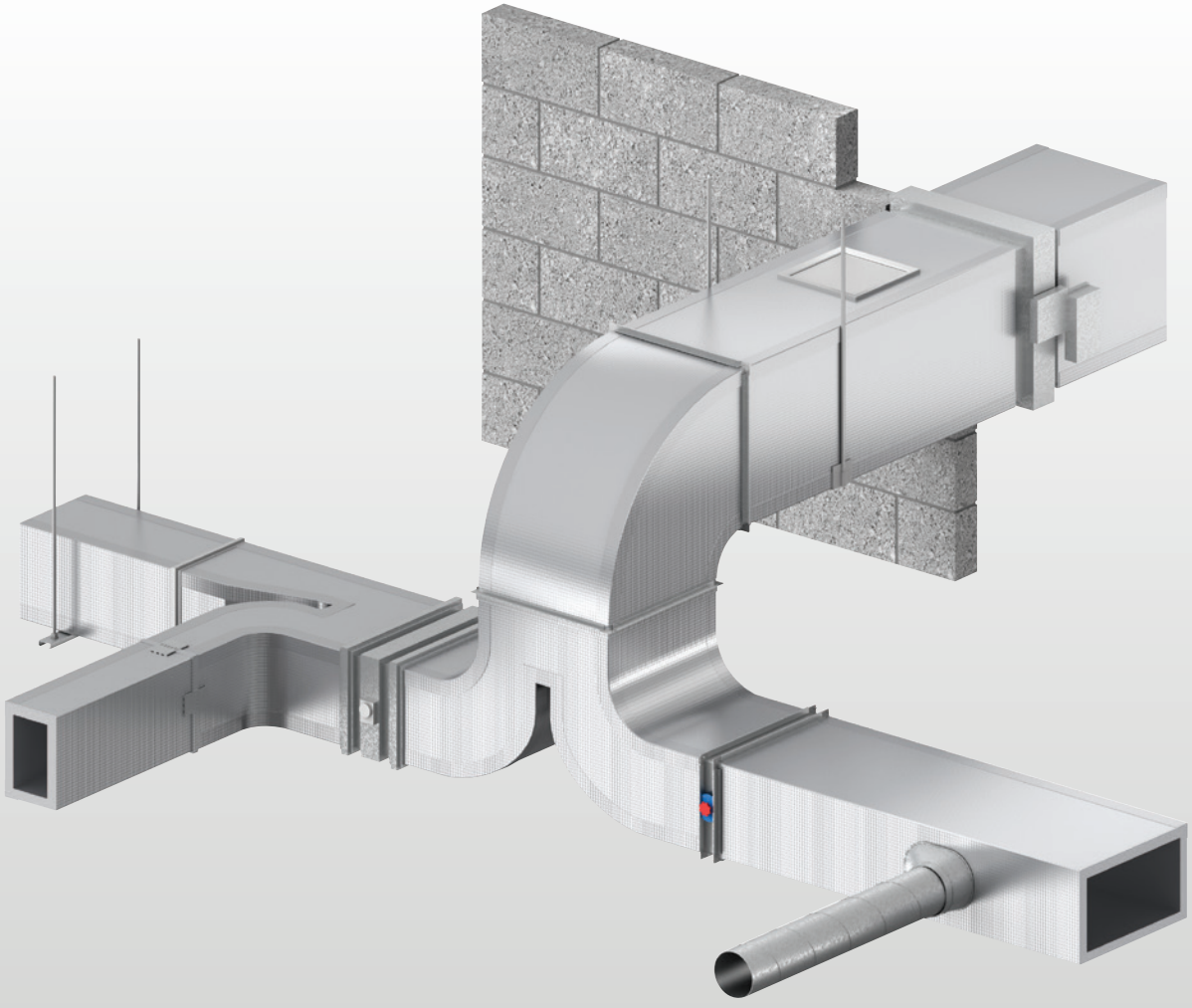
Insulation

Cl/SfB (57.9) In7 (M2)
First Issue April 2016

The Kingspan KoolDuct® System

TECHNICAL DATA SHEET



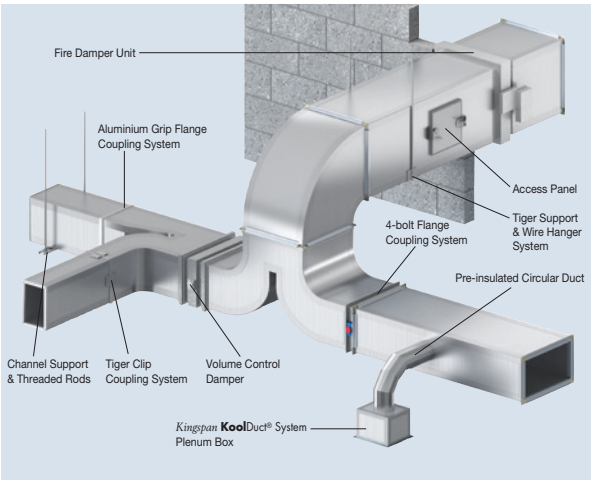
Fibre-free Core

Kingspan®

Low Energy –
Low Carbon Buildings

Introduction

The *Kingspan* **Kool**Duct® System is an innovative lightweight pre–insulated rectangular HVAC ductwork system. It comprises premium performance *Kingspan* **Kool**Duct® panels, fabrication methods, coupling systems and a complete line of accessories to produce ductwork in sections up to 2.95 m long.



Application Suitability

The *Kingspan* **Kool**Duct® System is designed for use in building services / HVAC applications. It is suitable for both new build and refurbishment projects in the residential, commercial, public, light industrial and leisure sectors. It is especially suitable for use in non–ferrous applications and on high specification projects where non–fibrous insulants may be preferred, for instance: the food, beverage and pharmaceutical industries; clean air and hygiene controlled environments; high relative humidity environments; swimming pools; and sterile areas of hospitals and communication / server rooms in data centers.

Ductwork fabricated from The *Kingspan* **Kool**Duct® System can be installed internally, externally, visibly mounted and concealed above false ceilings, below raised floors or within confined enclosures such as pre–fabricated modules.

Ductwork Design & Frictional Resistance

The design of ductwork, including fittings, fabricated from The *Kingspan* **Kool**Duct® System, follows the same calculation principles and duct sizing methods as are used for rectangular ductwork constructed from galvanised sheet steel.

The frictional resistance is comparable with that of galvanised sheet steel ductwork. As a result, frictional pressure drop data for galvanised sheet steel ductwork may also be used when designing ductwork systems fabricated from The *Kingspan* **Kool**Duct® System.

Operating Recommendations & Limitations

It is recommended that ductwork fabricated from The *Kingspan* **Kool**Duct® System is used for operation as supply, return, fresh and exhaust air ductwork for heating, ventilation and air–conditioning systems within the following limits:

Mean Air Velocity (Max.)	25.4 m/s
Design Pressure (Max.)	Positive: 1000 Pa Negative: 750 Pa
Temperature	Internal air temperature of –20°C to +80°C during continuous operation
Size	Unlimited (provided that *Kingspan* **Kool**Duct® System fabrication procedures are strictly observed).

These are maximum values. Refer to The Kingspan* **KoolDuct® System *Fabrication Manual series of publications for details (see rear cover).*

NB 'Mean Air Velocity' refers to the design air flow rate related to the cross–sectional area of the ductwork. 'Design Pressure' relates to the actual total pressure of the relevant section of ductwork and not the fan static pressure. 'Total Pressure' is a combination of both static and dynamic pressures.

Ductwork fabricated from The *Kingspan* **Kool**Duct® System should not be used in the following applications:

- conveyance of solids;
- fire resistant ductwork;
- kitchen / grease hood exhaust systems;
- chemical, fume or smoke exhaust systems;
- where combustible matter readily collects inside the ductwork;
- adjacent to any mechanical / electrical sources of extreme heat;
- where the failure of automatic control equipment may give rise to extreme temperatures; and
- outdoor / underground use without mechanical and / or weather protection.

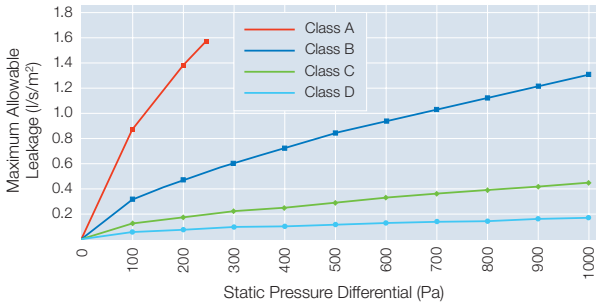
Pressure & Air-leakage

Air–leakage Classes & Limits

For HVAC systems designed to withstand a maximum static pressure of 1000 Pa, ductwork fabricated from The *Kingspan* **Kool**Duct® System, with different coupling systems, can achieve the ductwork air–leakage classes shown in the table.

	Air–leakage Classes Achievable with Different Coupling Systems		
Air–leakage Standard	4–bolt	Aluminium Grip	Tiger Clip
BS EN 1507: 2006	Class D	Class C	Class D
BS EN 13403: 2003	Class C	Class C	Class C
B&ES DW/144	Class C	Class C	Class C

The air–leakage limits for air–leakage Classes A to D, over the range of pressures from 0 to 1000 Pa, are shown in the graph.



Commissioning

The test pressure should not exceed the design pressure to which ductwork from The *Kingspan* **Kool**Duct® System has been fabricated. When pressure or air–leakage testing is known to be necessary, ductwork should be fabricated to withstand the test pressure, if greater than the design pressure.

Fabrication & Installation

Ductwork from The *Kingspan* **Kool**Duct® System should only be fabricated by specially trained fabricators who have completed The *Kingspan* **Kool**Duct® System Training Course, and who are registered on The *Kingspan* **Kool**Duct® System Competent Person's Database. It is recommended that ductwork is fabricated in accordance with the methods detailed in The *Kingspan* **Kool**Duct® System Fabrication Manual series of publications. Ductwork should be installed using best practice methods in accordance with industry accepted standards.

Suitable Finishes

Standard

Factory–applied aluminium foil vapour barrier facing.

Cosmetic

Paint (consideration should be given to any effect that it might have on the thermal and fire performance of the insulation and its factory–applied aluminium foil vapour barrier facing).

Mechanical & Weather Protection

Aluminium 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 manufacturer recommendations and project specification requirements).

Maintenance & Cleaning

Ductwork fabricated from The *Kingspan* **Kool**Duct® System can be cleaned to industry standards, as required by BS EN 15780: 2011, BS EN 13403: 2003 and B&ES TR/19, using many of the dry and non–abrasive cleaning methods offered through professional HVAC ductwork cleaning specialists.

For suitable methods, refer to The *Kingspan* **Kool**Duct® System – A Specifier's Guide or Fabrication Manual series of publications.

Kingspan **Kool**Duct® Panels

Description

Kingspan **Kool**Duct® panels comprise a non–fibrous rigid thermoset modified resin insulation core, faced on both sides with a protective and durable 25.4 micron aluminium foil that is reinforced with a 5 mm glass scrim.

Kingspan **Kool**Duct® panels are available either with silver aluminium foil on both sides, or silver aluminium foil on one side and black coated aluminium foil on the other. Both facings are autohesively bonded to the core during manufacture.

The core is manufactured with a CFC/HCFC–free blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

General Properties

Property	Typical Value	
Standard Dimensions	Length: 2950 mm Width: 1200 mm Thickness: 22mm and 30mm	
Nominal Density Range of Insulation	55-60 kg/m³	
Minimum Closed Cell Content of Insulation	> 90%	
Minimum Compressive Strength at 10% Compression (BS EN 826: 1996)	200 kPa	
Aged Thermal Conductivity (k–value / λ–value) (BS EN 14314:2009+A1:2013)	–20°C 10°C 19°C 25°C 50°C 80°C	0.025 0.022 0.022 0.023 0.026 0.030
Operating Temperature Limits	–20°C to +80°C	
Mean Maximum Specific Optical Density of Smoke (EN ISO 5659-2: 2006)	In Presence of Pilot Flame: 0 (25 kW/m²) 7 (50 kW/m²) In Absence of Pilot Flame: 0 (25 kW/m²) 6 (50 kW/m²)	

Fire & Smoke Classification

Kingspan **Kool**Duct® panels, faced either with silver aluminium foil on both sides, or with silver aluminium foil on one side and black coated aluminium foil on the other, and their rigid thermoset insulation core, are Class 0, as defined by the Building Regulations.

Kingspan **Kool**Duct® panels, faced with silver aluminium foil on both sides:

- are Euroclass B-s1,d0 as defined by the European Fire Classification System.
- satisfy the requirements of low flame spread, low smoke opacity and toxicity of IMO FTP Code Part 2 and 5.

Green Guide Rating & Responsible Sourcing

BRE has assigned *Kingspan* **Kool**Duct® panels, produced at Kingspan Insulation's Pembridge, UK, manufacturing facility, a 2008 Green Guide Summary Rating of A.

Kingspan **Kool**Duct® panels produced at Kingspan Insulation's Pembridge, UK manufacturing facility, are certified 'Excellent' to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products).

Compliance

UL Listing

Ductwork fabricated from The *Kingspan* **Kool**Duct® System is UL Listed as a Class 1 Air Duct, to Standard for Safety UL 181 (Underwriters Laboratories: Factory Made Air Ducts & Air Connectors). The UL Listing requires that ductwork is fabricated using:

- 20–45 mm *Kingspan* **Kool**Duct® panels, faced with silver aluminium foil autohesively bonded to the insulation core, on both sides, during their manufacture at Kingspan Insulation's Pembridge, UK, manufacturing facility;
- the 4–bolt, aluminium grip and / or the Tiger Clip coupling systems;
- a 63 mm wide (minimum) aluminium foil vapour barrier tape that is UL Listed A–P to Standard for Safety UL 181 A (Standard for Closure Systems for use with Rigid Air Ducts); and
- Kingspan High Performance Silicone Sealant / Caulk.

Thermal Performance

BS 5422, TIMSA and the Domestic / Non–domestic Building Services Compliance Guides detail maximum permissible heat transfer requirements for insulated ductwork. *Kingspan* **Kool**Duct® panels exceed the requirements for insulated heating ductwork, and meet the requirements for insulated cooling and dual purpose ductwork.

Specifications

Kingspan **Kool**Duct® panels and ductwork fabricated from the *Kingspan* **Kool**Duct® System satisfy the apposite requirements of many major national specifications. They include DIO (DEO) Specification 037, NES & NES+, NBS Plus and HTM 03-01. For clarification of the relevant sections and clauses, contact the Kingspan Insulation HVAC Technical Service Department.

CE Marking

Kingspan **Kool**Duct® panels are CE marked in conformance with BS EN 14314 and a Declaration of Performance is available to download from www.kingspaninsulation.co.uk.

Health & Safety

Kingspan **Kool**Duct® panels have a non–fibrous insulation core and are odourless, non–tainting, non–deleterious, and chemically inert and safe to use. Further information is contained in the *Kingspan* **Kool**Duct® Panel Product Safety Information Sheet.

NB The reflective surface on this product will reflect light as well as heat, including ultraviolet (UV) light. Therefore, it is advisable to wear UV protective sunglasses or goggles, and protect the bare skin with a UV block sun cream. The reflective facing used on this product can be slippery underfoot when wet. Warning – do not stand on or otherwise support your weight on this 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
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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
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– email: info@kingspaninsulation.ie

Technical Advisory Service

Kingspan Insulation products are 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 and installation, operation and maintenance of ductwork fabricated from Kingspan Insulation products, 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.

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