

Issues to Consider

1 Building Regulations / Standards

1.1 The requirements for thermal insulation (Conservation of fuel and power / energy) in buildings are detailed in the following Regulations / Standards.

- England & Wales: The Building Regulations. Approved Documents L1A, L1B, L2A & L2B.
- Scotland: The Building Standards (Scotland) Regulations. Technical Handbooks (Domestic & Non-Domestic). Sections 6.
- Republic of Ireland: The Building Regulations. Technical Guidance Document L.
- Northern Ireland: The Building Regulations (Northern Ireland). Technical Booklets F1 & F2.

England and Wales

1.2 On March 15, 2006, the new 2006 Editions of the Building Regulations 2000 (England and Wales) Approved Documents L1A, L1B, L2A & L2B (Conservation of fuel and power) were published by the Office of the Deputy Prime Minister (ODPM). They came into effect on April 6, 2006, and from that date, all plans submitted for Building Control approval needed to comply with the new requirements. Approved Documents L1A, L1B, L2A & L2B refer directly and indirectly to the TIMSA "Domestic and Non-Domestic Heating, Cooling and Ventilation Guide" (the TIMSA Guide) as the required standard for building services insulation.

1.3 Building Services Insulation and the new Building Regulations 2000 (England & Wales) Approved Documents L1A, L1B, L2A & L2B, 2006 Editions

New Dwellings

Approved Document L1A states that reasonable provision would be demonstrated by insulating ducts to standards that are not worse than those set out in the Domestic Heating Compliance Guide and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Domestic Heating Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but does not explicitly mention insulation for ductwork.

From the Building Regulations 2006 (England and Wales) Approved Document L1A (Conservation of fuel and power in new dwellings), 2006 Edition, ODPM and the Domestic Heating Compliance Guide, 2006 Edition, DCLG.

Existing Dwellings

Approved Document L1B states that reasonable provision would be demonstrated by insulating ducts to standards that are not worse than those set out in the Domestic Heating Compliance Guide as part of the provision or extension of a heating service and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Domestic Heating Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but does not explicitly mention insulation for ductwork.

From the Building Regulations 2006 (England and Wales) Approved Document L1B (Conservation of fuel and power in existing dwellings), 2006 Edition, ODPM and the Domestic Heating Compliance Guide, 2006 Edition, DCLG.

New Buildings Other than Dwellings

Approved Document L2A states that reasonable provision would be demonstrated by insulating ducts to standards that are not less than those set out in the Non-domestic Heating, Cooling and Ventilation Compliance Guide and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Non-domestic Heating, Cooling and Ventilation Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but in addition states that ducting should be insulated along its whole length in order to provide the necessary means of limiting heat gains and / or heat losses from ducts. Where ducting may be used for both heating and cooling duties at different periods during its lifecycle, the provisions for chilled ducting should be adopted, since these are the most onerous. Additional provision for the control of condensation may need to be made as detailed in the TIMSA Guide.

From the Building Regulations 2006 (England and Wales) Approved Document L2A (Conservation of fuel and power in new buildings other than dwellings), 2006 Edition, ODPM and the Non-domestic Heating, Cooling and Ventilation Compliance Guide, 2006 Edition, DCLG.

Existing Buildings Other than Dwellings

Approved Document L2B states that reasonable provision would be demonstrated by insulating ventilation ductwork to conserve energy and to maintain the temperature of the heating or cooling service to standards that are not less than those set out in the Non-domestic Heating, Cooling and Ventilation Compliance Guide as part of the provision or extension of a heating, cooling or hot water service and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Non-domestic Heating, Cooling and Ventilation Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but in addition states that ducting should be insulated along its whole length in order to provide the necessary means of limiting heat gains and / or heat losses from ducts. Where ducting may be used for both heating and cooling duties at different periods during its lifecycle, the provisions for chilled ducting should be adopted, since these are the most onerous. Additional provision for the control of condensation may need to be made as detailed in the TIMSA Guide.

From the Building Regulations 2006 (England and Wales) Approved Document L2B (Conservation of fuel and power in existing buildings other than dwellings), 2006 Edition, ODPM and the Non-domestic Heating, Cooling and Ventilation Compliance Guide, 2006 Edition, DCLG.

- 1.4 It is clear from the new Approved Documents L1A, L1B, L2A & L2B that the TIMSA Guide is the reference document for the required standard of insulation for ducts.
- 1.5 The TIMSA Guide is accepted as the required standard in the new Approved Documents L1A, L1B, L2A & L2B because it is based on a rigorous analysis of environmental benefit, practicality and cost effectiveness.
- 1.6 For more detail on the implications of the new TIMSA Guide please refer to section 2 of this Issues to Consider section of this document.

It is clear that the TIMSA Guide is the reference document for the required standard of insulation for ducts in England & Wales.

Scotland

- 1.7 On February 1, 2006, the new 2006 Editions of the Technical Handbooks (Domestic & Non-Domestic) to the Building (Scotland) Regulations 2004, Sections 6, Energy, were published by the Scottish Building Standards Agency (SBSA). They came into effect on May 1, 2006, and from that date, all plans submitted for Building Control approval needed to comply with the new requirements. The Sections 6 refer to BS 5422: 2001 as the required standard for building services insulation.
- 1.8 Building Services Insulation and the 2005 Edition of the Technical Handbooks (Domestic & Non-Domestic) to the Building (Scotland) Regulations 2004, Sections 6, Energy

New Systems in New Domestic Buildings or Conversions of Previously Unheated Buildings, Extensions with New or Full / Part Replacement Systems and Alterations with New or Full / Part Replacement Systems

Warm air ducts serving a space heating system should be insulated against heat loss unless the use of such ducts always contribute to heating demands for the room or space. In most instances this will be where duct runs occur outwith the insulation envelope of the building. This will not only address energy conservation issues but will also assist with frost protection. Guidance on suitable protection measures is given in BRE Report 262, Thermal insulation: avoiding risks published by BRE.

It is recognised that complete insulation will sometimes not be possible, where such services pass through or around structural building components, floor joists, for example. A balanced approach will be needed with carefully thought out routes for services to ensure that buildability is achieved.

A way of achieving insulation for such ducts is to follow the guidance for 'environmental thickness' given in BS 5422: 2001 'Methods for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40°C to +700°C'.

From the Building Standards (Scotland) Regulations 2004. Technical Handbook Section 6 (Domestic Buildings - Energy), 2006 Edition, SBSA.

New Systems in New Non-Domestic Buildings or Conversions of Previously Unheated Buildings, Extensions with New or Full / Part Replacement Systems and Alterations with New or Full / Part Replacement Systems

Ducts used for space heating and space cooling should be thermally insulated to reduce heat loss in the case of the former and heat gain in the case of the latter. This will not be necessary where the ducts always contribute to the heating or cooling demands of the room or space and the ducts are located at a height of 3 m or less above the floor.

It is recognised that complete insulation will sometimes not be possible, where such services pass through or around structural building components, floor joists, for example. A balanced approach will be needed with carefully thought out routes for services to ensure that buildability is achieved.

A way of achieving insulation for such ducts is to follow the guidance for 'environmental thickness' given in BS 5422: 2001 'Methods for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40°C to +700°C'.

From the Building Standards (Scotland) Regulations, 2004. Technical Handbook Section 6 (Non-domestic Buildings - Energy), 2006 Edition, SBSA.

- 1.9 It is clear from the new Section 6 that the BS 5422: 2001 is the reference document for the required standard of insulation for ducts.
- 1.10 For more details of BS 5422: 2001 please refer to section 3 of this Issues to Consider section of this document.

It is clear that BS 5422: 2001 is the reference document for the required standard of insulation for ducts in Scotland.

- 1.11 Early in 2006, a consultation paper was issued for new 2007 editions of the Technical Handbooks designed to implement parts of the EU Energy Performance of Buildings Directive. It included a draft new Section 6 which referred to BS 5422: 2001 as the required standard for building services insulation. Scotland operates under a different legal framework than England & Wales and the Technical Standards can only refer to British Standards and other reference texts that are current at the time of publication. The draft new Section 6 referred only to British Standards and other reference texts current as of the date of drafting. The new Domestic Heating Compliance Guide, Non-domestic Heating, Cooling and Ventilation Compliance Guide and TIMSA Guide were published after that date and so draft new Section 6 still refers to BS 5422: 2001. It is expected the new Domestic Heating Compliance Guide, Non-domestic Heating, Cooling and Ventilation Compliance Guide and TIMSA Guide will be referred to in the 2007 Technical Handbooks when they are issued.

Issues to Consider

Republic of Ireland

1.12 On May 31, 2006, the new 2006 Edition of the Building Regulations 2005 Technical Guidance Document L (Conservation of Fuel and Energy) was published by the Department of the Environment, Heritage and Local Government (DEHLG). It came into effect on July 1, 2006, and from that date, all plans submitted for planning approval needed to comply with the new requirements. Technical Guidance Document L refers directly to BS 5422: 2001 as the required standard for building services insulation.

1.13 Building Services Insulation for Dwellings and Technical Guidance Document L to the Building Regulations (Republic of Ireland), 2006 Edition

Dwellings – All Methods of Compliance

All ducts associated with the provision of heating in a dwelling should be insulated to prevent heat loss except for ducts within the normally heated area of the dwelling which contribute to the heat requirement of the dwelling.

Unless the heat loss from a duct contributes to the useful heat requirement of a room or space, the duct should be insulated. Levels of duct insulation meeting the recommendations of BS 5422: 2001 should suffice.

From the Building Regulations 2005. Technical Guidance Document L (Conservation of Fuel and Energy), 2006 Edition. DEHLG.

Buildings other than Dwellings – All Methods of Compliance

Ducts associated with the provision of heating in a building should be insulated to limit heat loss, except where the heat flow through the wall of the duct is always useful in conditioning the surrounding space. Ducts that serve air-conditioning systems should be insulated to limit heat gain from the surrounding environment.

Provision of insulation to ducts in accordance with the standards specified in BS 5422: 2001, should adequately limit heat loss or heat gain, as appropriate.

From the Building Regulations 2005. Technical Guidance Document L (Conservation of Fuel and Energy), 2006 Edition. DEHLG.

1.14 It is clear from the new Technical Guidance Document L that the BS 5422: 2001 is the reference document for the required standard of insulation for ducts.

1.15 For more details of BS 5422: 2001 please refer to section 3 of this Issues to Consider section of this document.

It is clear that BS 5422: 2001 is the reference document for the required standard of insulation for ducts in the Republic of Ireland.

Northern Ireland

1.16 On August 31, 2006, the new 2006 Editions of the Building Regulations (Northern Ireland) 2000 Technical Booklets F1 and F2 (Conservation of fuel and power) were published by the Department of Finance and Personnel (DFP). They came into effect on Nov 30, 2006, and from that date, all plans submitted for Building Control approval needed to comply with the new requirements. Technical Booklets F1 and F2 refer indirectly to the TIMSA “Domestic and Non-Domestic Heating, Cooling and Ventilation Guide” (the TIMSA Guide) as the required standard for building services insulation.

1.17 Building Services Insulation and the new Building Regulations (Northern Ireland) 2000 Technical Booklets F1 and F2, 2006 Editions

New Dwellings

Technical Booklet F1 states that ducts shall be insulated to standards not less than those given in the Domestic Heating Compliance Guide.

The Domestic Heating Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but does not explicitly mention insulation for ductwork.

From the Building Regulations (Northern Ireland) 2000, Technical Booklet F1 (Conservation of fuel and power in dwellings), 2006 Edition, DFP and the Domestic Heating Compliance Guide, 2006 Edition, DCLG.

Existing Dwellings

Technical Booklet F1 states that ducts shall be insulated to standards not less than those given in the Domestic Heating Compliance Guide as part of the provision or extension of a heating service.

The Domestic Heating Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but does not explicitly mention insulation for ductwork.

From the Building Regulations (Northern Ireland) 2000, Technical Booklet F1 (Conservation of fuel and power in dwellings), 2006 Edition, DFP and the Domestic Heating Compliance Guide, 2006 Edition, DCLG.

New Buildings Other than Dwellings

Technical Booklet F2 states that ventilation ductwork shall be insulated in accordance with the recommendations given in the Non-domestic Heating, Cooling and Ventilation Compliance Guide and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Non-domestic Heating, Cooling and Ventilation Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but in addition states that ducting should be insulated along its whole length in order to provide the necessary means of limiting heat gains and / or heat losses from ducts. Where ducting may be used for both heating and cooling duties at different periods during its lifecycle, the provisions for chilled ducting should be adopted, since these are the most onerous. Additional provision for the control of condensation may need to be made as detailed in the TIMSA Guide.

From the Building Regulations (Northern Ireland) 2000, Technical Booklet F2 (Conservation of fuel and power in buildings other than dwellings), 2006 Edition, DFP and the Non-domestic Heating, Cooling and Ventilation Compliance Guide, 2006 Edition, DCLG.

Existing Buildings Other than Dwellings

Technical Booklet F2 covers work involving the provision or extension of a fixed building service:

- when constructing an extension; and
- when undertaking a material change of use.

Technical Booklet F2 states that, in these circumstances, ventilation ductwork shall be insulated in accordance with the recommendations given in the Non-domestic Heating, Cooling and Ventilation Compliance Guide and that the TIMSA Guide explains the derivation of the performance standards and how they can be interpreted in practice.

The Non-domestic Heating, Cooling and Ventilation Compliance Guide refers to the TIMSA Guide as the source document for the appropriate standards of building services insulation but in addition states that ducting should be insulated along its whole length in order to provide the necessary means of limiting heat gains and / or heat losses from ducts. Where ducting may be used for both heating and cooling duties at different periods during its lifecycle, the provisions for chilled ducting should be adopted, since these are the most onerous. Additional provision for the control of condensation may need to be made as detailed in the TIMSA Guide.

From the Building Regulations (Northern Ireland) 2000, Technical Booklet F2 (Conservation of fuel and power in buildings other than dwellings), 2006 Edition, DFP and the Non-domestic Heating, Cooling and Ventilation Compliance Guide, 2006 Edition, DCLG.

- 1.18 It is clear from the new Technical Booklets F1 & F2 that the TIMSA Guide is the reference document for the required standard of insulation for ducts.
- 1.19 The TIMSA Guide is accepted as the required standard in the new Technical Booklets F1 & F2 because it is based on a rigorous analysis of environmental benefit, practicality and cost effectiveness.
- 1.20 For more detail on the implications of the new TIMSA Guide please refer to section 2 of this Issues to Consider section of this document.

It is clear that the TIMSA Guide is the reference document for the required standard of insulation for ducts in Northern Ireland.