

PRODUCT SELECTION GUIDE

for Original Equipment Manufacturers
in the Transportation Industry





Performance-proven solutions for sound absorption, thermal efficiency, tensile strength, and ease of fabrication and installation.



At **Johns Manville**, we are dedicated to consistently providing you with reliable, technologically advanced solutions you can count on. JM product quality, in combination with our excellent customer support and technical assistance, has made us a preferred brand among Original Equipment Manufacturers.



Every application demands its own materials, specific properties and unique construction. JM provides a variety of cost-effective products and innovative technical solutions to match your unique needs.

This selection guide provides a quick overview of the broad range of JM insulation products available to Original Equipment Manufacturers – specifically in the transportation sector. These products set the industry standard for quality, consistency and performance. At Johns Manville, we create inventive solutions to match your evolving needs.



The Markets We Serve

JM provides a wide variety of insulation products in an array of sizes, densities and configurations to match the growing and changing needs of the increasingly demanding transportation markets. These products have been designed and developed specifically to provide excellent thermal and acoustic performance for the Aircraft, Automotive, Rail and Space markets.



AIRCRAFT

JM fiberglass insulation addresses the critical space and weight requirements for aircraft. Our wide range of aerospace products provides superior acoustic and thermal performance, and can be fabricated to fit precisely to your configuration requirements. These products are resistant to high heat and have water-repellent characteristics to inhibit the absorption of moisture in the aircraft which can cause dangerous weight gain. With our Premium line of aerospace materials, you'll find superior, acoustic and thermal performance at an even lower weight.



SPACE

JM manufactures a unique line of Quartz fiber products, Q-Fiber®, and other Micro-Fiber® Felts. Q-Fiber is an amorphous, exceptionally pure, fibrous silica material. These flexible and resilient fibers enable Q-Fiber to be readily formed into a variety of standard and custom shapes, including sheets, felts, blocks, tiles and cast forms. Q-Fiber forms the primary component for a diverse range of insulating materials used in spacecraft, missile and satellite applications where service temperatures range from -170°F (-112°C) to 2300°F (1260°C).



AUTOMOTIVE

JM offers creative solutions to diverse automotive applications with products that help reduce both the transmission of noise and the transfer of heat. Moldable Glass Wool (MGW) blanket is manufactured using glass fibers treated with a highly specialized resin. It is manufactured in an uncured state and when molded, provides superior acoustic and thermal performance for use in the manufacture of components such as hoodliners or dash insulators. MGW is lightweight, flexible, heat-resistant and has low flammability and moisture absorption properties. MGW is available in both amber and black.



GENERAL TRANSPORTATION

(Light Rail,
High Speed Train,
Fast Ferries, etc)

JM's extensive line of insulation products addresses the needs of today's transportation industry where weight and space are critical, excellent acoustic and thermal properties are needed, and superior fire resistance with minimal smoke and toxic gas emissions are mandated. Our partnership with JM's approved Master Fabricators that are strategically located near Original Equipment Manufacturers across the U.S., allows us to deliver insulation products that meet your unique application demands and specific industry requirements. Product solutions can include plain roll goods, pre-molded shapes, and mats and boards with special facings.

At JM, we're committed to the details that matter most to you.



AIRCRAFT

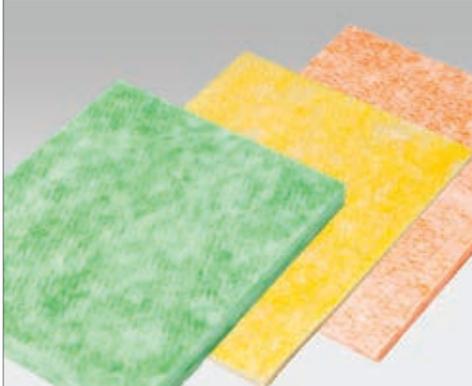
Microlite® B



Johns Manville Microlite® B Blanket is a lightweight, flexible, insulating material. This blanket is formed from flame attenuated borosilicate glass fibers and bonded with a thermosetting phenolic resin binder to provide the blanket with strong dimensional stability.

Temperature Limit: 450°F (232°C)

Microlite® AA Standard



Microlite® AA Blankets, formed from biosoluble fibers, are lightweight, flexible, thermal and acoustic insulating materials designed for use where space and weight savings are a critical consideration. Microlite AA Blankets are furnished with a thermosetting phenolic binder which is flame resistant and non-punking, and provides excellent dimensional stability. An additive is used to provide water repellency to the cured blanket for service in areas where high altitude moisture condensation may occur. In circumstances where moisture is not a concern, plain phenolic binder can be specified.

Temperature Limit: 450°F (232°C)

Microlite® AA Premium NR



Microlite® AA Premium NR is a lightweight, flexible, thermal and acoustic insulation material designed to provide the ultimate in noise reduction at minimal weight. Microlite AA Premium NR blankets are formed from resin-bonded borosilicate biosoluble glass fibers. An additive is used to provide water repellency to the cured blanket for service in areas where high altitude moisture condensation may occur.

Temperature Limit: 450°F (232°C)

Available Density & Thickness¹

0.5 - 1.0 pcf
0.5" - 1.0"

0.42 - 1.50 pcf
0.375" to 1.0"

0.34 - 1.20 pcf
0.375" & 1.0"

Thermal Conductivity (k) per ASTM C-518 Mean Temp @ 75°F (24°C)

| Density (lbs/ft ³) | | Btu-in/hr-ft ² -°F | | Density (lbs/ft ³) | | Btu-in/hr-ft ² -°F | | Density (lbs/ft ³) | | Btu-in/hr-ft ² -°F | |
|--------------------------------|------|-------------------------------|--|--------------------------------|------|-------------------------------|--|--------------------------------|------|-------------------------------|--|
| 0.5 | 1.0 | 0.31 | | 0.42 | 1.50 | 0.28 | | 0.34 | 1.20 | 0.28 | |
| 1.0 | | 0.25 | | 0.60 | | 0.25 | | 0.50 | | 0.25 | |
| | | | | 1.50 | | 0.22 | | 1.20 | | 0.21 | |
| Density (kg/m ³) | | Watts/Meter-°C | | Density (kg/m ³) | | Watts/Meter-°C | | Density (kg/m ³) | | Watts/Meter-°C | |
| 8.0 | 16.0 | 0.043 | | 6.7 | 9.6 | 0.040 | | 5.5 | 8.0 | 0.040 | |
| | | 0.036 | | 9.6 | 24.0 | 0.036 | | 8.0 | | 0.036 | |
| | | | | 24.0 | | 0.032 | | 19.2 | | 0.030 | |

Sound Absorption Coefficients per ASTM C-423 Type A Mounting

Noise Reduction Coefficient (NRC)

| | |
|---------------|------|
| 0.5pcf x 1" | 0.55 |
| 1.0pcf x 0.5" | 0.50 |
| 1.0pcf x 1.0" | 0.70 |

Sound Transmission Loss (DB) per ASTM E-90

Density x Thickness (3 Layers)

| Density | | Thickness | | Frequency (Hz) | | | | |
|---------|-------------------|-----------|-----|----------------|-----|------|------|------|
| pcf | kg/m ³ | in | mm | 250 | 500 | 1000 | 2000 | 4000 |
| 0.42 | 6.7 | 1 | 25 | 3.9 | 6.0 | 10.8 | 14.5 | 19.8 |
| 0.60 | 9.6 | 1 | 25 | 5.4 | 7.2 | 14.1 | 20.1 | 27.2 |
| 1.50 | 24 | .375 | 9.5 | 6.5 | 7.4 | 13.8 | 19.7 | 26.5 |

Density x Thickness (3 Layers)

| Density | | Thickness | | Frequency (Hz) | | | | |
|---------|-------------------|-----------|-----|----------------|-----|------|------|------|
| pcf | kg/m ³ | in | mm | 250 | 500 | 1000 | 2000 | 4000 |
| 0.34 | 5.5 | 1 | 25 | 3.1 | 5.0 | 9.6 | 15.0 | 21.4 |
| 0.5 | 8.0 | 1 | 25 | 3.7 | 6.1 | 13.3 | 23.4 | 36.1 |
| 1.20 | 19.2 | 0.375 | 9.5 | 4.0 | 4.8 | 9.5 | 17.9 | 29.8 |

Specification Compliance

ASTM C-800

ABS 5630
ASTM C-800 (replacing MIL-B-5924)
BMS 8-48
DMS 1967
DMS 2151
FAR 25.853
FAR 25.856A
OSU 65/65

ABS 5630
BMS 8-48
DMS 2385
FAR 25.853
FAR 25.856A
OSU 65/65

¹ See product specifications for more details on density and thickness availability.

SPACE

Q-Fiber® Bulk



Q-Fiber® is an amorphous, exceptionally pure fibrous silica material used as a lightweight, non-crystalline component in high temperature thermal insulations.

Q-Fiber is formed from high-silica-content sand which is melted, fiberized, acid-washed to remove impurities, rinsed, dried, and heat-treated for structural integrity.

Temperature Limit: Continuous Service 1800°F (982°C)
Intermittent Service 2300°F (1260°C)

Q-Fiber® Felt



Q-Fiber® Felt is formed from pure silica fibers using a water deposition process. It is clean, flexible, without binder of any kind, and possesses the thermo-physical and chemical stability of pure silica. Q-Fiber Felt is effective in a wide range of applications. It is unaffected by moisture, will not accelerate or cause corrosion, and is inert to most acids. Q-Fiber Felt is manufactured based on areal weight (weight per area) and is not produced or dimensioned to an exact thickness or density.

Temperature Limit: Continuous Service 1800°F (982°C)
Intermittent Service 2300°F (1260°C)

Available Density & Thickness¹

BET surface area measurements indicate 2.38 sq. meters/gm for fiber with an average diameter of 1.5 microns.

Density Range: pcf (kg/m³)

| | | | |
|--------|----------|--------|--------|
| 3 (48) | 3.5 (56) | 4 (64) | 6 (96) |
|--------|----------|--------|--------|

Thickness Range: in (mm)

| | | | |
|------------|-----------|-----------|------------|
| 3/16 (4.8) | 1/4 (6.4) | 3/8 (9.5) | 1/2 (12.7) |
|------------|-----------|-----------|------------|

Thermal Conductivity (k) per ASTM C-518

Mean Temp @ 75°F (24°C)

Mean Temp @ 800°F (427°C)

| Mean Temp @ 75°F (24°C) | Mean Temp @ 800°F (427°C) |
|--------------------------------|--------------------------------|
| Density (lbs/ft ³) | Density (lbs/ft ³) |
| Btu-in/hr-ft ² -°F | Btu-in/hr-ft ² -°F |
| 6.0* | 3.0 |
| 0.23 | 0.72 |
| 4.0 | 4.0 |
| 0.65 | 0.65 |
| 6.0 | 6.0 |
| 0.58 | 0.58 |
| Density (kg/m ³) | Density (kg/m ³) |
| Watts/Meter-°C | Watts/Meter-°C |
| 96* | 48 |
| 0.033 | 0.10 |
| 64 | 0.09 |
| 96 | 0.08 |

* When felted to 6.0 pcf (96 kg/m³) nominal density

Shrinkage (When felted to 6.0 pcf (96 kg/m³) nominal density)

| Temperature | | Direction of Shrinkage (%) | | |
|-------------|------|----------------------------|-------|-----------|
| °F | °C | Length | Width | Thickness |
| 1000 | 538 | 0.7 | 0.8 | 0.9 |
| 1200 | 649 | 1.4 | 1.5 | 1.0 |
| 1400 | 760 | 1.8 | 2.2 | 1.8 |
| 1600 | 871 | 2.0 | 2.2 | 2.0 |
| 1800 | 982 | 2.6 | 4.0 | 9.0 |
| 2000 | 1093 | 6.2 | 17.0 | 40.0 |

¹ See product specifications for more details on density and thickness availability.

HIGH-TEMPERATURE

Microlite® B Unbonded



Unbonded Microlite® B Blanket is a lightweight, binderless insulating blanket designed for thermal and acoustic applications in which intermittent temperatures may reach as high as 1000°F (538°C). This loosely felted, nonresilient blanket is formed from flame attenuated borosilicate glass fibers without binders and oils and is not dimensioned by thickness.

Temperature Limit: 850°F (454°C)

Microlite® AA Unbonded



Unbonded Microlite® AA Blanket is a lightweight, binderless insulating blanket designed for thermal and acoustic applications in which intermittent temperatures may reach as high as 1000°F (538°C). This loosely felted, nonresilient blanket is formed from flame attenuated borosilicate glass fibers without binders and oils and is not dimensioned by thickness.

Temperature Limit: 850°F (454°C)

Micro-Fiber® Felt



Micro-Fiber® Felt is formed from borosilicate glass fibers using a water deposition process. The result is a clean, flexible, binderless felt with excellent handling qualities.

Temperature Limit: 900°F (482°C)

Available Density & Thickness¹

Unbonded Microlite B Blanket is manufactured by weight. The B-010 size blanket has a nominal weight of 0.0625 lbs/ft² (306 gm/m²). These blankets are available in standard widths of 36" (91cm) and 72" (183cm) with standard roll length of 100 ft (30.5 m).

Unbonded Microlite AA Blanket is manufactured by weight. Unbonded Microlite AA has a nominal weight of 0.05 lb/ft² (244 gm/m²). This product is available in 72" (183cm) standard width with a roll length of 100 ft. (30.5m).

Available Density & Thickness

3.0 - 6.0 pcf
0.188" - 1.0"

Thermal Conductivity (k) per ASTM C-518² Mean Temp @ 75°F (24°C)

| Density (lbs/ft ³) | Btu-in/hr-ft ² -°F |
|--------------------------------|-------------------------------|
| 1.5 | 0.23 |
| 3.0 | 0.21 |
| 4.5 | 0.21 |
| Density (kg/m ³) | Watts/Meter-°C |
| 24 | 0.033 |
| 48 | 0.030 |
| 72 | 0.030 |

| Density (lbs/ft ³) | Btu-in/hr-ft ² -°F |
|--------------------------------|-------------------------------|
| 0.6 | 0.25 |
| Density (kg/m ³) | Watts/Meter-°C |
| 9.6 | 0.036 |

Thermal Conductivity (k) per ASTM C-518 Mean Temp @ 100°F (38°C)

| Density (lbs/ft ³) | Btu-in/hr-ft ² -°F |
|--------------------------------|-------------------------------|
| 3.0 | 0.23 |
| 4.0 | 0.23 |
| 6.0 | 0.22 |
| Density (kg/m ³) | Watts/Meter-°C |
| 48.0 | 0.033 |
| 64.0 | 0.033 |
| 96.0 | 0.032 |

Linear Shrinkage

When tested in accordance with requirements of ASTM C-356, the linear shrinkage of Unbonded Microlite B Blanket is not detectable at temperatures up to 450°F (204°C) and will not exceed 0.5% at temperatures up to 800°F (427°C).

When tested in accordance with requirements of ASTM C-356, the linear shrinkage of Unbonded Microlite AA Blanket is not detectable at temperatures up to 450°F (204°C) and will not exceed 0.5% at temperatures up to 800°F (427°C).

Sound Transmission Loss (DB) per ASTM E-90*

| Transmission Loss (dB) | Frequency (Hz) | | | | | | |
|------------------------|----------------|-----|-----|------|------|------|------|
| | 125 | 250 | 500 | 1000 | 2000 | 4000 | STC |
| | 5.3 | 6.4 | 8.9 | 12.5 | 11.9 | 23.8 | 12.0 |

*Test performed on Type 475 @ 3 pcf x 1 inch (48 kg/m³ x 25 mm).

¹ Not all density/thickness combinations are available.

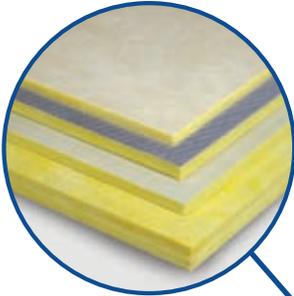
² Unbonded products are not dimensioned and are unresilient regarding thickness. Therefore density references are given only as examples to illustrate typical performance at various hypothetical applied densities and is not necessarily the density of the product as produced or shipped.

Additional Transportation Product Options

Cost-effective products – innovative technical solutions

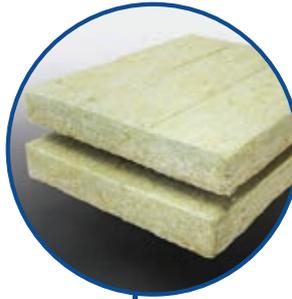
BOARDS

JM manufactures rigid board products ranging in densities from 2.5pcf to 6.0pcf. Thicknesses range from 1/4" to 2 1/2" dependent on the density. Fiberglass board products are highly resilient and resist settling, breakdown and sagging from vibration.



MINERAL WOOL

MinWool-1200® Board is made of inorganic fibers derived from basalt, a volcanic rock. Advanced manufacturing technology ensures consistent product quality with high fiber density and low shot content for excellent performance in fire resistant applications.



TRYMER® 25-50

TRYMER 25-50 is a modified polyisocyanurate (PIR) foam. The rigid insulation is supplied in the form of bunstock that can be fabricated into shapes for a variety of thermal insulation applications that require a Flame Spread Index of ≤ 25 and a Smoke Developed Index of ≤ 50 per ASTM E-84.



MICROLITE® BLANKET

Microlite is a lightweight blanket manufactured using flame-attenuated glass fibers bonded with a thermosetting resin. It can be formed around corners and curved and irregular surfaces. It is also easy to cut with a knife or steel rule die for fabrication.



POLYISO FOAM BOARD

XSPECT® ISOfoam APF Board is a closed-cell polyisocyanurate foam core bonded to a foil facer on both sides. XSPECT offers one of the highest R-values of any rigid insulation and is ideal for both hot and cold applications.



SG SERIES SPIN-GLAS®

SG Series Spin-Glas is a lightweight blanket made from rotary-process glass fibers bonded with a thermosetting resin. SG Series products provide superior thermal and acoustic performance and are available in a wide range of densities and thicknesses.



MICROPOROUS INSULATION

InsulThin® HT is a thin, flexible, high-temperature, hydrophobic blanket insulation. This microporous product is a highly efficient insulating material where space constraints prohibit the effective use of traditional insulation materials.





The physical and chemical properties of the products listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, which includes a Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions or for information on other Johns Manville thermal insulation and systems, visit www.jm.com/terms-conditions or call (800) 654-3103.

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New 01/20

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