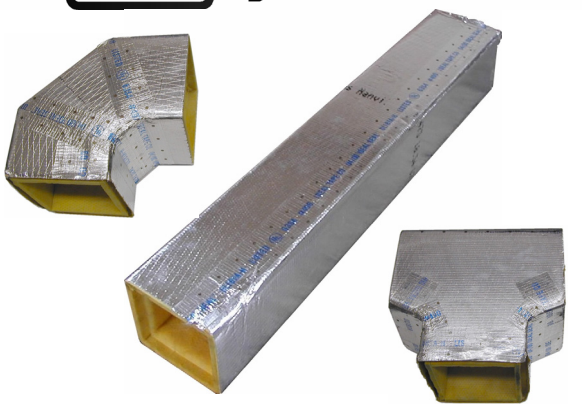
The Unico System®



Square Fiberglass Duct Specifications and Installation Instructions

GENERAL

Square fiberglass duct is available for use as plenum with The Unico System. Square duct is available ready to install and ships packaged in cartons of 4 lengths of 4-foot (1.2 m) duct, preformed 90º elbows and tees, and end caps.

Square fiberglass duct is also available in three different sizes of internal dimensions. The three internal dimension sizes include: 6.5-in. (17.8 cm), 8.5-in. (21.6 cm), and 9.5-in. (26.7 cm).

A number of different manufactures offer product of this type. Check with your Unico distributor or representative to ensure your selection meets the minimum specifications for use with The Unico System.

A Unico part number description is shown below to ensure the correct plenum for your application.

Part No. UPC-12-0XXS-4 (Square Fiberglass Duct)
UPC-15-0XXS-4 (End Caps)
UPC-16-0XXS-4,1 (Full Flow Tee)
UPC-18-0XXS-4,1 (Full Flow 90º Elbow)

– XX is duct ID (65=6.5-in., 85=8.5-in., and 95=9.5-in.)
Full flow tees and elbows are available in single quantity or 4 per package.

APPLICATION

Fiberglass duct board, when formed into square duct, can be used for all Unico Systems. The duct can be mounted directly to the blower module using the UPC-62-XXX plenum adapter. The last four digits of the adapter part number are the model number referring to the air handler being used. For example: UPC-62-2430 would be used with the MB2430L.

DESCRIPTION

Square fiberglass duct is manufactured from strong, flame-attenuated resin-bonded glass fibers which are designed to provide thermal insulation, vapor retarder, and acoustical absorption in one product. The exterior is covered with a tough, fire-resistant, UL-approved foil-scrim-kraft (FSK) jacketing. All duct board is available with a factory formed shiplap edges which makes strong, snug connections between sections. No expensive tools or equipment are required for installation.

General Properties

Inside Dimensions (square)	6.5 inch (17.8 cm) 8.5 inch (21.6 cm) 9.5 inch (26.7 cm)
Thickness	1.0 inch (25 mm)
Length	4 feet (1.2 m)
Air Velocity (max.)	5000 fpm (25.4 m/s)
Service Temperature (max.)	250°F (121°C)
Operating Pressure (max.)	±2 in. w.c.* (498 Pa)

Thermal Performance*

k-Value, Btu•/hr•ft²•°F (W/m•°C)	0.23 (0.033)
R-Value, hr•ft²•°F/Btu•in (m•°C/W)	4.3 (0.76)

*Tested in accordance with ASTM C 518 at 75ºF (24ºC) mean temperature.

Underwriters Laboratories (UL)
Surface Burning Characteristics
(UL 723)
Listed by UL as Class 1 complying with (UL181) "Standard for Safety for Air Ducts".

Flame Spread	not over 25
Smoke Developed	not over 50

Note — Specifications, Ratings, and Dimensions are subject to change without notice.

INSTALLATION

Tools required:

– Knife
– Shiplap cutter (or utility knife)
– 3-inch (76 mm) wide Aluminum tape as follows:
  UL 181A-H heat activated tape (UPC-17)
  UL 181A-M mastic
  UL 181A-P pressure sensitive tape

Optional tools:

– Heat iron for UL 181A-H tape capable of maintaining a surface temperature of 550°F to 650°F (288°C to 343°C).
– Tape squeegee for UL 181A-P tape
– GSH Metal reinforcement washers
– #10 x 1.5 Sheet metal screws

Insert the male end of the slip-joint into the female end of another section of duct. Use a slip-joint cutter or utility knife to form ends if necessary. Ends properly cut will fit snugly.

Seal the joints with an approved closure method described below. Overlap the joint 1-inch (76 mm) minimum on either side of the joint, (see *North American Insulation Manufacturers Association (NAIMA)* publication *#AH119*, *Fibrous Glass Residential Duct Construction Standards).*

When joining to a metal duct, use one of the standard taping methods below. If additional strength is required, use sheet metal screws through sheet metal washers.

UL 181A-H Heat Seal Closure. Heat and pressure should be applied until the green ABI dots have darkened. After heating the closure, use the surface of the iron, a leather glove, or other heat-resistant tool to press the closure into the duct facing scrim pattern. Use a combination of heat and pressure to rub the closure into the facing for best results.

Note: Open flame alone must not be used on heat seal closures. Heat alone is not sufficient to provide a good bond; physical pressure (typically applied by smearing action) is also necessary.

UL 181A-M Mastic Closure. Mastic systems registered with UL and carrying the designation UL 181A-M used in conjunction with a 3-inch (76 mm) wide glass fabric is also an acceptable closure system.

UL 181A-P Pressure Sensitive Tape Closure. The following information applies only to pressure sensitive tapes. For specific storage and installation instructions, refer to the data sheets provided by the tape manufacturer.

Shelf Life. Pressure sensitive tapes often have storage requirements and shelf life limitations. The installer should verify that these conditions have not been exceeded prior to use.

Note: A general rule for shelf life is 2 years. Exposure to high heat may accelerate aging. Consult the tape manufacturer for more detailed shelf life information.

Surface Preparation. In order to obtain satisfactory adhesion and bonding, the surface on which the closure will be applied must be clean and dry. Dust, dirt, oil, grease, moisture and similar substances may result in adhesion and bonding failure when present. Often, wiping the application surface with a clean, oil-free, lint-free rag or paper towel is sufficient. However, for the best results on contaminated or questionable surfaces, the cleaning recommendations of the tape manufacturer should be consulted.

Application above 50°F (10°C). Using 2.5 inches (64 mm) wide (minimum) tape, position the tape along the edge of the joint in a manner that will allow 1-inch (25 mm) minimum overlap on adjacent surfaces, (see *North American Insulation Manufacturers Association (NAIMA)* publication *#AH119*, *Fibrous Glass Residential Duct Construction Standards).* While holding the tape taut, press in place taking care to avoid wrinkles and folds. Rub tape firmly with a plastic squeegee until the facing reinforcement (scrim pattern) shows through the tape.

Application below 50°F (10°C). If tape has been stored at temperatures less than 50°F (10°C), it should be conditioned prior to use by placement in a warm environment in order to improve the initial tack.

Using any suitable heating iron with the plate temperature set at 400°F ± 25°F (204 ±14°C), preheat the area to be taped. Quickly position the tape on the preheated area and press in place. Pass the iron two or three times over the taped surface using a rapid “ironing” motion.

Complete the bond by rubbing the tape firmly with the plastic squeegee until the facing reinforcement shows through the tape.

SUPPORT

Square fiberglass duct should be hung so that the hanger will not damage the duct facing. Straps or saddles in contact with the duct should be fabricated of 24 gauge galvanized sheet metal, with a minimum width of 1-inch (25 mm). Sheared edges, or any burrs, should be rolled to the outside of the hanger. Hangers should not exceed 6 feet (1.8 m) on center, and should be located as close to the duct joints as practical. See Figure 1 for examples of square duct mounting.

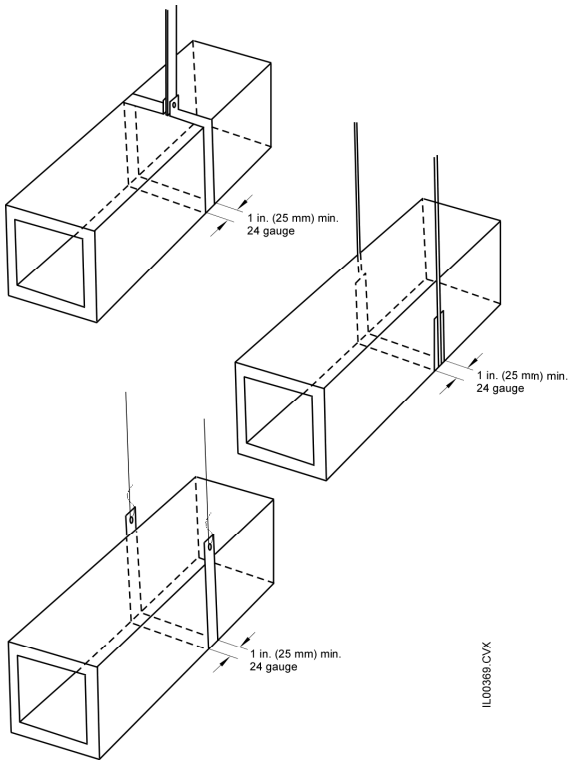


Figure 1. Plenum Support

PATCHING

Accidental punctures or tears in the facing should be repaired to minimize leakage and provide a neat appearance.

If the damaged area is small, repair with approved closure system above. Where larger areas of the facing have been damaged, remove the section of damaged duct. Replace with a new duct, using lap joints at both ends.

PLENUM TAKEOFF INSTALLATION

Plenum Takeoff Installation. Position the plenum takeoff so that the least amount of stress is applied to the connection and the duct is as straight as possible, see Figure 2 for takeoff placement.

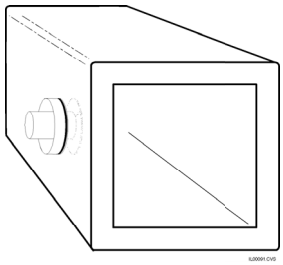


Figure 2. Plenum Takeoff Location

For 1-inch (25 mm) fiberglass plenum:

1. Use a UPC-55 hole-cutter ("cookie" cutter) to make a 2-inch hole in the plenum.

2. Cut a ½-inch (13 mm) slit in the FSK plenum jacket.

3. Bend the starting edge of the spin-in (UPC-23B) takeoff thread flange as shown in Figure 3. Then twist the spin-in into the hole. Be sure that the bottom flange is fully engaged on the inside of the plenum. It may be necessary to apply some pressure as you spin the takeoff a full 360° around. Inspect the inside of the takeoff to be sure no insulation from the plenum is projecting into the airstream. Continue to spin the takeoff until no excess insulation can be seen down inside the stub of the takeoff.

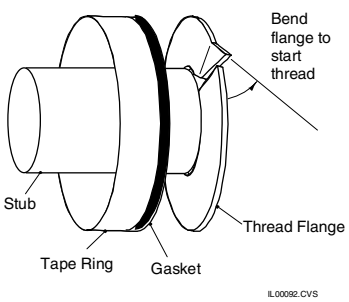


Figure 3. Spin-In Takeoff (for 1-inch (25 mm) Fiberglass Duct)

CONNECTING DUCT TO TAKEOFF OR TERMINATOR

1. Pull back the insulation of the supply tubing about 2 inches (5 cm) to expose the inner core.
2. Slip the clamp ring over the core
3. Slip the core over the stub of the takeoff or terminator as far as you can. Then secure with clamp using clamp pliers (UPC-54).
4. Stretch the insulation and outer jacket over the core and stub and stuff under the tape ring as best you can. Secure the outer jacket with UL-181A aluminum tape.