

Insulation



See rear cover for applicable countries

Second Issue

September 2016

# **Pal** Duct Systems

PRODUCT CATALOGUE



**Fibre-free**  
 **Core**

  
**Kingspan**<sup>TM</sup>

*Low Energy –  
Low Carbon Buildings*

# Introduction

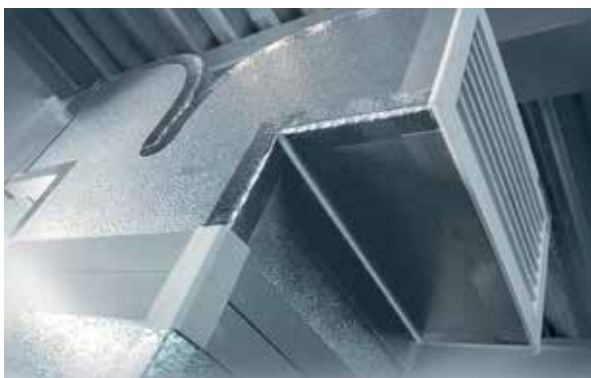
## Overview

The heating, ventilation and air-conditioning (HVAC) industry is in the midst of a dynamic era. However, air-distribution ductwork, a critical component of HVAC systems, has remained virtually unchanged since the early 1900s.

Several factors have introduced the need to revolutionise HVAC ductwork. Energy use has continued to escalate, and thus the demand for energy reducing solutions has intensified. Requirements for clean air are becoming increasingly prevalent. Speed of construction has become a valuable asset. Floor space and headroom are under constant pressure.



*Kingspan PalDuct* systems have been the pioneer in pre-insulated ducting. Pal was the first company in the world to introduce the innovative and revolutionary rigid pre-insulated ductwork as an alternative to sheet metal ductwork. It was invented by Claudio Ferraro of Bologna, Italy in 1965.



Kingspan Insulation has proven the value of its products and *Kingspan PalDuct* has been used in some of the most prestigious projects around the world, due to its known advantages over the traditional galvanised sheet metal ductwork.



Kingspan Insulation has commissioned state of the art manufacturing plants, established workshops in different regions worldwide and also provided specialised and comprehensive training courses conducted by service oriented and experienced trainers well-equipped with the latest technologies, all to ensure quality HVAC ductwork fabrications and installations. This is closely supervised by the representatives from subsidiary companies and sales offices worldwide.



In 2014 Kingspan Group acquired Pal International and assimilated it into its Insulation Division, which subsequently became responsible for the sales and marketing of *Kingspan PalDuct* products across the globe.

## What is *Kingspan PalDuct* Technology?

- Complete line of components and accessories.
- Professional hand tools and automated machinery.
- Specialised training courses for ductwork fabricators.
- “Duct Design Software” to size the ductwork and estimate the material needed.
- Technical Support.



## Advantages of *Kingspan PalDuct* Technology

- Easy to clean and hygienic.
- CFC/HCFC-free: helping to minimise the effects of Ozone Depletion and Global Warming
- Clean air: fibre-free insulation core.
- Lightweight: only 15% of the weight of sheet metal ductwork.
- Resistance to fungus growth.
- Space saving: flush fitting installation possible.
- Low leakage: fully sealed systems conform to the air-leakage limit of DW 144 Class C-high pressure.
- Low  $\lambda$  value.
- Energy saving: up to 20% annually.
- Fast-track installation: rapid erection combined with single-fix installation.
- On-site fabrication capability.
- No limits to duct sizes.
- High-compressive strength.
- High rigidity / integrity.
- Base material is impermeable to moisture.



## Specialised Training & Technical Support

Kingspan Insulation provides specialised and comprehensive training courses to appointed distributors and clients in order to ensure that fabricators carry out the fabrication of *Kingspan PalDuct* Systems for any project directly on-site, assuring fast and more accurate execution of duct installation requirements.

Kingspan Insulation also provides technical support to appointed distributors and clients in order to ensure the consistent quality of HVAC ductwork fabrication and installations.



## Certifications & Compliance

Kingspan Insulation is ISO certified and complies with Management System standards: ISO 9001:2008; ISO 18001:2007; and ISO 14001:2004. *Kingspan PalDuct* products have Factory Control, Product Level certification and have Product Approval issued by Warrington fire Mid-East Global Safety. *Kingspan PalDuct* panels have been tested and comply with the international standards listed below:

- EN 13501 (C-s2-d0);
- BS 476 Part 6 & 7 (Class 0);
- NFPA 101 Life & Safety Code;
- NFPA 255;
- UL 723;
- ASTM E84;
- NES 713;
- NFP 92-501;
- DW 144;
- ASTM C518;
- ASTM D1621;
- ASTM C203;
- ASTM D1622;
- BS 25750;
- ASTM G21;
- ASTM G22;
- BS EN 826;
- UNI 8270;
- DIN 52210; and
- ASTM C209.

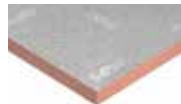


# Kingspan **PalDuct** PIR Panels

## Polyisocyanurate Insulation Panel

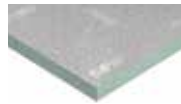
Kingspan **PalDuct** PIR Panels comprise a fibre-free high performance rigid thermoset polyisocyanurate (PIR) insulation core, faced on both sides with an embossed aluminium foil. The aluminium foil is lacquered with corrosion resistant polymer varnish.

### Art P 80 (Internal Use)



**20 P 80**

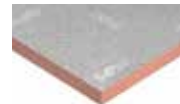
Thickness (mm)	20 / 30
Density (kg/m <sup>3</sup> )	45 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020



**30 P 80**

Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Pal 100 (Internal Use)

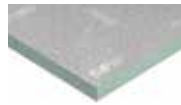


**PAL 100**

Thickness (mm)	20
Density (kg/m <sup>3</sup> )	50 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020

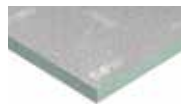
Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Art P 200 (External Use)



**20 P 200**

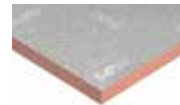
Thickness (mm)	20 / 30
Density (kg/m <sup>3</sup> )	50 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020



**30 P 200**

Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Art 10 P 80 (Internal Use)



**10 P 80**

Thickness (mm)	10
Density (kg/m <sup>3</sup> )	50 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.0272

Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Art PSS 80 (Smooth Facing PIR Panel)



**20 PSS 80**

Thickness (mm)	20
Density (kg/m <sup>3</sup> )	45 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020

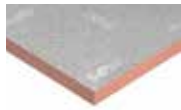
Aluminium Foil Finish	Smooth / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

# Kingspan **PalDuct** PUR Panels

## Polyurethane Insulation Panel

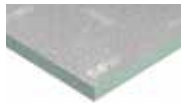
Kingspan **PalDuct** PUR Panels comprise a fibre-free high performance rigid thermoset polyurethane (PUR) insulation core, faced on both sides with an embossed aluminium foil. The aluminium foil is lacquered with corrosion resistant polymer varnish.

### Art PU 80 (Internal Use)



**20 PU 80**

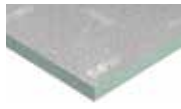
Thickness (mm)	20 / 30
Density (kg/m <sup>3</sup> )	45 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020



**30 PU 80**

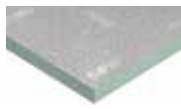
Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Art PU 200 (External Use)



**20 PU 200**

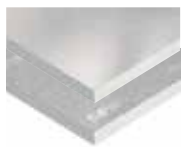
Thickness (mm)	20 / 30
Density (kg/m <sup>3</sup> )	50 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020



**30 PU 200**

Aluminium Foil Finish	Embossed / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

### Art PUSS 80 (Smooth Facing PUR Panel)



**20 PUSS 80**

Thickness (mm)	20
Density (kg/m <sup>3</sup> )	45 ± 3
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020

Aluminium Foil Finish	Smooth / Embossed
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

# Kingspan **PalDuct** Hydro Panel

## CFC/HCFC-free Insulation Panel

People, nowadays, are becoming even more conscious of their impact on the environment. *Kingspan PalDuct Hydro* Panel was developed out of the concern for the increasing Ozone Depletion and Global Warming.

The *Kingspan PalDuct Hydro* system uses panels which comprise a polyisocyanurate (PIR) insulation core, that is manufactured with a CFC/HCFC-free blowing agent. The blowing agent used has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

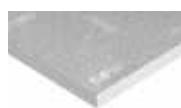
## Description

*Kingspan PalDuct Hydro* Panels comprise a fibre-free high performance rigid thermoset CFC/HCFC-free polyisocyanurate (PIR) insulation core, faced on both sides with an embossed aluminium foil. The aluminium foil is lacquered with corrosion resistant polymer varnish.

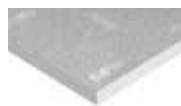
## Features

- Environmentally responsible insulation.
- CFC/HCFC-free.
- Manufactured with a blowing agent that had zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).
- Base material is impermeable to moisture.
- Creates an airtight seal, which helps to achieve low air-leakage rates and provide a constant temperature inside the building.

## Art PH 80 (Internal Use) / Art PH 200 (External Use)



**20 PH 80**



**30 PH 80**

Thickness (mm)	20 / 30
Density (kg/m <sup>3</sup> )	48 – 50
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020@10°C
Insulation Core	CFC/HCFC-free Polyisocyanurate (PIR)
Classification	EN 13501 – C,s2, d0 ASTM E84 NFPA 225 UL 723

# Kingspan **PalDuct** Eco Panel

## Antimicrobial Coated Panel

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.

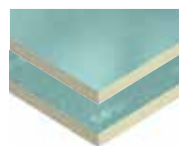
The HVAC industry has become to be increasingly concerned with the quality of air that is distributed through the ductwork in a building. Hygienic coatings for HVAC ductwork have been designed for use in locations such as food preparation areas, clinics, schools and hospitals, where it is important to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

## Description

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.

*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 antimicrobial coated with silver ion technology. The panels can be joined together with antimicrobial coated, green coloured aluminium and polymer profiles and adhesive materials to create a pre-insulated HVAC ductwork system that can resist the spread of bacteria.

## Art ES 80



**20 ES 80**

Thickness (mm)	21 – 30
Density (kg/m <sup>3</sup> )	48 – 50
Panel Dimension (mm)	4000 x 1200
Thermal Conductivity (W/m·K)	0.020
Aluminium Foil Finish	Embossed / Smooth
Antimicrobial and Antibacterial Reaction	ASTM G21 ASTM G22 ASTM E2180
Fire and Smoke Classification	Class "0" BS 476 Part 6 & 7 Class "A" ASTM E84

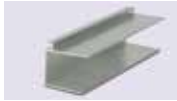
# Kingspan PalDuct Panel Accessories

## Art AC 10

**Polymer / Aluminium Invisible Profile**  
**Aluminium Joint Profile**



Thickness (mm)	20
Code	20 AC 10
Length (m)	4



Thickness (mm)	30
Code	30 AC 10
Length (m)	4

## Art ES 10

*Kingspan PalDuct Eco System Green Colour Polymer*  
**Invisible Profile**



Thickness (mm)	20
Code	20 ES 10
Length (m)	4

## Art AC 11

**H Bayonet in Polymer**  
**Aluminium Channel**



Thickness (mm)	20 / 30
Code	20 AC 11 30 AC 11
Length (m)	4



## Art AC 12

**Corner Cover in Polymer**  
**Steel Corner**



Code	20 AC 12 30 AC 12
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## Art ES 12

*Kingspan PalDuct Eco System Green Colour*  
**Cover in Polymer**



Code	20 ES 12
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## Art AC 13

**Corner Plate for Invisible Profile**



Thickness (mm)	20 / 30
Code	20 AC 13 30 AC 13



## Art AC 14

**Aluminium Profile**



Thickness (mm)	20 / 30
Code	20 AC 14 30 AC 14
Length (m)	4



## Art ES 14

*Kingspan PalDuct Eco System Green*  
**Aluminium U Profile**



Thickness (mm)	20
Code	20 ES 14
Length (m)	4

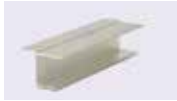
# Kingspan PalDuct Panel Accessories

## Art AC 15

### Aluminium Chair Profile



Thickness (mm)	20 / 30
Code	20 AC 15 30 AC 15
Length (m)	4



## Art ES 15

### Kingspan PalDuct Eco System Green Aluminium Chair Profile



Thickness (mm)	20 / 30
Code	20 ES 15 30 ES 15
Length (m)	4

## Art AC 16

### Aluminium F Profile

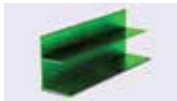


Thickness (mm)	20 / 30
Code	20 AC 16 30 AC 16



## Art ES 16

### Kingspan PalDuct Eco System Green Aluminium F Profile



Thickness (mm)	20
Code	20 ES 16
Length (m)	4

## Art AC 18

### Reinforcement Bar in Aluminium



Thickness (mm)	14
Code	AC 18
Length (m)	4

## Art AC 19

### Reinforcement Disc in Aluminium / Polymer



Code	AC 19
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## Art AC 20

### Duct Support



Code	AC 20
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## Art AC 21

### Tiger Connector



Code	AC 21
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## Art AC 22

### Tiger Closure



Code	AC 22
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## Art AC 19A

### Cross Fixing Device



Code	AC 19A
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## DTCM 02

### Screw for Stiffening Rod



Code	DTCM 02
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# Kingspan PalDuct Adhesive Material & Components

## Art M 23

Kingspan PalDuct Adhesive



Capacity	15 kg / Tin
Code	M 23

## Art VCD

Pre-insulated Volume Control Damper



Thickness (mm)	20 / 30
Code	VCD

## Art M 24

Aluminium Tape



Width	50 mm for 20 mm Panel
	75 mm for 30 mm Panel
Code	20 M 24 30 M 24



## Art DAC

Pre-insulated Access Door



Thickness (mm)	20 / 30
Code	DAC

## Art M 25

Kingspan PalDuct Sealant



Code	M 25
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## Art M 30

Gasket Self Adhesive



Code	M 30
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# Manual Fabrication Equipment

A complete set of professional hand tools and manual fabrication equipment has been specifically developed to enable the efficient and economical fabrication of ductwork. Ease of portability provides the option for on-site fabrication.

A full line of automated machinery is also available for high volume ductwork requirements.

## Art EM 27

### Portable Fabrication Table



Length (m)	4 x 1.2
Code	EM 27

## Art EM 28 / Art EM 29

### Aluminium Clamping Ruler



Length (m)	4
Code	EM 28



Length (m)	1.2
Code	EM 29



## Art EM 24

### Kingspan PalDuct Manual Fabrication Tool Kit



Left Cutter	45°
Right Cutter	45°
Double Blade Cutter	90°
Double Blade Cutter – 20 mm	45°
Compass	
Glue Spreading	Manual
Stiff Spatula	Aluminium
Manual Silicon Gun	
Measuring Tape	
Rivet Machine	
Rubber Hammer	
Knife	
Tape Maker	

## Art EM 30 / Art EM 31

### Square in Aluminium



Size (mm)	1200
Code	EM 30



Size (mm)	700
Code	EM 31

## Art EM 32

### Compass



Code	EM 32
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## Art EM 33

### Manual Bending Machine



Code	EM 33
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## Art EM 35

### Pneumatic Glue Spreader



Code	EM 35
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## Art EM 36

### Extended Silicon Tool



Code	EM 36
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## Art ST 42 / Art ST 43

### Double Blade Cutter



Size (mm)	20 / 30 45° Double Blade
Code	ST 42 (20 mm) ST 42 (30 mm)

## Art ST 44 / Art ST 45 / Art ST 46

### Single Blade Cutter



Size (mm)	20 / 30 90° Straight 45° Left 45° Right
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Code	ST 44 (90° Straight) ST 45 (45° Left) ST 46 (45° Right)
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## Art ST 48

### Stiff Spatula



Code	ST 48
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## Art ST 49

### Glue Spreader Manual



Code	ST 49
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## Art ST 50

### Tape Marker



Code	ST 50
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## DTCM 12

### Rubber Hammer



Code	DTCM 12
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# Automated Fabrication Equipment

Art EA 39

**Electric Bending Machine**



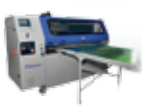
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Code	EA 39
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Art EA 40 A

*Kingspan* Ducting CNC Machine



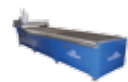
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Code	EA 40 A
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Art EA 40

*Kingspan* Ducting Supercut Machine



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Code	EA 40
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# Order Guide

## 20 mm Panel (Internal Use)

To produce 1,000 m<sup>2</sup> of *Kingspan PalDuct* Systems, the following is a list of material and accessories for a standard construction requirement:

Code	Description	UOM	Approx. Qty.
20P80	Panel 4000 x 1200 mm	m <sup>2</sup>	1,000
20AC10	Aluminum Invisible Profile	m	760
20AC11	H Bayonet in Polymer	m	400
20AC12	Corner Cover in Polymer	pc	900
20AC13	Corner Plate for Invisible Profile	pc	1,200
20AC14	Aluminum U Profile	m	80
20AC15	Aluminum Chair Profile	m	80
20AC16	Aluminum F Profile	m	80
M23	<i>Kingspan PalDuct</i> Adhesive	kg	90
20M24	Aluminum Tape	roll	150
M25	<i>Kingspan PalDuct</i> Sealant	tube	90

## 30 mm Panel (External Use)

To produce 1,000 m<sup>2</sup> of *Kingspan PalDuct* Systems, the following is a list of material and accessories for a standard construction requirement:

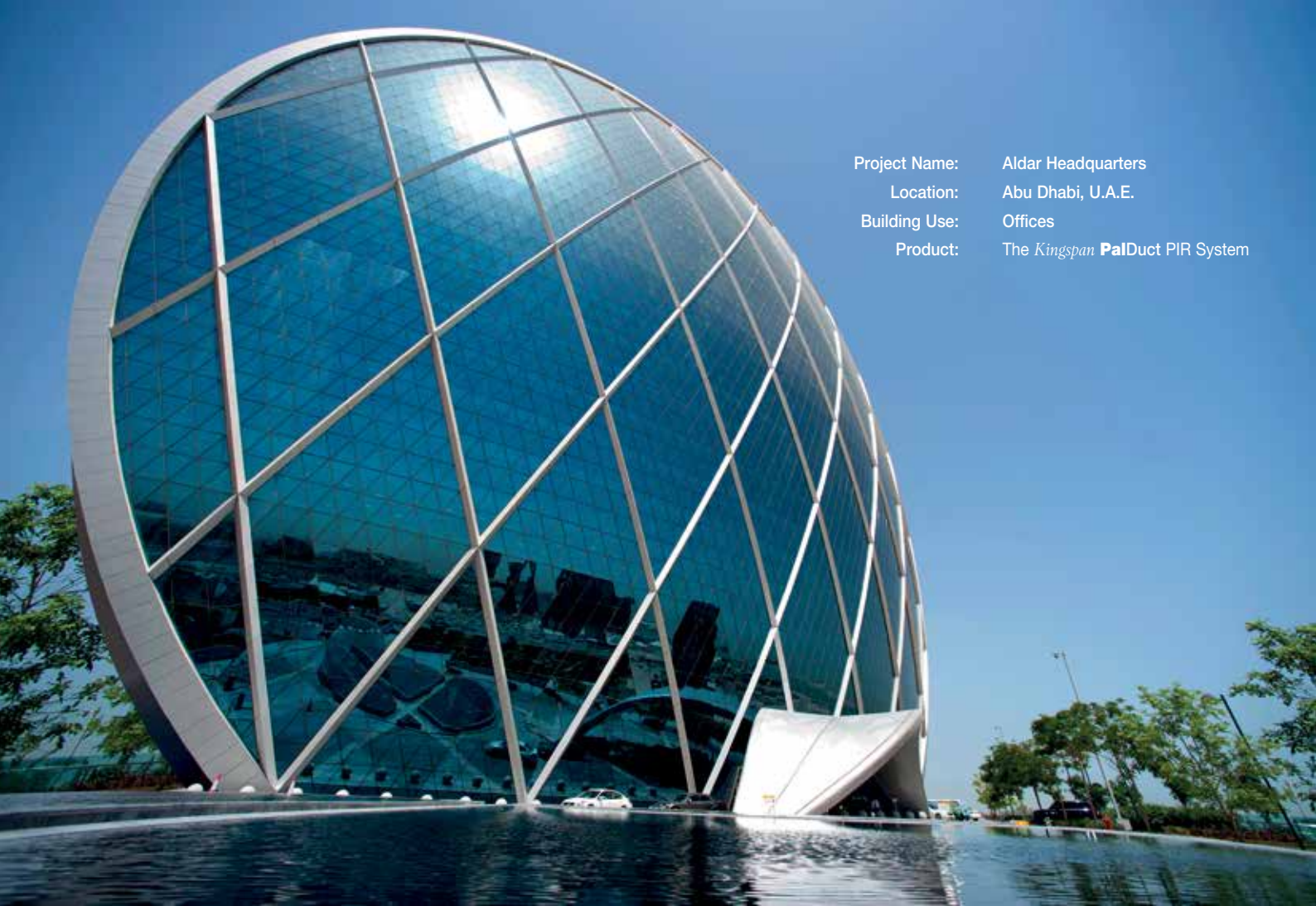
Code	Description	UOM	Approx. Qty.
30P200	Panel 4000 x 1200 mm	m <sup>2</sup>	1,000
30AC10	Aluminum Joint Profile	m	760
30AC11	Aluminum Channel	m	400
30AC12	Steel Corner	pc	1,500
30AC13	Corner Plate for Invisible Profile	pc	1,500
M30	Gasket	pc	400
30AC14	Aluminum U Profile	m	80
30AC15	Aluminum Chair Profile	m	80
30AC16	Aluminum F Profile	m	80
M23	<i>Kingspan PalDuct</i> Adhesive	kg	90
30M24	Aluminum Tape	roll	150
M25	<i>Kingspan PalDuct</i> Sealant	tube	90
AC18	Reinforcement Bar in Aluminum	m	120
AC19	Reinforcement Disc	pc	200



# Prestige Projects

Project Name: Nation Towers  
Location: Abu Dhabi, U.A.E.  
Building Use: Mixed Use  
Product: The *Kingspan PalDuct* PIR System  
and The *Kingspan PalDuct* Hydro System





Project Name: Aldar Headquarters  
Location: Abu Dhabi, U.A.E.  
Building Use: Offices  
Product: The *Kingspan PalDuct* PIR System



Project Name: Khalifa University  
Location: Abu Dhabi, U.A.E.  
Building Use: Education  
Product: The *Kingspan PalDuct* PIR System and  
The *Kingspan PalDuct* Hydro System

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[www.kingspaninsulation.com](http://www.kingspaninsulation.com)

Countries comprise: all of Africa; South and Central America except Mexico; the Caribbean; the Middle East and Asia as far north and east (and including) Turkey, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Afghanistan, Pakistan, India, Nepal, Bhutan and Bangladesh.

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