

- Ducts passing through outside or unconditioned spaces must be insulated with the minimum insulation thickness specified in Table 502.11 (2).

Table 502.11(2): Minimum Insulation Thickness for Ducts Passing Through Unconditioned Spaces

Minimum Air Temperature inside Duct (°C)							
15		10		5		0	
Minimum Thickness Of Insulating Material (mm)							
λ = 0.018 W/mK	λ = 0.038 W/mK	λ = 0.018 W/mK	λ = 0.038 W/mK	λ = 0.018 W/mK	λ = 0.038 W/mK	λ = 0.018 W/mK	λ = 0.038 W/mK
42	61	48	84	57	107	66	127

λ = thermal conductivity of insulating materials at a mean temperature of 10 °C.

Insulation materials must meet the requirements of *Regulation 701.01: Thermal and Acoustical Insulation Materials* or BS 5422:2009, whichever is more stringent.

Installation for all insulations must have suitable vapor barrier and protection from Ultra Violet (UV) light.

SIGNIFICANCE

Considerable lengths of pipework could be noticed in buildings with central chiller and ventilation systems. These pipes include those that carry water from chiller to devices like fan coil units or ducts that carry air cooled at air handling unit. Insulation of these pipes and ducts are very important to save energy from air conditioning systems. If these pipes and ducts are not properly insulated, the temperature of the water or air would increase even before it reaches its destination. To compensate these losses of energy additional cooling energy is utilised. Also, condensation is formed when warm humid air gets in contact with colder object. Further condensation will lead to mold and mildew formation causing severe health issues to building occupants.

Hence, selection and installation of correct insulation material is critical for energy conservation, reduction in heat loss, resistance to moisture absorption, noise attenuation, controlling temperature variation and prevention of condensation. Rusting, resulting from dripping of ducts and pipes can also be reduced by proper insulation.

APPLICABILITY

This regulation is applicable to all building types. Refer to Table 101.07(1) in Section One - Administration for detailed applicability levels.

IMPLEMENTATION

Thermal conductivity is the main factor for selecting the type of insulation material. Lower the thermal conductivity the better would be the insulation value. Insulation can be designed to achieve a specific resistance value by specifying adequate thickness. Design team shall identify the type of system that require insulation, which is passing through conditioned and unconditioned spaces. Specific requirements related to the insulation shall be included in the technical specifications.

British standard BS 5422 (latest edition): Method for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40°C to +700°C, shall be used for selecting insulation material for pipes and ducts passing through conditioned spaces.