



Technical Note

KINGSPAN KOOLDUCT - DUCTWORK COMMISSIONING AND TESTING



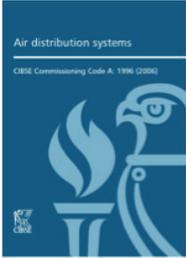
Low Energy –
Low Carbon Buildings

Contents

	Page
Introduction	3
Important Notice	3
Ductwork Pressure and Leakage Testing	3
Preliminary Checks before Initial Start	4
Fan Check	4
Pressure Relief Damper	4
In-Duct Flow Measurements	4
Contacts	5

Introduction

The purpose of commissioning an air distribution system is to confirm that its performance is as intended, and that the required internal environmental conditions are attained, with optimum efficiency.



HVAC pre-insulated ductwork manufactured from The *Kingspan KoolDuct® System* should be leak tested and commissioned (if required/specified) in line with accepted good practices, for example the “CIBSE Commissioning Code A: Air Distribution System”, or equivalent guidance.

Ductwork installation has influence on the accuracy of flow measurement and commissioning of ducted air systems. Therefore, it is normally the installer of the ductwork system that will supply the operatives of the commissioning process with appropriate instructions regarding ductwork manufactured from The *Kingspan KoolDuct® System*; this Technical Note must be part of the information supplied.

Important Notice

Over-pressure that might exceed the design pressure may consequently over stress the ductwork system. To prevent this risk, the commissioning specialist should include the following note in the commissioning method statement for the particular project:

During the commissioning process ductwork pressure shall never exceed the pressure rating to which the ductwork has been designed and fabricated.

Ductwork Pressure and Leakage Testing

Ductwork pressure and leakage testing is normally completed before the regulation of air flow is carried out; it shall be performed as required by the project specification in accordance with the procedures detailed in the appropriate standard, such as:

- BS EN 1507;
- B&ES (HVCA) DW/143 (Building & Engineering Services Association – formerly known as the Heating & Ventilation Contractors Association’ – A Practical Guide to Ductwork Leakage Testing, 2000 Edition);
- SMACNA HVAC Air Duct Leakage Test Manual; and
- other equivalent tests approved by the relevant authorities as having jurisdiction.

During ductwork pressure and leakage testing it is important to check the following:

- the **pressure class** for each ductwork system to be tested shall be known; and
- the **actual pressure** for safe operation shall be monitored: in any case, pressure must not exceed the maximum pressure rating to which the ductwork has been fabricated, for example:



Medium pressure class: duct with maximum operating pressure 1000 Pa / 4 in.w.g., pressure test shall NOT EXCEED 1000 Pa / 4 in.w.g.

Low pressure class: duct with maximum operating pressure 500 Pa / 2 IN.W.G., pressure test shall NOT EXCEED 500 Pa / 2 in.w.g.

Preliminary Checks before Initial Start

Before the initial running of a fan, it is important to check the following:

- the **pressure class** for each ductwork system to be tested shall be known
- **instruments** shall be in place to record the actual pressure inside the ductwork;
- **dampers** for volume control and fire dampers throughout the system shall be secured in the correct position and shall not be closed. If that is not possible where other requirements are specified, actions shall be taken to prevent the risk of over-pressure that might exceed the design pressure;
- **fan and associated automatic controls** shall be programmed correctly and shall not override control functions e.g. the fan shall NOT start with the automatic control damper remaining closed, which could cause excessive pressure at the supply fan inlet or the extract fan outlet (for more details see Guidance Note GN8 “Inverter drives for fans and pumps” from the Commissioning Specialist Association); and
- **VAV air handling units** shall be adjusted for shutdown not to exceed the duct construction pressure class for each system.

Fan Check

Knowledge of the fan characteristic is required to ensure that excessive suction or delivery pressures are not applied to the ductwork system.

During the balancing and commission procedure of fans it is important to check the following:

- **Monitor the duct pressure** for safe operation throughout the commissioning process, not to exceed the design pressure. In any case, pressure must not exceed the maximum pressure to which the ductwork has been fabricated.

Pressure Relief Damper

During testing or start-up, an accidental closure of a fire damper or volume control damper, due to a false alarm or a control failure, may create over-pressure that exceeds the design pressure, and consequently may affect the integrity of the ductwork system. In these cases, and in all cases where over-pressure is possible, the installation of a pressure relief damper (PRD) and bypass duct is recommended. During normal operation, the PRD is closed. If the maximum design pressure, to which the ductwork has been fabricated, is exceeded the PRD will open and redirect some of the airflow, thus maintaining the system design pressure inside the ductwork.

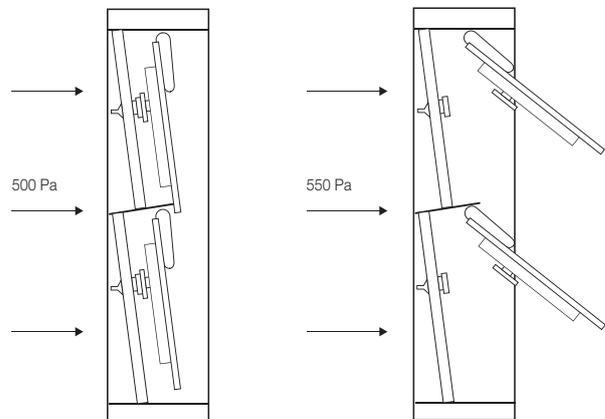


Figure 1 Installation of a Pressure Relief Damper

In-Duct Flow Measurements

Test holes are required in HVAC ductwork for the purpose of air flow measurement, testing and balancing. For The *Kingspan KoolDuct*[®] System, the location of test holes shall be as per current practice valid for conventional steel ductwork.

Temporary test holes for The *Kingspan KoolDuct*[®] System can be made at the location required by drilling through the *Kingspan KoolDuct*[®] panel using a pointed tool of appropriate size; usually, 10mm – 13mm (3/8”) test holes are required. Temporary test holes of a small diameter can then be closed and sealed using The *Kingspan KoolDuct*[®] Silicone Sealant.

For permanent test ports, products commonly available in the marketplace can be used with The *Kingspan KoolDuct*[®] system. The metal body of the test ports can be installed using only The *Kingspan KoolDuct*[®] Silicone Sealant. The ports are small and lightweight, so the silicone is normally strong enough to permanently fasten the port to the *Kingspan KoolDuct*[®] panel facing.

Contact Details

Customer Service

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

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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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