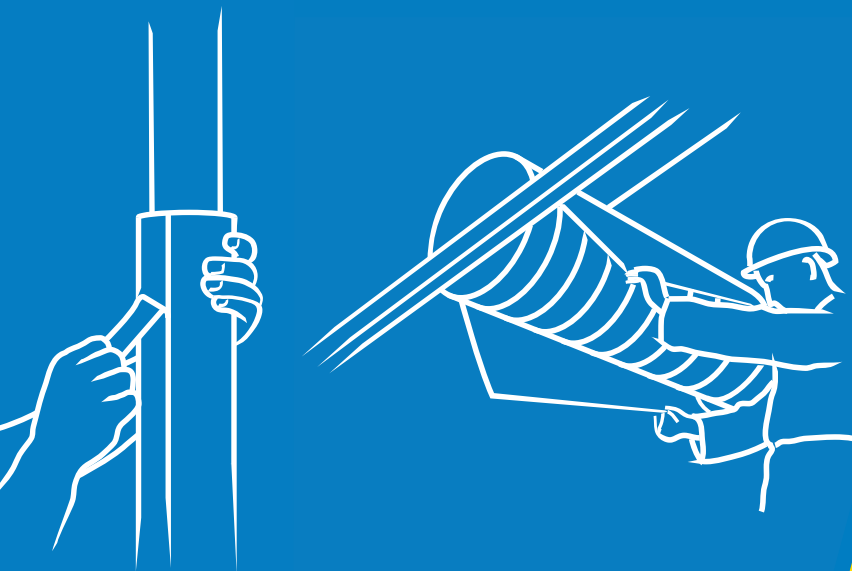




Isover HVAC Application Handbook

Installing Pipework and ductwork insulation

ISOVER
SAINT-GOBAIN

Your environment. It's the nature of our business.

HVAC - Insulation of Pipe and Metal ductwork



Reasons to thermally insulate pipework and ductwork

Why Insulate?

There are several reasons for applying insulation to Pipework and Ductwork, whether it is to save energy through reducing heat loss, temperature control or personnel protection.

Hot surfaces

- **Heat conservation** - To reduce heat losses from pipe and ductwork. All pipework will normally need insulating where operating temperatures exceed 60°C. Ductwork typically requires insulation at operating temperatures of 0°C upwards.
- **Temperature control** - To prevent temperatures falling below a certain pre-determined level and in turn conserving energy.
- **Personnel protection** - To prevent injuries to operators such as burns, in locations where they could come into contact with surfaces exceeding 50°C, during the normal course of their duties.

Cold surfaces

- **Reduce the rate of heat gain**
- **Prevent surface condensation** - If pipe and ductwork are not adequately insulated then condensation can form on the surface, this could lead to equipment damage such as corrosion.

Against frost

Insulation can help delay or avoid freezing altogether, if the time gaps where the liquid in the pipes is not moving are short enough.



Insulation for acoustic purposes/soundproofing

Insulation is used to reduce noise to an acceptable standard level whether for service pipes or for heating and ventilation units.

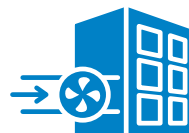


The importance of correctly installed insulation

The thermal efficiency of the insulation may be affected if the insulation is not in close contact with the surfaces to which it is applied. Insulation should therefore be secured as tightly as possible to the duct or pipe surface.

BS5970 'Code of practice for thermal insulation of pipework and equipment in the temperature range of -100°C to +870°C' has been developed as an industry guide to provide practical advice on choosing pipework and ductwork thermal insulating materials and systems, application techniques and much more.

It is our suggestion that BS5970 be referred to for fuller details on the practices and suggestions for thermally insulated pipework and ductwork: www.BSIgroup.com/standards-and-publications



Why use Isover glass mineral wool insulation?



The safe option for saving energy and providing comfort. At Isover, we focus on the unique thermal, acoustic and fire protection demands of the HVAC market. Whether it's a school, hospital, factory, office or home, our range of HVAC products will provide the most efficient insulation solutions for pipe and ductwork, ensuring the building environment is thermally protected, has minimal noise disruption and is fire safe.

All Isover HVAC glass mineral wool products provide the following:

Features	Benefits
• High levels of thermal and acoustic performance	• Meets all UK thermal building regulations and offers energy savings
• Euroclass A fire ratings; class '0' compliance *	• Completely fire safe
• Durable with consistent density and thickness	• No soft edges and excellent compression resistance Will not easily damage in storage, transportation or installation
• Easy to cut and flexible to bend	• Fast installation
• Factory applied aluminium foil facing	• Inherent vapour barrier
• High quality mineral wool	• Will not accelerate corrosion
	• Performance will not deteriorate over time
	• Product will not sag or consolidate over time

* Please see individual product pages for further guidance

Environmental credentials



At Isover we take our environmental responsibility seriously. The very nature of our business is to develop insulation solutions to protect both your built environment and the natural environment. That is why we have developed our 3 point plan for environmental sustainability. This dynamic plan focuses our efforts on continuously improving the way in which our products and processes impact your environment and seeks to ensure that Isover and our products when in-situ, use:

- Less Materials
- Less Energy
- Less Emissions

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Isover Foil Faced Pipe Sections

Isover Foil Faced Pipe Sections

Designed to provide thermal and acoustic insulation of pipework. Isover Foil Faced Pipe Sections are strong, lightweight pre-formed 'snap on' sections with a reinforced aluminium foil covering.



Features	Benefits
High levels of thermal and acoustic performance	Meets all UK thermal building regulations and offers energy savings
Euroclass A2 fire rating; class '0' compliance	Fire safe
Pipe section length of 1.2m	Longer than traditional stone wool solutions allowing quicker installation time
Incorporates a self-adhesive overlap	Providing a quick and effective vapour control finish
Durable with consistent density and thickness around the bore	No soft edges and excellent compression resistance, Will not easily damage in storage, transportation or installation
Isover Foil Faced Pipe Section corresponds to the BRE Global Green Guide online generic specification 'Glass wool insulation - density 80kg/m ³ ref 915320059 which achieves a summary rating of A within Domestic, Health, Industrial, Commercial, Retail, Education	Excellent environmental credentials
Up to 80% recycled post – consumer glass	

Fire classification - Euroclass A2 fire rating.

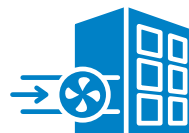
- The factory applied aluminium foil facing meets the highest standards required by BS476: Part 6 'Fire Propagation' and BS476: Part 7 'Surface spread of Flame'. The foil facing is therefore rated Class '0' to the Building Regulations.

Service temperature - Maximum continuous service temperatures up to 230°C. The temperature on the aluminium facing should not exceed 80°C.

Acoustic performance - Noise levels from pipework services can be greatly reduced with Isover Foil Faced Pipe Section. Please contact our Technical department for further information on 01928 796 180 or email techinsulation@saint-gobain.com.

Thermal Conductivity

Mean Temperature	(°C)	10	50	100	200
Thermal Conductivity	(W/mK)	0.032	0.035	0.043	0.062



Insulation of Pipework - Before you start

Site Storage

It is recommended that insulating materials should be kept dry during storage and installation.

Surface preparation

Where possible, ensure the surface to be insulated is clean and dry.

Contaminants on the surface of the insulation can lead to self-adhesive aluminium foil tapes not sticking fully to the insulation surface or delamination. Remove any contaminants with a dry clean cloth before applying tapes.

Handy tip

Most types of insulating materials should be supported or reinforced when applied. (See Adhesives and Mechanical securement methods page 17.)

Stainless Steel Pipework

For stainless steel pipe installations, an aluminium foil of no less than 0.06mm or specially compounded paints should be applied to the surface to minimise the risk of corrosion. Please refer to BS5970 for further guidance on stainless steel pipework.

NOTE: Paints cannot provide galvanic protection. Where paints are used the instructions of the manufacturer should be followed closely and the temperature limitation of the paint should not be exceeded. Paints containing metallic zinc should not be used.

Installation procedure - attaching insulation to pipework in accordance with BS5970

The following is a summary of some recommendations made in BS5970.

Pipe insulation should ideally be fitted above 10°C. The pipe section should be the same temperature as the pipe that is being insulated. The pipe should be free of oil, grease or water (see surface preparation).



Step 1

Make all necessary cuts and / or grooves for valves, suspensions, fittings etc before fitting the pipe section or removing the protective paper from the self-adhesive overlap.

HVAC - Insulation of Pipe and Metal ductwork



Step 2

Fit the snap-on-section around the pipe.



Step 3

Remove the protective paper from the self adhesive overlap, taking care not to touch the adhesive surface.



Step 4

Lightly press the adhesive surface of the overlap down at intervals along the length of the section, making corrections as necessary.

Firmly press along the joint using a good quality spatula or similar.



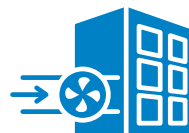
Step 5

Fix lacing wire or steel bands around the pipe section at pipe supports, hangers, valves etc.



Step 6

Ensure all joints are well butted together.



Step 7

Cover all butt joints and secure all longitudinal overlaps with self-adhesive aluminium foil tape.

NOTE: Self-adhesive aluminium foil tapes should, ideally, be a minimum of 75mm in width and have a thickness of at least 30 microns to ensure adequate adhesion.

Step 8

Where the pipe meets a surface, over tape the insulation edges and return to the pipe surface.



Step 9

Tape the insulation to all supports where the insulation meets the pipe supports.

Cold water pipes

Seal all cross joints, endings, holes etc with self-adhesive aluminium foil tape.

NOTE: Pipe sections with an inner diameter of 89mm or larger should be secured by wire or metal bands, at least 2 per section.



Step 10

All joints in the vapour barrier should be sealed, either by bonding the overlaps with adhesive or with matching self-adhesive aluminium foil tape.

Large diameter pipes

Pipe sections with an inner diameter of 89mm or larger are more likely to move. Secure the sections with lacing wire or metal bands using at least 2 bands per section.

Handy tip

Should the overlap or tape begin to lift (delaminate), prime the foil facing with a compatible contact adhesive before applying the tape.

If the correct method of securement is not used, over time the insulation could sag or become detached from the pipe. This can also result in mechanical failure between the tape and the foil covered surface of the insulation, damaging the integrity of the vapour barrier.

Generally, aluminium foil tapes should not be used as a mechanical fixing; their function is to provide a vapour barrier between the foil surfaces of separate foil faced insulation.



Insulating pipe bends in accordance with BS5970

The angle of the pipe bend will determine the angle of the mitred cut.

On the end of Isover pipe section packaging there are cutting guides that can help ensure the right mitred cut is achieved.

To form insulated elbows the Foil Faced Pipe Section is cut at angles to form segments.



Step 1

Identify the angle of the pipe bend required using the images on the carton lid for guidance. The carton lid provides a useful cutting guide throughout the cutting process.



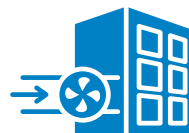
Step 2

Lay the section of Foil Faced Pipe Section to be cut on the straight line and keeping the saw upright, cut along the line(s) which point to the corner. The amount of segments depends on the size of the pipe and the angle of the elbow.



Step 3

Rotate the cut elements to sit along side each other forming a corner, as illustrated, on the carton lid.



Step 4

Where the facing is to provide a vapour barrier, all joints must be sealed with self-adhesive aluminium foil tape.



Step 5

When the Foil Faced Pipe segments are fit around the pipe, secure them using steel banding or wire ties per section.

NOTE: Isover mitred pipe sections can be applied direct to the pipework without an additional passivating bore coating.



Finished bend



The correct insulation product and thickness should always be selected. For advice on selecting the right Isover product and thickness please visit:

www.isover.co.uk and download a copy of our Isover technical product guide

or contact us on: **techinsulation@saint-gobain.com**

or call: **01928 796180**

HVAC - Insulation of Pipe and Metal ductwork



Insulation of circular metal ductwork Isover High Performance Duct Wrap



Strong and easy to handle for use with all shapes of ductwork. Ideal for thermal and acoustic insulation of circular ducts, installed at ceiling level inside a building.

For product features and benefits please see page 4.



Thermal conductivity (lambda λ)

Mean temperature	(°C)	10	50	100	200
Thermal conductivity	(W/mK)	0.030	0.036	0.045	0.068

Product range

Product	Order code	Thickness (mm)	Width (mm)	Length (mm)	m ² per pack	Packs per pallet	m ² per pallet
Isover High Performance Duct Wrap	5200013813	25	1200	18000	21.60	18	388.80
	5200013814	40	1200	12000	14.40	18	259.20
	5200013815	50	1200	9000	10.80	18	194.40

Isover Crimp Wrap



A flexible glass mineral wool roll, designed to provide thermal and acoustic insulation for ductwork, tanks and large diameter pipes. The increased compression resistance due to unique variably orientated fibres of this product makes it ideal for use at all levels, inside or outside a building with subsequent covering.

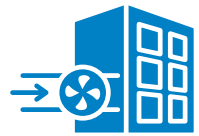
Isover Crimp Wrap has a natural curve which lends itself to being wrapped around curved surfaces. It is easy to cut and bend which allows faster installation.

Thermal conductivity (lambda λ)

Mean temperature	(°C)	10	50	100	200
Thermal conductivity	(W/mK)	0.034	0.039	0.049	0.077

Product range

Product	Order code	Thickness (mm)	Width (mm)	Length (mm)	m ² per pack	Packs per pallet	m ² per pallet
Isover Crimp Wrap	5200403264	40	1200	6000	7.20	18	129.60
	5200403265	50	1200	4800	5.76	18	103.68
	5200403266	60	1200	4000	4.80	18	86.40
	5200403267	80	1200	3000	3.60	18	64.80
	5200013587	100	1200	3750	4.50	12	54.00



Insulation of circular ductwork - Before you start

How much Duct Wrap is needed?



1. Measure the dimensions of the duct to be insulated.
2. Add the dimensions.
Width of insulation needed = $3.14 \times$
(Outer Diameter of the duct + (2 x thickness
of insulation))
3. Next measure the length of the duct and multiply both figures.

Surface preparation

- Before installing any insulation check the ductwork and joints for any gaps or cracks.
- Repair as necessary using heat sensitive aluminium foil tape and tape if necessary, making sure it is secure.
- Where possible, ensure the surface to be insulated is clean and dry.
- Contaminants on the surface of the insulation can lead to self-adhesive aluminium foil tapes not sticking fully to the insulation surface or delamination. Remove any contaminants with a dry clean cloth before applying tapes.

Handy tip

Most types of insulating materials should be supported or reinforced when applied.
(See Adhesives and Mechanical securement methods page 17.)

Installation procedure - attaching insulation to circular ductwork

The following is a summary of some recommendations made in BS5970.

NOTE: Isover Duct Wrap should ideally be fitted above 10°C. The insulation should be the same temperature as the duct that is being insulated. The surface should be free of oil, grease or water (see surface preparation).



Step 1

With the foil side of the insulation facing up, use a standard insulators knife to cut the insulation to size.

NOTE: Some areas may be too tight to completely wrap the duct, such as along joists or walls. In this case insulate as much of the area as possible. Then staple the ends of the Duct Wrap to the joists or wall.

HVAC - Insulation of Pipe and Metal ductwork



Step 2

Wrap the pre-cut Duct Wrap around the duct.

Handy Tip:

When installing Duct Wrap on horizontal ducts, best practice is to apply tape at the bottom of the duct rather than the top.



3

Secure the insulation with a self-adhesive aluminium foil tape tags ensuring that it is not pulled too tightly.

NOTE: Tags are made by doubling up small strips of tape and applied at regular intervals (minimum of 150mm intervals) to the overlap at butt joint.



Step 4

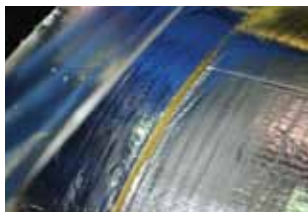
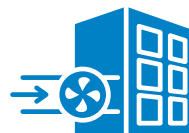
Apply self-adhesive aluminium foil tape along the length joint.

NOTE: Self-adhesive aluminium foil tapes should, ideally, be a minimum 75mm in width and have a thickness of at least 30 microns to ensure adequate adhesion.

Not Recommended



It is not recommended that an overlap method of installation is used. The overlap of material causes greater stress to be placed on the self-adhesive aluminium foil tape. This can result in delamination, breaking the vapour barrier provided by the tape.



Step 5

Continue this process down the entire length of the duct, ensuring all longitudinal joints are well butted together.

Step 6

Tape every joint along the seam where insulation butts together.

Handy tip

Using a boning tool / spatula to firm the self-adhesive aluminium foil tape down helps the tape stick more than pressing it down with just a hand.



Step 7

Secure the system using lace wire or circumferential bands tensioned over the outer surface. Wire netting over the insulation can sometimes serve the same purpose provided that the edges can be laced tightly together.

NOTE: Separate securing accessories are not needed if an integral sheet finish is arranged so that an edge overlap can be secured with adhesive.



Finished result

HVAC - Insulation of Pipe and Metal ductwork



Insulation of rectangular metal ductwork Isover High Performance Duct Slab



Ideal for thermal and acoustic insulation of metal ducts at all levels inside a building. Offering greater compressive strength, allowing subsequent covering and suitable for low level installation and outside applications.

For external conditions an exterior waterproofing system is required (see page 17). For further information or for design advice please contact our technical department on 01928 796180 or email: techinsulation@saint-gobain.com.

Thermal conductivity (λ)

Mean temperature	(°C)	10	50	100	200
Thermal conductivity	(W/mK)	0.029	0.034	0.041	0.058

Product range

Product	Order code	Thickness (mm)	Width (mm)	Length (mm)	Slabs per pack	m ² per pack	Packs per pallet	m ² per pallet
Isover High Performance Duct Slab (Foil Faced slabs)	5200013692	40	600	1200	10	7.20	16	115.20
	5200013849	50	600	1200	9	6.48	16	103.68

Isover Multi-Purpose Duct Slab



Ideal for thermal insulation of rectangular metal ducts, installed at a high / ceiling level inside a building.

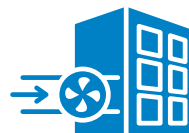


Thermal conductivity (λ)

Mean temperature	(°C)	10	50	100	200
Thermal conductivity	(W/mK)	0.030	0.036	0.044	0.064

Product range

Product	Order code	Thickness (mm)	Width (mm)	Length (mm)	Slabs per pack	m ² per pack	Packs per pallet	m ² per pallet
Isover Multi-Purpose Duct Slab (Foil Faced slabs)	5200013695	40	600	1200	12	8.64	16	138.24
	5200013696	50	600	1200	10	7.20	16	115.20



Insulation of rectangular ductwork - Before you start

How much Duct Slab is needed?



1. Measure the dimensions of the duct to be insulated.
2. Add the dimensions.
 $\text{Width of insulation needed} = (2 \times \text{height of duct}) + (2 \times \text{width of duct}) + 8 \times \text{thickness of insulation}$
3. Measure the length and multiply both figures.

Surface preparation

- Before installing any insulation check the ductwork and joints for any gaps or cracks.
- Repair as necessary using heat sensitive aluminium foil tape and tape if necessary, making sure it is secure.
- Where possible, ensure the surface to be insulated is clean and dry.
- Contaminants on the surface of the insulation can lead to self-adhesive aluminium foil tapes not sticking fully to the insulation surface or delamination. Remove any contaminants with a dry clean cloth before applying tapes.

Handy tip

Most types of insulating materials should be supported or reinforced when applied.
(See Adhesives and Mechanical securement methods page 17.)

Installation procedure - attaching insulation to rectangular ductwork

The following is a summary of some recommendations made in BS5970.

NOTE: Isover Duct Slab should ideally be fitted above 10°C. The insulation should be the same temperature as the duct that is being insulated. The surface should be free of oil, grease or water. (See surface preparation.)



Step 1

With the foil side of the insulation facing up, use a standard insulators knife to cut the insulation to size.

HVAC - Insulation of Pipe and Metal ductwork



Step 2

Position the pre-cut duct slab around the duct ensuring that the ends are butted tightly together.



Step 3

Secure the insulation by piercing it over stud or cleat attachments.

Continue this process down the entire length of the duct, ensuring all joints are well butted together.



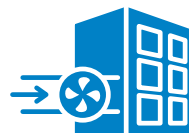
Step 4

Tape every joint completely along the seam where insulation butts together.

NOTE: Self-adhesive aluminium foil tapes should, ideally, be a minimum 75mm in width and have a thickness of at least 30 microns to ensure adequate adhesion.



Finished result



Adhesives and mechanical securement methods

Handy tip

Most types of insulating materials should be supported or reinforced when applied; whether it is permanently secured direct to the ductwork by use of adhesives, mechanical fixings or a combination of both.

Adhesives

When using adhesives to attach the insulation to the ductwork, the correct type of adhesive should be used, these are typically classified as *Insulation bonding adhesives*.

Mechanical Securement Methods

For circular and rectangular ductwork the use of tie wires, lacing wire and clips are the most common methods.

Banding and wire securements are used mainly to hold materials firmly to the plant to be insulated, such as large boilers and vessels; they can be of metal, fabric, plastics strip, etc.

For large flat surfaces, it is usual to secure the insulation by impaling it over studs or cleat attachments, using lacing wire to hold it in position. The lacing wire should be wrapped around the main attachments and crossed for tension.

Generally, self-adhesive aluminium foil tape should not be used as a mechanical fixing. Its function is to provide a vapour barrier between the foil surface and the separate foil faced insulation.

Finishing materials

There are three broad types of finishing materials:

- Sheet materials e.g. Metal, plastic sheet, insulating board, metal foils etc
- Liquid solutions and dispersions e.g. Weatherproof and decorative coatings
- Woven or knitted fabrics or fibrous sheet materials that may be based on cotton, organic polymer or glass fibre.

All of these are suitable for use over Isover Duct Wrap and Slab solutions.



Ductwork system with external weatherproof coating

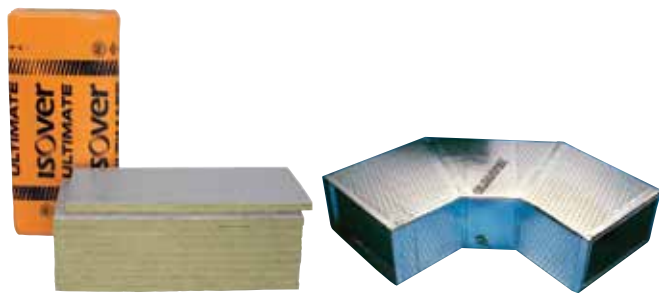
HVAC - Insulation of Pipe and Metal ductwork



Insulation checklist

To obtain the maximum efficiency from either the application or the replacement of thermal insulation materials, it is essential that the following points are checked:

1. Is the type, thickness and density of the insulation in accordance with the specification?
2. Has the insulation material been kept dry and free from dust and dirt:
 - A. During storage
 - B. During application
3. Has the insulation been properly fitted and secured to the pipe or duct, and all joints closely butted and sealed?
4. Are all vapour barriers on low temperature insulation the correct type, thickness and continuous and complete?
5. Are all protective covers applied with an adequate overlap and longitudinal joints positioned to shed water?
6. Has protective covering been applied as soon as possible?
7. That any metal covering to bends is correctly fitted and sealed to prevent ingress of moisture.



Isover offer a wide range of HVAC insulation solutions including Fire Protection and Pre-insulated ductwork solutions.



For further information on the **HVAC** Product range, please contact us

on **0115 969 8010**

email: **techinsulation@saint-gobain.com**

or for technical advice please call **01928 796 180**

Technical Insulation

including HVAC, Marine and OEM

Dedicated Technical Helpline

Tel: **01928 796 180**

e-mail: **techinsulation@saint-gobain.com**

Advice on

- » Compliance with National Building Regulations for Ductwork Systems
- » Consultant performance Specifications
- » Technical Product range and system applications
- » Heat Loss and energy savings calculations



- ★ Less Materials
- ★ Less Energy
- ★ Less Emissions

FSC LOGO

www.3pointplan.co.uk

www.isover.co.uk

Isover Order Placement or Order Enquiries:

Tel: 0800 032 2555

Fax: 0800 917 9188

Technical Insulation - Technical Enquiries

Tel: 01928 796 180

Email: techinsulation@saint-gobain.com

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Saint-Gobain Isover
UK Commercial Centre
Gotham Business Park
Leake Road
Gotham

Nottinghamshire
NG11 0LB

Tel: 0115 969 8010

Fax: 0115 983 1675

Email: isover@saint-gobain.com

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