Removable/Reusable Blanket Insulation For Sound Attenuation At The Source

Advantages:
• Completely removable and reusable
• Easy to install
• Can be reused after maintenance
• Custom-fit to existing conditions
• Guaranteed fit
• Predictable performance based on laboratory tests
• Suitable for harsh environments where solvents, acids, oils, and other contaminants are present
• Outdoor weather-resistant construction
• High temperature capability
• Self-contained insulation system
• Asbestos free
• Good combination of acoustic and thermal performance

Applications:
• Fans and blowers
• Compressor housings
• Gear boxes
• Valves
• Ejectors
• Steam and gas turbine casings
• Pumps
• Pipes and ducts
• Expansion joints
• Any hard to treat, irregular surface where removability is important
• Chillers and refrigeration equipment
• Engine exhaust systems
• Personnel protection (high temperature) for surfaces above 140°F
• Ball mills

GUARANTEED FIT ON ALL APPLICATIONS!
About BRD

HUSH COVER™

Acoustic Insulation:

BRD HUSH COVER™ acoustic blanket insulation is an extremely versatile and efficient solution to common industrial noise problems. It combines high density fiberglass mat with a mass-loaded vinyl sandwiched inside a weatherproof jacketing. The purpose of the fiberglass is to reduce reflected noise and to absorb noise energy, while the mass-loaded vinyl blocks transmitted noise. The fiberglass also has excellent thermal insulation qualities. Combining both an absorber material and a barrier material that are well matched yields a highly efficient and cost-effective means for solving industrial noise control problems.

Design Components

For HC-500S

OUTER JACKET: 16 oz./yd.² PTFE silicone impregnated fiberglass cloth

ACOUSTIC BARRIER: Barium sulfate loaded vinyl (1 lb. to 2 lb. density)

INSULATION: Fiberglass needle mat (11 lbs./ft.³ density)

INNER JACKET: 16 oz./yd.² PTFE silicone impregnated fiberglass cloth

Service:

The standard design (HC-450) can be used on equipment not exceeding 450°F (232°C). Other designs are available for equipment with temperatures exceeding 450°F.

HC-800 is suitable for up to 800°F. HC-1200 is suitable for up to 1200°F. Design components for these and other custom HUSH COVERS™ are available upon request.
**Acoustic Field Test Results**

Based on previously tested installations, actual dBA reductions range between 3 – 5 dBA for HC-500S-1” and 6 – 8 dBA for HC-500S-2”.

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The above data is representative of ASTM test procedure E-1222-87 for the laboratory measurement of the insertion loss of pipe lagging systems. BRD will not be warranted for performance results of HUSH COVER™ blanket insulation expressed or implied. Additional test data is available for a variety of blanket constructions.

---

Liquid cooled screw chiller noise is tamed using HUSH COVER™ model HC-500S-1.5”

Ball mill HUSH COVER™ using HC-500S-1” with banding attachment.

True performance estimates must include field verification of dBA levels and frequency concentrations on an application basis.
General Installation Instructions

1. Many of the blankets will have 2” flaps on the edges. These flaps are to be installed so that the flap on the upper blanket will cover over the edge of the lower blanket, creating a shingle effect.

2. Blanket installation should follow the recommended order of installation provided on the assembly drawings. Most blankets will either seam at the horizontal or vertical centerlines. All panels are tagged for easy identification.

3. “D” Ring assemblies have been provided to ease installation. To use, simply lace the strap through the adjoining blankets “D” Ring assembly and secure. Velcro Flaps are provided to permanently secure closing seams and to lock material in place.

4. Occasionally, certain blankets may be difficult to install due to space limitations or obstructions. If this occurs, it may be necessary to modify the blanket’s shape or size. Stainless steel staples are the recommended closure method for any modifications.

5. Generally, all tags should read from left to right and will be oriented horizontally. This will show the correct orientation of the acoustic blanket.
HUSH COVER™ blankets can be quoted based on field sketches, equipment cut sheets or templates created in the field.

Standard items such as valves, elbows, fittings, pumps, etc. can be quoted based on standardized take-off sheets such as the one shown above.

Field measurements by a qualified BRD Representative may be required prior to fabrication.

Fabrication techniques include computer aided design (CAD) capabilities to assure proper fit (see below).

HUSH COVER™ designs are complete and require no additional tools or materials.

When requesting a quotation, please supply the make and model of the equipment if known.

For OEM applications, private labeling can be provided to meet customer specifications.

HUSH COVER™ on air cooled screw chiller suction lines, compressor, discharge line and oil separator.

Typical “D” ring and strap attachment feature
Flexible Modular Curtain Systems To Contain And Absorb Noise Without Compromising Access

Advantages:
- Economical alternative to rigid enclosures
- Easy to install without special tools
- Maximum application flexibility
- Allows quick access to equipment for operation and maintenance
- Washable and steam cleanable
- Custom designs with standard components
- Fire safe ratings meeting ASTM E-84, class A
- Durable construction with good oil and chemical resistance
- Outdoor/high temperature designs available
- High noise reduction performance up to 15 dBA with open top designs
- Can include the support structure, roof panels, air vents and other accessories.

Applications:
- Metal working presses and equipment
- Generators and power equipment
- Dicers, granulators and pelletizers
- Compressors and pumps
- Fans and blowers
- Paper and corrugation machinery
- Foundry shakeouts
- Vibratory screeners and converters
- Dust collectors
- Pulverizers
- Hydraulic units
- Test areas
- Plant dividers
- Movable screens
- In-wall constructions
- Chillers and refrigeration equipment
- VAV boxes
- Packaged HVAC equipment
- Screw Machines

Typical BAC-110R HUSH FLEX™ curtain system (ceiling suspended) around a screw machine. Features include double track sliding panel access, viewing windows and overhead baffles.
About BRD HUSH FLEX™ Curtain Systems:

BRD HUSH FLEX™ curtain systems combine absorber and barrier layers into composite panels that can be readily hung from or mounted to customer supplied pipe, angle iron, strut, track or wood frames. BRD also offers a 16-gauge track system with all components as needed for a turnkey project. Twelve gauge and heavy-duty structural steel framework are also available.

Several system models are offered in two distinct styles: the BAC (Barrier/Absorber Composite) and ABAC (Absorber/Barrier/Absorber Composite) models. The BAC systems are used where maximum abuse resistance is important and on movable panels. The ABAC systems are used where absorption on the outside of curtains is desired or where the panels are used to separate noise sources on both sides. For further information, see also the section on HUSH QUILT™ composites.
Acoustic Performance Test Results

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<thead>
<tr>
<th>Model No.</th>
<th>Thickness (In.)</th>
<th>Wt. Lb./Ft.²</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1000</th>
<th>2000</th>
<th>4000</th>
<th>STC</th>
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<tr>
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<td>.75-1</td>
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<td>50</td>
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<td>ABAC-111N</td>
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<td>ABAC-121N</td>
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<table>
<thead>
<tr>
<th>Model No.</th>
<th>Sound Absorption Data Absorber Component Random Incident Sound Absorption</th>
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<tbody>
<tr>
<td>BAC Products</td>
<td>Sound Absorption Octave Band Center Frequencies</td>
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<td></td>
<td>125</td>
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<td>BAC Products</td>
<td>.12</td>
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<tr>
<td>ABAC &amp; 2”</td>
<td>.07</td>
</tr>
<tr>
<td>BAC Products</td>
<td>Sound Absorption Octave Band Center Frequencies</td>
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</tbody>
</table>

NOTE:
1) Acoustical testing per ASTM C-423-77, C-423-90A; ASTM E-90-75; E-90-90. Copies available upon request.
2) Actual noise reduction will vary with application, enclosure design, features and peak frequency of the sound source.

ABAC high temperature 12’ high curtains protect a welder from brake and shear noise in a machine shop.

Typical double track design sliding panel access for compressor enclosure.
Typical Panel Construction:
- Factory bound edges
- No. 8 brass grommets at top for hanging
- Velcro hook and loop fastening strips on vertical overlapping (2" standard) edges
- Optional corner strips
- Top edge reinforcing on BAC styles and when overall panel length dictates for ABAC styles
- Standard facing is vinyl coated fiberglass cloth good for service up to 180°F
- Optional silicone coated fiberglass cloth facing for high temperature applications or where there is exposure to UV rays (Temperature range is -90°F to 550°F)
- Heavy duty edge binding available for sliding panels
- Standard colors are gray, tan, white and black

Double track rails with roller trolley. Corner rails slide in to seal open ends.

ABAC-111N panel with 4" corner strip hung on roller trolley and track system.
**Features/Applications:**
- Manufactured from 2½" x 2½" x 3/16" tube steel members (oil enamel painted)
- Best suited for enclosure or barrier wall heights exceeding 10’; mandatory for heights exceeding 12’.
- Can be used for outdoor applications; larger tube steel members may be required based on final layout and wind exposure.
- Easy bolt together design simplifies assembly and installation
- Standard track channels can be added to cross members where panel mobility is required.
- Preferred method of panel support and attachment is with STS adjustable clips (illustrated on next page)
- Allows for greater column spans; up to 15’ for a 14’ high curtain system. Fewer column supports reduces material costs, installation labor and minimizes potential column interferences at floor level
STS Framing Details

Column Base Plate Detail

Base Plate Anchor Detail

STS Adjustable Clip Detail

Panel Attachment Detail

Crossbeam End Drilling Details

Long Corner End

Short Corner End

Mid Column End
HUSH FLEX™
Curtain Systems

Product Data Section

Step 1: Erect Framework

Step 2: Hang HUSH FLEX™ Curtains

Quick & Easy Installation!
FINISHING FIELD CUTS ON HUSH FLEX™ PANELS

Needed Tools & Materials

- Utility knife and shears
- Edge binding trim cloth to match panel quilted facing
- Tape measure
- Plier type staple gun
- Compass or scribe for radius or circular cut-outs

1) Cut panels with utility knife or shears to fit as snug as possible. Keep gaps to a minimum.

2) Fold edge binding material over edges, equal amounts on front and back. (Note: A few staples along cut edge will help compress material prior to installing edge binding.)

3) Staple bind edge binding material to panel, with staples every 2-3 inches.
Infrequent Entry Access
Overlapping (2") Velcro closures are standard for all HUSH FLEX™ systems on maximum 48” centers for ABAC panels or 54” centers for BAC curtains. This provides quick and easy entry access points around the entire perimeter of the enclosure and at the corners. Heavy duty edge binding increases panel edge durability where repeated handling is expected. Applies to fixed and movable suspension/attachment to the support framework.

Occasional Service/Entry Access
The BRD HUSH FLEX™ curtain system standard framework design is model STC Strut Track Channel with nylon wheel roller trolleys. When used with double track rail systems, curtain panels can be alternately suspended from the inside and outside track rails. Single or multiple curtain access clearance can be accomplished by disengaging the Velcro seams of the panel(s) and sliding it/them on the open track. Variations of this design include track wall extensions, corner radius tracks and triple/quad track layouts.

Frequent Service/Entry Access
Single or double panel access doors are designed with 8” to 12” of panel overlap at each edge of the required entry/service opening. This extended overlap compensates for the lack of Velcro to maintain acoustic performance while ensuring ease of movement/door operation. Sliding door panel features include cloth handles, heavy duty edge binding and optional viewing windows. When enclosure wall heights exceed 10’, independently supported access doors of a more workable 7’ to 8’ height are recommended.
The swivel and stack hardware system includes a full width top mounted channel support connected to a single suspension steel wheel heavy duty roller trolley. As pictured above, the single suspension point (top middle of each panel) allows the panel to swivel 90° so that it is perpendicular to the track. Successive addition panels along the enclosure wall can be swiveled in a similar manner to create a full or partially open area with the panels stacked at one end. A curtain wall measuring about 20’ long can be stacked to expose all but about 18”. The curtain enclosure layout must provide about 2’ of clearance on each side of the track in the area where the panels will be stacked/stored.
Curtain Panel
Ventilation Baffle

BAC-110R composite material used to form an air flow vent baffle. Can be used as an intake or discharge (covers cutout in a panel).

Rooftop Ventilation Baffle

16 gauge steel vent baffle with 1” thick faced acoustical foam liner. Can be used as an intake or discharge (covers cutout in roof panel).

Roof Panel
And Valance

Fixed Mounting Angle Detail
HUSH FLEX™ Options And Accessories

- Laminated facing construction
- Sliding/retractable roof panels
- Custom hardware to suit
- Circular support frame designs
- Strip curtains for access
- Heavy duty edge binding for sliding panels
- Ventilation fans
- Lighting
- Windows
- Accordion fold curtains
- Access flaps
- Feed chute openings
- Portable frames

Temporary Construction Barriers

- Model EBAC-110N-VCP construction
- Low cost HUSH FLEX™ construction for projects with typical life span of 3 – 5 years
- Non-reinforced vinyl barrier
- 2” thick exterior grade absorber
- Grommets and Velcro
- Rated at STC-32 and .85 NRC
- Contractor supplied framing
- Can be supplied in roll form or in custom size panels

PLEASE REFER TO THE HUSH GUARD™ PRODUCT DATA SECTION FOR ADDITIONAL INFORMATION ON TEMPORARY OUTDOOR SOUND BARRIERS
Guidelines for Outdoor Curtain Systems, Enclosures and Acoustical Barrier Walls

Recommended Exterior HUSH FLEX™ Construction

- Model EBAC-110R-P
- RLV-100 Barrier
- Vinyl coated polyester absorber facing
- Tenera thread stitching
- Exterior grade velcro

Fence Support Structures

- Cooling tower curtain system attached to chain link fence.
- Air-cooled screw chiller with HUSH FLEX™ curtain panels attached to chain link fence.
- HUSH FLEX™ panels attached to wood planking fence.
- Close-up of HUSH FLEX™ panels on inside of wood slat fence enclosure.
Concrete/stucco wall structure with HUSH FLEX™ panels creates efficient chiller sound enclosure.

Brick wall attachment of HUSH FLEX™ panels.

CMU block wall enclosure with HUSH FLEX™ exterior grade curtain panels.

HUSH FLEX™ curtain panels attached to inside of existing non-acoustical metal screen walls.

STS columns are tied to dunnage steel equipment support platform.

Finished enclosure with sliding access panel controls condensing unit noise.

Turnkey STS Structural Tube Steel Systems
Advantages:
- Polyurethane acoustical grade foam with controlled porosity for maximum sound absorption
- Optional melamine and polyimide foams
- Foam layers can be combined with loaded vinyl mass barriers to form hundreds of composite insulations for maximum overall acoustical performance
- Variety of protective film facings to withstand most industrial and harsh environments
- Pressure sensitive adhesive backings are available for easy installation
- Optional edge sealing protects foam edges from moisture and other contaminants
- K factor of .25 BTU per hour per inch per sq. ft. per °F for urethane foam products
- Can be cut to size with utility knife, scissors or die cut for use in OEM applications

Applications:
- Liners for truck, boat or yacht engine and generator compartments
- In-plant industrial equipment enclosure and panel insulation
- Rapid transit cars and buses
- Recreational vehicles
- Vehicle fire walls, floor and cab treatments
- Belt guard liners
- Pump or other motor driven equipment enclosures
- Absorptive liners for hoods, cabinets, panels and guards of industrial/OEM equipment
- Liners of printers and electronic equipment
- Not recommended for applications in buildings or areas of public assembly
- Cab liners and floor mats for transportation and off-road equipment such as cranes, pavers and construction machinery
About BRD HUSH FOAM™ Products:

BRD HUSH FOAM™ polyurethane acoustical foam is manufactured to exacting specifications of a partially reticulated cellular structure. This controlled porosity of the nominal 2 lbs./ft.³ density UL-94/HF1 foam results in maximum acoustical absorption. Product categories include type HFU (absorber only), type HFUB (barrier composites), type HFUD (damping composites) and type HFQC (quilted composites). To protect the foam in applications that require resistance to water, grease, dust, oil and other contaminants, film facings can be applied to the material with minimal impact on acoustic performance because of the diaphragmatic action transferring sound energy to the internal construction. Here acoustic energy is dissipated by means of friction in the form of heat. The products are available in rolls, sheets or die cut parts.

Application Guide:

<table>
<thead>
<tr>
<th>Product Type*</th>
<th>Roll Size</th>
<th>Sheet Size</th>
<th>PSA Adhesive Backing</th>
<th>Film Facings</th>
<th>Performance And Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFU</td>
<td>54&quot;x50'</td>
<td></td>
<td>Yes (optional)</td>
<td>All (optional)</td>
<td>To increase absorption and minimize reverberant noise build-up when existing barrier provides sufficient blocking (transmission loss). Increase the absorber thickness for best low frequency performance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>54&quot;x72&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFUB</td>
<td>54&quot;x50'</td>
<td>54&quot;x72&quot;</td>
<td>Yes (optional)</td>
<td>All (optional)</td>
<td>To increase absorption and blocking (transmission loss) when applied to lighter gauge sheet metal, plastic, wood or other existing panels, guards, cabinets, etc.</td>
</tr>
<tr>
<td>HFUD</td>
<td></td>
<td>54&quot;x40&quot;</td>
<td>Yes (standard)</td>
<td>All (optional)</td>
<td>To increase absorption and reduce structure-borne noise caused by panel vibration and resonance. Only available with PSA backing and in sheets or die cut parts.</td>
</tr>
<tr>
<td>HFQC</td>
<td>54&quot;x50'</td>
<td>54&quot;x10'</td>
<td>No</td>
<td>RP Only (standard)</td>
<td>Dual purpose composite increases absorption and blocking like HFUB materials. Unique quilted fiberglass absorber layer offers greater durability and improved fire retardancy.</td>
</tr>
</tbody>
</table>

*Additional description listed on the next page.
Standard Product Descriptions:

**ABSORBER ONLY:**

- HFU-050: 1/2" Thk. Urethane Acoustical Foam
- HFU-100: 1" Thk. Urethane Acoustical Foam
- HFU-200: 2" Thk. Urethane Acoustical Foam
- HFU-300: 3" Thk. Urethane Acoustical Foam
- HFU-400: 4" Thk. Urethane Acoustical Foam

Other Optional Foams:
- Melamine: Designate as HFM-XXX
- Polyimide: Designate as HFP-XXX

**DAMPING COMPOSITES:**

<table>
<thead>
<tr>
<th>HFUD-050</th>
<th>1/2&quot;</th>
<th>EVDS-100</th>
<th>5/8&quot;</th>
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<tr>
<td>HFUD-100</td>
<td>1&quot;</td>
<td>EVDS-100</td>
<td>1 1/8&quot;</td>
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<tr>
<td>HFUD-200</td>
<td>2&quot;</td>
<td>EVDS-100</td>
<td>2 1/8&quot;</td>
</tr>
</tbody>
</table>

A = Absorber Thickness
B = Damping Sheet Type
C = Nominal Overall Composite Thickness

**BARRIER COMPOSITES:**

| HFUB-025-050 | 1/4" | 1/2" | 3/4" |
| HFUB-025-100 | 1/4" | 1"   | 1 1/4" |
| HFUB-050     | 1/2" | 1    | 1/2" |
| HFUB-100     | 1"   | 1    | 1"   |

A = Decoupler Thickness
B = Vinyl Barrier Density (lbs./ft.²)
C = Absorber Thickness
D = Nominal Overall Composite Thickness

**QUILTED COMPOSITE:**

This unique composite product (model HFQC-025-100) combines a 1/4" thick foam decoupler, a 1 lb./ft.² density loaded vinyl barrier and a 3/4" thick quilted fiberglass absorber layer with a durable reinforced aluminized mylar film facing.

**OPTIONAL FILM FACINGS:**
- RP-Reinforced Aluminized Polyester
- AP-Aluminized Polyester
- BU-Black Urethane
- TU-Tan Urethane
- EM-Embossed
- GT-Gray Tedlar
- WH-Hypalon (white)
- Nomenclature Example: HFUB-100-AP

**OTHER OPTIONS:**
- Edge sealing
- Die cutting
- Densified surface
- Custom rolls, sheets and thicknesses
- Wear surface for floor mats
- PSA - pressure sensitive adhesive backing (3 mil unsupported acrylic)
- Nomenclature Example: HFU-200-PSA
Acoustic Performance Data:

Transmission Loss:
The above graph shows a typical range of transmission loss for type HFUB and HFQC composites when applied to a 20 gauge steel panel. Actual performance will be affected by the absorber thickness and facing as well as the mass and stiffness of the surface to be treated.

Sound Absorption:
The above graph shows a typical range of acoustical absorption for all HUSH FOAM™ absorbers and composites which utilize 1/2” and 1” thick absorber layers. Many factors such as the film facing and mounting method can affect the actual performance.

Other Physical Characteristics*

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Vibration Damping Performance</th>
<th>Temperature Range</th>
<th>Flammability Rating</th>
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</thead>
<tbody>
<tr>
<td>HFU</td>
<td></td>
<td>-40°F to 250°F</td>
<td>UL94/HF1</td>
</tr>
<tr>
<td>HFUB</td>
<td></td>
<td>-40°F to 250°F</td>
<td>UL94/HBF DOT 302/Pass</td>
</tr>
<tr>
<td>HFUD</td>
<td>Loss factor on .04” steel at 1000 Hz is .15</td>
<td>-22°F to 240°F</td>
<td>UL94/HBF FMVSS302/Pass</td>
</tr>
<tr>
<td>HFQC</td>
<td></td>
<td>-40°F to 240°F</td>
<td>Absorber meets class A per ASTM E-84 test</td>
</tr>
</tbody>
</table>

*Table values are for standard products without optional facings and adhesives.
Modular, Durable, Easy To Install Acoustical Panels For Maximum Noise Reductions

Advantages:
- Modular design to form partial or complete enclosures, partitions, dividers and walls
- Standard 2’, 3’ & 4’ wide panels can be combined with any size special width panels
- Turnkey design including doors, windows, silenced ventilation systems, lighting, structural steel and more
- Removable panels provide easy service access
- Durable rugged construction for long life
- Maximum noise reduction STC ratings of 37-48
- Highly customized designs to meet all customer needs/requirements
- Standard galvanized steel construction; also available in stainless steel and aluminum
- Readily assembled, demounted, relocated and/or reassembled without sacrificing structural integrity or acoustic performance

Applications:
- Machinery and equipment enclosures
- Shop offices and control pulpits
- Test environments
- Outdoor environmental barriers for HVAC, mass transportation, industrial and highway applications
- Broadcasting/recording studios
- Machine tool presses and equipment
- Music practice/educational study rooms
- Audiometric/medical test rooms
- Ovens
- Transformer stations
- Gas and electric utility equipment enclosures and barriers
- Partial personnel barriers
- Grinders, shredders and other size reduction equipment
- Wind tunnels
- HVAC fan plenums

OEM enclosure for hydraulic pump unit utilizes HUSH GUARD™ type HG-QR-200 quick release design.

Minster punch press enclosure using type HG-400 panels.
About BRD HUSH GUARD™ Products:

BRD HUSH GUARD™ acoustical panels are formed using sheet metal perimeter reinforcing channels spot welded or pop riveted to a solid and a perforated sheet filled with high density acoustical insulation for an overall thickness of 2”, 4” or 6” as standard. The perforated sheet acts as a retaining screen for the insulation but is acoustically transparent allowing sound waves from the noise source to be absorbed. The outside solid sheet acts as a sound barrier reflecting incident sound waves back through the acoustic fill where further absorption takes place. Standard and custom manufactured panels assemble together using “H” joiners or by tongue and groove and are further secured using sheet metal self-tapping screws.

Panel Vs. Enclosure Performance

The tables on the next page list laboratory test data for an individual one piece panel. This will not always be indicative of the enclosure performance because of noise leakage (flanking) over the surface area of the enclosure walls and roof. Leakage around pipe penetrations, under doors and around windows, through air ventilation openings, etc. can drastically compromise the panel performance as shown on the graph at right. In the example, an enclosure design that has as little as 1% open area over the entire surface area of the enclosure exhibits an actual transmission loss of about 20 even though the panels are rated for almost 40 dB transmission loss. The lesson to learn is that design drives the enclosure performance as much or more than the panel ratings.
Acoustic Performance Data:

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<tr>
<th>Product</th>
<th>Sound Transmission Loss (dB) Frequency (Hz)</th>
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<td>HG-500</td>
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<table>
<thead>
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<tr>
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<td>0.53</td>
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<tr>
<td>HG-400</td>
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<td>1.13</td>
</tr>
<tr>
<td>HG-410</td>
<td>0.68</td>
<td>1.06</td>
</tr>
<tr>
<td>HG-420</td>
<td>0.45</td>
<td>0.96</td>
</tr>
<tr>
<td>HG-500</td>
<td>0.92</td>
<td>1.15</td>
</tr>
</tbody>
</table>

Panel Constructions:

<table>
<thead>
<tr>
<th>Product</th>
<th>Thickness</th>
<th>Solid ¹ Skin</th>
<th>Perf. ² Skin</th>
<th>Weight per sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG-200</td>
<td>2&quot;</td>
<td>18 ga.</td>
<td>22 ga.</td>
<td>4.0 lbs.</td>
</tr>
<tr>
<td>HG-210</td>
<td>2&quot;</td>
<td>16 ga.</td>
<td>22 ga.</td>
<td>4.7 lbs.</td>
</tr>
<tr>
<td>HG-400</td>
<td>4&quot;</td>
<td>18 ga.</td>
<td>22 ga.</td>
<td>5.0 lbs.</td>
</tr>
<tr>
<td>HG-410</td>
<td>4&quot;</td>
<td>16 ga.</td>
<td>22 ga.</td>
<td>5.7 lbs.</td>
</tr>
<tr>
<td>HG-420</td>
<td>4&quot;</td>
<td>16 ga.</td>
<td>22 ga.</td>
<td>9.6 lbs.</td>
</tr>
<tr>
<td>HG-500</td>
<td>5&quot;</td>
<td>16 ga.</td>
<td>22 ga.</td>
<td>6.0 lbs.</td>
</tr>
</tbody>
</table>

1. Panel skins are all galvanized cold rolled steel.
2. Perf. skins have 3/32" holes on 3/16" staggered centers.
3. Optional aluminum and high density polyethylene constructions.
4. All stiffeners and panel channel framing is minimum 18 ga. steel with face sheets spot welded in place.
5. Panels are designed to withstand wind loads of 25 lbs/sq. ft., both negative and positive.
6. Panel fill is non-combustible high density semi-rigid non-hygrosopic HUSH BATT™ packed under 5% compression.

Panel Finishes:

1. Galvanized steel (std.)
2. Galvanneal “Paint Ready” steel
3. Air dried shop applied
4. Thermosetting TGIC Polyester Powder Coating in color selected by Architect
5. Custom as specified

Steel Finishes:

1. Prime Painted (standard)
2. Primer with air dried shop applied finish paint
3. Hot dip galvanized (availability dependent on final steel member sizing)
4. Colors available to match panels
5. Sand blasting prep only as specified by contractor
6. Custom as specified
Installation Guidelines

1) PLANNING
Review the CAD erection drawings and bill of materials which will list all panels, trim (flashing) and other accessory items required for the job.

2) INSTALLATION OF STRUCTURAL STEEL
Most HUSH GUARD™ enclosures up to a size that does not exceed a 12' roof span in any one direction or height are completely self-supporting without the use of supplementary structural steel. When required, the structural steel will be detailed on the drawings and should be installed according to the instructions.

3) INSTALLATION OF BASE CHANNEL
Like all trim and flashing, the base channel is supplied in standard lengths and must be cut to size by the installing contractor. It is the customer’s responsibility to be sure that the foundation or bearing surface is suitable for the support of the enclosure.

4) ERECTION OF WALL PANELS
Start at a corner and set panels on each side of the corner into the floor channel. Secure corner panels with outside corner flashing using sheet metal screws. Tongue and groove panels or supplementary H joiners are used to sequentially connect additional panels in either direction until all perimeter walls have been erected.

5) DOOR FRAMES AND DOORS
Door frames and doors are installed during the natural panel sequence with adjacent panels fitting against the frame on both sides for standard doors. Depending on the size, some standard and premium doors will be pre-installed in a larger panel.

6) INSTALLATION OF ROOF PANELS
Install the roof panels according to the erection sequence shown on the drawing.

7) INSTALLATION OF TRIM
Install all outside and inside trim and flashing. It is recommended to fasten inside flashing at all panel joints and at all internal panel stiffeners.

8) ACCESSORY ITEMS
Lighting, ventilation systems and other accessories should be installed as per the drawings.

9) CUTOUTS
Factory and field cutouts must be sealed in accordance with BRD guidelines described in a separate bulletin.
Typical Installation Details

Typical Tongue And Groove Panel Connection

Typical Panel To Curb Connection

Typical 90 Degree Panel Connection

Typical Panel To Wall Connection
Minimum Design Goals For All HUSH GUARD™ Enclosures:

- Noise abatement/reduction
- Lowest dollar per dB reduction
- Provide for maintenance/service access
- Accommodate work flow
- Occupy minimum floor space
- Meet ventilation requirements
- Provide adequate lighting
- Facilitate necessary visual access
- Aesthetic design and appearance
- Maintain maximum productivity

Architectural Applications For HUSH GUARD™ Enclosures:

- Band practice rooms (see right)
- Recording/broadcast studios
- Language labs
- Medical and life sciences
- Test chambers
- Anechoic and hemi-anechoic chambers
- Rooftop barriers and screens
- Voice over booths
- Educational study rooms
- Music and choral rooms
- Tape recording rooms
- Dubbing rooms
- Interview/examination rooms
- Audiometric booths
- Radio rooms

Grinder enclosure using HUSH GUARD™ HG-400-SC panels. Scrap feed conveyor requires a separate feed tunnel complete with access doors to meet the 85 dBA requirement.

Type HG-400 panels are used to quiet an Amada automatic punch press. Design features include sliding access doors for material flow and integration of the control panel in the right side of the enclosure.

Multiple room installation of HUSH GUARD™ HG-400 band practice rooms.
Typical Outdoor Sound Barrier Applications

- Utilities and substations
- Mass transportation
- Highway barriers
- Rooftop and HVAC equipment
- Airports and military bases
- Race tracks and open recreational areas
- Industrial, commercial and residential
- Any outdoor equipment or noise source
- Construction barriers (portable designs available for purchase or rent)
Non-Progressive Panel Joining Systems

- Free standing roof allows removal of individual components or complete walls without disturbing roof panels
- Individual panels can be quickly and selectively removed for service access
- Minimal sheet metal screws to cause erection or reassembly problems
- No tongue and groove fastening required
- Panels and components may be removed, reconfigured or relocated to meet future enclosure needs
- Three fastening systems available
- Highest degree of design flexibility, service access and ease of installation

**TYPE QR**
Panel joining is done with tension latches and sponge gasketing

**TYPE RH**
Panel joining is done with two-piece removable "H" channels

**TYPE SE**
Panel joining is done with Speed-Erect patented features
HUSH GUARD™ type SE panel joining as shown in above exploded view allows quick and easy access to areas not serviced through doors. The illustration below shows a model HGNP-401 enclosure with partially removed roof and side wall to access the punch press fly wheel.
Non-Progressive Panel Constructions

<table>
<thead>
<tr>
<th>Product</th>
<th>STC Rating</th>
<th>NRC Rating</th>
<th>Thickness</th>
<th>Panel Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGNP-201</td>
<td>37</td>
<td>1.0</td>
<td>2&quot;</td>
<td>16 gauge damped solid outer skin and 22 gauge perforated inner skin sandwiched around 2&quot; of high density acoustical insulation.</td>
</tr>
<tr>
<td>HGNP-401</td>
<td>40</td>
<td>1.0</td>
<td>4&quot;</td>
<td>16 gauge damped solid outer skin and 22 gauge perforated inner skin sandwiched around 4&quot; of high density acoustical insulation.</td>
</tr>
<tr>
<td>HGNP-402</td>
<td>42</td>
<td>1.1</td>
<td>4&quot;</td>
<td>14 gauge damped solid outer skin and 22 gauge perforated inner skin sandwiched around 4&quot; of high density acoustical insulation.</td>
</tr>
<tr>
<td>HGNP-403</td>
<td>48</td>
<td>.95</td>
<td>4&quot;</td>
<td>Same as construction for HGNP-402 with the addition of a septum barrier layer for increased low frequency performance (acoustic performance data is estimated).</td>
</tr>
</tbody>
</table>

Header equipment enclosure with telescoping HGNP-201 access doors.

Custom OEM machinery enclosure with pneumatically operated access door.

HGNP-402 enclosure with lift-out sliding access doors forming machine tool.

Non-progressive design allows easy access to areas not serviced through door openings.
Standard And Custom Acoustical Shop Offices

Custom Designs:
- Custom dimensions
- Clam shell split designs
- Polycarbonate or other window materials
- Can ship fully assembled or knocked-down
- Can be integrated with control consoles
- Sloped windows for pulpit applications
- Platform mounted personnel enclosures

Optional Accessories:
- Drop ceilings and custom interior finishes
- Explosion proof electrical wiring
- Air filters
- Recessed lighting
- Integral vibration Isolation
- Heaters and air conditioners
- Eyebolts for lifting

Dimensions do not include wall or roof mounted fans.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>WEIGHT (LBS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGSO-1</td>
<td>48”</td>
<td>60”</td>
<td>88”</td>
<td>1,100</td>
</tr>
<tr>
<td>HGSO-2</td>
<td>48”</td>
<td>90”</td>
<td>88”</td>
<td>1,400</td>
</tr>
<tr>
<td>HGSO-3</td>
<td>78”</td>
<td>90”</td>
<td>88”</td>
<td>1,700</td>
</tr>
<tr>
<td>HGSO-4</td>
<td>90”</td>
<td>90”</td>
<td>88”</td>
<td>1,800</td>
</tr>
<tr>
<td>HGSO-5</td>
<td>108”</td>
<td>90”</td>
<td>88”</td>
<td>2,000</td>
</tr>
<tr>
<td>HGSO-6</td>
<td>126”</td>
<td>90”</td>
<td>88”</td>
<td>2,300</td>
</tr>
<tr>
<td>HGSO-7</td>
<td>153”</td>
<td>90”</td>
<td>88”</td>
<td>2,600</td>
</tr>
</tbody>
</table>

Custom modification of a model HGSO-2 at a cement plant.
Audiometric Booths and Rooms To Meet The Assessment Needs of Audiologists, Doctors, Researchers and Hearing Aid Specialists

Wall and Ceiling
The 4” tongue and groove panel design is made from 16 gauge galvanized outer skin, 16 gauge galvanized roll formed channels and an inner skin of 22 gauge galvanized steel perforated to achieve a 25% open surface for maximum acoustical absorption.

The 16 gauge outer skin is lined with a 1” layer of gypsum board to reduce low frequency noise transmission. Then it is filled with a 2 pound fiberglass insulation that meets UL fire hazard ratings as per ASTM D-84.

Floor
The 2” thick floor panels consist of high density fiberglass sandwiched between the 1/8” thick inner skin and 16 gauge outer skin. A 1” layer of gypsum board is also used similar to the walls and ceiling. The thinner floor increases accessibility for wheelchair and handicapped patients.

Wiring & Ventilation
All electrical wiring is concealed within the panel using UL labeled fixtures. The room is equipped with recessed lighting fixtures and hospital grade outlets.

Model HH-100 & 101 booths are furnished with a standard “Jack” panel, consisting of three, 3-pin phone jacks, one each of Cinch Jones 303 & 304 connectors.

Models HH-200, HH-201, & HH-300 rooms are furnished with a standard clinical “Jack” panel. The pre-wired panel is supplied with ten, 3-wire phone jacks, two Cinch Jones 303 & 304 plug connectors, two coaxial plugs, one 24-pin parallel port, one 9-pin serial port and a 1” capped passthrough. Other configurations are available upon request. All “Jack” panels are pre-wired and ready to receive the latest audiometric test equipment.

Ventilation is achieved through an intake and discharge silencer designed to allow 1 air change per minute. The entire ventilation system will not generate a noise level in excess of ANSI-SI-1991 standards.

Doors
Door construction is similar to that of the walls to achieve the same high acoustical performance. The door includes a double magnetic seal gasket, sturdy cam lift hinges and recessed sill for ease of exiting. Chrome plated door pulls on the interior and exterior of the door facilitate easy entrance and exit.

Windows
Windows are double glazed with a ¼” safety glass isolated in an attractive aluminum frame. Standard window size is 24” W x 30” H.
Tight Fitting Acoustical Lagging Panels/System For Source Treatment On Large Surface Area Ductwork And Equipment

About BRD HUSH LAG™ Panel Systems:
BRD HUSH LAG™ acoustical lagging panels and systems have prefabricated customized multi-layer composite construction. Composite panel designs utilize absorptive and barrier components to achieve the highest possible noise reduction in a direct attachment source treatment. The typical panel construction (shown at right) utilizes a steel or aluminum outer skin for strength and durability. High density acoustic fill may include a layer of HUSH BLOCK™ flexible barrier material for added transmission loss. The inside retaining screen and impaling clips hold the insulation layers in place. Typical panel thickness ranges from 2” to 6” depending on the acoustical performance criteria.

Structural steel angle or channel sub-girts are welded to the equipment or ductwork skin with a minimal number of attachment points to reduce structure-borne noise that can radiate to the panel outer skin. Sheet metal screws or other anchors are used to attach HUSH LAG™ panels to the sub-girts. Final installation of flashing and trim at corners and joints covers all exposed fiberglass and edges. Access doors and removable panel sections can be incorporated.

Advantages:
- Finished interior panel surface is not necessary (saves on cost)
- Construction and panel design flexibility to meet project acoustical performance criteria
- Meets acoustical and thermal requirements
- Easy to install according to factory supplied drawings and instructions
- More economical than freestanding, modular, HUSH GUARD™ traditional enclosures

Applications:
- Forced draft and induced draft fans
- Primary, secondary and seal air fans
- Scrubber systems
- Large dust collectors and baghouses
- Above grade equipment and ductwork
- Large HVAC & exhaust duct systems
- Heat recovery steam generators (HRSG)
- Ductwork connected to large fans, boilers, turbines, dust collectors, incinerators, etc.
Untreated (above left) process ductwork before installation of type HLP HUSH LAG™ acoustical lagging panels (above right).

Typical installation sequence (at left) and panel attachment details (above) using HUSH LAG™ panels on a fan housing.

FAN TO BE TREATED  TOP PERIMETER FRAME  SKELETAL FRAME
COMPLETED FRAME  INSTALL PANELS  INSTALL FLASHINGS AND ACCESSORIES

1-610-863-6300  Noise and Vibration Control, Inc.
Power plant turbine inlet ductwork, elbow and silencer showing sub-girt angle locations (at left). Type HLP-300 panels are attached to the sub-girts (as right).

**Standard Panel Designs**

<table>
<thead>
<tr>
<th>Product</th>
<th>Thickness</th>
<th>Exterior Skin</th>
<th>Acoustic Insulation</th>
<th>Septum</th>
<th>Interior Skin</th>
<th>Material/Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLP-300</td>
<td>3&quot;</td>
<td>18 GA</td>
<td>8 lbs/ft³</td>
<td>Loaded Vinyl</td>
<td>Screen and impaling clips</td>
<td>Galvanized steel</td>
</tr>
<tr>
<td>HLP-301</td>
<td>3&quot;</td>
<td>18 GA</td>
<td>8 lbs/ft³</td>
<td>None</td>
<td>Screen and impaling clips</td>
<td>Galvanized steel</td>
</tr>
<tr>
<td>HLP-302</td>
<td>3&quot;</td>
<td>20 GA</td>
<td>8 lbs/ft³</td>
<td>None</td>
<td>Vinyl Screen and impaling clips</td>
<td>Galvanized steel</td>
</tr>
</tbody>
</table>

**Acoustic Performance Data**

<table>
<thead>
<tr>
<th>Product</th>
<th>63</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1000</th>
<th>2000</th>
<th>4000</th>
<th>8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLP-300</td>
<td>8</td>
<td>15</td>
<td>24</td>
<td>28</td>
<td>32</td>
<td>32</td>
<td>40</td>
<td>43</td>
</tr>
<tr>
<td>HLP-301</td>
<td>0</td>
<td>6</td>
<td>15</td>
<td>20</td>
<td>22</td>
<td>25</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>HLP-302</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>8</td>
<td>15</td>
<td>10</td>
<td>22</td>
<td>25</td>
</tr>
</tbody>
</table>

Consult BRD for custom panel designs to meet your performance requirements.
Composite Performance For Demanding Applications
Where Sound Control And Fire Safety Are Critical

Advantages:
- Extremely long service life
- Superior low frequency performance
- Class A rated per ASTM E-84 for most styles
- Combines excellent sound absorption and effective transmission loss (blocking)
- Available in sheets, rolls and die cut shapes
- Optional stitch binding eliminates raw edges
- Absorption ratings up to .85 NRC and transmission loss ratings up to STC-33
- Fiber free class A construction is also available
- Durable facings shed dirt, grease and oils and can be cleaned or wiped down
- Variety of facings to withstand most industrial and harsh environments
- Can be customized with grommets, velcro, straps, eyelets and other fasteners

Applications:
- In-wall treatments
- Machinery cabinets and compartments
- Truck and off-road equipment
- Firewalls
- Operator cabs
- Pipe and duct wrap
- Ceiling, metal deck and roof treatments
- Bus and transportation equipment
- Mechanical equipment room and wall liners
- Fan and blower housings
- Above wall cross talk barriers
- Base products for acoustical curtain systems (see section on HUSH FLEX™ curtains)
- Liners for truck, boat or yacht engine and generator compartments
- Recreational vehicles
- Plant divider walls and portable screens
About BRD HUSH QUILT™ Composites:
Dual layer construction combines absorber layers to dissipate acoustic energy at the source with a flexible vinyl sound barrier to block and contain sound transmission traveling to adjacent areas or spaces. Sound waves originating from the source will be initially absorbed by the absorber layer and then reflected by the flexible barrier resulting in further dissipation.

Type ABAC Composites

Design Components:
A: Absorber materials:
- Standard is fiberglass batt
- Fiber free Willtec class A foam (designate as FF-BAC-XXXX or FF-ABAC-XXXX)
B: Barriers:
- R-Polyester reinforced loaded vinyl
- N-Non-reinforced loaded vinyl
F: Facings:
- V-Standard is vinyl coated fiberglass cloth rated at -20°F to 180°F.
- S-High temperature silicone coated fiberglass cloth rated for -90°F to 550°F. Required for all outdoor projects to guard against UV attack. Designate as BAC-XXXX-S or ABAC-XXXX-SS.
Optional Components:
- Brass grommets
- Velcro fastening strips
- Snaps, bands and other fasteners
- Laminated facing construction
- Silicone sealing of stitching
- Special colors and stitch patterns
- Needle matt fiberglass absorbers
- Extensional damping sheets
- Other barrier densities
- Other absorber thicknesses

Type BAC Composites

Product Designations:
BAC-11OR:
- Nominal 1” thick fiberglass absorber with standard “V” facing and 1 lb./ft.² type “R” barrier backing.
BAC-21OR:
- Nominal 2” thick fiberglass absorber with standard “V” facing and 1 lb./ft.² type “R” barrier backing.
BAC-11ON:
- Nominal 1” thick fiberglass absorber with standard “V” facing and 1 lb./ft.² type “N” barrier backing.
ABAC-111N:
- Two nominal 1” thick fiberglass absorbers separated by a 1 lb./ft.² type “N” barrier septum. Facing on each absorber is the standard “V” type.
ABAC-121N:
- Two nominal 1” thick fiberglass absorbers separated by a 2 lbs./ft.² type “N” barrier septum. Facing on each absorber is the standard “V” type.
ABAC-RIIIN:
- Same as ABAC-111N above except with additional plywood core for better rigidity on roof, deck and ceiling/horizontal applications.

Fiber Free Construction:
- Any of the above materials can be supplied in fiber free construction. Designate as FF-BAC-XXXX or FF-ABAC-XXXX.
# Acoustic Performance And Other Data:

<table>
<thead>
<tr>
<th>Product</th>
<th>Sound Transmission Loss (dB) Frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
</tr>
<tr>
<td>BAC-110R</td>
<td>11</td>
</tr>
<tr>
<td>BAC-210R</td>
<td>13</td>
</tr>
<tr>
<td>ABAC-111N</td>
<td>12</td>
</tr>
<tr>
<td>ABAC-121N</td>
<td>19</td>
</tr>
<tr>
<td>ABAC-R111N</td>
<td>19</td>
</tr>
</tbody>
</table>

### Notes:

1) Acoustical testing per ASTM C-423-77, C-423-90A, ASTM E-90-75; E-90-90. Copies available upon request.

2) Flame spread and smoke density ratings are per ASTM designation E-84 (surface burning characteristics of building materials). Select products meet ASTM E-162 flame spread and E-662 smoke density criteria.

### When ordering roll goods:

Standard HUSH QUILT™ roll goods are all furnished with unbound edges. Purchase orders not specifically requesting stitch edge binding will be processed as unbound material. Standard roll good material may be returned in unused condition subject to a 35% re-stock charge upon receipt of a return material authorization (RMA) from BRD.
Portable Construction To Maintain Design, Layout And Access Flexibility

OEM roll-away metal panel type HG-400 sound enclosure reduces generator noise in a power plant.

Advantages:
- Reduces noise without jeopardizing work flow and productivity
- Standard 4’ wide portable curtain screens can be joined together by velcro to form any configuration required
- Custom equipment and personnel enclosures can be easily moved and relocated
- Custom fabrication for any size application
- Completely mobile on casters for maximum accessibility
- Rugged framing using structural tube, angle or channel for long service life
- Low or no installation costs
- Adapt quickly and easily to changes in production routines
- Optional windows, ventilation baffles and other accessories can be included
- Best for temporary or short term installations (can be reused)

Applications:
- Welding screens and shields
- Work station dividers and personnel enclosures
- Any equipment enclosure which requires quick and easy access for service, maintenance or emergency repairs
- Applications which require frequent equipment access
- Hoistable enclosures
- Partition manufacturing areas from employee work areas or offices
- Machinery partitions and dividers
- Architectural screens or dividers for multipurpose areas
- For multiple machine installations where portable treatment can be “swapped” between prime service units and back-up or stand-by units
- Infrequently used equipment such as emergency generators

Portable enclosure using type ABAC-111N curtain panels allows for easy maintenance around a noisy pump skid.
How To Use HUSH ROLL™ Portable Noise Screens

1) Surround the noise source

2) Shield the employees

3) Separate manufacturing and employee areas

4) Separate multiple work stations

HUSH ROLL™ portable noise screen features include adjustable feet, casters, rugged structural tube frame, Velcro closures and optional windows.

HUSH ROLL™ 4’ x 8’ portable screens using ABAC-111N curtain panels contain riveting noise spillover to adjacent work areas.

1-610-863-6300 Noise and Vibration Control, Inc.
Acoustic Performance Data:

<table>
<thead>
<tr>
<th>Product</th>
<th>Transmission Loss at Octave Frequencies (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
</tr>
<tr>
<td>ABAC-111N</td>
<td>12</td>
</tr>
<tr>
<td>HG-400</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Absorption at Octave Frequencies (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
</tr>
<tr>
<td>ABAC-111N</td>
<td>.07</td>
</tr>
<tr>
<td>HG-400</td>
<td>.60</td>
</tr>
</tbody>
</table>

NOTE: HUSH ROLL™ portable screens, partitions and enclosures can be completely customized by material and/or design. Consult your BRD representative for your special applications.
Composite Or Built-Up Systems To Quiet Pipes, Ducts And Equipment Housings

Advantages:
- Good for high (LVQ styles) and low temperature applications
- Easy to cut, fit and install
- One step composite insulation or built-up systems are available.
- Suitable for indoor or outdoor applications
- Durable construction is tear and puncture resistant (foil faced barriers)
- Good oil and chemical resistance
- Easily combined with HUSH COVER™ removable blankets where access is needed
- Lead and asbestos free
- Can be installed with fasteners, banding and matching tape
- STC ratings from 25 to 35
- Dual purpose thermal/acoustic materials

Applications:
- Gas utility pressure reducing and metering station piping systems
- HVAC ductwork and plenums
- Pneumatic convey/material transfer lines
- Fan and other equipment housings
- Heat exchangers
- Process piping and controls in refineries and chemical plants
- Wastewater treatment plant blower piping
- Condensate and refrigerant piping
- Industrial exhaust ducting
- Dust collector ductwork
- Heat pumps and air handling units
- Silencers and muffler wraps
- Any rigid vibrating surface which radiates structure-borne noise
About HUSH WRAP™ Acoustic Insulation Composite Products:

HUSH WRAP™ composite products combine a layer of HUSH BLOCK™ type LV-100-LAG with a layer of type QAB HUSH QUILT™ absorber blanket. The QAB layer is applied to the source and acts as an absorber and more importantly as a spacer or decoupler for the flexible barrier layer. The decoupling or floating of the HUSH BLOCK™ barrier helps achieve greater noise reductions than if the barrier was attached directly to the noise emitting surface. The biggest advantage of HUSH WRAP™ composites is the easy one-step installation of both decoupler and barrier layers thus offering substantially lower installation costs compared with built-up systems. Matching trim tape can be used to seal all seams and edges. This family of composites can usually be installed by factory personnel. Acoustic performance data is listed on the opposite page.

About HUSH WRAP™ Acoustic Insulation Built-Up Component Systems:

HUSH WRAP™ built-up component systems also combine both decoupler and barrier components for maximum performance. Built-up systems require a multi-step installation procedure. The absorber/decoupler layer is usually type HB HUSH BATT™ thermal/acoustic insulation in 2” to 4” thickness and a density of between 4 lbs. and 8 lbs. per cubic foot. The exterior barrier jacketing is type LVAL consisting of a smooth or stucco embossed aluminum or other metallic skin bonded to a layer of loaded vinyl. Built-up systems offer greater flexibility on selection of materials in order to fine tune frequency specific performance in contrast to the average all purpose performance of HUSH WRAP™ composites. Actual field testing of HUSH WRAP™ built-up systems shows insertion loss performance as high as 42 dB at 2000 Hz. Built-up component systems are also superior to composite treatments where durability and abuse resistance are important in severe service and heavy industrial applications. The neat, clean and more attractive appearance of this technique is also a factor in deciding which treatment to use. Disadvantages of built-up systems are higher installation costs and the need to use outside installation contractors who are experienced with acoustical applications.
Acoustic Performance Data:

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Roll Size</th>
<th>Transmission Loss at Octave Frequencies (Hz)</th>
<th>STC</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVAL-100</td>
<td>.019&quot; aluminum bonded to 1 lb. density loaded vinyl</td>
<td>48&quot; W x 25' L</td>
<td>12 17 22 28 32 37 27</td>
<td></td>
</tr>
<tr>
<td>LVAL-200</td>
<td>.022&quot; aluminum bonded to 2 lbs. density loaded vinyl</td>
<td>48&quot; W x 25' L</td>
<td>12 21 26 30 35 42 29</td>
<td></td>
</tr>
<tr>
<td>LV-100-LAG</td>
<td>1 lb. density foil faced loaded vinyl</td>
<td>48&quot; W x 60' L</td>
<td>13 17 22 26 32 37 26</td>
<td></td>
</tr>
<tr>
<td>RLV-100</td>
<td>1 lb. density reinforced loaded vinyl</td>
<td>54&quot; W x 60' L</td>
<td>13 17 22 26 32 37 26</td>
<td></td>
</tr>
<tr>
<td>LVQ-110-LAG</td>
<td>1&quot; quilted blanket bonded to foil faced 1 lb. density loaded vinyl</td>
<td>46&quot; W x 30' L</td>
<td>18 18 23 30 39 46 29</td>
<td></td>
</tr>
<tr>
<td>LVQ-210-LAG</td>
<td>2&quot; quilted blanket bonded to foil faced 1 lb. density loaded vinyl</td>
<td>46&quot; W x 30' L</td>
<td>19 20 23 33 44 53 30</td>
<td></td>
</tr>
</tbody>
</table>

Insertion loss field test data from gas transmission compressor piping application for a built-up system using LVAL-100 and HUSH BATT™ HB-300.

Understanding Lab Tests:
The table at the top of this page shows lab test data to indicate relative performance of one material to another and further by frequency. Transmission loss lab data is not a very good indicator of field performance when products are applied to pipes, ducts and equipment housings. Because of this BRD has built an extensive backlog of field test data that can accurately predict future performance in similar applications. One such set of field data is shown in the graph above.

Dust collector material transfer ducting treated with LVAL-100 and HUSH BATT™ HB-200 insulation.

LVQ-110-LAG composite material (Velcro is not standard)
How To Install HUSH WRAP™ Composite Acoustic Insulation:

- Determine circumference of duct or pipe to be wrapped. Add a minimum of 4" overlap of product onto itself allowing also for additional length required to accommodate the thickness of the material.
- Utilize standard 48" wide rolls of HUSH WRAP™ LVQ composite to cut lengths as required.
- Band or tape the material in place on large ductwork. Stick pins or weld pins should be utilized with additional emphasis on supporting the product across the bottom of rectangular duct systems.
- It is recommended that the quilted portion of the product wrap around and butt with the last 4" (+/-) of quilt trimmed off so that the barrier only overlaps onto the starting point of the wrap. Use an appropriate adhesive such as BURR-STICK-R-100 to secure the overlap.
- Cut and install the next section in the same fashion while overlapping the seam lightly. Tape or glue this seam as well.
- In all cases the important element is to assure there are no gaps or leaks whatsoever.
- Seams should be on underside of pipes/ducts.

How To Install HUSH WRAP™ Built-Up Component Acoustic Insulation:

- For built-up systems, installation procedures are complex and are best handled by a qualified insulation contractor. This contractor should comply with standard practices outlined in the National Insulation Contractors Association (NICA) insulation standard.
- The detail below shows how flat material can be cut using patterns detailed in the NICA insulation standard to form material around an elbow. This is commonly referred to as a gore type elbow.
- The use of HUSH SEALANT™ caulk is required to seal off all sectioned pieces.
- Avoid the use of screws and rivets as they tend to loosen and fall out. Ideally, hemmed seams provide the best acoustic seal, aesthetic appearance and longest service life.
- Call BRD for a list of qualified installers.