



Kingspan **Therma**[™] Duct Insulation

DUCT INSULATION FOR OUTDOOR RECTANGULAR, CIRCULAR AND FLAT OVAL / BUILDING SERVICES DUCTWORK



Low Energy –
Low Carbon Buildings

Kingspan Therma™ Duct Insulation

Overview

Kingspan Therma™ Duct Insulation is a high performance thermal insulation designed for use on rectangular, circular and flat oval ductwork in HVAC / building services applications. It can be used to insulate ductwork and associated equipment outdoors, operating within the temperature range of -20°C to $+80^{\circ}\text{C}$.

Kingspan Therma™ Duct Insulation is suitable for both new build and refurbishment projects in the residential, commercial, institutional, light industrial and leisure sectors.

Moreover, it is especially suitable for high specification projects where non-fibrous insulants may be preferred, for example: in the food, beverage and pharmaceutical industries; and clean air and hygiene controlled environments such as sterile areas of hospitals or laboratories.

Kingspan Therma™ Duct Insulation is CE marked in conformance with BS EN 14314 and a Declaration of Performance is available to download from www.kingspaninsulation.co.uk.



Kingspan Therma™ Duct Insulation

Kingspan Therma™ Duct Insulation comprises a high performance fibre-free rigid thermoset polyisocyanurate (PIR) insulation core, faced on both sides with a low emissivity composite foil autohesively bonded to the insulation core during manufacture.



The insulation core is manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

Kingspan Therma™ Duct Insulation has a 90% (or greater) closed cell structure and a compressive strength that typically exceeds 140 kPa at 10% compression. The product can be V-grooved through its internal face to accommodate the surface curvature of circular and flat oval ductwork with an outside diameter (O.D.) of 80 mm or greater*.

The rigid nature of *Kingspan Therma™* Duct Insulation enables the specified thickness of insulation to be maintained at the corners of ductwork, and at locations where HVAC / building services equipment is specified. Non-rigid glass and rock mineral fibre duct wrap products, on the other hand, risk being overstretched and compressed in these locations, potentially leading to a reduction in thermal performance.

Its rigidity also enables the straightforward application of vapour barrier tape and finishing materials which, in turn, facilitates the creation of a continuous and fully sealed vapour barrier.

This can provide a neater, cleaner, closer fitting and more aesthetically pleasing finish than that achievable with non-rigid glass or rock mineral fibre duct wrap products.

Kingspan Therma™ Insulated Duct Support Inserts

Kingspan Therma™ Insulated Duct Support Inserts can be fabricated on site from *Kingspan Therma™* Duct Insulation. *Kingspan Therma™* Duct Insulation can withstand the loads imposed by HVAC / building services ductwork at locations where ductwork supports and hangers are installed.

Kingspan Therma™ Duct Insulation can be fabricated on site to form two different types of Insulated Duct Support Inserts:

- *Kingspan Therma™* Flat Insulated Duct Support Inserts; and
- *Kingspan Therma™* Circular Insulated Duct Support Inserts.

Kingspan Therma™ Flat Insulated Duct Support Inserts are flat rectangular strips of *Kingspan Therma™* Duct Insulation. They are used with rectangular and flat oval ductwork.

Kingspan Therma™ Circular Insulated Duct Support Inserts are V-grooved strips of *Kingspan Therma™* Duct Insulation. They are used with circular ductwork that has an outside diameter (O.D.) of 80 mm or greater*. They are not, however, designed to support the compressive loads imposed by pipework carrying water or other liquids and should not be used in such applications.

Kingspan Therma™ Insulated Duct Support Inserts enable a more consistent run of ductwork insulation, by allowing specified insulation levels to be maintained at ductwork support and hanger locations.

Interruptions in insulation continuity, by materials with significantly worse thermal conductivities, or no insulation at all, can result in thermal bridging (sometimes referred to as cold bridging). This can reduce the efficacy of the insulation through consequential heat losses / gains. The use of non-insulated duct support inserts can result in up to 5% of the total area of a ductwork system being seriously under-insulated.

Tarecpir® M1-CR Pipe
Insulation installed on curved surfaces < 80 mm Ø

Steel channel & threaded rod support system

Flat oval duct

Kingspan Therma™ Flat Insulated Duct Support Insert installed to extend ≥ 50 mm either side of support

Kingspan Therma™ Duct Insulation V-grooved through its internal face to accommodate curved surfaces ≥ 80 mm Ø

Kingspan Therma™ Duct Insulation and **Kingspan Therma™** Insulated Duct Support Inserts, where appropriately taped and sealed, can facilitate the creation of a continuous and fully sealed vapour barrier. This is particularly important for ductwork operating at below ambient temperatures, or in high relative humidity environments and could be considered good practice.

For curved surfaces with an O.D. less than 80 mm, it is recommended that **Tarecpir® M1-CR is used.*

Thermal Properties

The thermal conductivities (λ -values) detailed below are quoted in accordance with BS EN 14308:2013 – Thermal insulation products for building equipment and industrial installations – Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products.

Temperature (°C)	Thermal Conductivity (W/m·K)
- 20°C	0.022
+ 10°C	0.023
+ 19°C	0.023
+ 25°C	0.023
+ 50°C	0.026
+ 80°C	0.030

Table 1: Thermal Conductivity of **Kingspan Therma™** Duct Insulation

Space Saving

Thin insulation can contribute towards space savings. Increased space can facilitate installation, cleaning and maintenance operations in confined areas. Furthermore, thinner insulation can result in a reduction in surface area and therefore savings in finishing materials.

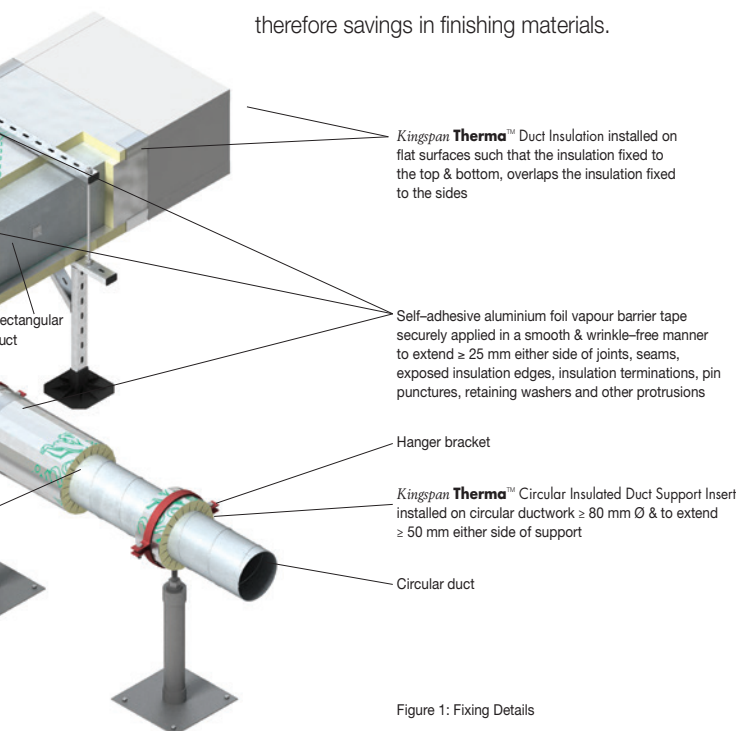


Figure 1: Fixing Details

Compliance

Kingspan Therma™ Duct Insulation is available in thicknesses that meet or exceed the maximum permissible heat transfer requirements, for insulated heating, cooling and dual purpose ductwork, as defined by the Non-Domestic Building Services Compliance Guide (NDBSCG).

Ductwork Type	Heat Transfer	Thickness
Cooling and Dual Purpose	-6.45 W/m ²	40 mm
Heating	16.34 W/m ²	20 mm

Table 2: Thickness of **Kingspan Therma™** Duct Insulation that meet the Heat transfer requirements detailed in NDBSCG

Environmental Impact & Responsible Sourcing

Green Guide Rating

An Ecoprofile, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, has been created for **Kingspan Therma™** Duct Insulation produced at Kingspan Insulation's British manufacturing facilities. The BRE has assigned the product a 2008 Green Guide Summary Rating of A+.

Responsible Sourcing

Kingspan Therma™ Duct Insulation produced at Kingspan Insulation's Pembridge and Selby manufacturing facilities, are certified to BES 6001 'Very Good'.

NB The above information is correct at the time of writing. Please confirm at the point of need by contacting Kingspan Insulation's Technical Service Department (see rear cover), from which copies of Kingspan Insulation and its suppliers' BES 6001 certificates can be obtained along with confirmation of Kingspan Insulation's products' Green Guide ratings.

Sustainability & Responsibility

Kingspan Insulation has a long-term commitment to sustainability and responsibility: as a manufacturer and supplier of insulation products; as an employer; as a substantial landholder; and as a key member of its neighbouring communities.

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's British operations is available at www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Fire Performance

Kingspan Therma™ Duct Insulation is Class 1, as defined by BS 476-7: 1997 (Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products).

Further details of the fire performance of Kingspan Insulation products may be obtained from the Kingspan Insulation Technical Service Department (see rear cover).

Sitework

Introduction

In addition to the information given in this section, it is recommended that reference is also made to BS 5970: 2012 (Thermal insulation of pipework, ductwork, associated equipment and other industrial installations in the temperature range of -100°C to $+870^{\circ}\text{C}$ – Code of practice).

Installation

- Care should be taken when handling and transporting insulation products to prevent physical damage.
- The insulation should only be installed after all testing of the ductwork system has been completed.
- In addition to the surfaces of ductwork and associated HVAC equipment – flanged joints, stiffeners, fasteners and connections must also be effectively insulated in order to reduce heat loss, heat gain and / or to control condensation.
- To facilitate inspection, testing, adjustment, balancing, maintenance and cleaning, a removable and fully vapour sealed piece of insulation, of sufficient size, must be provided at access door locations, if the door is not already pre-insulated.
- Insulation must not be installed at locations where the ductwork penetrates fire resistance rated walls, partitions, floors and ceiling-floor assemblies. Consideration should be given to current Buildings Regulations / Standards with regard to the requirements for, and provision of, fire stops.
- Before being insulated, surfaces must be made clean, dry and free from grease, dust, dirt, loose rust, scale and all other foreign matter.
- The insulation should be installed to achieve a close fit between the insulation and substrate, as well as between insulation joints.
- The ingress of moisture, or other foreign matter, either into the insulation or between the insulation and substrate, should be prevented during installation.
- When insulating rectangular ductwork, the thickness of insulation that has been specified should be maintained at all four corners of the duct.
- On horizontally orientated ducts, the insulation fixed to the top and bottom should overlap the insulation that is fixed to the sides (see Figure 1 on pages 2–3 of this document).
- Insulated duct support inserts should be of the same thickness as that of the adjacent duct insulation. In order to facilitate the straightforward application of self-adhesive vapour barrier tape, they should be installed to extend no less than 50 mm either side of the support.
- The insulation must be securely fixed to the substrate by means of adhesive, by mechanical fixings or by a combination of both.
- A compatible high-strength contact adhesive, must be applied in accordance with the manufacturer's recommendations. For suitable adhesives, please contact the Kingspan Insulation Technical Service Department (see rear cover).
- Insulation fixed to circular ductwork must be additionally supported with banding (preferably aluminium) and matching seals. The banding must be no less than 15 mm wide and should be applied circumferentially at 350 mm centres.
- On rectangular ductwork the selection of compatible mechanical fixings will be dependent upon: the substrate material; operating temperatures, size and orientation of the duct and the duct wall; and the degree of vibration to which the duct is subjected during operation.
- Mechanical fixings, if used, must be corrosion resistant, capable of sustaining the calculated tensile dead load perpendicular to the duct wall, and securely fixed so that they do not detach from the duct during its service life.
- Mechanical fixings should be positioned so that they are neatly and evenly distributed under each piece of insulation. They should be located no less than 50 mm, and no greater than 150 mm, from insulation edges and corners.

Vapour Barrier

- The vapour barrier over the insulation should be continuous and fully sealed.
- A high strength self-adhesive aluminium foil vapour barrier tape should be applied to all discontinuities in the vapour barrier. This includes those between insulated duct support inserts and abutting duct insulation, joints, seams, exposed insulation edges, insulation terminations, pin punctures, retaining washers and other protrusions.
- The self-adhesive vapour barrier tape should be applied in a smooth and wrinkle-free manner. It should extend no less than 25 mm either side of joints, seams, insulation edges and terminations, as well as in all directions of pin punctures, retaining washers and other protrusions.
- To ensure successful adhesion, all surfaces to receive self-adhesive vapour barrier tape should be made clean, dry and free from grease, dust, dirt and all other foreign matter prior to application. If required, surfaces may be primed with a thin coat of compatible high-strength contact adhesive. A gentle pressure may also be exerted using a soft spatula tool, whilst applying the tape.

Protection & Finishes

- The insulation must be adequately protected with an additional weatherproof and water / vapour tight finish that shields against the effects of wind, sunlight and birds. The finish must also be capable of providing suitable protection if at risk of being subjected to mechanical or physical abuse. Suitable finishes include: aluminium or stainless steel sheet; aluminium–zinc alloy coated steel sheet; heavy–duty, self–adhesive laminate; synthetic elastomeric jacketing, systems; reinforcing glass / synthetic cloth embedded, between two coats of appropriate coating; or UV resistant glass reinforced polyester / epoxy (GRP / GRE) cladding systems (all applied in accordance with the manufacturer's recommendations and the project's specification requirements).
- If installing an additional finish over the standard factory–applied low emissivity composite foil facing, extreme care must be taken to preserve the integrity of the vapour barrier at all times.

Identification of Services

- Both insulated and non-insulated services should be clearly identifiable.
- The identification system should preferably be in accordance with the requirements of BS 1710: 1984 (Specification for identification of pipelines and services), but should always be approved by the engineer.
- The identification system and its method of application should be compatible with the finish. They should also be suitable for the operating and ambient conditions.



General

Cutting

- Manual cutting of the insulation boards should be carried out either by using a fine toothed saw, or by scoring with a sharp knife, snapping the board over a straight edge and then cutting the facing on the other side.
- Ensure accurate trimming to achieve close-butting joints and continuity of insulation.
- Automated computer aided cutting may be carried out using CNC blade / router machinery.

Availability

- **Kingspan Therma™** Duct Insulation is available through specialist insulation distributors and selected Delivery Partners throughout the UK and Ireland.

Packaging & Storage

- The polyethylene packaging of Kingspan Insulation products, which is recyclable, should not be considered adequate for outdoor protection.
- Insulation materials should be adequately protected from the weather, humidity, abrasive matter, contaminants and all other foreign matter.
- Ideally, products should be stored inside a building. If, however, outside storage cannot be avoided, they should be stored in a dry atmosphere, clear of the ground, out of direct sunlight and covered with an opaque and weatherproof material. Products that have been allowed to get wet should not be used.
- Insulation products should be maintained in good condition throughout the duration of the works and should not be unpacked onsite until required for immediate use. They should be returned to storage at the end of each workday.

Health & Safety

- **Kingspan Therma™** Duct Insulation is chemically inert and safe to use.
- A Safety Information Data Sheet is available from the Kingspan Insulation website www.kingspaninsulation.co.uk/safety

NB The reflective surfaces on this product are designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet (UV) light. Therefore, if the product is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream. The reflective facing used on this product can be slippery underfoot when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard. Warning – do not stand on or otherwise support your weight on the product.

Contact Details

Customer Service

For quotations, order placement and details of despatches, please contact the Kingspan Insulation Customer Service Department:

UK – Tel: +44 (0) 1544 388 601
– Fax: +44 (0) 1544 388 888
– email: customerservice@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie

Literature & Samples

Kingspan Insulation produces a comprehensive range of technical literature for designers, specifiers, fabricators, installers, building services managers and facilities managers. The literature contains clear 'user friendly' advice on design, design considerations, specification, fabrication, installation, maintenance and product data.

Available as individual brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website:

UK – Tel: +44 (0) 1544 387 384
– Fax: +44 (0) 1544 387 484
– email: info@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie

Technical Advisory Service

Kingspan Therma™ Duct Insulation is supported by a complementary and comprehensive technical advisory service for designers, specifiers, fabricators, installers, building services managers and facilities managers. Expert guidance is provided to make specification, installation and maintenance of **Kingspan Therma™** Duct Insulation, as straightforward as possible. Project specific advice and solutions for non-standard applications and complex technical issues are also offered.

Amongst other services, heat loss / gain, condensation / dew point risk and required insulation thickness can be calculated.

Kingspan Insulation also provides a series of technical presentations specifically tailored for designers, specifiers, local authorities and developers. Additionally, site surveys and visits can also be undertaken, if required.

UK – Tel: +44 (0) 1544 387 382
– Fax: +44 (0) 1544 387 482
– email: hvactechnical@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 4297
– Fax: +353 (0) 42 975 4296
– email: technical@kingspaninsulation.ie

General Enquiries

For all other enquiries:

UK – Tel: +44 (0) 1544 388 601
– Fax: +44 (0) 1544 388 888
– email: info@kingspaninsulation.co.uk

Ireland – Tel: +353 (0) 42 979 5000
– Fax: +353 (0) 42 975 4299
– email: info@kingspaninsulation.ie

Kingspan Insulation Ltd reserves the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and reference should be made to the current Kingspan Insulation Ltd price list or advice sought directly from Kingspan Insulation Ltd. The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described herein. Recommendations for use should be verified as to the suitability and compliance with actual requirements, specifications and any applicable codes, laws and regulations. For other applications or conditions of use, Kingspan Insulation Ltd offers a Technical Advisory Service, the advice of which should be sought for uses of Kingspan Insulation Ltd products that are not specifically described herein. The fire tests referenced in this literature and the assigned results are not intended to reflect hazards presented by the materials and products described herein under actual fire conditions. Please check that your copy of the literature is current by visiting www.kingspaninsulation.co.uk.



Kingspan Insulation Ltd

Pembridge, Leominster, Herefordshire HR6 9LA, UK
Castleblayney, County Monaghan, Ireland

www.kingspaninsulation.co.uk www.kingspaninsulation.ie

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