

technical information

The NEW grades of Expanded Polystyrene for insulation and construction applications

Background

As from 1st April 2002, Building Regulations Documents L1 and L2 'Conservation of Fuel and Power' calls for improved insulation of buildings. This paralleled in Scotland with the introduction of Part J, whilst new European Standards are also being introduced for insulation materials – including expanded polystyrene (EPS).

Equivalent grades

The manufacturers of EPS are producing material in accordance with the new standard BS EN 13163, and to help specifiers and contractors 'make the switch' from the previous standard BS 3837 Part 1, the following table sets out the new equivalents to the old grades of material.

'Ageing' of material

BS EN 13163 is one of a raft of new standards concerning insulation materials such as cellular glass, mineral wool, phenolic foam, extruded polystyrene and polyurethane. It is important to note that any loss of thermal performance over time must be taken into account when declaring conductivity data. This requirement does not affect EPS, which retains its 'as new' thermal characteristics indefinitely, but will be significant for other materials.

Blowing agents

A further point is that, due to concerns about depletion of the ozone layer, hydrofluorocarbons (HCFCs) are being phased out as 'blowing agents' in the manufacture of insulation materials. This will have major impact on the manufacture and performance of polyurethane, polyisocyanurate, polyethylene, extruded polystyrene and phenolic foams. EPS is manufactured using the much more environmentally friendly pentane as blowing agent, and will be unaffected by this legislation, which started to take effect from 1st January, 2002.

Reaction to Fire Classification of EPS

The Reaction to Fire Classification of expanded polystyrene insulation as a naked board is Euroclass F. Boards containing a flame retardant additive will achieve Euroclass E. However the Classification that can be achieved when installed in end-use conditions will be considerably better. For example when used in a masonry cavity wall or protected by plasterboard, a Euroclass B Classification can be expected. Full details of test methods for products in end-use conditions, are currently being developed and further information will be published when available.

New equivalents to old grades of EPS

| BS EN 13163 (new) grades* | BS 3837 (old) grades** | Physical properties | | |
|------------------------------|---------------------------|---|---|---------------------------|
| | | Thermal Conductivity LAMBDA Value (W/mK) | Compressive stress at 10% of deformation (kPa) | Bending strength (kPa) |
| EPS 70 | SD | 0.038 | 70 | 115 |
| EPS 100 | HD | 0.036 | 100 | 150 |
| EPS 150 | EHD | 0.035 | 150 | 200 |
| EPS 200 | UHD | 0.034 | 200 | 250 |

* BS EN 13163 – Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – Specification

** BS 3837 – Expanded polystyrene boards – Part 1 – specification for boards manufactured from expandable beads

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