



Product Information from NAIMA:

Fibrous Glass Insulation Boards

In this issue, we address the specific uses, performance characteristics, fire safety, condensation control, personnel protection, and installation recommendations for fibrous glass insulation boards.

Uses

Fibrous glass insulation boards may be applied to the exterior of sheet metal ducts, housings, and plenums. These semi-rigid to rigid boards are also suitable for insulating chillers and other cold or hot equipment, and can be used in applications operating within the temperature range of 0°F (-18°C) to 450°F (232°C). They are available in thicknesses from 1 in. (25 mm) to 4 in. (102 mm) in ½ in. (13 mm) increments.

Description

These products are composed of glass fibers bonded together with a thermosetting resin. They are manufactured in various densities and thicknesses. Fibrous glass insulation boards are available unfaced, or faced with FSK (foil/scrim/kraft) or ASJ (all-service jacket) facings. Both are excellent vapor retarders; FSK provides a metallic finish, while ASJ presents a white finish.

Features and Benefits

Versatility

Fibrous glass insulation boards are available in a range of stiffnesses, faced or unfaced, and in a range of thicknesses. They may be applied to round, rectangular, oval, or irregularly shaped ducts, plenums, and equipment.

Thermally efficient

These insulations reduce heat loss or gain through duct, plenum, and equipment walls, saving energy and helping to reduce equipment operating costs.

Mechanical strength

Higher density insulation boards resist compression. They are especially suited for use in mechanical rooms, where traffic is frequent and a neat finished appearance is desired. They are frequently used as insulations in systems exposed to the weather.

Easy to install

Fibrous glass insulation boards can be installed simply by impaling on weld pins and securing with speed clips or washers, or using special weld pins with integral cupped head washers. Panels are easy to handle, cut, and install.

Acoustical performance

These fibrous glass insulations provide excellent sound absorption properties for vibration damping but do not control airborne noise. Consult manufacturers' literature for specific sound absorption data.

Code compliance

Fibrous glass insulation boards meet the physical property requirements of ASTM C 612 as well as meeting the fire safety requirements of NFPA 90A and

90B including limited combustibility, 25/50 in accordance to ASTM E 84, and ASTM C 411 at a minimum of 250°F (121°C). They also comply with all requirements listed in the ICC codes.

Thermal Performance

Manufacturers' published literature shows these products to perform in the R-value ranges shown in Table 1, depending on product density and thickness.

Installation

On exterior duct surfaces, insulation is installed by impaling it on weld pins and securing with speed clips or washers, or using special weld pins with integral cupped head washers. Unfaced boards can then be finished with

reinforced insulating cement, canvas, or weatherproof mastic, depending upon the application. See Figure 1 (next page). Faced boards can be installed in the same way. Joints between boards are sealed with pressure-sensitive tape or glass fabric and mastic. For complete installation details consult the MICA fabrication and installation standards.

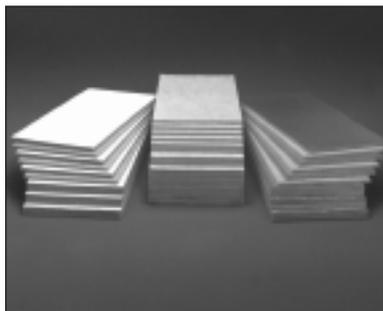
Condensation Control

Figure 2 (next page) shows the installed R-values of fibrous glass insulation boards required to prevent moisture condensation on the vapor retarder surface under varying conditions of ambient temperature and relative humidity. Curves are based on internal air temperatures of 55°F (13°C) and no air movement on the exterior surface. Note: R-values

Table 1 – Commonly Available R-Values

Thickness, in. (mm)	1 (25)	1½ (38)	2 (51)	2½ (64)	3 (76)	3½ (89)	4 (102)
R value, hr•ft ² •°F/Btu	4.0–4.5	6.0–6.8	8.0–9.0	10.0–11.4	12.0–13.6	14.0–16.0	16.0–18.0
(RSI, m ² •°C/W)	0.70–0.79	1.06–1.20	1.41–1.58	1.75–2.01	2.11–2.39	2.46–2.82	2.82–3.17

Thermal values are for insulation only as determined by ASTM C 518 at 75° F (24° C) mean temperature and do not include air films or reflective surfaces. Values are subject to manufacturing and testing tolerances.



Fibrous glass insulation boards are available unfaced, or with ASJ (all-service jacket) or FSK (foil/scrim/kraft) vapor retarder facings. Faced boards are easily installed by cutting to size and trimming to provide a staple flap. Where a vapor

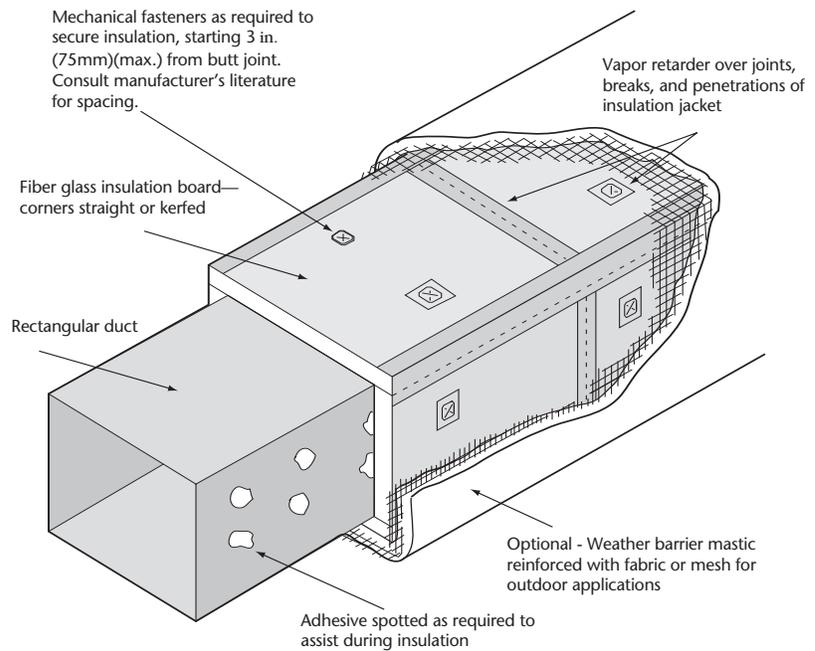
retarder is required, seams and joints are sealed with glass fabric and mastic or with pressure sensitive tape. These boards may also be installed by impaling on weld pins and securing with clips or washers.

as required by ASHRAE 90.1 may not be sufficient for condensation control, as may be seen in Figure 2.

Insulating for Personnel Protection

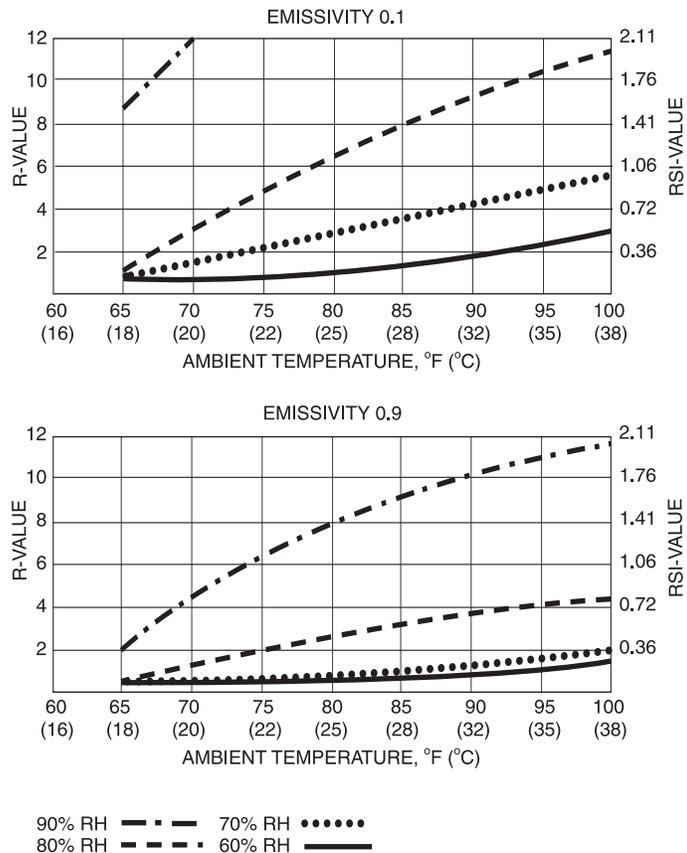
Insulation thickness is considered sufficient to provide personnel protection when its surface temperature does not exceed 140°F (60°C). Table 2 (next page), based on NAIMA 3E Plus® Program, gives the thicknesses of fibrous glass insulation boards that will achieve such protection at operating temperatures to 450°F (232°C).

Figure 1 – Installation of fibrous glass insulation board on duct or plenum exterior.



(From National Commercial & Industrial Insulation Standards, Midwest Insulation Contractors Association)

Figure 2 – Required R-Values to Prevent Moisture Condensation



**Table 2 – Thickness Required for Personnel Protection
Insulation Thickness, in. (mm)**

System Operating Temperature	FSK Facing	ASJ or bare
150°F (66°C)	½ (13)	½ (13)
200°F (93°C)	½ (13)	½ (13)
250°F (121°C)	1 (25)	½ (13)
300°F (149°C)	1 (25)	½ (13)
350°F (177°C)	1½ (38)	1 (25)
400°F (204°C)	2 (51)	1 (25)
450°F (232°C)	2½ (64)	1 (25)

Short Form Field Inspection Check List

YES NO

Are insulation boards certified to comply with ASTM C 612?	<input type="checkbox"/>	<input type="checkbox"/>
Is the insulation with the proper R-value as required by the building code, condensation or personal protection control been selected?	<input type="checkbox"/>	<input type="checkbox"/>
Were all joints in sheet metal ductwork tightly sealed before installing insulation?	<input type="checkbox"/>	<input type="checkbox"/>
Are mechanical fasteners the right length for the insulation thickness?	<input type="checkbox"/>	<input type="checkbox"/>
Are mechanical fasteners spaced on 16 to 18 in. (400 to 450 mm) centers starting no more than 3 in. (75 mm) from joints?	<input type="checkbox"/>	<input type="checkbox"/>
Are mechanical fasteners spaced at the correct intervals?	<input type="checkbox"/>	<input type="checkbox"/>
Where a vapor retarder is required, are seams of insulation boards tightly taped or sealed with glass fabric and mastic?	<input type="checkbox"/>	<input type="checkbox"/>
Is pressure-sensitive tape at least 3 in. (76mm) wide over all seams and joints?	<input type="checkbox"/>	<input type="checkbox"/>
Is field-jacketing material evenly and uniformly applied, with no gaps or seams?	<input type="checkbox"/>	<input type="checkbox"/>
Where a vapor retarder is required, are all fasteners tightly sealed with pressure-sensitive tape matching the insulation facing?	<input type="checkbox"/>	<input type="checkbox"/>

About NAIMA

NAIMA is the association for North American manufacturers of fiber glass, rock wool, and slag wool insulation products. Its role is to promote energy efficiency and environmental preservation through the use of fiber glass, rock wool, and slag wool insulation, and to encourage the safe production and use of these materials.

In May, 1999, NAIMA began implementing a comprehensive voluntary work practice partnership with the U. S. Occupational Safety and Health Administration (OSHA). The program, known as the Health and Safety Partnership Program, or HSPP, promotes the safe handling and use of insulation materials and incorporates education and training for the manufacture, fabrication, installation, and removal of fiber glass, rock wool, and slag wool insulation products.

**For more information, contact:
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For additional information on fibrous glass insulation boards, contact one of the manufacturers listed below.

CertainTeed Corp.
P. O. Box 860
Valley Forge, PA 19482
800-233-8990

Johns Manville
P. O. Box 5108
Denver, CO 80217
800-654-3103

Knauf Insulation
One Knauf Drive
Shelbyville, IN 46176
800-825-4434

Owens Corning
One Owens Corning Parkway
Toledo, OH 43659
800-GET-PINK