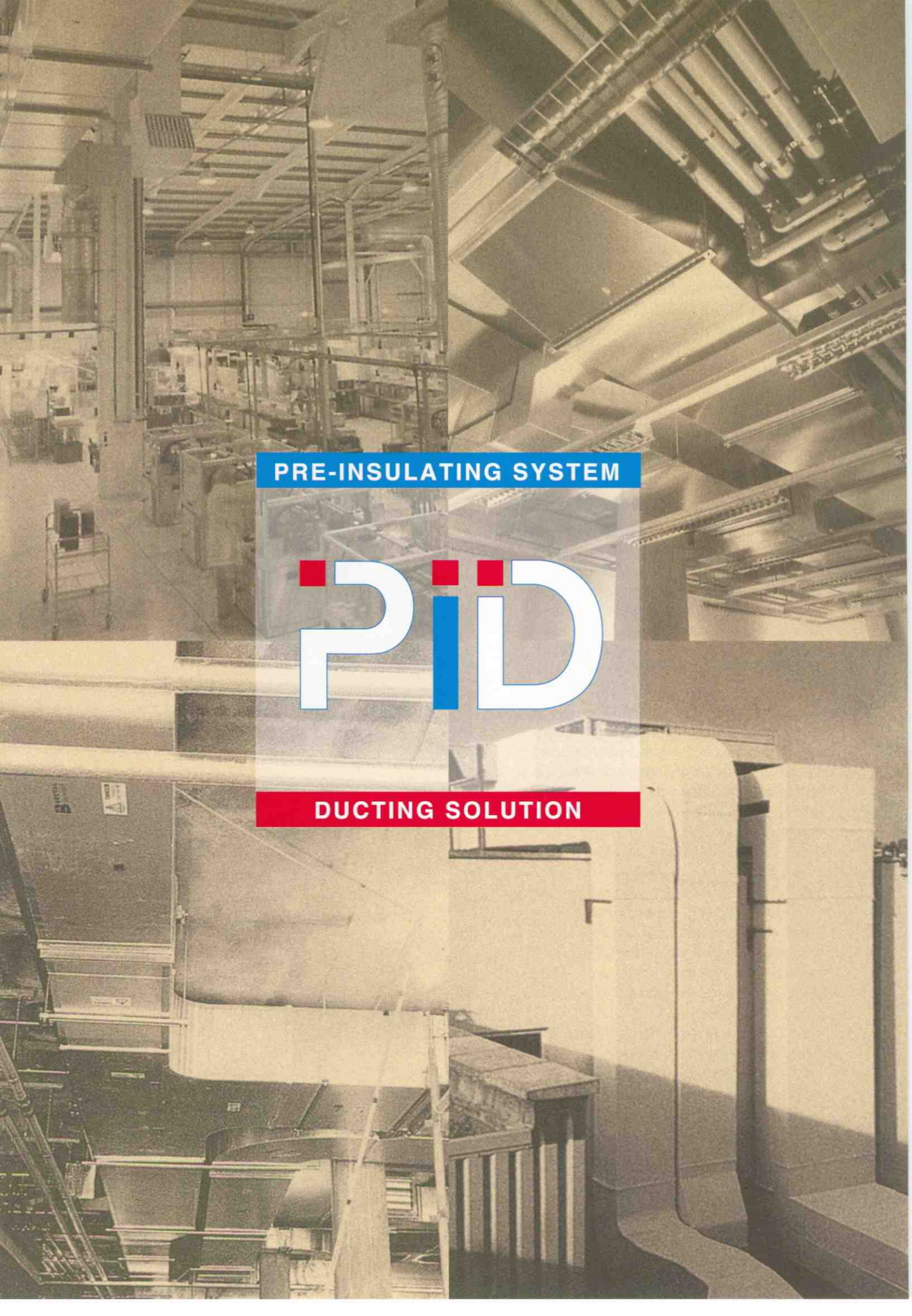
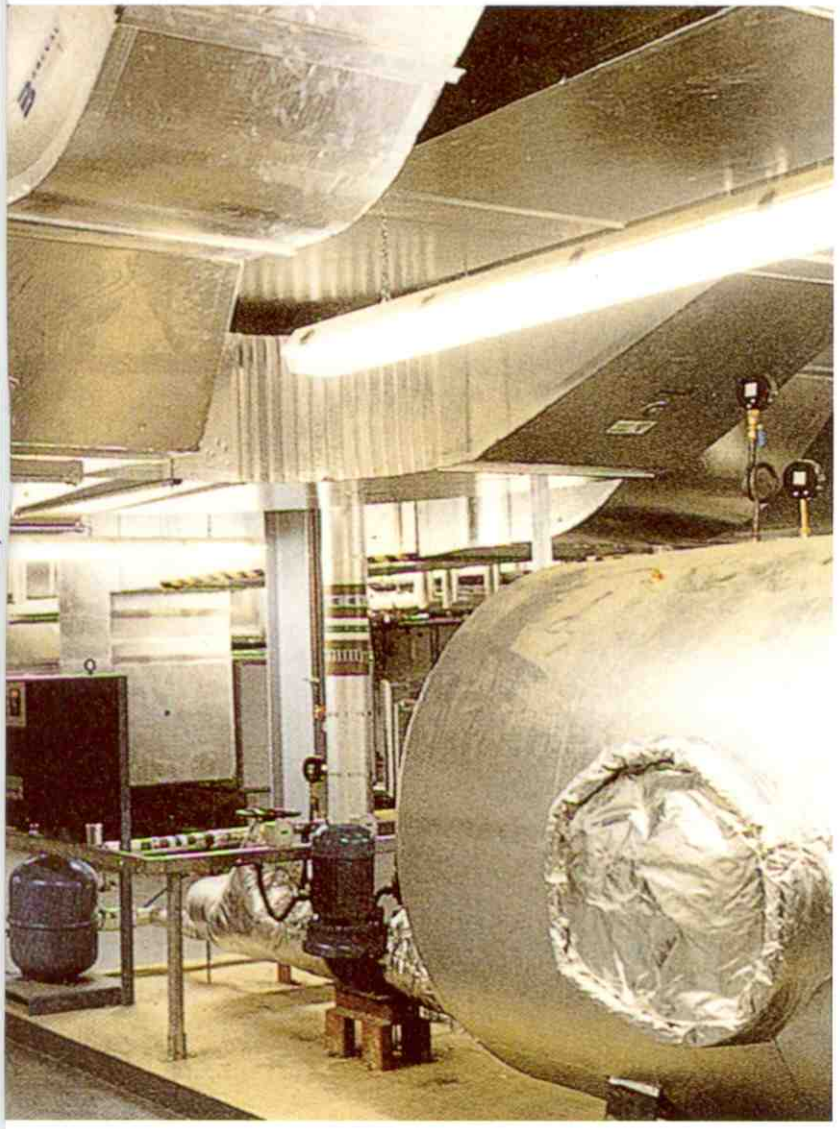


PRE-INSULATING SYSTEM

PiD

DUCTING SOLUTION



The PID Pre-insulating System Benefits & Advantages

- Installed cost can be up to 10% cheaper than sheet metal ducting:
  - 15% of the weight of sheet metal ducting
  - can be installed quickly by two people
  - single fix fast track installation
  - no lagging required
  - 3m long segments rather than 1.2/1.5m
  - fewer sections and less handling
  - can be installed twice as fast as unlagged sheet metal ducting
- Can yield electrical consumption savings of up to 20%:
  - air leakage is a fraction of sheet metal's
  - best available thermal insulation
  - provides the optimum energy saving and environmental solution
- Space saving – can be installed flush to the ceiling
- Fibre-free – suitable for food processing, pharmaceutical, medical and other clean air environments
- Aesthetically pleasing appearance – suitable for open-to-view applications
- Excellent strength-to-weight ratio and impressive moisture resistance – suitable for rooptop installations
- Installed only by specially trained fabricators
- Class O fire rating and negligible smoke emission

PID Pre-insulating Complete Ducting System Technology

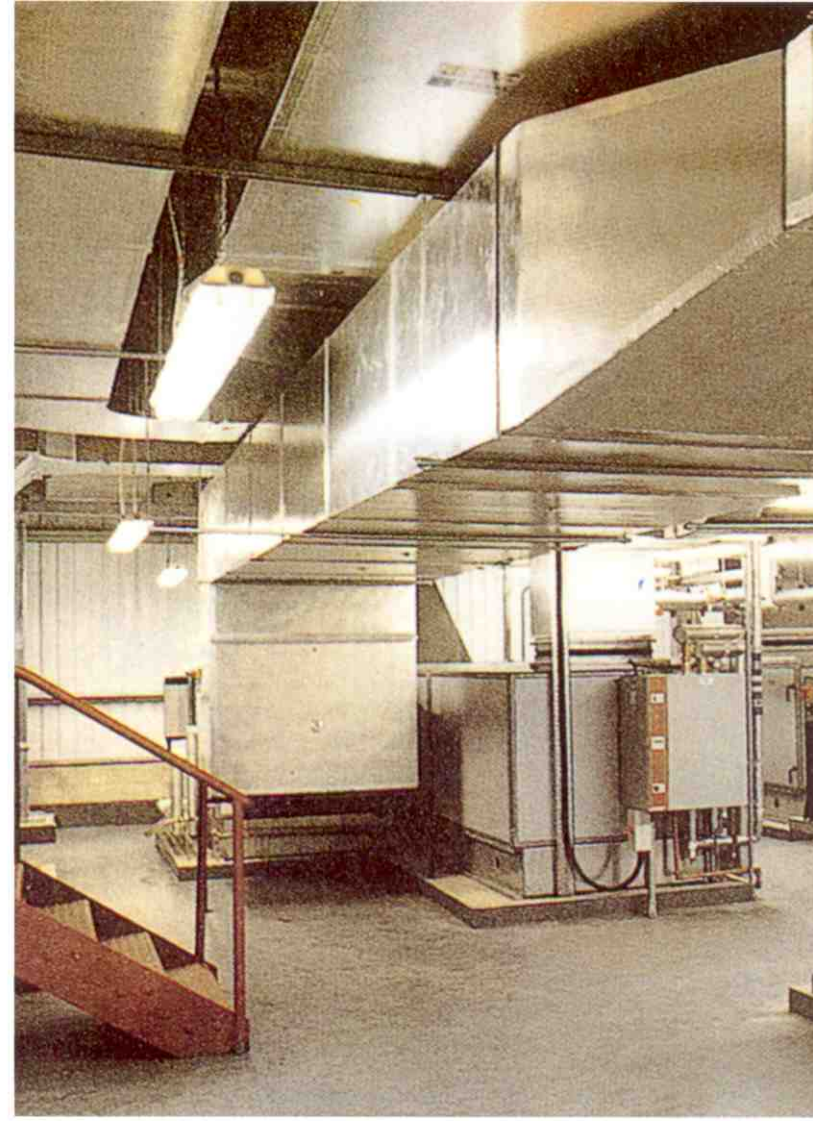
The Heating, Ventilation and Air Conditioning (HVAC) industry is in the midst of a dynamic era. However, air ducting, a critical component of HVAC systems, has remained virtually unchanged since the early 1900's. Several factors and recent innovations have introduced the need to revolutionise air ducting. Building materials and insulating products have dramatically improved. Requirements for clean air are becoming increasing stringent. Energy costs have continued to escalate. Changing fire and smoke regulations have raised the standards for compliance.

PID is please to present a revolutionary approach to insulated ductwork. The PID Pre-insulating System is like no other insulated ducting. It is the most advanced and innovative System of pre-insulated ducting air distribution ductwork available in the world. The PID Pre-insulating System of pre-insulated ducting is a proven, easy, innovative product providing a new perspective in the field of air distribution.

The third generation System virtually eliminates all the problems of traditional metal ductwork while a the same time offering extra advantages to both the consulting engineer and the fabricator/installer. The System is the clear leader in the new generation of insulated prefabricated ducting and has already proved itself in the highly competitive global marketplace.

What's different about the PID Pre-insulating System? Traditionally, ducting is made of sheet metal which is installed first and then lagged with insulation as a second operation. The PID Pre-insulating System comprises pre-insulated ducting with aluminium surfaces in a single fix.

The PID Pre-insulating System comprises duct sections fabricated from polylsocyanurate insulation panels and joined together with proprietary jointing systems.



Benefits of The PID Pre-insulating System

Installed Cost

The installed cost of the PID Pre-insulating System can be up to 10% cheaper than sheet metal ducting.

Weight

The exceptional strength to weight ratio of Pre-insulating ducting results in a duct that is lightweight and easy to handle and install. The PID Pre-insulating System weighs about 1.4kg/m² compared to over 10kg/m² for sheet metal ducting (about 15% of the weight). This results in much lower handling costs because fewer people are required to install a duct section and easier installation. Two people can quickly and easily install substantial sizes of pre-fabricated ducting.

Most older buildings involved in refurbishment projects are not designed to support the additional weight of insulated sheet metal ductwork. The PID Pre-insulating System generally alleviates the requirement for additional structural support.

Speed

The PID Pre-insulating System has a single fix installation, by virtue of the elimination of the lagging operation, reducing site time and contractor management. The ability to manufacture 3m long segments rather than 1.2/1.5m long segments in the case of sheet metal ducting means fewer sections and less handling. This coupled with increased support centres and ease of handling results in a fast track installation. The PID Pre-insulating System can be installed twice as fast as sheet metal ducting – not even taking lagging into account. Faster installation obviously means lower costs and no work disruption for other trades.

Energy Efficiency & System, running costs

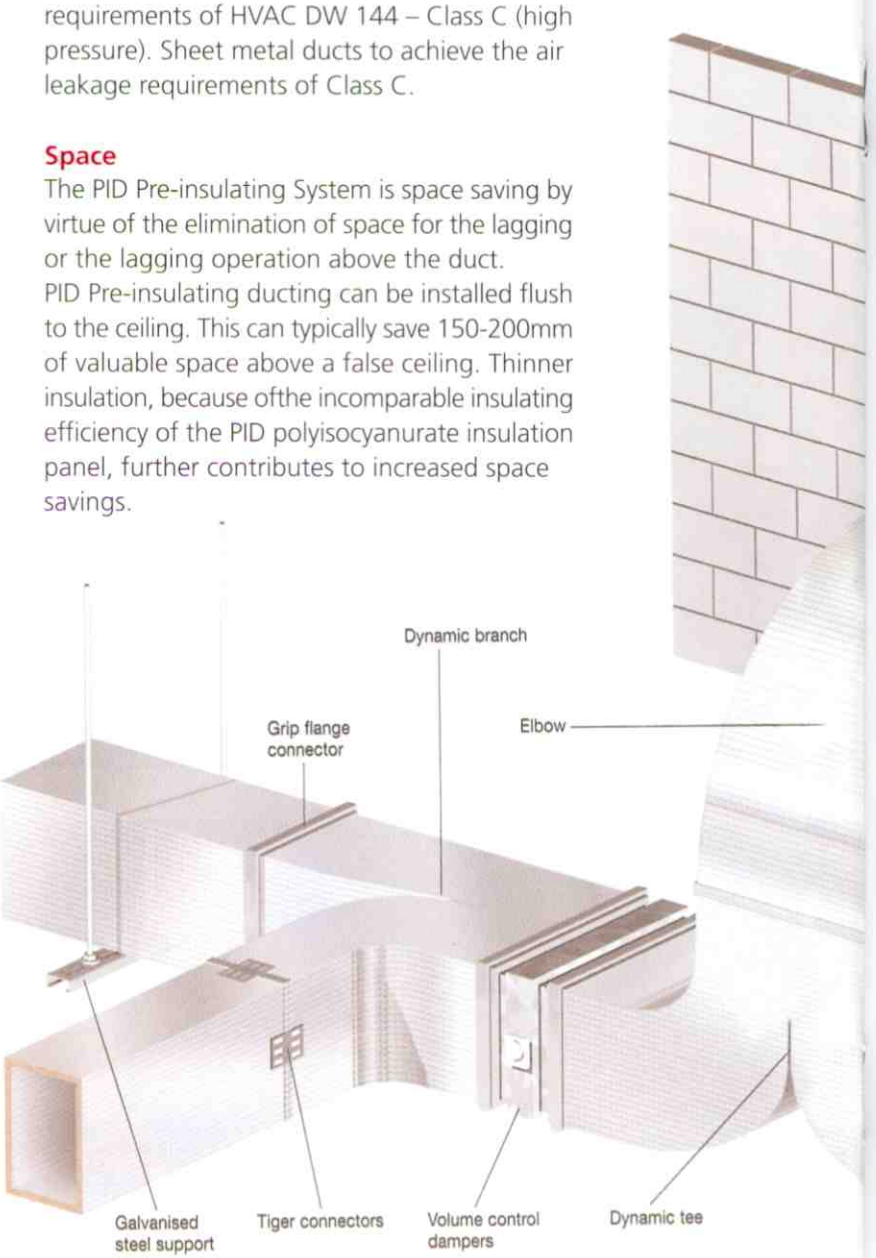
The superior insulation properties of the PID polyisocyanurate insulation panel, combined with minimal air leakage of the PID Pre-insulating System yield significant electrical consumption savings of up to 20% because of reduced heating and cooling loads. The PID Pre-insulating System provides the optimum energy saving and environmental solution in comparison with other ductwork systems.

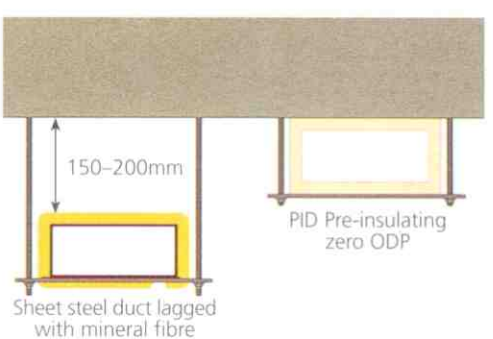
Air Leakage

The PID Pre-insulating System technology, the fabrication methodology combined with the patented jointing system and the complete line of bespoke accessories produce a System where the air leakage is reduced to a fraction of that found with sheet metal ducting. The PID Pre-insulating System easily meets the air leakage requirements of HVAC DW 144 – Class C (high pressure). Sheet metal ducts to achieve the air leakage requirements of Class C.

Space

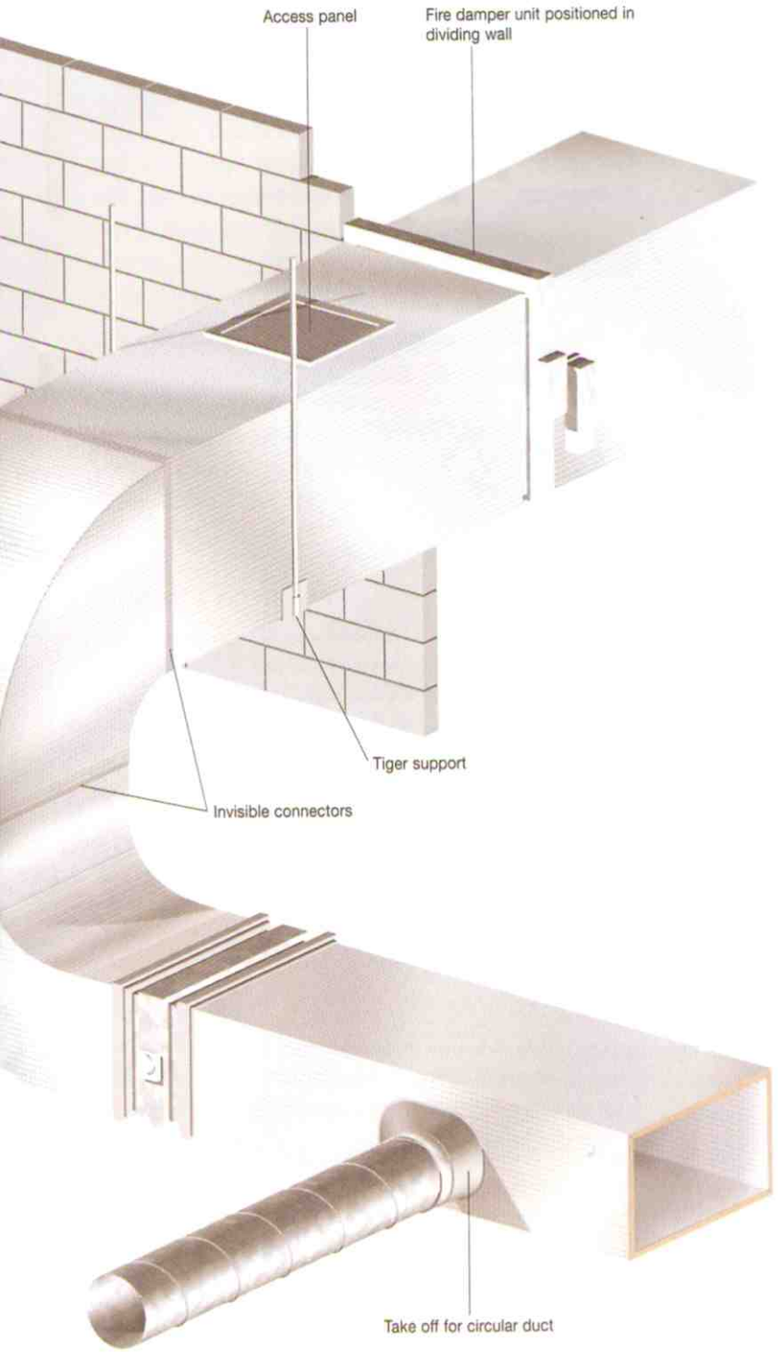
The PID Pre-insulating System is space saving by virtue of the elimination of space for the lagging or the lagging operation above the duct. PID Pre-insulating ducting can be installed flush to the ceiling. This can typically save 150-200mm of valuable space above a false ceiling. Thinner insulation, because ofthe incomparable insulating efficiency of the PID polyisocyanurate insulation panel, further contributes to increased space savings.





Air Quality

The airstream through the hermetically sealed PID Pre-insulating System flows on only aluminium and does not have any contact with a material that produces loose fibres which could be harmful making it ideally suited for high specifications projects. If the sheet metal ducting and into the general environment then into recirculation systems and back into air handling system.



Versatility

The PID Pre-insulating System can be installed internally, externally, concealed above a false ceiling or visibly mounted. It can be installed in very high temperature and relative humility ambient operating conditions. The PID Pre-insulating System can be installed in residential commercial and industrial applications and also for special applications such as food industries, pharmaceutical, special clean air applications and hospitals.

Aesthetics

The PID Pre-insulating System is aesthetically acceptable in open to view applications.

Strength

PID Pre-insulating ducting is very strong, does not require bracing for any size and is self supporting. PID polyisocyanurate insulation panels are capable of being permanently formed to the required shape and duct integrity under operating conditions and limits covered by "The PID Pre-insulating System Design Guide". Ducts of larger sizes and ducts subjected to high pressures may require additional stiffening as specified within "The PID Pre-insulating System Design Guide" to avoid deflection.

Installed by trained Fabricators

The PID Pre-insulating System is installed only be specially trained fabricators. Comprehensive training guarantees uniform excellence. All registered contractors attend a specialised training course to ensure that uniform quality standards are maintained. An official certificate of competency is awarded to all trainees who successfully complete this training program. The course combines both theoretical and practical concepts:

- air flow dynamics, pressure and velocity
- basic techniques in cutting and duct design
- construction of a wide range of sizes and shapes
- utilisation of aluminium profiles for duct reinforcement, duct jointing and connection to sheet metal ductwork components and plant
- an introduction to project cost estimation

Product Data

PID Polyisocyanurate Insulaton Panel Specification

PID Pre-insulating polyisocyanurate insulation panels are rigid flat boards manufactured from polyisocyanurate insulation laminated on both sides to protective low vapour with a 5mm glass tissue mesh.

Environmental Properties

Inaddition to its contributions to energy efficiency, PID Pre-insulating polyisocyanurate insulation panels are entirely CFC-free. They provide designers and specifiers with an optimum solution towards compliance with international environmental agreements.

In terms of overall environmental efficiency on a cradle to grave analysis, PID Pre-insulating can provide a very significant environmental advantage compared to all other insulation materials when specified to BS 5422: 1990 (Method for specifying thermal insulating materals on pipes, ductwork and equipment in the temperature range -40°C to +700°C).

Moisture Resistance

PID Pre-insulating polyisocyanurate insulation panels have >90% closed cell structure which makes them highly resistant to moisture penetration and also non wicking.

Heat Resistance

The PID Pre-insulating System is suitable for use in peak temperatures as high as 80°C and continuous operating temperatures up to 70°C.

Thermal Performance

The thermal conductivity of PID Pre-insulating phenolic insulation panels is 0.018 W/mK at 10°C, the lowest of any commonly available insulation material, which allows the thinnest possible insulation to achieve the required thermal performance.

Fire & Smoke Performance

The PID Pre-insulating polyisocyanurate insulation panel's resistance to burning and spread of flame is far superior to that of any other cellular plastic insulation, regardless of facing type. In addition, there is an almost complete absence of smoke when subjected to a flame source. The PID Pre-insulating polyisocyanurate insulation panel has been extensively tested by independent laboratories. The following tests have been successfully passed.

The PID Pre-insulating polyisocyanurate insulation panel achieves a Class O rating to the Building Regulations based on the results of the following tests:

- BS 476: Part 6: 1989 (Method of test for fire propagation for products; and
- BS476: Part 7: 1997 (Method of test to determine the classification of the surface spread of flame of product)

The PID Pre-insulating polyisocyanurate insulation panel achieves a mean maximum obscuration not exceeding 5% when tested to BS 5111: Part 1: 1974 (Laboratory methods of test for determination of smoke generation characteristics of cellular plastics and cellular rubber materials).

The PID Pre-insulating polyisocyanurate insulation panel achieves the following results when tested to BS 6401: 1983 (Method for measurement, in the laboratory, of the specific optical density of smoke generated by materials):
the avg. specific optical density (non-flaming mode) = 8; and the avg. specific optical density (flaming mode) = 5.

The PID Pre-insulating polyisocyanurate insulation panel achieves a toxicity index not exceeding 6.9 when tested to NES 713 (Smoke Toxicity).

Quality Assurance

PID Pre-insulating polyisocyanurate insulation panels are manufactured to ISO 9002: 1994 (Quality systems. Mode for quality assurance in production, installation and servicing).

Standards

PID Pre-insulating polyisocyanurate conforms to the specification and dimensional tolerances laid down in BS 3927: 1986 (1996) (Specification for rigid phenolic foam for thermal insulation in the form of slabs and profiled sections), Table 1 (Type A).

Typical Properties of PID Pre-insulating Phenolic Insulation Panels

Moisture Resistance Mositure Vapour Transmission of Foil Facing	1.21×10^{-5} g/MNs
Nominal Density	55-60 kg/m³
Dimensions Panel Length Panel Width Panel Thickness	 3,950 mm 1,250 mm 20 mm ± 1 mm
Average Compressive Strength	249 kPa
Average Flexural Strength when tested to BS 2972: 1989 (Methods of test for inorganic thermal insulating materials)	1,200 kPa

It may be used to satisfy the requirements of BS 5422: 1990 and other major national specifications including,NHS C02, NES Y50, M&E 100.

Other System Components

To simplify duct joining the System comes with a patented range of aluminium grip flanges – which also facilitate fast connection to genetic ducting components such as fire dampers, VCDs, attenuators, flex duct and even conventional sheet metal ductwork.

A thermal break flange is available for high humidity or tropical environments.

An to facilitate greater efficiency and ease-of-working the PID Pre-insulating System has been evolved to include standard accessories such as glue, tape, silicone sealant and gaskets – all highly specialised and manufactured specifically for the PID Pre-insulating System.

All accessories have been rigorously tested in the laboratory and the field.

Frictional Resistance

The basic principals of duct deign and friction loss for smooth sheet metal ducting apply equally to the PID Pre-insulating System. The pressure losses due to elbows, divergence, take-offs, contractions, expansions, etc. should be computed as for sheet metal ducting. Specifically, the designer should apply the same pressure drop factors for sheet metal duct fittings as defined in the current issue of the CIBSE Guide to Current Practice.

Handling and Storage

Care should be exercised in handling PID Pre-insulating System components and duct sections. Storage should be under cover and all materials should be protected from the environment. In all cases where the materials are stored for prolonged periods, all open ends of ducts should be sealed with polythene sheet or other suitable materials to prevent the ingress of foreign matter.

Cleaning

The PID Pre-insulating System can be cleaned with compressed air and vacuum, as in the High Jetting System.

Ease of Used

The PID Pre-insulating System is easy to manufacture and assemble in the workshop or on site requiring only hand tools.

Ease of Modification

The PID Pre-insulating ducting is easily modified or repaired. Doors and hatches for cleaning and access can be readily added even post installation.

Track Record

The PID Pre-insulating System concept started in Italy some 35 years ago as a solution to the problems presented by traditional sheet metal ducting.

So effective is the solution that as much as 35% of all ducting used in Italy is pre-insulated.

Technical & Support Services

Application and installation advice, including customer and site vists where appropriate, is available from PID's Technical Services Department.

Full design and specification literature for the PID Pre-insulating System is available direct from PID's Marketing or Technical Services Departments.

Health and Safety information and other data can be obtained direct through PID's Customer Services.