Description - Tuff Duct is the answer to all your outdoor ductwork needs. This weatherproof and watertight ductwork system encompasses rigid board Phenolic Insulation, which boasts the highest R value of any insulation within the industry. With its "Tuff" baked on precoat and galvanized steel outer shell, Tuff Duct is designed to endure extreme outdoor environments. The Sherwin-Williams WeatherXL coating on the outer shell has a 40-year warranty and is also available in a variety of colors that you can select from when designing your project to create an aesthetically appealing exterior ductwork system.

Product Advantages/ Standards

- Patented Waterproof Connection Cover/Corners
- Sherwin Williams Synthetic Modified Polyester Coating
- Kingspan Kool Duct Insulation
- Built to SMACNA Standards
- Sheetmetal Standard Installation Practices
- Can be field modified to comply with accessory items.
- All Connection Hardware

Project ID:	Project Name:	Date Submitted:	Engineer:

Interior Options & Configuration

R6 Insulation ☐ R8 Insulation ☐ R12 Insulation ☐ R14 Insulation ☐

R16 Insulation ☐ R18 Insulation ☐ R20 Insulation ☐ R24 Insulation ☐

Interior Liners

Aluminum ☐ Stainless Steel ☐ Galvanized G90 ☐

Exterior Options & Configuration

Pressure Class +,- 2" WG ☐ +,- 4" WG ☐ +,- 6" WG ☐ +,- 10" WG ☐

TDC Connection Flange ☐ Pre-Manufactured Connection Flange ☐

Optional Sloped Top ☐ Standard G90 Gray ☐ Standard G90 White ☐

Aluminum Mill Finish ☐ Galvanized Mill Finish ☐ Stainless Steel Mill Finish ☐

Custom Color Options Available Upon Request for G90 Only: Custom Color _____

Product Data Highlights

- ASTMB117 Salt Spray Rating = 1,000 HRS
- UL 181 Class 1 Air Duct
- SMACNA Seal Class A
- National Fire Protective Assembly= Class 1
- Smooth Non-Fibrous Vapor Barrier
- 25 Year Standard Warranty

Tuff Cap/ Corner

Our patented Tuff Cap and Corner design has revolutionized rectangular duct installations with providing a watertight and leakproof seal to fundamentally keep out any excess water that would contribute to the development of mold and bacteria within duct that the airstream travels though.

General Testing and Product Certifications

Inner Liner: System shall incorporate a fortified inner liner with included testing and passing the following:

- ASTM C 423 noise reduction
- ASTM C 518: 2004, Standard Test Method for Steady–State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM C 1071 for erosion
- ASTM E 84 tested, Tunnel Test, Does not exceed 25 flame spread, 50 smoke developed.
- ASTM E 96/E 96M Procedure A for permeability
- ASTM E2257 Standard Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies
- NFPA Compliance:
  NFPA 90A, "Installation of Air Conditioning and Ventilating Systems"
  NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems"
  NFPA 255, "Standard Method of Test of Surface Burning Characteristics of Building Materials
- NRTL product approval, (Subpart S of 29 CFR Part 1910, OSHA)
- UL 181 Standard for Factory-Made Air Ducts and Air Connectors
- UL 723 Test for Surface Burning Characteristics of Building Materials

USA TUFF DUCT SYSTEMS
tuffductsystems.com

Operation/ Procedure

- Tuff Duct is designed to be utilized in applications that include Supply, Return, Fresh Air, and Exhaust Air movement throughout any and all exterior air ducts.

Installation/Fabrication

- Prefabricated joints, seams, transitions, taps, elbows, tees, and access doors according to Manufacturer's instructions.
- Prefabricated radius heel 45-degree throat elbow (SMACNA Figure 4-2, page 4.4).
- Prefabricated ductwork shall include 5 inches of straight on the end of each connecting piece, leaving room to install the connection cover.
- Fabricated duct segments utilizing internal and external sealed Pittsburgh seams. Internal seams will be sealed with VOC silicone. Each duct segment will be factory supplied with either 4-bolt TDC or slip-on flange in accordance with manufacturer's submittal package.
- Applied internal and external duct reinforcement to prevent swelling and narrowing of duct based on positive and negative pressure guidelines provided by the manufacturer.
- Designed and fabricated duct segments and fittings will be in compliance with latest edition SMACNA HVAC Duct Construction Standards.
- Both positive and negative ductwork and fittings shall be constructed to incorporate a UL Listed – Class 1 air duct to Standard for Safety UL 181 liner with an exterior pre-coated galvanized shell—with options for aluminum and stainless—for permanent protection against water intrusion.
- Ductwork designed to comply with contract documents as provided. Any requirements beyond the contract documents must be identified by purchaser/engineer/end user.

Outer Metal Jacket Data

Precoated Galvanized Information

- The Tuff Duct pre-coated galvanized outer metal jacket selection is:
  - .20-.30 Mil Sherwin-Williams Valspar Primer baked on finish
  - .70-.80 Mil Sherwin Williams Valspar Polyester Top Coat

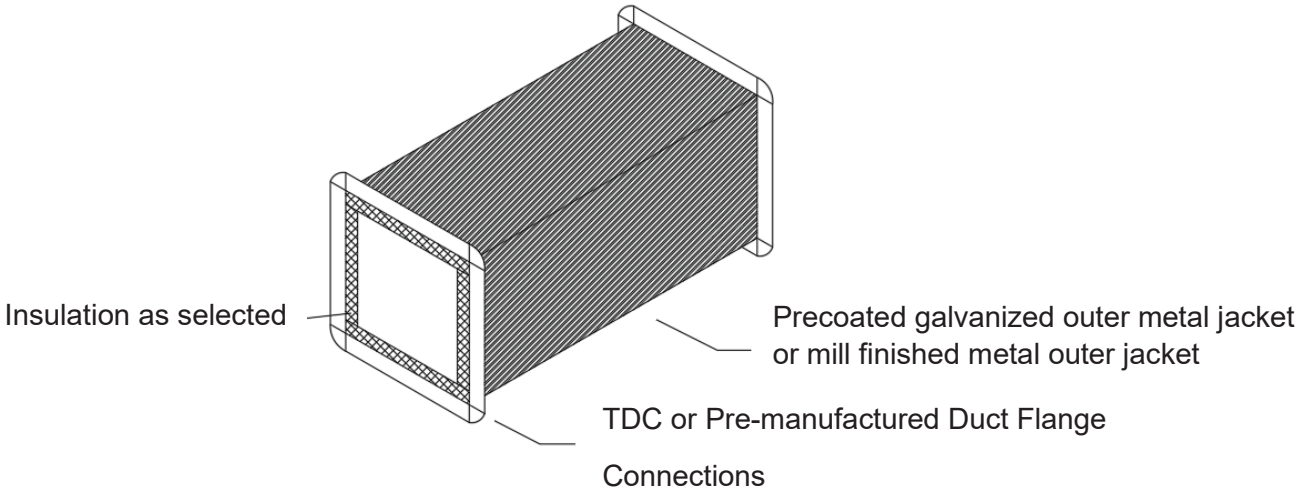
- Colors Available
  - Standard Silver Gray Optional Bright White
  - Custom Colors are also available
- Precoated finish data sheets are in the data sheet portion of this document

Mill Finished Metal Information

- G90 Galvanized
- H3003 Aluminum
- Stainless Steel 304 or 316

Tuff Duct Construction Information

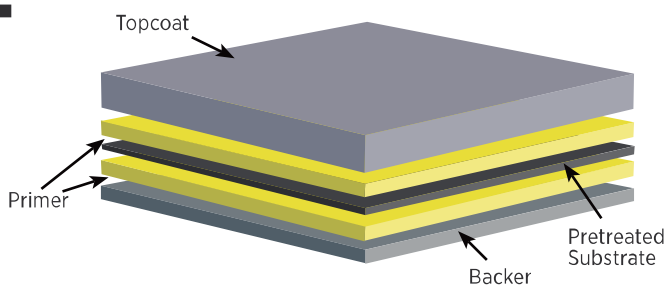
- Tuff Duct is built to project specific pressure class requirements following SMACNA standards (Chapter 2 Section 52 Table 2-20), Seal Class A



TUFF DUCT CONSTRUCTION DETAIL(ISO)

COMMITMENT TO QUALITY

Our coatings are trusted and field-proven through rigorous testing, providing key benefits to our customers.



SMP COIL COATING SYSTEM

Number of Coats	Dry Film Thickness (DFT)		Total Topside DFT:	
	Primer	Topcoat		Backer
2-Coat	0.2–0.3 mils	0.7–0.8 mils	**0.9–1.1 mils**	0.2–0.3 mils

WEATHERXL™ AND WEATHERXL CRINKLE FINISH PERFORMANCE TESTING

Industry Specifications Compliance	**AAMA[1] 2604-17A Requirements**	Voluntary Specification, Performance Requirements and Test Procedures for High-Performing Organic Coatings on Architectural Aluminum Extrusions and Panels
Substrates	Pretreated Galvalume, Hot-Dipped Galvinized (HDG) steel and aluminium	

PHYSICAL TESTING	ASTM[2] TEST METHOD	AAMA[1] 2604-17A REQUIRED TEST RESULT
Falling Sand Abrasion	ASTM D 968	35 ± 10 liters
Film Adhesion	ASTM D 3359	No removal of film under tape in the cross-hatched area. (Dry, Wet, Boiling Water)
Surface Burning Characteristics	ASTM E 84	Flame Spread Index: Class A. Smoke Developed Index: Class A.
Graffiti Resistance	ASTM D 6578/D 6578M	Meets and exceeds
Humidity Resistance	ASTM D 2247: 100% RH at 100° F for 2,000 hours	Galvalume or HDG: No field blisters Aluminum: No field blisters
Impact Resistance (direct)	ASTM D 2794	Galvalme or HDG: 3x metal thickness inch-pound, no loss of adhesion
Pencil Hardness	ASTM D 3363	HB to 2H.
Salt Spray	ASTM B 117: 1,000 Hours 3,000 Hours	Galvalume or HDG: Creep from scribe ≤ 1/8" (3mm), none or few #8 blisters. Aluminum: Creep from scribe ≤ 1/8" (3mm), few#8 blisters.
Specular Gloss 60°	ASTM D 523	**WeatherXL:** 20-80 **WeatherXL Crinkle Finish:** <5 @ 60 degrees
T-Bends	ASTM D 4145[3]	2T-4T, no loss of adhesion.

SOUTH FLORIDA EXPOSURE TESTING 45 degree southern exposure for panel racking

Color	ASTM D 2244	No more than 5Δ E Hunter units at 90° vertical angle and 6Δ E non-vertical at 20 years.
Chalk	ASTM D 4214	Rating no less than 8 at 90° angle and 7 at non-vertical angle at 20 years.
Film Integrity	ASTM G 7	25 years, no blisters, peeling or cracking

[1]American Architectural Manufacturers Association. [2]American Society for Testing and Materials. [3]WeatherXL is not designed to bridge cracks in the substrate. WeatherXL coatings will generally meet the requirements for most post-painted fabrication processes. However, variations in metal quality, thickness or cleaning/pretreatment applications can lead to diminished flexibility.

For details and health, safety and handling information, Material Safety Data Sheets (MSDS) are available at coil.sherwin.com. WeatherXL™ is a registered trademark of Sherwin-Williams. Galvalume® is a registered trademark of BIEC International, Inc.

SHERWIN-WILLIAMS. Coil Coatings

coil.sherwin.com or call (888) 306-2645

SW-CC-2,200-9-2018

Internal Insulation Data

Phenolic Insulation Liner Information

- Phenolic duct liner (Kingspan Kool Duct Panels) provides a fiber free insulation option, installed per manufacturer's requirements.
- Phenolic liner is a rigid insulation core with a protective 1 mil aluminum foil.
- Phenolic liner has an internal temperature rating of -15 to +185 Fahrenheit
- Phenolic liner thicknesses can be combined creating extremely high R Values, for instances combing 2 layers of the 1 ¾" thickness will achieve an R24 value. Phenolic liner available in:
    - 7/8" =R6
    - 1-3/16" =R8
    - 1-3/4" =R12
- Phenolic liner is sealed in the corners and taped to the connection flange.
- Phenolic product data sheet is in the data sheet portion of this document.

Duct Liner Information

- Duct liner is a flexible bonded fibrous glass with thermosetting resin.
- Duct liner contains an EPA-registered anti-microbial agent.
- Duct liner is available in the following thicknesses, R-values, and densities:
    - 1" =R4.2 / 1.5 pcf
    - 1.5 " =R6.3 / 1.5 pcf
    - 2" =R8.0 / 1.5 pcf
- Duct liner product data sheet is in the data sheet portion of this document.

Insulation

Tenth Issue April 2018

The Kingspan KoolDuct® System

SUBMITTAL SHEET

Job Reference	Job Name	Job Location

Submitted To

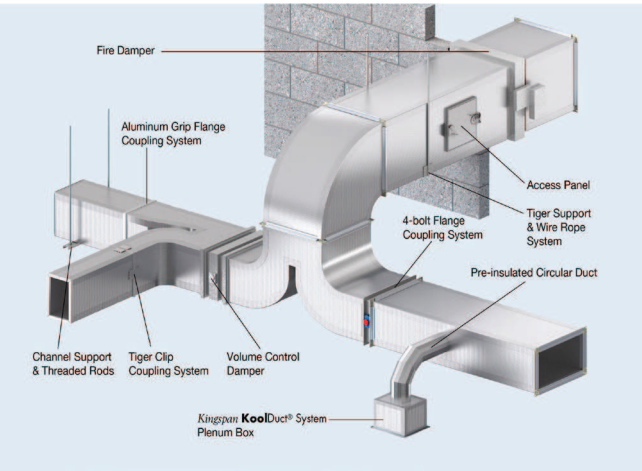
Date	Phone

Submitted By

Date	Phone

Introduction

The *Kingspan* **Kool**Duct® System is an innovative, lightweight, pre-insulated, rectangular HVAC ductwork system. It comprises premium performance *Kingspan* **Kool**Duct® panels, fabrication methods, coupling systems and a complete line of accessories to produce pre-insulated rectangular ductwork in sections up to 13 ft / 3.93 m long.



Application Suitability

The *Kingspan* **Kool**Duct® System is designed for use in building services / HVAC applications. It is suitable for both new build and retrofit projects in the residential, commercial, public, light industrial and leisure sectors. It is especially suitable for use in non–ferrous applications and on high specification projects where non–fibrous insulants may be preferred, for instance: the food, beverage and pharmaceutical industries; clean air and hygiene controlled environments; high relative humidity environments; swimming pools; pools; and sterile areas of hospitals and communication / server rooms in data centers. Ductwork fabricated from The *Kingspan* **Kool**Duct® System can be installed internally, externally, visibly mounted and concealed above false ceilings, below raised floors or within confined enclosures such as pre-fabricated modules.

Ductwork Design & Frictional Resistance

The design of ductwork, including fittings, fabricated from The *Kingspan* **Kool**Duct® System, follows the same calculation principles and duct sizing methods as are used for rectangular ductwork constructed from galvanized sheet steel. The frictional resistance is comparable with that of galvanized sheet steel ductwork.

As a result, frictional pressure drop data for galvanized sheet steel ductwork may also be used when designing ductwork systems fabricated from The *Kingspan* **Kool**Duct® System.

Operating Recommendations & Limitations

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

Mean 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* **Kool**Duct® 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* **Kool**Duct® System should not be used in the following applications:

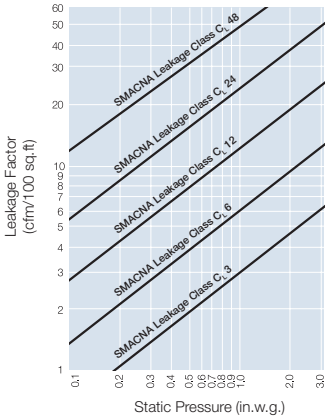
- conveyance of solids;
- fire resistant ductwork;
- kitchen / grease hood exhaust systems;
- chemical, fume or smoke exhaust systems;
- where combustible matter readily collects inside the ductwork;
- adjacent to any mechanical / electrical sources of extreme heat;
- where the failure of automatic control 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* **Kool**Duct® 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')

Commissioning

The test pressure should not exceed the design pressure to which ductwork from The *Kingspan* **Kool**Duct® System has been fabricated. When pressure or air-leakage testing is known to be necessary, ductwork should be fabricated to withstand the test pressure, if greater than the design pressure.

Fabrication & Installation

Ductwork from The *Kingspan* **Kool**Duct® System should only be fabricated by specially trained fabricators who have completed The *Kingspan* **Kool**Duct® System Training Course. It is recommended that ductwork is fabricated in accordance with the methods detailed in The *Kingspan* **Kool**Duct® System Fabrication Manual series of publications or with SMACNA Phenolic Duct Construction Standards. Ductwork should be installed using best practice methods in accordance with industry accepted standards.

Suitable Finishes

Standard

Factory-applied aluminum foil vapor barrier facing.

Cosmetic

Paint (consideration should be given to any effect that it might have on the thermal and fire performance of the finished ductwork).

Mechanical & Weather Protection

Aluminum sheet; aluminum-zinc alloy coated steel sheet; heavy-duty self-adhesive 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* **Kool**Duct® 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* **Kool**Duct® System – A Specifier's Guide or Fabrication Manual series of publications.

Kingspan **Kool**Duct® Panels

Description

Kingspan **Kool**Duct® 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 **Kool**Duct® panels are available with branded silver aluminum foil on one side and plain silver aluminum foil on the other. Both facings are autohesively 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).

Fiber-free Core

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	3.43-3.75 pcf / 55-60 kg/m^3
Closed Cell Content	> 90%
Minimum Compressive Strength at 10% Compression (BS EN 826: 1996):	29 psi / 200 kPa
Thermal Conductivity (k-value / λ-value) at 50-74°F / 10-23°C Mean (ASTM C 518):	0.146 Btu·in/ft^2·hr·°F / 0.021 W/m·K
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	-15°F to +185°F / -26°C to +85°C

Fire & Smoke Performance

When subjected to the Underwriters Laboratories Fire Test Standards specified in the table, *Kingspan* **Kool**Duct® 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

Management Systems' Standards

Kingspan **Kool**Duct® panels are manufactured to the highest standards under a management system certified to ISO 9001: 2008, ISO 14001: 2004 and BS OHSAS 18001: 2007 and ISO 50001:2011.

LEED®

Ductwork fabricated from The *Kingspan* **Kool**Duct® System can contribute points towards achieving credits, including pilot credits, in many of the LEED® (Leadership in Energy & Environmental Design) rating systems, developed by the USGBC (United States Green Building Council).

Compliance

UL (Underwriters Laboratories)

Ductwork fabricated from The *Kingspan* **Kool**Duct® 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* **Kool**Duct® panels faced with silver aluminum foil, autohesively bonded to the insulation core, on both sides during their manufacture at Kingspan Insulation's Pembridge, UK manufacturing facility.
- the 4-bolt, aluminum grip flange and / or Tiger Clip coupling 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* **Kool**Duct® 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* **Kool**Duct® 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* **Kool**Duct® 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* **Kool**Duct® System satisfies the requirements for non-metallic ducts constructed with Class 1 duct material, whilst *Kingspan* **Kool**Duct® 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* **Kool**Duct® System satisfies the requirements for factory-made air ducts, constructed with Class 1 duct material.

Health & Safety

Kingspan **Kool**Duct® 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* **Kool**Duct® Panel Product Safety Information Sheet.

NB The reflective surface on this product (Kingspan **Kool**Duct® *panels and ductwork fabricated from the Kingspan* **Kool**Duct® 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.*

Contact Details

Sales and Technical Support
Tel 1 800 241 4402
Fax 1 678 589 7325
email info@kingspaninsulation.us
website www.kingspaninsulation.us

Kingspan Insulation LLC believes the information and recommendations herein to be accurate and reliable. However, since use conditions are not within its control, Kingspan Insulation LLC does not guarantee results from use of such products or other information herein and disclaims all liability from any resulting damage or loss. No warranty, express or implied, is given as to the merchantability, fitness for particular purpose, or otherwise with respect to the products referred to.

For more information on specific building product recommendations and product data, contact your Kingspan Insulation LLC representative.

For the most current installation guidelines and compliance information go to www.kingspaninsulation.us.

Silver Associate MEMBER SMACNA

Kingspan®

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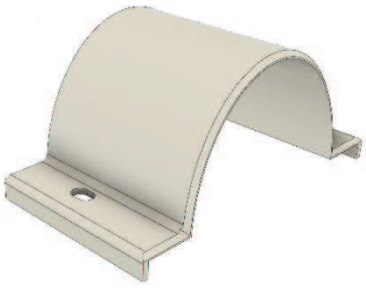
www.kingspaninsulation.us
www.kingspaninsulation.ca

SF-KDUCT-1804

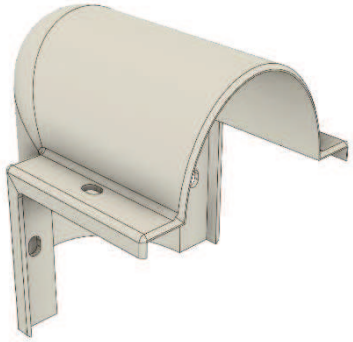
Connection Cover Data

- Tuff Duct comes with a watertight connection cover that will prevent water from seeping into the duct through the connections. The Tuff Cap connection cover is very easy to install.
- Tuff Cap connection covers are made of high impact PVC with UV stabilizers added for protection from the suns ultra-violet rays. Tuff Cap connection covers can be factory cut to length or ordered in 12’ stock lengths for easy field installation.
- Tuff Cap connection covers are color matched to the outer jacket coated color. When mill finished materials are used the standard gray color is provided for the Tuff Cap.

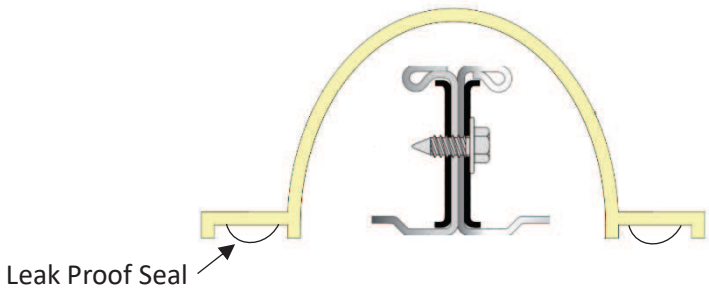
Tuff Cap Cover



Tuff Cap Coupling

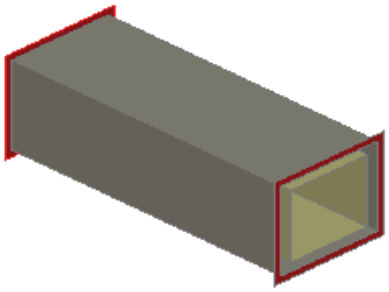


Tuff Cap Corner



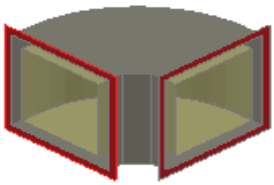
Tuff Cap on Connection

Types of Fittings



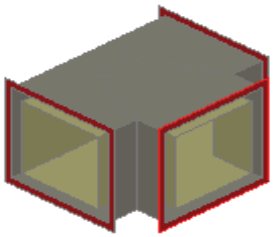
Straight Joint

46.75” Standard Length

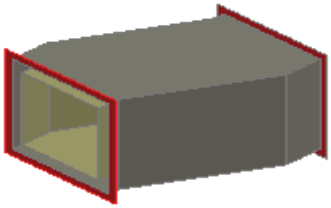


Square Elbow

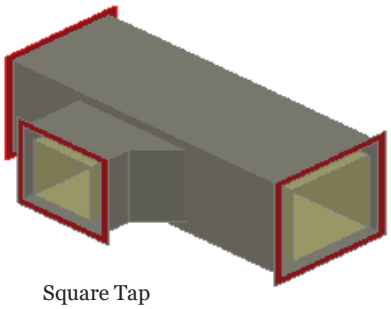
Radius Heel, Mitered 45 Degree Throat



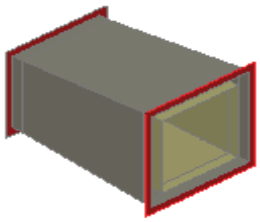
Square Tee



Square Offset



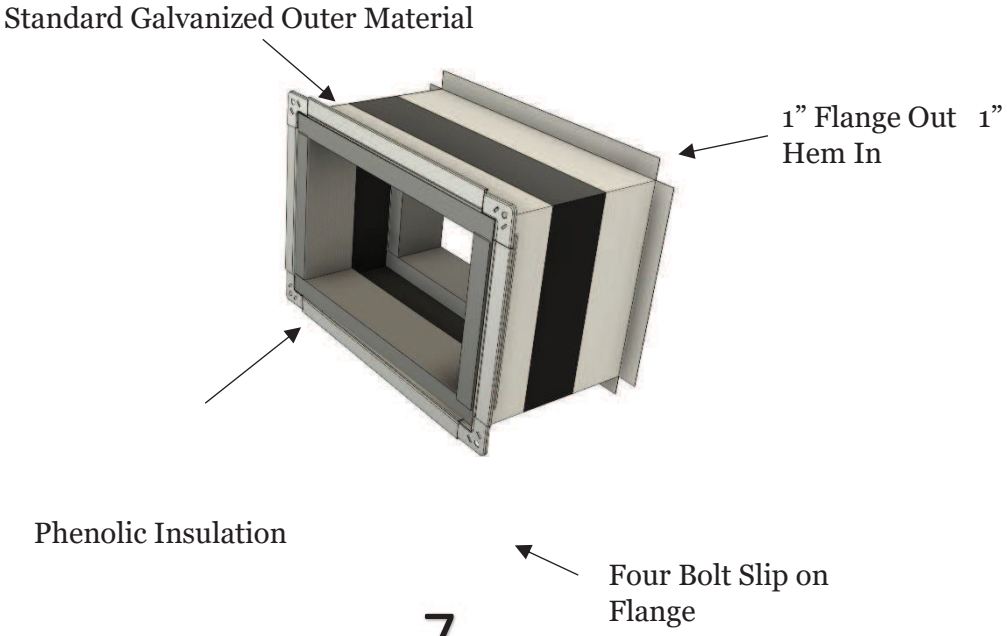
Square Tap



Transition

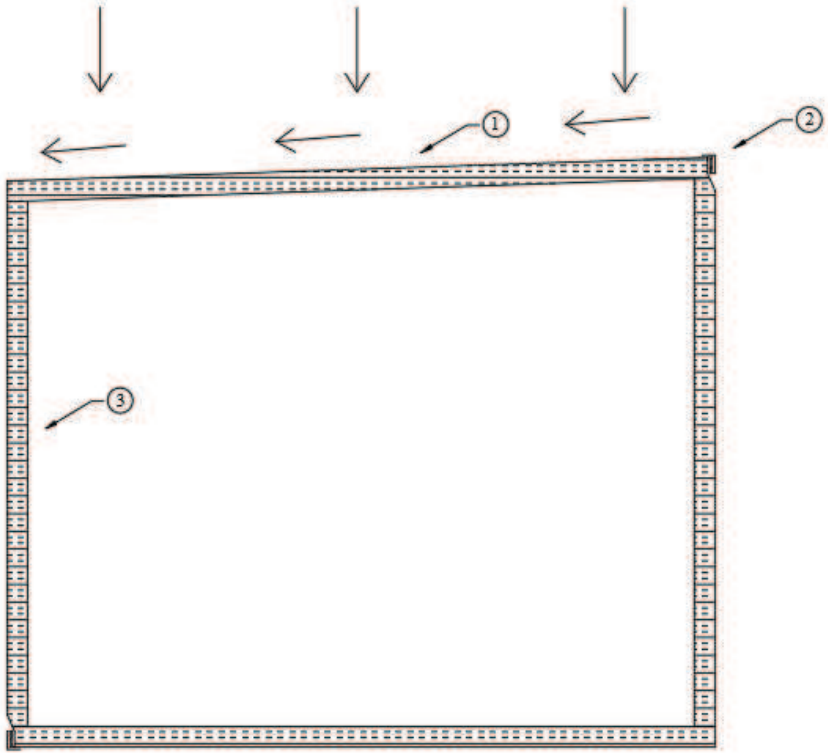
Canvas Connections

All orders come with a canvas connection coming off the unit supply and return. The provided Tuff Duct canvas connections are typical industry standard helping to eliminate noise and vibration downstream of HVAC equipment. The duct connection side will have a 4 bolt slip on flange and the side attached to the unit will have a 1” flange out with a 1” hem in. Tuff Duct canvas connections are also insulated with the same phenolic insulation provided in the duct system to create maximum R values in the duct system. Canvas connections are provided with a standard galvanized G90 finish.



Sloped Ductwork Data

- Tuff Duct can be sloped for water run off, preventing puddling on top of the ductwork.
- Tuff Duct can be fabricated with one side 2” higher than the other creating the slope
- Seam locations must be on the higher side. This prevents puddling that would occur if the seam was on the lower side.
- Sloped Tuff Duct prevents the need for sloped hanging practice that can be time consuming.

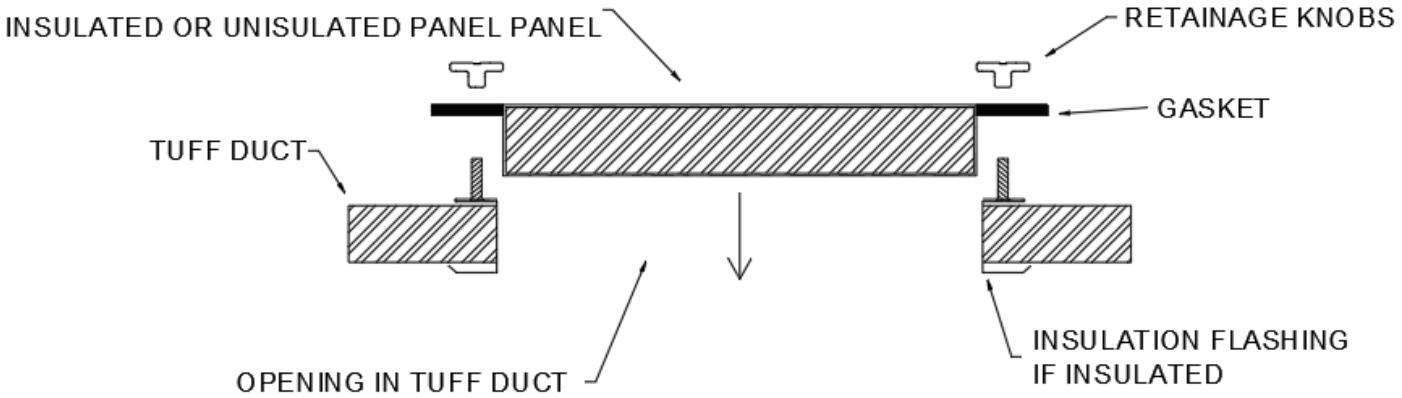


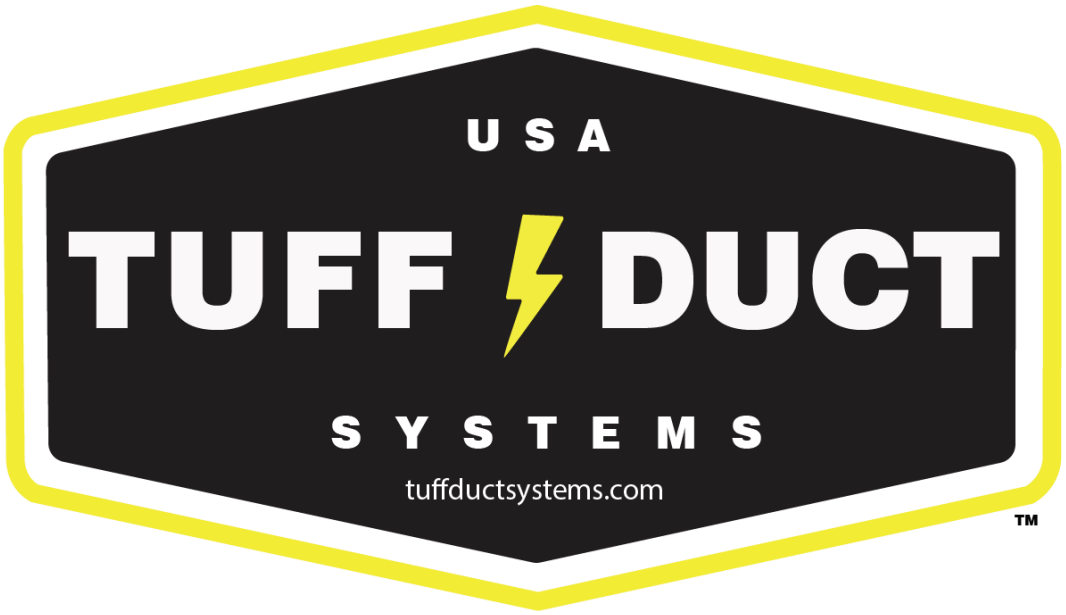
Sloped Tuff Duct Detail

1. Tuff Duct to be sloped min 2" for water runoff.
2. Seam location must be on high side of ductwork.
3. Liner if applicable.

Access Door Data

- Tuff Duct access doors are available if required. Tuff Duct access doors can either be factory installed of installed in the field.
- An installation kit is provided, with all necessary material and instructions, for field installed access doors
- Tuff Duct access door material will match the material of the Tuff Duct itself.
- Tuff Duct access doors will be insulated with the same insulation as the Tuff Duct it is mounted on.
- Tuff Duct access doors utilize retainage knobs and gasket to ensure a watertight seal on the ductwork.





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