

# Issues to Consider

## 4 NHS. Model Engineering Specifications. C02. Thermal Insulation. (NHS C02)

- 4.1 The NHS have recognised the environmental consequences and energy costs associated with the construction of their premises and have issued targets on energy efficiency for capital schemes entitled “NHS. Model Engineering Specifications. C02. Thermal Insulation.” or NHS C02 for short, to take account of minimising energy costs.
- 4.2 The NHS C02 specification originated in April 1993 and was written by NHS energy specialists. This document has been continually updated and the most recent was issued November 1997.
- 4.3 On January 18, 2001, John Denham, Minister of State, Department of Health gave a written answer to the House of Commons which stated as follows:

“The National Health Service has a good track record in achieving environmental targets, and there are a number of initiatives under way to support the NHS in achieving greater energy efficiency. This is an important matter, and we do not propose to stand still. We are therefore taking the following programme of action:

We will write to all NHS trusts setting new mandatory targets for overall energy use and will be providing guidance to the NHS on how to improve its environmental performance.

We will make existing targets for capital schemes mandatory, which means that all output specifications for private finance initiative schemes must comply with those targets.

We will include a new section on energy efficiency in the Business Case checklist, which the Department uses in assessing the quality and readiness of proposals for capital schemes.

The current British Standard for heat insulation is under review, and I have asked that my officials review the current model engineering specification in the light of this.

The revised capital investment manual will include a new section focusing on environmental issues.

A joint NHS Estates / Department of the Environment, Transport and the Regions research and development project is under way to produce a Building Research Establishment environmental assessment model for hospitals.

### NHS C02 is being made mandatory for all capital schemes in the NHS.

- 4.4 The thicknesses of different insulation materials required to meet the standard are shown in the table below. More detail is given in “NHS. Model Engineering Specifications. C02. Thermal Insulation.” itself.

Temperature difference between air inside ductwork and ambient air (°C)	Kingspan <b>Kooltherm</b> ® Duct Insulation	Mineral Fibre	Nitrile Rubber
Up to 25	31	50*	60
Maximum Air Temperature Inside Ductwork: Assumed Thermal Conductivity (k-value) of Insulation:			+40°C
	Kingspan <b>Kooltherm</b> ® Duct Insulation		0.021 W/m-K
	Mineral Fibre		0.035 W/m-K
	Nitrile Rubber (Class O)		0.040 W/m-K

**Minimum Thickness (mm) of Insulation for Ductwork Carrying Warm Air to Control Heat Loss (Based on NHS C02 Table 14)**

\* This figure is based on an insulation thermal conductivity of 0.035 W/m-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 W/m-K. For accurate thicknesses of those products please refer to a mineral fibre manufacturer. This table takes 0.035 W/m-K as a "safe" value.

The NHS C02 Table 14, Note 2, refers to Table 10 of BS 5422 for minimum thickness (mm) of insulation for ductwork carrying chilled air to control heat gain. For more details of BS 5422: 2001 please refer to section 3 of this Issues to Consider section of this document.

4.5 It can be seen from the above that the required thickness of *Kingspan Kooltherm*<sup>®</sup> Duct Insulation can be significantly less than that for mineral fibre (up to 38% thinner) or nitrile rubber (up to 48% thinner).

The thickness of *Kingspan Kooltherm*<sup>®</sup> Duct Insulation required by NHS C02 can be up to **38%** thinner than that for mineral fibre and up to **48%** thinner than that for nitrile rubber.

4.6 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.

4.7 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.

4.8 *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.

4.9 Design Note 15 for NHS C02 states:

“The use of man-made mineral fibre (MMMF) insulation has been deliberately restricted in this Specification from certain areas of Health Care Buildings.”

4.10 NHS C02 Element 02 Materials states:

that insulation shall not “be used in kitchens, food preparation or food storage areas (including ceiling voids and ducts, and access from these areas etc.) nor in air conditioned / aseptic spaces if it contains glass or rock fibre.”

4.11 NHS C02 Element 08 Table 4:

restricts mineral fibre from all cold water services and chilled water services, from all air conditioning supply and plenum ducts and from all occupied areas and other ducts.

NHS C02 restricts mineral fibre from all cold water services and chilled water services, from all air conditioning supply and plenum ducts and from all occupied areas and other ducts.

4.12 The NHS C02 Specification is due for revision.