

Duct Liner MGC

Sound absorption for air rush noise

Glass fibre bonded with synthetic polymerised resins, faced one side with a black coated glass cloth offering minimum resistance to air flow and maximum resistance to air erosion.

Advantages

- Absorb unwanted crosstalk, equipment and air rush noise
- Improves energy efficiency by reducing heat gain or loss
- Performs in most types of heating and cooling duct systems, operating at velocities up to 6000 fpm and temperatures to 250° F

Applications

Primarily used as an acoustic liner in sheet metal ducts to absorb unwanted equipment and air rush noise.

Specification

Density:	32kg/m ³	32kg/m ³
Roll Size:	1.2m x 10m	1.2m x 5m
Thicknesses:	25mm	50mm

Moisture Absorption

0.04% moisture absorbed by volume

Temperature Range

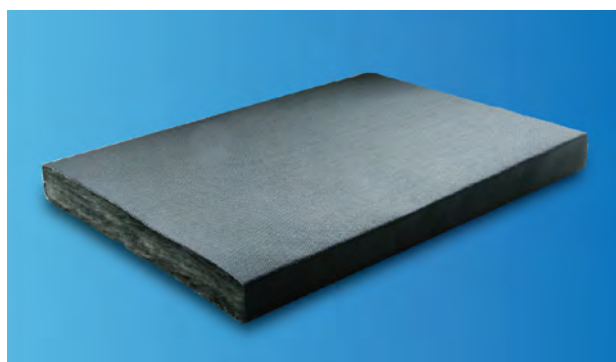
+4 to +200° C

Maximum Velocity

The maximum velocity of the air stream should not exceed 30 m/s. At this velocity no air erosion will occur when fixed in accordance with the manufacturer's instructions.

Dimensional Stability

Will not disintegrate under vibration.



Fire Resistance

Complies with:

Composite:	BS 476 Parts 6 & 7	Class 0
Glass Fibre:	BS 476 Part 4	Pass

Thermal Conductivity

Testing carried out in accordance with BS 874

Temperature (°C)	10	25	50
Thermal Conductivity (K Value)	0.030	0.032	0.035

Sound Absorption

Testing carried out in accordance with ASTM C423-81

Frequency Hz	125	250	500	1k	2k	4k
25mm	0.08	0.36	0.59	0.86	0.95	0.90
50mm	0.34	0.64	0.96	1.03	1.00	1.03

Installation Instruction

Flexible duct liner of the specified material thickness and density shall be finished and installed where shown on the contract drawing.

Unless otherwise indicated, the net free area of the duct dimensions given on the contract drawing shall be maintained. The duct dimensions shall be increased as necessary to compensate for liner thickness.

The liner surface designated to be exposed shall face the air-stream.

Each layer of duct liner shall be adheres with 90% coverage of adhesive at liner contact surface area.

All edges of liner facing in the direction of airflow and not receiving metal nosing shall be coated with adhesive. Liner shall be neatly butted without gaps at transverse joints and shall be coated adhesive at such joints.

Liner shall be folded and compressed in the corners of rectangular duct sections or shall be cut and fit to assure butted edge overlapping. Longitudinal joints in duct liner shall not occur except at the corners of ducts unless the size of the duct and standard liner product dimensions make such necessary.

Interior widths of duct not exceeding 8" do not require mechanical fasteners in additions to adhesive.

Excepts noted in paragraph S2.6 herein mechanical fasteners shall be located with respect to interior dimensions and regardless of airflow direction as follows:

Velocity	Transversely Around Perimeter	Longitudinally
2500 fpm dn	At 4" from corners and at intervals not exceeding 12"	At 3" from transverse joints and at intervals not exceeding 18"
2501 fpm to 6000 fpm	At 3" from corners and at intervals not exceeding 6"	At 3" transverse joints and at intervals not exceeding 16"

Longitudinal joints in liner shall be coated with adhesive at velocities over 2500 fpm.

Metal nosings that are either channel or Z profile or are integrally-formed from the duct wall shall be securely installed over transversely oriented liner edges facing the air-stream at fan discharge and at any interval of lined duct preceded by unlined duct. In addition, where velocities exceed 4000 fpm metal nosing shall be used on upstream edges of liner at every transverse joint.

Where dampers, turning vane assemblies or other devices are placed inside of lined duct or fittings, the installation must not damage the liner or cause erosion of the liner. The use of metal hat sections or other buildout means is optional; when used, buildouts shall be secured to the duct wall with bolts, screws, rivets or welds.

Liner shall also be installed with mechanical fastening devices that

- are spaced in accordance with Figure 2,
- when installed, are as corrosion resistant as G60 coated galvanised steel,
- will not adversely affect the fire resistance classification of liner and adhesives,
- do not damage the liner when applied as recommended by the manufacturer,
- do not cause leakage in the duct,
- do not project more than nominally into the air-stream,
- will indefinitely sustain a 50lb tensile dead load test perpendicular to the duct wall,
- are the correct length for the specified liner thickness.

Commentary

These standards presuppose that the designer of a duct system has:

- Clearly designated on the contract drawings the amount of ductwork to receive lining.
- Elsewhere specified the type of liner, thickness and density of liner and type of adhesive to be used.
- Determined that the liner materials specified have the acoustical, friction loss and other performance characteristics required for the application.
- Provided for condensation control where interruption of liner would cause a problem.

Typically, duct liner is of flexible, fibrous glass material of 1/3" thickness and 1-1.5 lbs per ft. density. It is primarily used for its sound absorption characteristics although it may have some thermal resistance value. Moulded round liner is available. Metal wall liner lining is available for all conventional duct shapes: typically of 22 gauge galvanised steel with 3/32" diameter holes on 3/16" or 1/4" centres. The double wall style of duct is used where increased resistance to damage is desired or erosion of the inner surface might occur.

Standard flexible liner is normally shop installed. Minor damage to the liner surface may occur in transportation and handling. Small cuts, tears or abrasions may be repaired with fire retardant adhesive. Significant damage would not constitute material in new condition.

Liner is normally pre-qualified for certain resistance to moisture absorption, mould growth and degradation from high humidity. The occasional exposure to wet weather during transportation or pre-building enclosure conditions in new construction does not necessarily impair performance of liner; in such cases drying or other corrective measures recommended by the material manufacturer should be followed.

Installing two layers of materials to meet a minimum liner thickness is not recommended. For the special circumstances in which it must be done, 90% minimum adhesive coverage of each layer should be as though it were the only layer. In addition, special attention to leading edge conditions is required.

Duct linings are normally required to be interrupted at fire dampers (to avoid adverse effect on damper operation) and at heat sources (to meet minimum clearance specified as a condition of equipment listings). Note. Some appliances are rated for zero clearance to combustible material.

Liner adhesives are usually water based or solvent based and they may be flammable in wet or dry or both wet dry states. Designers are urged to select adhesives that meet construction and code requirements. So-called safety standards may involve test that report various characteristics but abstain from hazard classification under installed conditions. Contractors are invited to follow ventilation, storage and other precautions published by the adhesive manufacturers.

Liner Fasteners

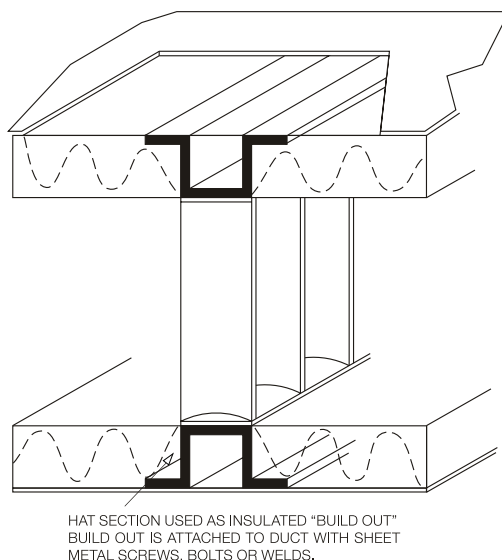
Three types of fastener are commonly used with duct liner. For each type of fastener a specific pin length is appropriate for each type and thickness of liner. It is important that the proper pin length be used. A faulty installation will result when it is not.

Adhesively secured fasteners have large base for use with an adhesive. After sufficient time has been allowed to achieve adequate bond strength - which will depend upon the prevailing temperature duct liner is impaled in the pin and spring-clip or washer added.

Mechanically secured fasteners are attached by two techniques, resistance welding and capacitance discharge welding. Correct adjustment of the timing devices is necessary to obtain a solid weld without burn-through.

The type of pin that is applied prior to the duct liner installation takes a spring-clip or washer. Pins with pre-attached caps are pressed through the installation and attached to the duct in a single operation.

Depending on the type of fastener used, discolouration or dimpling may be evident when fasteners are properly attached to sheet metal. This does not affect the serviceability of the fastener or the sheet metal.



NOTE:
VANES AND DAMPERS MUST BE INSTALLED IN A MANNER THAT WILL NOT DISRUPT LINER, RESTRICT DAMPER OR INCREASE FRICTION LOSS.

Figure 1

WHEN VELOCITY EXCEEDS 4000FPM USE METAL NOSING ON EVERY EDGE. NOSING MAY BE FORMED ON DUCT OR BE CHANNEL OR 'Z' PROFILE ATTACHED BY SCREWS, RIVETS OR WELDS.

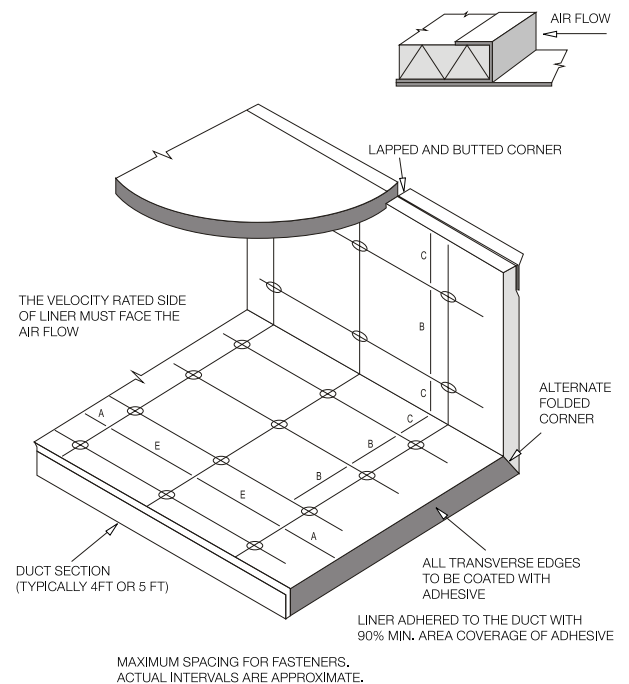


Figure 2

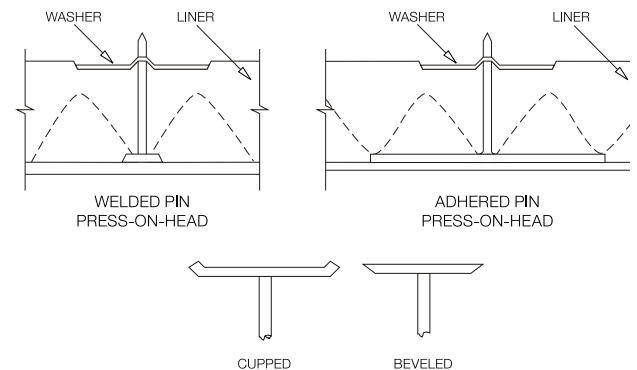


Figure 3

SoundPro® is the registered trademark of Wilhams Insulation Far East Sdn Bhd

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