Insulation

See rear cover for applicable countries

Third Issue November 2016

πPal™ Duct Eco System

USING ANTI-MICROBIAL COATED ALUMINIUM FACED PANELS

Fibre-free Core

Biomaster PROTECTED

Kingspan™

Low Energy – Low Carbon Buildings

Kingspan **PalDuct** Eco System

Introduction

Microorganisms are unavoidably present in the air we breathe. Microorganisms such as bacteria, fungi and algae can be harmful and can be the cause of unwanted odours, stains and infectious diseases. They are airborne and can be easily transmitted from one person to another.

The HVAC industry has become to be increasingly concerned with the quality of air that is distributed through the ductwork in a building. Hygienic coatings for HVAC ductwork have been designed for use in locations such as food preparation areas, clinics, schools and hospitals, where it is important to limit the growth of bacteria. Moreover, this may be especially important in high humidity areas where bacteria can multiply rapidly.

The *Kingspan* **PalDuct** Eco System is an advanced and innovative pre-insulated rectangular HVAC ductwork system. It comprises *Kingspan* **PalDuct** Eco panels, fabrication methods, coupling systems and a complete line of accessories to produce ductwork in sections up to 4 m long.

The *Kingspan* **PalDuct** Eco System uses Panels and components, which are coated in an innovative antimicrobial technology that resists against mould, mildew, bacteria, fungi and algae.

Operating Recommendations & Limitations

It is recommended that ductwork fabricated from The *Kingspan* **PalDuct** Eco System is used for operation as supply, return, fresh and exhaust air ductwork for HVAC systems within the limits shown in the table below. These limits assume that the ductwork has been fabricated in accordance with the *Kingspan* **PalDuct** Fabrication Guidelines.

Property	Value
Pressure Limit (Pa)	1000
Air Speed (m/s)	15
Application	Indoor
Temperature	Internal air temperature of –20°C to +80°C during continuous operation

Application Suitability

The *Kingspan* **PalDuct** Eco 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 and light industrial and leisure sectors. Moreover, it is especially suitable for use in projects where the spread of bacteria may be a consideration, such as:

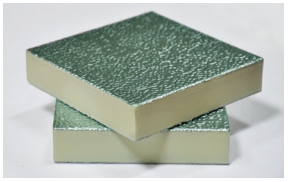
- clinics and hospitals;
- clean air and hygiene controlled environments;
- laboratories;
- food, beverage and pharmaceutical industries; and
- operating rooms.

Fabrication and Installation

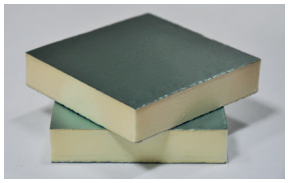
Ductwork fabricated from The *Kingspan* **PalDuct** Eco System should only be fabricated by specially trained fabricators who have completed the specialised and comprehensive training course provided for the System.

Kingspan **PalDuct** Eco Panels

Kingspan **PalDuct** Eco Panel comprises a fibre-free rigid thermoset polyisocyanurate (PIR) or polyurethane (PUR) insulation core, faced on one side with an embossed aluminium foil and the other with a smooth aluminium foil. Both facings are coated with Biomaster antimicrobial technology. The panels can be joined together with antimicrobial coated, green coloured aluminium and polymer profiles and adhesive materials to create a pre–insulated Fibre-free Core HVAC ductwork system that can resist the spread of bacteria.



Embossed



Smooth

Property	Value
Thickness (mm)	21–30
Panel Dimensions (mm)	4000 x 1200
Density (kg/m^3)	48–50
Thermal Conductivity (W/m·K)	0.020 @ 10°C (ASTM C 518)
Aluminium Foil	Smooth / embossed Antimicrobial Coating
Compressive Strength (kPa)	220.9 (ASTM D 1621)
Water Absorption Level (ASTM C209)	0.14% (24 hour immersion)

Fittings & Accessories

The *Kingspan* **PalDuct** Eco System comprises a complete line of profiles and accessories for joining panels, which produces pre–insulated rigid ductwork sections that resist the spread of bacteria.

Features

The *Kingspan* **PalDuct Eco** System has been developed to fight harmful airborne micro-organisms more effectively. *Kingspan* **PalDuct Eco** Panels ensure that the air passing through the duct and the air moving around outside the duct is safe and clean due to its antimicrobial feature.

The *Kingspan* **PalDuct Eco** System has been tested by an American laboratory and found to have bacterial and fungal growth resistance on the following organisms:

- pseudomas aeruginosa;
- staphylococcus aureus;
- aspergillus niger;
- aureobasidium pullulans;
- chaeromium globosum;
- penicillium funiculosum; and
- trichoderma virens.

The System is easy to clean and maintain, which ensures that a consistent hygienic quality of air can be upheld inside the ductwork. In addition, due to its pre-insulated nature the System is lightweight, and therefore, easy to install.

How does Biomaster protection work?

Biomaster is based on silver ion technology. When bacteria comes into contact with a Biomaster protected surface, the silver ions prevent them from growing, producing energy or replicating, therefore they die.

The controlled release of the active ingredient provides maximum antibacterial protection for the lifetime of the product.

Test Report & Certificate

Description	Test Method & Statement	Laboratory	Classification & Results
Bacterial and Fungal Growth Resistance	ASTM G21-Panel ASTM G21-Accessories	Biosan Laboratories	resistance to the following organisms: aspergillus niger aureobasidium pullulans chaetomium globosum penicillium funiculosum trichoderma virens
Bacterial and Fungal Growth Resistance	ASTM G22	Al Futtaim Exova	No growth for the following organisms: pseudomonas aeruginosa staphylococcus aureus
Bacterial Growth Resistance	ASTM E2180	Biosan Laboratories	resistance to staphylococcus aureus
Fire Propagation Index	BS 476: Part 6	Warringtonfire	Class 0
Surface Spread of Flame	BS 476: Part 7	Warringtonfire	Class 1
Certification of Product Listing No. 016	BS 476: Part 6, 7	Warringtonfire - mideast	Class 0
Certificate of Factory Production Control and Product Labels	Certificate of Approval ME0016	Warringtonfire - mideast	
Epiradiateur Test	NFP 92-501	Warringtonfire	M1
Flame Spread Index	ASTM E 84 NFPA 255 UL 723 NFPA 101 Life Safety Code	Commercial Testing Company	Class 'A'
Fire and Smoke Classification	EN 13501	Warringtonfire	c-s2-d0
Smoke Developed Index	ASTM E 84 NFPA 255 UL 723 NFPA 101 Life Safety Code	Commercial Testing Company	Class A
Toxicity Index	NES 713 IMO Resolution MSC 61 (67)	5.7 Warringtonfire	Average S.O.D. < 200
Flexural Strength	ASTM C203	Dubai Municipality	1170 kpa
Sound Attenuation Test	UNI 8270 DIN 52210	Instituto Giordano	Average SRI (100-3150 Hz) 14.1

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