

Aluminum Supply Tubing



UPC-25 R4 -1

— quantity per box
— Nominal R-factor
— Part No.

General

The Unico System aluminum supply tubing is a 2-inch (51 mm) Flexible Air Duct. It provides an insulated vapor barrier to prevent condensation from forming on the outside of the duct. However, the aluminum supply tubing is not designed to reduce the high velocity air noise. Therefore, it is essential to use the UPC-26 sound attenuator at the end of every branch duct to prevent unwanted noise.

The supply tubing is offered with several different choices of insulation thickness. In most cases, the standard supply tubing should be used. However, for extremely cold or humid environments or where the local building code requires a specific R-factor and the duct is installed in an unconditioned space, use the R4, R6, or R8 products. The R4, R6, and R8 ducts have thicker and heavier insulation than the standard sound attenuator to reduce thermal losses.

Application

The UPC-26 sound attenuator significantly reduces sound from the outlets. Therefore, for proper noise control, it is recommended to use at least 3 feet (1 m) of the UPC-26 sound attenuator at the end of every two-inch branch run. An entire branch duct can be made of one or more lengths of the UPC-26 sound attenuator. However, because the aluminum core tubing is stronger than the sound core, for lengths greater than 12-feet (3.7 m) it is best to use almost all UPC-25 aluminum supply tubing with a 3-foot (0.9 m) length of sound attenuator at the end (Figure 1).

Where runs are required to be installed in unconditioned spaces every attempt should be made to limit the length of the duct run to 12-feet or less using the proper R-factor for the application. However, as an air duct, there is no limit to the length used other than its ability to deliver the air.

For sizing and to determine run capacity, add up all tubing lengths in the run and use the charts or curves provided in Bulletin 40-40, System Sizing and Layout Procedure.

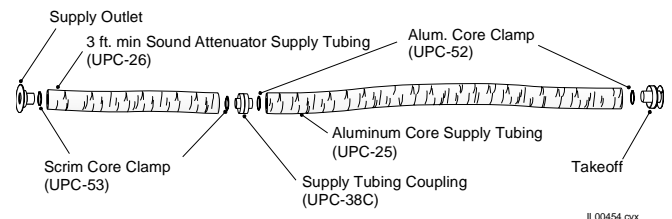


Figure 1: Assembly of Branch Duct Runs

Construction

The aluminum supply tubing has a 2-inch (51-mm) inside diameter supplied in 25-foot (7.7- m) lengths and can be cut as needed. As shown in Figure 2, the standard supply tubing (UPC-25) is made of three layers. These layers combined have an R factor of 3.2 °F-hr-ft²/Btu.

CONFORMS TO UL STD 181
CERTIFIED TO
CAN/ULC STD S110-M86



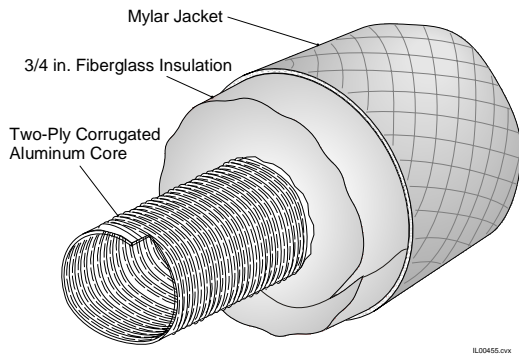


Figure 2. Standard Supply Tubing

The inner layer/core is made of two-ply corrugated aluminum. The outer jacket is made of two-ply reinforced reflective mylar; providing a vapor seal to prevent leakage and moisture migration, and increases the insulation factor by reducing the radiant heat transfer. Fiberglass blanket insulation fills the void between the jacket and the nylon core.

The standard duct has one insulation layer 0.75 inch (19 mm) thick; the R4 duct insulation layer is 1.0 inch (25 mm). The R6 and R8 duct both have two layers of insulation and a double vapor seal; The R6 total insulation thickness is 1.5 inches (38 mm) and R8 total insulation thickness is 2.0 inches (51 mm).

Installation

For complete installation instructions refer to Bulletin 30-55.

Duct Heat Gain/Loss

Whenever duct is installed in an unconditioned space, the heat gain and loss calculations must include duct loss. Table 1 shows the recommended values for the different supply tubing models. These are based on both thermal losses and losses due to leakage for a typical installation.

Table 1. Recommended Duct Loss (includes leakage)

Season	Conventional Duct	Unico Duct, UPC-26C			
		-	-R4	-R6	-R8
Cooling*	15	8	6	5	3
Heating**	20	15	11	9	6

* Based on 120°F surrounding temperature

** Based on 10°F surrounding temperature

The R-factor is calculated per the Air Diffusion Council (ADC) Flexible Duct Standard. This code assumes that the duct wall is flat. This assumption works well for conventional ducts because the duct radius is usually quite large. However, for small ducts, assuming the duct wall is flat overestimates the thermal losses. Therefore, the R-factor specified for a small duct may be less than the value required for a conventional duct. This is described as an equivalent R-factor in Table 2 and is further explained in National Evaluation Service, Inc. (NES) Report Number NER-A74177.

Specifications

Certifications:	UL Standard 181 <i>Flexible Air Ducts</i> ADC <i>Flexible Duct Performance & Installation Standard</i>
Classification:	Air Duct per UL Standard 181
Smoke Developed Rating:	less than 50
Flame Spread Index:	less than 25
Inside Diameter:	2.0 inches (51 mm)
Outside Diameter:	UPC-25: 3.5 inch (89 mm) UPC-25R4: 4.0 inch (102 mm) UPC-25R6: 5.0 inch (127 mm) UPC-25R8: 6.0 inch (152 mm)
Duct Material:	Two-ply corrugated aluminum
Filter Particle Size:	5 μ
Insulation:	Fiberglass
Vapor Barrier:	Reinforced Aluminized Mylar
Min. Pressure:	negative 0.5-inch w.c. (125 Pa)
Max. Pressure:	4.0 inches w.c. (1000 Pa)
Max. Velocity:	5000 ft/min (25 m/s)
Min. Length:	none
Max. Length:	30 ft (9 m)
Support Distance:	every 6-ft (2 m)
Min. Inside Bend Radius:	6 inch (150 mm)
R-Factor:	see Table 2

Table 2. Duct R-factor

Model	Outside Dia, inch (mm)	R-factor °F-hr-ft ² /Btu	
		Rated*	Effective**
UPC-25	3.5 (89)	3.2	4.2
UPC-25R4	4.0 (102)	4.2	5.8
UPC-25R6	5.0 (127)	6.0	9.2
UPC-25R8	6.0 (152)	8.0	13.7

* per ADC Flexible Duct Standard, based on flat thickness, k=.24 Btu-in/h·ft²·°F

** per ASHARE 2001 Fundamentals Handbook p. 23.21, based on curved thickness