Acoustic Louvres Type LAAC 30 & LAAC 15

Usage

EMTEC LAAC 15 and LAAC 30 Acoustic Louvres are external weather louvres with acoustically absorbent blade elements specifically designed to reduce the level of noise passing through the opening into which the louvre is mounted.

The aerodynamic shape of the individual blades minimises the resistance to airflow and the incorporation of water traps ensures that rain ingress is effectively eliminated.

EMTEC LAAC 15 and LAAC 30 Acoustic Louvres can be installed as individual units or by bolting more than one unit together openings of any size can be accommodated. Each louvre has a robust outer framework which acts as vertical or horizontal mullions when several units are fixed together. If a continuous blade effect is preferred this can also be supplied.

The main uses of EMTEC Acoustic Louvres are in the control of mechanical fan noise when used as the termination of ducted air systems. Both exhaust air outlets and fresh air intakes can be fitted with EMTEC acoustic louvres. EMTEC Acoustic Louvres can also be used as plantroom ventilation louvres in order to attenuate general plant noise and as general purpose ventilation louvres in order to reduce external aircraft or traffic noise. In all these applications the louvres are normally built into structural openings and a number of alternative fixing arrangements can be supplied.

EMTEC Acoustic Louvres can be used as screens around equipment such as chillers, cooling towers or condensing units where an acoustic barrier is required and large volume airflows must be accommodated. In this application EMTEC Acoustic Louvres may be supplied complete with corner units, supporting steelwork, doors and dummy sections in order to form a complete self-contained structure.It is advisable that such applications be discussed with an EMTEC engineer who will be pleased to assist you in the formulation of a detailed design layout.

Construction

Standard EMTEC LAAC 15 and LAAC 30 Acoustic Louvres are manufactured from high quality galvanized sheet steel. The louvre frame and the upper surface of the blades are formed from plain sheet and the under side of the blades from perforated sheet. The acoustic media contained within the louvre blades is inert, non-flammable mineral wool and where a birdscreen is fitted to the rear face of the louvre
this is made from galvanized steel wire mesh having
12mm spacings.

EMTEC LAAC 15 and LAAC 30 Acoustic Louvres can be supplied in aluminium, stainless steel, plastic coated steel or galvanized steel polyester powder coated to compliment the architectural design of the final installation.

External or internal angle flanges can be supplied to fix louvres into structural openings and are normally manufactured from the same material as the louvre itself. Both types of acoustic louvre can be supplied with such flanges which can be pre-drilled to allow fixing to the adjacent structure. The louvre casing can alternatively be pre-drilled through the sides of the unit to allow louvres to be bolted together or when units are to be fixed into a timber frame. Fixing details of individual louvres are normally supplied at the time of order but can be furnished on request.

The height of the smallest EMTEC LAAC 15 Acoustic Louvre is 300mm and larger sizes increase in height multiples of 105mm (i.e: 405, 510, 615mm etc.). The height of the smallest EMTEC LAAC 30 Acoustic Louvre is 650mm and larger sizes increase in height by multiples of 225mm
(i.e: 875, 1100, 1325mm etc.) up to a maximum height for
a single louvre unit of 2450mm.

All EMTEC LAAC 15 Acoustic Louvres have a standard depth of 150mm. All EMTEC LAAC 30 Acoustic Louvres have a standard depth of 300mm. Widths are made to suit customers requirements up to a maximum width for a single louvre unit of 2400mm.

Typical Specification

Into Builderswork Opening:

EMTEC LAAC 15 Acoustic Louvres shall be installed in the positions indicated on the drawings to maintain the acoustic criteria shown in the specification. The acosutic louvres shall be constructed from galvanized steel and be supplied complete with external mounting flanges and birdscreens fixed to the rear face of the louvres. The louvres will be polyester powder coated to a standard, non-metallic, BS4800 or RAL colour.

As Acoustic Screen:

A screen of EMTEC LAAC 30 Acoustic Louvres shall be installed around the roof mounted chiller to a height of 2450mm. The screen shall be mounted on a pre-formed concrete plinth, 300mm high by 350mm wide, and supplied complete with dummy corner units, structural supports and
a louvred access door. The louvres are to form a self-supporting structure and the external finish will be black plastic coated steel.

Acoustic Performance

Acoustic Louvre	Sound Reduction Index in dB at Octave band centre frequencies (Hz)							
	63	125	250	500	1k	2k	4k	8k
LAAC 30 & LAAC 15	5	7	9	12	18	19	15	15

Aerodynamic Performance

It may be necessary to establish the correct size of acoustic louvre knowing that a certain pressure loss is required across the louvre for a given volume of air. In this case the face velocity of the louvre is read off the chart opposite and the louvre dimensions established from the formula:

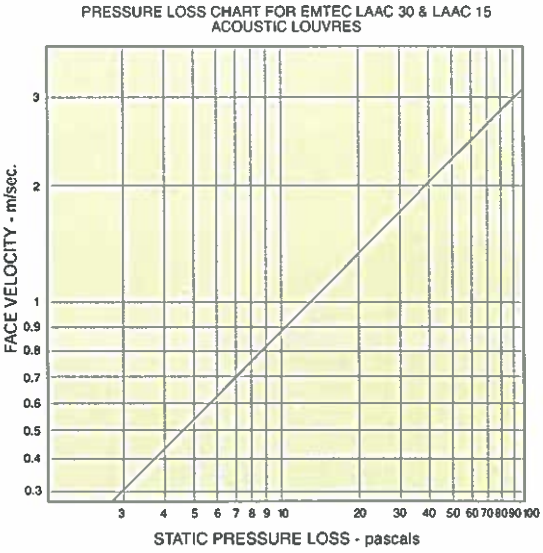
Airflow(Q) = Louvre Face Area (A_L)
x Louvre Face Velocity (V_L)

Conversely, for a known opening size and airflow, the pressure loss across the louvre can be obtained from the chart opposite.

Selection Example:
Assume the airflow is 5m³/sec and the structural opening is to be made approximately 2000mm wide by 1500mm high. From the formula above a louvre face velocity is established as

$$V_L = \frac{Q}{A_L} = \frac{5}{2 \times 1.5} = 1.666\text{m/sec.}$$

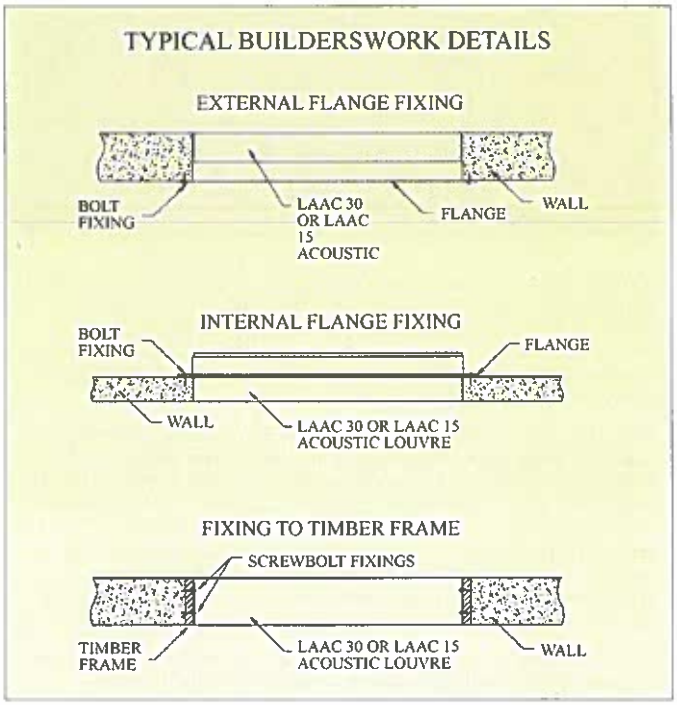
From the chart opposite this gives a pressure loss of 28 pascals. The exact louvre height nearest to 1500mm high is 1525mm which would give a final louvre selection as shown below.
LAAC 30 Acoustic Louvre -
2000mm wide x 1525mm high x 300mm deep.



Physical Properties

LAAC 30 Acoustic Louvre.

LAAC 15 Acoustic Louvre.



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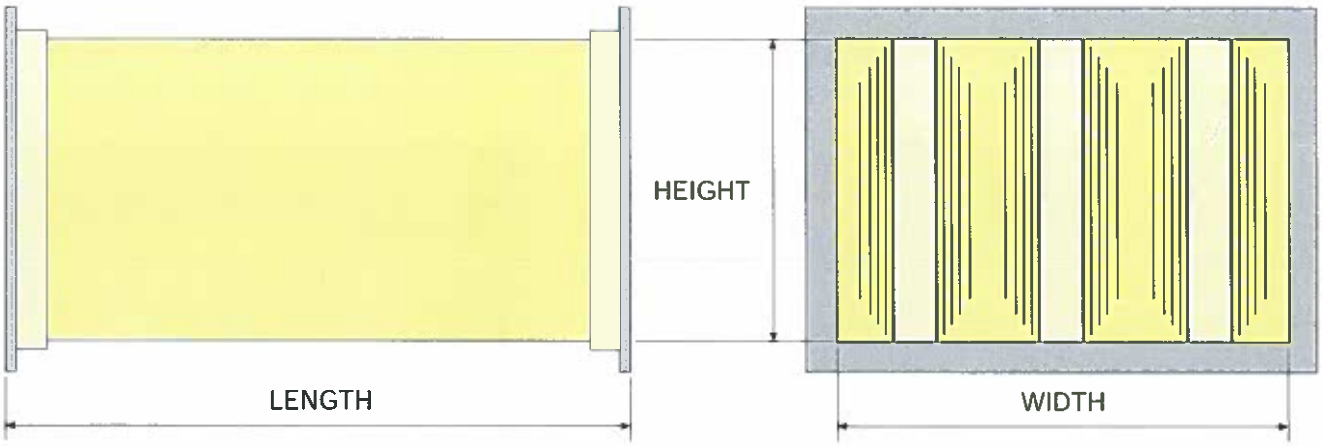
Rectangular Duct Silencer Type RAAC 25



Usage

The EMTEC RAAC 25 Rectangular Duct Silencer is an absorptive baffle attenuator which converts duct-borne noise energy into thermal energy within the acoustic media contained in the baffle elements.

The RAAC Rectangular Duct Silencer range has been specifically designed for use in ducted ventilation and air conditioning systems. The main applications of RAAC silencers are the reduction of mechanical noise generated by the primary air circulation fan and the elimination of secondary regenerated noise from terminal units, mixing chambers or pressure reducing devices.

EMTEC RAAC Rectangular Duct Silencers are also used to reduce the level of external noise (aircraft, traffic etc.) entering a building, to control and contain the noise of enclosed machinery (pumps, compressors, generating sets etc.) and the elimination of speech interference, transferred by interconnecting ducting, across office walls and partitions.

Selection of the correct RAAC silencer is by subtraction of the Dynamic Insertion Loss from the source sound level with corrections being made for the natural attenuation of the duct system to obtain the established space noise criteria. EMTEC engineers are available on request to assist you in the proper selection of silencers for your particular requirements.

Construction

The EMTEC RAAC 25 Rectangular Duct Silencer has inter-baffle separation of 75mm and the individual baffle elements are 200mm wide. This gives a modular width of 275mm and with this combination gives high attenuation over a short silencer length. An increase in duct cross sectional area will probably be required to optimise the silencer's pressure loss and self noise.

RAAC 25 Silencers are supplied with duct widths equal to any multiple of 275mm, with duct heights to suit the customer requirements and in any one of nine standard lengths (600, 900, 1200, 1500, 1800, 2100, 2400, 2700 and 3000mm).

EMTEC RAAC Standard Rectangular Duct Silencers are constructed from high quality galvanised sheet steel. The casings are lockformed and comply with the latest HVCA ductwork standard. All joints are sealed with a suitable mastic sealant and the baffle elements and end flanges are retained by sealed fixings. In this standard form EMTEC RAAC Silencers can withstand duct static pressures up to 1250 pascals. For higher static pressures the casing of the silencer is constructed from mild steel sheet, all joints being continuously seam welded.

The baffle elements contain inert, non-flammable, tissue faced mineral wool retained in a galvanised sheet steel casing. The inlet profile of the baffle is aerodynamically shaped to minimise pressure losses and the side faces of the baffle are formed from stiffened perforated metal to ensure stability and integrity of the acoustic media even under adverse airflow conditions. The acoustic media can be further protected for special applications such as supplying air to clean rooms or operating theatres or extracting from kitchens, laboratories or highly contaminated industrial process areas. For such special applications an EMTEC engineer should be consulted to establish the most appropriate treatment.

Typical Specification

EMTEC RAAC Rectangular Duct Silencers shall be installed in the positions indicated on the drawings to maintain the acoustic criteria shown in the specification. The silencers shall have galvanised sheet steel casings with drilled, mild steel end flanges. The inlet section of the baffle elements shall be aerodynamically shaped. The acoustic media shall be inert, non-flammable, tissue faced mineral wool. The acoustic media shall be retained in position by perforated, galvanised steel face sheets stiffened to maintain the integrity of the baffle element even under adverse airflow conditions.

Acoustic

Length (mm)	Dynamic Insertion Loss (dB) at Octave band centres (Hz)							
	63	125	250	500	1K	2K	4K	8K
600	6	9	15	27	34	34	31	28
900	7	11	18	32	40	40	36	33
1200	8	14	26	39	49	47	45	36
1500	9	18	30	48	50	50	50	50
1800	10	20	36	50	50	50	50	50
2100	12	24	42	50	50	50	50	50
2400	14	27	47	50	50	50	50	50
2700	16	29	50	50	50	50	50	50
3000	18	31	50	50	50	50	50	50

Duct Velocity (m/sec)	Corrections to D.I.L. in dB for duct velocities greater than 4 m/sec							
	63	125	250	500	1K	2K	4K	8K
+4	0	-1	-2	-3	-3	-2	-2	-2
+8	-3	-3	-3	-4	-4	-5	-6	-6
-4	0	+1	+1	+2	+2	+1	+1	0
-8	+2	+2	+3	+3	+3	+3	+2	+2

+ve velocities are for noise and airflow in the same direction and -ve velocities where noise and airflow are in opposite directions

Duct Face Velocity (m/sec)	Silencer Self Noise in dB ref 10^{-12} watts for different velocities							
	63	125	250	500	1K	2K	4K	8K
2	39	36	37	36	36	35	33	27
3	49	45	46	43	43	42	42	38
5	58	55	53	55	53	54	53	45
8	66	60	61	61	63	63	60	61

The silencer self noise levels .given in the table opposite are for a face area of 0.5m². For areas greater or smaller the dB corrections shown below should be applied.

Face area (m²)	0.1	0.25	0.75	1	3	5	10
Corrections to PWL (dB)	-7	-3	+2	+3	+7	+10	+13

Aerodynamic

It may be necessary to establish the correct size of silencer knowing that a certain pressure loss is required across the silencer for a given volume of air. In this case the duct face velocity is read off the chart opposite and the silencer dimensions established from the formula below:

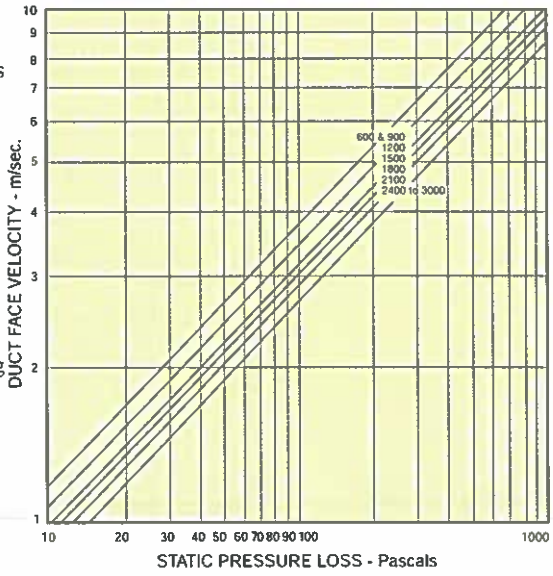
Airflow(Q)=Duct Area (A) x Duct Face Velocity (v)

Conversely for a known duct size and airflow the pressure loss across the silencer can be obtained from the chart opposite.

Selection Example:
Assuming the airflow is 5m³/sec and the maximum allowable pressure loss is 100 pascals. Assuming also that a 1200mm long silencer will meet the acoustic requirements by entering the chart opposite on the horizontal axis at 100 pascals, for a 1200mm long silencer, a duct velocity of 3.5m/sec is obtained. The duct area is then given as A=Q/v=5/3.5=1.43m². If a width of 1375mm is now selected (being 5 x modular width) the height will be 1050mm and the final selection will be as shown below.

EMTEC RAAC/25/1200 Silencer -
1375mm x 1050mm x 1200mm long.

PRESSURE LOSS CHART FOR EMTEC RAAC 25 SILENCER



Physical

EMTEC RAAC Rectangular Duct Silencers can be positioned at any point in a ductwork system consistent with good airflow and acoustic design considerations. The silencer performance may be compromised if the flow conditions immediately before or after the silencer location are excessively turbulent. For this reason it is recommended that a minimum length of straight ducting on both sides of the silencer be allowed equal to three times the largest duct dimension. When plantroom arrangements do not allow this minimum condition then it is advisable to incorporate turning or guide vanes into the duct design to ensure that the airflow is uniform across the silencer face area.

The EMTEC RAAC 25 Rectangular Duct Silencer has an approximate volumetric weight of 180 Kg/m³. Silencers should be installed onto angle or channel supports placed at right angles to the baffle elements across the width of the silencer. When lifting an EMTEC RAAC 25 Rectangular Duct Silencer into position on site it is important to ensure that the slings used are placed around the outside of the silencer casing and the silencer lifted with the baffle elements vertical. It is imperative that silencers not be lifted by their end flanges or by slinging through the internal airway passages.

Silencers of large dimension (above a face area of 1.5m²) can be supplied in modules for on site assembly. For individual requirements please consult an EMTEC engineer.

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