

EZ-R Phenolic Lined Duct

Phenolic Lined Ductwork for Outdoor or Indoor Use

Sheet Metal Connectors now offers EZ-R phenolic lined metal ductwork, which is easier to install and simpler to handle than traditional 3" doublewall insulated sheet metal. This HVAC lined duct comes pre-insulated, fully assembled, and ready to install in your indoor and outdoor applications. EZ-R Duct has high thermal resistance values and closed-cell insulation. EZ-R duct is available in R-8, R-12, R-16, and R-20 to meet your specification.

EZ-R duct and fittings combine two proven and familiar products to create a superior high R-value lined duct option. EZ-R is made from standard galvanized sheet metal with TDC connections and constructed to SMACNA 2020 Duct Construction Standards. It is then lined with Kingspan Koolduct liner and mechanically fastened and sealed. EZ-R can also be constructed with any of the other material options SMC has to offer including: paint grip, stainless steel, aluminum, polyvinyl coated, and G-90.

Phenolic Duct Insulation That's Convenient, Efficient, and Affordable

EZ-R Duct weighs significantly less than doublewall insulated sheet metal and achieves a higher R-Value in less space. R-12 phenolic panels are only 1.75" thick compared to 3" for R-12 fiberglass liner. With its high R values, virtually no air leakage, lightweight convenience, and shorter installation time, EZ-R is a good choice for a range of indoor and outdoor air distribution applications, especially budget-minded rooftop ductwork. EZ-R Duct is suitable for new and retrofit commercial, light industrial and institutional projects.

EZ-R reduces air-leakage rates to a fraction of standard rectangular sheet metal ductwork and is significant in three key areas: cutting costs, slashing energy use and trimming operational carbon dioxide emissions.

SMC has applied its 50+ years of fabrication experience to the phenolic duct market. With our new processes and equipment, we can fabricate high-quality EZ-R phenolic lined duct and custom fittings at an extremely reasonable cost compared to other systems. **Send us your takeoff today or enter it into PriceDuct for an instant quote.**

HVAC Duct Liner Insulation with the Highest R Values

With the highest R-value-to-size ratio in-market, phenolic panels are available in the following thicknesses and installed

R-values:

- R-8 (1x 1 3/16" Panel)
- R-12 (1 x 1 3/4" Panel)
- R-16 (2 x 1 3/16" Panel)
- R-20 (1 x 1 3/4" Panel, 1 x 1 3/16" Panel)
- R-24 (2 x 1 3/4" Panel)

EZ-R Duct Benefits Include:

- Highly competitive cost vs. other phenolic duct options AND doublewall
- Installs faster than doublewall duct, saving time and money
- Available for bidding and purchasing on PriceDuct
- Saves energy by reducing air leakage, all EZ-R duct is thoroughly sealed
- Can be easily modified and adjusted to deal with onsite design changes
- Fiber-free insulation core to minimize loose fibers entering the airstream

Compliance

EZ-R phenolic lined duct meets and exceeds 2020 SMACNA duct construction standards and requirements. This duct insulation, which is UL listed as a Class 1 Air Duct Standard for Safety UL 181, also complies with NFPA Standards 90A and 90B.

All SMC custom sheet metal products, including EZ-R Duct, are designed and manufactured in our yellow-label union shop.



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EZ-R Rectangular Duct Construction

Sheet Metal Connectors, Inc. (SMC) TDC, Slip/Drive and Raw

Sheet Metal Connectors, Inc. rectangular duct and fittings are one part of our complete line of HVAC products. SMC manufactures coil line ductwork in 4' lengths. All ductwork comes standard with stiffening beads. Ductwork is fabricated with either Snap Lock, Pittsburgh or Welded longitudinal seams. Sealant is available in the seams upon request. Rectangular ductwork is manufactured in three different styles.

They are as follows:

Wrap Around Duct / L-Shape Duct / 4 Piece Duct. All sizes shall be listed using outside dimensions. Please refer to the following charts for specific materials, gauges, and end treatments.

TDC Ductwork and Fittings

SMACNA recommended TDC™ duct is a 4-bolt system with a difference. Instead of cutting, assembling and installing a separate flange onto the ductwork, the TDC flange is roll formed directly onto the duct. This provides a solid metal connection that reduces leakage which is why the TDC system is the best for minimum leakage application. A TDC assembly instruction manual is available upon request.

MATERIAL	THICKNESS	ASTM	TYPE	DUCT	END TREATMENT
Galvanized	26 - 18 gauge	A-653	G60-G90	44 1/2"	TDC
Paint Grip	26 - 18 gauge	A-653	A60	44 1/2"	TDC
PVS	26 - 18 gauge	A-653	4 x 1, 4 x 4	44 1/2"	TDC
Aluminum	.032 - .050	B-316	3003 H-14	44 1/2"	TDC
Stainless Steel	24 - 20 gauge	A-240	304 or 316	44 1/2"	TDC

EZ-R Rectangular Fittings

Sheet Metal Connectors, Inc. manufactures EZ-R rectangular fittings in most sizes and configurations. Fittings are manufactured on our state of the art fabrication equipment. All fittings are fabricated with stiffening beads on duct sizes 19" wide and larger which have more than 10 square feet of unbraced panel. Fittings shall be beaded unless duct will have an insulation covering or an acoustical liner. This requirement is applicable to 20 gauge or less in thickness and 3" W.G. or less. Most fittings are fabricated with Pittsburgh seams. All fittings come completely assembled with all accessories (reinforcement, vane & rail, etc...) installed. Completely assembled and sealed.

Turning Vane and Rail

SMC manufactures several types of turning vane and E-Z rail. Turning vane and E-Z rail are recommended for square throat elbows and tees. When using turning vane and E-Z rail performance is greatly enhanced in the HVAC duct system.

Test data is available upon request.

Maximum Unsupported Vane Length

- 4" single turning vane36" maximum length
- 2" double turning vane48" maximum length
- 4" double turning vane72" maximum length
- 4" acoustical vane72" maximum length

When exceeding maximum vane length, vanes can be installed in sections or a tie rod can be tack welded to the face of the turning vane.

Transverse Joint and Intermediate Reinforcement

SMC manufactures many different types of reinforcement. SMC's most popular types are as follows:

- Tie Rod Reinforcement: threaded inserts installed into each end of thin wall (emt) conduit. These are installed internally at both the joint and/or intermediate duct spacing and sealed externally to prevent leakage.
- R-Angle Reinforcement: roll formed pre-punched angle iron reinforcement. Tack welded to duct to prevent leakage.



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EZ-R Liner Data

Operating Recommendations & Limitations

It is recommended that ductwork fabricated from Kingspan KoolDuct® is used for operation as supply, return, fresh and exhaust air ductwork for heating, ventilation and air-conditioning systems within the following limits:

Air Velocity(Max.)	5000 fpm / 25.4 m/s
Design Pressure (Max.)*	Positive: 4 in.w.g. / 1000 Pa Negative: 3 in.w.g. / 750 Pa
Temperature	Internal air temperature of -15°F to +185°F / -26°C to 85 °C during continuous operation.
Size	Unlimited (provided that recommended Kingspan KoolDuct® System fabrication techniques and installation procedures are strictly observed).

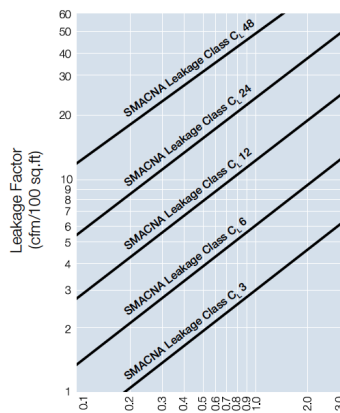
*These are maximum values and vary depending upon both the coupling system and the size of the ductwork. Refer to The Kingspan KoolDuct® System Fabrication Manual series of publications for details (see rear cover). NB 'Mean Air Velocity' refers to the design air flow rate related to the cross sectional area of the ductwork. 'Design Pressure' relates to the actual total pressure of the relevant section of ductwork and not the fan static pressure. 'Total Pressure' is a combination of both static and dynamic pressures.

Ductwork fabricated from The Kingspan KoolDuct® System should not be used in the following applications:

- conveyance of solids;
- fire resistant ductwork;
- kitchen / grease hood exhaust systems;
- chemical, fume or smoke exhaust systems;
- where combustible matter readily collects inside the ductwork;
- adjacent to any mechanical / electrical sources of extreme heat;
- where the failure of automatic control equipment may give rise to extreme temperatures; and
- outdoor / underground use without mechanical and / or weather protection;

**Pressure & Air-leakage
Air-leakage Classes & Limits**

Ductwork fabricated from The Kingspan KoolDuct® System is designed to withstand a maximum static pressure of 4 in.w.g. / 1000 Pa, and can easily achieve SMACNA Air-leakage Class 3 with the 4-bolt, the aluminum grip and Tiger Clip coupling systems. The graph shows the air-leakage limits for SMACNA Air-leakage Classes 3 to 48, over the range of pressures from 0 to 4 in.w.g. / 0 to 1000 Pa.



(Based on SMACNA HVAC Air Duct Leakage Test Manual, 1985 Edition, Figure 4-1 'Duct Leakage Classification')

Suitable Finishes

Standard

Factory-applied aluminum foil vapor barrier facing.

Mechanical & Weather Protection

Aluminum sheet; aluminum-zinc alloy coated steel sheet; heavy-duty selfadhesive laminate; synthetic elastomeric jacketing systems; reinforcing glass / synthetic cloth embedded between two coats of appropriate coating; or UV resistant glass reinforced polyester / epoxy (GRP / GRE) cladding systems (all applied in accordance with manufacturer recommendations and project specification requirements).

Maintenance & Cleaning

Ductwork fabricated from The Kingspan KoolDuct® System can be cleaned to industry standards, as required by NADCA ACR: 2006 (National Air Duct Cleaners Association: Assessment, Cleaning & Restoration of HVAC Systems), using many of the dry and non-abrasive cleaning methods offered through professional HVAC ductwork cleaning specialists. For suitable methods, refer to The Kingspan KoolDuct® System – A Specifier’s Guide or Fabrication Manual series of publications.

Kingspan KoolDuct® Panels

Description

Kingspan KoolDuct® panels comprise a fiber-free rigid thermoset phenolic insulation core, faced on both sides with a protective and durable 1 mil / 25.4 micron aluminum foil that is reinforced with a 0.2" / 5 mm glass scrim.

Kingspan KoolDuct® panels are available with branded silver aluminum foil on one side and plain silver aluminum foil on the other. Both facings are autohe- sively bonded to the core during manufacture.



The core is manufactured with a CFC/HCFC-free blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).



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EZ-R Liner Data

GENERAL PROPERTIES	
Property	Typical Value
Standard Dimensions:	Length: 12.89 ft / 3930 mm Width: 3.94 ft / 1200 mm Thickness: 7/8", 1 3/16" & 1 25/32 / 22 mm, 30 mm & 45 mm
Nominal Density Range of Insulation	N3.43-3.75 pcf / 55-60 kg/m ³
Closed Cell Content	≥ 90%
Minimum Compressive Strength at 10% Compression (BS EN 826: 1996):	>25 psi / >175 kPa
Thermal Resistance Material R-value: Installed & Out of Package (ASTM C 518)	7/8": 6.0 ft ² .hr.°F/Btu / 22 mm: 1.047 m ² .K/W 1 3/16": 8.1 ft ² .hr.°F/Btu / 30 mm: 1.428 m ² .K/W 1 25/32": 12.0 ft ² .hr.°F/Btu / 45 mm: 2.15 m ² .K/W
Operating Temperature Limits	-4°F to +176°F / -20°C to +80°C

Fire & Smoke Performance

When subjected to the Underwriters Laboratories Fire Test Standards specified in the table, Kingspan KoolDuct® panels, faced with branded silver aluminum foil on one side and plain silver aluminum foil on the other, have achieved the results shown.

Standard	Result
UL 723 (Test for Surface Burning Characteristics of Building Materials)	Flame spread / smoke developed indices: ≤ 25/50
UL 181 (Factory Made Air Ducts & Air Connectors)	Burning (as part of fabricated duct section): Pass Flame penetration: 30 Minutes

LEED®

Ductwork fabricated from the Kingspan KoolDuct® System can contribute points towards achieving credits in the LEED® (Leadership in Energy & Environmental Design) rating systems developed by USGBC (United States Green Building Council).

Compliance

UL (Underwriters Laboratories)

Ductwork fabricated from The Kingspan KoolDuct® System is UL Listed as a Class 1 Air Duct, to Standard for Safety UL 181 (Factory Made Air Ducts & Air Connectors), when fabricated to a specification clearly defined by UL.



The UL Listing requires that ductwork is fabricated using:

- 25/32"-1 25/32" / 20-45 mm Kingspan KoolDuct® panels faced with silver aluminum foil, autohesively bonded to the insulation core, on both sides during their manufacture at Kingspan Insulation's Pembridge, UK or Castleblayney Ireland manufacturing facility.
- the 4-bolt, aluminum grip flange and / or Tiger Clip couplings systems;
- a 2 1/2" / 63 mm wide (minimum) aluminum foil vapor barrier-tape that is UL Listed A-P to Standard for Safety UL 181 A(- Standard for Closure Systems for Use With Rigid Air Ducts); and
- Kingspan High Performance Silicone Sealant / Caulk.

NFPA (National Fire Protection Assembly)

UL Listed ductwork fabricated from The Kingspan KoolDuct® System meets the requirements of Class 1 Rigid Air Ducts, as defined by:

- 90A (Standard for the Installation of Air-Conditioning & Ventilating Systems); and
- 90B (Standard for Warm Air Heating & Air-Conditioning Systems).

ANSI / ASHRAE / IESNA (American National Standards Institute (ANSI) American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE) Illuminating Engineering Society of North America (IESNA) Standards)

- 7/8" & 1 3/16" / 22 mm & 30 mm Kingspan KoolDuct® panels meet or exceed the minimum duct insulation R-value requirements of 90.1: 2004, 2007 & 2010 (Energy Standard for Buildings except Low-Rise Residential Buildings), for heating and cooling supply and return ducts. ICC

(International Code Council)

- IECC (International Energy Conservation Codes): 7/8" & 1 3/16" / 22 mm & 30 mm Kingspan KoolDuct® panels meet the minimum duct insulation R-value requirements for supply and return air ducts and plenums.
- IMC (International Mechanical Codes): UL Listed ductwork fabricated from The Kingspan KoolDuct® System satisfies the requirements for non-metallic ducts constructed with Class 1 duct material, whilst Kingspan KoolDuct® panels exceed the flame spread & smoke developed requirements for foam plastic insulation used as interior trim in plenums.
- IBC (International Building Codes): UL Listed ductwork fabricated from The Kingspan KoolDuct® System satisfies the requirements for factory-made air ducts, constructed with Class 1 duct material.

Health & Safety

Kingspan KoolDuct® panels have a fiber-free insulation core and are odorless, non-tainting, non-deleterious, and chemically inert and safe to use. Further information is contained in the Kingspan KoolDuct® Panel Product Safety Information Sheet.

NB The reflective surface on this product (Kingspan KoolDuct® panels and ductwork fabricated from the Kingspan KoolDuct® System) is designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet (UV) light. Therefore, if this product is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream. The reflective facing used on this product can be slippery underfoot when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard. Warning – do not stand on or otherwise support your weight on this product.



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EZ-R Duct Standards

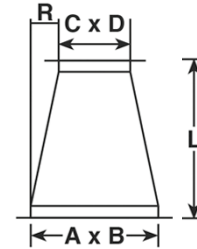
The below standards and minimums will be applied to all R-8 and R-12 EZ-R Duct straight duct and fittings.

General Standards

- All pieces full assembled
- Pressure Class +2" w.g. standard
- Material - Galvanized G-60 or better (Paint Grip available)
- All duct and fittings are manually sealed
- End Treatments
 - TDC standard
 - J-Flange available for cut joints

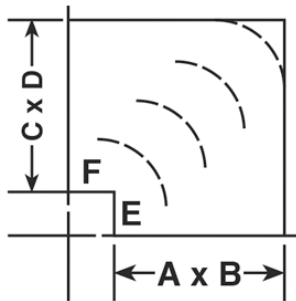
Transitions

- Length - 30° max slope
- 4" minimum straight on each end
- Minimum length - 12"
- Centerline left to right
- Flat on bottom



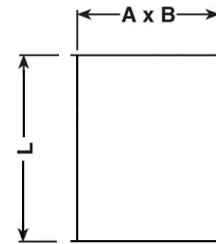
Elbows

- No radius elbows
- All elbows are square throat and heel
- Supply elbows include turning vane if noted
- First dimension listed is cheek of elbow
- 6"x 6" Standard ID throat
- 6"x 6" Minimum ID throat
- Singlewall vane standard
- No cut joints



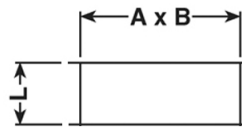
Straight Duct

- Standard length - 44.25" flange to flange
- Minimum length - 12"
- Field cut joints come with J-Flange frame loose



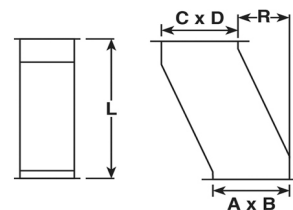
Taps

- Straight tap standard
- Increased tap available
- 6" long standard for straight
- 14" long, 6" increase standard for increased
- 1" flange out standard connection



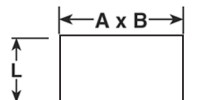
Offsets

- Mitered offset standard
- Radius not available
- Length - 30° max slope



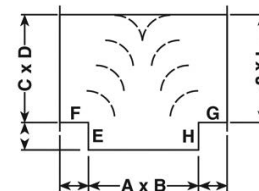
End Caps

- Depth = 2 x insulation thickness
- TDC Connection



90 Degree Tees

- No radius tees
- 6"x6" Minimum ID throat
- Singlewall vane standard



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