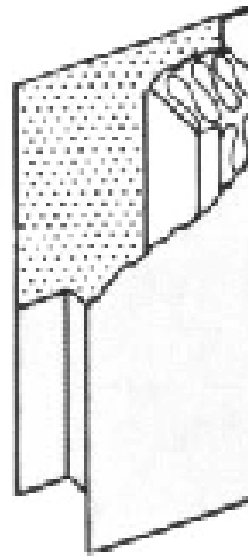


(Typical Arrangement)



(Internal View)



(Example: Specialty Design for machine outlet)

## **ENFORCER Series □ Acoustical Enclosure**

### **Application**

The control of noise in industry is becoming very important. Increased worker compensation claims involving hearing damage, and the advent of ever-increasing legislative; safety and economic requirements make a noise reduction program mandatory for many industries. Additionally, State, Federal, Provincial, or Local ordinances have been enacted to further protect the communities from unwanted 'Industrial 'noise as it migrates off-site. To meet these specific noise reduction requirements, E.I. Williams manufactures a complete line of acoustically designed panels, which can be quickly and easily assembled to provide complete or as desired, partial enclosures for any noisy equipment. E.I. Williams panels are designed to provide optimum noise control through the time proven method of sound transmission loss and sound absorption, using our proprietary internal arrangements and key specified materials to meet or exceed your requirements. Our E.I. Williams unique panel internal arrangements are specifically designed for each application and are sized to meet your requirements.

Additionally, enclosures can be designed with doors, windows, access panels and removable panels, floors. Doors are equipped with heavy-duty hardware and with seals to prevent further noise leakage. Window panels are framed and gasket sealed as specified. If constant access to the equipment is needed, removable panels will be incorporated in the enclosure design. All-important ventilation of the enclosure is also incorporated into the design based upon your requirements. Specialty paints, finishes and metal types are also available upon request.



## **ENFORCER Series □ Acoustical Enclosure**

### **Standard Panel Construction**

<b>Product</b>	<b>Typical Reduction</b>	<b>Service Type</b>	<b>Panel Construction</b>
<b>EE-2</b>	15-20	Mid and high frequency applications or where clearance only permits a 2" thick panel.	18-gauge solid galvanized steel outer skin and 22-gauge perforated galvanized steel inner skin and 2" of high-density acoustical insulation.
<b>EEC-2</b>	15-20	Mid and high frequency applications or where clearance only permits a 2" thick panel. Used specifically on P.D. Blowers and other similar equipment.	"Clam-shell" Design 18-gauge solid galvanized steel outer skin and 22-gauge perforated galvanized steel inner skin and 2" of high-density acoustical insulation.
<b>EE-4</b>	18-25	Best general-purpose construction. Will handle most applications at an affordable cost.	18-gauge solid galvanized steel outer skin and 22-gauge perforated galvanized steel inner skin and 4" of high-density acoustical insulation.
<b>EE-4HD</b>	25-30	Increased low frequency performance where a lower absorption coefficient is not a concern. Can be used in areas where the panels are used outdoors or in environments where contamination of the acoustic material is a concern.	16-gauge solid galvanized steel outer skin and 20-gauge perforated galvanized steel inner skin and 4" of high-density acoustical insulation.
<b>EE-4SHD</b>	30-40	Increased low frequency performance where a lower absorption coefficient is not a concern in certain bands. Can be used in areas where the panels are used outdoors or in environments where contamination of the acoustic material is a concern.	Same as construction <b>EE-4HD</b> with the addition of an 18-gauge septum between the high-density acoustical insulation and the perforated skin.



**ENFORCER Series □ Acoustical Enclosure**

**Acoustical Performance Datum:**

**Typical Sound Transmission Loss (dB) Frequency (Hz)**

Product	125	250	500	1000	2000	4000	STC	Notes
EE-2	17	23	34	47	55	57	37	
EEC-2	17	23	34	47	55	57	37	Clamshell design
EE-4	21	28	39	48	56	58	40	
EE-4HD	28	38	46	49	54	62	48	
EE-4SHD	27	34	48	61	66	70	48	Septum barrier

**Typical Sound Absorption Coefficients Per Frequency (Hz)**

Product	125	250	500	1000	2000	4000	STC	Notes
EE-2	0.15	0.66	1.07	1.06	0.97	0.86	0.95	
EEC-2	0.15	0.66	1.07	1.06	0.97	0.86	0.95	Clamshell design
EE-4	0.60	1.13	1.12	1.09	1.03	0.91	1.00	
EE-4HD	0.60	1.13	1.12	1.09	1.03	0.91	1.00	
EE-4SHD	0.86	1.09	1.22	1.06	1.05	1.04	1.10	Septum barrier

**Panel Vs. Enclosure Performance**

The above charts list test data for an individual one-piece panel. This is not always indicative of total enclosure performance because of noise leakage over the surface area of the enclosure walls and roof. Furthermore, leakage around pipe penetrations, under doors and around windows, through air ventilation openings, etc. can considerably reduce panel performance. For example, generally accepted studies have shown – when an enclosure design having panels incorporated for a near 40 dB transmission loss – have as little as 1% open area over the entire surface area of the enclosure - it will only yield an actual transmission loss of about 20dB.

**Lesson - Design is critical**

Our E.I. Williams experienced staff understands these issues and circumvents lower than expected transmission loss by understanding your operating environment needs initially, and incorporating a design that is specifically tailored for your application to gain maximum dB reduction in your enclosure.



**E. I. WILLIAMS TRADING (1992) CO.  
STEEL DIVISION**

**ENFORCER Series □ Acoustical Enclosure**

**ENFORCER Series □ Enclosure Specifications**

**1.0 General**

Panel enclosure systems shall be of acoustically filled double-wall construction and shall be provided as indicated on drawings to be supplied by the manufacturer. A recognized manufacturer with published standards of construction shall provide panels, components and accessories, as well as, published technical performance.

Performance of the fabricated and installed system shall conform to all specifications listed below.

**2.0 Materials - Acoustical Metal Panels**

**A.** All panels and their components shall be pre-fabricated, sectional, comprised of metal fabrication, modular and designed for easy and accurate field assembly. The panels and components shall not be subject to damage due to extended exposure to vibration, air temperature or humidity, unless otherwise specified for severe duty. -Severe duty is defined as Marine /Artic / Mobile Equipment/ and Military Duty.

**B. Panel Construction**

**1.** All panels shall be 2 to 4 inches thick, as noted on drawings, with a Mild-Carbon Steel or solid Galvanized Steel exterior shell, and a perforated/ Mild-Carbon Steel or solid Galvanized Steel interior shell. In the case of severe heavy-duty applications An E.I. Williams proprietary septum will be utilized within the enclosure confines. In order to ensure a further reduction in noise, the panels shall be connected together by means of a tongue and groove connection and held together rigidly by the use of self-taping sheet metal screws, to be installed on maximum 18" centers on the inside and outside of the panels.

**2.** The panel shells, framing members, and internal reinforcements shall form a metal-structure panel of sufficient strength for maximum operating loads specified in the structural performance section of these specifications.

**3.** The outer Mild-Carbon Steel or solid Galvanized Steel thickness shall be 18-gauge minimum and the inner Mild-Carbon Steel or solid Galvanized Steel shell shall be 22-gauge minimum thickness.

**4.** Where perforated materials are indicated, all perforations shall be 3/32" diameter holes on 3/16" staggered centers that shall result in an open area of no less than 25 percent.

**5.** All panel internal and external reinforcing members shall be minimum 18-gauge Mild-Carbon Steel or solid Galvanized Steel construction.



**E. I. WILLIAMS TRADING (1992) CO.  
STEEL DIVISION**

**ENFORCER Series □ Enclosure Specifications (Continued)**

6. Each panel shall be filled with absorptive and fire-retardant materials that are inert, mildew-resistant, and vermin proof. Specified absorptant material shall be equal to or greater than EI Williams proprietary "Ellis Quiet PAK 200" materials as follows:

**-DESCRIPTION**

-Semi-rigid batt that is a lightweight, water repellent, bonded rock wool product providing acoustical insulation, and has fire stopping properties

-Water repellent yet porous material, nevertheless, it absorbs water only when it is pressed or forced into the material. When the pressure is relieved the water will evaporate without any loss of integrity to the materials shape or insulating properties.

**-ACOUSTICAL PERFORMANCE\***

ATSM-C423

Thickness (inch)	Noise Reduction Co-efficient represented in Hz					NRC	
	125	250	500	1000	2000	4000	
2.0	0.26	0.68	1.12	1.10	1.03	1.04	1.00
3.0	0.63	0.95	1.14	1.01	1.03	1.04	1.05
4.0	1.03	1.07	1.12	1.04	1.07	1.08	1.10

**-FIRE PERFORMANCE\***

Materials shall be equal to or exceed "Ellis Quiet PAK 200" non-combustible rock wool product being able to withstand temperatures exceeding 1832°F (1000°C) without melting

**-APPROVALS \***

CSA A101-M83

VTEC 100-170-3

**-TEST RESULTS\*:**

CAN/ULC - S114	- Non-combustible
ASTM-E136	- Non-combustible
CAN/ULC - S102.2 - M88	- Flame spread 0
CAN/ULC - S102.2 - M88	- smoke developed <5
ASTM-E84	- Flame spread 0
ASTM-E84	- Smoke developed <5
CAN/ULC (formerly ULC C723)	- Smolder resistance 0.01%
ASTM C-518	- Thermal resistance R = 4.4 per inch

\*All performance, testing and approvals are provided for under Roxul Inc.- product manufacturer, for E.I. Williams, Inc.



***ENFORCER Series* □ Acoustical Enclosure**

**Enclosure Specifications (continued)**

**B. Panel Construction (continued)**

7. Where indicated on drawings, septum panels shall consist of a solid 16-gauge minimum Mild-Carbon Steel or solid Galvanized Steel, a minimum 18-gauge Mild-Carbon Steel or solid Galvanized Steel septum between the outer and inner skins and a 20-gauge minimum Mild-Carbon Steel or solid Galvanized Steel skin.

**C. Panel Components and Installation**

1. All accessory trim items shall be of 18-gauge minimum Mild-Carbon Steel or solid Galvanized Steel and shall be furnished in factory-standard lengths to be field cut to specified dimensions. Locations and quantity of sheet metal screws and trim requirements shall be in accordance with the manufacturer's installation details.

2. Base channel shall be installed on a level and true steel or concrete surface.

Floor level specifications\*

Variation from level or established grades for floors:

- When overall length of line or surface is:

Less than 3 meters . . . . . ±6 mm

3 to 6 meters, inclusive . . . . . ±10 mm

More than 6 meters, but less than 12 meters . . . . . ±12 mm

12 meters or more . . . . . ±20 mm

3. All external panel connectors, trim items, accessories, base channel/panel interfaces/base channel/floor interfaces, and other sections as noted on the drawings shall be sealed with an acoustical sealant that shall not harden.

**D. Structural Performance**

1. Any special external panel loading conditions including wind, snow and equipment shall be provided for as per specifications.

2. Under the indicated loading conditions, the entire enclosure system shall be self-supporting and/or will be supported as per the specifications. The installer shall furnish and assemble all structural members in strict accordance with drawings and manufacturer's installation details.

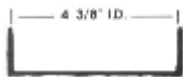
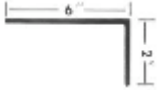


**E. Acoustical Performance**

1. The manufacturer shall provide certified testing data indicating sound absorption and transmission loss characteristics of the panel assembly, upon request.



**ENFORCER Series □ Acoustical Enclosure**

**Accessory Engineering Datum**

Components	Section Details	Application	Standard Lengths (inches)	Unit Weight - lbs./ft.	Notes
Floor Channel		Securing panels to floor area	120	Guage16 1.5	See Floor level Specification*
Outside Angle		Used to secure Vertical Corners and Rooftop	120	Guage16 2.0	N/A
Inside Angle		Used for inside trim, can be used for sealing ducts.	120	Guage16 1.0	N/A
Ceiling Cap		Used for joining roof to walls	120120	Guage16 3.5	N/A
Gasket/Pads	Various	Under Floor Channel	Various	N/A	Used to assist leveling tolerances/seal acoustic leaks