

# Issues to Consider

## 3 BS 5422: 2001

- 3.1 The British Standard, BS 5422: 2001 (Method for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range  $-40^{\circ}\text{C}$  to  $+700^{\circ}\text{C}$ ), has been replaced by the TIMSA Guide, as the reference document for the required standard of duct insulation to control heat loss / gain for compliance with Approved Documents L to the Building Regulations in England and Wales and Technical Booklets F to the Building Regulations (Northern Ireland).
- 3.2 BS 5422: 2001 is still the main reference document for compliance with Technical Handbooks Section 6 to the Building Standards in Scotland and Technical Guidance Document L to the Building Regulations in the Republic of Ireland.
- 3.3 All tables in BS 5422: 2001 are set out in a standardised format requiring the following data in order to use them effectively:
- the application of the ductwork (e.g. warm air or chilled air);
  - either the temperature difference between air inside the ductwork and the ambient air, or the minimum air temperature inside the ductwork; and
  - the temperature conductivity of the insulation being used (at the mean operating temperature) in Watts per metre Kelvin ( $\text{W/m}\cdot\text{K}$ ).

- 3.4 With this data, it is possible to use the tables to determine the thickness of insulation required to meet the standard. Examples of the thicknesses required by BS 5422: 2001 are shown in the tables below. More detail is given in the Tables in Appendix C of the Project Specification section of this document.

Temperature difference between air inside ductwork and ambient air ( $^{\circ}\text{C}$ )	<i>Kingspan Kooltherm<sup>®</sup></i> Duct Insulation	Mineral Fibre	Nitrile Rubber
10	20	34*	38
25	27	44*	50

Environmental Thickness (mm) of Insulation for Ductwork Carrying Warm Air to Control Heat Loss (Based on BS 5422: 2001 Table 11)

Minimum air temperature inside ductwork ( $^{\circ}\text{C}$ )	<i>Kingspan Kooltherm<sup>®</sup></i> Duct Insulation	Mineral Fibre
15	16	25*
10	28	45*

Thickness (mm) of Insulation for Condensation Control Ductwork Carrying Chilled Air in Ambient Conditions (Based on BS 5422: 2001 Table 10)

\* This figure is based on an insulation thermal conductivity of  $0.035 \text{ W/m}\cdot\text{K}$  at the average temperature of the insulation material. At the average temperature of the insulation material, some mineral fibre duct insulation products may have a thermal conductivity lower than  $0.035 \text{ W/m}\cdot\text{K}$ . For accurate thicknesses of those products please refer to a mineral fibre manufacturer. This table takes  $0.035 \text{ W/m}\cdot\text{K}$  as a "safe" value.

- 3.5 It can be seen from the tables above that in all circumstances shown, the thickness of *Kingspan Kooltherm<sup>®</sup>* Duct Insulation can be significantly less than that for mineral fibre (up to 41% thinner) or nitrile rubber (up to 47% thinner).

The thickness of *Kingspan Kooltherm<sup>®</sup>* Duct Insulation can be up to **41%** thinner than that for mineral fibre and up to **47%** thinner than that for nitrile rubber.

- 3.6 Reduction in insulation thickness facilitates the installation of ductwork in confined spaces.

*Kingspan Kooltherm<sup>®</sup>* Duct Insulation can be easier to install in confined spaces.

3.7 Installing *Kingspan Kooltherm*<sup>®</sup> Duct Insulation, in preference to mineral fibre or nitrile rubber, enables you to reduce the thickness of the insulated duct support inserts, thus making significant savings.

*Kingspan Kooltherm*<sup>®</sup> Duct Insulation means reduced insulated duct support insert thickness, thus saving on capital costs.

3.8 *Kingspan Kooltherm*<sup>®</sup> Duct Insulation can be installed as a single layer, unlike nitrile rubber which can only be supplied in a single layer up to a limited maximum thickness, significantly reducing labour costs and time.

*Kingspan Kooltherm*<sup>®</sup> Duct Insulation can always be installed as a single layer, unlike nitrile rubber, significantly reducing labour costs and time.

