulation requirements.

The sheets are robust, shatter resistant, and unaffected by high or low temperatures.

Specifications for **FILON CITADEL** sheeting and fixing recommendations are formulated to meet local environmental and structural requirements on individual projects.

IMI Kesher Plant

Following extensive laboratory tests to assess durability of alternative materials in harsh operating environments, IMI Copper Refiners specified FILON heavyweight terracotta and natural translucent cladding for the refurbishment of their 'Kesher Plant' in the West Midlands.

Product Information

Profile, Weight and Length

FILON CITADEL sheets are manufactured from glass reinforced polyester resin to match most common industrial roofing and cladding profiles, in weights from 1.83Kg/m^2 to 3.66Kg/m^2, and in **FILON DR** and **FILON SupasaFe,** in lengths up to 12m.

Colour

Sheets are produced in natural translucent, tinted and opaque colours. Comparable matching g.r.p. ridge units and flashings are available.

Chemical and Weather Protection

External and internal surfaces are protected by a coating which can be tailored to suit the conditions that prevail.

Double Reinforcement

When used for opaque roofing, which may be required to meet the impact resistant requirements of the HSE Drop Test, **FILON CITADEL** sheets may incorporate additional woven glass reinforcement.

To simulate a human body falling onto a roof, the test requires a roof to prevent a 300mm dia. bag, weighing 45Kg, from falling through the sheet when dropped from a height of 1.2m.

The same reinforcement mat is used to improve the 'pull through' (i.e. force required to pull the sheets over the fixing washers) performance of vertical claddings in very exposed environments.

Fire Resistance

FILON CITADEL sheets are manufactured in three fire resistant grades, **101**, **104**, and **300**.

These sheets have been tested under conditions laid down in BS 476 'Fire Tests', and have been rated in accordance with **Table 1**.

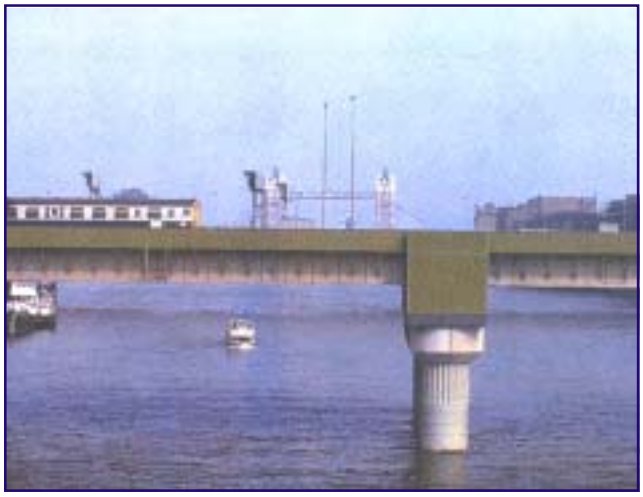
Table 1: Fire Performance

FILON Grade	Part 3	BS 476 Part 6	Part 7
101	AA	(I) < 12[1] (i) < 6	Class 1
104	AA	(I) < 20	Class 1
300	AB	_	Class 3

[1] By definition under UK Building Regulations, FILON Grade **101** sheets which have an index of performance of less than 12 and 6 when tested under BS 476 : Part 6, are designated **Class 0**.

Score (Europe)

Bridge Over the Thames



On the high level exposed footbridge over the Thames, users are sheltered from wind and rain squalls by opaque FILON cladding.

Gold tinted, factory assembled, double-skin translucent FILON wall units provide the ideal internal working conditions in this huge engineering and stores complex. Sited adjacent to the sea in Peterhead to serve the offshore oil industry, the external FILON surfaces are protected from the salt laden North Sea environment with isophthalic polyester gel coat.

Cooling Plant

The large concrete waisted cooling towers, which dominate the older Power Stations, are being replaced with more efficient modern cooling plants designed to totally condense the steam. To withstand the constant hot and wet conditions in this plant, which is being constructed at the new Power Station at Teesside, opaque FILON internal partitions and external cladding are being used.

Applications

The improved chemical resistant properties of **FILON CITADEL** compared to 'Standard Quality' g.r.p. sheeting are clearly illustrated in **Table 2**.

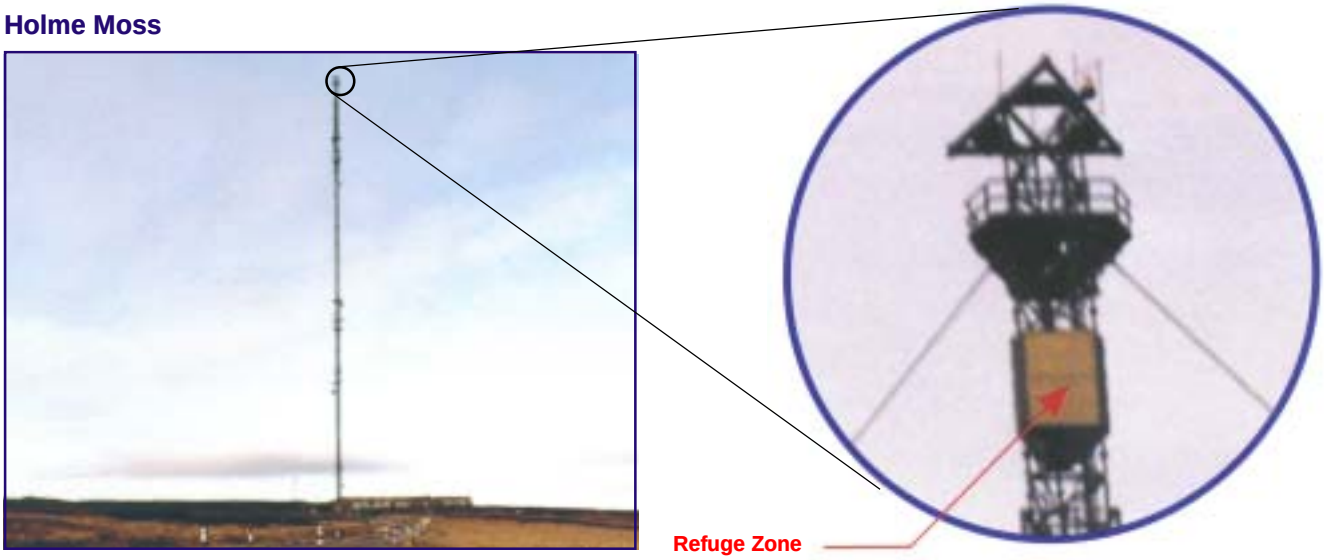
Table 2: Chemical Resistance.

Type of Chemical Solution	ISOFLEX 'S'	ISOFLEX 'C'	MELINEX 389 FILM
Caustic Alkali :			
10% Sodium Hydroxide	L	S	S
10% Potassium Hydroxide	L	S	S
Weak Acids :			
10% Citric Acid	S	S	S
10% Acetic Acid	S	S	S
Strong Acids :			
10% Sulphuric Acid	L	S	L
10% Hydrochloric Acid	L	S	S
10% Nitric Acid	N	S	N
Hydrocarbons :			
Benzene	N	L	L
Petroleum	S	S	S
Solvents :			
Acetone	N	L	L
Ethyl Acetate	N	L	L
Water	S	S	S
Chlorinated Solvents :			
Methylene Chloride	N	N	L
Chloroform	N	N	L
Salts			
10% Sodium Chloride	S	S	S
Saturated Sodium Carbonate	S	S	S
Alcohols			
Methanol	L	S	S
10% Phenol	N	N	N

S = Suitable for Continuous Exposure to Vapours
L = Suitable for Limited Exposure to Vapours Only
N = Not Recommended

Noted this table is presented as an initial guide. For specific resistance of **FILON CITADEL** to the above and other chemicals, refer to Filon Laboratory .

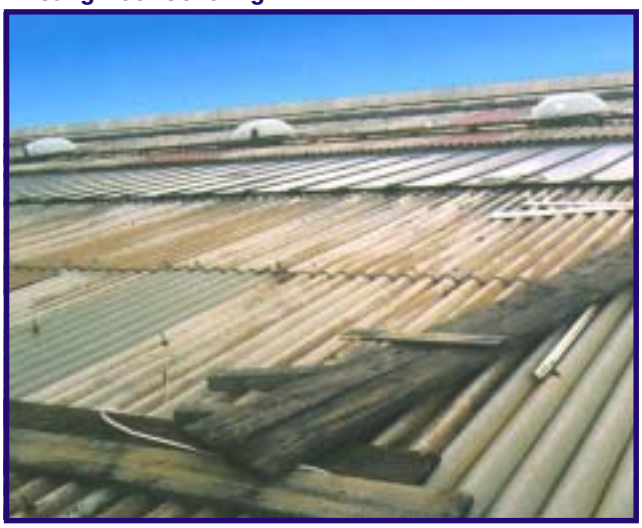
Holme Moss



High winds and deplorable weather conditions, high on the TV mast located at Holme Moss in the Pennines, frequently deteriorate faster than workmen can dismount from the mast. For over 15 years FILON clad Refuge Zones have provided workmen with temporary protection when these conditions occur.

IMI Copper Recovery Plant

Existing Roof Covering



Complete New Refurbished Roof

Harsh acidic environments in this major copper refinery plant in the West Midlands had contributed to the deterioration of the roof sheets, glazing and ventilation systems, causing the roof to become unstable, resulting in high and dangerous maintenance costs and disruption in plant operations.
After careful evaluation of alternative systems, the client specified a double-skin insulated FILON roof. This consisted of white opaque FILON lining sheets with an acid resistant isophthalic polyester gel coat on the exposed internal surface, galvanised spacer bars and fibreglass insulation, with an external heavyweight 'DR' double reinforced terracotta coloured FILON sheets with a protective gel coat surface. By incorporating approximately 20% double-skin FILON rooflights, replacing the ventilation system, together with improved roof insulation and white linings, this has resulted in greatly improved working conditions in this harsh environment.

Siteworks

Storage

Sheets are generally supplied loose. Store on clean level battens at centres not exceeding 1.5m. Stacks should not exceed 1m and must not overhang at ends.

Secure and protect from wind and mechanical damage. When stored in open protect with opaque waterproof covers.

Cutting and Drilling

Cut sheets with a hacksaw with 6/8 teeth per centimetre. Best results are obtained if the saw is held at a shallow oblique angle. When cutting with power tools use 40/60 grit diamond blade operating at medium speed.

Labour Safety

Do NOT walk on sheets, ALWAYS use crawling boards. Attention is drawn to the Health and Safety Executive Guidance Notes HS (G)33 '**Safety in Roof Work**', published by HMSO. Particular attention is drawn to paragraphs 29-35 inclusive detailing safety precautions which must be put into practice.

Although **FILON CITADEL** sheeting incorporating additional woven glass reinforcement is designed to withstand impact from a falling body, they may deflect under local point loadings. To prevent any deflections damaging the sheets or sealants, crawling boards MUST always be used when fixing and carrying out maintenance work.

Technical Services

FILON CITADEL sheets are manufactured as a roof and wall system for use in difficult environments. As the needs on individual projects vary, contact Area Sales Managers or Filon Technical Services Department for recommendations.

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