

# SUGGESTED SPECIFICATION MODULAR ACOUSTICAL PLENUMS



Commercial Acoustics

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A DIVISION OF METAL FORM MANUFACTURING

## GENERAL

Furnish and install modular Factory Fabricated Acoustical Plenums as shown on plans and as specified. Acoustical panels and components shall be the product of Commercial Acoustics Division of Metal Form Manufacturing. Any change in this specification must be submitted to and approved by the architect/engineer, both in writing, at least 10 days prior to the bid due-date.

## MATERIALS AND CONSTRUCTION

Plenum(s) shall be mounted on a level concrete curb (furnished by others). Panels shall be 4-1/4" or 2-1/4" thick with interior perforated panel sheets of 22 gauge galvanized steel with 3/32" diameter holes spaced on 3/16" staggered centers. Exterior solid panel sheets shall be 18 gauge G90 galvanized steel. Sound retarding and absorbing fill shall be incombustible, inert, mildew-resistant and vermin-proof. Internal panel reinforcement shall be roll formed 16 gauge galvanized steel and spaced so that span does not exceed 2'0". Perimeter and internal reinforcement and panel sheets shall be welded and/or riveted to form a rugged metal-sheathed acoustical panel. Spot welds shall not exceed three inches on centers. Prior to attaching the face sheet, the panel shall be filled with sound retardent and absorbing fill as specified above. The fill shall be slightly larger and thicker than the inside dimensions of the panel. No voids will be tolerated. The face sheet shall be welded and/or riveted to the panel assembly so as to compress and hold the fill materials in place under severe conditions of vibration such as encountered in shipment, installation and operation.

## DOORS

Door panels shall be of similar construction to standard panels. Doors shall be supplied 24" wide x 60" high or as specified on the drawings. Doors shall be 4 1/4" thick with double overlapping air/acoustic seals around the sill, jambs, and head. Door frames shall be 6063-T5 extruded aluminum, 0.156 inch thick with gasket recess. Frames shall be mitered with continuously welded seams to prevent leakage. Face sheets shall be 18 gauge G90 galvanized steel or 18 gauge, 3003-H 34 stucco embossed aluminum. Each door shall have two hinges and two latches with inside release handles. Hinges shall be heavy duty ball bearing type designed for door size and weight. Latches to be wedge lever type with inside handle. Each door shall be assembled and installed at factory into door panel with hinge hardware attached and adjusted. Panel to be pre-drilled for field installation of latch assembly. Doors shall be installed to open against air pressure.

## WINDOWS

Windows shall be furnished for doors where shown on the drawings and shall consist of two layers of 1/4" wire reinforced glass separated by an air space and sealed acoustically and air tight with rubber seals. Glass shall have 4" radius corners. Air space shall contain a dessicant to prevent misting.

## ACCESSORIES

Floor channels shall be rolled formed 16 gauge G90 galvanized steel. Panel connectros, if used, shall be roll formed 16 gauge G90 galvanized steel for greater strength. All panel accessories and trim shall be made of 18 gauge G90 galvanized steel furnished in standard lengths to be field cut as required. Openings for fan and duct connections where required shall be provided by the plenum manufacturer. Pipe and conduit penetrations shall be located and cut in the field and sealed in accordance with the Manufacturer's instructions. Fasteners shall be zinc plated, #12 x 1", self-drilling, self-tapping hex head sheet metal screws located 12 inch on center.

## ACOUSTICAL PERFORMANCE

Acoustical panel ratings shall be determined by the dual reveberation room method in accordance with ASTM specifications E-90-81, E413-73, C423-81a, E795, or latest versions thereof. The test set-up and procedure shall be such that all effects due to flanking transmission, standing waves and test chamber sound absorption are eliminated. Data shall be presented for tests conducted using current production samples. The minimum allowable transmission loss (TL) of the panel, including all components, when tested in accordance with ASTM E-90-81 and E413-73, or the latest versions thereof, shall be as follows:

### TRANSMISSION LOSS IN DECIBELS

| Octave Band            | 2   | 3   | 4   | 5    | 6    | 7    |            |
|------------------------|-----|-----|-----|------|------|------|------------|
| Center Frequencies, Hz | 125 | 250 | 500 | 1000 | 2000 | 4000 | <u>SIC</u> |
| Transmission           |     |     |     |      |      |      |            |
| Loss 4-1/4"            | 22  | 29  | 40  | 48   | 54   | 60   | 41         |
| (TL) 2-1/4"            | 21  | 24  | 35  | 43   | 52   | 57   | 37         |



The composite panel assembly, when tested in accordance with ANSI/ASTM C423-81a and E795, or the latest version thereof, shall have minimum absorption coefficients as follows:

**SOUND ABSORPTION CHARACTERISTICS**

| Octave Band            |        | 2    | 3    | 4    | 5    | 6    | 7    |            |
|------------------------|--------|------|------|------|------|------|------|------------|
| Center Frequencies, Hz |        | 125  | 250  | 500  | 1000 | 2000 | 4000 | <u>STC</u> |
| Absorption             | 4-1/4" | 0.86 | 1.09 | 1.22 | 1.06 | 1.05 | 1.04 | 1.1        |
| Coefficients           | 2-1/4" | 0.31 | 0.82 | 1.19 | 1.12 | 1.07 | 1.06 | 1.11       |

**STRUCTURAL PERFORMANCE**

Plenum installation shall be capable of withstanding a positive internal static air pressure of (insert no.) inches. Plenum installation shall be capable of withstanding a negative internal static air pressure of (insert no.) inches. The complete plenum structure shall be nominally self-supporting and air-tight up to a pressure differential of 10 i.w.g. Where roof spans, pressures, and wall loadings require additional structural strength, it shall be furnished either by additional panel reinforcement or additional structural members and/or pipe columns. Additional structural support shall be designed to assure that the plenum will be air-tight and not deflect more than 1/240th of the longest span. Metal surfaces shall be galvanized except exposed structural members and/or pipe columns which shall be HR steel with factory applied prime coat paint.

**THERMAL PERFORMANCE**

Individual panels shall have a heat transfer factor, "U", of 0.07 BTU/hour/sq. ft./degree Fahrenheit. The completed panel plenum shall have a heat transfer factor, "U", of 0.14 BTU/hour/sq. ft./degree Fahrenheit.

**FIRE HAZARD RATING**

Individual panels shall meet the following UL Fire Hazard Ratings as per ASTM specification E-84, or the latest version thereof.

- Flame Spread - 15
- Fuel Contributed - 0
- Smoke Developed - 0

**INSTALLATION**

Plenum manufacturer shall furnish complete erection drawings and installation instructions, including a bill of materials. Each panel shall be marked to match the drawings and the bill of material.

**WARRANTY**

Plenum manufacturer shall warrant that when plenum(s) are installed in a workmanlike manner in strict accordance with these specifications and manufacturer's instructions, plenum(s) shall meet the acoustical, thermal, and air pressure performance specified. Plenum components shall be furnished clean, well made and free of any defects which may adversely affect appearance, serviceability, performance.

**CERTIFICATION**

The manufacturer shall supply certified test data on transmission loss and absorption coefficients to the architect/engineer, in writing, at least 10 days prior to bid due-date. Test data shall be for a standard product. All rating tests shall be conducted by a nationally recognized acoustic testing laboratory in their facility, utilizing the same panels. This facility shall be open to inspection at the request of the architect/engineer. The testing laboratory shall be totally independent from the manufacturer. Data obtained in the manufacturer's test lab will not be acceptable unless substantiated by test reports conducted by a nationally recognized acoustic testing laboratory.

The manufacturer shall furnish proof, found to be satisfactory to the architect/engineer, of having manufactured similar plenums for at least five (5) years prior to this installation.