



Expert commentary

BS 5422:2023 — *Methods for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40 °C to +700 °C*

Alex Hill, Managing Director, Whitecode Consulting Ltd

1 Overview

This is a full revision of the standard. The revision covers the latest influences on the energy landscape.

1.1 Reasons for change

The purpose of the revision is to:

- update the insulation types and performance levels to those who dominate the market today
 - offer improved insulation level options so as to reduce losses
 - anticipate a greater future contribution from district heating systems
 - bring more clarity regarding insulation fire performance, which must remain uppermost in the construction industry's thoughts
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2 Main commentary

The revision introduces the following principal changes:

- tables have been revised with simplification in mind where possible. For example, higher thermal conductivity values for materials no longer supplied or very rarely used have been removed. Thermal conductivity values in this edition are based on the most commonly used insulation materials at time of revision
 - all pipe sizes are indicated as 'less than or equal to' values, which reduce the need for interpolation and tend to increase the overall thermal efficiency of the targeted systems. This has also allowed the removal of tables specific to copper pipe sizes (Tables 7 and 9)
 - reaction to fire is defined within this publication in terms of Euroclass, which is used in today's Building Regulations documents and is the default in product marking. Euroclass reaction to fire gives a more comprehensive and clear definition of the behaviour of materials exposed to fire than the more limited legacy BS 476 based scope
 - enhanced insulation thicknesses have been captured from the legacy Energy Technology List/Capital Allowances levels, also known as NES Y-50, and these can be found in Tables 15B, 16B, 17B, 18B, 19B and 20B. It was found that it was appropriate to raise the base standard of insulation. The level chosen was set in combination with the effect of interpolation between sizes not now being necessary that also gives a further enhancement. Many other standards are now starting to be brought forward that also touch on pipework insulation standards. These can offer further enhanced requirements that may be implemented through Planning Policy or client specification routes
 - district heating tables for secondary systems have been added in Tables 19C and 20C
 - plastic pipes (single wall) are now treated as having no insulative value of their own, as the thermal contribution is of very little significance in any calculation
 - the standard balances the demand for ever-greater thermal efficiency with a recognition that insulation thicknesses can become impractical and indeed have been recognized as so in the past. Therefore, enhanced thicknesses have been introduced for heating and hot water service in Tables 15B, 16B, 17B, 18B, 19B and 20B. These are also known as NES Y-50 levels. The previously existing thicknesses for the same service are retained as a base level thickness option so that the use of non-combustible insulation, which can tend to have slightly greater thicknesses, is not restricted. These are sometimes reported to already be at practical limits
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3 Wider context

3.1 Building regulations

The Building Regulations Merged Approved Documents include the 2021 editions of:

- Approved Document L Volume 1 — Conservation of fuel and power — Dwellings
- Approved Document L Volume 2 — Conservation of fuel and power — Buildings other than dwellings

These introduce simplified tables for 'limiting heat losses and gains from building services' but also continue to refer to BS 5422 as a method for compliance.