**ECOTITE SPRAY FOAM INSULATION**

**Ecotite Polyurethane Spray Foam Technical Specifications**

**Product Description**

Ecotite supplied polyurethane spray foam is a HCFC AND CFC FREE two component, 1:1 ratio, rigid foam system which when processed through

suitable spray machinery ( Gusmer, Glas-Craft/Probler etc ) will produce a rigid foam of approximate density 35kg/m3 with exceptionally good compressive strength. Service temperature range -15oC to 70oC. When tested to BS476 part 7 the foam achieves a Class 1 surface spread of flame.

**Uses**

Polyurethane spray foam is used for insulation in: New build

Loft conversions

Commercial buildings

Ocean going yachts / canal barges

Polyurethane spray foam can be used to upgrade the thermal performance of roofs, floors or walls of any property, to meet current building regulations.

**Equipment**

IsoSpray maintaining the mix ratio at ±2% accuracy and controlling the component temperatures at 40-50oC (variable). Recommended machine settings

Block Temperature Minimum, operating 100-120°F / 40-50°C Hose Temperature Minimum, operating 100°F / 40°C Chemical Pressures Minimum, operating 500 psi,

not greater than 200 psi difference iso / res

**Spray Techniques**

The general requirements are as follows:

The substrate should be clean, dry and free of dirt, grease, oil and loose particles. In certain cases primer may be necessary to maximise adhesion.

Climatic conditions must be suitable for spraying with regard to humidity and wind velocities.

The foam should be built up in passes of not less than 15mm and not more than 10 minutes should elapse between passes. The requirements of any relevant Agrément Certificates or British Standards should be followed.

**Physical Properties**

Ecotite supplied foam is a two component, modified polyurethane rigid foam which, sprayed through suitable foam machinery, gives a product of

nominal density 35 kg/m³.

Laboratory test results (typical):-

|  |  |  |
| --- | --- | --- |
| Cream time | 3-4 | seconds |
| Tack free time | 12-18 | seconds |
| Rise time | 25-36 | seconds |
| Free rise density | 28-32 | kg/m³ |

**Storage, Handling and Personal Protection**

The recommendations in our Method Statement for polyurethane foam must be followed at all times.

|  |  |  |
| --- | --- | --- |
| **Typical Properties Of Ecotite Polyurethane Foam**  Core density | Value  35 kg/m³ | Test Method  BS4370 |
| Compressive strength - Parallel to rise | 200 kpa | BS4370 |
| Tensile strength - Perpendicular to rise  Shear strength - Perpendicular to rise  Close Cell Content  Thermal Conductivity -10°C Mean – Initial  - Aged  Water Absorption - 7 days no head | 110 kpa  145 kpa  92 % min.  0.020 W/mK  0.026 W/mK  0.24 kg/m² | BS4370  BS4370  ASTM D2856  ASTM C518 (ANACON) ASTM D2126 |
| Water Vapour  Transmission- 25mm, 38° C, 88% RH | 3.9 ng/Pa.sm | BS4370 |
| Dimensional Stability - 7 days @ -15° C (Linear Change) - 7 days @ 70° C, 95% RH Ozone Depletion Potential | -0.6% vol.  +5.0% vol. ZERO | ASTM D212 |

Burning Characteristics – These are laboratory scale tests and bear no relation to the performance of the material in a real fire situation. Care must be

exercised in the end use to satisfy the demands of the Fire Authorities, and moral obligations to the safety of persons and property.

|  |  |  |
| --- | --- | --- |
| Extent of burn | <25 mm | BS4735-74 |
| Surface spread of flame | Class 1 | BS476 pt. 7-97 |

**Condensation**

The foam provides excellent condensation control and provides a “warm” surface to prevent condensation. Ventilation requirements are defined in

Approval Document F under the categories of 'Cold Roofs', 'Warm Roofs', and 'Alternative Approach'. The 'Alternative Approach' is a free design method which has to comply with the requirements of BS 5250:'Control of Condensation in Buildings'. Ecotite Spray Foam Duratherm OS meets the Building Regulations in respect of condensation control by compliance with the Approved Document F 'Alternative Approach' for non-ventilated roofs. Control calculations are made in accordance with BS 5250 clauses 9.1 and 9.3.

**Condensation Risk Analysis**

Internal/external conditions: 20.0C @ 60.0%RH /5.7C @ 83.5%RH Build-up period 28 days

Interface tempDew point temp Vapour Pressure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Outside surface resistance | C  5.9 | C  3.1 | kPa  0.76 | kPa  0.93 | Condensa  No |
| Tiling including batten space | 6.5 | 3.2 | 0.77 | 0.97 | No |
| Duratherm | 18.7 | 3.3 | 0.77 | 2.15 | No |
| Cavity >24mm, roof | 19.3 | 3.3 | 0.77 | 2.24 | No |
| Aluminium foil | 19.3 | 12.0 | 1.40 | 2.24 | No |
| Plasterboard | 19.6 | 12.0 | 1.40 | 2.28 | No |

Saturated V.P.

tion

**Materials & Workmanship (Regulation 7)**

Ecotite Spray Foam Insulation meets the requirements on the basis of:

a) past experience in the usage of roofs in the UK (13 years plus)

b) The relevant physical properties of Ecotite Spray Foam with regard to:

- vapour resistance

- water resistance

- durability

- thermal resistance

- behaviour in fire

As assessed in Isothane technical calculations and specifications and tested by BBA.

To calculate a composite 'U' value further information is typically required. However, for thin skin structures (i.e. aluminium sheet, asbestos, steel sheet, etc.) the effect of the substrate can be ignored and the composite 'U' value taken as simply that of the foam, in the knowledge that the composite will be better.

**Thermal Insulation**: The foam has a very low thermal conductivity of just 0.020 W/mK. A foam depth of 40 mm nominal provides a ‘U’ value of at least 0.53 W/m2K or better (typically 0.48) to concrete/ masonry/tile substrates depending on substrate composition and enclosure.

**'U' value of a structure if a certain thickness of foam is used**

|  |  |  |
| --- | --- | --- |
|  | **K factor W/m2K** | **U value W/m2K** |
| **Foam Thickness** |
|  |

|  |  |  |
| --- | --- | --- |
| 25mm | 0.023 | 0.877 |
| 30mm | 0.023 | 0.689 |
| 35mm | 0.023 | 0.600 |
| 40mm | 0.023 | 0.529 |
| 50mm | 0.023 | 0.431 |
| 75mm | 0.023 | 0.293 |
| 100mm | 0.023 | 0.250 |
| 130mm | 0.023 | 0.160 |

**Cold Bridging:** The method of installation ensures that the rafters do not form a cold bridge. The foam insulation is sprayed between the rafters and the roof surface, tile or slate. The space between the tile/slate and the rafter is foam filled thus ensuring that the rafter is insulated and no cold bridge is formed. This method of installation meets the requirement for a warm deck as defined in the building regulations.

**Fire Control:** The foam installed is hereby certified to be Class 1 Fire Rated as defined by British Standards BS 476 Part 7. This means that the product resists the spread of flame.

**Polyurethane Foam Structure:** The foam is 95% closed cell in formulation. This means that the product is semi permeable and allows the substrate to

“breathe”. Timber can breathe as normal allowing seasonal moisture changes and movement through flexibility in the foam structure.