

Technical Insulation

Great Britain & Ireland

The Kingspan KoolDuct® System Installed and Whole Life Cost Savings

Significant savings possible with pre-insulated ductwork

Delivering value for money with specifications is more important than ever in the current economic environment. When assessing building services options, it is important to consider not only the initial cost of materials and labour, but also the cost of maintaining the system across its lifespan. New research from Rider Levett Bucknall has shown that the installed cost of pre-insulated ductwork fabricated from The Kingspan KoolDuct® System can be up to 22.0% lower than traditional insulated metal ductwork, whilst whole life cost savings can be as much as 48.7%.

Pre-insulated benefits

Traditional galvanised steel ductwork can present a number of challenges for installers. The weight of the materials mean that the installation is labour intensive, with ductwork typically needing to be installed in short sections and requiring a number of hangers and supports of significant size and thickness to hold it in place safely. The steel sections are also difficult to modify onsite if late or unexpected changes have been made to the final building construction and, once installed, must be lagged in a separate operation, adding further time and labour to the installation process.

Pre-insulated ductwork approaches such as The Kingspan KoolDuct® System can help to solve these issues. The ductwork is fabricated from lightweight rigid insulation panels with a foil facing. This not only eliminates the need for a separate lagging stage but also means the ductwork can be up to 75% lighter than a comparative galvanised steel ductwork system with mineral fibre lagging.

The rectangular ductwork can be fabricated in sections up to 2.95 m long and it is often possible for installers to join several of these sections together at floor level before installing them. This means lengths of up to 15 m can be fitted in a single operation whilst structural support requirements are also greatly reduced. Ductwork fabricated from The Kingspan KoolDuct® System can also be easily modified onsite, allowing installers to easily handle any unexpected changes to the building layout.

Long-term maintenance of the pre-insulated ductwork is relatively straightforward. Access hatches can be easily incorporated into the ductwork either during initial fabrication or once in-situ. The ductwork can then be cleaned using a mechanical rotary brush with polypropylene fibres and a plastic ball tip at a speed of up to 900 RPM.

In addition to these practical benefits, ductwork fabricated from The Kingspan KoolDuct® System can also achieve air-leakage rates far lower than those of conventional sheet metal

alternatives, meeting air-leakage Class C and D both at low and medium pressures (ref: BS EN 1507: 2006 (Ventilation for buildings. Sheet metal air ducts with rectangular section. Requirements for strength and leakage), BS EN 13403: 2003 (Ventilation for buildings. Non metallic ducts. Ductwork made from insulation ductboards) and BESA DW/144: Specification for Sheet Metal Ductwork). This can allow the desired air flow rates to be met with smaller, more efficient fans, potentially significantly lowering long-term energy demand.



Research - Supply and install costs

Kingspan Technical Insulation asked Rider Levett Bucknall to carry out research assessing how the use of The Kingspan KoolDuct® System could affect installed cost and whole life costs when compared with insulated galvanised steel ductwork.

To achieve this, they first conducted a detailed cost analysis, consulting with a number of suppliers and installers. The companies were issued with a standardised duct layout comprising a number of different duct dimensions and components, including straight sections, 45 and 90 degree bends and tapers. They were then asked to provide supply and installation costings for two comparative specifications of the different ductwork systems:

- The Kingspan KoolDuct® System with 22 mm thick panels vs galvanised steel ductwork with 40 mm mineral fibre
- The Kingspan KoolDuct® System with 30 mm thick panels vs galvanised steel ductwork with 50 mm mineral fibre



Rider Levett Bucknall then averaged the quotations provided to generate an indicative costing for each specification.

The results showed that in both scenarios, significant savings could be achieved with The Kingspan KoolDuct® System. In the first scenario, it was possible to achieve average cost savings of £3,735.16, a reduction of 21.8%. The savings were even greater in the second scenario with estimated costs falling by over £4,012 (22%).

A summary of the total installed cost, (labour and materials, including fixings and first level support members), per linear metre of ductwork, for the different duct sizes of each ductwork specification, is shown in Table 1.

Duct Size (mm)	Installed Cost (2020 Update) (£/lin.m)		Cost Saving (%)
	30 mm Kingspan KoolDuct®	50 mm Mineral Fibre Insulated Galvanised Sheet Steel	
200 x 200	£ 56.84	£ 90.24	37.01
400 x 400	£ 92.34	£ 126.49	27.00
600 x 600	£ 153.01	£ 170.01	10.00
800 x 800	£ 197.25	£ 216.41	8.85
1000 x 1000	£ 203.09	£ 279.30	27.29
1200 x 1200	£ 321.56	£ 371.36	13.41
All	£ 1024.09	£ 1253.81	18.32

Table 1: A summary of the installed cost comparison between ductwork fabricated from The Kingspan KoolDuct® System & Mineral Fibre Insulated Galvanised Sheet Steel ductwork.

Research - Whole life costs

Rider Levett Bucknall then carried out a whole life cost analysis, considering the cost of maintaining and repairing the different ductwork specifications over time. The research suggested that the cost of maintaining The Kingspan KoolDuct® System manufactured from 22 mm thick panels, would be just over half that of the galvanised steel ductwork (£3,230 vs £6,190) whilst savings of over 48% could be achieved on The Kingspan KoolDuct® System manufactured from 30 mm thick panels, over the alternative galvanised steel system; the research assumed that changes and adaptations over time are less costly and ductwork fabricated from The Kingspan KoolDuct® System is less likely to be damaged during routine maintenance.

The report also noted that expected energy demand for the different systems was not considered as part of this analysis. Depending on the operational parameters for the ventilation system, the enhanced airtightness of The Kingspan KoolDuct® System could allow considerable energy savings to be achieved over time - further reducing operational costs.

Quality and value

It is often assumed that, in order to reduce project costs, compromises must be made in the quality of the final building. Rider Levett Bucknall's research shows that this is not the case for ductwork specifications. By selecting pre-insulated ductwork, it is possible to reduce both initial and whole life costs and to improve the energy performance of the ventilation system over the long-term.

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