

Design ■ Products ■ Materials ■ Systems ■ Installation



**Acoustical Products and Systems
for Noise Control**

800-954-1998

www.inc-noise.com

ABOUT INC

Industrial Noise Control, Inc. (INC) has been focused on providing cost-effective solutions to noise problems of all kinds since 1968. As a sales and engineering firm, our founder's vision was to combine the art and science of noise control into practical, effective solutions for industry using the most suitable products and materials available.

Experience and success has allowed INC to grow and expand our core capabilities to include full scale design and manufacture of innovative acoustical products and components. Today INC manufactures and distributes a broad range of high performing products and structures required to solve the most common to the most unusual, complex and interesting noise control applications that occur in the industrial, commercial, architectural and environmental markets we serve.

Our modern facility in North Aurora, Illinois is located and designed specifically to support the array of manufacturing skills and operations necessary to assure our continued delivery of high quality products and systems. With the room and flexibility to accommodate both the manufacture of highly custom structures as well as higher volume standard products, INC is uniquely positioned to meet the challenges of increasing customer demands for new products, short lead times and lower costs.

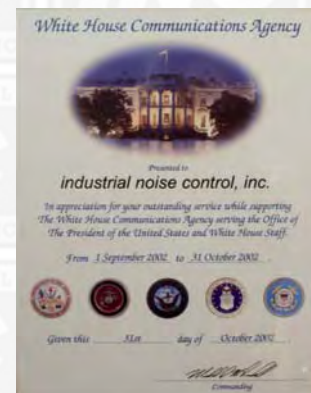
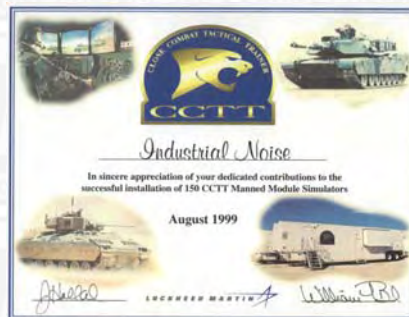


INC has a rich history of innovation and creative problem solving simply because we aren't afraid to take on projects that demand it. From the development of high performing sound isolation rooms with a fraction of the mass, bulk and complexity typically required ... to the re-invention of acoustical cladding panels providing high sound isolation, physical security, weather resistance and reduced construction time ... we consider challenges nothing more than opportunities.

Our flexibility allows us to meet our customers' specific needs. We have developed an agility and versatility that helps us find ways of solving problems, making changes and staying on schedule and on budget when others can't. Our Small Business of The Year Award for 100% quality and on-time delivery from Lockheed-Martin Corporation is a testament to our ability to perform and meet commitments. Everyone at INC solves problems, corrects mistakes and takes responsibility for our customers' satisfaction.

Offering a complete range of acoustical materials, products and engineered systems ... INC is committed to continued growth, innovation and success – ours and our customers'.

Noteworthy Associations and Recognitions:



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INC Noise Control Catalog

This catalog is organized into these three broad categories:

- **Noise Control Materials**
- **Ready-To-Use Noise Control Products**
- **Custom Engineered Solutions**

Review these summaries to learn more about the various categories and to drill down to the products themselves. With this wide range of offerings, INC can help you solve any noise control problem.

Noise Control Materials



Top quality flexible noise control materials are the building blocks of successful noise control projects. We offer a complete selection, with offerings in every category: barriers, absorbers, composites, and vibration damping materials. From do-it-yourself projects, to acoustical materials and parts OEM's, or anything in between... we have what you need. Don't hesitate to call with any questions regarding our products, their correct application, availability and options.

Flexible Noise Barriers

Choose from several mass-loaded vinyls, in various densities.

Flexible Noise Absorbers

Choose from flat or convoluted urethane foam, quilted fiberglass or fiberglass duct liner noise absorber materials, with many thickness and facing options.

Flexible Barrier/Absorber Composites

Choose from many popular combinations of the above barriers and absorbers, permanently laminated together at our manufacturing facility.

Vibration Damping Materials

Choose from convenient flexible sheets with PSA backing or a mastic compound that can be troweled, rolled, painted or sprayed on.

Ready-To-Use Products



Many noise problems can be solved without custom-engineered solutions using our Ready-To-Use Products that get the job done right out of the box! Use these reliable winners to acoustically treat interior spaces to eliminate excessive reverberation, create acoustical partitions and enclosures that isolate or separate noisy areas, and to eliminate HVAC ductwork-borne noise.

Check out the products below to find out if one of these proven strategies will work in your situation. Many of these products are readily available from stock for a quick solution to your noise problems. Call us with any questions, or just to discuss the possibilities we are ready to help!

INC Portable Noise Screens

INC Portable Noise Screens are sturdy, high quality units that assemble in minutes, can be used individually or joined to form partitions or enclosures of virtually any shape. A very effective way to block and absorb noise that can be easily moved at a moments notice.

Sorba-Glas® Wall Blankets

Dissipate noise and eliminate reverberation (echo) from any kind of hard surface with these cost-effective, high performance, and easy-to-install units. ASTM E-84 Class I fire rated, and suitable for the most demanding work environments. The tough outer facing is impervious to water, oils, grease, dust, dirt, and airborne contaminants.

Pani-Sorb® Acoustical Metal Panel Absorbers

These high-performance, durable noise absorbers in a metal shell are tough enough for mean industrial environments and attractive enough to have been installed them in theaters. The ASTM-E84 Class I fire rated panels are available in galvanized, powder-coated and enamel finishes. From wastewater treatment facilities to auditoriums, these acoustical wall panels can provide effective sound absorption in a rugged, attractive module.

Fabri-Sorb® Fabric Covered Acoustical Panels

High-performance noise absorbers in an attractive, ASTM-E84 Class I fire rated package. Suitable for offices, lunchrooms, multi-use rooms, auditoriums, meeting rooms, and more. Available in 48 colors, and many standard sizes.

Bafl-Sorb® Ceiling Baffles

The ceiling is an ideal place to add noise absorption ... un-treated it is a huge noise reflector, but treated it becomes a huge noise trap. Ceiling baffles are a convenient and extremely cost-effective way to add absorption to any space and greatly reduce noise reflections and reverberation time.

Hardware, Adhesives and Accessories

INC has everything you need to make installation and customization of our materials and products a snap.

HVAC Silencers

Untreated HVAC ductwork is often a conduit for the noise of moving air, air handlers, equipment vibrations, and even activities being conducted in other nearby (and sometimes not so nearby) spaces. INC HVAC Silencers are highly effective at eliminating these types of problems completely.

Custom Engineered Solutions



INC manufactures and distributes a broad range of high performing products and structures used to solve the most common to the most unusual and complex noise control applications ... from a simple soundproof partition to a jet engine test cell ... INC does it all. Our Custom Engineered Solutions Group has specialized in this kind of work for over 35 years, often taking on challenges others refuse. We are ready to design, build and install a complete turnkey solution for you of any size or description. INC Sales Engineers are experts at configuring custom solutions, and will guide you every step to success.

Panel-Wall® Modular Metal Panel System

Our Panel-Wall® product line consists of pre-engineered, modular acoustical components ... *building blocks* ... that can be configured and assembled into a wide variety of structures used to control and reduce excessive noise in industrial, commercial, institutional and community environments. Creating rugged free-standing structures that acoustically enclose or isolate equipment, operations, or personnel often becomes a simple matter of choosing components and specifying sizes and dimensions. And Panel-Wall® is not *just* an integrated system of panels, doors, windows, and ventilation - but can include anything your unique application demands such as EMI/RFI and X-ray shielding, lighting & electrical systems, explosion vents, ballistic impact resistance, and more.

Outdoor Noise Barriers

The Panel-Wall® Outdoor Noise Barrier (ONB) system is noise control designed to stand up to the elements with it's sleek horizontal interlocking panels and available tough UV-resistant finishes. Pre-engineered modular components ensure Panel-Wall® ONB projects deliver reliable structural and acoustical performance in a package that is straightforward to design and install. Our ONB system can be easily configured and assembled into enclosures, screens, partial enclosures and barriers to provide sound attenuation for all kinds of outdoor industrial, community and environmental noise problems.

Pre-Assembled Structures

INC Pre-Assembled Structures take the uncertainty out of installation schedules, minimize downtime and expense, and can guarantee levels of mechanical, structural and acoustical performance difficult or impossible to deliver with modular field-erected solutions. Applications include Operator Control Rooms, Pulpits, Crane Cabs, Mechanical / Electrical Equipment Housings, Computer Rooms, Quiet Rooms, and many more.

Acoustical Test and Measurement Cells

INC engineered test chambers provide specific, controlled acoustical environments for performing accurate and repeatable testing of many types - everything from table top chambers to small vehicle test rooms.

Flexi-Sorb® Modular Flexible Curtain System

Pre-engineered, modular Flexi-Sorb® Noise Control Curtains and pre-engineered support track and framework components are flexible building blocks that can be configured into a wide variety of full & partial enclosures, barriers and partitions. Used to control and reduce excessive noise in industrial, commercial, institutional environments, Flexi-Sorb® is an excellent choice for applications requiring maximum accessibility, design flexibility, ease of installation and maintenance, low installed cost and quick delivery.

Mass-Loaded Acoustical Vinyl Barriers

INC flexible mass-loaded opaque and clear vinyl barriers control noise by blocking the transmission of sound energy and damping vibrations. Amazingly, pound-for-pound INC Flexible Vinyl Noise Barriers acoustically outperform steel and other building materials. INC Flexible Vinyl Noise Barriers install quickly and inexpensively, and are fundamental components of the INC Flexi-Sorb® Curtain System and are also often used in composite with INC Flexible Noise Absorbers to create curtain partitions and enclosures, septum walls and de-coupled barriers. But the uses for INC Flexible Barriers don't stop with curtain systems ... they are also used to line equipment cabinets, or as a noise barrier layer within conventional wall and floor structures. Our clear type "V" noise barrier material can be used to create clear curtain panels, viewing windows and strip doors.



Product Selection Tips:

- Select **poly-reinforced (P)** vinyl barriers in situations where the vinyl will be physically stressed such as when hanging panels vertically from hooks, or in situations where the vinyl will undergo repetitive contact, movement, or physical abuse.
- Select **non-reinforced (N)** vinyl barriers when the vinyl will not be physically stressed such as to line an equipment cabinet or wrapping ducts and pipes.
- Select lighter density barriers for general use, where lighter overall weight is desired, or for open-top enclosures or partial barriers. Select heavier density barriers for greater noise level reduction.

Product Features: Opaque Vinyl

- Excellent acoustical performance
- Sound barrier characteristic up to STC-26
- Three weights to choose from
- Strong polyester-reinforced "P" versions suitable for use in curtain systems and partitions in abusive industrial environments
- Economical non-reinforced "N" versions for applications such as pipe lagging or equipment wraps
- Available in rolls or fabricated to your specifications

Product Features: Clear PVC Vinyl

- Excellent acoustical performance
- Sound barrier characteristics of STC-19
- Quite strong without extra reinforcement
- Used for curtain panel windows or clear full panels
- Available in strips, rolls or fabricated to your specifications

ACOUSTICAL DATA & Roll Size

					STL, by Octave Band Frequency (Hz)						
Barrier Style	Part Number	Roll Size	Weight	THK	125	250	500	1000	2000	4000	STC
Reinforced Opaque											
	W-5P-60	54" x 60'	½ LB / sf	.053"	12	13	16	21	27	32	21
	W-5P-30	54" x 30'	½ LB / sf	.053"	12	13	16	21	27	32	21
	W-7P-60	54" x 60'	¾ LB / sf	.075"	13	15	18	23	30	34	23
	W-7P-30	54" x 30'	¾ LB / sf	.075"	13	15	18	23	30	34	23
	W-1P-60	54" x 60'	1 LB /sf	.100"	15	16	21	26	33	38	26
	W-1P-30	54" x 30'	1 LB /sf	.100"	15	16	21	26	33	38	26
Non-Reinforced Opaque											
	W-5N-60	54" x 60'	½ LB / sf	.041"	12	13	16	21	27	32	21
	W-5N-30	54" x 30'	½ LB / sf	.041"	12	13	16	21	27	32	21
	W-1N-60	54" x 60'	1 LB /sf	.077"	15	16	21	26	33	38	26
	W-1N-30	54" x 30'	1 LB /sf	.077"	15	16	21	26	33	38	26
Clear											
	W-6V-30	48" c 30'	¾ LB sf	.120"	13	15	17	17	21	24	19
	W6-V8-30	8" x 30	¾ LB sf	.120"	13	15	17	17	21	24	19
	W6-V12-30	12" x 30'	¾ LB sf	.120"	13	15	17	17	21	24	19

Notes:

All INC Flexible Vinyl Noise Barriers are available in rolls 54" wide.

Select "N" for non-reinforced vinyl barrier.

Select "P" for polyester reinforced vinyl barrier.

Material Properties:

Temperature Range from 14° F to 180° F

All "P" reinforced opaque vinyl meet MVSS-302 and FAR 25.853 Flammability Standards

All "N" non-reinforced opaque vinyl meet MVSS-302, UL-94 V-0 and CSA 0-6V-O Flammability Standards

W6V clear vinyl meets DIN 53382 Flammability Standard

All "P" reinforced opaque vinyl is USDA approved for incidental food contact

Availability:

- All Vinyl Barrier styles are sold in full or half rolls

Convuluted Acoustical Foam

Scientifically Designed Noise Absorption

INC acoustical convuluted foam is a 1.5 LB ft³ density open cell polyurethane noise absorbing foam scientifically developed to provide superior sound absorption characteristics in the mid-low frequency ranges. The distinctive "cone" shape provides four times more absorptive surface area than flat foam, and it deflects and entraps sound waves within the material making this a very acoustically efficient foam.



Product Features

- Strong light weight material
- Meets UL 94 fire rating
- 250° F maximum temperature range
- Resist oils, alkali and mild acids
- Charcoal Color
- Supplied in standard sets of two mating sheets
- Pressure sensitive adhesive backing available
- Cuts easily with sharp utility knife
- Can be applied to most surfaces using foam adhesive, INC mounting-pin assemblies or mechanical fasteners.

Typical Applications

INC convoluted acoustical foam is a great choice when a lightweight, high-performance noise absorber is needed, particularly where low and mid range frequency sound absorption is required, and a UL-94 fire rating is sufficient. . It can be cut into custom sizes or shapes using a sharp safety knife. *Do not use near open flame or sparks.* Ideally suited for lining:



- Machinery Surfaces
- Cabinets
- Guards
- Walls
- Enclosures
- Ducts
- Privacy Panels
- Computer Rooms
- Recording Studios
- Firing Ranges
- and many others

Lower Reverberation Time, Reduce Echo & Lower Noise Levels!

Convoluted Acoustical Foam

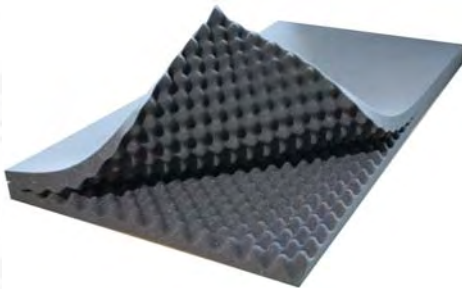
ACOUSTICAL DATA

Acoustical Convoluted Foams - Acoustical Data

Convoluted Foam Style	Thickness	Sq.Ft. / Set	NRC, by Octave Band Frequency (Hz)						NRC
			125	250	500	1000	2000	4000	
CVF-1-2754	1" Peak	20.25	0.20	0.32	0.59	0.96	0.94	0.88	0.70
CVF-2-2754	2" Peak	20.25	0.15	0.31	0.73	1.04	1.08	1.12	0.80
CVF-3-2754	3" Peak	20.25	0.24	0.46	1.08	1.05	0.98	0.90	0.90

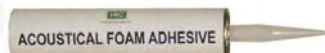
Availability:

- All convoluted foams are sold in sets of two mating sheets each 27" x 54"
- Economy bulk packaging is available for orders of more than 20 sets
- For large volume requirements special order sheets of 54" x 96" are available
- Pressure sensitive adhesive backing is available on selected products as a special order



Mating sheets supplied as a set

Mounting Accessories:



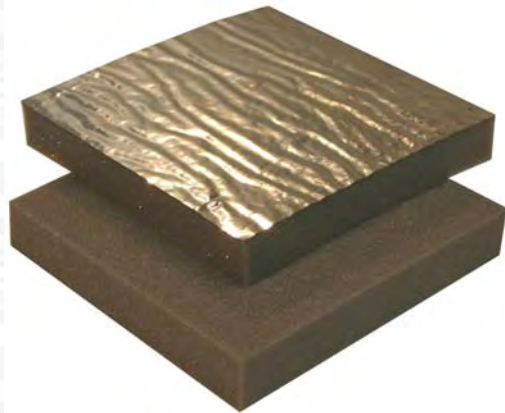
INC foam adhesive available in standard caulk tubes



INC mounting pin assemblies make it easy to fasten foam to any surface.

Flat Acoustical K-Foam

INC K-Foam is a 2 LB density open-celled flat urethane foam noise absorber material that is extremely lightweight, featuring great noise absorption performance with a self-extinguishing UL-94 fire rating. K-Foam is available either unfaced plain, or with one side faced in Aluminized Mylar®. Several thicknesses are available.



Product Features

- Extremely light weight
- Available with 1.5 mil Aluminized Mylar® facing
- Meets UL-94 HF-1, MVSS 302, ASTM D 1692-74
- 250° F maximum temperature range for plain foam
- 120° F maximum temperature range for faced foam
- Cuts easily with sharp utility knife

Typical Applications

INC Flat Acoustical K-foam is a great choice when a lightweight, high-performance noise absorber is needed, particularly where mid and high range frequency sound absorption is required, and a UL-94 fire rating is sufficient. . It can be cut into custom sizes or shapes using a sharp safety knife. *Do not use near open flame or sparks.* Ideally suited for lining:

Can be applied to most surfaces using foam adhesive, INC mounting-pin assemblies or mechanical fasteners

- Machinery Surfaces
- Cabinets
- Guards
- Walls
- Enclosures
- Ducts
- Sound Traps
- Housings
- Plenums
- Firing Ranges
- and many others

Lower Reverberation Time, Reduce Echo & Lower Noise Levels!

Flat Acoustical K-Foam

ACOUSTICAL DATA

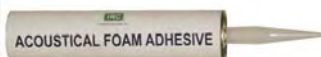
Standard K-Foam Flat Acoustical Foams - Acoustical Data

				NRC, by Octave Band Frequency (Hz)							
K-Foam Style	Thickness	Facing	Roll Size	125	250	500	1000	2000	4000	8000	NRC
Plain Unfaced Foams											
K-2	¼"	Plain	54" x 100'	0.08	0.10	0.20	0.30	0.70	1.00	0.92	0.33
K-5	½"	Plain	54" x 100'	0.09	0.11	0.22	0.60	0.88	0.94	0.90	0.45
K-75	¾"	Plain	54" x 100'	0.20	0.32	0.59	0.96	0.94	0.99	0.94	0.70
K-10	1"	Plain	54" x 100'	0.22	0.35	0.60	0.98	0.94	0.99	0.96	0.72
K-20	2"	Plain	54" x 100'	0.28	0.40	0.86	0.95	0.98	0.97	0.98	0.80
Aluminized Mylar Faced Foams											
K-10M	1"	Mylar	54" x 100'	0.10	0.57	0.57	0.39	0.68	0.35	0.15	0.55
K-20M	2"	Mylar	54" x 50'	0.20	0.61	1.0	0.91	0.64	0.56	0.22	0.80

Availability:

- All K-foams are sold in full or half rolls
- Pressure sensitive adhesive backing is available on selected products as a special order

Mounting Accessories:



INC foam adhesive available in standard caulk tubes



INC mounting pin assemblies make it easy to fasten foam to any surface.

Sorba-Glas® Quilted Absorber

INC Sorba-Glas® noise absorbers reduce overall noise levels by dissipating noise energy. Sorba-Glas® products combine excellent acoustical performance with a superior ASTM-E84 Class I fire-rating and a tough, impervious facing making it the ideal sound absorber for a wide variety of applications.

Sorba-Glas® is offered in bulk rolls, fabricated Wall Blankets, and in custom fabricated shapes. It is also a featured component in Sorba-Glas® Composite Materials, the INC Flexi-Sorb® Noise Control Curtain System and on the INC Portable Noise Screen. Sorba-Glas® is available with one or both sides faced, in 1" and 2" thicknesses, a limited range of colors and with an optional "hi-temp" silicone coating.



**ASTM E-84 Class I
Fire Rating!**

Product Features

- Light weight, tough, highly abrasion resistant quilted facing is impervious to water, dust, oils grease, air-borne contaminants, and most solvents
- ASTM-E84 Class I fire rating
- Standard color is Gray, special orders available in White, Blue or Tan
- 250° F maximum temperature range for standard product
- Hi-Temp silicone facings available for 500° F maximum temperature range
- Polyester scrim on un-faced side provides product stability and encapsulates any loose fibers
- Easily cut, sewn, stapled or grommeted
- Easily attached to many surfaces using grommeted holes, glued directly to surface, using INC mounting-pin assemblies, or common mechanical fasteners

Typical Applications

Sorba-Glas® is the best choice for any situation where a noise absorber with an extremely tough facing is required, and in applications where ASTM-E84 Class I fire performance is desired.



• Machinery Surfaces
• Cabinets
• Guards
• Walls
• Enclosures
• Ducts
• Gymnasiums
• Swimming Pools
• Workout Rooms
• Firing Ranges
• Wastewater Treatment Plants
.... and many others

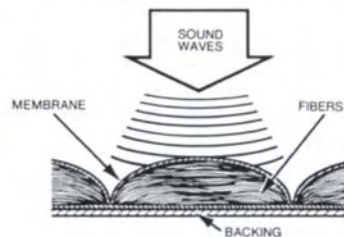
Sorba-Glas® Quilted Absorber

THE MATERIAL

Our high performance Wall Blankets are fabricated from our quilted fiberglass sound absorbing materials called Sorba-Glas®. This material is ideally suited for reducing noise levels in harsh environments or where the treatment may be subjected to high traffic and physical abuse.

HOW DOES SORBA-GLAS® WORK?

Sorba-Glas® features an extremely tough fabric facing. This facing gives Sorba-Glas® its excellent resistance to abrasion and damage by dust, solvents and dirt without seriously affecting the acoustical performance. Under normal circumstances a heavy facing would seriously detract from the acoustical performance of an absorber.



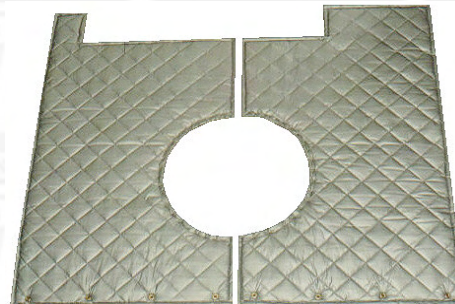
The difference with Sorba-Glas® is that the tough fabric facing is applied by a method that takes advantage of the *Membrane Principal* of noise absorption. The idea of the *membrane principal* is that sound can pass through (even though the membrane may be relatively thick and non-porous) provided the membrane is free to move under slight air-pressure variations (sound waves). Sorba-Glas® uses a special fabricating process which maximizes the compliance of the tough fabric facing. This process allows the membrane to move freely and transmit noise to the inner cavity of fibers, where it is efficiently dissipated.



Sorba-Glas® as seen from the back or unfaced side.



Sorba-Glas® with facing on both sides.



These custom fabricated Sorba-Glas® pieces are typical of those used to line machine cabinets, housings, guards, etc.. The impervious quilted facing prevents oil and other contaminants from penetrating the blanket's inner fibers.

Product Selection Tips:

- Select "Faced One Side" when attaching to a wall or other surface
- Select "Faced Both Sides" when free-hanging or otherwise exposed on both sides or for additional durability
- Select 1" thickness for most broad band noise problems, 2" for added low frequency absorption

Style #	Cross Section
110	
210	
120	
220	

Sorba-Glas® Quilted Absorber

ACOUSTICAL DATA

Standard Sorba-Glas® Styles - Acoustical Data & Roll Size

Sorba-Glas® Style	Roll Width	Roll Length	Sq. Ft.	NRC by Octave Band Frequency (Hz)						NRC
				125	250	500	1000	2000	4000	
1" Thick Faced One Side										
SG-110-25	48"	25'	100	0.39	0.59	0.87	0.84	0.73	0.59	0.75
SG-110-50	48"	50'	200	0.39	0.59	0.87	0.84	0.73	0.59	0.75
1" Thick Faced Both Sides										
SG-120-25	48"	25'	100	0.39	0.59	0.87	0.84	0.73	0.59	0.75
SG-120-50	48"	50'	200	0.39	0.59	0.87	0.84	0.73	0.59	0.75
2" Thick Faced One Side										
SG-210-25	48"	25'	100	0.53	0.77	0.88	0.77	0.71	0.63	0.80
SG-210-50	48"	50'	200	0.53	0.77	0.88	0.77	0.71	0.63	0.80
2" Thick Faced Both Sides										
SG-220-25	48"	25'	100	0.53	0.77	0.88	0.77	0.71	0.63	0.80
SG-220-50	48"	50'	200	0.53	0.77	0.88	0.77	0.71	0.63	0.80
Non-Adhesive Trim Tape	4"	100'	-	-	-	-	-	-	-	-

Availability:

- All Sorba-Glas® styles are sold in full or half rolls
- Non-Adhesive Trim Tape is sold in 100' rolls



Trim Tape

ACCESSORIES:

These accessories are available to help you install Sorba-Glas® to almost any surface:



Punch & Grommet Kit, Industrial Stapler, and Mounting Pin Sets.

Acoustical Duct Liner

INC Acoustic Duct Liner is easy to install in HVAC ductwork and plenums to reduce fan and other air-borne noises. Bonded glass fibers specifically designed to be installed inside sheet metal ductwork to provide acoustical and thermal benefits. The smooth, fire resistant air stream surfaces resist damage during installation and in service.



- ✓ Enhances indoor comfort and more
- ✓ Easy fabrication
- ✓ Clean cutting
- ✓ Comfortable handling
- ✓ Lasting performance
- ✓ Discreet appearance
- ✓ Virtually damage-proof construction
- ✓ Bacteria and fungi protection

Product Features

- Available in 1" and 2" thickness
- Air stream surface resists fiber migration and damage
- Resists fungi, mold, mildew, bacteria growth, mild dust, dirt and humidity
- Clean to handle, cut and install
- Installs with mounting pin assemblies, foam adhesive, or mechanical fasteners
- 2" material has a thermal k factor of 0.25 at 75° F
- Operating temperature range: -45° to 250° F
- Maximum air velocity in ductwork of 4,000 fpm with intervals to 6,000 fpm
- Available in 48" wide x 25' long rolls
- Meets Flammability Standard NFPA 90A/90B

Not for use near open flame or sparks, in kitchen or fume ducting, or in applications that may come in contact with water.

Typical Applications

- HVAC Ductwork
- Plenums
- Fan Housings
- Mixing Boxes
- Furnaces & AC Equipment
- Silencers
- Sound Traps
- Cross-Talk Vents
- and many others

Acoustical Duct Liner

ACOUSTICAL DATA

Standard Ductliner® Styles - Acoustical Data & Roll Size

Ductliner Style	Roll Width	Roll Length	Sq. Ft.	NRC by Octave Band Frequency (Hz)						NRC
				125	250	500	1000	2000	4000	
1" Thick										
DL100	48"	25'	100	0.13	0.28	0.51	0.70	0.81	0.86	0.60
2" Thick										
DL200	48"	25'	100	0.14	0.41	0.80	0.92	1.01	0.94	0.80

Insertion Loss, dB per ft of Lined Duct

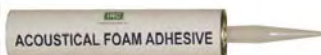
Ductliner Style	Roll Width	Roll Length	Sq. Ft.	Frequency (Hz)							
				125	250	500	1000	2000	4000		
1" Thick											
DL100	48"	25'	100	0.6	1.5	2.7	5.8	7.4	4.3		
2" Thick											
DL200	48"	25'	100	0.8	2.9	4.9	7.2	7.4	4.3		

Ductliner Insertion Loss based on a duct perimeter, ft/duct cross sectional area (ft²) = 8

Availability:

- All Duct Liner is sold in full rolls

Mounting Accessories:



INC foam adhesive available in standard caulk tubes



INC mounting pin assemblies make it easy to fasten to any surface.

Acoustical Duct Liner

SPECIFICATIONS & USE

Description, Specification & Installation Recommendations

INC Acoustic Duct Liner is a bonded blanket of glass fibers designed to be installed inside sheet metal ductwork and plenums with metal fasteners and adhesives. The smooth, fire-resistant air stream surfaces resist damage during installation and in service. INC Duct Liner complies with requirements of National Fire Protection Association Standards NFPA 90A and 90B, qualifying it under other model codes.

INC Duct Liner is available in a selection of densities and thicknesses to meet specific system thermal and acoustical performance requirements (see availability table at right). Rolls are sized to run efficiently on modern automatic coil lines. INC Duct Liner has a tough, flame-retardant air stream surface with an EPA registered biocide that stands up to gouging and other abuse in the shop and on the way to the job-site. It also contributes to reliable long-term service at internal air velocities up to 6,000 fpm (30.5 m/s). The factory applied edge coating complies with industry standards requiring treated transverse joints.

Uses

INC Duct Liner enhances indoor environmental quality by absorbing noise within sheet metal ducts, and contributes to indoor comfort by lowering heat loss or gain through duct walls.

Product Attributes

Bacterial and Fungal Growth Resistance

An EPT registered biocide in the air stream surface protects INC Duct Liner from microbial growth and meets requirements of ASTM C 1338, ASTM G 21 (fungi test) and ASTM G 22 (bacteria test).

Tips to Avoid Mold Growth in Ducts

Mold in duct systems occurs when moisture comes into contact with dirt or dust collected on the duct system surfaces. Proper filters will minimize the collection of dust and dirt, but care needs to be exercised to prevent water formation in the duct. A properly sized and operated air conditioning unit will minimize the likelihood of water formation. The system must be maintained and operated to insure that sufficient dehumidification is occurring and that filters are installed and changed as recommended by the equipment manufacturer.

Assured Thermal Performance

When installed in accordance with instructions so that compression is controlled, INC Duct Liner provides specified thermal performance. See R-value table below. Operating costs are controlled due to reduction of heat loss or gain through duct walls.

Acoustically Efficient

Duct systems built with this liner absorb fan and air turbulence noise and reduce popping noises caused by sheet metal expansion, contraction and vibration.

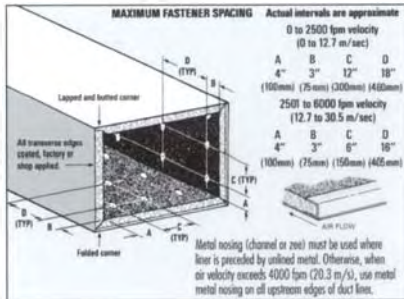
Application Recommendations

All portions of duct designated to be treated shall be completely covered with duct liner, adhered to the sheet metal with 90% coverage of adhesive complying with ASTM C 916. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. All transverse joints shall be edge-coated. Metal nosing on leading edges must be used where duct liner is preceded by unlined metal and on all upstream edges when velocity exceeds 4,000 fpm (20.3m/s). The black mat faced surface of the duct liner shall face the air stream.

Acoustical Duct Liner

SPECIFICATIONS & USE

INC Duct Liner shall also be secured with mechanical fasteners, either impact-driven or weld-secured, which shall compress the duct liner sufficiently to hold it firmly in place. For fastener spacing, see illustration.



Duct liner shall be cut to assure over-lapped and compressed longitudinal corner joints. For details, refer to NAIMA Publication AH124, Fibrous Glass Duct Liner Standard.

Minor damage and small tears may be repaired by coating with adhesive. After installation, and prior to occupancy, blow out duct system to remove any cutting scraps or foreign material remaining in the duct.

Installing two layers of material to meet a specific liner thickness is not recommended. If the specification forces the use of multiple layers, the following steps must be taken:

- Adhere bottom layer of duct liner to duct in normal manner.
- Adhere top layer to bottom layer of liner using a minimum of 90% adhesive coverage.
- Treat all leading edges with metal nosings to prevent separation of the two layers.
- Use mechanical fasteners of the proper length for double layer.

Specification Compliance

ASTM C 1071, Type I, Flexible (replaces obsolete Federal Specification HH-I-545B).
 NFPA 90A/90B
 ICC Compliant
 California Title 24
 SMACNA Application Standard for Duct Liners
 NAIMA Fibrous Glass Duct Liner Installation Standard
 Conforms to ASHRAE 62-2001

Application Limitations

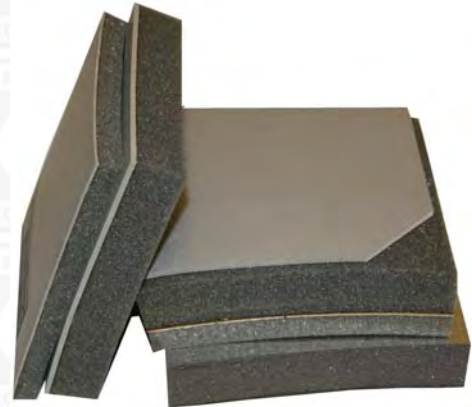
Use of INC Duct Liner is not recommended for the following applications:

- With wood or coal fired equipment, or equipment of any type which does not include automatic maximum temperature controls and where operating temperature of 250°F (121°C) may be exceeded.
- In kitchen or fume exhaust ducts, or ducts conveying solids or corrosive gases.
- In any application where the duct liner may come in direct contact with liquid water (such as cooling coils, humidifiers, and evaporative coolers) unless protected from the water source.
- Inside fire damper sleeves.
 Immediately adjacent to high temperature heating coils without radiation protection.

K-Foam Flexible Composites

Flexible Noise Absorbers and Mass-Loaded Barriers Combined

INC noise control composite materials achieve superior acoustical performance by combining two basic noise reduction strategies in a single product. An INC mass-loaded flexible noise barrier is permanently laminated to one of our acoustical K-Foam or quilted Sorba-Glas® noise absorbers to create a material that both blocks *and* absorbs noise.



Standard K-Foam® Composite Styles - Acoustical Data

				STL, by Octave Band Frequency (Hz)							
Composite Style	Barrier	Absorber		125	250	500	1000	2000	4000	STC	NRC
Barrier / ½" Absorber											
K5-N/P-5-30	½ LB Vinyl	½" Foam		12	13	16	21	27	32	21	0.45
K1-N/P-5-30	1 LB Vinyl	½" Foam		15	16	21	26	33	38	26	0.72
Barrier / 1" Absorber											
K5-N/P-10-30	½ LB Vinyl	1" Foam		16	17	20	25	31	36	25	0.72
K5-N/P-10M-30 (Mylar Faced)	½ LB Vinyl	1" Foam		16	17	20	25	31	36	25	0.72
K1-N/P-10-30	1 LB Vinyl	1" Foam		17	18	23	28	35	40	28	0.72
K1-N/P-10M-30 (Mylar Faced)	1 LB Vinyl	1" Foam		17	18	23	28	35	40	28	0.72
½" Absorber / Barrier / 1" Absorber	See Note 4										
K5-N/P-105-30	½ LB Vinyl	½"+1" Foam		16	17	20	25	31	36	25	0.72
K5-N/P-105M-30 (Mylar Faced)	½ LB Vinyl	½"+1" Foam		16	17	20	25	31	36	25	0.72
K1-N/P-105-30	1 LB Vinyl	½"+1" Foam		17	18	23	28	35	40	28	0.72
K1-N/P-105M-30	1 LB Vinyl	½"+1" Foam		17	18	23	28	35	40	28	0.72

Notes:

1. All K-Foam composites are sold in rolls 54" wide x 30' long (provides 135 ft² of material).
2. Select "N" for non-reinforced vinyl barrier.
3. Select "P" for polyester reinforced vinyl barrier.
4. Commonly used as a decoupled barrier / absorber where the ½" thick layer of foam is the decoupler.

Sorba-Glas® Flexible Composites

Flexible Noise Absorbers and Mass-Loaded Barriers Combined

INC noise control composite materials achieve superior acoustical performance by combining two basic noise reduction strategies in a single product. An INC mass-loaded flexible noise barrier is permanently laminated to one of our acoustical K-Foam or quilted Sorba-Glas® noise absorbers to create a material



Standard Sorba-Glas® Composite Styles - Acoustical Data

				STL, by Octave Band Frequency (Hz)							
Composite Style	Barrier	Absorber		125	250	500	1000	2000	4000	STC	NRC
Barrier / 1" Absorber											
115-N/P-25/50	½ LB Vinyl	1" Quilted		16	17	20	25	31	36	25	0.75
117-N/P-25/50	¾ LB Vinyl	1" Quilted		15	17	20	25	33	39	25	0.75
111-N/P-25/50	1 LB Vinyl	1" Quilted		17	18	23	28	35	40	28	0.75
Barrier / 2" Absorber											
215-N/P-25/50	½ LB Vinyl	2" Quilted		18	19	22	27	33	38	27	0.80
217-N/P-25/50	¾ LB Vinyl	2" Quilted		17	19	22	27	35	41	27	0.80
211-N/P-25/50	1 LB Vinyl	2" Quilted		18	19	24	29	36	41	29	0.80
1" Absorber / Barrier / 1" Absorber											
115-N/P-S-25/50	¾ LB Vinyl	2" Quilted		18	19	22	27	33	38	27	0.75
117-N/P-S-25/50	1 LB Vinyl	2" Quilted		17	19	22	27	35	41	27	0.75
111-N/P-S-25/50	1 LB Vinyl	2" Quilted		18	19	24	29	36	41	29	0.75
2" Absorber / Barrier / 2" Absorber											
215-N/P-S-25/50	½ LB Vinyl	2" Quilted		18	19	22	27	33	38	27	0.80
217-N/P-S-25/50	¾ LB Vinyl	2" Quilted		17	19	22	27	35	41	27	0.80
211-N/P-S-25/50	1 LB Vinyl	2" Quilted		19	20	25	30	37	42	30	0.80

Notes:

1. All Sorba-Glas® composites are sold in rolls 54" wide.
2. Select "N" for non-reinforced vinyl barrier.
3. Select "P" for polyester reinforced vinyl barrier.
4. Select "25" for 25' long half-roll (provides 112.50 ft² of material).
5. Select "50" for 50' long full roll (provides 225 ft² of material).

Adhesive Damping Sheets • Spray-On Damping Compound

Thin metal parts and structures easily transmit noise when impacted or by natural resonance when excited by acoustic energy. Vibrating or resonating metal is a common noise problem in industrial and commercial environments and one that OEM's must often take into consideration.

These types of noise problems are often easily solved by applying damping material to these metal surfaces. Damping materials work by changing the natural vibration frequency of the vibrating surface and thereby lowering radiated noise and increasing the transmission loss of the material. INC offers two very effective products, **INC Damping Compound** and **INC Vibration Damping Sheets**, that convert ordinary sheet metal into damped metal greatly reducing the tendency to transmit noise and vibration

Easy-To-Apply Materials That Take the "Ring" Out



INC Damping Materials effectively reduces the resonant vibration of sheet metal panels that radiate noise. They also reduces the loudness and duration caused by random impact noises when panels are struck.



Typical Applications

INC Damping products can reduce or eliminate "ring", vibration and noise of sheet metal wherever it is found. Typical applications include:

- Chutes, Bins, & Hoppers
- Conveyors
- Motor & Transformer Housings
- Machine Housings & Belt Guards
- Safety Covers & Guards
- Sheet Metal Ducts & Parts
- Metal Office Furniture
- Air Conditioners, Ventilating Fans & Housings
- Vehicle Body Parts, Bulkheads, Cabs & Panels
- and many more

Two Styles Available

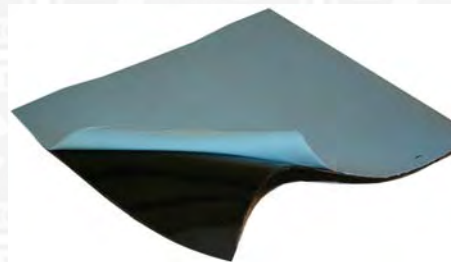
Convenient Self-Adhesive Backed Sheets Easily Cut To Fit

Style D-305 Product Features

INC D-305 Damping Pad is a filled asphaltic mastic acoustical sheet material designed for cost-effective vibration damping. Model D-305 contains a pressure-sensitive adhesive on one side which is protected by an easily strippable release liner. D-305 will withstand temperatures up to 400°F (204°C) which permits passage through paint ovens without blistering or sliding down vertical surfaces.

Style D-305 Properties

- Available in 35" x 53" sheets
- Density = 102 LB per ft³
- Temperature Range of -30° F to 400° F
- Meets UL 94 flammability rating and is self-extinguishing
- Loss factor of .05 at 250 Hz on 20 gauge steel
- Can be painted



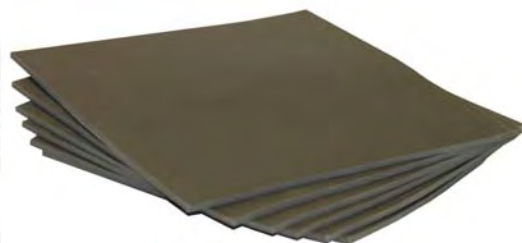
D-305 is easily cut with a knife or ordinary scissors and applies easily to solid non-porous surfaces such as sheet metal.

Style D-306 Product Features

INC D-306 Damping Pad consists of high density PVC vinyl acoustical sheet material designed for vibration damping. Model D-306 contains a pressure-sensitive adhesive on one side which is protected by an easily strippable release liner.

Style D-306 Properties

- Available in 54" x 58" sheets
- Resistant to a wide range of chemicals
- Easily cleaned
- Density = 105 LB per ft³
- Temperature Range of 0° F to 225° F
- Meets UL 94 flammability rating and is self-extinguishing
- Loss factor of .04 at 1000Hz on 20 gauge steel



These materials can be slit, punched, or die-cut into parts to meet your specifications. The adhesive is a high performance, permanent acrylic adhesive which exhibits high tack for easy installation resulting in 100% contact for maximum damping effectiveness. Maximum vibration reduction is achieved because the adhesive is an integral part of the sound deadener.

Non-Toxic Waterbased Material Cleans Up With Water—Dries to A Light Tan Color!

Style DC-10 Product Features

INC DC-10 is a visco-elastic sprayable liquid sound damping compound used to reduce noise radiated by vibration or shock excited metal surfaces, suitable for use virtually anywhere such surfaces are found. Ideal for architectural and mechanical equipment applications such as treating ducts, mixing boxes, sound-proof doors, and metal partitions- especially in the new construction field where it is mandatory to use non-combustible or non-smoke generating materials to meet local fire codes and ordinances.

Style DC-10 Properties

- Available 5 gallon containers (56.25 LBS)
- Light Tan color
- Resistant to water, solvents, acids & corrosive gases
- Average curing time of 4 to 24 hours at room temperature
- Density = 105 LB per ft³
- Temperature range of 0° F to 225° F
- Meets ASTM E162 Class I fire rating
- Waterbased Non-Toxic and odorless
- VOC per EPA Method #24 = 0 LBS / Gallon
- Loss factor of .066 at 200Hz on 20 gauge steel
- Protect From Freezing
- Painting is recommended for outdoor use



DC-10 applies easily to solid non-porous surfaces such as sheet metal with a trowel, brush, or airless sprayer.

PATENTED DESIGN • IN STOCK • SHIPS by UPS

INC Patented Portable Noise Screens are a practical, cost-effective alternative to permanent enclosures, especially in high production, multi-noise source situations. These free-standing acoustical screens separate workers from noise sources providing excellent noise barrier and noise absorption characteristics.

Individual screens assemble in minutes and may be easily joined to form wall sections of any length or enclosures of any shape. INC Portable Noise Screens make it quick and easy to create noise partitions, equipment enclosures, employee noise shelters, and work station dividers.



Effective Noise Control Right Out Of The Box !

Typical Applications

INC Portable Noise Screens are extremely versatile. They can be used individually or joined to form partial enclosures and partitions. Here are a few popular and effective applications:

- Separate Noisy and Quiet Areas
- Isolate Noise Sources From Adjacent Work Areas
- Create Employee Shelters to Minimize TWA Noise Exposure
- Create Safe Zones for Break & Rest Periods
- Work Station Dividers
- Maintenance Screens
- Movable Barriers
- Small Equipment Enclosures
- and many more

Product Features & Options

- Standard 4'x 8' screens are available from stock
- Patented snap-together frame with adjustable feet allows for unlimited positioning of your screen
- Frame is powder coated with a tough black enamel finish for lasting durability
- Noise barrier and absorber composite curtain panel easily attaches securely to the frame
- Curtain features our reinforced $\frac{3}{4}$ LB vinyl barrier with our 1" thick Sorba-Glas® quilted absorber
- Screen provides STC-25 and NRC 0.75 acoustical performance
- Unit meets ASTM E84 Class I fire rating
- Screens assemble in minutes without tools
- Add our optional swivel casters for maximum portability

Curtain Performance Ratings of STC-25 with NRC=0.75



Standard screen is 4' wide x 8' tall and includes fully adjustable feet. Covered by US Patent No.6,206,079 B1.



Your INC Portable Noise Screen is shipped complete in this box with all frame components and one full acoustical curtain!

Use INC Portable Noise Screens to Divide and Conquer® the cumulative effect of many noise sources limiting your employee's noise exposure and reducing TWA !

Noise Control Versatility!

Just like a fixed 8' tall INC Flexi-Sorb® noise control curtain system, an inter-connected set of INC Portable Noise Screens is an excellent choice for attacking a modest noise problem. But our Noise Screens offers one additional huge advantage: as work areas relocate or change size or shape an enclosure or partition comprising a set of INC Portable Noise Screens can move and change with them!



15 dBA Noise Reduction !

Acoustical Test Data

The following is a sampling of acoustical characteristics of our standard Portable Noise Screen. Certified test reports are available from an independent acoustical testing lab.

INC Portable Noise Screen - Acoustical Data

Portable Screen Style	Barrier	Absorber		STL / NRC by Octave Band Frequency (Hz)						STC	NRC
				125	250	500	1000	2000	4000		
NS-117-PKD											
Sound Absorption Data	¾ LB Vinyl	1" Quilted	NR	0.39	0.59	0.87	0.84	0.73	0.59	-	0.75
Sound Barrier Data	¾ LB Vinyl	1" Quilted	TL	15	17	20	25	33	39	25	-

TL=Transmission Loss in dB, STC= Sound Transmission Class, NR / NRC=Noise Reduction Coefficient

Sorba-Glas® Sound Absorptive Wall Blankets

Flexible • Easy To Install • Durable • Good Noise Reduction • Economical

INC Sorba-Glas® Wall Blankets combine excellent noise absorption characteristics and durability with an ASTM-E84 Class I Fire Rating. Our fiberglass blanket features an attractive abrasion resistant quilted facing that is impervious to dirt, grease, solvents and airborne contaminants.

Installing INC Sorba-Glas® Wall Blankets in strategic locations will dramatically reduce noise levels without any interruption in production routines, housekeeping activities and work flow. Hanging Sorba-Glas® Wall Blankets on walls, partitions or equipment enclosures immediately lowers overall noise levels and reduces echo, creating a safer and more productive workspace. Increased comfort and easier communication is a very welcome benefit in many noisy areas.

The excellent sound absorption properties of Sorba-Glas® products make solving many reverberation problems with as little as 25-30% coverage of the reflective surfaces. INC Sorba-Glas® Wall Blankets can be mounted anywhere on walls and ceilings and are easily field cut & trimmed to accommodate pipes, windows, and ductwork.

High performance and fire safety combined with ease of installation makes Sorba-Glas® Wall Blankets a very cost-effective solution for a wide range of noise problems.



ASTM E-84 Class I Fire Rating!

Typical Applications

Sorba-Glas® Wall Blankets provide excellent reverberation control anywhere with hard reflective surfaces and excessive noise such as:

- Manufacturing Facilities
- Warehouses
- Distribution Centers
- Water Treatment Plants
- School Gymnasiums
- Swimming Pools
- Multi-Purpose Rooms
- Correctional Facilities
- Garages
- Firing Ranges
- and many others



Lower Reverberation Time, Reduce Echo & Lower Noise Levels!

Wall Blanket Styles & Options

Design Choices

INC offers several blanket styles to meet any application



Available in 1" and 2" Thicknesses with Facing on One or Both Sides

Wall Blanket Construction Options

- Available in 1" and 2" thickness
- Abrasion resistant quilted facing available on one or both sides
- Standard blankets are 48" wide X up to 16' long
- Blankets are factory sewn and bound on all edges
- Machine set brass grommets for easy installation and reliability
- 250° F maximum temperature range for standard product
- High mechanical strength
- Easily cut and trimmed in the field allowing modifications during installation
- Custom fabrication, special contours, sizes, hanging and fastening options are available
- ASTM E-84 Class I fire rating
- Standard is silver-gray. Available in white, black and tan (minimum orders apply).
- Silicone facing available for 500° F maximum temperature range



Standard 48" x 8'-0" Blanket



Wall Blanket Selection Tips

- Select "*Faced One Side*" when the material will be attached to a wall or other surface
- Select "*Faced Both Sides*" when the material will be free-hanging or otherwise exposed on both sides
- Select "*Faced Both Sides*" for additional durability where product may be removed or handled periodically
- Select 1" thickness for most broad band noise problems
- Select the 2" thickness where noise levels are higher in the lower frequencies bands - below 500 Hz

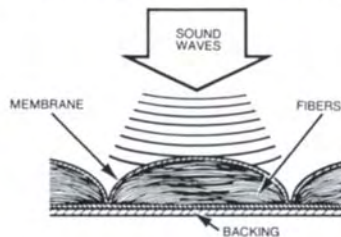
Blanket Performance Ratings of To NRC=0.80

THE MATERIAL

Our high performance Wall Blankets are fabricated from our quilted fiberglass sound absorbing materials called Sorba-Glas®. This material is ideally suited for reducing noise levels in harsh environments or where the treatment may be subjected to high traffic and physical abuse.

HOW DOES SORBA-GLAS® WORK?

Sorba-Glas® features an extremely tough fabric facing. This facing gives Sorba-Glas® its excellent resistance to abrasion and damage by dust, solvents and dirt without seriously affecting the acoustical performance. Under normal circumstances a heavy facing would seriously detract from the acoustical performance of an absorber.



The difference with Sorba-Glas® is that the tough fabric facing is applied by a method that takes advantage of the *Membrane Principle* of noise absorption. The idea of the *membrane principle* is that sound can pass through (even though the membrane may be relatively thick and non-porous) provided the membrane is free to move under slight air-pressure variations (sound waves). Sorba-Glas® uses a special fabricating process which maximizes the compliance of the tough fabric facing. This process allows the membrane to move freely and transmit noise to the inner cavity of fibers, where it is efficiently dissipated.



Sorba-Glas® as seen from the back or unfaced side.



Custom Wall Blankets in a Seed Sorting Facility

Acoustical Test Data

The following is a sampling of acoustical characteristics of our most popular noise control curtain construction styles. Certified test reports are available from an independent acoustical testing lab.

Sorba-Glas® Sound Absorbing Wall Blankets - Acoustical Data

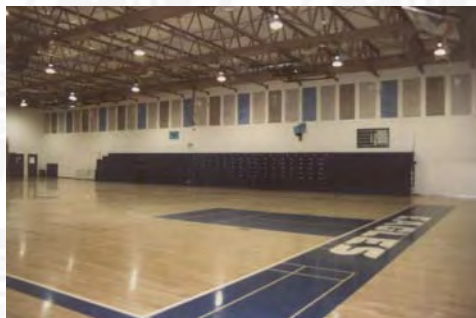
Wall Blanket Style	Mounting	Thickness		Absorption Data by Octave Band Frequency (Hz)					NRC
				250	500	1000	2000	4000	
SG-110 / SG-120	Flush	1"	NR	0.59	0.87	0.84	0.73	0.59	0.75
	Flush	1"	Sabins	18.90	27.84	26.89	23.40	18.90	
SG-210 / SG-220	Flush	2"	NR	0.77	0.88	0.77	0.71	0.63	0.80
	Flush	2"	Sabins	24.64	28.16	24.64	22.72	20.16	

NR / NRC=Noise Reduction Coefficient
 SG-110: 1" thick with Facing One Side
 SG-120: 1" thick with Facing Both Sides
 SG-210: 2" thick with Facing One Side
 SG-220: 2" thick with Facing Both Sides

Panl-Sorb® Sound Absorptive Wall & Ceiling Panels

Easy To Install • Durable • Attractive • Cost-Effective Noise Reduction

INC Panl-Sorb® Metal Acoustical Panels combine maximum noise absorption and durability in an attractive, modular unit. Our functional flat perforated panels can be located anywhere on walls and ceilings to instantly reduce noise levels and control reverberation ... solving the problems that make communication and concentration difficult in many environments.



Units are rugged enough for industrial environments, yet attractive enough for placement in commercial and institutional spaces like offices, auditoriums and gymnasiums making Panl-Sorb® one of the most versatile sound absorbers available. And with their high noise reduction characteristics, most problems can be solved with as little as 25-30% coverage of the reflective surfaces making Panl-Sorb® a very cost-effective solution to your noise problem.



Typical Applications

Panl-Sorb® Metal Acoustical Panels provide excellent acoustical and aesthetic enhancement to these typical spaces:

- Manufacturing Facilities
- Warehouses
- Distribution Centers
- Water Treatment Plants
- School Gymnasiums
- Swimming Pools
- Multi-Purpose Rooms
- Correctional Facilities
- Garages
- Firing Ranges
- Subway Stations & Transit Facilities
- Recording Studios
- Power Plants
- Theaters, Auditoriums, Convention Halls
- Test Cells
- and many others

Panel Performance Ratings up to NRC=1.05



Custom Panl-Sorb® installed on passenger platform for Chicago Mass Transit System

Lower Reverberation Time, Reduce Echo & Lower Noise Levels!

SUITABLE FOR A VARIETY OF APPLICATIONS

Our high performance Acoustical Panels are fabricated from tough perforated steel and are ideally suited for reducing noise levels in harsh environments, where the treatment may be subjected to high traffic and physical abuse or where a very consistent attractive appearance is desired.



Typical Panl-Sorb® used in industrial and commercial applications

Offered in a wide variety of colors and sizes with built in mounting brackets, Panl-Sorb® acoustical panels can be installed in rows or a variety of patterns that will best compliment your room's interior design. Optional low-frequency and continuous coverage mounting systems are also available to provide a broad range of performance requirements.

Custom Panl-Sorb® installed on passenger platform for Chicago Mass Transit System

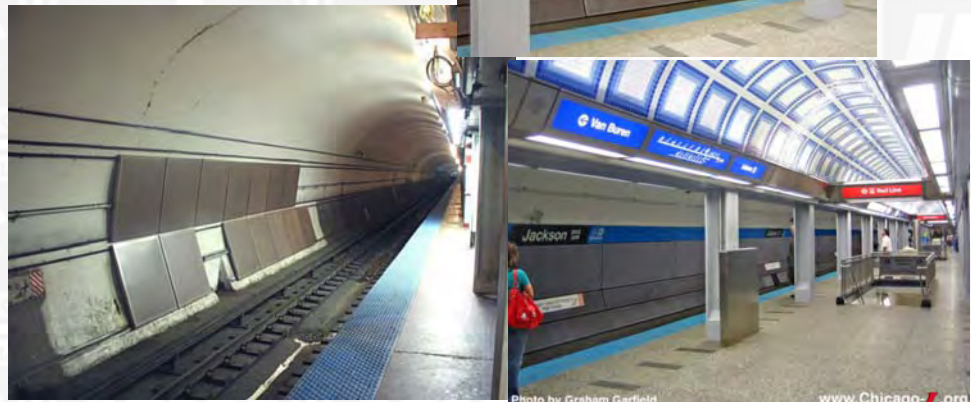


Photo by Graham Garfield

www.Chicago-T.org

Panel-Sorb® Construction Features

- Fully formed one-piece perforated metal panel shell is attractive and sturdy
- Standard panels fabricated of 22 gauge perforated steel
- Standard panels are 30" wide X up to 12' long
- Standard panels fabricated of corrosion resistant electro-galvanized steel
- Standard built-in flush mount brackets are 18 gauge steel
- Low frequency stand-off mounting brackets available
- High-Performance noise absorption characteristics to NRC 1.05
- Choice of sound absorbing fills and densities
- Several protective fill encapsulation options available
- ASTM E-84 Class I fire rating

Two Standard Styles ... Industrial / Commercial

- **Commercial** version uses 3 LB density fiberglass board
- **Industrial** version uses 4 LB density mineral wool

Finishes & Options

- Air dry enamel painting
- Epoxy and chemical cure coatings
- Outdoor graffiti resistant coatings
- Baked polyester powder coating available
- Heavy duty construction available up to 14 gauge steel
- Aluminum and stainless steel construction available



Available in Lengths Up To 12' Long with Flush or Stand-Off Mounting

Standard Panels In-Stock ... Ship Next Day!

- 30" x 5'-0" Commercial Style White Powder Coat Finish
- 30" x 8'-0" Commercial Style White Powder Coat Finish

Acoustical Test Data

The following is a sampling of acoustical characteristics of our most popular Panl-Sorb® styles and mounting conditions. Certified test reports are available from an independent acoustical testing lab.

Panl-Sorb® Metal Acoustical Panels - Acoustical Data

Panl-Sorb® Style	Mounting			Absorption Data by Octave Band Frequency (Hz)					NRC
				250	500	1000	2000	4000	
PS-C (Commercial)	Flush		NR	0.62	1.18	1.26	1.16	1.29	1.05
	Flush		Sabins	15.47	29.49	31.39	29.11	32.22	
	4" Space		Sabins	17.23	35.32	36.01	32.56	38.33	
PS-I (Industrial)	Flush		NR	0.59	1.19	1.23	1.16	1.22	1.05
	Flush		Sabins	14.64	29.76	30.63	28.90	30.43	
	4" Space		Sabins	16.31	35.65	35.14	32.33	36.20	
PS-I-FS (1.5 Mil Encapsulated)	Flush		NR	0.64	1.05	1.16	1.05	1.05	0.95
	Flush		Sabins	15.95	26.22	28.92	26.35	26.36	
	4" Space		Sabins	25.25	37.03	34.88	33.16	34.90	

Acoustical data based on a 30" x 10' x 2" thick Panl-Sorb® tested in accordance with ASTM C423-02a and E795-00.

NR / NRC=Noise Reduction Coefficient

PS-C (Panl-Sorb® Commercial Style)

PS-I (Panl-Sorb® Industrial Style)

FS (Encapsulated Acoustic Fill)

INC Parl-Sorb®
Metal Faced Acoustical Panels
Suggested Construction Specification
Section 09840

1.01 GENERAL – METAL FACED ACOUSTICAL PANELS

A. Sound Absorbing acoustical wall and ceiling treatment shall be accomplished by using INC Parl-Sorb® Metal Faced Acoustical Panels. The manufacturer shall have a complete pre-engineered system of components available including panels, mounting brackets and low-frequency stand-offs as required to construct a complete system as designed.

B. Panels and components shall be supplied in ready to use modules manufactured by Industrial Noise Control, Inc. (INC) of North Aurora, IL.

2.01 DESIGN REQUIREMENTS

A. Acoustical panels shall be modular and demountable. All panel connections shall allow easy disassembly and reassembly with no degradation of acoustical or mechanical performance. All components of like function and size shall be interchangeable.

3.01 MATERIALS

A. Panels shall be 2" thick consisting of a one-piece formed perforated panel body filled with acoustical sound absorbing material.

B. Steel Materials: All steel used in the panel construction shall be galvanized coated. Standard panels are electro-galvanized (EG) and may be painted without chemical wash. G-90 hot dipped galvanized, aluminum or stainless steel used when specified.

C. Perforated Panel Body: Shall be 22 gauge EG sheet steel perforated to an effective open area of 33% using 0.093" diameter holes on .156" staggered centers. Panel body shall be fully perforated and formed on the long edges to provide additional 13% additional absorptive surface.

D. Mounting Channels: Shall be 18 gauge formed with smooth rolled or hemmed edges with pre-punched mounting holes.

E. Absorptive Fill: Shall be a 2" thick x 1.5LB minimum density fibrous sound absorbing material. Insulation shall meet ASTM C-423 Sound Absorption Coefficient of NRC-1.15. Insulation shall exhibit the following properties:

1. Odor: None
2. Corrosiveness (ASTM C 665):
Does not accelerate corrosion on steel, copper or aluminum.
3. Resistance to Fungi or Bacteria (ASTM C665):
Does not promote growth of fungi or bacteria and shall be mold and vermin resistant.
4. Water Vapor Sorption (ASTM C1104):
Less than 0.01% by volume.
5. Temperature Resistance (ASTM C 411):
Will not deteriorate up to +1200° F.

F. Fill Protection: Panel fill shall be totally encapsulated using a 1.5 mil polyethylene film. Wrap shall be separated from the panel perforated skin with a polyethylene web mesh spacer. Metal spacers, chicken wire, etc., are not be acceptable

4.01 CONSTRUCTION

A. Panel Size: 30" standard panel width available to 42" maximum width x 12' maximum length.

B. Module Thickness: 2" standard units.

C. Panel Body: Shall be one-piece formed construction. Spotwelded or otherwise assembled panel shells are not acceptable.

D. Internal Panel Reinforcement: When specified, an internal 18 gauge steel reinforcement channel shall be inserted to provide additional panel rigidity.

5.01 FINISH

- A. All components may be supplied either unpainted in EG or factory finished using manufacturer's standard paint coating systems.
- B. When factory painting is required all components shall be properly cleaned and degreased, and be free of blemishes prior to applying the coating system.
- C. Polyester baked powder coat finish used when specified.

6.01 FIRE RATING

- A. Standard panels meet ASTM E84 Class I Smoke & Fire Standards.
- B. Panel acoustical fill meets the following:
 - Surface Burning Characteristics (ASTM E84, NFPA 255 & UL 723):
 - Flame Spread = 5
 - Smoke Developed = 5

7.01 MANUFACTURER EXPERIENCE & CERTIFICATIONS

- A. The manufacturer shall have designed and produced a standard pre-engineered system meeting the specifications stated herein for a minim of 10 years.
- B. The manufacturer warrants that when the panels and components are assembled in strict accordance with its specifications and instructions, that the resulting completed structure shall meet the intended mechanical and acoustical performance specified for the project.
- C. Products shall be warranted for a period of one year from the date of shipment against any defects in workmanship or materials.

Fabri-Sorb® Decorative Acoustic Wall Panels

INC offers a complete line of Sound Absorbing Wall & Ceiling Panels to compliment any environment. Elegant appearance, excellent noise absorbing characteristics, durability and ease of installation make our Fabri-Sorb® Decorative Fabric Acoustic Panels the best choice for controlling noise and echo where aesthetics are important such as office, multi-purpose, auditorium, broadcast, theater, school and meeting room environments. Panels can be easily mounted to walls, ceilings, partitions or any other flat surfaces. Offered in a variety of colors, sizes and edge details allows design and placement flexibility.

Fabri-Sorb® panels feature a dense rigid fiberglass noise absorbing core with hardened edges factory wrapped with attractive ASTM E84 Class I Fire Rated fabrics. Available in several ready to mount modules with NRC ratings from 0.55 to 1.10. Matching tack boards also available to nicely complete any project.



Typical Applications:

- Offices
- Meeting Rooms
- Multi-Purpose Rooms
- Auditoriums
- Churches
- Broadcast, Theaters
- Classrooms
- Labs
- and many others

Lower Reverberation Time, Reduce Echo & Lower Noise Levels!



Standard Sizes:

2' x 2'
2' x 3'
2' x 4'
2' x 8'
2' x 10'
4' x 4'
4' x 5'
4' x 8'
4' x 10'



Available Edge Details
(Radius, Miter, Bevel, Square)

Style FWPS80 Standard Acoustic Panel

Constructed using a 6-7LB density rigid fiberglass acoustical core with resin hardened edges expertly wrapped with Guilford fabric Style 701. Tailored corners and wrinkle-free surfaces make this a very attractive product suitable for any environment.

- Available in 1" and 2" thick versions in a wide range of standard sizes
- Wide range of ASTM E-84 Class I fire rated, acoustically matched fabrics to choose from
- Four edge profiles available



Style FWPTK Tackable Acoustic Panel

Constructed using a 10LB density rigid fiberglass acoustical core with resin hardened edges expertly wrapped with Guilford fabric Style 701. The same tailoring as our standard panels make this a very attractive tackable panel surface far superior than standard corkboard with the added benefit of some acoustical absorption.

- Available in 1/2" thick panel in a wide range of standard sizes
- Wide range of ASTM E-84 Class I fire rated, acoustically matched fabrics to choose from
- Four edge profiles available

ACOUSTICAL DATA

Fabri-Sorb® Style	Core	Casing		Absorption Coefficient by Octave Band Frequency (Hz)						NRC
				125	250	500	1000	2000	4000	
FWPS80										
1" Thick	6-7 LB ft ³	Fabric		0.14	0.27	0.66	0.92	1.10	1.25	0.75
2" Thick	6-7 LB ft ³	Fabric		0.25	0.89	1.17	1.16	1.10	1.08	1.10
FWPTK (Tackable)										
1/2" Thick	10.0 LB ft ³	Fabric		0.04	0.11	0.38	0.80	0.96	1.04	0.55

Bafl-Sorb® Sound Absorbing Baffles

INC offers a complete line of Sound Absorbing Ceiling Baffles to compliment any environment. Our ceiling baffles are among the most cost-effective method of adding sound absorption to any space for dramatic improvements in overall room acoustics by reducing reverberation time and eliminating sound reflections from the ceiling. Baffles can be installed in rows, egg-crate or other patterns for optimal distribution and appearance.

Large spaces such as factory areas, gymnasiums, atriums, multi-purpose rooms and pools typically benefit the most from the installation of a Bafl-Sorb® system.



We offer a wide variety of styles, materials of construction, colors and sizes to meet just about any desired performance, budget and interior design. Most styles meet ASTM-E84 Class I fire ratings with FDA and Clean Room versions available.

Lower Reverberation Time, Reduce Echo & Lower Noise Levels!

Type "G" Standard Economy Vinyl Baffles

Semi-rigid low to medium density fiberglass acoustical core heat sealed into a fire retardant, 2 mil *smooth* vinyl casing with light reflective finish. Baffle maintains it's clean look, is waterproof and resistant to UV exposure.

- Available in 24" x 48" x 1.5" thick units
- Selected range of ASTM E-84 Class I fire rated vinyl to choose from, white color only
- Secure hanging grommets with wire hangers for easy installation



Our most economical baffle especially suited for industrial applications, gymnasiums, warehouses.



Sold in Boxes of Ten

Type "E" Quality Embossed Vinyl Baffles

Semi-rigid medium density fiberglass acoustical core heat sealed into a fire retardant, 3 mil *embossed* vinyl casing with a matt finish. Baffle resists wrinkling and deformation over time retaining it's clean, sleek look and is waterproof and resistant to UV exposure.

- Available in 24" x 48" x 1.5" thick units
- Selected range of ASTM E-84 Class I fire rated vinyl to choose from, white and custom colors
- Secure hanging grommets with wire hangers for easy installation



Cost-effective still, but heavy duty and attractive especially suited for high ceiling environments such as multi-purpose rooms, pools, factory areas. Custom colors available!



Available Colors

Sold in Boxes of Ten

Type CLS: Premium Fabric "Soft" Baffles

Semi-rigid 3LB density fiberglass acoustical core sewn into a high quality fabric casing. Baffle resists wrinkling and deformation over time retaining it's clean, decorative look.

- Standard size is 24" x 48" x 2" thick, Available in sizes up to 48" x 96"
- Wide range of ASTM E-84 Class I fire rated, acoustically matched fabrics to choose from
- Secure hanging grommets with "S" hooks for easy installation



Attractive sewn fabric casing available in many colors is a great choice for commercial spaces, office interiors, and open space plans where a soft look is preferred.



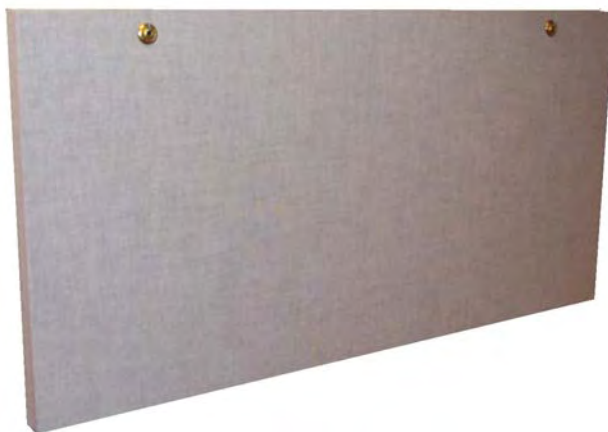
Available Colors

Sold in Boxes of Ten

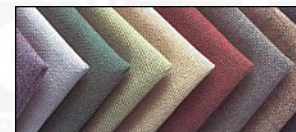
Type CLR: Premium Fabric "Rigid" Baffles

Rigid 6LB density fiberglass acoustical core covered with a high quality fabric casing stretched and glued to core. Baffle will not wrinkle or deform over time retaining it's clean, decorative look.

- Standard size is 24" x 48" x 2" thick, Available in sizes up to 48" x 96"
- Wide range of ASTM E-84 Class I fire rated, acoustically matched fabrics to choose from
- Secure hanging grommets with cable loops for easy installation



Sharp corners and tailored looks make this rigid baffle an attractive choice for controlling noise in atriums, churches, or any space where a trim finish is desired.



Available Colors

Sold in Boxes of Ten

Type SG: Sorba-Glas® Quilted Baffles

These super-tough ASTM E-84 "Class I fire-rated fiberglass baffles have a quilted vinyl facing that is impervious to moisture, oils, grease, dirt, dust and airborne contaminants. The 2" thick Sorba-Glas® baffle panels are completely sealed ... factory sewn on all four edges.

- Standard size is 24" x 48", Available in sizes up to 48" x 300"
- Available in 1" (Model 24SG1) and 2" (Model 24SG2) thicknesses
- Available in gray, white, black and tan colors
- Secure hanging grommets with S hooks for easy installation



The best choice where rugged durability in a harsh environment is needed. Our SG baffles are tough and last a lifetime.

Sold in Boxes of Ten

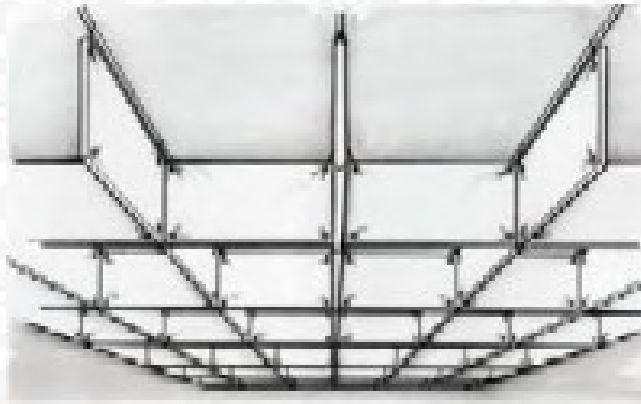


Great For Use In Harsh Environments!

Meets ASTM E84 Class I Fire Rating

Installation Hardware & Guidelines

INC BafI-Sorb® baffles install quickly and easily in almost any facility. You can arrange the baffles in almost any pattern without compromising the acoustical performance so long as the baffles are evenly disbursed throughout the area to be treated, generally in a density one baffle for every 10 to 15 square feet of ceiling area. The most common arrangements are either a grid or “egg-crate” pattern, or simply a straight row pattern. Typically, baffles are installed above any existing lighting and sprinkler systems by simply stringing non-stretch galvanized steel aircraft cables perpendicular to your ceiling support bar joists, trusses, or beams using a series of turnbuckles, clips and hooks (all available from INC). The cable is fastened taught and the baffles are suspended from the cable using the included hanging wires attached to the grommets in the baffles.



All of the Hardware and Tools required for the installation of any BafI-Sorb® system are available from INC !

Sold in Convenient Quantity
for Most Typical Applications

ACOUSTICAL DATA

Bafl-Sorb® Sound Absorbing Baffles - Acoustical Data

Bafl-Sorb® Style	Core	Casing		Absorption Data by Octave Band Frequency (Hz)						NRC Total
				125	250	500	1000	2000	4000	
24G	1.55 ft ³	2 mil Vinyl	NR	.032	.057	1.00	1.53	1.33	0.92	1.13
			Sabins	2.52	4.58	8.75	12.24	10.70	7.33	9.07
27G	2.70 ft ³	2 mil Vinyl	NR	0.34	0.63	1.21	1.65	1.49	1.03	1.24
			Sabins	2.77	5.04	9.68	13.22	11.95	8.26	9.97
27E	2.70 ft ³	3 mil Vinyl	NR	0.45	0.55	1.22	1.47	0.87	0.41	1.03
			Sabins	3.58	4.40	9.81	11.79	6.99	3.31	8.25
24SG1	2.00 ft ³	Quilted	NR	0.39	0.59	0.87	0.84	0.73	0.59	0.75
			Sabins	3.25	4.91	7.24	6.99	6.08	4.91	6.25
24SG2	2.00 ft ³	Quilted	NR	0.53	0.77	0.88	0.77	0.71	0.63	0.80
			Sabins	4.42	6.41	7.33	6.42	5.91	5.25	6.64
24CLS	2.70 ft ³	Cloth	NR	0.31	0.50	1.07	1.30	1.30	1.24	1.05
			Sabins	2.68	4.33	9.27	11.26	11.26	11.60	9.09
24CLR	6.00 ft ³	Cloth	NR	0.25	0.89	1.10	1.10	1.10	1.08	1.04
			Sabins	2.16	7.70	9.52	9.52	9.52	9.34	9.00

SPECIFICATIONS

General

Sound absorbing baffles shall be Bafl-Sorb® as manufactured by Industrial Noise Control, Inc, North Aurora, IL consisting of an inner sound absorbing core, completely encapsulated by the specified outer casing. All units shall be manufactured to be of consistent size, shape and appearance. Each unit shall have a minimum of two machine set, rolled rim #3 brass grommets to accept 16 gauge steel "S" hooks or wire hangers.

Sound Absorbing Core:

Inner Core shall be fiberglass of the specified density according to baffle style. Fiberglass shall be inert, mildew and vermin proof and of a consistent density and uniform thickness.

Outer Casing:

Outer casing shall completely encapsulate the inner core of each unit. All vinyl casings shall be sealed around the core on three sides using a thermal impulse sealer with 5/16" wide elements on both sides of the seal creating a sturdy, water and dust tight bond. Vinyl "G" casings shall have a smooth reflective finish. Vinyl "E" casings shall have an embossed matt finish. All cloth casings shall be machine sewn around the inner core using an internal double ship lap seam. Quilted casings shall be machine sewn on all edges with a matching trim piping.

Fire Rating:

All vinyl casing shall meet Class I Fire Rating per UL-723. All cloth and quilt casings shall meet Class I Fire Rating per ASTM E-84.

Even the best noise control materials will do little good if not trimmed and installed properly and securely. Over the years we have found the following items to be extremely helpful for gluing, fastening, stapling, mounting, and trimming of our products. All available from INC for your single source convenience.

IPA-02 Foam Adhesive



A water-based synthetic latex adhesive specifically selected for use on acoustical urethane foams. Resists cracking, peeling, mildew, moisture and UV. Sets in one-to-five minutes. Packaged in 11-oz. cartridge for use with any standard caulking gun. Sufficient coverage for gluing 20 ft² of foam. (using a 1/4" bead around the perimeter, and an "x" from corner to corner). Meets NFPA 90A and 90B, Non Flammable.

Sorba-Glas® Trim Tape



Field cuts to Sorba-Glas® are easily trimmed using our non-adhesive edge Trim Tape, and an industrial open-jaws stapler. Made of the same material as the impervious Sorba-Glas® aluminized vinyl facing. Trim Tape rolls are 4" wide, 100' long. Operating temperature range is -30 to 250 F, and Trim Tape is resistant to moisture, lubricants, fuels, grease, and solvents. Flammability: ASTM E84 Class I.

#3 Grommet Kit



Our grommet kit makes it easy to place grommets exactly where you need them. Consists of a #4 trade size grommet hole punch and a #3 trade size grommet insert punch and die set and #3 brass grommets. Simply punch hole, place washer in die, fit material over washer, and position grommet into hole in material. The punch design ensures perfect alignment of washer and grommet pieces.

Mounting Pin Assemblies



These steel mounting pin assemblies cannot be beat when it comes to providing a simple, safe and secure method of attaching noise absorption quilts, foams, or liners to almost any clean, flat surface. Consists of a PSA base, pin and cap. Corrosion-resistant. 50 sets per box.

Nylon Curtain Hardware



Simple nylon nut, bolt and washer hardware is a good way to join overlapping edges of noise control curtain panels. Strong, won't corrode, rust or come loose.

Industrial Stapler



An open-jaws industrial stapler ideal for field trimming cut edges of Sorba-Glas® with Trim Tape. Box of 5000 staples included.

Installation Hardware & Tools for Bafi-Sorb® Systems



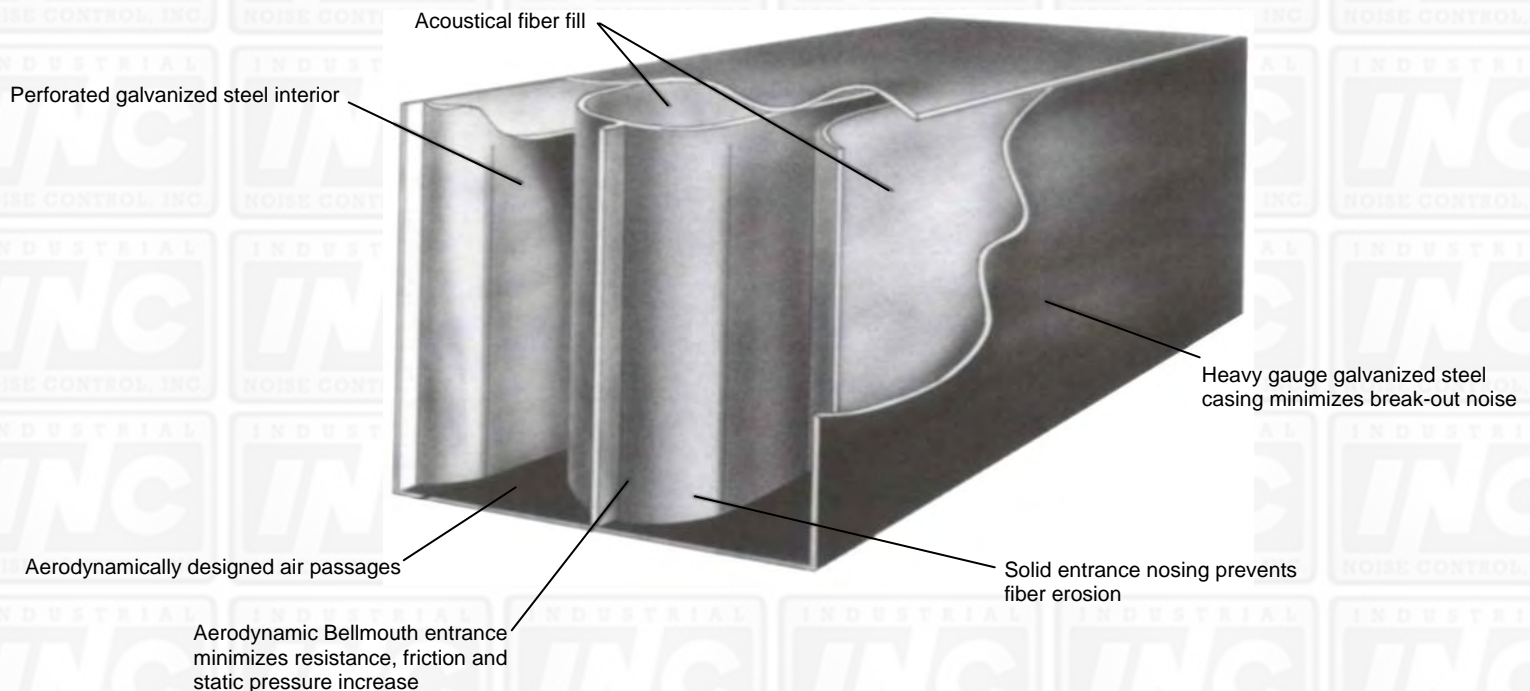
All of the hardware including non-stretch woven wire cable, turnbuckles, crimping sleeves, beam clamps, and crimping tools are available from INC.

Panl-Flow[®] HVAC & Industrial Silencers

Standard Duct Sizes • High Insertion Loss • Low Pressure Drop • Low Break-Out Noise

INC Panl-Flow[®] silencers are used to attenuate airborne noise through commercial HVAC ductwork systems, building openings, sound enclosures, ventilating fans and plenum equipment. Panl-Flow[®] silencers are an excellent choice for applications requiring maximum insertion loss (noise reduction), low static pressure drop, low maintenance, and quick delivery. Use a Panl-Flow[®] silencer wherever you need to reduce airborne noise while allowing air movement:

- Air flow in and out of a noisy area or building
- Fan and blower intake or discharge
- Air Handling Plenums
- Equipment Enclosures



Typical Applications:

- HVAC Ductwork
- Turbines
- Fans
- Material Handling & Conveying Equipment
- Engine Intakes & Discharge
- Blowers
- Air Handlers
- Radiators
- Plenums
- Cooling Towers
- Building Vent Walls
- Sound Enclosures
- Genset Housings
- Compressor Enclosures
- Engine Test Cells
- and many others

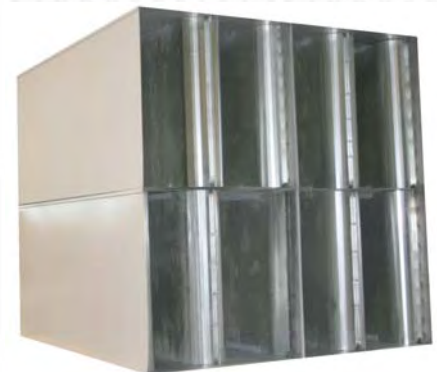
Silencer Design & Construction

An INC Panl-Flow® silencers are of an absorptive design, manufactured in square and rectangular sizes to match common ductwork and equipment dimensions. The length of the silencer combined with the volume and velocity of the air moving through it determines the insertion loss or sound attenuation characteristics of the unit. Our silencers are constructed of an exterior sealed shell with sound absorbing baffles or “bullets” running lengthwise through the silencer. Panl-Flow® construction features:

- Rigid assembly with all exterior joints and seams lock-formed to be air and water-tight
- Standard 26 gauge solid exterior with 22 gauge interior perforated interior designed and sized for maximum performance
- Heavy 18 gauge exterior casings available for low “break-out” noise
- Solid rounded aerodynamic bullet ends for minimum pressure drop and smooth air flow
- Absorptive fill is inert, and meets ASTM E-84 Class A fire rating
- Custom designs available for a wide range of CFM, pressure drop and insertion loss requirements



Internal Bullets Ready for Filling



Bank of Stacked Silencers

Accessories & Options

- Silencers can be stacked in banks to achieve large openings
- All silencers can be fitted with mounting flanges, bird screens, and weather caps
- Compatible elbows and other ducting transition shapes available
- Cross-talk designs available



Custom Mounting Flanges



Square to Round Transition



Typical Elbow Fitting



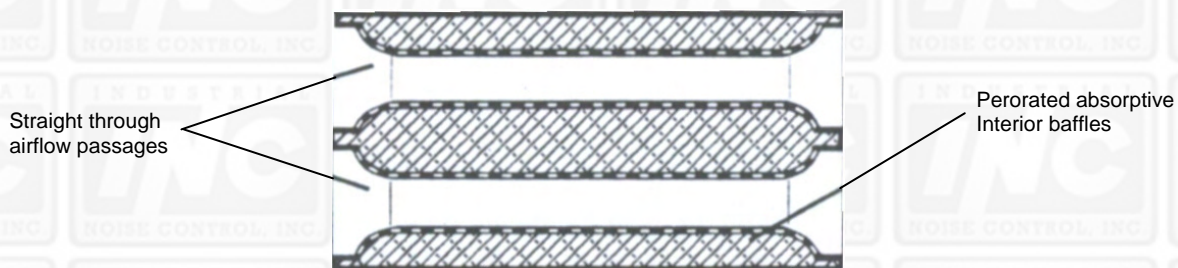
Silencers Fitted with Bird Screens & Collars

Selection Guide

How An Absorptive Silencer Works

INC Panl-Flow[®] absorptive silencer works by directing the airflow containing the unwanted noise through a series of highly sound absorptive passages of various lengths and widths causing the sound energy to be dissipated by the sound absorbing media while allowing the air to flow relatively unimpeded. The length and ratio of width to height relative to the frequency of the sound determines the amount of sound attenuation or insertion loss that the silencer will provide. Generally, the longer the silencer the greater the attenuation, especially at the lower frequency ranges.

Because the interior surfaces of the airflow passages are perforated metal and of a smaller free area than the originating ductwork, friction is encountered that results in increased resistance that the air flow must overcome. This is known as static pressure.



Typical Cross-Section of Panl-Flow[®] Absorptive Silencer

SELECTING THE PROPER SILENCER

Selecting the proper Panl-Flow[®] Silencer will ensure adequate and economical sound attenuation for your application. The first step is to analyze your system and determine the amount of noise reduction required. This is expressed as *insertion loss in decibels* when referring to silencer acoustical performance data. You will also need to know the maximum amount of resistance you can add to the air flow that your system can handle. This is expressed as *static pressure drop in inches of water (WG)* and is the additional resistance the fan or air moving equipment in the system will have to be able to overcome to maintain the same air flow and efficiency. You should have the following information available when making your silencer selection:

- Insertion Loss in dB required at each octave band frequency from 63 hz to 8000 hz
- Total air flow in CFM
- Maximum static pressure drop in inches per water column (WG)
- Duct, exhaust or fan size dimensions
- Maximum allowable length of silencer

Once you have this information you will be able to simply select the silencer size and model that matches your criteria. You will see that we have two basic silencer designs, one resulting in Standard Pressure Drops (our Model SP) and one resulting in Lower Pressure Drops (our Model LP). Typically low pressure drop silencers result in lower insertion loss as well, especially in the lower frequency ranges.

AERODYNAMIC PERFORMANCE - SILENCER TYPE SP

			STATIC PRESSURE - Inches W.G.												
SILENCER		MODEL													
SIZE	FACE	36LP	0.05	0.10	0.14	0.18	0.23	0.27	0.36	0.46	0.55	0.73	0.90	1.2	1.4
W x H	AREA	60LP	0.05	0.10	0.15	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.3	1.6
(Inches)	ft ²	84LP	0.06	0.11	0.16	0.22	0.27	0.32	0.44	0.54	0.66	0.87	1.1	1.3	1.8
12 x 6	0.5		158	223	270	313	350	383	443	495	540	625	700	798	885
12 x 12	1.0		315	445	540	625	700	765	885	990	1080	1250	1400	1595	1770
12 x 18	1.5		473	668	810	938	1050	1148	1328	1485	1620	1875	2100	2393	2655
12 x 24	2.0		630	890	1080	1250	1400	1530	1770	1980	2160	2500	2800	3190	3540
12 x 30	2.5		788	1113	1350	1563	1750	1913	2213	2475	2700	3125	3500	3988	4425
12 x 36	3.0		945	1335	1620	1875	2100	2295	2655	2970	3240	3750	4200	4785	5310
12 x 42	3.5		1103	1558	1890	2188	2450	2678	3098	3465	3780	4375	4900	5583	6195
12 x 48	4.0		1260	1780	2160	2500	2800	3060	3540	3960	4320	5000	5600	6380	7080
24 x 6	1.0		315	445	540	625	700	765	885	990	1080	1250	1400	1595	1770
24 x 12	2.0		630	890	1080	1250	1400	1530	1770	1980	2160	2500	2800	3190	3540
24 x 18	3.0		945	1335	1620	1875	2100	2295	2655	2970	3240	3750	4200	4785	5310
24 x 24	4.0		1260	1780	2160	2500	2800	3060	3540	3960	4320	5000	5600	6380	7080
24 x 30	5.0		1575	2225	2700	3125	3500	3825	4425	4950	5400	6250	7000	7975	8850
24 x 36	6.0		1890	2670	3240	3750	4200	4590	5310	5940	6480	7500	8400	9570	10620
24 x 42	7.0		2205	3115	3780	4375	4900	5355	6195	6930	7560	8750	9800	11165	12390
24 x 48	8.0		2520	3560	4320	5000	5600	6120	7080	7920	8640	10000	11200	12760	14160
36 x 6	1.5		473	668	810	938	1050	1148	1328	1485	1620	1875	2100	2393	2655
36 x 12	3.0		945	1335	1620	1875	2100	2295	2655	2970	3240	3750	4200	4785	5310
36 x 18	4.5		1418	2003	2430	2813	3150	3443	3983	4455	4860	5625	6300	7178	7965
36 x 24	6.0		1890	2670	3240	3750	4200	4590	5310	5940	6480	7500	8400	9570	10620
36 x 30	7.5		2363	3338	4050	4688	5250	5738	6638	7425	8100	9375	10500	11963	13275
36 x 36	9.0		2835	4005	4860	5625	6300	6885	7965	8910	9720	11250	12600	14355	15930
36 x 42	10.5		3308	4673	5670	6563	7350	8033	9293	10395	11340	13125	14700	16748	18585
36 x 48	12.0		3780	5340	6480	7500	8400	9180	10620	11880	12960	15000	16800	19140	21240
48 x 6	2.0		630	890	1080	1250	1400	1530	1770	1980	2160	2500	2800	3190	3540
48 x 12	4.0		1260	1780	2160	2500	2800	3060	3540	3960	4320	5000	5600	6380	7080
48 x 18	6.0		1890	2670	3240	3750	4200	4590	5310	5940	6480	7500	8400	9570	10620
48 x 24	8.0		2520	3560	4320	5000	5600	6120	7080	7920	8640	10000	11200	12760	14160
48 x 30	10.0		3150	4450	5400	6250	7000	7650	8850	9900	10800	12500	14000	15950	17700
48 x 36	12.0		3780	5340	6480	7500	8400	9180	10620	11880	12960	15000	16800	19140	21240
48 x 42	14.0		4410	6230	7560	8750	9800	10710	12390	13860	15120	17500	19600	22330	24780
48 x 48	16.0		5040	7120	8640	10000	11200	12240	14160	15840	17280	20000	22400	25520	28320
FACE VELOCITY			315	445	540	625	700	765	885	990	1080	1250	1400	1595	1770

Standard Pressure Drop Units

AERODYNAMIC PERFORMANCE - SILENCER TYPE LP

			STATIC PRESSURE - Inches W.G.												
SILENCER		MODEL													
SIZE	FACE	36LP	0.05	0.09	0.13	0.18	0.22	0.27	0.37	0.45	0.54	0.73	0.90	1.20	1.50
W x H	AREA	60LP	0.05	0.10	0.15	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.30	1.60
(Inches)	ft ²	84LP	0.06	0.11	0.16	0.22	0.27	0.33	0.44	0.55	0.66	0.87	1.10	1.40	1.70
12 x 6	0.5		460	645	790	915	1020	1120	1290	1445	1575	1820	2040	2325	2580
12 x 12	1.0		915	1290	1580	1825	2040	2235	2580	2890	3150	3640	4075	4645	5160
12 x 18	1.5		1375	1935	2370	2740	3060	3355	3870	4335	4725	5460	6115	6970	7740
12 x 24	2.0		1830	2580	3160	3650	4080	4470	5160	5780	6300	7280	8150	9290	10320
12 x 30	2.5		2290	3225	3950	4565	5100	5590	6450	7225	7875	9100	10190	11615	12900
12 x 36	3.0		2745	3870	4740	5475	6120	6710	7740	8670	9450	10920	12225	13935	15480
12 x 42	3.5		3200	4515	5530	6390	7140	7825	9030	10115	11025	12740	14265	16260	18060
12 x 48	4.0		3660	5160	6320	7300	8160	8940	10320	11560	12600	14560	16300	18580	20640
24 x 6	1.0		915	1290	1580	1825	2040	2235	2580	2890	3150	3640	4075	4645	5160
24 x 12	2.0		1830	2580	3160	3650	4080	4470	5160	5780	6300	7280	8150	9290	10320
24 x 18	3.0		2750	3870	4740	5475	6120	6710	7740	8670	9450	10920	12225	13935	15480
24 x 24	4.0		3660	5160	6320	7300	8160	8940	10320	11560	12600	14560	16300	18580	20640
24 x 30	5.0		4575	6450	7900	9125	10200	11175	12900	14450	15750	18200	20375	23225	25800
24 x 36	6.0		5490	7740	9480	10950	12240	13410	15480	17340	18900	21840	24450	27870	30960
24 x 42	7.0		6400	9030	11060	12775	14280	15645	18060	20230	22050	25480	28525	32515	36120
24 x 48	8.0		7320	10320	12640	14600	16320	17880	20640	23120	25200	29120	32600	37160	41280
36 x 6	1.5		1375	1935	2370	2740	3060	3355	3870	4335	4725	5460	6115	6970	7740
36 x 12	3.0		2745	3870	4740	5475	6120	6710	7740	8670	9450	10920	12225	13935	15480
36 x 18	4.5		4120	5800	7110	8215	9180	10060	11610	13005	14175	16380	18340	20905	23220
36 x 24	6.0		5490	7740	9480	10950	12240	13410	15480	17340	18900	21840	24450	27870	30960
36 x 30	7.5		6865	9675	11850	13690	15300	16765	19350	21675	23625	27300	30565	34840	38700
36 x 36	9.0		8235	11610	14220	16425	18360	20115	23220	26010	28350	32760	36675	41805	46440
36 x 42	10.5		9600	13545	16590	19165	21420	23470	27090	30345	33075	38220	42790	48775	54180
36 x 48	12.0		10980	15480	18960	21900	24480	26820	30960	34680	37800	43680	48900	55740	61920
48 x 6	2.0		1830	2580	3160	3650	4080	4470	5160	5780	6300	7280	8150	9290	10320
48 x 12	4.0		3660	5160	6320	7300	8160	8940	10320	11560	12600	14560	16300	18580	20640
48 x 18	6.0		5490	7740	9480	10950	12240	13410	15480	17340	18900	21840	24450	27870	30960
48 x 24	8.0		7320	10320	12640	14600	16320	17880	20640	23120	25200	29120	32600	37160	41280
48 x 30	10.0		9150	12900	15800	18250	20400	22350	25800	28900	31500	36400	40750	46450	51600
48 x 36	12.0		10980	15480	18960	21900	24480	26820	30960	34680	37800	43680	48900	55740	61920
48 x 42	14.0		12810	18060	22120	25550	28560	31290	36120	40460	44100	50960	57050	65030	72240
48 x 48	16.0		14640	20640	25280	29200	32640	35760	41280	46240	50400	58240	65200	74320	82560
FACE VELOCITY			915	1290	1580	1825	2040	2235	2580	2890	3150	3640	4075	4645	5160

Low Pressure Drop Units

ACOUSTICAL PERFORMANCE

Silencer Style	Max CFM	Face Velocity FPM	Net Insertion Loss (dB) by Octave Band Frequency (Hz)							
			63	125	250	500	1000	2000	4000	8000
Model LP (Low Pressure Drop)	82500									
36" Length		0	3	3	7	11	16	17	10	7
36" Length		1000	2	3	7	11	16	17	10	7
36" Length		2000	1	3	6	10	15	17	10	7
60" Length		0	5	6	12	18	27	27	15	10
60" Length		1000	3	6	11	18	27	27	15	10
60" Length		2000	2	5	11	17	26	27	15	10
84" Length		0	6	7	13	25	37	35	19	13
84" Length		1000	5	7	13	24	37	35	19	13
84" Length		2000	3	7	13	23	35	34	19	13
Model SP (Std. Pressure Drop)	28320									
36" Length		0	6	7	16	28	35	41	32	25
36" Length		1000	5	7	15	27	33	39	31	24
36" Length		2000	4	6	15	23	30	34	29	23
60" Length		0	7	16	25	41	49	46	41	29
60" Length		1000	6	14	23	40	45	43	39	28
60" Length		2000	5	12	21	36	43	40	36	26
84" Length		0	10	15	33	42	48	45	44	32
84" Length		1000	8	13	29	40	44	42	41	30
84" Length		2000	6	11	28	37	41	40	39	29

Silencer Style	Max CFM	Face Velocity FPM	Self-Generated Noise (dB) by Octave Band Frequency (Hz)							
			63	125	250	500	1000	2000	4000	8000
Model LP (Low Pressure Drop)	82500									
36" Length		1000	52	39	37	34	33	24	(17)	(17)
36" Length		2000	55	56	52	50	48	51	45	38
36" Length		2500	61	58	64	58	52	56	54	48
60" Length		1000	53	40	37	32	33	25	(17)	(17)
60" Length		2000	56	56	51	46	46	50	44	38
60" Length		2500	60	57	62	56	50	55	52	47
84" Length		1000	52	40	37	31	30	22	(17)	(17)
84" Length		2000	56	54	51	45	46	49	43	35
84" Length		2500	61	57	62	57	50	55	51	46
Model SP (Std. Pressure Drop)	28320									
36" Length		1000	53	46	43	41	42	47	44	41
36" Length		2000	74	71	63	60	56	57	61	61
36" Length		2500	79	78	71	66	63	63	66	67
60" Length		1000	51	50	44	42	41	44	42	40
60" Length		2000	71	70	64	63	56	58	62	63
60" Length		2500	76	74	68	68	61	62	66	67
84" Length		1000	49	45	44	45	46	49	44	38
84" Length		2000	72	67	66	66	59	61	64	62
84" Length		2500	79	73	68	70	62	63	67	66

Silencer Design & Construction

INC Panl-Flow® silencers are of an absorptive design, manufactured in square and rectangular sizes with round transitions to match common ductwork and equipment dimensions. Our silencers are constructed of an exterior sealed shell with sound absorbing baffles or “bullets” running lengthwise through the silencer. Panl-Flow® construction features:

- Rigid assembly with all exterior joints and seams lock-formed to be air and water-tight.
- Standard 26 gauge solid exterior with 22 gauge interior perforated interior bullets designed and sized for maximum performance.
- Heavy 18 gauge exterior casings available for low “break-out” noise.
- Solid rounded aerodynamic bullet ends for minimum pressure drop and smooth air flow.
- Absorptive fill is inert, and meets ASTM E-84 Class I fire rating.
- Custom designs available for a wide range of CFM, pressure drop and insertion loss requirements.
- Standard materials include G90 galvanized, electro-galvanized, aluminum and stainless steel.

Accessories & Options

- Silencers can be stacked in banks for large openings applications.
- All silencers can be fitted with mounting flanges, bird screens, and weather caps.
- Compatible elbows and other ducting transition shapes available.
- Cross-talk designs available.



Array of Custom Silencers, Plenum Boxes, Fittings & Transitions

INC[®] Custom Engineered Solutions Capabilities

Analysis • Design • Manufacture • Installation • Turnkey Solutions • Results

INC manufactures and distributes a broad range of high performing products and structures used to solve the most common to the most unusual and complex noise control applications ... from a simple soundproof partition to a jet engine test cell ... INC does it all. We are unique in our ability to provide truly customized systems in a timely and cost-effective manner. With INC, your specific project needs and performance goals will never be compromised simply to fit into a standard product offering or pre-conceived solution.

Our Custom Engineered Solutions Group provides structures used for three basic approaches to noise control:

- Enclose or isolate noisy equipment or operations
- Enclose or isolate personnel, operators and technicians
- Create controlled test and measurement environments



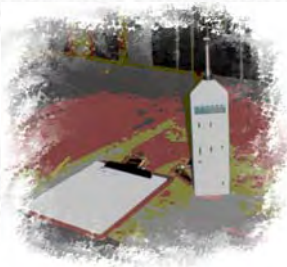
Machine Sound Enclosures • Quiet Rooms • Sound Booths • Control Rooms • Pulpits •
Soundproof Partitions • Noise Barriers • Factory Offices • QC Rooms • Power Plant Offices •
Generator Enclosures • Outdoor Noise Barriers • Printing Press Enclosures • Dynamometer Test Cells •
Factory Pre-Assembled Structures • Product Testing Chambers • Sound Walls • RFI Shielding

Using our complete line of high performance pre-engineered acoustical products and systems, our *Custom Engineered Solutions Group* can help you solve your noise problems ... the possibilities for noise control solutions are limited only by imagination and the laws of physics.

Our Team Of Experts

Our talented staff is at your disposal ... *Uniquely Applying Our Expertise to Your Specific Project Needs*

Sales Engineering



INC offers comprehensive sales engineering services which include noise measurement & analysis as required to develop the most cost-effective solutions to our customer's noise control projects. All of our direct sales engineers and managers are experts in noise control solution design and have broad based field experience.

Design & System Engineering



Sales engineering concepts and recommendations are turned into hardware & product designs by our Design Engineering Group. Utilizing the latest CAD technology we produce drawings ranging from preliminary proposal drawings, detailed submittal drawings for customer approval to assembly & manufacturing details and bills of material. Our range of engineering disciplines include acoustics, mechanical, structural, electrical and civil.

Product Manufacturing



Manufacturing details and bills of material created by our design team are turned into a wide range of standard and custom products and components by our manufacturing group. Our complete metal fabricating operation is geared towards the production of our line of state-of-the-art Panl-Wall® modular and pre-assembled systems. In addition, we also maintain a "soft good" fabricating department for the production of our Flexi-Sorb® curtain systems and other non-metallic acoustical products.

Project Management & Installation



With our network of experienced installation partners & contractors along with our in-house project management team, INC can offer professional site erection & installation of any type of product or system we manufacture. Our ability to perform this type of field work in a timely, professional and equally cost-effective manner is unequalled in our industry. For a truly turnkey noise control solution, turn to INC.

Let INC Design a System That Fits Your Needs and Budget

Solutions can take the form of enclosures, barriers, partitions and rooms designed from the following array of INC product lines.

Panl-Wall® Modular Metal Panel System:

Our Panl-Wall® product line consists of pre-engineered, modular acoustical components ... *building blocks* ... that can be configured and assembled into a wide variety of structures used to control and reduce excessive noise in industrial, commercial, institutional and community environments. Creating rugged free-standing structures that acoustically enclose or isolate equipment, operations, or personnel often becomes a simple matter of choosing components and specifying sizes and dimensions. And Panl-Wall® is not *just* an integrated system of panels, doors, windows, and ventilation - but can include anything your unique application demands- such as EMI/RFI and X-ray shielding, lighting & electrical systems, explosion vents, ballistic impact resistance, and more.

Flexi-Sorb® Modular Flexible Curtain System:

Pre-engineered, modular Flexi-Sorb® noise control curtains and pre-engineered support track and framework components are flexible building blocks that can be configured into a wide variety of full & partial enclosures, barriers and partitions. Used to control and reduce excessive noise in industrial, commercial, institutional environments, Flexi-Sorb® is an excellent choice for applications requiring maximum accessibility, design flexibility, ease of installation and maintenance, low installed cost and quick delivery.

Pre-Assembled Structures:

INC Pre-Assembled structures take the uncertainty out of installation schedules, minimize downtime and expense, and can guarantee levels of mechanical, structural and acoustical performance difficult or impossible to deliver with modular field-erected solutions. Applications include Operator Control Rooms, Pulpits, Crane Cabs, Mechanical / Electrical Equipment Housings, Computer Rooms, Quiet Rooms, and many more.

Outdoor Noise Barriers:

The Panl-Wall® Outdoor Noise Barrier (ONB) system is noise control designed to stand up to the elements- with it's sleek horizontal interlocking panels and available tough UV-resistant finishes. Pre-engineered modular components ensure Panl-Wall® ONB projects deliver reliable structural and acoustical performance- and in a package that is straightforward to design and install. Our ONB system can be easily configured and assembled into enclosures, screens, partial enclosures and barriers to provide sound attenuation for all kinds of outdoor industrial, community and environmental noise problems.

Acoustical Test and Measurement Chambers:

INC engineered test chambers provide specific, controlled acoustical environments for performing accurate and repeatable testing of many types- everything from table top chambers to small vehicle test rooms.

Power Sports Dyno Test Cells:

The use of an INC Professional Dyno Room will ensure a stable, repeatable environment for your dynamometer runs and a safe work space for your technicians. INC offers a complete line of affordable, functional Dyno Test Rooms just right for any dynamometer set up. Recognized as a world class provider, INC Dyno test Rooms are featured on HorsePower TV and are in use in hundreds of facilities throughout the US.

Panl-Wall® Modular Acoustical Panel System

Pre-Engineered • Flexible Modular Design • Predictable Performance • Built To Last



Our Panl-Wall® product line consists of pre-engineered, modular acoustical components ... *building blocks* ... that can be configured and assembled into a wide variety of structures used to control and reduce excessive noise in industrial, commercial, institutional and community environments. Panl-Wall® is an excellent choice for these three most common approaches to noise control:

- Enclose or isolate noisy equipment or operations
- Enclose or isolate personnel, operators and technicians
- Create controlled test and measurement environments



Typical Applications

Using the modular acoustical panel as the basic building block combined with our full range of components and accessories including acoustical doors and windows, removable access panels, ventilation and electrical systems, and all required joiners, trims, supports and hardware ... the possibilities for noise control solutions are limited only by imagination and the laws of physics.



- Machine Sound Enclosures
- Quiet Rooms
- Sound Booths
- Control Rooms
- Pulpits
- Soundproof Partitions
- Noise Barriers
- Factory Offices
- QC Rooms
- Pressurized HVAC Plenums
- Generator Enclosures
- Outdoor Noise Barriers
- Printing Press Enclosures
- Dynamometer Test Cells
- Pre-Assembled Structures
- Product Testing Chambers
- Sound Walls
- Rooftop Equipment Screens
- and many more

THE BASICS

With these basic components, you can design an almost unlimited range of noise control structures. Contact INC and we'll help you explore the possibilities!

Modular Wall & Roof Panels

Prefabricated welded panel modules are used to form the walls and roof of any structure. Available in a variety of thicknesses and acoustical performance ratings, panels of like size and type are fully interchangeable making assembly and modifications easy.

Panel Joiners

Panel modules are connected using one or more of our unique joiners to form an acoustically and structurally robust joint. Our standard method is a one-piece formed H-Joiner. For greater design flexibility we also offer a bolt-together H-Joiner assembly that allows any panel to be individually removed from the structure, and T-Joiners. INC also manufactures two distinct styles of interlocking panel designs that do not require separate joiners.

Assembly & Finishing Trim Components

A complete array of additional pre-engineered assembly components such as base & top channels, corner trims, wall channels, aprons and flashings are available to make the structure complete.

Doors & Access Points

Single and double leaf acoustical hinged doors as well as manual and automated sliding doors are available to provide personnel and parts entry and exit wherever needed. In addition we offer a full compliment of access plugs and removable panels for local access.

Viewing Windows

High performance double glazed window units are available in a wide range of sizes and glazing materials to suit the most critical requirements. Our windows can be sized and arranged to provide unlimited viewing access.

Silenced Ventilation

Fully silenced acoustically compatible ventilation systems are available to integrate with any Panel-Wall® structure. We offer a variety of ventilating fans and air conditioners along with acoustically and aerodynamically designed silencers, baffles and vent panels.

Lighting & Electric

For general lighting and convenience electrics we offer basic components for either surface or concealed mounting.



Versatility • Choices • Selection • Performance • Satisfaction

Modular Panel Styles & Options

To provide solutions for the widest variety of applications, Panl-Wall® features an array of related components providing high performance acoustical characteristics combined with rugged structural integrity and design flexibility. A range of basic panel constructions and joining methods are offered each providing a unique combination of acoustical and mechanical features to best meet your specific requirements.

Design Choices

INC offers three distinct panel designs to meet any application

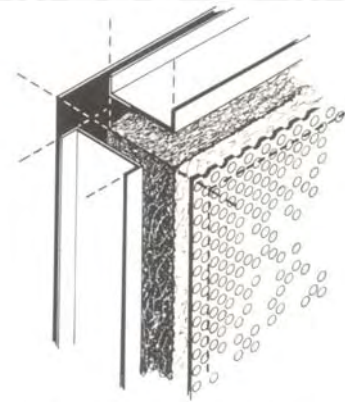
H-Member Joint

Tongue-and-Groove Plenum Style

Outdoor Interlock

Construction Options

- Standard panel thicknesses of 2" and 4"
- Panel modules available up to 48" wide X 15' long
- Standard panel performance up to STC-52 and NRC=1.05
- Standard material is electro-galvanized steel, available in G90 galvanized steel, cold rolled steel, aluminum and stainless steel
- Standard panel exterior is 18 gauge steel
- Standard panel interior is 22 gauge perforated steel
- Heavy duty construction material gauges up to ¼" steel plate
- Standard acoustical fill is 4LB mineral wool ... optional materials and protective polyethylene film encapsulation available
- All panels meet ASTM E84 Class I fire rating ... fire resistive panel construction available in 60 and 90 minute designs based on ASTM E119 criteria



Panel Construction (exploded view)

Assembly Features

- Panels and components of like type are fully interchangeable providing the greatest degree of design flexibility
- Basic standard panel assembly method utilizes our square edge panel style and one-piece formed H-Member joiner suitable for most general applications ... very easy assembly
- Roll formed tongue-and-groove panel design available for air and water tight pressurized plenum applications or where a sleek, flush joint appearance is important ... very attractive.
- Horizontal interlocking panel design available for use as outdoor noise barriers, roof top equipment screens and other structures requiring a water-shed joint design and easy installation
- Corners are built-up using our individual corner flashings and connectors or can be made using our one-piece formed corner panels for superior strength
- Several removable access panel options are available including T-Joints, bolt together joiners, and key or plug panels
- Structures greater than 15' high are assembled by stacking multiple tiers of panels
- Factory pre-assembled structures also available using Panl-Wall®



Acoustical Personnel Doors

We offer a variety of hinged and sliding doors to accommodate most personnel access requirements. Our doors are fully compatible with all Panl-Wall® components both structurally and acoustically.

Door Performance Ratings of STC-30 • STC-40 • STC-47 • STC-52

Standard Door Features & Available Options

- From 2' to 4' wide single leaf swing
- From 6' to 10' wide double leaf swing
- Standard units from 6', 7', 8' and 10' high
- Single and double sealed units
- Magnetic and compression acoustical seals
- Lift-off and level swing hinges
- Several latch and lock styles
- Panic egress hardware
- Viewing Windows
- Door closers
- Automatic door operators
- Single and bi-parting slide doors
- Custom sizes and configurations available
- Doors available in all construction materials to match panels



Acoustical Viewing Windows

Available as either integrated factory glazed units or as modular windows sized and designed to meet your requirements.

Window Performance Ratings of STC-45 • STC-52

Acoustical Window Features & Available Options

- From 12" x 12" up to 48" x 96" window size
- Double glazed using leak proof automotive grade gasket
- Moisture absorbing desiccant eliminates fogging
- Available in tempered, safety or wire reinforced glass up to 1/2" thick
- Polycarbonate or Lexan® available
- Impact resistant units available to UL Level 3 bullet resistance
- Custom shapes, slanted and cantilevered windows available



Factory Finishes

INC can apply expert high quality factory finishes to any of our Panl-Wall® components and systems including:

- Industrial duty air-dry enamel paint systems
- Catalyzed epoxy and chemical cure paint systems
- UV inhibited paint coatings
- Tnemec Endurashield® outdoor coatings
- Textured finishes

Local Access

You won't have to compromise on local access for maintenance, parts loading or unloading, inspection or other requirements with our array of options.

- Access plugs
- Removable panels
- Hinged access ports

Ventilation

A complete range of silenced ventilation packages are readily available to meet most requirements and are fully compatible with your completed Panl-Wall® structure.

- Ducted and non-ducted exhaust fans
- Silenced vent panels, baffles, and plenums
- Ducted and non-ducted air conditioning units
- Acoustical louvers and silencers

Lighting & Electric

A variety of electrical accessories are available that can be incorporated into your system including:

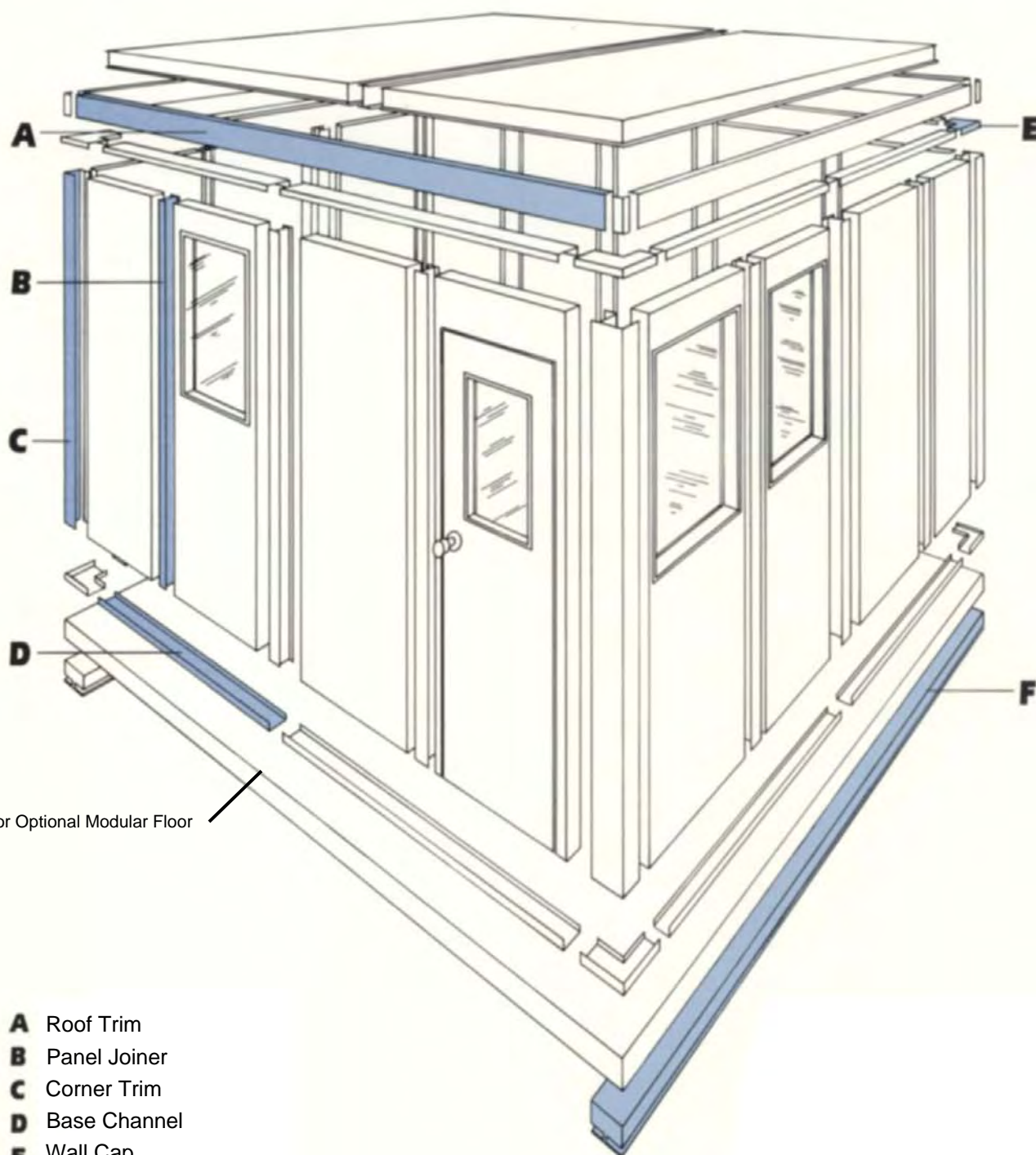
- Convenience wall receptacles and switches
- Several styles of lighting including fluorescent with discreet ballasts
- Load and distribution centers
- Exposed or concealed wiring packages
- Telephone & data lines

Structural Integrity

Panl-Wall® components are designed to be structurally robust resulting in typically self-supporting structures that meet all normal use codes. For applications subject to increased load bearing requirements such as outdoor structures subject to wind and snow loads, seismic applications, or for very large expanse or unusual structures, INC can design and manufacture a completely integrated structural support system that will meet the project criteria.

Standard Options Custom Results!

Modular Acoustical Panels



Base or Optional Modular Floor

- A** Roof Trim
- B** Panel Joiner
- C** Corner Trim
- D** Base Channel
- E** Wall Cap
- F** Optional Vibration Rail
(For Use With Modular Floors)

ACOUSTICAL PERFORMANCE

A. All modular acoustical panels shall exhibit the following Sound Transmission Loss (STL) characteristics as tested and documented by an independent, accredited test laboratory in accordance with ASTM E90..

B. All modular acoustical panels shall exhibit the following Sound Absorption Coefficients (NRC) characteristics as tested and documented by an independent, accredited test laboratory in accordance with ASTM C423.

SOUND TRANSMISSION LOSS in dB

Standard Module	Exterior	Interior	Thick-ness	STL, by Octave Band Frequency (Hz)						STC	
				125	250	500	1000	2000	4000		
PWL-2-18	18GA Solid	22GA Perf	2"	20	22	32	42	50	57	35	
PWL-4-18	18GA Solid	22GA Perf	4"	22	26	40	50	50	57	41	
PWL-4-16	16GA Solid	22GA Perf	4"	26	29	42	52	55	59	44	
PWL-4-14	14GA Solid	22GA Perf	4"	26	30	42	51	55	59	44	
PWL-4-18-H	18GA Solid	18GA Solid	4"	28	43	55	63	63	69	52	

SOUND ABSORPTION COEFFICIENTS

Standard Module	Exterior	Interior	Thick-ness	NR, by Octave Band Frequency (Hz)						NRC	
				125	250	500	1000	2000	4000		
PWL-2-18	18GA Solid	22GA Perf	2"	0.21	0.61	1.01	1.07	1.07	0.98	0.95	
PWL-4-18	18GA Solid	22GA Perf	4"	0.21	0.61	1.01	1.07	1.07	0.98	0.95	
PWL-4-16	16GA Solid	22GA Perf	4"	0.75	1.05	1.10	1.07	1.03	0.94	1.00	
PWL-4-14	14GA Solid	22GA Perf	4"	0.75	1.05	1.10	1.07	1.03	0.94	1.00	
PWL-4-18-H	18GA Solid	18GA Solid	4"	-	-	-	-	-	-	N/A	

Modular Acoustical Metal Panels Suggested Construction Specification Section 13080

1.01 GENERAL – MODULAR ACOUSTICAL PANELS & COMPONENTS

- A. Prefabricated modular acoustical structures, barriers, enclosures, etc., shall be designed using INC Parl-Wall® Modular Acoustical Panels and Components. The manufacturer shall have a complete pre-engineered system of components available including wall and roof panels, window panels, doors, joiners and assembly components as required to construct a complete system as designed.
- B. Panels and components shall be supplied in ready to use modules manufactured by Industrial Noise Control, Inc. (INC) of North Aurora, IL.

2.01 DESIGN REQUIREMENTS

- A. The completed structure shall be modular and demountable. All panel connections shall allow easy disassembly and reassembly with no degradation of acoustical or mechanical performance. All components of like function and size shall be interchangeable.

3.01 MATERIALS

- A. Panels shall be 2" or 4" thick as required for the specific application, of a double wall insulated unit construction consisting of a solid exterior face sheet, a perforated interior face sheet with the space between filled with acoustical sound absorbing material.
- A. Steel Materials: All steel used in the panel construction shall be galvanized coated. Standard panels are electro-galvanized (EG) and may be painted without chemical wash. G-90 hot dipped galvanized is available as an option.
- B. Internal Panel Frame: Shall be formed channel of 18 gauge EG sheet steel.
- C. Solid Panel Face: Shall be 18 or 14 gauge EG sheet steel.
- D. Perforated Panel Face: Shall be 22 gauge EG sheet steel perforated to an effective open area of 33% using 0.093" diameter holes on .156" staggered centers.
- E. Absorptive Fill: Shall be a 4" thick x 4LB density mineral fiber. Insulation shall meet ASTM C-423 Sound Absorption Coefficient of NRC-1.15. Insulation shall exhibit the following properties:
1. Odor: None
 2. Corrosiveness (ASTM C 665): Does not accelerate corrosion on steel, copper or aluminum.
 3. Resistance to Fungi or Bacteria (ASTM C665): Does not promote growth of fungi or bacteria, mold and vermin resistant.
 4. Water Vapor Sorption (ASTM C1104): Less than 0.01% by volume.
 5. Temperature Resistance (ASTM C 411): Will not deteriorate up to +1200° F.
- F. Fill Protection: Panel fill shall be totally encapsulated using a 1.5 mil polyethylene film. Wrap shall be separated from the panel perforated skin with a polyethylene web mesh spacer. Metal spacers, chicken wire, etc., are not be acceptable.

4.01 CONSTRUCTION

- A. Module Size: 48" maximum width x 15' maximum length.
- B. Module Thickness: 2" or 4" standard units.
- C. Welded Module Construction: Panels shall be constructed to retain their shape such that system components will fit together and function throughout the expected life of the structure and to allow dismantle and re-assembly a minimum of three times. The internal panel frame shall be welded while firmly clamped and gauged to ensure a square module that resists racking and twisting under stress. The solid and perforated panel face sheets shall be spotwelded or cinch locked to the internal channel frame on all perimeter edges at 6" to 8" on center. Spotweld or cinch locks shall have a minimum shear breaking load strength of 1350 lbs and an approximate diameter of 0.250".
- D. Panel Fill: Prior to attaching the second panel skin, the panel shall be filled with sound absorbing material without voids. The fill shall be slightly oversized and will not sag when the panel is complete and oriented in its intended design configuration.
- E. Internal Panel Reinforcement: When specified, an internal 18 gauge steel reinforcement channel shall be inserted between the solid and perforated face sheets, fastened to both, to provide additional panel rigidity.

5.01 SYSTEM ASSEMBLY COMPONENTS

- A. All panels are joined together using our either one-piece steel H-Joiner, removable two-piece H-Joiner, or T-Joiner as specified on the drawings.
- B. Pre-engineered base channel, wall cap channel, corner angles and finishing trims shall be included and supplied in manufacturer's standard lengths and shall be a minimum of 18 gauge EG steel.
- C. All panel connections as indicated on the drawings shall be properly caulked and sealed during assembly using a non-hardening acoustic sealant. All voids shall be filled with insulation.

6.01 FINISH

- A. All components may be supplied either unpainted in EG or factory finished using manufacturer's standard paint coating systems.
- B. When factory painting is required all components shall be properly cleaned and degreased, and be free of blemishes prior to applying the coating system.

7.01 PANEL STRUCTURAL CHARACTERISTICS

- A. Standard panels are designed for interior applications and typical loadings. The entire completed structure shall be self-supporting or will be supported as indicated on the drawings.
 - 1. Wall panels can withstand 40 psf lateral loads.
 - 2. Roof panels, when assembled using H-Joiners can withstand a roof load capacity of 35 psf and will allow personnel access for maintenance, etc., but is not intended for storage.
 - 3. For installation in seismic zones or for additional loading requirements additional seismic bracing and supports may be required.

8.01 FIRE RATING

- A. Standard panels meet ASTM E84 Class I Smoke & Fire Standards.
- B. Panel acoustical fill meets the following:
 - Surface Burning Characteristics (ASTM E84, NFPA 255 & UL 723):
 - Flame Spread = 5
 - Smoke Developed = 5

9.01 MANUFACTURER EXPERIENCE & CERTIFICATIONS

- A. The manufacturer shall have designed and produced a standard pre-engineered system meeting the specifications stated herein for a minimum of 10 years.
- B. The manufacturer warrants that when the panels and components are assembled in strict accordance with its specifications and instructions, that the resulting completed structure shall meet the intended mechanical and acoustical performance specified for the project.
- C. Products shall be warranted for a period of one year from the date of shipment against any defects in workmanship or materials.

INC[®] ONB Modular Acoustical Outdoor Panels

Pre-Fabricated • High Acoustical Rating • Weather Resistant • Easy Installation



Our Panel-Wall[®] Outdoor Noise Barrier (ONB) product line consists of pre-engineered, modular acoustical components ... *building blocks* ... that can be easily configured and assembled into enclosures, screens, partial enclosures and barriers to provide sound attenuation for all kinds of outdoor industrial, community and environmental noise problems.



Typical Applications

Our horizontal interlocking panel design creates a sleek, weather resistant assembly that combines high acoustical characteristics with robust structural stability to stand up to the elements. Available in either a high STC sound barrier only version, or our soft side barrier absorber combination, these 4" thick modules are easy to assemble into many varying configurations.



- Rooftop Equipment Screens
- Transportation / Highway Sound Barriers
- Outdoor Utility Enclosures
- Cooling Tower Enclosures
- Chiller Screens
- Generator Enclosures
- Airport Sound Barriers
- Loading Dock Screens
- Air Conditioner Enclosures
- Transformer Enclosures
- Substation Barriers
- Deep Well Pump Enclosures
- and many more



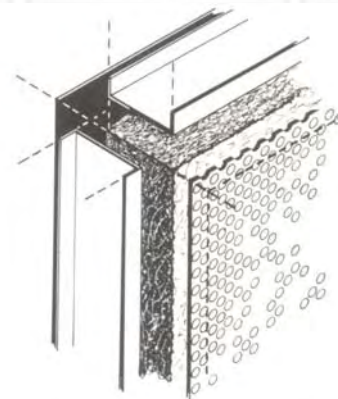
Let INC Design a System That Fits Your Needs and Budget

Modular Panel Construction & Options

To provide solutions for the widest variety of applications, Panl-Wall® ONB Outdoor Noise Barrier System features an array of related components providing high performance acoustical characteristics combined with rugged structural integrity and design flexibility.

Construction Options

- Standard panel thickness of 4"
- Panel modules available up to 48" high X 12' wide
- Standard panel performance up to STC-52 and NRC=1.05
- Standard material is electro-galvanized steel, available in G90 galvanized steel, cold rolled steel, aluminum and stainless steel
- Standard panel exterior is 18 gauge steel
- Standard absorptive panel interior is 22 gauge perforated steel
- Heavy duty construction material up to 12 gauges
- Standard acoustical fill is 4LB mineral wool ... optional materials and protective polyethylene film encapsulation available
- All panels meet ASTM E84 Class I fire rating



Panel Construction (exploded view)

Assembly Features

- Panels and components of like type are fully interchangeable providing the greatest degree of design flexibility
- Basic standard panel assembly method utilizes our horizontal interlocking tongue-in-groove panel design providing a water-shed joint design. Modules stack up between support posts.
- Corners are built-up using our individual corner flashings and connectors
- Design accommodates most required structure heights.
- ONB panels can be ground mounted upon footings, curbs, or pillars; or rooftop mounted.
- ONB barrier panels shall withstand wind velocities up to 100 MPH when installed in a properly designed support frame. Designs for specific wind and seismic loading is available.

Factory Finishes

INC can apply expert high quality factory finishes to any of our Panl-Wall® ONB components and systems including:

- Industrial duty air-dry enamel paint systems
- Catalyzed epoxy and chemical cure paint systems
- UV inhibited paint coatings
- Tnemec Endurashield® outdoor coatings
- Textured finishes

Structural Integrity

Panl-Wall® ONB components are designed to be structurally robust resulting in typically self-supporting structures that meet all normal use codes. For applications subject to increased load bearing requirements such as outdoor structures subject to wind and snow loads, seismic applications, or for very large expanse or unusual structures, INC can design and manufacture a completely integrated structural support system that will meet the project criteria.



Airport Sound Barrier Wall



Municipal Deep Well Pump Enclosure



Variable Frequency Drive (VFD)
Sound / Weather / Security Enclosure



Gas Compressor Sound Enclosure

ACOUSTICAL PERFORMANCE

- A. All modular acoustical panels shall exhibit the following Sound Transmission Loss (STL) characteristics as tested and documented by an independent, accredited test laboratory in accordance with ASTM E90..
- B. All modular acoustical panels shall exhibit the following Sound Absorption Coefficients (NRC) characteristics as tested and documented by an independent, accredited test laboratory in accordance with ASTM C423.

SOUND TRANSMISSION LOSS (dB)

Standard Module	Exterior	Interior	Thick-ness	STL, by Octave Band Frequency (Hz)						STC	
				125	250	500	1000	2000	4000		
ONB-4-18-S	18GA Solid	22GA Perf	4"	22	26	40	50	50	57	41	
ONB-4-18-H	18GA Solid	18GA Solid	4"	28	43	55	63	63	69	52	

SOUND ABSORPTION COEFFICIENTS

Standard Module	Exterior	Interior	Thick-ness	NR, by Octave Band Frequency (Hz)						NRC	
				125	250	500	1000	2000	4000		
ONB-4-18-S	18GA Solid	22GA Perf	4"	0.21	0.61	1.01	1.07	1.07	0.98	0.95	
ONB-4-18-H	18GA Solid	18GA Solid	4"	-	-	-	-	-	-	N/A	

INC Panl-Wall® ONB Outdoor Noise Barrier Panels Suggested Construction Specification Section 13080

1.01 GENERAL – MODULAR ACOUSTICAL PANELS & COMPONENTS

- A. Prefabricated outdoor acoustical structures, barriers, and enclosures that need to shed water shall be designed using INC Panl-Wall® ONB Outdoor Acoustical Panels and Components. The manufacturer shall have a complete pre-engineered system of components available including wall panels, doors, supports and assembly components as required to construct a complete system as designed.
- B. Panels and components shall be supplied in ready to use modules manufactured by Industrial Noise Control, Inc. (INC) of North Aurora, IL.

2.01 DESIGN REQUIREMENTS

- A. The completed structure shall be modular and demountable. All panel connections shall allow easy disassembly and reassembly with no degradation of acoustical or mechanical performance. All components of like function and size shall be interchangeable. Panels are intended to be assembled with the joints or seams horizontal and shall fit together with an interlocking integrated panel joint that seals acoustically and sheds water. Separate panel joiners are not required or acceptable.

3.01 MATERIALS

- A. Panels shall be 4" thick as required for the specific application, of a double wall insulated unit construction consisting of a solid exterior face sheet, a perforated interior face sheet with the space between filled with acoustical sound absorbing material.
- A. Steel Materials: All steel used in the panel construction shall be galvanized coated. Standard panels are electro-galvanized (EG) and may be painted without chemical wash. G-90 hot dipped galvanized is available as an option.
- B. Internal Panel Frame: Shall be formed channel of 18 gauge EG sheet steel.
- C. Solid Panel Face: Shall be 18 gauge EG sheet steel.
- D. Perforated Panel Face: Shall be 22 gauge EG sheet steel perforated to an effective open area of 33% using 0.093" diameter holes on .156" staggered centers.
- E. Absorptive Fill: Shall be a 4" thick non-hygroscopic, non-wicking material. Insulation shall meet ASTM C-423 Sound Absorption Coefficient of NRC-1.15. Insulation shall exhibit the following properties:
1. Odor: None
 2. Corrosiveness (ASTM C 665):
Does not accelerate corrosion on steel, copper or aluminum.
 3. Resistance to Fungi or Bacteria (ASTM C665):
Does not promote growth of fungi or bacteria and shall be mold and vermin resistant.
 4. Water Vapor Sorption (ASTM C1104):
Less than 0.01% by volume.
 5. Temperature Resistance (ASTM C 411):
Will not deteriorate up to +1200° F.

4.01 CONSTRUCTION

- A. Module Size: Available in 12", 24", 36" and 48" modules x 12' maximum width..
- B. Module Thickness: 4" standard units.
- C. Welded Module Construction: Panels shall be constructed to retain their shape such that system components will fit together and function throughout the expected life of the structure and to allow dismantle and re-assembly a minimum of three times. The internal panel frame shall be welded while firmly clamped and gauged to ensure a square module that resists racking and twisting under stress. The solid and perforated panel face sheets shall be spotwelded or cinch locked to the internal channel frame on all perimeter edges at 6" to 8" on center. Spotweld or cinch locks shall have a minimum shear breaking load strength of 1350 lbs and an approximate diameter of 0.250".
- D. Panel Fill: Prior to attaching the second panel skin, the panel shall be filled with sound absorbing material without voids. The fill shall be slightly oversized and will not sag when the panel is complete and oriented in its intended design configuration.
- E. Internal Panel Reinforcement: When specified, an internal 18 gauge steel reinforcement channel shall be inserted between the solid and perforated face sheets, fastened to both, to provide additional panel rigidity.

5.01 SYSTEM ASSEMBLY COMPONENTS

- A. All panels are designed and manufactured to be stackable between W-flange support columns with no pockets for water accumulation using interlocking, formed tongue-in-groove style horizontal panel edges. Separate joiners are not required.
- B. Pre-engineered base channel, wall cap channel, corner angles and finishing trims shall be included and supplied in manufacturer's standard lengths and shall be a minimum of 18 gauge EG steel.
- C. All panel connections as indicated on the drawings shall be properly caulked and sealed during assembly using a non-hardening acoustic sealant. All voids shall be filled with insulation when specified.

6.01 FINISH

- A. All components may be supplied either unpainted in EG or factory finished using manufacturer's standard paint coating systems. Specify if graffiti resistant coating is required.
- B. When factory painting is required all components shall be properly cleaned and degreased, and be free of blemishes prior to applying the coating system.

7.01 STRUCTURAL PERFORMANCE & SUPPORT DESIGN

- A. ONB barrier panels shall withstand wind velocities up to 100 MPH when installed in a properly designed support frame. Designs for specific wind and seismic loading is available.
- B. All column posts shall be fabricated from ASTM A36 steel with appropriate base plates. Anchor bolts provided by installer.
- C. Foundation or footings designed for the specific application and shall have a compressive strength exceeding 3000 psi and shall be reinforced with #4 rebar.

8.01 FIRE RATING

- A. Standard panels meet ASTM E84 Class I Smoke & Fire Standards.
- B. Panel acoustical fill meets the following:
 - Surface Burning Characteristics (ASTM E84, NFPA 255 & UL 723)
 - Flame Spread = 5
 - Smoke Developed = 5

9.01 MANUFACTURER EXPERIENCE & CERTIFICATIONS

- A. The manufacturer shall have designed and produced a standard pre-engineered system meeting the specifications stated herein for a minim of 10 years.
- B. The manufacturer warrants that when the panels and components are assembled in strict accordance with its specifications and instructions, that the resulting completed structure shall meet the intended mechanical and acoustical performance specified for the project.
- C. Products shall be warranted for a period of one year from the date of shipment against any defects in workmanship or materials.

INC[®] Drop-In-Place Noise Control Structures

Pre-Engineered • Factory Finished • High Performance • Rugged Durability

INC pre-assembled structures offer a high performance, cost-effective alternative to field built designs based on either conventional construction materials or modular acoustical components. Our pre-assembled structures are the ideal solution for projects facing limited time, space or funding. By controlling every aspect of the design and assembly in our factory, we can guarantee levels of mechanical, structural and acoustical performance that are difficult to achieve in the field.

Take Advantage of These Benefits

- ✓ Demanding Design Possibilities
- ✓ Controlled Fit & Finish Details
- ✓ Shorter Overall Project Lead Times
- ✓ Minimal Site Down Time and Expense
- ✓ No Construction Mess or Disruption
- ✓ Crane or Fork Lift Portability
- ✓ Fixed Total Project Cost
- ✓ High Acoustical & Structural Performance
- ✓ Guaranteed Finished Results



Typical Applications

The design parameters of an INC pre-assembled structure is limited only by shipping and handling restrictions that may exist. Ideal applications include:

- Operator Control Rooms
- Pulpits
- Crane Cabs
- Quiet Rooms
- Security Rooms
- Genset Enclosures
- Test Chambers
- Factory Offices
- QC Rooms
- Construction Site Offices
- Speech Isolation Booths
- Outdoor Equipment Enclosures
- Broadcast / Communication Center
- Test Cells
- Military SCIF
- Mechanical / Electrical Equipment Housing
- Computer Rooms
- Power Plant Control Rooms
- and many more



Let INC Design a System That Fits Your Needs and Budget

Construction Basics

Our general construction method will depend largely upon the design and performance criteria specified for any given project. For medium duty industrial and commercial applications we will typically base the design around using our modular acoustical panel system called Panl-Wall® and incorporate unitized assembly methods and floors when required. This can be as simple as assembling a modular panel enclosure for example, on to a unitized base frame or floor with fork-lift capability.

For more robust structures requiring greater portability, high acoustical performance and resistance to severe environments, we may begin with a complete, fully welded structural sub-frame upon which we will construct walls and ceiling with either pre-engineered modular components or built-up insulated construction with steel skins.

Doors & Access Points

Single and double leaf acoustical hinged doors as well as manual and automated sliding doors are available to provide personnel and parts entry and exit wherever needed. In addition we offer a full compliment of access plugs and removable panels for local access.

Viewing Windows

High performance double glazed window units are available in a wide range of sizes and glazing materials to suit the most critical requirements. Our windows can be sized and arranged to provide unlimited viewing access.

Silenced Ventilation

Fully silenced acoustically compatible ventilation systems are available to integrate with any Panl-Wall® structure. We offer a variety of ventilating fans and air conditioners along with acoustically and aerodynamically designed silencers, baffles and vent panels.

Lighting & Electric

For general lighting and convenience electrics we offer basic components for either surface or concealed mounting.

Portability & Handling

Our structures can be designed for handling by fork lifts or overhead cranes either lifting from either top or base mounted lifting points.

Severe Service Option

For use in extremely harsh environments such as steel mills, pulp & paper plants, mines, rolling mills, etc., INC has developed our Severe Service Option which includes cladding all exposed outside corners and edges with $\frac{3}{8}$ " thick structural angle, fully welded corners and joints, heavy lifting plates and brackets and heavily reinforced floors and bases. Heavy gauge exterior surfaces up to $\frac{1}{4}$ " thick steel.

Load Bearing Ceilings

INC can provide a load bearing ceiling to allow storage or equipment placement on top of your pre-assembled structure or to allow for two-story stacking of structures.



Construction Styles & Options

To provide solutions for the widest variety of applications, INC Pre-Assembled Structures feature an array of related components providing high performance acoustical characteristics combined with rugged structural integrity and design flexibility. A range of basic panel constructions and joining methods are offered each providing a unique combination of acoustical and mechanical features to best meet your specific requirements.

Design Choices

INC offers these distinct construction designs to meet any application:

H-Member Joint

Tongue-and-Groove Plenum Style

Outdoor Interlock

Seamless Unitized

Construction Options

- Wall construction up to 8" thick"
- Sound transmission loss ratings up to STC-52 and NRC=1.05
- Interior sound absorption ratings up to NRC=1.05
- Fully insulated and vibration isolated floors
- Standard material is electro-galvanized steel, available in G90 galvanized steel, cold rolled steel, aluminum and stainless steel
- Standard construction material gauges from 22 gauge to 18 gauge
- Heavy duty construction material gauges up to 1/4" steel plate
- All panels meet ASTM E84 Class I fire rating ... fire resistive panel construction available in 60 and 90 minute designs based on ASTM E119 criteria



Performance Enhancements

- RFI / EMI Shielding
- X-ray Shielding
- Ballistic Impact Resistance
- Outdoor Weather Resistance

Portability / Handling Options

- Fork liftable from base using dedicated fork tubes
- Crane liftable from base using fixed or detachable lifting brackets
- Crane liftable from top using lift eye and plates
- Base casters and levelers available for some applications



Base Casters



Dedicated Fork Tubes

Acoustical Personnel Doors

We offer a variety of hinged and sliding doors to accommodate most personnel access requirements. Our doors are fully compatible with all Panl-Wall® and Pre-Assembled components both structurally and acoustically.

Door Performance Ratings of STC-30 • STC-40 • STC-47 • STC-52

Standard Door Features & Available Options

- From 2' to 4' wide single leaf swing
- From 6' to 10' wide double leaf swing
- Standard units from 6', 7', 8' and 10' high
- Single and double sealed units
- Magnetic and compression acoustical seals
- Lift-off and level swing hinges
- Several latch and lock styles
- Panic egress hardware
- Viewing Windows
- Door closers
- Automatic door operators
- Single and bi-parting slide doors
- Custom sizes and configurations available
- Doors available in all construction materials to match panels



Acoustical Viewing Windows

Available as either integrated factory glazed units or as modular windows sized and designed to meet your requirements.

Window Performance Ratings of STC-45 • STC-52

Acoustical Window Features & Available Options

- From 12" x 12" up to 48" x 96" window size
- Double glazed using leak proof automotive grade gasket
- Moisture absorbing desiccant eliminates fogging
- Available in tempered, safety or wire reinforced glass up to 1/2" thick
- Polycarbonate or Lexan® available
- Impact resistant units available to UL Level 3 bullet resistance
- Custom shapes, slanted and cantilevered windows available



Factory Finishes

INC can apply expert high quality factory finishes to any of our Pre-Assembled Structures:

- Industrial duty air-dry enamel paint systems
- Catalyzed epoxy and chemical cure paint systems
- UV inhibited paint coatings
- Tnemec Endurashield® outdoor coatings
- Textured finishes



Interior Finishes

- Typically our interior wall surfaces are perforated and acoustically absorptive
- Solid interior surfaces are available and may be treated with individually mounted decorative fabric wrapped acoustical panels
- Floors may be supplied as painted or unpainted flat or diamond plate steel or may be finished with a variety of industrial grade tiles and finishes
- Custom work benches, tables and shelving available



Custom Work Table

Local Access

You won't have to compromise on local access for maintenance, parts loading or unloading, inspection or other requirements with our array of options.

- Access plugs
- Removable panels
- Hinged access ports

Ventilation

A complete range of silenced ventilation packages are readily available to meet most requirements and are fully compatible with your completed INC® structure.

- Ducted and non-ducted exhaust fans
- Silenced vent panels, baffles, and plenums
- Ducted and non-ducted air conditioning units
- Acoustical louvers and silencers

Lighting & Electric

A variety of electrical accessories are available that can be incorporated into your system including:

- Convenience wall receptacles and switches
- Several styles of lighting including fluorescent with discreet ballasts
- Load and distribution centers
- Exposed or concealed wiring packages
- Telephone & data lines



Factory Wiring

Standard Options Custom Results!

Pre-Assembled Structures

By fabricating and assembling our structures entirely in our factory, INC is able to guarantee the fit, finish and performance of all our pre-assembled units. Here is a sampling of the many steps involved:



Custom Base Section Being Fabricated



Custom Floor Section Being Fabricated



Custom Load Bearing Roof Section Being Fabricated



Modular Wall Panels Being Assembled Onto Base



Custom Suite Being Assembled



Assembled Structure Ready for Finishing Trim



Electrical & Finish Work Being Completed



Custom Cantilevered Walls & Windows Being Assembled

Versatility • Choices • Selection • Performance • Satisfaction

INC[®] Test & Measurement Chambers

Controlled Acoustic Environment • Repeatable Test Accuracy • Durable

Typical Users

- ✓ Universities
- ✓ OEMS
- ✓ Testing Laboratories
- ✓ Government
- ✓ Aerospace
- ✓ Medical Research Facilities
- ✓ Communication Centers

The INC Custom Engineered Solutions Group can design and manufacture an engineered test chamber that will provide a specific, controlled acoustical environment in which to perform accurate and repeatable testing of many types. From a table top chamber to a small vehicle test room, we will custom design a system specifically for your testing criteria. Our systems can provide high acoustic isolation from ambient environment, low interior noise level, with reverberation or anechoic characteristics.

Applications

- Shake & Rattle Tests
- Automotive Parts testing
- Electrical Component Testing
- Siren QC Test
- Speaker & Sound System Testing
- Office Machine Testing
- Computer Component Testing
- Small Appliance Test
- Small Sample STC Test
- Speech Isolation Chambers
- Dynamometer Testing
- Aerospace Parts Fatigue Testing
- Military SCIF
- Impact Noise Testing
- RFI & X-Ray Shielded Chambers
- and many more



Cost-Effective Testing From INC for OEM Product Testing & Verification!

Design and Construction Basics

Our general construction method will depend largely upon the design and performance criteria specified for any given project. For most generic testing applications we will typically base the design around using our modular acoustical panel system called Panl-Wall® and incorporate unique construction techniques necessary to achieve the required acoustical environment and characteristics.

For more robust structures requiring greater portability, maximum acoustical performance and resistance to severe environments, we may begin with a complete, fully welded structural sub-frame upon which we will construct walls and ceiling with either pre-engineered modular components or built-up insulated construction with steel skins.

Design Choices INC offers these distinct construction designs to meet any application:

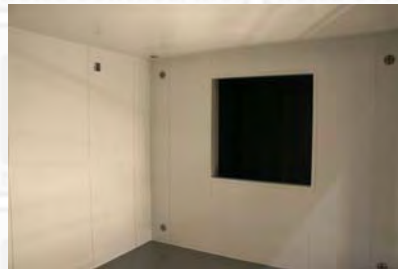
Modular Erect On-Site

Factory Pre-Assembled

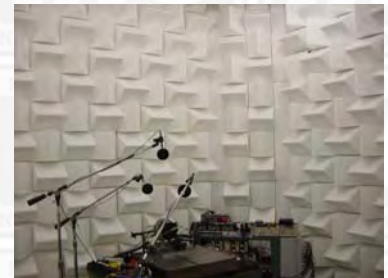
Fixed or Portable

Available Features

- Modular or Unitized Construction
- Pre-assembled Small Test Chambers
- Source / Receiver Room Suites
- Single or Double Wall Construction
- Compatible Lighting & Silenced Ventilation
- Instrumentation Sleeves and Cable-Passes
- Variety of Doors
- Free Field Interior Using Flat or Wedge Sound Absorbers
- Diffuse Field Interior Using Damped Steel
- ASTM E84 Class I fire rating ... fire resistive panel construction available in 60 and 90 minute designs based on ASTM E119 criteria



Reverb Room Interior



Anechoic Room Interior

Factory Finishes

INC can apply expert high quality factory finishes to any of our Pre-Assembled Structures:

- Industrial duty air-dry enamel paint systems
- Catalyzed epoxy and chemical cure paint systems
- UV inhibited paint coatings
- Tnemec Endurashield® outdoor coatings
- Textured finishes

Performance Enhancements

- RFI / EMI Shielding
- X-ray Shielding
- Ballistic Impact Resistance
- Outdoor Weather Resistance



Factory Wiring



Unlimited Configurations Are Possible!

Our line of Test & Measurement Chambers falls squarely in the center of our Custom Engineered Solutions activity and as such, we do not have a list of standard sizes and configurations. Each is designed to meet the criteria that you require and is unique in that regard. For INC to prepare a proposal and price quotation we need you to tell us about the performance requirements you are seeking including acoustics, aesthetics, mechanical and structural design goals.



Flexi-Sorb® Noise Control Curtain System

Versatile • Flexible • Easy To Install • Durable • Good Noise Reduction • Economical



Our Flexi-Sorb® noise control curtain product line consists of flexible, durable acoustical curtain panels with pre-engineered support track and framework components ... *flexible building blocks* ... that can be configured into a wide variety of full & partial enclosures, barriers and partitions used to control and reduce excessive noise in industrial, commercial, institutional environments. Flexi-Sorb® is an excellent choice for applications requiring maximum accessibility, design flexibility, ease of installation and maintenance, low installed cost and quick delivery.

- Enclose or isolate noisy equipment or operations
- Enclose or isolate personnel, operators and technicians
- Separate noisy operations or areas
- Achieve 15 to 25 dBA noise reductions



Typical Applications

Using our modular acoustical curtain as the basic building block together with our pre-engineered track and support system components ... you can easily and economically tackle many diverse noise problems.



- Machine Sound Enclosures
- Soundproof Partitions
- Curtain Dividers
- Flexible Doorways
- Fan Enclosures
- Noisy Grinders & Compactors
- Noise Barriers
- Room Dividers
- Generators
- Plenum Barriers
- Movable Barriers
- Generator Enclosures
- Outdoor Noise Barriers
- Sound Walls
- and many more

Let INC Design a System That Fits Your Needs and Budget

THE BASICS

With these basic components, you can design a wide range of noise control solutions. Contact INC and we'll help you explore the possibilities!

Modular Flexible Curtains

Prefabricated flexible curtain modules are used to form the walls and roof of any structure. Available in a variety of material combinations and acoustical performance ratings, curtains of like size and type are fully interchangeable making assembly and modifications easy.



Curtain Hangers

Typically a curtain system will have stationary and moving curtain panels to meet design goals. Our basic curtain slider is used to hang stationary or very infrequently moved curtains and is the most economical hanger. We offer two styles of curtain rollers, each with sealed bearing wheels for smooth easy rolling of curtain panels ... the best choice for frequent access.

Curtain Joiners

Adjacent curtain panels can be simply overlapped for access anytime, joined with Velcro® hook and loop fasteners for frequent access, or semi-permanently joined using our non-corrosive nylon nut and bolt assemblies.

Track & Support Hardware

A complete system of pre-engineered track, framing and support components is available to allow you to configure your INC curtain system in almost any geometry, either ceiling or floor supported.



Doors & Access Points

Double track slide-by curtain doors as well as clear vinyl strip doors are available for easy access in and out of any curtain wall or enclosure. Openings for material entry points are easily made in the field or can be supplied with factory made covers for optimum sound attenuation.

Viewing Windows

Clear vinyl viewing window can be installed in any of our curtain panels.

Versatility • Choices • Selection • Performance • Satisfaction

Flexible Curtain Styles & Options

An INC Flexi-Sorb® noise control curtain system typically consists of one or more pre-fabricated flexible acoustical curtain panels suspended from our track to form a barrier or enclosure. The basic curtain panel is a limp-mass reinforced flexible vinyl noise barrier with hanging grommets and joining accessories fabricated to size. This basic sound barrier panel can have a variety of sound absorber materials laminated to one or both sides to create a curtain composite with the desired acoustical characteristics. The materials used to fabricate the curtain panel is selected based upon the acoustical and mechanical requirements of the application.

Design Choices

INC offers three distinct curtain styles to meet any application

Barrier Only

Absorber / Barrier / Absorber

Barrier / Absorber

Curtain Construction Options

Basic Curtain Barrier Materials

- INC Flexible Noise Barriers available in ½, ¾ and 1 LB density mass in 54" maximum widths
- Barrier materials are polyester reinforced for superior strength and durability
- Reinforced brass grommets are machine set into the top of each curtain for secure hanging
- Barriers are impervious to water, oils and most solvents
- Clear vinyl barriers also available
- Clear vinyl strips available for pass-thru sections and doors



Factory sewn laminations made to last!

Sorba-Glas® Quilted Fiberglass Blanket Absorber

- In either 1" or 2" thickness
- INC Sorba-Glas® quilted acoustical blanket can be factory laminated to one or both sides of any vinyl barrier curtain
- Edges are factory bound and finished
- Meets ASTM E-84 Class I fire rating
- Facing is strong, durable, washable and especially suited for harsh condi-



Note Reinforced Grommet, Standard Joining Holes & Optional Velcro

Curtain Performance Ratings of STC-21 to STC-30

Curtain Joining Methods

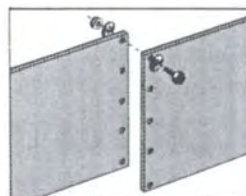
- Basic curtains are supplied with punched holes along the vertical edges and nylon threaded fasteners to join adjacent panels
- Velcro® hook & loop fasteners are available factory sewn to the curtain edges
- Curtain panels may also be configured to overlap without joiners for maximum accessibility



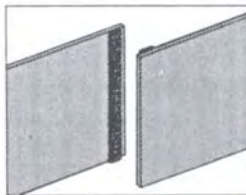
Nylon Fastening Hardware



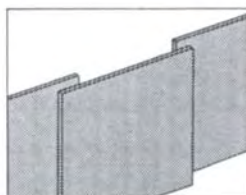
Velcro Curtain Joiner



Occasional Access
Nylon fasteners join adjacent curtain sections.



Frequent Access
Velcro strips mounted along the entire length of the curtain allow easy opening and closing.



Maximum Access
Curtain section(s) suspended from a separate track slide by fixed curtain sections.

Curtain System Accessories

You can fully customize your INC Flexi-Sorb® noise control curtain system with these available options:

- Clear vinyl viewing windows either factory installed or as field kits
- Clear vinyl strip access doors and sections
- Curtain roof sections & supports available
- Hinged curtain access doors available
- UV resistant materials for outdoor use

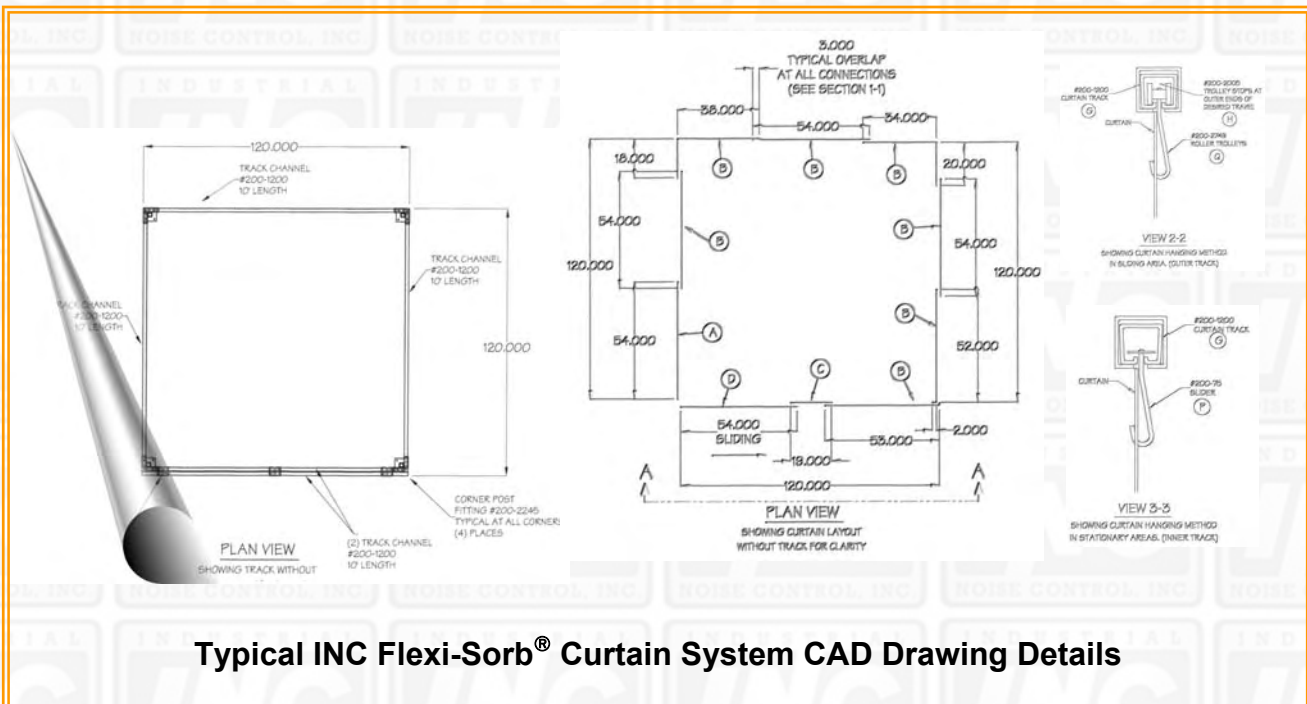


Acoustical Test Data

Standard Flexi-Sorb® Curtain Styles - Acoustical Data

				STL / NR, by Octave Band Frequency (Hz)							
Curtain Panel Style	Barrier	Absorber		125	250	500	1000	2000	4000	STC	NRC
Barrier Only											
Curtain W5P	½ LB Vinyl	N/A	TL	12	13	16	21	27	32	21	N/A
Curtain W7P	¾ LB Vinyl	N/A	TL	13	15	18	23	30	34	23	N/A
Curtain W1P	1 LB Vinyl	N/A	TL	15	16	21	26	33	38	26	N/A
Barrier / Absorber											
Curtain W115P	½ LB Vinyl	1" Quilted	TL	16	17	20	25	31	36	25	
Curtain W117P	¾ LB Vinyl	1" Quilted	TL	15	17	20	25	33	39	25	
Curtain W111P	1 LB Vinyl	1" Quilted	TL	17	18	23	28	35	40	28	
			NR	0.39	.059	.087	.084	.073	.059		0.75
Barrier / Absorber											
Curtain W215P	½ LB Vinyl	2" Quilted	TL	18	19	22	27	33	38	27	
Curtain W217P	¾ LB Vinyl	2" Quilted	TL	17	19	22	27	35	41	27	
Curtain W211P	1 LB Vinyl	2" Quilted	TL	18	19	24	29	36	41	29	
			NR	0.53	0.77	0.88	0.77	0.71	0.63		0.80
Absorber / Barrier / Absorber											
Curtain W215PS	½ LB Vinyl	1" Quilted	TL	18	19	22	27	33	38	27	
Curtain W217PS	¾ LB Vinyl	1" Quilted	TL	17	19	22	27	35	41	27	
Curtain W211PS	1 LB Vinyl	1" Quilted	TL	19	20	25	30	37	42	30	
			NR	0.39	.059	.087	.084	.073	.059		0.75

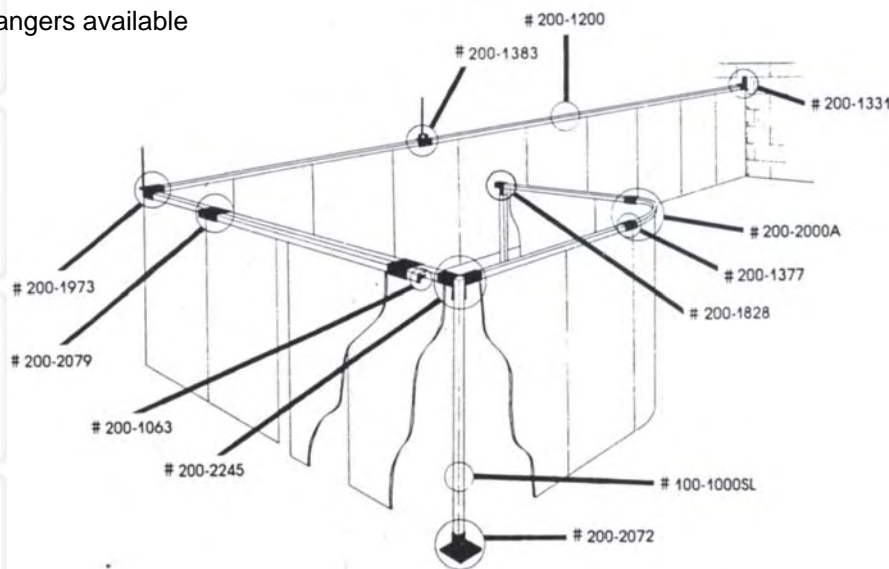
TL=Transmission Loss in dB, STC= Sound Transmission Class, NR / NRC=Noise Reduction Coefficient



Curtain Track & Hardware System

We offer a complete line of pre-engineered track and suspension components to allow you to configure your INC noise control curtain system into a variety of shapes such as enclosures and partitions.

- Heavy duty 12 gauge zinc coated roll formed track
- Radius track sections for curved structures
- Dual track arrangements for slide-by curtain designs
- Heavy gauge track connectors, hangers, and mounts allow track configurations of any geometry
- Floor or overhead support systems available
- Two or four-wheeled ball bearing roller trolley assemblies available for sliding curtains
- Economy friction slider hangers available










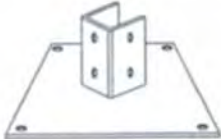
Our complete pre-engineered track system will allow you to configure your curtain system into a wide variety of shapes, from partition walls and partial barriers to complete enclosures of any dimension. Your track system can be either floor supported using our corner and mid post assemblies, or ceiling supported using our corner and mid track hanger assemblies.









Use the typical layout drawing above as your guide to selecting the proper components. Where sliding curtain access is desired be sure to use dual "slide-by" tracks. We recommend placing a mid-support post or track hanger a minimum of every 10' of track span. The maximum height for a single-tier curtain system is 15'.


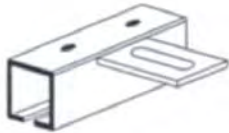
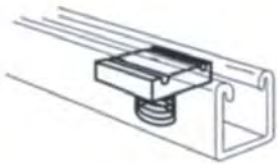




All of our track splices, connectors, etc., have half dog set screws that lock into a hole against the track section (a 3/16" hex key is required). The screw pushes the track against the bottom of the connector providing a smooth and true alignment between rolling surfaces. This method of attachment reduces installation time and increases the stability of the system.

On the following pages you will find a part number and description of all of our track sections, track connectors and fittings, and curtain hanging components.

Standard Options Custom Results!

Curtain Hanging Hardware - 5 per standard curtain panel		
2 Wheel Roller Trolley #200-2749	Supports movable sections.	
4 Wheel Roller Trolley #200-2750	Heavy duty movable support.	
Slider #200-75	Supports stationary panels.	
Roller Hook #200-2708	Suspends curtains from 3/4" pipe.	
Curtain Track		
Track Channel #200-1200	12 gauge galvanized steel. Stock lengths: 10' & 20'. Can be field cut.	
Radius Track Channel #200-2000	12 gauge galvanized steel. Stock radius: 90° Can be field cut.	
Post Channel #100-1000SL	Vertical support member. Stock lengths: 10' & 20'. Can be field cut.	
Post Base #200-2072	Anchors floor post supports. 6" x 6" steel plate with 4 pre-drilled anchor holes.	

Curtain Track Fittings		
Track Connector #200-1377	Connects any two sections of track.	
Trolley Stop #200-1063	Limits movement of sliding sections. Can be placed anywhere along track.	
Twin Track Plate #200-2079	Used to create "slide-by" doors. Minimum of 2 per double track section.	
Mid-Post Fitting #200-1828	Attaches to floor posts or directly to walls. Mounts anywhere on track or post.	
Corner Post Fitting #200-2245	Creates post supported 90° corners. Can be mounted at any height on the post.	
Ceiling Support Corner Plate #200-1973	Supports corners on ceiling mounted systems.	
Ceiling Bracket #200-1131	Mounts track sections flush to ceiling.	
Track Hanger #200-1383	Ties track sections to 3/8" threaded rod mounted to ceiling deck.	

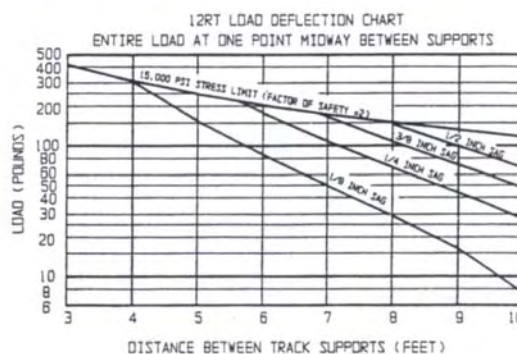
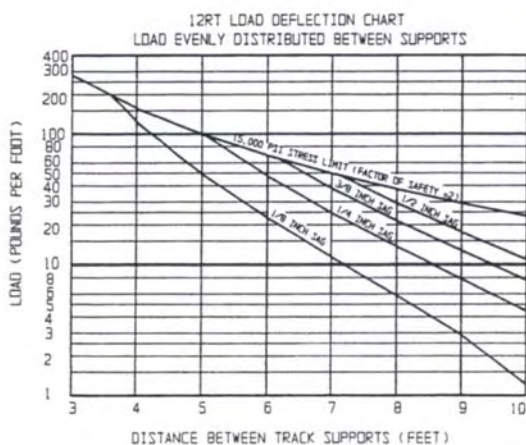
Curtain Track Fittings		
Wall Bracket #200-1331	Mounts track sections perpendicular to walls.	
90° "T" Cross Brace Fitting #200-1031	Connects track sections to slotted support channels.	
Curtain Hardware		
Hex Bolts with Spring Nuts #200-1008 (Included with fittings.)	Connects track fittings to slotted post channels. Includes spring nut, 2 washers and 3/8" bolt.	
Stud Anchor Assembly (Included with #200-2072 Post Base)	3/8" Stud Anchor Assembly fastens Post Base to concrete floors.	
Threaded Rod	3/8" x 10' Threaded Rod fastens track to building surfaces. Nuts and washers included.	
Curtain Section Joining Methods		
Velcro Strips	2" wide, black, hook & loop fasteners. Adhesive backing attaches to curtain sections.	
Nylon Fasteners	Black, nylon hex head nylon bolt, hex nut and two washers.	

■ ENCLOSED TRACK CAPACITY & DEFLECTION CHARTS

The charts show track capacity for various support spacings. The curves represent: (1.) loads evenly distributed between supports and (2.) loads concentrated at the center of the span between supports. Interpolate between the two curves when the total load can be bunched together and is not long enough to fill the space between supports.

The curves on the chart represent the track loaded at 15,000 psi maximum stress. Since yield stress for the low carbon steel track is 30,000 psi the factor of safety at these loads is 2:1. The factor of safety compared to ultimate tensile strength is 3:1.

For hazardous applications where these factors of safety are inadequate, multiply the actual loads by compensating factors before using the charts. High elevation above the floor or the presence of a catwalk or other maintenance area near the track system might qualify for a more conservative design.



All INC track sections and fittings are fabricated of 12 gauge zinc coated steel. Use charts for 12RT sections. All fittings and components are supplied complete with fasteners and set screws where required.

Frequently Asked Questions About Noise

What Is Noise?

Noise is unwanted sound which may be hazardous to health, interfere with speech and verbal communications or is otherwise disturbing, irritating or annoying.

What Is Sound?

Sound is defined as any pressure variation in air, water or other fluid medium which may be detected by the human ear.

What Are The Characteristics Of Sound?

The two most important characteristics which must be known in order to evaluate the sound or noise are its amplitude and frequency. The amplitude or height of the sound wave from peak to valley determines the loudness or intensity. The wave length determines the frequency, pitch or tone of the sound.

What Are Wavelengths?

Sound wavelengths are the linear measurement of one full cycle of displacement where the motion of air molecules is first compressed and then rarefied or expanded. The wavelength is determined by the ratio of the speed of sound to the frequency.

How Are These Characteristics Expressed?

The frequency of sound is expressed in wavelengths per second or cycles per second (CPS). It is more commonly referred to as Hertz. Low frequency noise is 250 Hertz (Hz) and below. High frequency noise is 2000 Hz and above. Mid-frequency noise falls between 250 and 2000 Hz.

The amplitude of sound is expressed in decibels (dB). This is a logarithmic compressed scale dealing in powers of 10 where small increments in dB correspond to large changes in acoustic energy.

What Are Octave Bands?

Standardized octave bands are groups of frequencies named by the center frequency where the upper limit is always twice the lower limit of the range. Test data for performance of acoustical materials is standardized for easy comparison at the center frequencies. Equipment noise levels and measurement devices (dB meters) also follow the preferred octave bands.

What Is The Difference Between dB And dBA?

dB sound pressure levels are un-weighted. dBA levels are "A" weighted according to the weighting curves shown below to approximate the way the human ear hears. For example, a 100 dB level at 100 Hz will be perceived to have a loudness equal to only 80 dB at 1000 Hz. Other weighting scales (C and B) are also shown. The dBA scale is based on a child's hearing and was originally documented based on actual hearing tests to characterize the human ear's relative response to noise.

Is Hearing Loss Permanent?

Yes! Permanent hearing loss occurs when the tiny hair cells in the cochlea (inner ear) are damaged or destroyed. A healthy cochlea contains approximately 40 thousand hair cells which are necessary to transmit sound vibrations to the brain. Exposure to excessive noise levels will damage the hair cells resulting in permanent, irreversible hearing loss.

Is A 5 dB Change Significant?

Yes! The pressure associated with the loudest known sound is more than one billion times that associated with the faintest sound. Such a large range is unmanageable for measurement purposes. Using a logarithmic scale compresses the range to between 0 and 200 dB. At right, various sound level changes are referenced to relative loudness and acoustic energy loss. A 5 dB change is more than a 50% change in acoustic energy!

Sound Level Change	Acoustic Energy Loss	Relative Loudness
0 dB	0	Reference
-3 dB	50%	Perceptible Change
-10 dB	90%	Half as Loud
-20 dB	99%	1/4 as Loud
-30 dB	99.9%	1/8 as Loud
-40 dB	99.99%	1/16 as Loud

Frequently Asked Questions About Noise

Is Sound Power The Same As Sound Pressure?

No! While both sound power levels (L_w) and sound pressure levels (L_p) are both expressed in decibels, the referenced standards for each are different. More importantly, the sound power level is the total acoustic energy output of a noise source independent of environment. Sound pressure levels are dependent on environmental factors such as the distance from the source, the presence of reflective surfaces and other characteristics of the room/building/area hosting the source. Actual sound pressure levels will always be higher than sound power levels.

What Is Tonal Noise?

Tonal noise is commonly referred to as discrete frequency noise and is characterized by spectral tones that are pure tone in nature. Pure tones are wave forms that occur at a single frequency. Tonal noise is generated by rotating equipment at a predictable frequency relating to the rotational speed of the shaft and the number of compressor vanes, fan blades, engine pistons, gear teeth, etc. The fundamental tone (F) may also manifest itself at progressively lower intensity levels at integer harmonic multiples (2F, 3F, etc.). Tolerance levels for tonal noise are generally at a lower threshold.

What Is Impulse Noise?

Impulse noise is a short duration transient acoustic event characterized by a sudden rise or spike in sound pressure followed by a uniform or oscillatory decay (depends on type of source equipment) lasting less than $\frac{1}{2}$ second. Impulse noise usually exhibits a distinct spectral signature across the frequency range without the presence of discrete tones. Examples of impulse noise include gunshots, pulse cleaning systems, punch presses, etc.

What Is The Audible Range?

At birth, the audible frequency range is 20 Hz to 20,000 Hz. Generally speaking the average audible range in humans is from 30 Hz to 17,000 Hz. Sound pressure wave forms below and above this range are described as infrasonic and ultrasonic. Infrasonic sound is experienced as a flutter while ultrasonic sound produces no sensation of hearing.

What Is Diffraction?

Diffraction of sound is "bending" of the pressure wave around objects, obstacles and walls. Diffraction is greatest with low frequency sound or where the wavelength is large compared to the object it strikes. As illustrated above, diffraction of sound results in a less pronounced acoustic shadow zone.

Glossary of Acoustical Terms

Absorption Coefficient: The absorption coefficient of a material or sound absorbing device is the ratio of the sound absorbed to the sound incident on the material or device.

Acoustical Material: A material used to alter a sound field. The material may be used to absorb, damp or block acoustical energy.

Airborne Noise: A condition when sound waves are being carried by the atmosphere.

Ambient Noise: All the sounds from many sources associated with a given environment.

Anechoic Room: A test chamber which has a lining of absorbent acoustical material to eliminate all sound reflections. It is most often used to determine the sound radiation characteristics of equipment.

Damping: The process of dissipating mechanical vibratory energy into heat. In noise control, a damping material is usually applied to a vibrating surface to reduce the noise radiating from that surface.

Dissipative Silencer: A device inserted into an air duct or opening to reduce noise transmitted through the duct or opening. Noise reduction is accomplished through the use of internal sound absorbing materials.

Flanking Transmission: Noise that reaches an observer by paths around or over an acoustical barrier.

Glossary of Acoustical Terms

Frequency Spectrum: A graph or plot of the sound pressure level in each band from a set of octave or 1/3 octave bands.

Insertion Loss: The reduction of sound power level attained by inserting a silencer or muffler in an acoustic transmission system (see ASTM E-477).

Loudness: Loudness is the subjective human definition of the intensity of a sound. Human reaction to sound is highly dependent on the sound pressure and frequency.

Mass Law: A rule for estimating the transmission loss of a barrier in its mass controlled region. The rule states that transmission loss increases/decreases 6 dB for each doubling/halving of either frequency or barrier surface density.

Noise: Any undesired sound.

Noise Reduction (NR): The reduction in sound pressure level caused by making some alteration to a sound field.

Noise Reduction Coefficient (NRC): A single number rating which is the average of the sound absorption coefficients in the octave bands centered at 250, 500, 1000 and 2000 Hz expressed to the nearest integral multiple of 0.05 (see ASTM C-423).

Octave Band (O.B.): A range of frequencies where the highest frequency of the band is double the lowest frequency of the band. The band is usually specified by the center frequency, i.e., 31.5, 63, 125, 250, 500, 1000, 2000, 4000 HZ.

Radiation: The process whereby structure-borne vibration is converted into airborne sound.

Reverberation: Reverberation is the echoing of previously generated sound caused by reflection of acoustic waves from the surface of enclosed spaces.

Reverberation Room: A test chamber so designed that the reverberant sound field within the room has an intensity that is approximately the same in all directions and at every point. It is commonly used to measure sound absorption, ASTM C-423 and transmission loss, ASTM E-90.

Sabin: The unit of measure of sound absorption. The number of square feet of sound absorbing material multiplied by the material absorption coefficient.

Sound: Pressure waves that are traveling in the air or other elastic materials.

Sound Absorption: The acoustical process whereby sound energy is dissipated as heat rather than reflected back to the environment.

Sound Level Meter: An instrument used to measure sound pressure level. Sound level meters are commonly either Type 1, precision instruments, or Type 2, general purpose instruments. Both types can have weighting and filter networks to provide dB readings by octave band in the A, B, or C scales.

Sound Power Level (Lw): A measure of the total airborne acoustic power generated by a noise source, expressed on a decibel scale referenced to some standard (usually 10-12 watts).

Sound Pressure Level (Lp): A measure of the air pressure change caused by a sound wave, expressed on a decibel scale referenced to 20 μ Pa.

Sound Transmission Class (STC): A single number rating derived from measured values of transmission loss in accordance with ASTM 413. The rating provides an estimate of the performance of a barrier in certain common noise attenuation applications.

Structure-borne Noise: Mechanical vibration in a structure which can ultimately become audible sound. Until such time as radiation occurs, these vibrations are inaudible and of little concern.

Transmission Loss (TL): The reduction in sound power that is caused by placing a wall or barrier between the source and receiver. Transmission loss is expressed in decibels.

Acoustical Properties of Common Materials

Noise Reduction Coefficients of Materials	NRC
Brick, unglazed	.05
Concrete block	.05
1/8" pile Carpet	.15
5/16" pile Carpet and foam	.35
Concrete floor	.00
Plaster, smooth finish	.05
Plywood paneling, 1/4" thick	.10
Water surface (as in swimming pool)	.00
1" thick fiberglass curtain	.70
4" thick smooth surface foam	.89
4" thick INC metal panel	.95

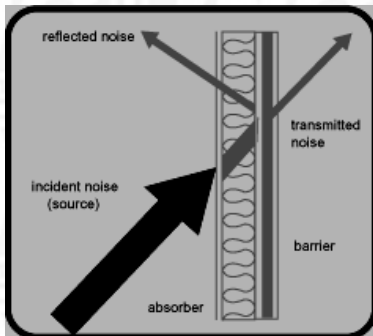
Sound Transmission Class of Materials	STC
1 lb. density barrier material	26
1 lb. density transparent curtain	26
5/8" Gypsum wallboard	30
3/16" Steel wall	31
2" fiberglass curtain with 1 lb. barrier	29
2" thick INC metal panel (solid and perforated)	35
4" thick INC metal panel (solid and perforated)	41
12" thick concrete	53
3/8" plasterboard	26
22 gauge steel	25
Solid core wood door, closed	27
Concrete block wall, unpainted	44

How Do Acoustical Materials Work?

Noise Control Basics 101

ABSORBERS

Use: To reduce noise reflection. To dissipate noise energy.



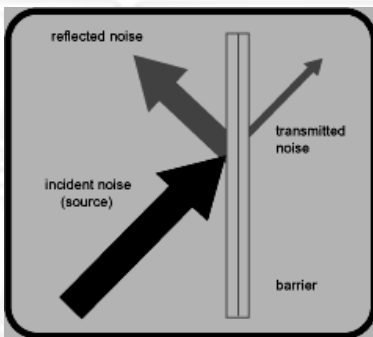
Physical Properties: Porous, fibrous and sometimes covered with protective membranes. Noise enters the absorber and is partly dissipated (absorbed) within the material. Some is transmitted. Some is reflected. Absorber performance is expressed as a decimal value. A perfect absorber is rated at 1.00. The higher the decimal value the more effective the absorber will be.

Effectiveness is expressed as NRC (Noise Reduction Coefficient).

NRC: Percentage of acoustical energy absorbed calculated as an average of laboratory test data at several frequencies.

BARRIERS

Use: To block transmission of noise.



Physical Properties: Non-porous, high density and usually non-fibrous. Barriers are generally flexible or damped. The noise is blocked, reflected and re-routed in another direction. Barrier materials are tested and rated for their Sound Transmission Loss capability. The number is stated in dB and the higher number signifies the better barrier.

Effectiveness is expressed as STC (Sound Transmission Class).

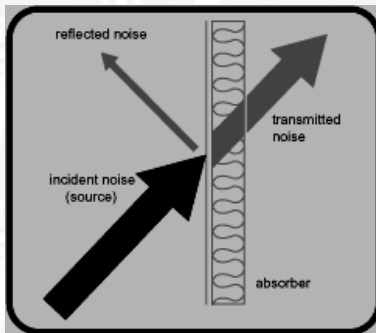
STC: Single number rating derived from decibel loss data at several frequencies.

How Do Acoustical Materials Work?

Noise Control Basics 101

COMPOSITES

Use: To block the transmission of noise and reduce reflections from the barrier.

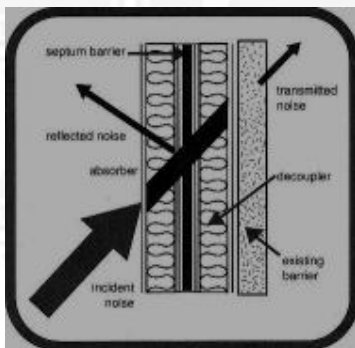


Physical Properties: Consists usually of a layer of porous material and a layer of dense material. The composite material will have a performance capability as an absorber and as a barrier. Septum barriers are sandwiched between two absorber layers.

Effectiveness is a combination of STC and NRC ratings.

DECOUPLED COMPOSITES

Use: To enhance the performance of the composite material when applied to the inside of an existing barrier.



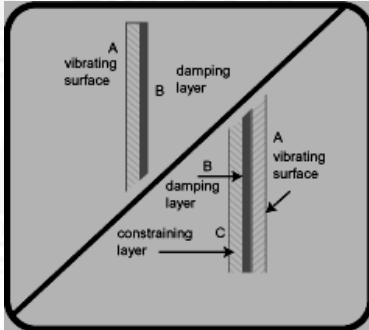
Decoupling creates an air space between the existing barrier and the septum composite barrier boosting transmission loss beyond what could be expected with direct attachment.

How Do Acoustical Materials Work?

Noise Control Basics 101

DAMPING

Use: To reduce noise radiated from vibrating surfaces.



Physical Properties: Visco-elastic. Damping coatings take many forms. There are mastics for spraying, troweling, etc. and there are tapes and sheets with pressure sensitive adhesive. Damping treatments are sometimes combined with absorbers.

Effectiveness is expressed as a "loss factor" which is the damping/stiffness ratio of a material.

TERMS

TERMS & CONDITIONS OF SALE

ACCEPTANCE: All orders are subject to acceptance by an officer of INC and are not binding on INC unless and until so accepted. Acceptance of an order constitutes a complete and binding contract governed by the laws of the State of Illinois.

PRICES: Catalog prices are subject to change without notice. Orders received after the effective date of catalog price revisions will be accepted at the price in effect at the time the order is received by Industrial Noise Control (INC).

QUOTATION VALIDITY: Quotations are firm for a period of thirty (30) days from the date of the quotation. Orders received after the quotation expires will be rejected unless the purchaser agrees to the price in effect at the time the order is received by INC.

PRICE PROTECTION: Prices and quotations are firm, provided shipment is made within four (4) months from the date the order is accepted by INC. Shipments made after four (4) months will be invoiced at the price in effect at the time of shipment.

MINIMUM ORDER: \$ 500 net (less freight).

VERBAL ORDERS: INC will accept verbal purchase orders but will not ship any product until a written purchase order is received signed by an authorized buyer's employee.

FOB / FREIGHT: All prices are FOB shipping point (North Aurora, IL) with no freight included or allowed unless specifically stated otherwise on our proposal. All shipments will be made via common carrier **FREIGHT COLLECT** unless other arrangements are discussed prior to order acceptance. For orders with freight charges to be prepaid and add, INC will charge a 25% processing & handling fee.

TERMS: Granting of Payment Terms is not automatic and will only be extended upon credit approval by INC management to customers in good standing. Depending upon the specifics of the order, first time purchasers may be denied terms. Payment for invoiced amounts is due 100% net 10-15-30 days after invoice date. A monthly service charges of 1.5% will be assessed on all past due invoice amounts. *INC does not accept terms that stipulate payment to INC contingent upon payment by Owner or third party to contractor or reseller.*

DEPOSITS: May be required for orders requiring non-standard custom materials or for buyers with unacceptable credit history.

TAXES: All applicable taxes are the sole responsibility of the buyer. INC collects & remits sales tax in the states of IL, OH, & CA only. If your purchase is tax exempt in those states, you must submit a resale number or other documentation of exemption. We do not collect & remit taxes in any other state. If your purchase is taxable you must remit to your state directly.

RETURNS: Standard INC Catalog items may be returned, with prior written approval from INC, within 30 days of shipment and are subject to a 30% restocking charge. All returns must be in resalable condition, properly packed and shipped back to INC with all freight charges prepaid. Custom ordered or fabricated products are not returnable.

CLAIMS for LOSS or DAMAGE: Claims for shortages must be made in writing to INC and the carrier within (15) days of receipt. Claims for loss or damages in transit must be filed by the buyer with the carrier. The buyer must thoroughly inspect the shipment received from INC immediately upon delivery. Our products are shipped FOB our dock and our responsibility and liability for the shipment transfers to the buyer when the carrier signs the freight bill. You must notify the carrier of any and all damage and loss, even if concealed, within 15 days of delivery. Claims for loss or damage during transit must be made with the carrier – not to INC. INC will pack all products for shipment with reasonable care and using normal packing material. However, INC assumes no responsibility for loss or damage to the products during shipment. INC is willing to assist the buyer in every possible manner to collecting claims for loss or damage, but the responsibility for presenting and collecting claims and the responsibility for loss is with the buyer. If you believe INC failed to ship an item or shipped a defective item, you must notify INC in writing within 5 days of delivery.

CANCELLATIONS: Buyer may cancel prior to shipment, all or any portion of an order by giving INC written notice by certified mail. On receipt of the cancellation notice, work will be stopped as promptly as is reasonably possible, and the buyer will be invoiced for and will pay INC a cancellation charge computed on the basis of established prices for all completed items. Incomplete items will be invoiced at full cost incurred by INC plus an additional 35%. All orders are subject to a minimum \$ 250.00 cancellation fee. Custom or Engineered system orders that are cancelled prior to shipment are subject to the above referenced cancellation fees plus all engineering and sales costs incurred up to the date of cancellation which may be significant.

DELAYS: Shipment and delivery dates are estimated dates only. INC shall not be liable for any expenses, loss or damage resulting from delay or prevention of performance caused by fires, floods, Acts of God, strikes, labor disputes, labor shortages, inability to secure materials, equipment or manufacturing facilities, riots, thefts, acts of terrorism, accidents, transportation delays, acts or failure to act of Government or of Buyer, major equipment breakdown, fuel shortages, or any other cause whatsoever whether similar or dissimilar to those enumerated above, beyond the reasonable control of INC.

WARRANTY: INC warrants to the original buyer that all products are free from defects in material or workmanship for one year from the date of shipment by INC which are used under normal working conditions. Any product which is portable must be returned to the factory prepaid, and which upon examination appears to INC's satisfaction to be defective shall be repaired or replaced at INC's sole option. Any repairs or expenses made outside of INC's factory shall be the buyer's responsibility unless INC has given prior written approval. **THE FOREGOING WARRANTY AND REMEDY ARE EXCLUSIVE AND IN LIEU OF ALL OTHER REPRESENTATIONS, SPECIFICATIONS, WARRANTIES AND REMEDIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A SPECIFIED OF INTENDED PURPOSE. THE REMEDY SPECIFIED REPRESENTS THE SOLE LIABILITY OF INC AND THE SOLE REMEDY OF THE BUYER WITH RESPECT TO OR ARISING OUT OF THE EQUIPMENT OR SERVICES WHETHER BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), OR OTHERWISE.**

CONSEQUENTIAL DAMAGES: Notwithstanding any other provision of this contract, in no event shall INC be liable, whether arising under performance of this contract or breach of this contract, tort, including negligence and strict liability, or otherwise, for loss of anticipated profits, loss by reason of plant shutdown, non-operation or increased expense of operation, service interruptions, cost of money, loss of use of capital or revenue, or for any special, incidental or consequential loss or damage.

LIMITATION OF LIABILITY: INC's liability on any claim of any kind, including negligence or strict liability, for any loss or damage arising out of or relating to this contract shall in no case exceed the contract price of the part or parts giving rise to the claim.

GENERAL: The provisions stipulated herein supersede any communication expressed are implied, written or verbal, between the parties thereto, and shall constitute the sole and entire agreement. No modifications shall be made by either party, unless it is in writing and duly accepted by INC and the buyer, INC's failure to object to provisions contained in the buyer's purchase order or other communications shall not be deemed a waiver of the terms or conditions hereof nor acceptance of such provisions. The buyer assumes all risks and liability for all loss, damage, or injury to person or property resulting from the use of the product purchased. INC assumes no liability for consequential, special, or incidental damages.

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Design ■ Products ■ Materials ■ Systems ■ Installation



Acoustical Products and Systems for Noise Control

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