

Heating Ventilation & Air Conditioning

A high level of comfort is probably the most important requirement today for the occupants of buildings. Reduction in carbon emission should also be a key consideration.



Overview

'Mechanical services' (i.e. heating, ventilation, and airconditioning – commonly known as HVAC) are a fundamental consideration when designing for comfort.

The efficient design of HVAC services not only increases the occupants' sense of well-being, it can also create considerable savings in building operation costs.

The running of HVAC services will be most efficient when pipes and ducts are insulated.

This will:

- reduce energy costs
- prevent condensation and freezing
- provide sound as well as thermal insulation
- protect occupants from dangerous contact with hot surfaces

Advantages

The Knauf Insulation approach to HVAC

Knauf Insulation has the UK's widest range in of fire-safe glass wool insulation products for HVAC pipe and ductwork. With locally based manufacturing, we can supply insulation for 'next day delivery' and even make bespoke products for contractors on large projects to meet specific design requirements.

There are many products from Knauf Insulation for the designer to consider, products that have unique advantages for installers, contractors and stockists.

HVAC products from Knauf Insulation

- Crown Pipe Insulation – a high quality pre-formed pipe insulation product, which is made from shot-free noncombustible glass wool. It has a factory-applied bright Class 'O' facing with a self-adhesive overlap.
- Crown Duct Roll – a strong, flexible roll of shot-free, non-combustible glass wool with a bright Class 'O' aluminium foil facing on one side.
- Crown Duct Slab – a strong, semirigid insulation slab of shot-free, noncombustible glass wool, faced on one side with a bright Class 'O' reinforced aluminium foil.
- Crown Duct Slab Plus – a strong, rigid insulation slab of shot-free, noncombustible glass wool, faced on one side with a bright Class 'O' reinforced aluminium foil. The facing provides a bright, washable surface and is an effective vapour control layer.
- Crown Acoustic Duct Liner – a roll of strong, flexible glass wool, faced on one side with a tough white glass cloth.
- Crown Universal Slab – comprises a range of semi-rigid to rigid shot-free, non-combustible, unfaced glass wool slabs. These can be supplied with a bright Class 'O' facing and in a wide range of densities.
- Rocksilk Duct Slab – manufactured from non-combustible, inorganic rock mineral wool for strength, and with a factory-applied bright Class 'O' reinforced aluminium facing, providing up to 2 hours fire protection.
- Rocksilk Mattress – in non-combustible rock mineral wool, faced on one or both sides with galvanised or stainless steel wire mesh, providing a firm but flexible general purpose insulating mattress.
- Rocksilk PyroDuct – a high-density rock mineral wool slab, available faced or unfaced with a bright Class 'O' reinforced aluminium foil.
- Icerock Ductwrap – a strong, flexible roll of rock mineral wool of 45 kg/m³ nominal density, with a bright Class 'O' reinforced aluminium facing.

Summary

Knauf Insulation provides a wide range of HVAC products for the mechanical engineer and contractor. Many different application options and solutions are possible, depending on the building type, the function of the HVAC

equipment, and the particular benefits required of the insulation.

Website Options

Links To Other Country Sites

Search



Latest News

International

www.knaufinsulation.com
www.knauf.com
www.knaufinsulation.co.uk

KEY :



Heat Conservation

Minimising heat transfer from pipes and ducts to the surrounding environment.



Safety

Protecting people against injury from contact with pipes and ducts, and HVAC equipment itself from damage.



Fire Protection

Preventing fire risk from the contents of services, and protecting HVAC equipment from external fire damage.



Acoustic Reduction

Minimising disturbance to building users from noise transmitted along pipes and ducts.



Frost Protection

Preventing the freezing of liquid passing through pipes.



Condensation Protection

Minimising condensation build-up and corrosion risk to pipes and ducts

Building type



HVAC functions

Heating Services

Application

Boiler Rooms Pipe	Boiler Rooms Duct	Service Areas Pipe	Service Areas Duct	Storage Tank & Calorifier	Occupied Areas Pipe	Occupied Areas Duct	Ventilation Duct

Required benefits of Insulation

Critical ↑

Important

Other Consideration

Building type



HVAC functions

Cooling Services

Kitchen Services

Toilet Services

Application

Cooling Towers Pipe	Chiller Rooms Pipe	A/C Duct	Extraction Duct	Cold Stores Pipe	Hot Water Pipe	Hot and Cold Pipe	Extraction Duct

Required benefits of Insulation

Critical ↑

Important

Other Consideration

Requirements of Pipe & Duct Insulation

Requirement



Heat Conservation

Minimising the loss of heat from the working fluid to the surrounding environment will save energy and cost. Returning unused energy to the heat source for recirculation will reduce fuel demand on the boiler/heater, with associated energy cost savings. Higher return temperatures also improve appliance performance, with faster heatup times and operation at optimum temperature. Heat lost because of insufficient insulation cannot usually be recovered, thus wasting the fuel energy used to produce it. The temperature of the working fluid is usually controlled by the boiler/heater. If insulation minimises transmission losses, and these are predictable, then end-user conditions are more stable and less subject to outside influences.



Safety

The possibility of human contact with heated or chilled ducts and pipes introduces a risk of injury. A suitably finished insulation cover will reduce this risk. Ducts and pipes can also create obstruction hazards, but the resilience of glass mineral wool insulation is an effective cushion. Uncontrolled losses from ducts and pipes can create discomfort by affecting environmental conditions or conflicting with control measures. Heating or chilling of adjacent materials can also occur when the heat released conflicts with the fluid temperature in adjacent pipes and ducts, or affects the temperature of local materials such as cables, plastics, paper or board products, etc.



Fire Protection

Fire risk must be minimised by using noncombustible materials wherever possible. Fire is prevented from spreading from one area to another by sealing with a fire barrier. Service connections between these areas should be protected by a heat resistant layer providing a stipulated period of fire protection. In addition to protecting the building and occupants, fire precautions may be required for specific local considerations. Materials with a low melting point, such as plastics, may need protection from overheating or against fire from a local heat source. Volatile materials in containers or pipes may also require extra protection against overheating or exposure to flame.



Acoustic Protection

Noise transmission into occupied areas from mechanical services machinery can be a serious nuisance. Air movement in ducts and liquid movement in pipes can also generate noise from turbulence. Noise does not have to be loud to cause problems. Low-level continuous sounds can also be stressful and disruptive. The damping effect of insulation can reduce the vibration noise from a pipe or duct, which might otherwise be transmitted from one area to another. Noise from machinery such as pumps, fans etc. will be greatly reduced by the acoustic absorption effect of glass mineral wool and rock mineral wool insulation, as will disruption from the noise of turbulent flow in pipes and ducts.



Frost Protection

If aqueous solutions are left static, there is a risk of freezing in below ambient temperatures. This risk is increased by the effect of draughts causing a chilling effect to exposed surfaces. If the surfaces are damp or wet then the chilling effect is further increased by evaporation. Frost protection can be achieved with the use of 'trace heating' elements wrapped around pipes to contribute a low heat input and keep temperatures above freezing. The effectiveness of this low grade heating is greatly improved by using pipe insulation to retain the heat.



Condensation Protection

The moisture-carrying capacity of the air is related to its temperature. When moist warm air comes into contact with cold surfaces – e.g. pipes and ducts – the air is cooled and will produce precipitation on the cold surface. Condensation can be hazardous if it drips onto floors, creating dangerously slippery surfaces underfoot. Condensation can also corrode steel pipes, ducts, and their supports. Continual moisture contact or dripping can result in cosmetic water damage to surfaces, fungal infestation, or even rotting of susceptible materials.

Product Selection

Considerations

- Glass and rock mineral wool both withstand high temperatures, Crown Pipe Insulation is suitable for use with operating temperatures up to 230°C – ideal for HPHW and steam pipes
- Ageing of insulant: phenolic foam becomes less effective over time because of the release of insulation gases (blowing agents)
- All glass mineral wool and rock mineral wool are robust
- Glass mineral wool is easy to cut and work with
- Glass mineral wool joints are naturally sealing and prevent thermal bridging
- Glass mineral wool is resilient
- Phenolic foam is brittle, which can result in damage and gaps at joints and fittings
- The mineral wool of all Crown and Rocksilk products is non-combustible. All products are classified as noncombustible to Euroclass A1, except for the pipe sections
- Crown and Rocksilk products do not emit fumes nor propagate fire
- Rocksilk PyroDuct is designed to provide up to 2 hours fire protection to steel ventilation ductwork
- Glass mineral wool and rock mineral wool have excellent acoustic absorption characteristics that significantly reduce noise from pipes and ducts
- Glass mineral wool and rock mineral wool provide excellent thermal insulation.
- Crown Pipe Insulation with an aluminium finish works as an integral vapour check when effectively sealed with foil jointing tape.
- The silicate ions in glass mineral wool provide 'natural' corrosion protection to stainless steel pipes
- Glass mineral wool and rock mineral wool provide excellent thermal insulation.
- Crown Pipe Insulation with an aluminium finish works as integral vapour check when effectively sealed with foil jointing tape.

Detailed Design Considerations

Advantages of glass mineral wool insulation in HVAC applications:

- Non-combustible and an 'unbeatable' A1 fire classification for most products
- Easy and effective jointing as glass mineral wool 'knits' together at joints and mitres to reduce heat loss and thermal bridging
- Flexible and non-brittle to reduce damage during and after installation
- Lightweight (compared with rock mineral wool) to potentially reduce requirement for ceiling support hangers
- Non-corrosive to pipes and ducts - reduces maintenance costs

Advantages of Knauf Insulation pipe and duct products:

- Widest range of products in the UK
- Easy to understand, solution-based literature
- A Technical Advisory Centre for design and installation queries
- Next day delivery
- Potential to combine order with other insulation products
- Potential for fast fulfilment of bespoke orders
- Long 1200mm sections for faster installation



In the images above, the left hand image shows effective jointing to avoid thermal bridging, while the other two images show cutting the insulation to make room for the pipe hanger - notice the good workability of glass mineral wool compared to rock mineral wool

Features*	Glass Wool	Rock Wool	Phenolic Foam	Closed cell rubber	Comment
Withstands high temperatures	Y	Y	N	Y	Crown Pipe Insulation is suitable for use up to 230°C, ideal for HPHW and steam pipes
Acoustic performance	Y	Y	N	N	Glass mineral wool and Rock mineral wool offer excellent acoustic absorption
Corrosion free	Y	Y	N	N	The silicate ions in glass mineral wool provide corrosion protection for stainless steel pipes
No thermal bridging	Y	Y	N	Y	The brittle nature of phenolic foam can result in gaps at joints and fittings
Ageing characteristics	Y	Y	N	N	Phenolic foam ages over time due to the release of the insulating gases
Quicker installation	Y	N	Y	N	Crown Pipe Insulation is lighter than rock and is supplied in longer section lengths for quicker installation
Lightness	Y	N	Y	Y	At 80 kg/m ³ , Crown Pipe Insulation is 33% lighter than rock pipe insulation requiring less support hangers
Non-combustible	Y(A1)	Y(A1)	Y(C)	Y(C)	All Crown and Rocksilk products are non-combustible and most are classified as Euroclass A1
Thermal performance	Y	Y	Y	Y	All four materials offer high thermal resistance
Durability	Y	N	N	Y	Crown Pipe Insulation and duct products are robust and not susceptible to damage in material handling
Workability	Y	N	N	Y	Homogeneous construction of pipe section and duct products means that glass mineral wool can be cut and shaped accurately for joints, hangers and over cladding

* This table is based on generic product performances

[Pipes | Ducts & Tanks](#)