



Gripple Wire Rope Suspension Systems

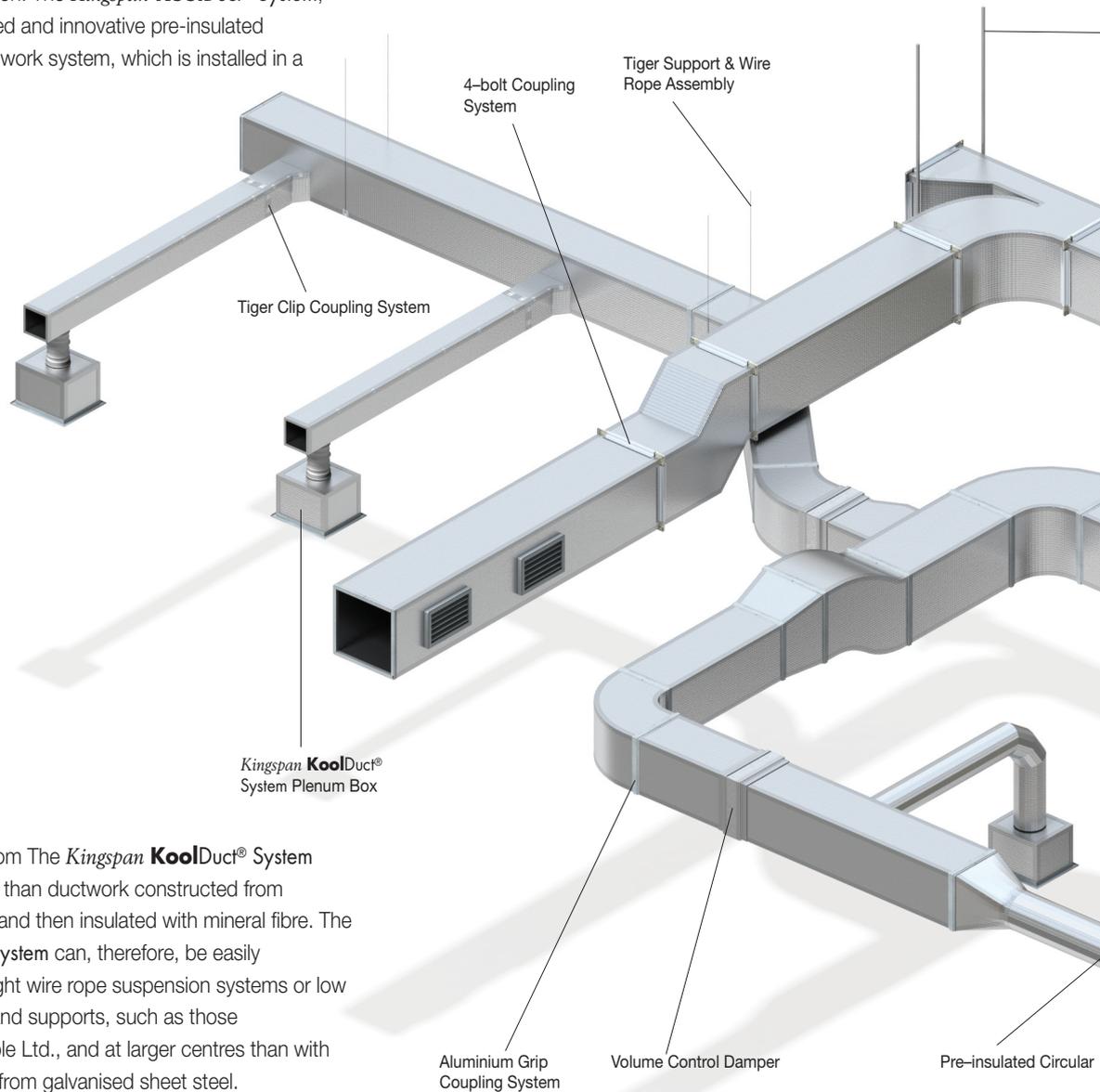
GUIDANCE FOR USE IN THE SUSPENSION OF THE
KINGSPAN KOOLDUCT SYSTEM



*Low Energy –
Low Carbon Buildings*

Introduction

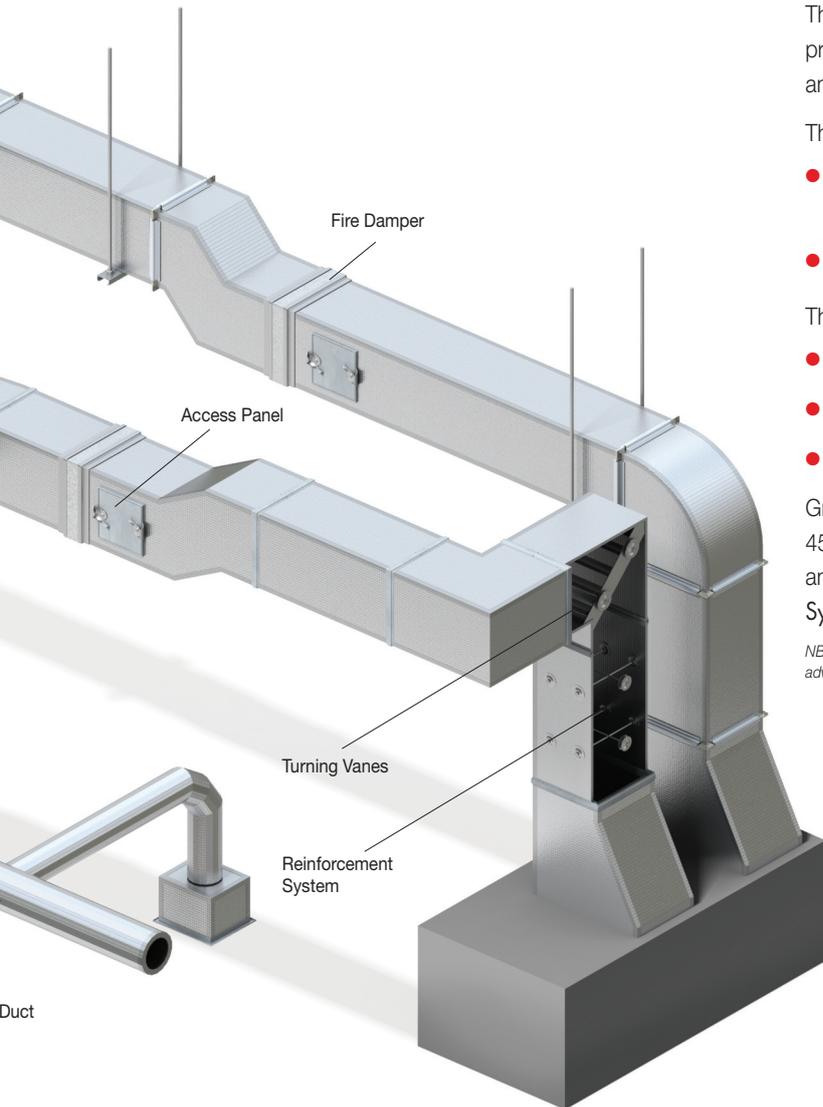
Traditionally, HVAC ductwork is constructed from galvanised sheet steel, which is installed first and then insulated separately as a secondary operation. The *Kingspan KoolDuct®* System, however, is an advanced and innovative pre-insulated rectangular HVAC ductwork system, which is installed in a single fix.



Ductwork fabricated from The *Kingspan KoolDuct®* System weighs up to 75% less than ductwork constructed from galvanised sheet steel and then insulated with mineral fibre. The *Kingspan KoolDuct®* System can, therefore, be easily supported by lightweight wire rope suspension systems or low gauge metal hangers and supports, such as those manufactured by Grippler Ltd., and at larger centres than with ductwork constructed from galvanised sheet steel.



Steel Channel Support
& Threaded Rods



Duct

Gripple Ltd. offers an alternative means of suspension, using wire ropes and proprietary locking devices in place of, and sometimes in combination with, conventional steel channel supports. Gripple wire rope systems are a highly efficient solution to support ductwork fabricated from The *Kingspan KoolDuct*[®] System.

This document provides guidance on the use of Gripple products with The *Kingspan KoolDuct*[®] System, internally fixed and suspended from soffits, beams, purlins or roof trusses.

This document illustrates two solutions:

- Gripple Wire Rope with Trapeze and steel channel support; and
- Gripple Wire Rope with Corner Supports.

Three different end fixings are considered:

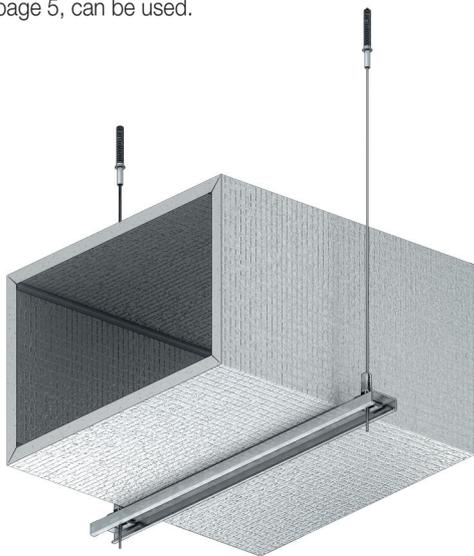
- Ring Anchor & Loop / Standard Hanger;
- Loop / Standard Hanger with Choke Knot; and
- Drop-in Anchor & Stud.

Gripple No.2 System components have a maximum load of 45 kg per suspension point and are suitable to carry the load of any size of ductwork fabricated from The *Kingspan KoolDuct*[®] System.

NB Kingspan Insulation does not accept responsibility for Gripple suspensions. For technical advice on Gripple suspensions please contact Gripple Ltd.

Gripple Wire Rope with Trapeze and Steel Channel Support

Using this method, The *Kingspan KoolDuct®* System is supported by steel channel supports which are each suspended with two Gripple No.2 Wire Ropes. A Gripple Trapeze No.2 locks each of the Wire Ropes into the steel support. The position of the Gripple Trapeze is used to adjust the length of the Wire Ropes. Any of the end fixings, illustrated on page 5, can be used.

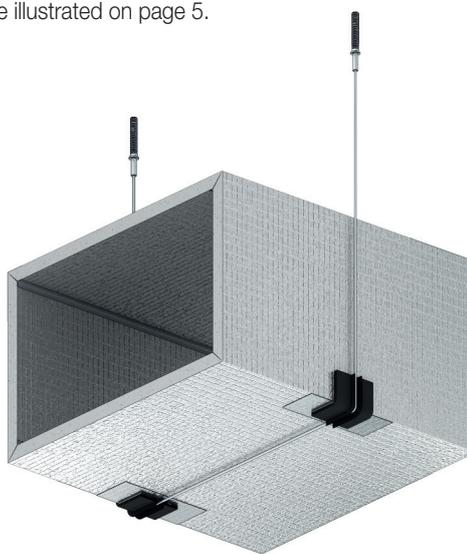


Gripple Trapeze



Gripple Wire Rope with Corner Supports

Alternatively, The *Kingspan KoolDuct®* System can be supported using one single Gripple No.2 Wire Rope. This negates the use of the steel channel support, and instead, utilises protective corners, which are used between the Wire Rope and ductwork. Either Kingspan Tiger Supports or Gripple Corner Saddles can be used to protect the corners of ductwork, preventing the Wire Rope from cutting into the insulation panels. One end fixing must include a Gripple Standard Hanger No.2, as this allows the length of the Wire Rope to be adjusted. The other end fixing can be any of those illustrated on page 5.



Gripple Corner Saddle



Kingspan Tiger Support

Note:

These methods are suitable to support the weight of all *Kingspan KoolDuct®* System duct dimensions up to 2000 mm.

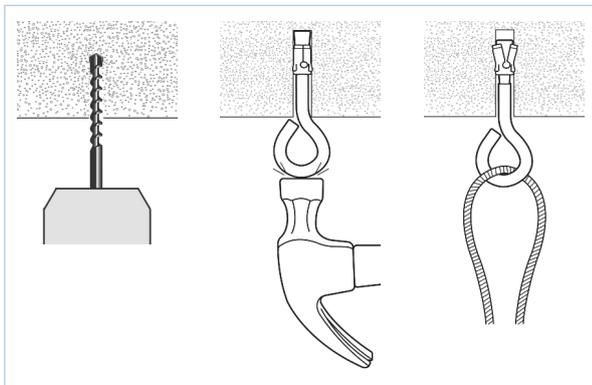
Assumptions:

- Max load of Gripple No.2: 45 kg per suspension point.
- The load rating of wire ropes with two suspension points is doubled.
- Maximum calculated duct weight: 53 kg for 30 mm *Kingspan KoolDuct®* System, with a duct dimension of 2000 x 2000 mm and support centres at 1800 mm.

End Fixings

Ring Anchor & Loop / Standard Hanger

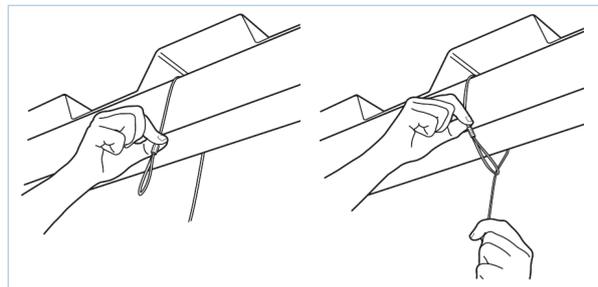
The Gripple Ring Anchor No.2 self-expands when it is knocked into a pre-drilled hole in a soffit. The Wire Rope loop of the Gripple Loop No.2 or Gripple Standard Hanger No.2 is fixed inside the ring. It is suitable for concrete and cracked concrete.



Loop / Standard Hanger & Choke Knot

The Gripple Loop No.2 and Gripple Standard Hanger No.2 are ideal for installing Wire Rope directly around a beam, purlin or roof truss using a simple, non-invasive choke knot.

The Gripple Standard Hanger allows the length of the Wire Rope to be adjusted.

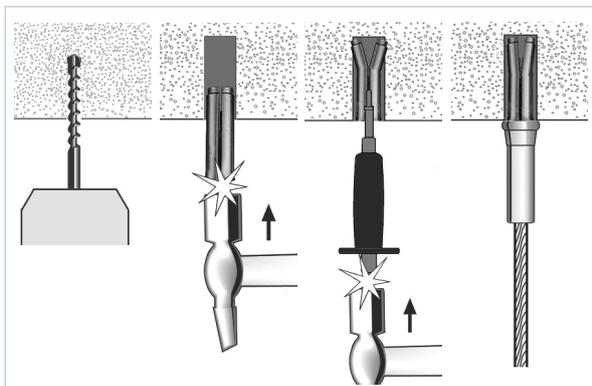


Drop-in Anchor & Stud

The M6 Drop-in Anchor is knocked into a pre-drilled hole into the soffit, and then a punch tool is used to set the anchor. The anchor has a female internal thread to suit a Gripper Stud No.2. It is suitable for non-cracked concrete, precast hollow core concrete and hard natural stone.



The threaded Gripper Stud No.2 is permanently fixed to one end of the Gripper Wire Rope and is screwed into the Drop-in Anchor.



Recommended Maximum Hanger & Support Centres

General recommendations for the spacing and placement of duct supports and hangers are given below. However, accurate determination of actual spacing and placement remains the responsibility of the ductwork installer, who must also ensure that the ductwork system is properly hung and adequately supported.

It is recommended that duct supports and hangers supporting straight runs of ductwork are positioned in accordance with Table 1 below. For supports at branch connections, tee fittings and changes of direction, the guidance given in BESA (HVCA) DW/144 Part 6: Hangers and Supports, or equivalent guidance, should be followed.

NB: Narrower spacing and / or additional duct supports and hangers may be required in circumstances where the building structure presents limitations, or where the necessary rigidity of ductwork needs to be achieved.

Kingspan KoolDuct Section Lengths	Largest Cross Sectional Dimension Centres	Recommended Maximum Hanger & Support
2950 mm or 3930 mm*	< 1200 mm	2950 mm or 3930 mm
1200 mm	1200 – 2000 mm	1800 mm
1200 mm	> 2000 mm	Special analysis required, please contact Kingspan Insulation

**Note: depending on Kingspan KoolDuct® panel lengths of 2950 mm or 3930 mm*

Table 1 – Recommended Hanger & Support Centres

Stability of Installed Ductwork

When installed, the ductwork system should be stable and should not swing or move. Excessive movement can lead to fatigue in ductwork joints and connections.

If required, consideration should be given to intermittently replacing wire rope hangers with rigid hangers and supports (e.g. threaded bars and strut channels) or installing other means of preventing excessive lateral or horizontal movement.

Note on Load Ratings

End Fixings are subjected to the vertical load of the ductwork. The load rating given for Gripple End Fixings is based on the suspensions being hung vertically at 90° to the soffit or other surface. If the wire rope is suspended at an angle less than 90°, an additional sideways load is applied which reduces the capacity of the overall suspension. Please refer to Gripple literature for guidance in such circumstances.

If ductwork is double stacked, Gripple No.3 components may be required, please contact Gripple Ltd. for more details.

Note on Redundancy

The support system is said to provide “redundancy” when it can sustain the load of the ductwork in the unlikely event of a support element failure.

For linear supports, redundancy can usually be assumed when the load of ductwork can be safely transferred to two adjacent fixings.

The guidance in this document has taken redundancy into account so that the maximum load rating for the support is not exceeded even in the unlikely event of one support failure.

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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:

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Technical Advisory Service

The **Kingspan KoolDuct® System** 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 and installation, operation and maintenance of ductwork fabricated from The **Kingspan KoolDuct® System**, 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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