

Engineering Sound Solutions

FOR A NOISY WORLD



Ruskin can quiet the toughest noise problems.

With over 40 years of experience, Ruskin is recognized as a leading manufacturer of acoustical duct silencers and acoustical thermal modular housings, providing top quality and unparalleled performance at an economical price.

Ruskin has a complete line of acoustical products as well as the experience and knowledge to design products for special conditions. Ruskin products have been installed in a wide variety of applications with engineering assistance provided at every step along the way.

Ruskin's operations, manufacturing and management strength ensures you will receive the industry's finest acoustical products and solutions for all your sound control challenges. Take a look at what we have to offer and you'll see why Ruskin is the leader in providing acoustical products.

TABLE OF CONTENTS

Silencers

Applications	3
Guidelines for Silencer Selection.	4
Rectangular Dissipative Silencers	6
Rectangular Reactive Silencers	8
Tubular Dissipative Silencers	9
Acoustical Louvers.	12
Grille Silence	13
Air Vent Silencers	14
Custom Designed Products.	15

Modular Panel Systems

Applications	17
SoundChek Performance	18
R&D and Ruskin's Acoustical Laboratory	20
What Happens When You Order.	20
Panel & Trim Details	21
Sample Specifications	22
Performance and Installation Guidelines	23
Variations of Construction	24

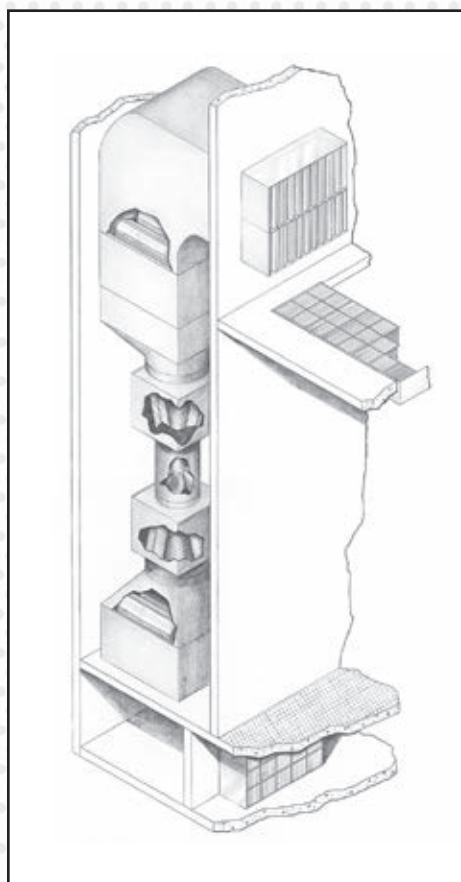
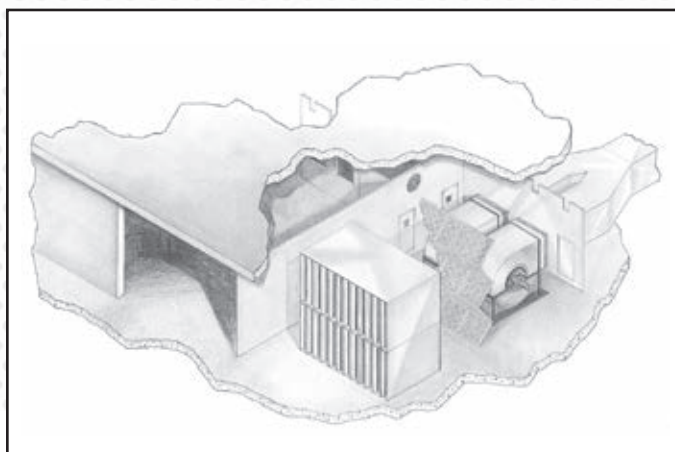
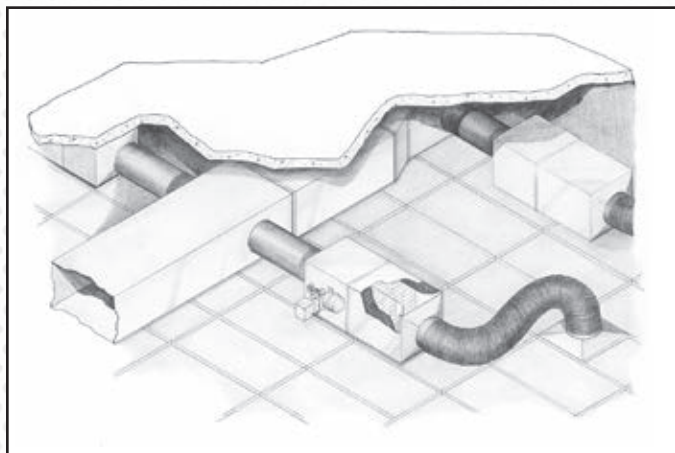
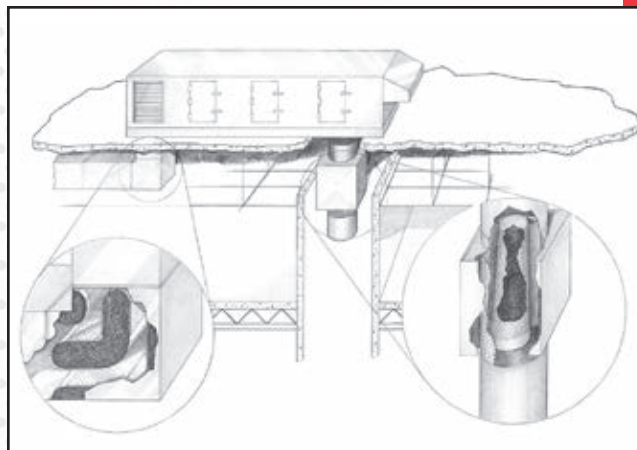
SILENCER

APPLICATIONS

Noise control is critical for any ventilation system. Ruskin silencers provide the best control in the business with silencers that can be used with virtually any application and ductwork. Ruskin silencers are:

- innovative, based on new developments in Ruskin's laboratory
- available for a variety of applications
- durable and built to last.

The following are examples of common applications:



GUIDELINES FOR SILENCER SELECTION

APPLICATION	A	AM	DM	RECTANGULAR DISSIPATIVE				RECTANGULAR REACTIVE	
				SLF	MLF	LLF	HTL*	TRC	PR
Rectangular HVAC Ducts	X	X	X	X	X	X	X	X	X
Round HVAC Ducts									
Clean Room Systems	Xa	Xa	Xa	Xa	Xa	Xa	Xa	X	X
Hospitals	Xa	Xa	Xa	Xa	Xa	Xa	Xa	X	X
Chemical Laboratories	Xa	Xa	Xa	Xa	Xa	Xa	Xa	X	X
VAV Boxes	X	X	X	X	X	X	X	X	X
Cooling Towers			X			X			
Air Handling Units	X	X	X	X	X	X			
Axial Fans									
Generators	X	X	X	X	X	X			
Cross Talk									
Package Vertical A/C Unit									
Grilles									
Finished Openings									
Secure Environment							X		

X^a = w/non-fibrous liner
 *HTL = High Transmission Loss Casing

The following guidelines are provided to speed the process of silencer selection. If an application arises which does not fall strictly within the guidelines provided, call your Ruskin representative for assistance. Ruskin can handle your custom applications as well!

STEP 1

Determine the Dynamic Insertion Loss Needs of your system

The best method of determining the Dynamic Insertion Loss (DIL) needs of your system is to perform a complete acoustical analysis. Your local acoustical consultant can provide this service to you. If you do not have access to such services, or if you are performing preliminary analysis for budgetary purposes, Ruskin has a host of design tools to help you with product selection.

“HVAC Analysis for Silencer Selection” – This design manual provides enough information to perform analysis of airborne noise in ducted HVAC systems where; the design goals are NC30 or greater,

the system is constant volume and duct velocity does not exceed 1500 FPM. The information contained in this technical bulletin has been derived from ASHRAE and SMACNA sources and is organized for easy look-up and recording of your results on a convenient worksheet included with the manual.

Acoustical Analysis and Silencer Selection Program

– This tool will allow an analysis of systems to determine DIL and Transmission Loss needs and selection of Ruskin product to meet the identified needs.

Application Assistance Service – Ruskin will help with preliminary analysis of your systems in order to suggest product solutions and to show you how Ruskin software can be utilized. Upon receipt of your plans and necessary design detail, Ruskin will perform an analysis of the system and report the results to you with product suggestions to meet the needs of the project. Based on the workload, the results can usually be returned the same week.

TUBULAR DISSIPATIVE			SPECIALTY				APPLICATION
AX	CN	XFA	ELBOW	GSV	LAS	AIR VENT	
			X				Rectangular HVAC Ducts
X	X						Round HVAC Ducts
X ^a	X ^a	X ^a	X ^a				Clean Room Systems
X ^a	X ^a	X ^a	X ^a				Hospitals
X ^a	X ^a	X ^a	X ^a				Chemical Laboratories
							VAV Boxes
					X		Cooling Towers
							Air Handling Units
X	X	X					Axial Fans
							Generators
						X	Cross Talk
				X			Package Vertical A/C Unit
				X			Grilles
					X		Finished Openings
							Secure Environment

STEP 2

Determine System Configuration (Selecting Silencer Family)

First, using the table above, match your application to the silencer family which will best accommodate the system configuration. Ruskin has four main silencer families:

Rectangular Dissipative Silencers

Tapered Pod Dissipative – A, AM, DM
Straight Pod Dissipative – SLF, MLF, LLF
High Transmission Loss Casing

Rectangular Reactive Silencers

Tuned Resonant Chamber – TRC
Packless Rectangular – PR Series (SL, SM, LL, LM)

Tubular Silencers

Insulated Outer Casing – AX
Single Outer Casing – CN
Axial Fan Attenuator – XFA

Specialty Silencers

Elbow Silencers
Louvers/Grille Silencers – LAS, GSV
Air Vent Silencers
Custom Silencers

STEP 3

Narrow the Field (Select a Model Within a Family)

The silencer size and the system CFM will determine the Face Velocity of the silencer. The maximum system pressure with the silencer in place will determine the allowable Pressure Drop through the silencer. The sound generating device and system attenuation coupled with the design goals will determine the Dynamic Insertion Loss (DIL) requirements for the silencer.

Once the Face Velocity, maximum Pressure Drop and DIL are known, utilize the Ruskin specification data sheets to determine the silencer which will best meet the requirements of the system. Typically, the shortest silencer which will meet the DIL requirements within the allowable Pressure Drop criteria will be the most economical solution. Therefore, begin with the silencer with the highest DIL characteristics within a family and work through the family in gradually longer silencers until the criteria are met.

RECTANGULAR DISSIPATIVE SILENCERS

Tapered Pod Design – A, AM and DM

KEY DESIGN FEATURES

- Solid Radius Nosepiece
- Fully Tapered Pod
- Uniform Expansion Angle
- Superior Static Pressure Performance
- Acoustically transparent perforated liner
- Acoustical grade fibrous media
- 1-1/2" slip flange

TAPERED POD DESIGN

Ruskin Models A, AM and DM are the first choice of designers for rectangular dissipative silencers. This family of silencers was developed with superior Dynamic Insertion Loss and Static Pressure characteristics. As with all Ruskin silencers, the data for these products has been developed in strict accord with ASTM E477 in independent, nationally recognized laboratories.

PRIMARY APPLICATIONS

Standard: VAV boxes, rectangular ductwork, air handling units, generator radiator silencing, tunnel ventilation, general ventilation

W/ Non-fibrous Liner: Cleanroom systems, hospitals, chemical laboratories, cooling towers (DM), fume hood exhaust

CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Can be stacked to make large banks
- Can be sized to match duct dimensions, eliminating need for expensive transitions between silencer and ductwork
- Standard lengths of 36," 60," 84," 120." Ruskin will manufacture silencers of any intermediate length.

SPECIFICATION

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and



Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.

Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 10" W.G. differential pressure. Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent. The liner shall have a uniform taper over the length of the silencer.

Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread 20
 Fuel Contributed 15
 Smoke Developed 20

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise. Basis of specification is Ruskin Sound Control, a Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Width* Range (in)
A	High	Broadband	Standard	Band 4, 5	3, 5, 7, 10	2000	6 - 48
AM	Med	Broadband	Medium	Band 4, 5	3, 5, 7, 10	3000	6 - 48
DM	Low	Broadband	Low	Band 4, 5	3, 5, 7, 10	4000	6 - 48

*Bank silencers for larger sizes

RECTANGULAR DISSIPATIVE SILENCERS

Straight Pod Design – SLF, MLF and LLF

KEY DESIGN FEATURES

- Solid Radius Nosepiece
- Acoustically transparent perforated liner
- Acoustical grade fibrous media
- 1-1/2" slip flange

STRAIGHT POD DESIGN

Straight pod dissipative silencers are normally a secondary option to the Ruskin tapered pod design. These silencers do attenuate additional low frequency energy particularly in the 84" and 120" models and thus may be particularly suited to applications where those characteristics are desirable.

PRIMARY APPLICATIONS

Standard: VAV boxes, rectangular ductwork, air handling units, generator radiator silencing, tunnel ventilation, general ventilation

W/ Non-fibrous Liner: Cleanroom systems, hospitals, chemical laboratories, cooling towers (LLF), fume hood exhaust

CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Can be stacked to make large banks
- Can be sized to match duct dimensions, eliminating need for expensive transitions between silencer and ductwork
- Standard lengths of 36," 60," 84," 120." Ruskin will manufacture silencers of any intermediate length.

SPECIFICATION

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.



Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 10" W.G. differential pressure. Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.

Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread 20
Fuel Contributed 15
Smoke Developed 20

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise.

Basis of specification is product as manufactured by Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Width* Range (in)
SLF	High	Broadband/Low	Standard	Band 4, 5	3, 5, 7, 10	1000	6 - 48
MLF	Med	Broadband/Low	Medium	Band 4, 5	3, 5, 7, 10	2000	6 - 48
LLF	Low	Broadband/Low	Low	Band 4, 5	3, 5, 7, 10	4000	6 - 48

*Bank silencers for larger sizes

RECTANGULAR REACTIVE SILENCERS

PR Series and TRC

KEY DESIGN FEATURES

- No fiberglass or other media in airstream
- Solid Radius Nosepiece
- Modules optimized for maximum attenuation
- Tuned resonator cavity
- 100% metal construction

REACTIVE SILENCERS

Ruskin has the most complete line of rectangular reactive silencers on the market. Reactive silencers are specifically designed to address the needs of those applications which require no media of any kind in the airstream. They act as resonators to dissipate the acoustical energy introduced via the airstream.

PRIMARY APPLICATIONS

Standard: VAV boxes, rectangular ductwork, air handling units, generator radiator silencing, cleanroom systems, hospitals, chemical laboratories, fume hood exhaust

CHARACTERISTICS

- Performance tuned to particular bands
- Can be stacked to make banks of size larger than maximum module
- Are designed around modules of 12" and 15" and must be selected in integrals of those widths
- Standard lengths of 36," 60," 84," 108," and 120."
- (Other lengths will require advanced testing and associated lead time.)

SPECIFICATION

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.



Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 10" W.G. differential pressure. Casings shall not vibrate audibly during normal operation of air moving device.

Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be designed to act with the non-airstream cavity to dissipate the acoustical energy through resonator action. Products which utilize non-metallic materials as part of the active resonator shall not be acceptable. This includes but is not limited to paper or plastic film and non-metallic spacers.

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise. Basis of specification is product as manufactured by Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Width Module (in)
PRSL	Tuned	Standard	Band 3, 4	3, 6, 9	1500	12
PRSM	Tuned	Standard	Band 4, 5	3, 6, 9	1500	12
PRLI	Tuned	Medium	Band 3, 4	3, 6, 9	2000	15
PRLM	Tuned	Medium	Band 4, 5	3, 6, 9	2000	15
TRC	Tuned	Medium	Band 3	3, 5, 8	2000	12

TUBULAR DISSIPATIVE SILENCERS

AX

KEY DESIGN FEATURES

- Fully-insulated outer casing
- Full-length center bullet
- Domed bullet cap
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

FULLY INSULATED TUBULAR SILENCER

This silencer is for those situations when you need superior performance from your tubular silencer. The AX silencer offers the maximum amount of acoustical performance for a tubular silencer delivered in an economical package. The fully-insulated rectangular outer casing offers performance superior to the double-wall competitors and the aerodynamic performance of the silencer allows it to be used over a wide variety of applications.

PRIMARY APPLICATIONS

Standard: Round ductwork, ducted axial fans, tunnel ventilation, general ventilation

W/ Non-fibrous Liner: Cleanroom systems, hospitals, chemical laboratories, fume hood exhaust

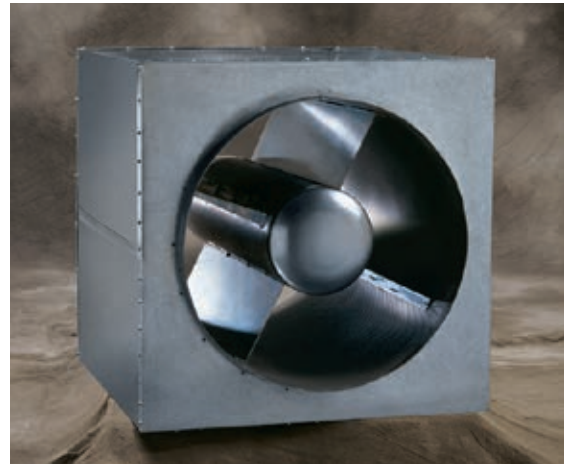
CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Standard lengths of 2 x diameter (36" min).
Custom lengths available

SPECIFICATIONS

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.

Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall



be airtight up to 10" W.G. differential pressure. Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.

Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed	20

Center bullet shall be capped to minimize turbulence and entrance loss.

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise. Basis of specification is Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Diameter Range (in)
AX-A	High	Broadband	Low	Band 5	2 x Length	6000	12 - 60
AX-B	Med	Broadband	Low	Band 4, 5	2 x Length	6000	12 - 60
AX-C	Low	Broadband	Low	Band 4, 5	2 x Length	6000	12 - 60

TUBULAR DISSIPATIVE SILENCERS

CN

KEY DESIGN FEATURES

- Full-length center bullet
- Domed bullet cap
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

SINGLE WALL TUBULAR SILENCER

Where economy is of primary performance and where an externally wrapped duct system is specified, the CN series of silencers may be your answer. The CN offers a single wall outer casing which can be made to match your round duct diameter. The center bullet acts to attenuate the acoustical energy and the free area ratio is varied to give a wide range of performance.

PRIMARY APPLICATIONS

Standard: Round ductwork, ducted axial fans, tunnel ventilation, general ventilation

W/ Non-fibrous Liner: Cleanroom systems, hospitals, chemical laboratories, fume hood exhaust

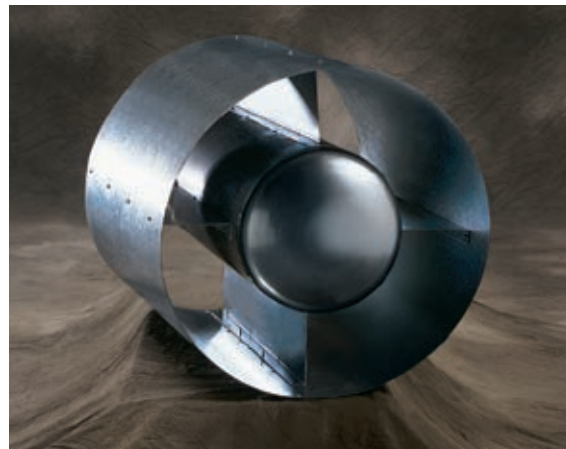
CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Standard lengths of 3 x diameter (48" min).
Custom lengths available

SPECIFICATIONS

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.

Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 10" W.G. differential pressure.



Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.

Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed	20

Center bullet shall be capped to minimize turbulence and entrance loss.

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise. Basis of specification is Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Diameter Range (in)
CN-A	High	Broadband	Low	Band 4, 5	3 x Length	6000	12 - 60
CN-B	Med	Broadband	Low	Band 4, 5	3 x Length	6000	12 - 60

TUBULAR DISSIPATIVE SILENCERS

Axial Fan Attenuator – XFA

KEY DESIGN FEATURES

- Fan-specific component dimensions
- Domed bullet cap
- Acoustically transparent perforated liner
- Acoustical grade fibrous media
- Performance-enhancing airstream taper

AXIAL FAN ATTENUATOR

Often the best location to attenuate noise is as close to the source as possible. The XFA has been designed to do just this, while actually enhancing the performance of the axial fan to which it is coupled. The component dimensions (inner radius and center bullet diameter) are specifically matched to the exact fan installed by the contractor.

PRIMARY APPLICATIONS

Standard: Round ductwork, ducted or non-ducted axial fans, tunnel ventilation, parking garage ventilation, fan towers, general ventilation

W/ Non-fibrous Liner: Cleanroom systems, hospitals, chemical laboratories, fume hood exhaust

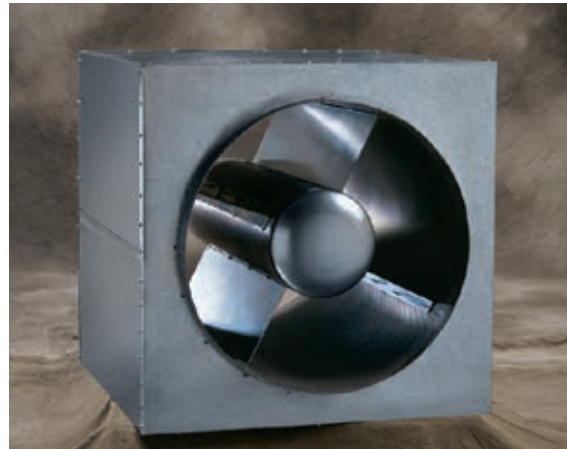
CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Sized to match fan dimensions
- Enhances fan performance

SPECIFICATIONS

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance) by a nationally recognized independent laboratory.

Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 10" W.G. differential pressure.



Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.

Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed	20

Airstream dimensions shall match the axial fan to which it is coupled. Outer wall taper shall be designed to enhance the performance of the axial fan. Center bullet shall be capped to minimize turbulence and entrance loss.

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise. Basis of specification is Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Max Velocity (fpm)	Diameter Range (in)
XFA	High	Broadband	Low	Band 5	4000	24 - 84

ACOUSTICAL LOUVERS

LAS

KEY DESIGN FEATURES

- Architecturally appealing appearance
- AMCA licensed water penetration performance
- AMCA licensed air performance
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

ACOUSTICAL LOUVERS

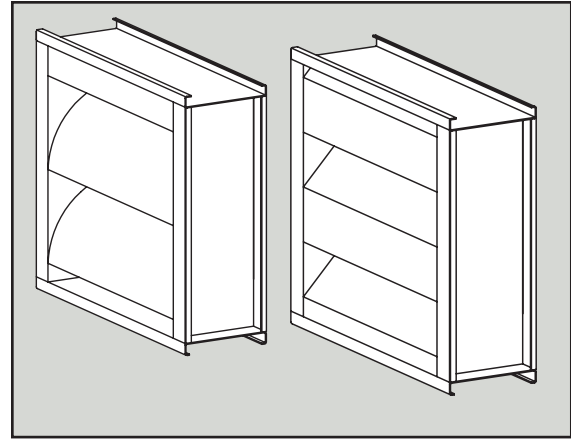
Ruskin offers the most complete line of acoustical louvers on the market. All products are AMCA licensed for water penetration and air performance. The product is offered in standard galvanized steel or alternative aluminum construction, and can be offered in a wide variety of finishes. The LAS louver family includes standard or airfoil blade design and depths between 4" and 12."

PRIMARY APPLICATIONS

Cooling towers, mechanical rooms, tunnel ventilation, parking garage ventilation, general ventilation

CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Good water penetration performance
- May be provided with a number of variations such as filter racks, security bars, and insect and bird screens



SPECIFICATIONS

Furnish and install louvers as hereinafter specified where shown on plans or as described in schedules. Louvers shall be stationary acoustical type of blade shape and frame depth specified. Louver components (heads, jambs, sill, blades, and mullions) shall be factory assembled by the louver manufacturer. Louver sizes too large for shipping shall be built up by the contractor from factory assembled louver sections to provide overall sizes required. Louver design shall incorporate structural supports required to withstand a windload of 20 lbs. Per sq. ft. (equivalent of a 90 mph wind).

Louvers shall be licensed to bear the AMCA Seal for Air Performance and Water Penetration.

Louvers shall be Ruskin Model (insert appropriate model here). Published louver performance data bearing the AMCA Certified Ratings Seal for Air Performance must be submitted for approval prior to fabrication and must demonstrate pressure drop equal to or less than the Ruskin model specified.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation (ft)	Max Velocity (fpm)*	Size Range (in)
LAS-4	Low	Broadband	Med	Band 6	703	See spec sheet
LAS-6	Med	Broadband	Med	Band 6	872	See spec sheet
LAS-8	Med	Broadband	Med	Band 5, 6	959	See spec sheet
LAS-12	High	Broadband	Med	Band 5	1143	See spec sheet
LAS-8AF	Med	Broadband	Low	Band 5, 6	1250	See spec sheet
LAS-12AF	High	Broadband	Low	Band 6	1030	See spec sheet

*For recommended rate of water penetration

GRILLE SILENCER

GSV

KEY DESIGN FEATURES

- Compact design
- Good broadband performance
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

GRILLE SILENCER

The GSV is designed for low volume, low velocity situations where spot attenuation is necessary. The 4" depth allows plenty of options for the installation of this silencer. The product provides an amazing amount of attenuation in such a compact and economical package.

PRIMARY APPLICATIONS

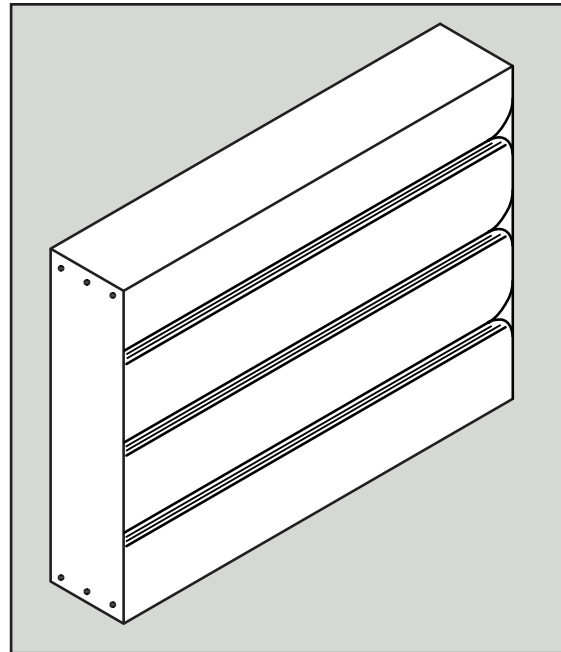
Non-ducted return grilles, vertical packaged AHU return/supply grille, retrofit applications, general ventilation, portable gen sets

CHARACTERISTICS

- Broadband acoustical performance
- 4" depth

SPECIFICATIONS

Grille silencer frame shall be of not less than 16 gauge galvanized steel construction. Components shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.



Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed	20

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, and SP. Basis of specification is Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Max Velocity (fpm)	Size Range (in)
GSV	Med	Broadband	High	Band 5	500	6 - 48

KEY DESIGN FEATURES

- Compact design
- Good broadband performance
- Wide variety of configurations
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

AIR VENT SILENCER

The GSV is designed for low volume, low velocity situations where spot attenuation is necessary. The 4" depth allows plenty of options for the installation of this silencer. The product provides an amazing amount of attenuation in such a compact and economical package.

PRIMARY APPLICATIONS

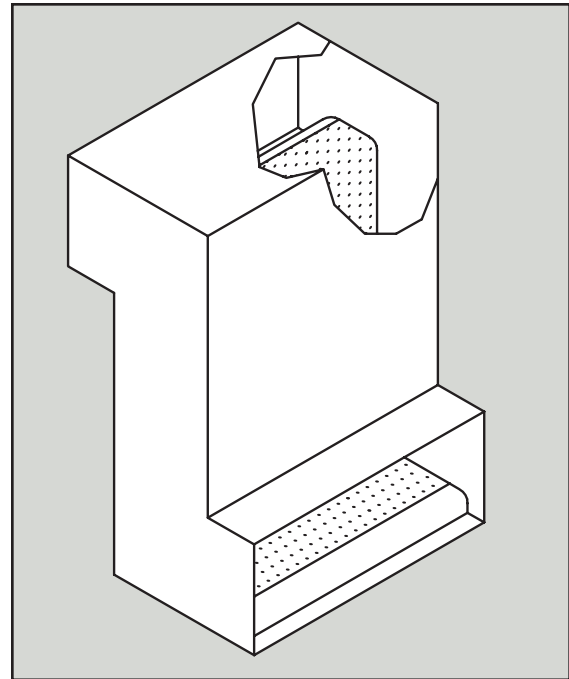
Non-ducted return plenums, hotel restroom exhaust, retrofit applications, general ventilation

CHARACTERISTICS

- Broadband acoustical performance
- Configurations for all applications

SPECIFICATIONS

Air vent silencer shall be of not less than 22 gauge galvanized steel construction. Components shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.



Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent settling. Material shall be vermin and moisture proof and impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed	20

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for attenuation, and SP. Basis of specification is Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	Peak Attenuation	Volume Range (cfm)	Application
D	Med	Broadband	Band 6, 7	200 - 450	Door
CT	Med	Broadband	Band 6	175 - 795	Ceiling
L Type "C"	High	Broadband	Band 7	120 - 1210	Ceiling
L Type "H"	High	Broadband	Band 7	120 - 1210	Wall
L Type "W"	High	Broadband	Band 7	120 - 1210	Wall
S	Med	Broadband	Band 7	100 - 297	Wall

There are few occasions when the standard product offering which Ruskin presents do not meet the project needs. In those instances Ruskin will design silencers which solve the unique problems of your installation.

ELBOW SILENCER

Straight silencers require a significant amount of straight duct run because they require fully established laminar flow. Ruskin offers the elbow silencer for situations where straight silencer placement is difficult or impossible. By combining a duct elbow and a silencer, two necessary elements can be combined into one location.

KEY DESIGN FEATURES

- Compact design
- Excellent broadband performance
- Wide variety of configurations
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

PRIMARY APPLICATIONS

Rooftop AHU supply and return ducts, duct systems lacking sufficient duct runs, rectangular ductwork, generator radiator silencing, general ventilation.

CHARACTERISTICS

- Acoustical attenuation across all eight octave bands
- Can be stacked to allow for banks of larger than maximum module
- Aerodynamically designed for low system effects
- Standard lengths of 36", 60", 84", 120"
- Can be configured with different up and down stream lengths (ex. 2'4" up, 4'8" down)

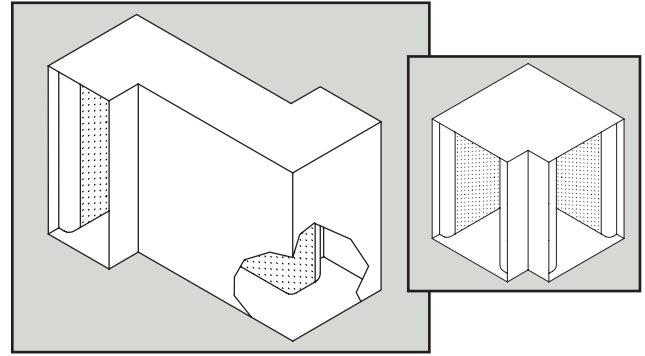
SPECIFICATIONS

Silencer shall be tested in accord with ASTM-E477 (Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and

Airflow Performance) by a nationally recognized independent laboratory.

Outer casing shall be of not less than 22 gauge galvanized steel construction. All external seams shall be lockformed and filled with mastic and shall be airtight up to 8" W.G. differential air pressure.

Casings shall not vibrate audibly during normal operation of air moving device. Acoustical perforated liner shall be of not less than 24 gauge galvanized steel and shall be acoustically transparent.



Absorptive material shall be of acoustical grade and shall be compressed not less than 5% to prevent voids due to settling. Material shall be vermin and moisture proof and shall impart no odor to the airstream. Fibrous media shall exhibit not more than the following fire hazard classification values when tested in accord with ASTM E84, NFPA 255, or UL-723 test methods:

Flamespread	20
Fuel Contributed	15
Smoke Developed.	20

Performance ratings shall be as stated in the silencer schedule within the precision and bias of the test standard for DIL, SP and self-generated noise.

Basis of specification is product as manufactured by Ruskin Sound Control, Division of Ruskin Manufacturing.

PHYSICAL DATA

Model	IL	IL Characteristics	SP	Peak Attenuation	Standard Lengths (ft)	Max Velocity (fpm)	Width* Range (in)
ELBSP	High	Broadband	Standard	Band 4, 5	3, 5, 7, 10	2000	6 - 48
ELBMP	Med	Broadband	Medium	Band 4, 5	3, 5, 7, 10	3000	6 - 48
ELBLP	Low	Broadband	Low	Band 4, 5, 6	3, 5, 7, 10	4000	6 - 48

HIGH TRANSMISSION LOSS SILENCERS

In highly sensitive areas where duct breakout or breakin noise is worrisome, silencers can be designed with a high transmission loss casing. This casing can be manufactured of a more massive single wall outer casing or with external insulation and casing.

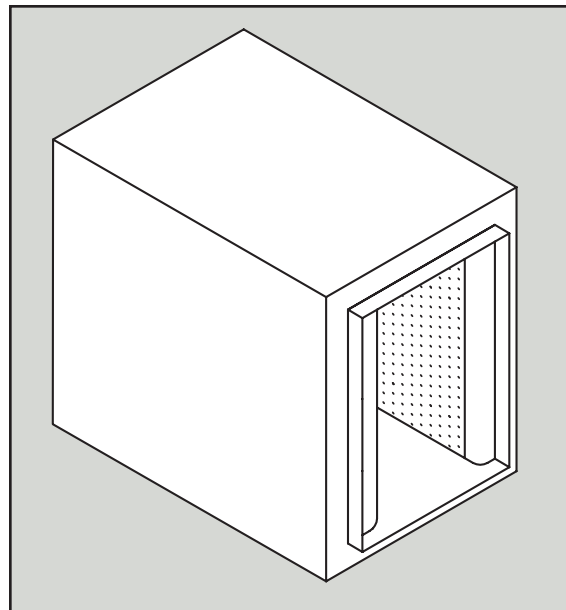
KEY DESIGN FEATURES

- Thicker outer casing or external insulated casing
- Wide variety of performances
- Acoustically transparent perforated liner
- Acoustical grade fibrous media

PRIMARY APPLICATIONS

Government buildings, recording studios, board rooms, mechanical rooms, general ventilation

If you do not see your application in this brochure, call your local representative for design assistance. Ruskin wants to provide solutions to meet your acoustical needs.

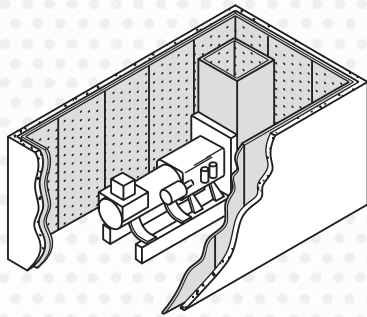


MODULAR PANEL

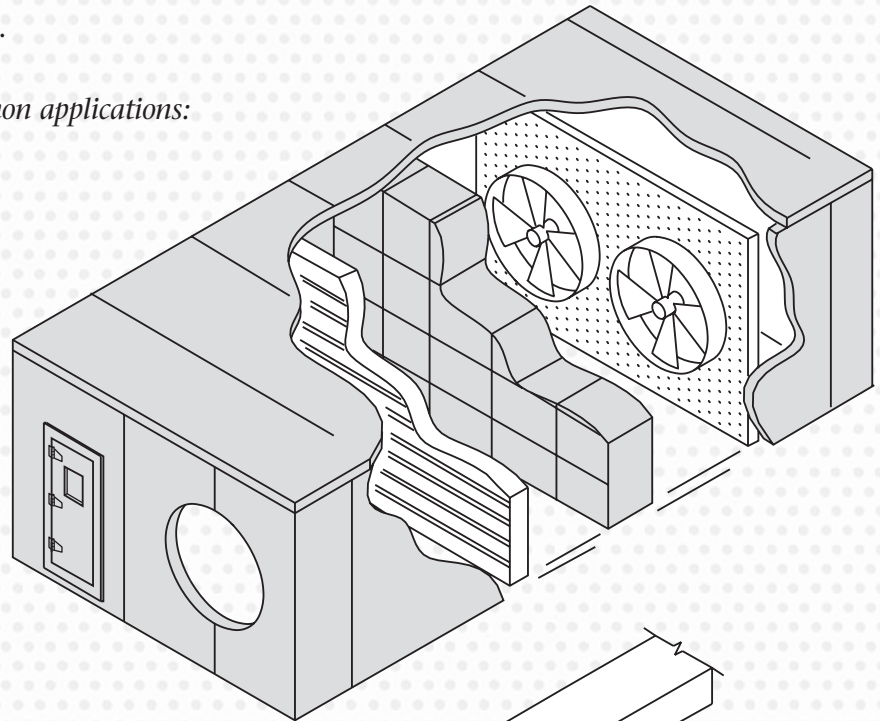
APPLICATIONS

SoundChek modular acoustical panels are used for a wide variety of applications. The modular panel system can be factory designed to make any size plenum, enclosure, or barrier wall.

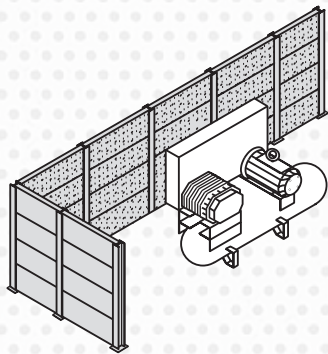
The following are examples of common applications:



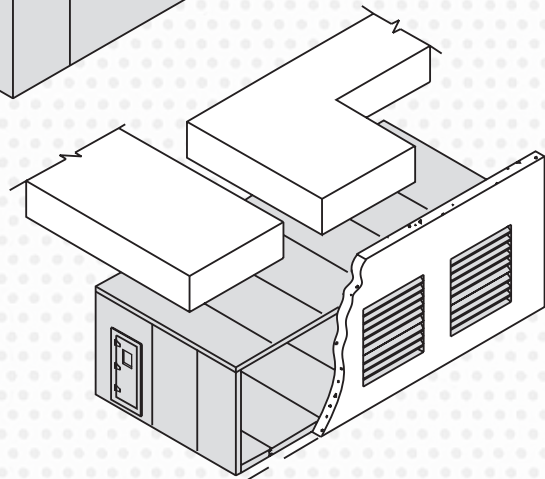
GENERATOR / POSITIVE DISPLACEMENT
BLOWERS / MACHINE ENCLOSURES



AIR HANDLING UNITS
(AHU) PLENUMS



ACOUSTICAL BARRIER
WALL SYSTEMS



LOW TEMPERATURE OVEN

What makes Ruskin the Leader in the Modular Panel Industry?

WE'RE YOUR SYSTEM DESIGN ASSISTANT

Utilizing Ruskin's modular SoundChek panel system is easy. Simply lay out the size plenum or enclosure that your project requires and let Ruskin's engineers know the system parameters such as pressure class, acoustical and thermal requirements — Ruskin's engineers will take it from there.

STRUCTURAL INTEGRITY

Ruskin's SoundChek panels have internal stiffeners placed at no more than 16" on-center. The box frame is also welded in the corners of the rails to end caps to assure true and square panels. This makes our panels the most rigid in the industry.

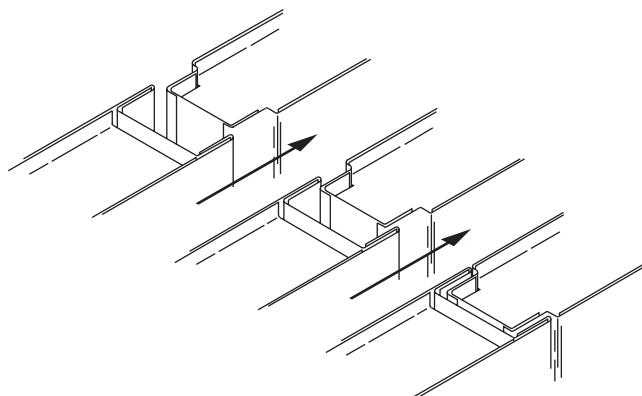
Longer span panels without the need for additional field supplied high cost structural steel. Another labor saver when it comes to assembly.

SoundChek modular panels can be used to manufacture plenums and enclosures much larger than 20 feet, therefore Ruskin designers can incorporate structural steel beams and angles to carry increased panel spans, wind loads, live loads and even snow loads. Ruskin has the in-house expertise to design such systems and provide the structural steel required to meet your project requirements. All Ruskin structural components come from the factory cut to length and prime painted. Just another manufacturing policy that saves the installer labor, time and money!

RUSKIN PANELS UTILIZE A TONGUE AND GROOVE PANEL JOINT

Ruskin's panel joint offers an air tight, structurally strong slip fit connection. This joint is factory insulated to prevent thermal break out. The joint also allows for access in the future if you ever need access to the area. Don't be fooled by snap lock joints that allow no future access!

Ruskin's joint requires only one set of screws, one bead of caulking and no joint trim (H-Strip) to be handled during the assembly process. The box framing of the panel has been designed so that the panel's insulation fills the joint, no dirty loose pieces of insulation have to be handled during assembly. Therefore no condensation can build-up on the outside of the plenum. Air tight and thermally sound the first time!



STRUCTURAL PERFORMANCE*

Static Pressure	Max. Unreinforced Panel Span	
	2"	4"
10 in. W.G.	10'-0"	16'-0"
5 in. W.G.	12'-0"	19'-0"
2 in. W.G.	15'-0"	25'-0"

*Structural spans were determined by an independent and licensed structural engineer to limit deflection to 1/240th of the unsupported span.

THERMAL PERFORMANCE

Panel "U" Factor	
2"	4"
.10	.07

The Panel (heat transfer) factor is noted in BTU/hour/square foot/degree F.

Ruskin's design staff has many years of experience to lay out a system to meet your needs. We will design a system that not only will satisfy the system requirements but one that can be easily installed on site. Our modular panel system is also more than just a truck load of parts. The key to our success has been in offering the whole package. Long before parts arrive at the job site the engineering has been completed with each part marked and tagged with assembly instructions that match the drawings provided with the system.

ACOUSTICAL PERFORMANCE

Octave Band	Mid Freq. HZ	Absorption Coefficient		Transmission Loss	
		2"	4"	2"	4"
2	125	.24	.66	17	21
3	250	.74	1.22	24	33
4	500	1.08	1.12	32	43
5	1000	1.09	1.06	42	54
6	2000	1.01	1.03	50	57
7	4000	.96	.96	53	62
		NRC	NRC	STC	STC
		1.0	1.1	35	43

Sound Transmission loss data was derived from tests conducted in strict accordance with ASTM-E90-83 by an independent acoustical laboratory. Sound absorption coefficients were derived from tests conducted by an independent laboratory using ASTM-C423-84A test method.



RUSKIN USES THE LATEST IN COMPUTER AIDED DESIGN PROGRAMS

Ruskin's modular panel systems are submitted using the very latest in computer aided design. Your drawing will be provided in a clear and concise format. Eliminate errors with detailed drawings as well as long term (as-built plans) for future reference.

RUSKIN SOLVES YOUR NOISE CONTROL PROBLEMS

The main advantage of Ruskin's SoundChek modular panels are their ability to offer all of the above while at the same time solving your noise control problems. The panel system both absorbs sound and blocks it. The inside of the plenum or enclosure will be 100% protected by perforated steel; no absorptive fill will be left exposed. The outside of the panel blocks any access noise from breaking out of the plenum. These panels are ideal to lower the acoustical energy not only in the system but also prevent any unwanted noise from effecting nearby noise sensitive spaces.

Ruskin SoundChek panels have been designed and tested to meet the highest of industry standards. What makes our product perfect for so diverse a set of applications is that Ruskin SoundChek panels have been tested for structural rigidity, acoustical transmission loss, acoustical absorption coefficients, and thermal conductivity. All of this testing has allowed Ruskin to offer a superior panel at a reduced cost.

Ruskin maintains a full acoustical laboratory to assure our customers get the best products on the market. This laboratory is also utilized in the development of project specific solutions to noise problems that require specialized products. If you have a difficult requirement that needs a non-standard product, let the Ruskin team show you our capabilities.

What Happens When You Specify or Order a Modular Panel System

STEP 1

Ruskin's sales team gathers all pertinent facts. This may be from written specifications, drawings or sketches.

STEP 2

Ruskin's designers provide a complete (project specific) submittal drawing for your review.

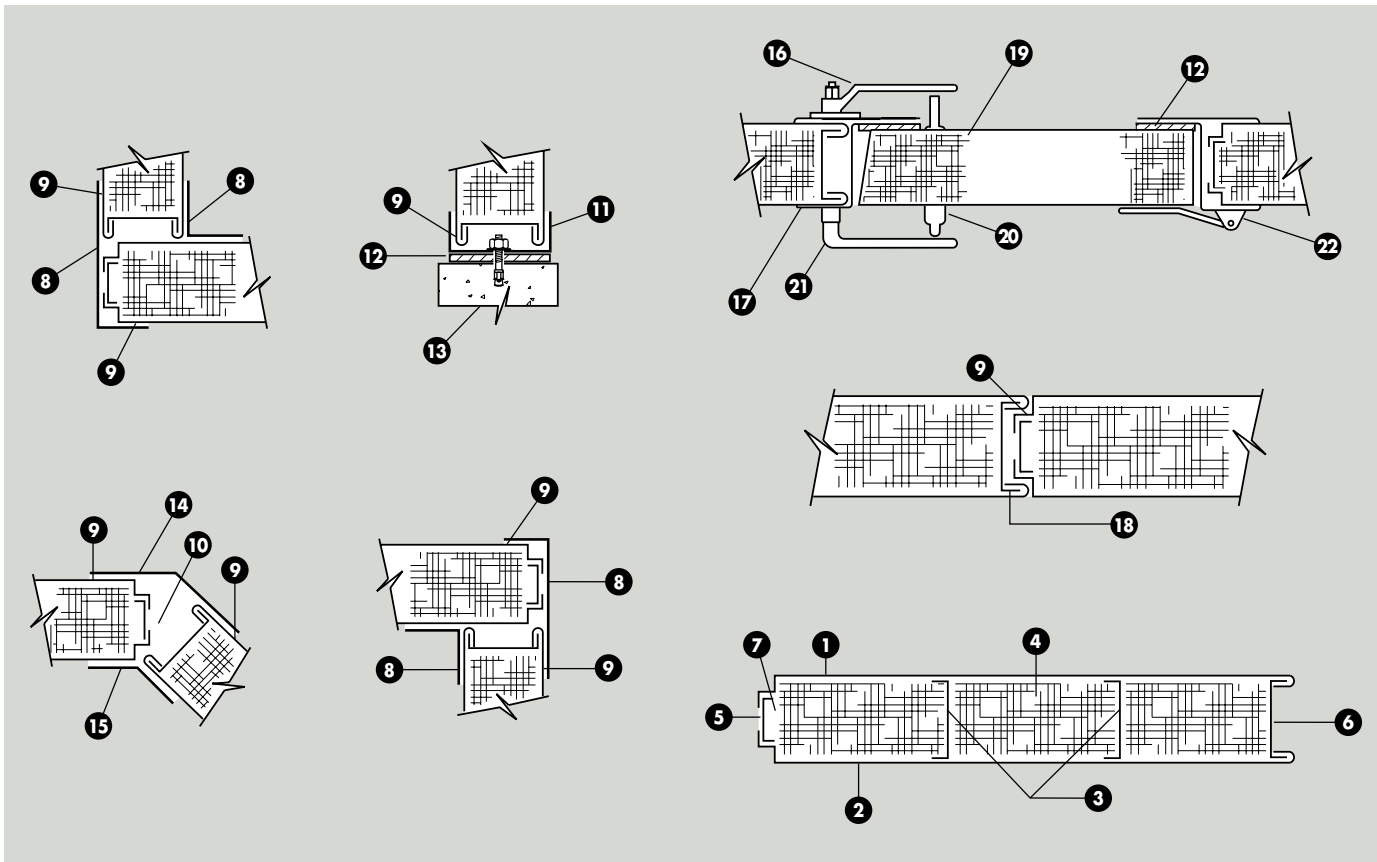
STEP 3

On approval of the submittal, Ruskin's designers engineer each component of the system. These components are each listed on the drawing so as to match the piece mark on the component part. The final drawings are complete in every detail right down to the sequence of assembly. This detail allows for easy field step-by-step assembly.

STEP 4

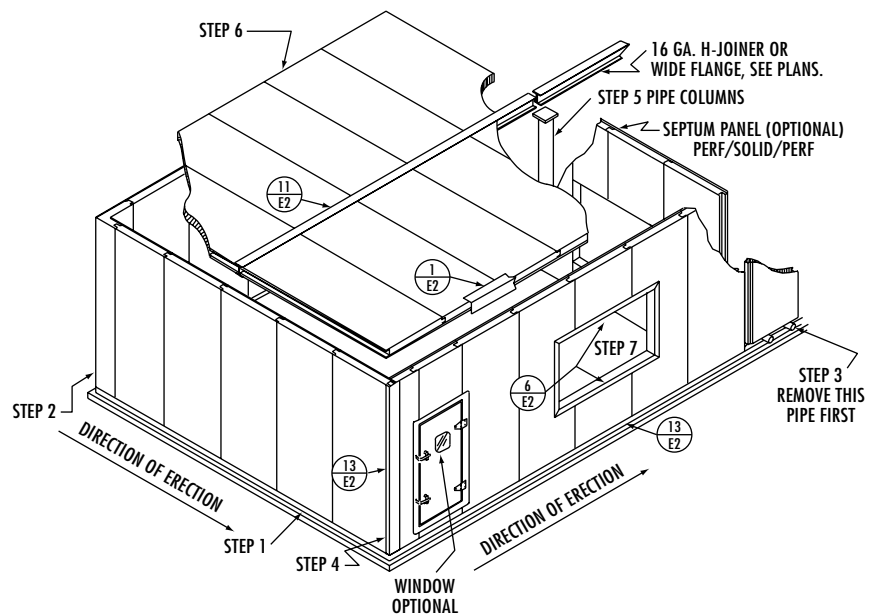
Ruskin fabricates each component part of your plenum or enclosure as outlined on your approved drawings.

PANEL AND TRIM DETAILS



1. 18 gauge galvanized exterior
2. 22 gauge perforated galvanized interior consisting of 3/32" diameter holes on 3/16" staggered centers
3. 16 gauge galvanized stiffeners
4. 4 P.C.F density glass fiber insulation
5. Male connection 2" and 4" panels
6. Female connection 2" and 4" panels
7. Totally insulated panel joint
8. Angle trim
9. Sealant (continuous bead)
10. Packed with fill
11. Channel trim
12. Gasket
13. Finished floor or curb (by others)
14. Special outside angle
15. Size of angle fabricated to suit application
16. Inside release lever
17. Door frame
18. Typical joint detail
19. Pre-hung door
20. Door Pull
21. Door latch assembly
22. Hinge

*Simple modular systems
make your project run
smoothly and get finished on time!*



SAMPLE SPECIFICATIONS

GENERAL

Furnish and install pre-fabricated panel housing as shown on plans. Panels shall exhibit all specified acoustical, thermal and structural characteristics without exception and shall be SoundChek panels as manufactured by Ruskin.

CONSTRUCTION

Modular panels shall be double-wall 4" thick, acoustically insulated, pre-fabricated and supplied by a nationally recognized manufacturer with published standards of construction, assembly, and technical performance. The manufacturer shall have produced a standardized pre-fabricated panel system for a minimum of 10 years.

Modular panels shall be of interlocking tongue and groove design. Panel's exterior skin shall be minimum 18 gauge solid G-90 galvanized steel. Interior skin shall be minimum 22 gauge perforated G-90 galvanized steel. Perforations shall be 3/32-inch-diameter round holes on 3/16-inch staggered centers and shall result in a 23% maximum open area. G-60 galvanized steel shall not be substituted in any case without prior written approval by engineer of record.

Modular panel shall be fully framed with 18 gauge galvanized steel channel welded to both exterior and interior skin. Furthermore, the box frame shall be welded from side rail to end cap including corners for added stiffness. Panel shall have internal stiffeners welded to exterior skin and structurally attached to interior skin on not greater than 16" centers.

Panels shall be packed to minimum 5% compression with high density acoustical-thermal insulating material. Panel joints shall be insulated throughout without voids. Accessory angles and channels shall be minimum 16 gauge galvanized steel and furnished in standard 10'-0" lengths.

Access doors shall be solid 18 gauge galvanized steel on both interior and exterior sides. Doors shall be sized as shown on the plans. Doors shall be 4" thick with overlapping seal. Doors shall be located such that they will open against air pressure. Each door shall be supplied with a single continuous air/acoustic seal around sill, jambs and head. Doors shall have a minimum of two hinges and two latches. Each door shall be factory assembled with hinges attached and adjusted in door frame. Door latches to be wedge type lever with inside release handle. Hinges shall be designed to accommodate door size and weight.

Modular Septum panels shall be 4" thick as shown on plans. Modular Septum panels shall conform to wall panel specifications as listed above with the exception that both outer surfaces shall be minimum 22 gauge perforated G-90 galvanized steel. Center sheet shall be minimum 18 gauge solid G-90 galvanized steel. Center sheet shall be completely sealed against box frame to prevent leakage.

**Note: 2" panel may be used in lieu of 4."
Refer to 2" panel performance.**

PERFORMANCE

Acoustical ratings shall meet the following Transmission Loss (TL) characteristics without exception, as tested in a qualified acoustical laboratory in accordance with ASTM-E90-83.

OCTAVE BANDS	2	3	4	5	6	7	
FREQUENCY (Hz)	125	250	500	1000	2000	4000	STC
TL (dB)	21	33	43	54	57	62	43

Panels shall have the minimum Sound Absorption Coefficients without exception, as tested by a qualified laboratory in accordance with ASTM-C 423-84A.

OCTAVE BANDS	2	3	4	5	6	7	
FREQUENCY (Hz)	125	250	500	1000	2000	4000	STC
SOUND ABSORPTION COEFFICIENT	.66	1.22	1.12	1.06	1.03	.96	1.10

Thermal – Panels shall have a heat transfer (“U”) factor of 0.07 BTU/hr./sq. ft./degree F.

Structural – Fan plenum shall be self-supporting and shall withstand a pressure differential of +/- 10” WG. Where required, additional structural support shall be provided by the panel manufacturer. At this pressure differential, the casing shall be air-tight and shall not deflect more than L/240 of span.

Fire hazard classification code – Incombustible filler material shall exhibit no more than the following fire hazard classification values when tested in accordance with standard ASTM-E 84, NFPA-255, or UL-723 test methods:

Flamespread	15
Fuel Contributed	0
Smoke Developed	0

INSTALLATION GUIDELINES

Acoustical panel housing manufacturer shall furnish complete erection drawings and installation instructions, including a bill of materials. Each piece shall be marked to match the location shown on the drawings. All openings or panel penetrations greater than 6” (diameter or length and width) shall be cut and framed at factory. Openings and penetrations less than 6” shall be located and cut by the installer. All filler sheets and safing between the interior equipment and the acoustical panel housing shall be provided by the installer.

Ruskin PROVIDES THE WHOLE PACKAGE

Years of experience allow Ruskin to service your project's needs with high quality products, a strong design team, R&D, and exceptional performance.

VARIATIONS OF CONSTRUCTION

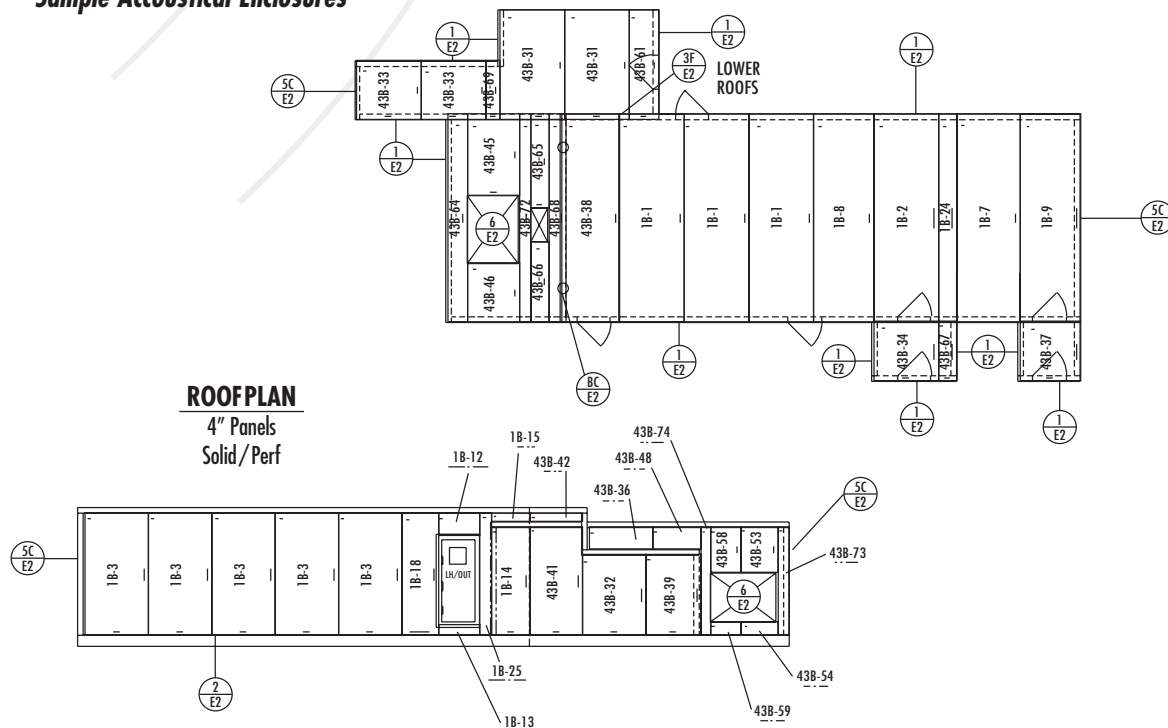
Ruskin's SoundChek modular panels can be made from many different raw materials for special applications. The majority of the requirements can be met by our standard 4" thick, G-90 galvanized construction. However, if special corrosive elements or extremely high transmission loss is required, consult the factory.

PARTIAL LISTING OF SPECIAL CONSTRUCTIONS:

- 2" thick panels
- Stainless Steel
- Aluminum
- Mass Load high TL designs
- Aluminized



Sample Acoustical Enclosures



RUSKIN®
Sound Control

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