

Best Practices for Insulation Space Requirements

Heating, Ventilation and Air-Conditioning - HVAC

Spaces required for installation of insulation

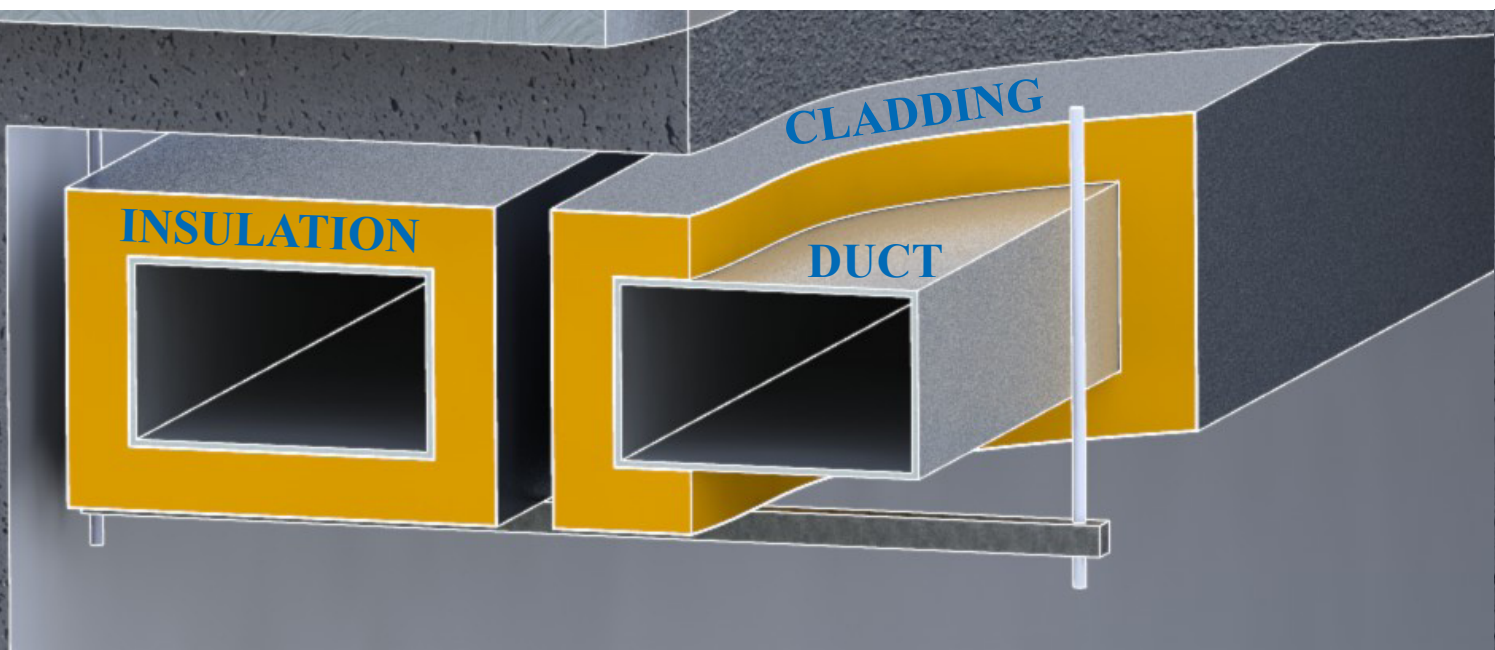
HVAC is a very important element in the construction industry. It represents the lungs of every building, responsible for regulating the temperature and humidity. However great and necessary this technology is, poor designs can lead to installation delays, additional expenses and in the end, energy losses. Although there are many different ways of working and different local habits all across Europe, the insulation element from the HVAC system plays an important role hence, it is vital that during the design phase adequate spaces are allowed so the insulation and cladding can be sufficiently installed.

To ensure a proper insulation on pipes and ducts the insulation installer needs to be able to put his hands, arms and / or upper-body next or along the pipe and duct.

This paper will provide the HVAC designer with 'best calculation practices' to implement a minimum space for insulation & installation. The designing stage is crucial to ensure that all elements of the system are taken into calculation such as the size of the installations, insulation thickness and cladding. It is also extremely important that this design is passed on to all the trades that will have an effect on the final product such as the builders, plumbers, electricians and insulators. For example, it is absolutely crucial for an installer to be aware of the insulation thickness that will later be installed.

To offer a clear overview, some of the most common examples will be presented based on practical experiences accumulated over many years and by most insulation contractors. It aims to tackle some of the most common mistakes that can lead to heavy liabilities in terms of project completion and related extra costs.

Whilst this paper will present the best practices for calculating adequate spacing, it also strongly recommends the user to refer to the appropriate available standards. In addition, insulation against fire contains even more stringent requirements therefore, the appropriate standards and manufacturer's recommendation must always be observed and respected.



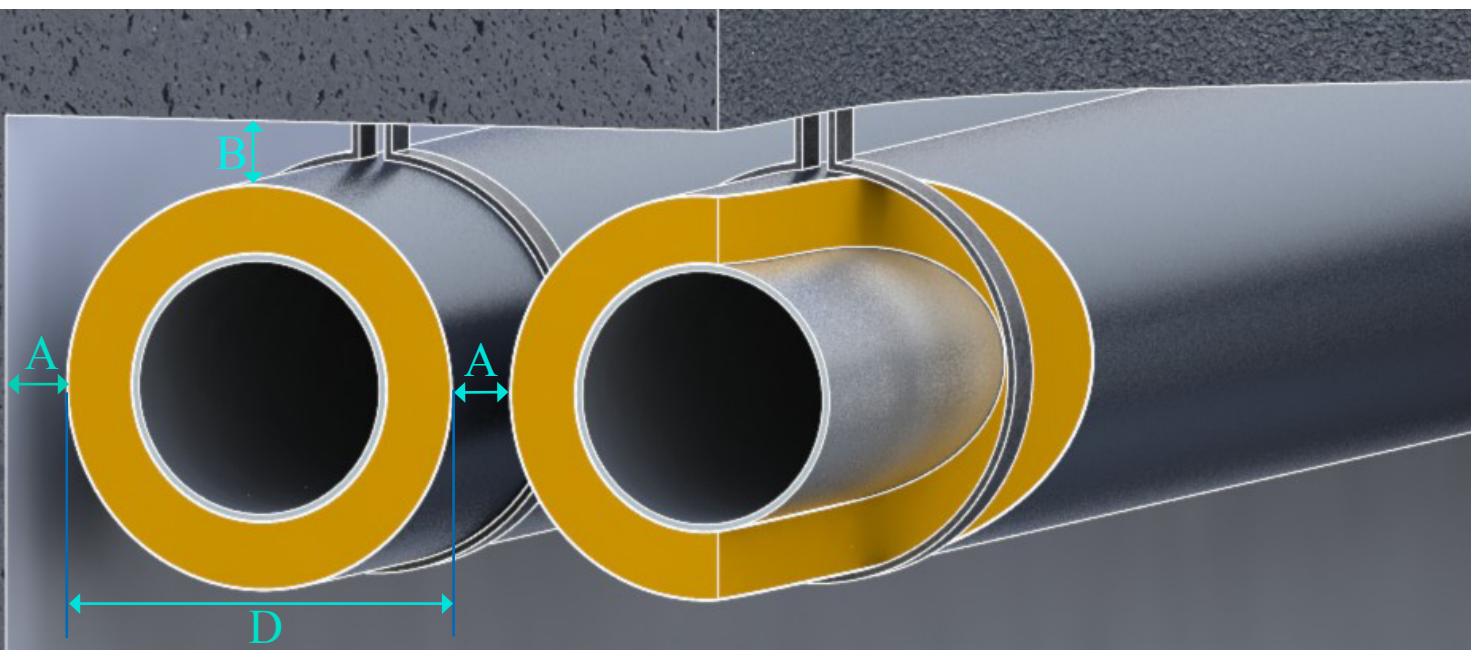
Pipe installations and Circular channels

General note:

HVAC ducts as well as all other installation equipment in buildings are commonly centrally located in a building. From this central point (technical space) installations are diverted to all other locations in the building. The specially designed diverters, bends, t-pieces consume much more space then the plain straight forward pipes and ducts. It is therefore recommended to closely pay attention to the design of these crossroads and insulation & installation space.

D*	A	B
≤ 160	50	50
160 - 300	100	50
300 - 500	200	50
>500	400	50
*Outside Diameter in mm (pipe + insulation)		

Always observe surrounding elements such as cable trays and crossing pipes. Consider the fire, sound and condensation issues and make sure that at least one side of the installation is fully accesible by the installer.



Rectangular Ducts

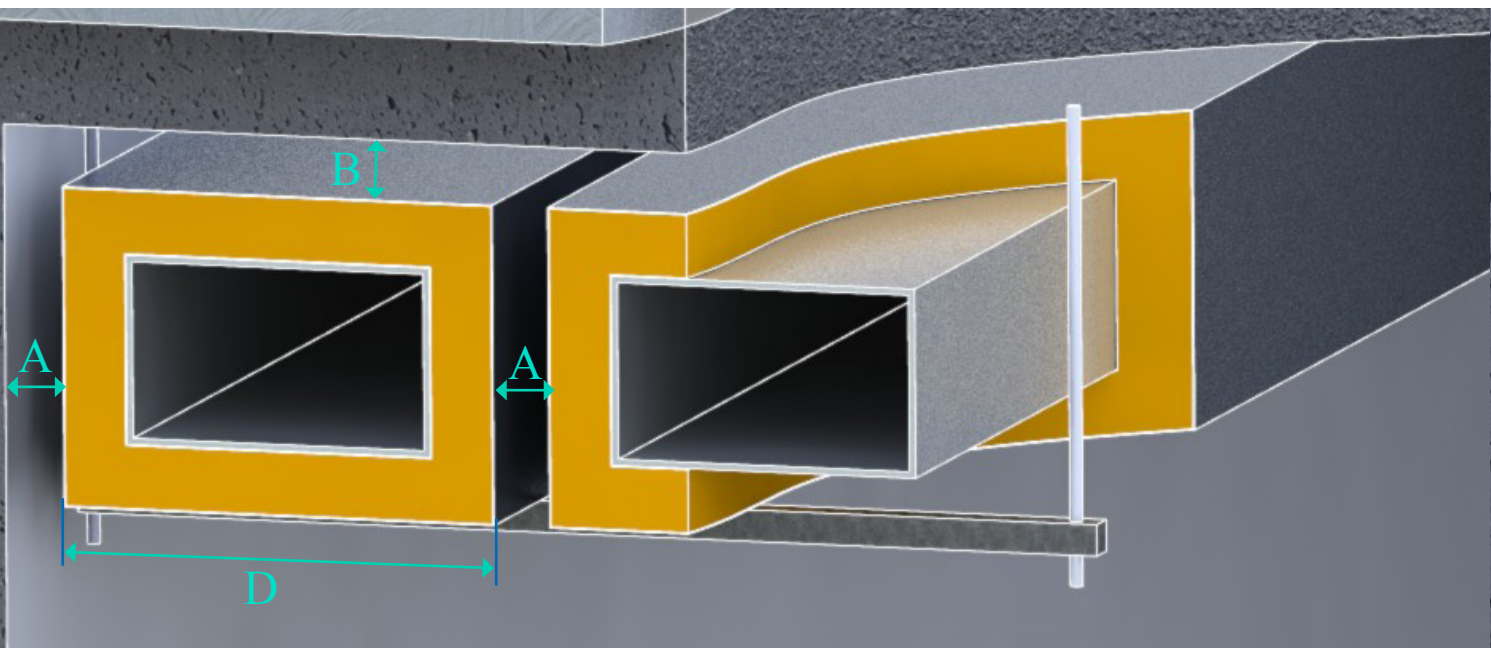
All ventilation ducts require between each other and/or walls and other equipment enough space to allow the installer to carry out the insulation and cladding systems. It is not the purpose of this paper to define the thickness of any insulation however, once the thickness has been decided upon, there must be a clear guidance as to the space also required for that insulation to be applied.

The application of any insulation will be greatly impacted by the size of the ducts and all the surrounding elements such as walls, cable trays and pipe junctions.

Duct size	< 700 mm
B	> 150 mm
A	400 mm

Duct size	700 - 1200 mm
B	> 200 mm
A	400 mm

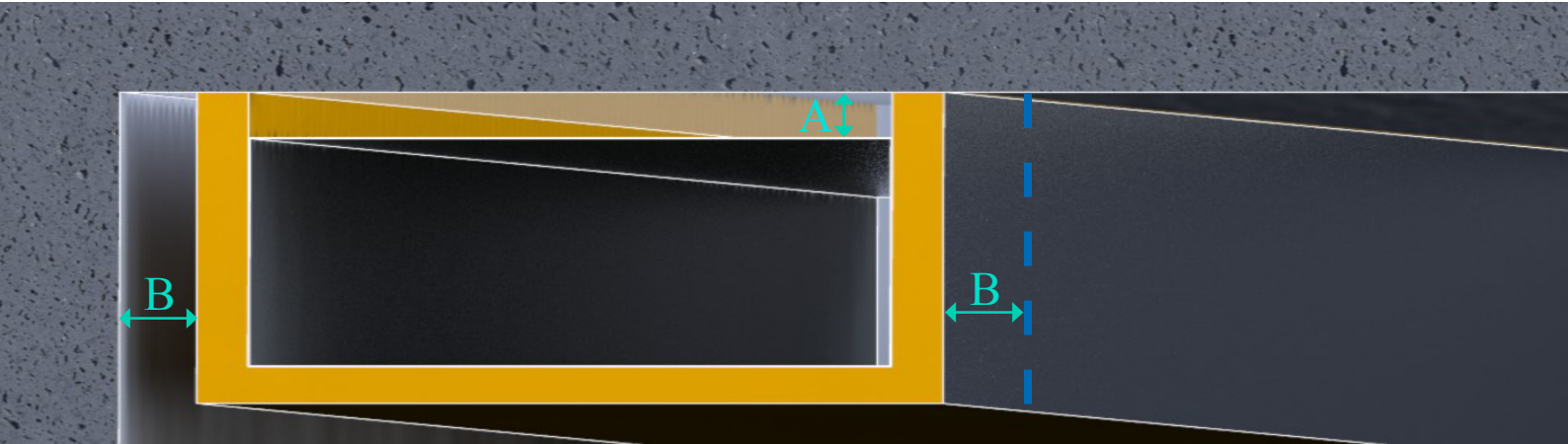
Duct size	> 1200mm
B	> 400 mm
A	400 mm



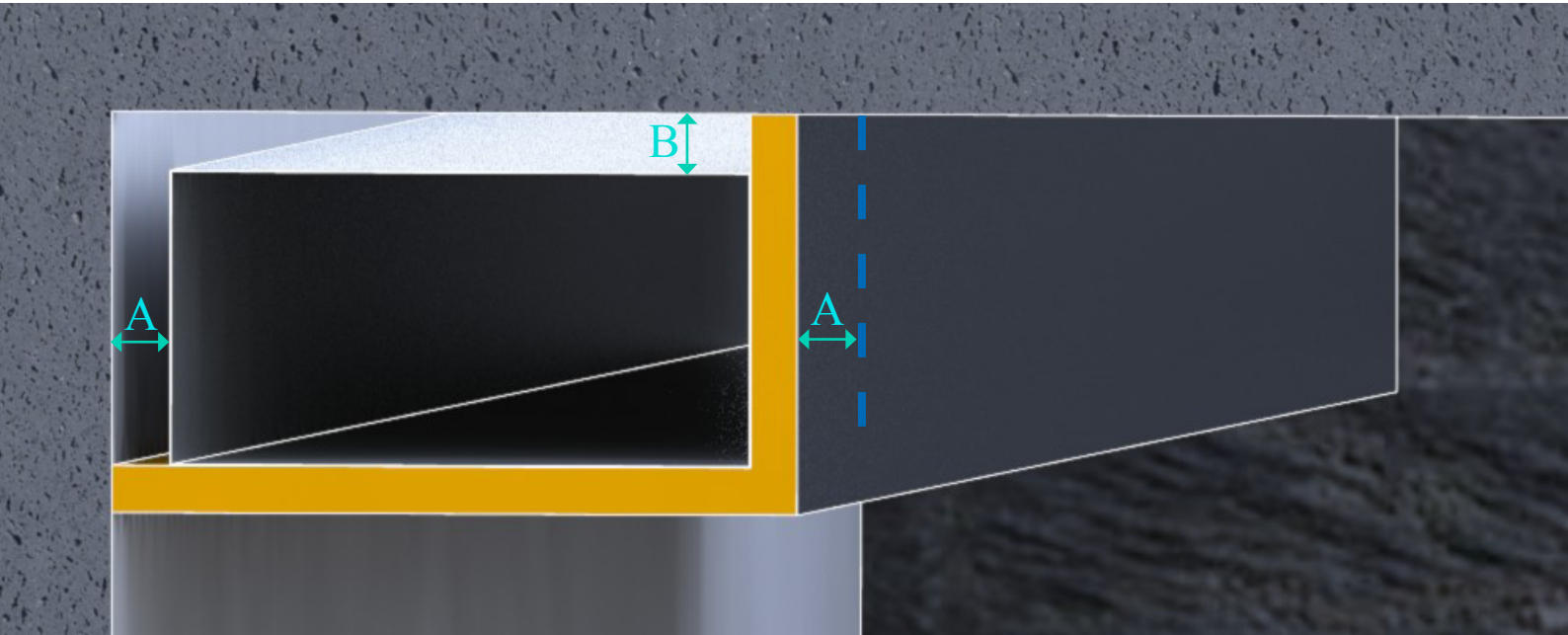
Horizontal Ducts with Exposed Sides - the sides without any insulation assumes that the building* part complies with the insulation attributes

*In case of fire protective insulation it is mandatory to follow the producers guidelines if 1,2 or 3-sided insulation is allowed.

Insulation applied on three sides	
Duct longer side < 700 mm	Duct open side ≥ 700 mm
a = max 40 mm	a = max 40 mm
b = 400 mm	b = 400 mm



Insulation applied on two sides of the duct	
Duct longer side < 700 mm	Duct open side ≥ 700
a = max 30 mm*	a = max 30 mm*
b = 400 mm	b = 600 mm





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