

# PRO series™

Thermaflex®

The #1 Commercial

Flexible Duct in the World.

FLEXIBLE DUCT PRODUCTS for HVAC APPLICATIONS

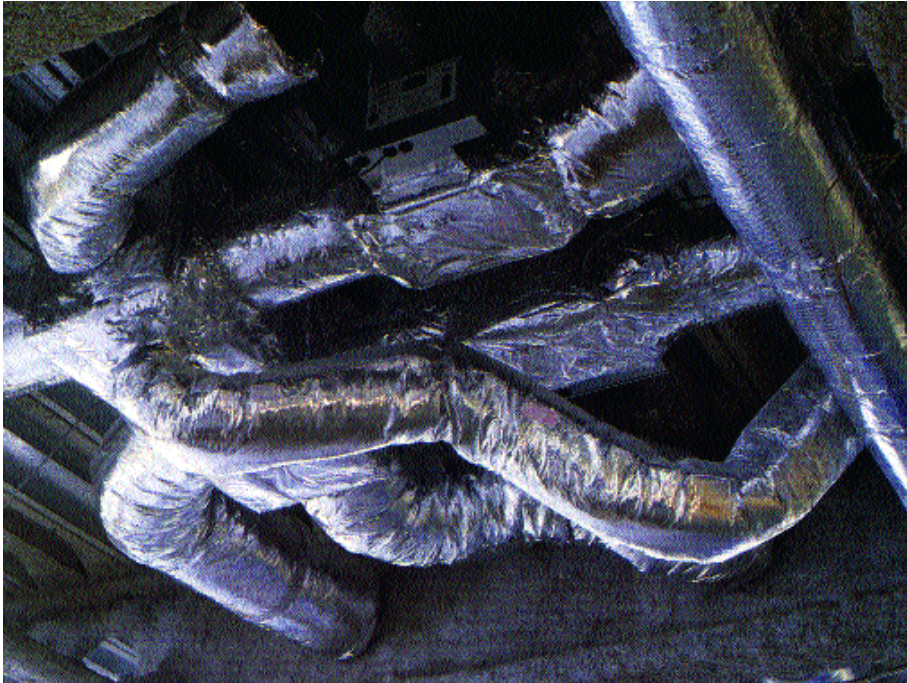


# T

Thermaflex®

## The #1 Flexible Duct in the World Just Got Better.

For over 50 years, Thermaflex® has led the industry in creating solutions for enhancing air distribution performance. Now, the world's most popular commercial flexible duct is stronger, easier to use and more profitable for you.



**An Exclusive 10 Year Pro Series™ Warranty. An Even Better IAQ Story. And All-New Levels of Engineering Support.**

The Thermaflex® Pro Series product line was created with the professional HVAC engineer in mind. The Pro Series offers you a complete range of commercial flexible duct products that provide the highest possible performance. Additionally, you get the support and experience of a company with over 50 years of problem solving in air distribution applications.

### The Best Warranty in the Business

When you have the best flexible duct in the business, you have the confidence to back it up with the longest and strongest warranty in the industry.

Every Thermaflex Pro Series product is warranted for 10 full years, by far the best protection in the HVAC industry. You and your customers have the assurance of the industry's oldest company standing behind the products you specify.

Our Pro Warranty assures that all our products are free from defects in materials and factory workmanship for 10 full years. During this 10 year period, Thermaflex will cover all duct costs, material costs and any reasonable labor costs provided the flexible duct was properly installed in accordance with our written instructions. (Ducts exposed to direct or indirect sunlight are excluded from this warranty.)



No other flexible duct manufacturer can match our

## 50 YEARS OF INNOVATION AND QUALITY

warranty protection. No one. It's your guarantee from a company with over 50 years of HVAC experience.

Can you afford anything less?

### An Even Better IAQ Story

We've improved our fiberglass insulation and enhanced other aspects of our construction. Insulated materials are shielded from exposure to the airstream. Thermaflex insulation is guaranteed not to support mold or bacterial growth. And Thermaflex M-KC is the first flexible duct to earn GreenGuard Certification for Superior Indoor Air Quality.

### R&D that Keeps Bringing New Ideas to You

In this catalog, you'll see new accessories and adapters that are designed to make your job easier and your business more profitable. You'll also see comprehensive technical data to support your recommendation of Thermaflex products.

Flexible duct is more than 50 years old, however, at Thermaflex, we're constantly looking for new and innovative ways for every day use.

Thermaflex traces its roots back to World War II and portable ventilation systems for the U.S. Navy. The Navy needed a hose that was portable, retractable, easy to handle, and capable of standing up to extreme temperatures. The new product,



called "Spiratube," enjoyed widespread use by the Army, Navy, and Air Corps during the war.

The company that produced wartime products for the military converted to peacetime production after the war, and in 1953, a brand-new product was introduced for the heating and air conditioning market: Thermaflex.

One of the first flexible duct systems designed for this purpose, Thermaflex became the premier brand for the heating, venting, and air conditioning systems throughout the country.

It provided faster, easier, and better connections between terminal air devices and hot and cold trunks from residential and commercial climate control. Since then, the company has steadily grown, expanding to provide the most comprehensive product line and the highest quality flexible duct products available in the marketplace.

Thermaflex has always been the professional's choice for flexible ducting and Thermaflex is focused on developing new duct products and accessories that allow professionals to be more productive and more profitable. New ideas like the FlexFlow Elbow™ and Flexaboot™ simplify installations and improve flexible duct performance, giving contractors new opportunities for building business.





## Made with Quality in the USA

Compare our built-in quality to other ductwork.  
Feature for feature, dollar for dollar, Thermaflex  
Pro Series is built stronger to last longer.

### 1 Wire that Won't Corrode or Weaken.

Soft wire is cheaper than hard wire, and it collapses under impact, weight, or external strain. When wire is too thin, the helix is too weak to support itself. Ensure the wire diameter is right for the job; don't be misled by the appearance of a "tight" helix. If the wire is too soft or thin, close spacing alone won't make it a high performance flexible duct. In addition to diameter, also look for "coated" wire. Non-coated wire can corrode and ultimately collapse. Thermaflex wire is 20% stronger than wire used in conventional flexible duct. We use a vinyl-coated, carbon steel wire that ranges from .041 to .072 gauge thick. The special coating prevents corrosion.

### 2 Core Materials that Are Strong and Flame Resistant.

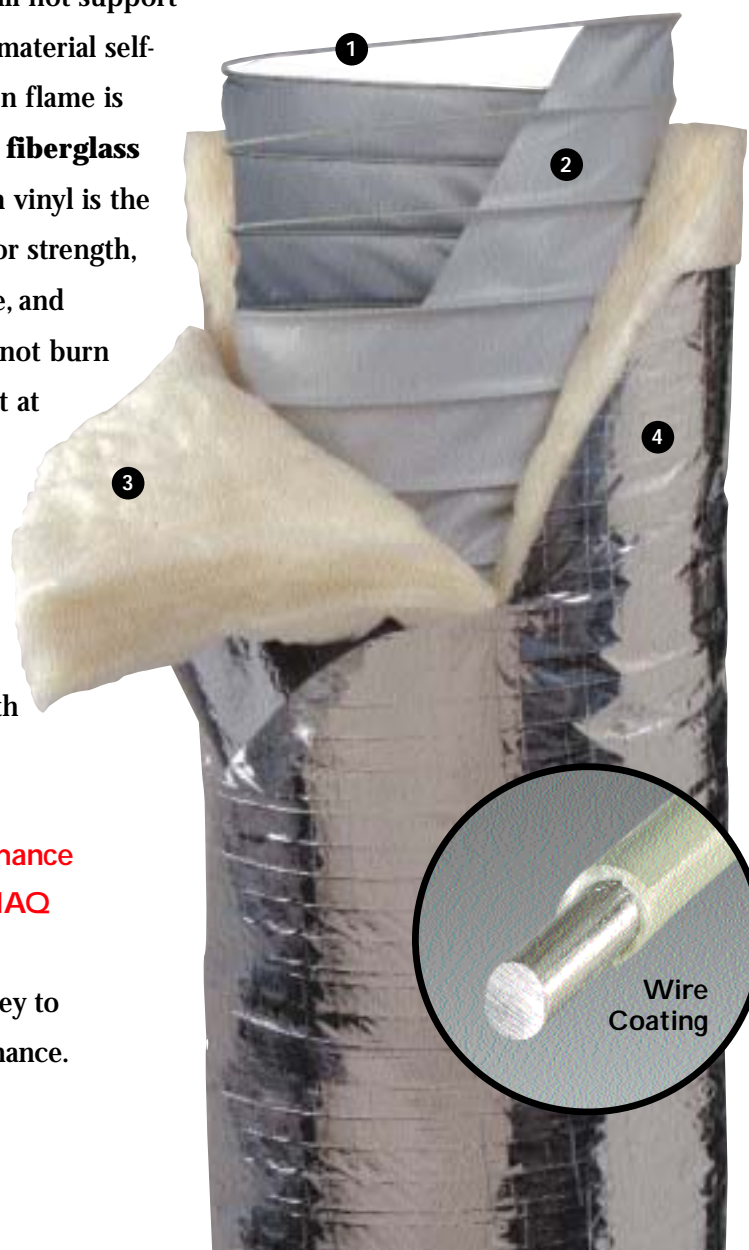
**Polyester film** is the least expensive core material, but it can

combust and it makes a "paper" noise that can be distracting. **Chlorinated polyethylene (CPE)** provides superior acoustical properties and will not support combustion. The material self-extinguishes when flame is removed. **Woven fiberglass** impregnated with vinyl is the ultimate choice for strength, high performance, and durability. It will not burn and will only melt at the melting point of fiberglass. Our cores are solvent-welded to the wire helix for maximum strength and durability.

### 3 High Performance Insulation. New IAQ Advantages.

Thickness is the key to insulation performance.

The thicker the fiberglass, the higher its resistance to heat transfer. When in doubt, measure. Some claim that density is a way to measure insulation value, and you may hear about "R," "C," "K," and "U" factors. But thickness is still the critical determinant for actual thermal resistance, so always measure the insulation.



Thermaflex provides certified R-values of 4.2, 6.0 and 8.0. And remember our exclusive advantage. Thermaflex insulation will not support mold and bacterial growth.

**4 Vapor Barriers that Are Proven Tough.**

**Metallized polyester film (MPF)** is unquestionably the best barrier material. Make sure the MPF you specify has bi-directional reinforcement for maximum toughness and tear resistance.

**Polyethylene film** has good barrier properties and is less expensive than MPF; it cannot match MPF in resistance to punctures or tearing. Thermaflex gives you both options in vapor barriers.

*Make sure your flexible duct is certified by UL and the Air Diffusion Council (ADC). All Thermaflex duct is UL and ADC certified. Thermaflex complies with the standards of the National Fire Protection Association NFPA No. 90A and 90B.*

## Exclusive 10-Year

## Thermaflex Pro Warranty

(See Page 18 for details)

### THERMAL PERFORMANCE PROGRAM

The Air Diffusion Council (ADC) and Underwriters Laboratories, Inc., (UL) have established a program to evaluate listed air ducts and air connectors for thermal resistance properties in accordance with the ADC Flexible Duct Performance & Installation Standard (1991, Revised 1996), using ASTM C-518 (1991) at installed wall thickness on flat insulation only. Look for this marking on the flexible duct products you purchase.



ADC has established a thermal performance certification program in which ADC member companies producing flexible ducts can participate. Both the ADC certification program and the UL testing program provide a uniform and verifiable system for certifying the thermal properties of flexible air ducts and air connectors. ADC member products that are evaluated per this standard will bear the official ADC seal of certification as follows:

The thermal resistance (R) shall be determined using the relationship  $R = th/k$ .

- Where: **R** = thermal resistance (formula) rounded to the nearest .1
- th** = duct insulation wall thickness (in.) rounded to the nearest 1/16"
- k** = measured apparent thermal conductivity (formula) at 75°F mean temperature at installed thickness.

The insulation's thermal conductivity is measured according to ASTM C.518 or ASTM C.177 at 75°F mean temperature.

Installed insulation thickness is determined by the following:

$$th = \frac{\left\{ \frac{\text{Jacket Layflat Width} \times 2}{3.14159} \right\} \text{Nom. Core Diameter}}{2}$$

# Insulated Flexible Duct

## Thermaflex Advantages

- Reduced total installed cost—fast economical installation.
- Superior insulation and thermal performance.
- Easily shaped to fit oval inlets and fittings.
- All components of M-KC, M-KE and G-KM are self-extinguishing and won't support flame.
- Underwriters Laboratories UL181 listed and complies with NFPA Standards 90A and 90B.
- Complies with most state and federal standards or codes.
- Unique construction will not unravel when cut.
- Suitable for air venting and drying applications.

## Thermaflex M-KC

Top quality, high pressure flexible duct for use in low to high pressure heating and cooling systems. New and improved bi-directional reinforced metallized vapor barrier will not unravel.

Extremely strong, woven fiberglass fabric core with a flame resistant coating permanently bonded to a coated spring steel wire helix which supports a thick blanket of insulation and provides a double air seal.

*Meets UL 181 and NFPA 90A-90B Fire Codes*



### M-KC SPECS:

**Diameter:** 4-16 inches ID

**Pressure Rating:** (WG)

**Positive:** 16 inches (4"-10" ID)

10 inches (12"-16" ID)

**Negative:** 2 inches (4"-16" ID)

**Velocity:** 6000 FPM

**Temp. Range:** -20F to 250F cont.

**R-Value:** R-4.2, R-6.0

## GREENGUARD CERTIFIED FOR SUPERIOR INDOOR AIR QUALITY

The Thermaflex M-KC flexible duct has been awarded GREENGUARD Certification by the GREENGUARD Environmental Institute (GEI). To earn certification M-KC went through a series of rigorous emissions tests for levels of total particles, formaldehyde, and other volatile organic compounds (VOCs). M-KC also undergoes quarterly monitoring tests to provide ongoing assurance of low emitting status.

The GREENGUARD Certification Program is the only independent testing program for low-emitting products. It helps builders, architects, interior designers, specifying professionals, and consumers create better indoor environments, by providing a free online guide to scientifically tested low emitting products.



## Thermaflex M-KE

Highly efficient, thermally insulated flexible duct for use in low and medium pressure heating and cooling systems. New and improved bi-directional reinforced metallized vapor barrier will not unravel. Acoustically rated, self-extinguishing chlorinated polyethylene (CPE) core easily expands over fittings. Core is permanently bonded to a coated spring steel wire helix that

supports an ample blanket of fiberglass insulation, providing a double air seal.



M-KE

Meets UL 181 and NFPA 90A-90B Fire Codes



## M-KE SPECS:

**Diameter:** 4-20 inches ID

**Pressure Rating:** (WG)

**Positive:** 10 inches (4"-12" ID)

6 inches (14"-16" ID)

4 inches (18"-20" ID)

**Negative:** 1 inch (4"-12" ID)

1/2 inch (14"-20" ID)

**Velocity:** 5000 FPM

**Temp. Range:** -20F to 200F cont.

-20F to 250F intermittent

**R-Value:** R-4.2, R-6.0, R-8.0

## Thermaflex G-KM

Highly efficient, thermally insulated flexible duct for use in low and medium pressure heating and cooling systems. Acoustically rated, self-extinguishing CPE core easily expands over fittings. Core is permanently bonded to a coated spring steel wire helix that supports an ample blanket of fiberglass insulation over a fiberglass scrim and a tough polyethylene vapor barrier. Smooth liner, insulation, and tough vapor barrier provide even airflow and a double air seal.



G-KM

Meets UL 181 and NFPA 90A-90B Fire Codes



## G-KM SPECS:

**Diameter:** 3-20 inches ID

**Pressure Rating:** (WG)

**Positive:** 6 inches (3"-16" ID)

4 inches (18"-20" ID)

**Negative:** 1 inch (4"-12" ID)

1/2 inch (14"-20" ID)

**Velocity:** 5000 FPM

**Temp. Range:** -20F to 200F cont.

-20F to 250F intermittent

**R-Value:** R-4.2, R-8.0

## Non-Insulated Flexible Duct

### Thermaflex Advantages

- Reduced total installed cost—fast economical installation.
- Easily shaped to fit oval inlets and fittings.
- All components of S-TL, S-LP-10 and S-LD are self-extinguishing and will not support flame.
- Underwriters Laboratories UL181 listed and complies with NFPA Standards 90A and 90B.
- Complies with most state and federal standards or codes.
- Unique construction will not unravel when cut.
- Ideal for residential dryer and bathroom applications.

### Thermaflex S-TL

Non-insulated UL181 Class 1 flexible air duct, extremely strong with heavy fiberglass cloth fabric permanently bonded to a corrosion resistant spring steel wire helix. For low to high pressure heating and cooling systems. A superior alternative in applications where insulated duct is not required or cannot be used, e.g., clean room applications. Unlike connector-rated products, S-TL is not limited to length of run.

### S-TL SPECS:

**Diameter:** 2-20 inches ID

**Pressure Rating:** (WG)

**Positive:** 16 inches (2"-10" ID)

10 inches (12"-20" ID)

**Negative:** 1 inch (2"-20" ID)

**Velocity:** 6000 FPM

**Temperature Range:** -20F to 250F



S-TL

Meets UL 181 and NFPA 90A-90B Fire Codes



### CASE IN POINT



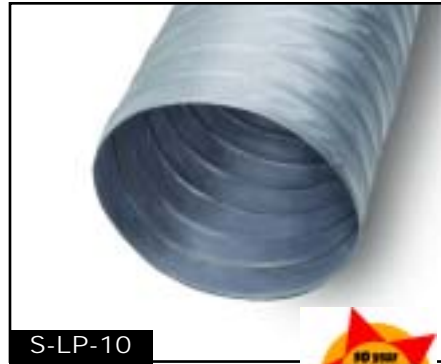
### One-Fifth the Cost

Thermaflex flexible duct saved big money for the Fox Valley Commons Office Complex by using Thermaflex S-TL for return air connections on 28 rooftop heating and air conditioning units.



## Thermaflex S-LP-10

Non-insulated air connector with extremely strong woven fiberglass fabric with flame retardant coating, permanently bonded to a corrosion resistant coated spring steel wire helix. For low and medium pressure heating and cooling systems. A superior alternative in applications where insulated duct is not required, or cannot be used.



S-LP-10

Meets UL 181 and NFPA  
90A-90B Fire Codes



## S-LP-10 SPECS:

**Diameter:** 2-14 inches ID

**Pressure Rating:** (WG)

**Positive:** 10 inches (2"-14" ID)

**Negative:** 1 inch (2"-14" ID)

**Velocity:** 5000 FPM

**Temperature Range:** -20F to 250F

## Thermaflex S-LD

Non-insulated air connector with a reinforced metallized film laminate jacket, permanently bonded to a corrosion resistant coated spring steel wire helix. For low and medium pressure heating and cooling systems. An economical alternative where insulated duct is not required.



S-LD

Meets UL 181 and NFPA  
90A-90B Fire Codes



## S-LD SPECS:

**Diameter:** 3-14 inches ID

**Pressure Rating:** (WG)

**Positive:** 10 inches (3"-14" ID)

**Negative:** 1 inch (3"-14" ID)

**Velocity:** 5000 FPM

**Temperature Range:** -20F to 250F

Instead of fabricating a galvanized steel return air duct system, 16" diameter non-insulated Thermaflex duct was connected to the 18" x 18" return air drop above the ceiling in each office suite. Performance was not compromised. Had the contractor used a standard

24 gauge galvanized system, the work would have cost five times more. Additionally, Thermaflex flexible duct allowed the job to be installed much faster – providing a substantial savings in labor costs.

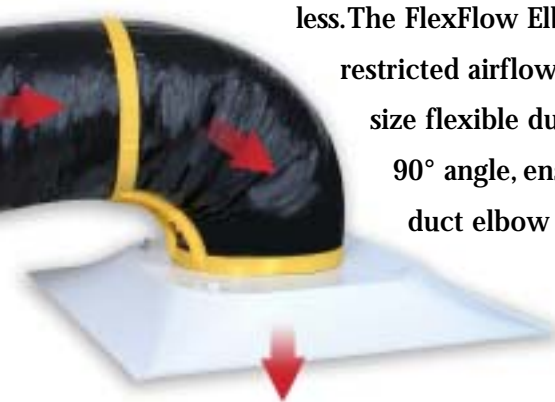
Thermaflex insulated flexible duct was also used in the project for all

warm air supply branches, creating significant energy savings. In all, more than 1,650 feet of flexible duct was used for the project, saving money during construction and continuing to save in lower energy costs throughout the lifetime of the Fox Valley Commons Office Complex.

## Accessories that Improve Performance and Profitability

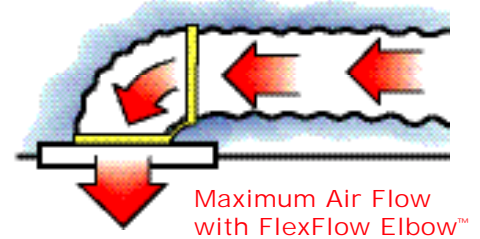
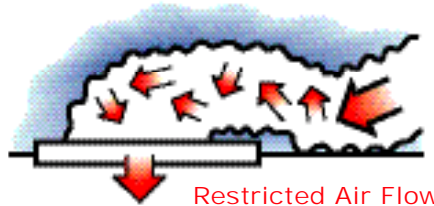
### FlexFlow Elbow™

Improve air flow with the FlexFlow Elbow. You get a system that's air tight, saves energy and costs less. The FlexFlow Elbow eliminates restricted airflow by forming any size flexible duct into a perfect 90° angle, ensuring that a flexible duct elbow maintains the proper



*The FlexFlow Elbow installs over the outer jacket of the flexible duct in less than 30 seconds.*

shape for maximum airflow. The FlexFlow Elbow installs over the duct jacket in a matter of seconds. It is much less expensive than a galvanized elbow, both in material costs and labor. And unlike galvanized elbows, the FlexFlow Elbow doesn't leak or require insulation. Adjustable bands allow the FlexFlow Elbow to fit any size and any brand of flexible duct from 6 inches to 16 inches.



### Flexible Duct Assemblies

Thermaflex flexible duct assemblies are thermally insulated, fully lined, and designed for efficient installation in low and medium pressure HVAC systems.

Assemblies are 7 feet in length and are available in M-KC, M-KE and G-KM insulated products. Assemblies have galvanized male and female fittings attached to the inner core and outer vapor barrier. These units are

especially suited for modular buildings and air distribution systems. They are affordable and convenient for jobs requiring large quantities of duplicated standardized preassembled air system connectors.

These assemblies are available in standard insulation values of R-4.2, R-6.0 and R-8.0. Diameters range from 4 inches through 20 inches (R-4.2 and R-6.0) and from 5 inches through 20 inches (R-8.0).



Female



Male



M-KC



M-KE



G-KM

## Flexaboot by Thermaflex

Replaces expensive and cumbersome rectangular internally-lined sheet metal boots at less than half the cost. UL approved for return air plenum spaces. The Flexaboot is acoustically designed and tested for optimum sound attenuation.

The Flexaboot comes precut with factory collars installed on both ends insuring that no fibrous materials are exposed to the airstream. It can be rotated 360 degrees to maximize sound attenuation position. It fits all 16" round neck return grills and installs on any

24" x 24" return grill with optional square to round adapter. Reduces labor, shipping, and material handling costs. It also reduces chances of ceiling grid damage. Two per carton.



Accoustical Return Air Boot

## Thermasleeve

Energy efficient pipe insulation in either metallized or polyethylene sleeve.

Thick insulation blanket with R-values of 4.2, 6.0, and 8.0. Fast and economical to install over round sheet metal duct. UL classified for pipe and equipment covering.

- Permeability Rating: 0.1
- Flame Spread: Less than 25
- Smoke Developed: Less than 50
- 5' standard lengths
- R-Values: 4.2, 6.0, and 8.0
- Diameters: 4, 5, 6, 7, 8, 10, 12, 14, 16 and 18 inches.



Thermasleeve

## Plastic Installation Cap

One (1) plastic installation cap supplied with each carton.



Plastic Installation Cap

## Snaplock®

Stainless steel band, cadmium plated hexbolt attaches Thermaflex to metal fittings. Available in three diameters: 6", 8", and 12".



Snaplock

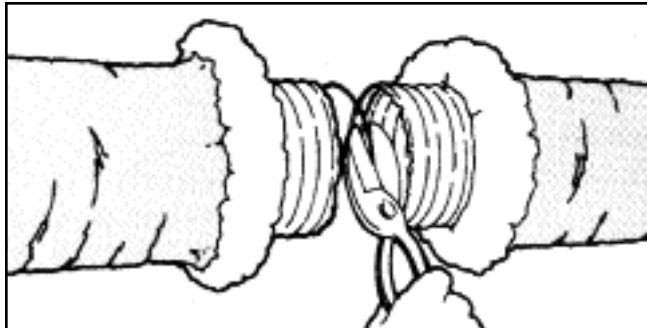
## Installation Instructions

Air Ducts and Air Connectors Nonmetallic with Plain Ends

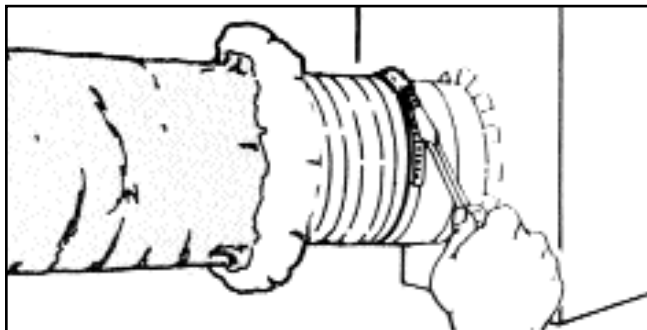


1000 E. Woodfield Road  
Suite 102  
Schaumburg, IL 60173-5921

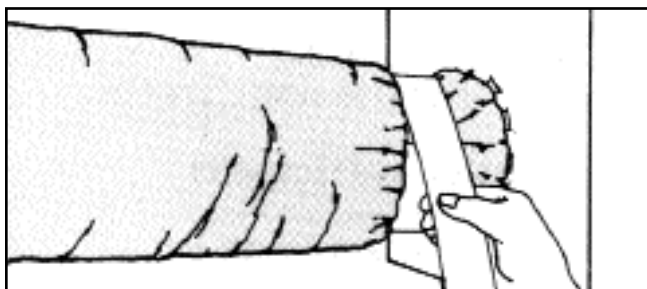
### Connections



1. After desired length is determined, cut completely around or through duct with knife or scissors. Cut wire with wire cutters.

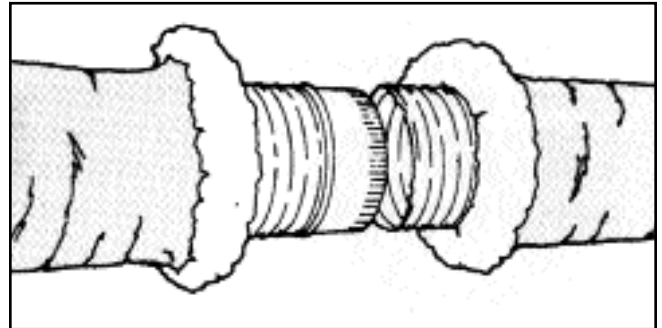


2. Pull back jacket and insulation from core. Slide at least 1" (25 mm) of core over collar, pipe, or fitting. Tape core with at least two wraps of duct tape. Secure with clamp.

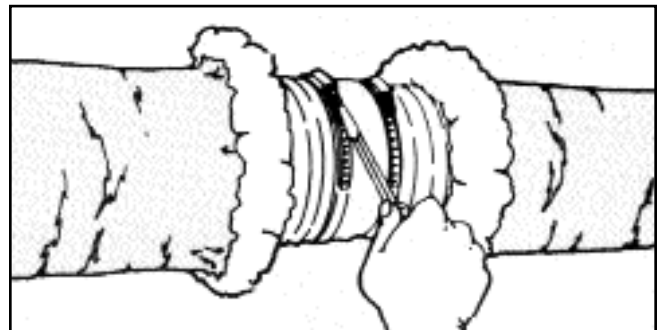


3. Pull jacket and insulation back over core. Tape jacket with at least two wraps of duct tape. A clamp may be used in place or in combination with duct tape.

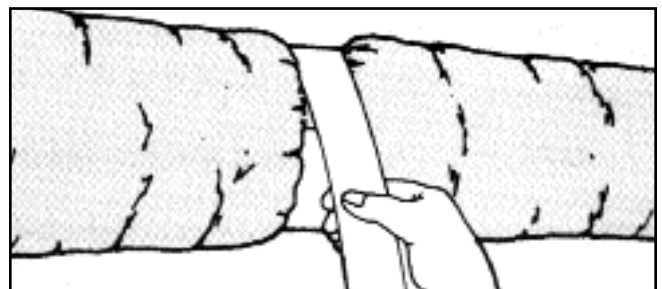
### Splices



1. Peel back jacket and insulation from core. Butt two cores together on a standard 4" (100 mm) metal sleeve.



2. Tape cores together with at least two wraps of duct tape. Secure with two clamps.



3. Pull jacket and insulation back over cores. Tape jackets together with at least two wraps of duct tape.

- NOTES:**
1. For uninsulated air ducts and air connectors, disregard references to insulation and jacket.
  2. Use beaded fittings for pressures exceeding 2" w.g. (500 Pa) and for diameters 12" (300 mm) and larger.
  3. Use tapes listed and labeled in accordance with Standard UL 181B and marked "181B-FX."
  4. Use clamps as specified on manufacturer's UL 181 installation instructions.

# Installation Instructions

Complies with UL-181 Requirements

## Splicing Two Lengths of Thermaflex Insulated Ducts

1. Expose end of liner.
2. Trim excess material from liner.
3. Bend ends of wire to avoid snagging.
4. Screw liners on standard 4" metal sleeve to butt joint and apply two wraps of duct tape\*. Finish seal with clamp\*.
5. Overlap insulation in smooth piles over spliced liners.
6. Overlap loose barrier seam in smooth piles over insulation.
7. Apply two wraps of duct tape\*.

## Splicing Two Lengths of Non-Insulated Ducts

1. Trim excess material from ducts.
2. Bend ends of wire to prevent snagging.
3. Apply mastic\* to a depth of 2 inches (minimum) inside duct liner ends.
4. Slide duct end with adhesive to form butt joint on 4" metal sleeve.
5. Apply duct clamp\* and allow joints to dry.

## Connecting Insulated Duct to Fitting Medium to High Pressure

1. Cut duct to length.
2. Apply liner onto fitting.
3. Apply two wraps of duct tape\* over liner to fitting seam.
4. When duct tape\* is not used, apply mastic\* to fitting and slide liner at least 2 inches. Apply clamp\* and allow it to dry.
5. Pleat and seal barrier to fitting with two wraps of duct tape\* and apply clamp\* over the tape with tension tool.

## Low Pressure Two Inches or Lower

1. Follow steps 1 and 2 above.
2. Apply two wraps of duct tape\* and duct clamp\* over lining to fitting seam connecting M-KC, M-KE, or G-KM duct having factory installed metal collars to fitting.
3. Pleat and seal barrier with two wraps of duct tape\* or clamp\* insulation and barrier to fitting in place of tape\*.

See separate instruction sheet inside carton for factory installed duct assemblies.

**Clamps\*:** 1/2" wide standards, metal band clamps or Panduit PLT5H or PLT8H, Tyton T150L or LX and Thomas and Betts Dukt-Rap™, VAL-26-50 or VAL 275X-25.

**Tapes\*:** Use tapes listed and labeled in accordance with UL-181 marked "181B-FX."

**Mastics\*:** Use mastics listed and labeled in accordance with UL-181 marked "181B-M."

## NOTES

- a. Types S-LP, S-LD, MC and insulated Thermaflex connectors are not to be installed in lengths exceeding 14 feet (4.25 meters).
- b. Follow application rate of Mastics\* according to manufacturer's recommendations.
- c. Look for separate installation instructions inside carton on short duct assemblies having factory installed collars.

# Air Flow Tests and Air Friction Data

## Air Diffusion Council Flexible Air Duct Test Code FD-72 R1

Thermaflex considers the Air Diffusion Council Flexible Air Duct Test Code FD-72 R1 as the most dependable standard pertaining specifically to flexible ducts and air flow. Therefore, air flow and friction loss tests have been conducted in full conformity with ADC FD-72 R1 with a view toward presenting data as accurately and reliably as possible for flexible ducts.

Use of Air Diffusion Council Test Code provides data most nearly approaching results which can be expected under field operating conditions, providing flexible ducts are installed properly; e.g., suspended or supported properly to avoid sagging or kinking, use of accurate lengths to eliminate "snaking" of excess ducting between connecting points or use of other careful, workmanlike practices.

## Use of Air Friction Charts and Related Data Ducts in Straight Runs

**Air Volume** in cubic feet per minute (CFM) is plotted vertically along left side of charts: **Friction Loss** in inches of water (In H2O) per 100 feet of straight duct is plotted horizontally along bottom of charts: **Duct Sizes** as inside diameters (ID inches) are shown on the diagonal lines sloping upward from left to right: **Air Velocity** in feet per minute (FPM) is shown along the diagonal lines sloping upward from right to left.

One method for using charts is: Supposing **Air Volume** is known at 600 CFM through an 8" ID Thermaflex M-KC. In this case, use Chart No. 3 and locate the 600 CFM line at intersection with 8" ID line; read downward to **Friction Loss** line and note loss as 1.0 In. H2O per 100 feet. Supposing actual straight duct length is known to be 15 feet, then calculate accordingly to arrive at **Friction Loss** of .15 In. H2O for 15 feet.

A second method for using charts is: Supposing **Air Velocity** is known at 1000 FPM through 6" ID Thermaflex M-KE. In this

case, use Chart No. 1 and locate the diagonal 1000 FPM line at intersection with 6" ID line; then read downward vertically to Friction Loss line and note loss as .8 In. H2O per 100 feet. Supposing actual straight duct length is known at 12 feet, then calculate accordingly to arrive at **Friction Loss** of .1 In. H2O for 12 feet.

A third way for using charts and related data is determining **Air Velocity** (FPM) through given Duct Size when **Air Volume** (CFM) is known. Supposing **Air Volume** is known at 600 CFM and **Duct Size** is 8 inches ID. In this case, divide 600 CFM by .3490 square feet **Duct Cross Section Area** for 8 inches ID duct to arrive at 1719 FPM **Air Velocity**. Converting **Air Velocity** to **Air Volume** is calculated by multiplying FPM by **Duct Cross Section Area**. (See Duct Cross Section Areas Table.)

## Ducts in Bends

Air friction for ducts in bends is determined by first finding the Duct Radius Ratio (R/D) by dividing R (Center Line Bend Radius) by D (Duct Diameter). For example, 8" diameter duct installed on 16" centerline bend radius has R/D of 2.

Equivalent Lengths of Straight Duct in Diameters can be found quickly by using Bend Friction Loss. Continuing the example: by locating R/D of 2 intersecting the curve and reading to the left, 20" diameters of 8" duct (160" or 13.3 feet) is seen as the Equivalent Length of Straight Duct.

Air Friction Loss can then be calculated from the charts and information given for Ducts in Straight Runs.

## USE OF BEND LOSS COEFFICIENTS

The loss coefficients ( $C_D$ ) tabulated are actual test values obtained on 12 inch nominal duct diameters. Pressure loss ( $\Delta P$ ) in 90° bends can be calculated using pressure loss coefficients ( $C_D$ ) in the following formula:

NOMINAL DUCT AREAS TABLE

Duct Inside Diameter (inches)	Duct Cross-Section Area (sq. ft.)
2	.0218
3	.0491
4	.0873
5	.1363
6	.1963
7	.2672
8	.3490
9	.4418
10	.5454
12	.7854
14	1.0690
16	1.396
18	1.767
20	2.182

PRESSURE LOSS COEFFICIENTS ( $C_D$ ) in 90° BENDS

Centerline Bend Radius Ratio R/D	1.0	2.5	4.0
Thermaflex M-KE, G-KM	0.82	0.82	0.86
Thermaflex M-KC, S-LP-10, STL ( $C_D$ )	0.84	0.85	0.87

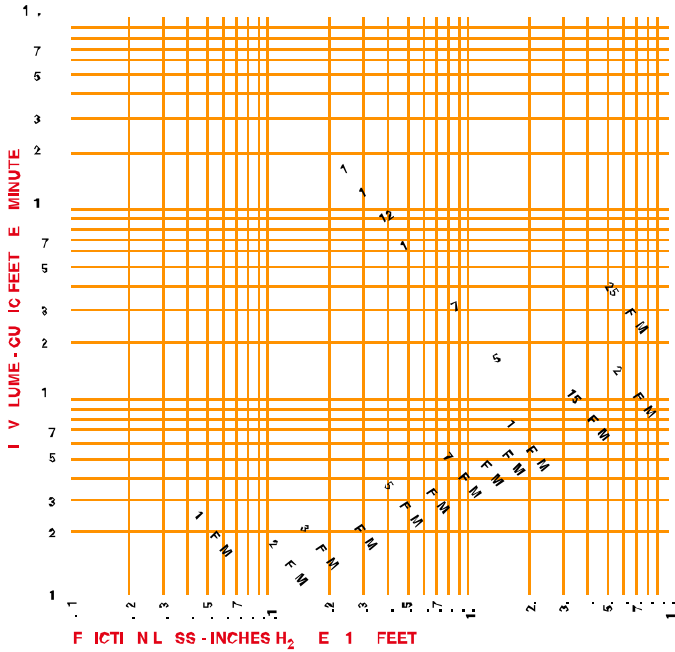
$$\Delta P = (C_D) \left[ \rho \left( \frac{V}{1097} \right)^2 \right]$$

- $\rho$  = 0.075 lb./ft.<sup>3</sup> (density of air)
- V = fpm (velocity of air)
- $\Delta P$  = in w.g. (pressure loss of the 90° bend)

## CHART 1 – THERMAFLEX M-KE, G-KM

Flexible Duct – Straight Run

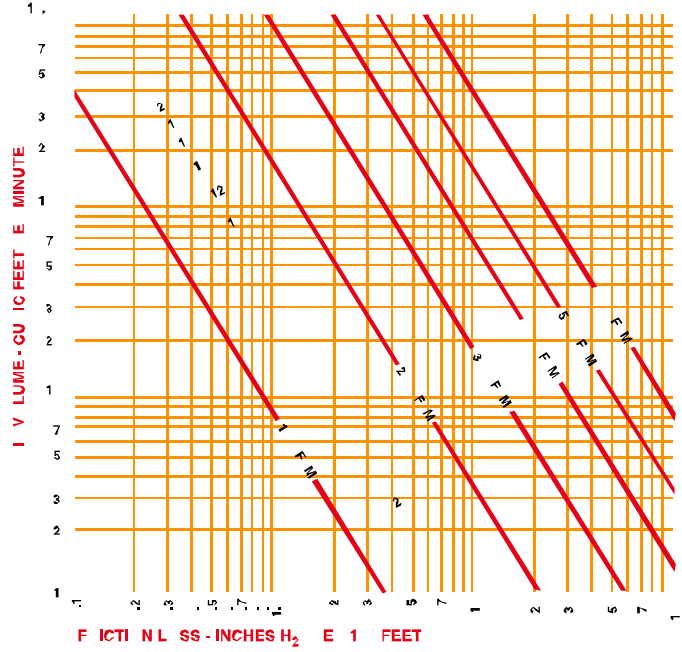
Friction Loss per 100 ft.



## CHART 2 – THERMAFLEX M-KC, S-LP-10, S-TL

Flexible Duct – Straight Run

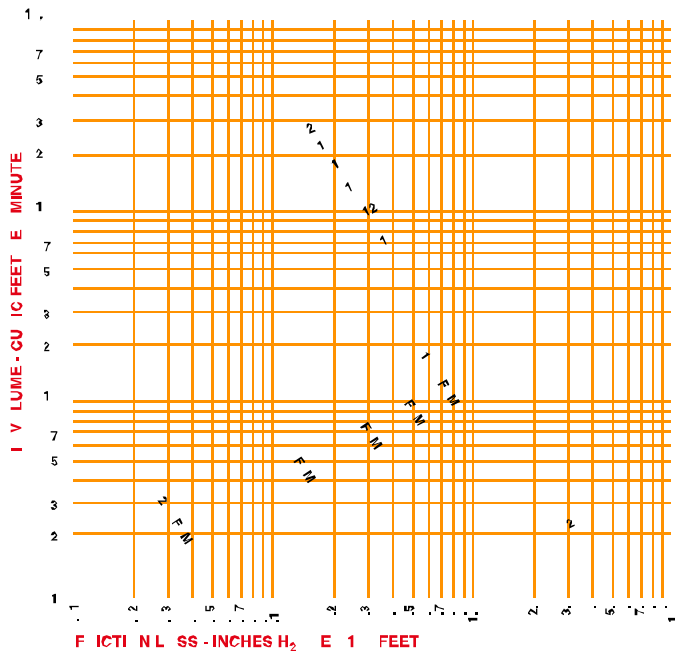
Friction Loss per 100 ft.



## CHART 3 – THERMAFLEX M-KC, S-LP-10, S-TL

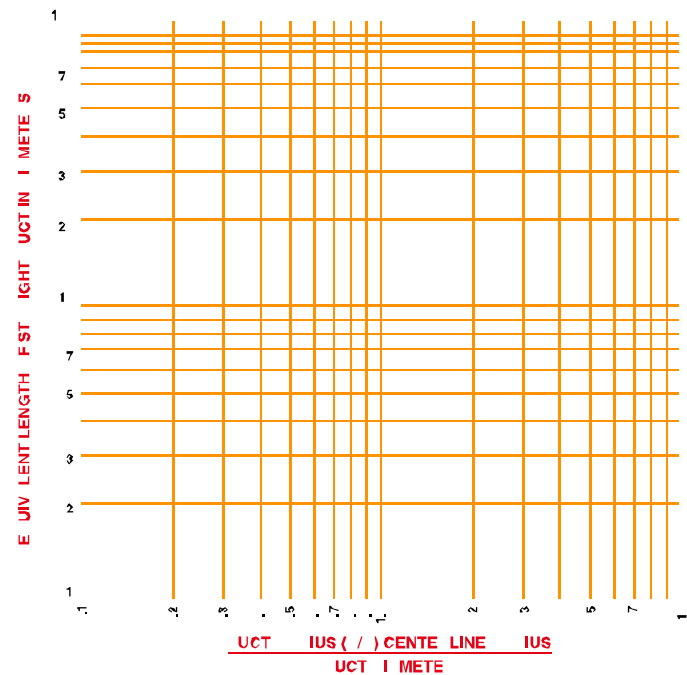
Flexible Duct – Straight Run

Friction Loss per 100 ft.



## CHART 4

Flexible Duct – Bend Friction Loss



## Sound Generation Data

### Sound Attenuation (Net Insertion Loss, or I.L.)

Sound attenuation is the reduction of sound power level as a sound travels through a duct. The sound attenuating properties of a flexible duct are determined by the insertion loss method with and without air flowing through the duct. The net insertion loss is measured in the test laboratory as the difference between the sound attenuating effectiveness of the flexible duct and an empty standard sheet metal duct. This difference is expressed in decibels at reported frequencies. Data are presented in this brochure for flexible ducts in straight positions and in 90 degree bends.

### Sound Generation

Sound generation, also called "self noise" or "generated noise" or "regenerated noise", is the sound power generated by air flow through the test duct. When applied to flexible air duct that

services terminal devices, this form of rating is useful for determining whether the flexible duct sound generation will exceed the sound generation of the terminal device. Sound generation data are presented in decibels at reported frequencies and air velocities. Also presented are sound operation data for equivalent diameters of duct made of light gauge sheet metal.

### Radiated Noise

Radiated noise is the sound that is radiated (transmitted) through the duct wall. Radiated noise is measured with and without air flow with the duct connected and disconnected within the reverberation room. Radiated noise reduction is the difference between the measured sound with the duct disconnected and the duct connected expressed in decibels at reported frequencies.

### Decibels

The acoustical properties of materials used in air distribution systems are compared and selected in terms of decibels (dB). Sound pressure levels are referenced to .0002 microbar and sound power levels (LW) are referenced to  $10^{-12}$  watt.

### Noise Criteria

Noise criteria information and data, given and explained in the ASHRAE Guide, represent a series of reasonably acceptable sound spectra related to the use of a space for given functional purposes.



# Sound Generation in Sound Power Level (LW)dB 10<sup>-12</sup> Watt

Thermaflex Flexible Duct vs. "Empty" Metal Duct

## CHART 5 – M-KE and G-KM

Flexible Duct Per Length of 10 ft. in Straight Position

	Octave Band No. Center Freq. Hz	(2) 125	(3) 250	(4) 500	(5) 1000	(6) 2000	(7) 4000	(8) 8000
6 inch ID	Lw @ 1000fpm	(32)	29	22	(17)	(17)	(19)	(20)
	Lw @ 1500fpm	(32)	35	31	28	19	(19)	(20)
	Lw @ 2000fpm	(32)	40	39	36	31	23	(20)
	Lw @ 3000fpm	46	47	48	47	43	38	31
Empty Metal Duct	Lw @ 1000fpm	(32)	28	(21)	(17)	(17)	(19)	(20)
	Lw @ 1500fpm	(32)	34	32	25	(17)	(19)	(20)
	Lw @ 2000fpm	(32)	37	37	32	24	(19)	(20)
	Lw @ 3000fpm	43	45	45	46	38	36	27
8 inch ID	Lw @ 1000fpm	34	30	22	(16)	(17)	(18)	(18)
	Lw @ 1500fpm	36	35	35	32	25	(18)	(18)
	Lw @ 2000fpm	42	41	42	39	34	27	21
	Lw @ 3000fpm	52	50	53	51	49	43	38
Empty Metal Duct	Lw @ 1000fpm	(30)	(26)	25	(16)	(17)	(18)	(18)
	Lw @ 1500fpm	(30)	(26)	26	21	(17)	(18)	(18)
	Lw @ 2000fpm	(30)	34	33	28	20	(18)	(18)
	Lw @ 3000fpm	41	44	44	40	37	32	25
12 inch ID	Lw @ 1000fpm	(30)	28	22	18	(17)	(18)	(18)
	Lw @ 1500fpm	31	34	35	32	23	(18)	(18)
	Lw @ 2000fpm	41	39	40	39	32	21	(18)
	Lw @ 3000fpm	51	50	51	51	47	41	35
Empty Metal Duct	Lw @ 1000fpm	(30)	(26)	(19)	(16)	(17)	(18)	(18)
	Lw @ 1500fpm	(30)	29	20	19	19	(18)	(18)
	Lw @ 2000fpm	36	38	37	30	30	20	(18)
	Lw @ 3000fpm	45	46	42	39	38	35	29

# Results of Tests and Measurements Sound Attenuation

With and Without Air Flow Through Duct

## CHART 6 – M-KE and G-KM

Straight Duct Insertion Loss (I.L.) per Length of 10 ft. in dB

	Octave Band No. Center Freq. Hz	(2) 125	(3) 250	(4) 500	(5) 1000	(6) 2000	(7) 4000	(8) 8000
6" ID	I.L. @ 0 Flow	15	20	36	39	39	23	14
	I.L. @ 2500fpm	13	19	34	37	38	22	14
8" ID	I.L. @ 0 Flow	8	12	29	35	36	24	14
	I.L. @ 2500fpm	8	13	29	35	36	24	14
12" ID	I.L. @ 0 Flow	20	26	26	35	30	16	8
	I.L. @ 2500fpm	20	26	27	34	30	15	9

Duct as Elbow, Insertion Loss (I.L.) per Length of 10 ft. in dB

	Octave Band No. Center Freq. Hz	(2) 125	(3) 250	(4) 500	(5) 1000	(6) 2000	(7) 4000	(8) 8000
6" ID	I.L. @ 0 Flow	11	24	32	34	30	19	8
	I.L. @ 2500fpm	11	24	32	33	29	19	8
8" ID	I.L. @ 0 Flow	5	14	25	33	33	21	12
	I.L. @ 2500fpm	5	14	26	32	33	22	12
12" ID	I.L. @ 0 Flow	5	16	24	33	33	19	9
	I.L. @ 2500fpm	5	16	25	32	32	18	9

Radiated Noise Reduction per Length of 10 ft./Duct in Straight Position

	Octave Band No. Center Freq. Hz	(2) 125	(3) 250	(4) 500	(5) 1000	(6) 2000	(7) 4000	(8) 8000
6" ID	I.L. @ 0 Flow	8	7	10	12	12	19	21
	I.L. @ 2500fpm	8	7	9	12	13	18	21
8" ID	I.L. @ 0 Flow	7	11	11	11	11	13	13
	I.L. @ 2500fpm	7	11	12	12	11	13	14
12" ID	I.L. @ 0 Flow	4	6	6	6	8	11	18
	I.L. @ 2500fpm	4	5	6	6	8	12	18

## Certifications and Associations

### Underwriters Laboratories Inc.®

Flexible Technologies is authorized to use the UL markings on such products that comply with the standards of the National Fire Protection Association NFPA No. 90A and NFPA No. 90B, also with the Follow-up Services Procedure and other applicable requirements of Underwriters Laboratories Inc. Only those products that properly bear the UL Mark are considered as listed by Underwriters Laboratories.



### Air Diffusion Council

Charter Member of the Council, comprised of the leading manufacturers of flexible duct in North America. "...the purpose for which the Air Diffusion Council was formed are in general to promote and further the interests of the manufacturers of flexible duct and related products, and the interests of the general public in safety, quality, efficiency, and energy conservation."



*As stated in the Bylaws of the Air Diffusion Council*

## Approvals

### Domestic

NYC Department of Buildings

MEA 48-75-M

MEA 12-80-M

MEA 427-85-M

MEA 47-75-M

MEA 44-69-M

Los Angeles Mechanical Code  
Sections: 95.105, 95.504, 95.60,  
95.603

City of Chicago Department of  
Buildings Code Chapter 41.1

### International

Canadian Underwriters  
Laboratories Inc.



Class NK 認定 認定番号 : 99FPA7CM
防火構造材料 Thermasleeve M-R4.2
Flexible Technologies Inc.

Nippon Kaiji Kyokai  
(Japanese Bureau of Shipping)

建設大臣 認定 不燃 (個) 第11758号 不燃材料
ポリエチレンテレフタレート系グラスウールダクト (サーマフレックス [Thermaflex] M-KF-R&E)
www.セキウエアコンテック

Japanese Ministry  
of Construction

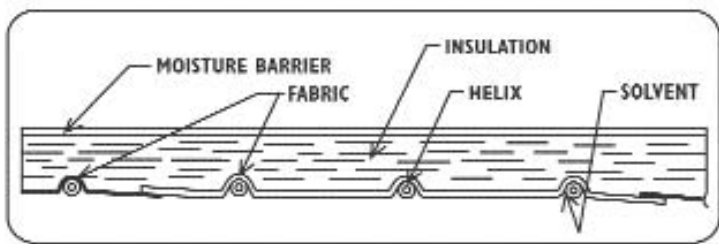


# SUBMITTAL SHEET for Flexible Duct

## M-KC Insulated Flexible Air Duct for Environmental Air Handling Systems

<b>CODES/STANDARDS</b>		GreenGuard Certified for Superior Indoor Quality		Listed and labeled by Underwriters' Laboratories, Inc., as a Class I Air Duct, Standard 181. It complies with the latest NFPA Bulletins 90A and 90B. Meets FHA and other U.S. government agency standards. Flame spread: not over 25. Smoke developed: not over 50.											
<b>FABRIC TYPE</b>		Coated fiberglass woven fabric.													
<b>INSULATION</b>		R-4.2	1 1/2", .76 lb. minimum density fiberglass blanket.												
<b>EXTERIOR FACING AND VAPOR BARRIER</b>		R-6.0	2", .76 lb. minimum density fiberglass blanket.												
<b>THE</b>		polyester film													
<b>VAPOR</b>		POLYESTER FILM - MEETS PERFORMANCE AND DURABILITY REQUIREMENTS OF ASTM D-219 (1991) SOLUTION ONLY													
<b>TEMP</b>															
<b>SIZES</b>		6 18 20													
<b>LENGTH</b>		25 ft.													
<b>INSIDE (inches)</b>		4	5	6	7	8	9	10	12	14	16	18	20		
<b>STEEL WIRE</b>		Coated spring steel wire helix.													
<b>RATED VELOCITY</b>		6000 fpm.													
<b>MAX RATED PRESSURE (inches water column)</b>		<b>POSITIVE</b>						<b>NEGATIVE</b>							
		16 inches (4-10 in. dia.)						10 inches (12-16 in. dia.)							
		2 inches													

**Sample Submittal Form**  
 Download forms from our web site  
[www.wereflexible.com](http://www.wereflexible.com)



<b>JOB LOCATION</b> _____		<b>P.O. NO.</b> _____	
<b>ENGINEER</b> _____		<b>JOB NO.</b> _____	
<b>CONTRACTOR</b> _____		<b>REPRESENTATIVE</b> _____	
<i>Certified Correct</i>		<i>Approved for Construction</i>	
<b>BY</b> _____		<b>BY</b> _____	
<b>TITLE</b> _____		<b>TITLE</b> _____	
<b>DATE</b> _____		<b>DATE</b> _____	

**THERMAFLEX**™ - A Division of Flexible Technologies, Inc., a subsidiary of Smiths Group plc.  
 Customer Service Departments:  
 Box 888 • Carwellyn Rd. • Abbeville, SC 29620 • 864-459-5441  
 Thermaflex • 9101 Perkins St. • Pico Rivera, CA 90660 • 562-801-1634



## Exclusive 10 Year Pro Warranty

Since 1953, Thermaflex has been the premier brand of flexible ductwork for HVAC applications. We offer the most comprehensive product line of flexible duct products, ideal for offices, schools, hospitals, industrial and other commercial installations.



### The Best Warranty in the Business

Thermaflex offers a full 10 year warranty—the strongest in the business—on its Thermaflex Pro Series products.

Our 10 Year Pro Warranty ensures that all Thermaflex insulated and non-insulated products will be free of defects in material and factory workmanship for a period of 10 years from the date of manufacture. During this 10 year period, Thermaflex will cover all duct costs, material costs, and any reasonable labor costs provided the flexible duct was properly installed in accordance with our written instructions. (Ducts exposed to direct or indirect sunlight are excluded from this warranty.)

When you choose Thermaflex, you're backed by a company with more than a half century of experience. No other flexible duct manufacturer can match our warranty protection. No one. You get 10 full years because Thermaflex is built stronger to last longer.

Can you afford anything less?

### National Sales Headquarters

**Customer Service Dept.**  
Box 888 (528 Carwellyn Road)  
ABBEVILLE, SC 29620  
864-459-5441  
Fax: 864-459-8771

9101 Perkins Street  
PICO RIVERA, CA 90660  
562-801-1634  
Fax: 562-801-0096

455 East 12th Ave., N.E.  
CAIRO, GA 31728  
229-377-2910  
Fax: 229-377-1382

### Canada

1630 Matheson Blvd. E.  
MISSISSAUGA, ONTARIO L4W 1Y4  
905-602-9660  
Fax: 905-602-9665



Named South Carolina  
Chamber of Commerce  
*Manufacturer of the Year, 2000*

### Toll Free Customer Service:

Western States: **800-821-2417**  
All Others: **800-459-4822**

[www.wereflexible.com](http://www.wereflexible.com)  
[www.flexflowelbow.com](http://www.flexflowelbow.com)



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All Others: 800-459-4822

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