Thermal advantage of Insultrak™ Roof Insulation spacers/packers in an over-purlin fibre-glass roof installation

D&D Roof Insulations, the manufacturers of the Insultrak™ Roof Insulation spacer system have had the ASHRAE Zone Method calculation performed in order to compare the thermal resistance performance of faced fibre roof insulation installed with and without Insultrak™.

The ASHRAE Zone method is a series/parallel calculation of heat flows and incorporates an edge effect zone that approximates the tendency for heat to enter and leave highly conductive elements which might intrude through a system (ASHRAE Fundamentals handbook 2009, vol. 27.5). The calculation of width of edge effect is in accordance with guidance given in ISO 6946.

RESULTS

The results may be summarised in absolute terms or as a percentage reduction relative to an installed thickness of fibre insulation:

THERMAL RESISTANCE (R-VALUES IN M^2K/W):

- 100mm Fibre insulation installed over-purlin under roof sheet without Insultrak™ - 1.49
- 100mm Fibre Insulation installed over-purlin under roof-sheet with Insultrak™ - 2.16
- Percentage increase in Thermal Resistance (R-value) with Insultrak™ - 45%

COMMENTS ON RESULTS

The absolute value obtained correlates extremely well with results of hot-box testing of installed 101.6mm (4 inch) fibre published in the ASHRAE Fundamentals Handbook 1985 Table 5C.

The calculated result is obtained by assuming a net average 60mm of effective thickness of fibre as a result of the caternary effect and the compression of the fibre by the purlins and supporting wires.

The average effective thickness of fibre with the Insultrak is similarly very conservatively estimated at 80mm. In practise the fibreglass insulation achieves its full thickness of 100mm nearly across the full span of an 1 800mm purlin centre.

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