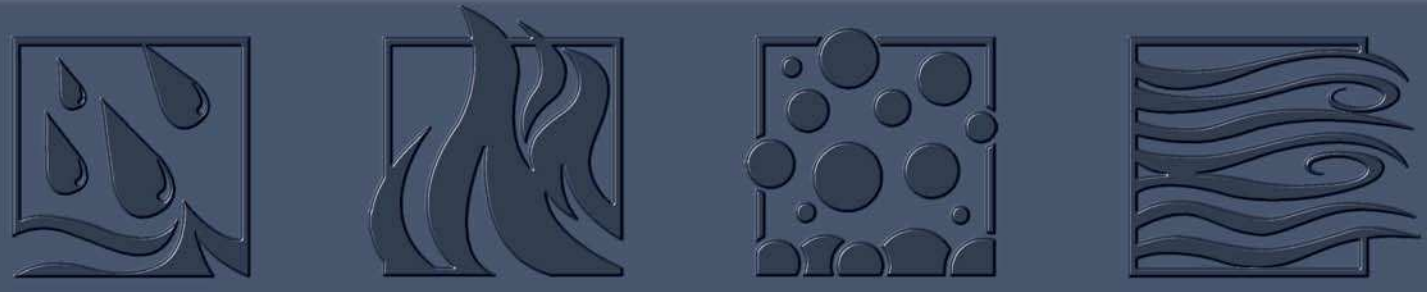
Johns Manville

Defy the Elements



Commercial / Industrial Roofing

Roofing Systems Catalog

Johns Manville

A Roofing Resource for More Than a Century and a Half, Look to Johns Manville for Superior Service and Comprehensive Solutions That Perform for the Long Term.

Table of Contents

To access data on JM Roofing Systems, visit our Web site at www.jm.com/roofing.

Today's commercial roofing offers extraordinary opportunities to be on the forefront of tomorrow's building initiatives. This is a position quite familiar to Johns Manville. Now, as owners and specifiers demand not only top-quality installation and performance, but increasingly are looking for new, cost-effective alternatives and environmentally smart solutions, they continue to look to JM.

Dedicated to Service and Support

When you specify a commercial roof from JM, you get far more than just superior systems and products. We complement the roofing investment with a variety of unique programs that bring added value to product information, installation and long-term performance of your roof. Our roofing services include:

- JM Peak Advantage® Guarantees and Support
- JM Peak Advantage® Contractor Program
- Owner Portfolio Services
- JM Roofing Institute™, Better Understanding of Roofing Systems Institute (BURSI®) and Rockdale Training Center

JM has distinguished itself in the roofing industry with its leadership in developing new roofing solutions, offering product and application technical assistance and continuing education for roofing professionals. We also offer some of the strongest guarantees in the industry. Working with JM means adding value to every aspect of roof ownership.

JM's Innovation Delivers High-Performing Systems

Our emphasis on research and development helps us anticipate market needs and meet evolving building requirements with creative solutions — faster and easier. Today, we are one of the few U.S. manufacturers offering an all-inclusive list of low-slope roofing alternatives for the commercial, industrial and institutional roofing markets. With the convenience of a single-source provider, we offer a complete line of membranes, thermal insulations, adhesives, cements and roof coatings, as well as a full line of specialty roofing products.

The Johns Manville Technical Center in Littleton, Colorado, is one of the best-equipped research facilities in the country, with extensive capabilities in structural, chemical, mechanical and thermal analyses. Here, JM scientists and engineers test and develop products to find technology-based solutions for specific market and product needs.

Through our ongoing research and development process, JM has responded with new technologies to meet the evolving requirements of today's roofing industry. Examples of JM innovations include:

- JM E^{3}co. Solar and Sustainable Roofing – offer a variety of solar, vegetative and LEED®-qualified systems.
- Cool Roof Reflective Membranes – offer greater energy efficiency by using reflective, white mineral-surfaced BUR and SBS CR cap sheets or white JM TPO and JM PVC single ply membranes.
- Invinsa® Roof Board – a lightweight board that reduces labor and optimizes longevity of the roofing system.
- Liquid-Applied Systems:
  - SeamFree™ Liquid Membrane – provides an elastomeric, monolithic roof membrane ideal for small or hard-to-access areas.
  - PermaFlash™ Bituminous Flashing System – flexible enough for use on any penetration.

WATER FIRE HAIL WIND

Johns Manville

Bringing the Latest Technology to Modified Bitumen Systems.

SBS Modified Bitumen Systems

Johns Manville has been producing quality SBS (Styrene-Butadiene-Styrene) products since 1986. SBS products are comprised of a reinforcement of either fiber glass, polyester or a combination of both. SBS is a rubberized modifier that increases the overall performance of the sheet by providing superior elongation and recovery characteristics.

SBS modifiers extend the service range of the product so it can be handled in cooler temperatures without cracking or shattering, or in warmer temperatures without softening to the point where it begins to flow. In all instances, high performance prevails.

SBS Products

Reinforcements play a key role in performance. Since the inception of modified bitumen products, several reinforcements have entered into the JM SBS line, each targeting specific performance needs.

Fiber glass reinforcements offer tensile strength and dimensional stability required for rooftops with heavy traffic areas.

Fiber Glass-Reinforced Sheets	ASTM Standard*
Cap Sheets	
DynaGlas®	D 6163 Type I Grade G
DynaGlas® FR	D 6163 Type I Grade G
DynaGlas® FR CR	D 6163 Type I Grade G
DynaGlas® 30 FR	D 6163 Type I Grade G
DynaWeld™ Cap FR	D 6163 Type I Grade G
DynaWeld™ Cap FR CR	D 6163 Type I Grade G
Base Sheets	
DynaBase®	D 6163 Type I Grade S
DynaWeld™ Base	D 6163 Type I Grade S

*Material tested in accordance with ASTM D 5147 "Standard Test Methods for Sampling and Testing Bituminous Sheeting Material."

Polyester-reinforced mats deliver superior tear strength and puncture resistance, and can handle continual stress created by rooftop movement.

Polyester-Reinforced Sheets	ASTM Standard*
Cap Sheets	
DynaLastic® 180	D 6164 Type I Grade G
DynaLastic® 180 FR	D 6164 Type I Grade G
DynaLastic® 180 FR CR	D 6164 Type I Grade G
DynaWeld™ Cap 180 FR	D 6164 Type I Grade G
DynaWeld™ Cap 180 FR CR	D 6164 Type I Grade G
DynaLastic® 250	D 6164 Type II Grade G
DynaLastic® 250 FR	D 6164 Type II Grade G
DynaLastic® 250 FR CR	D 6164 Type II Grade G
DynaWeld™ Cap 250 FR	D 6164 Type II Grade G
DynaWeld™ Cap 250 FR CR	D 6164 Type II Grade G
Base Sheets	
DynaLastic® 180 S	D 6164 Type I Grade S
DynaWeld™ 180 S	D 6164 Type I Grade S
DynaWeld™ 250 S	D 6164 Type II Grade S

*Material tested in accordance with ASTM D 5147 "Standard Test Methods for Sampling and Testing Bituminous Sheeting Material."

Composite-reinforced mats combine the strength of fiber glass with the flexibility of polyester, delivering ultimate tensile strength, dimensional stability and puncture resistance. They provide durability and afford better natural resistance to other factors that affect roof performance.

Composite-Reinforced Sheets	ASTM Standard*
Cap Sheets	
DynaKap®	D 6162 Type II Grade G
DynaKap® FR	D 6162 Type II Grade G
DynaKap® FR CR	D 6162 Type II Grade G
DynaKap® FR HW	D 6162 Type II Grade G
Base Sheets	
DynaPly®	D 6162 Type II Grade S
DynaPly® HW	D 6162 Type II Grade S
Flashing Sheet	
DynaFlex®	D 6221 Type I
DynaFlex® CR	D 6221 Type I

*Material tested in accordance with ASTM D 5147 "Standard Test Methods for Sampling and Testing Bituminous Sheeting Material."

SBS Cool Roofing (CR) Membranes offer highly emissive (0.85) and reflective (0.76) roofing surfaces to significantly reduce energy costs and drive environmental best practices.

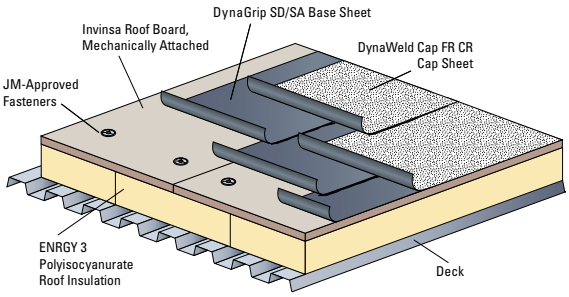
Consider the following advantages of an SBS CR solution on your next roofing project:

- Proven, high-quality white acrylic coating specifically engineered for bituminous roof applications.
- Redundant granule and UV blocker coating delivers exceptional UV protection.
- Highly reflective and emissive roof surface as listed with CRRC® (Cool Roof Rating Council).
- Proven performance of a JM multi-ply SBS modified bitumen roofing system.
- Quality assurance of a factory-applied coating.
- Excellent resistance to weather damage and foot traffic.

SBS Self-adhering Membranes make installation cleaner, with minimal odor and heavy equipment, reducing disruptions during normal building operations. These self-adhering membranes offer an easy-to-peel, removable plastic release film. Products include:

DynaGrip™ SD/SA, an ideal base sheet solution for heat-weld applications, and **DynaGrip™ Cap**, delivering a self-adhering bottom surface and protected, durable mineral top surface.

***JM*CleanBond®** SBS Self-Adhering Fire Resistant System is JM's asphalt-to-asphalt self-adhering technology with a unique mechanical bond. The system includes a base sheet, cap sheet, base and cap flashing and utility sheet.



Two-ply, modified bitumen, roofing system with a self-adhering base sheet and heat-welded cap (2FID SA/HW). For use over JM insulation, approved decks or other approved insulations on inclines up to 3 inches/foot (250 mm/m).

Johns Manville Adhesive Line

MBR® Cold Application Adhesive is compatible with all JM SBS membranes that do not have burn-off films. Excellent consistency for spray or squeegee application methods.

MBR® Flashing Cement is a unique, two-component adhesive for use with all SBS modified bitumen membrane products without burn-off films.

MBR® Utility Cement is a ready-to-use, trowel-grade elastomeric adhesive for SBS modified bitumen flashing products.

MBR® Bonding Adhesive is a premeasured, easy-to-mix, two-part adhesive used for those specifications calling for adhesives containing no VOCs.

JM Two-Part Urethane Insulation Adhesive (UIA) is a two-component polyurethane adhesive used for attaching insulation boards to the roof deck or to other insulation boards. JM also offers **JM Green Two-Part UIA** as a plant-based alternative.

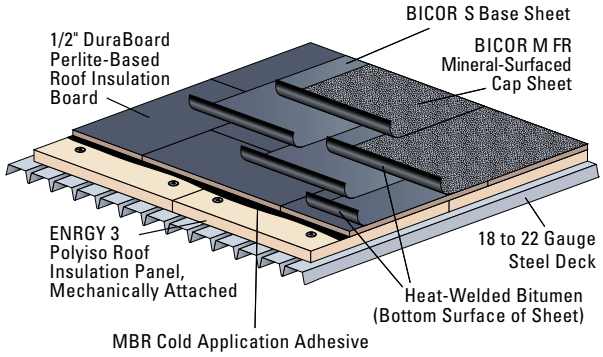
WATER FIRE HAIL WIND

Johns Manville

APP Modified Bitumen Systems

Like our SBS products, our APP modified bitumen products provide high-tensile strength while maintaining critical flexibility. However, through the scientifically advanced formulation, our APP membranes (coated with a proprietary blend of asphalt and atactic polypropylene) are more compatible with heat-welding application methods.

With APP, hot mopping is no longer necessary because the bottom coating may be heated to a point where it acts as its own adhesive, bonding the sheet to a substrate and bonding the overlapping edges. While all our APP membranes are designed to be heat welded, some may also be applied in cold adhesive. These products have a sand backing in lieu of the burn-off film often found on the heat-welded products.



Two-ply, heat-welded, modified bitumen, mineral-surfaced roofing system. For use over JM insulation, approved decks or other approved insulations on inclines up to 6 inches per foot (500 mm/m).

Many of the APP membranes have a factory-applied mineral surfacing (available in colors) and do not need further protection from harmful UV rays. However, for various purposes, JM also provides smooth-surfaced APP membranes. These membranes must subsequently be protected from UV rays by applying a compatible roof coating.

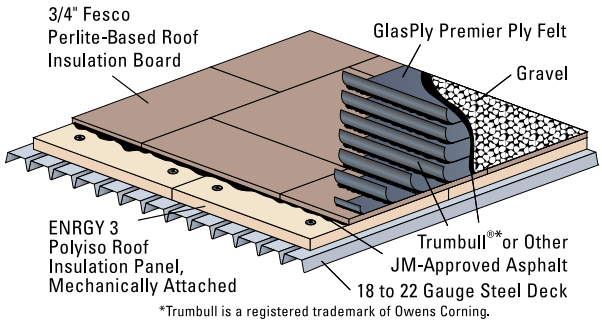
Several products are available for varying degrees of strength, elasticity and flexibility. The following complete system component list shows the ASTM standard that applies to each membrane. Membranes with brand names designated "FR" also contain flame-retardant additives.

Mineral-Surfaced Cap Sheets	**ASTM Standard***
APPeX® 4.5M**	D 6222 Type I Grade G
APPeX® 4.5M FR**	D 6222 Type I Grade G
BICOR™ M FR**	D 6223 Type II Grade G
TRICOR™ M FR**	D 6223 Type II Grade G
Mineral-Surfaced Cap or Interply Sheets	
APPeX® 4S	D 6222 Type I Grade S
BICOR™ S	D 6223 Type II Grade S
TRICOR™ S	D 6223 Type II Grade S
Base Sheets	
JM APP™ Base	D 6509

*Material tested in accordance with ASTM D 5147 "Standard Test Methods for Sampling and Testing Bituminous Sheeting Material."
**Due to weatherability, durability and handling characteristics, may also be used as flashing material.

Built-Up Roofing Systems

Conventional bituminous built-up roofing (BUR) membranes have been used effectively for more than 100 years and are still popular today. With BUR roofing systems, the waterproof membrane is field fabricated with layers of bitumen alternating with plies of reinforcing felts. JM manufactures a complete line of fiber glass felts, including base, ply and mineral-surfaced cap sheets.



*Trumbull is a registered trademark of Owens Corning.

Four-ply, gravel-surfaced, fiber glass built-up roof. For use over JM insulation, approved decks or other approved insulations, on inclines up to 3 inches per foot (250 mm/m).

JM BUR offers many advantages over competitive systems. Benefits include:

- Reliability – BUR is known to be one of the most reliable and longest lasting roofs on the market. Guarantees are available for up to 30 years.
- Toughness – our gravel surfacing option provides one of the toughest roofs available, resistant to the many forms of weather such as rain, snow, wind, hail and fire.
- Reflectivity for Cool Roofs – several cap sheet and coating options have an SRI (Solar Reflective Index) that exceeds U.S. EPA and California Title 24 standards, offering additional savings on cooling costs.
- Variety of Colors – many of our durable cap sheets are available in several different colors, including our top-selling GlasKap CR in cool roof white.
- History and Leadership – Johns Manville is the pioneer of built-up roofing and, in fact, created the first BUR roof in America! We later developed BURSI, originally known as the Built-Up Roofing Systems Institute (now the Better Understanding of Roofing Systems Institute). More than 50,000 graduates apply good roofing principles in their organizations as a result of BURSI training.

Of course, various cements, coatings and surfacings are available for a complete, single-source system. JM-approved asphalt is required for hot-applied BUR systems.

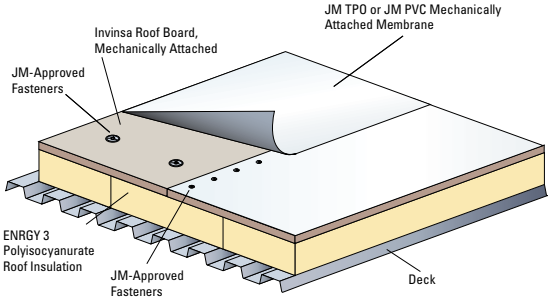
Ply Felts	**ASTM Standard**
GlasPly® Premier	D 2178 Type VI
GlasPly® IV	D 2178 Type IV
Base Sheets	
GlasBase™ Plus	D 4601 Type II Region 3 Only
PermaPly® 28	D 4601 Type II
Ventsulation® Felt	D 4897 Type II
Flashing and Cold Application Systems	
GlasTite® Flexible	
Cap Sheets	
GlasKap® CR	D 3909
GlasKap®	D 3909
GlasKap® Plus	D 3909 Region 3 Only
Roofing Cements	
Bestile™ Industrial Roof Cement	D 4586 Type II
Roof Coatings and Surfacings	
TopGard® Type A	
TopGard® Type B	D 1227 Type IV
TopGard® 4000	D 6083
TopGard® 5000	D 6083
Fibrated Aluminum	D 2824 Type III
Primer	
Concrete Primer	D 41

Johns Manville

Single Ply Systems from a Company You Know and Trust.

JM TPO and JM PVC Single Ply Roofing Systems

JM TPO is the result of extensive research and customer feedback. We evaluated and optimized the formulation to deliver high-performing results – thickness over scrim, ozone resistance, reflectivity, consistent thickness across the sheet and overall weather resistance. JM TPO clearly has the advantage over other products on the market, and now our valued customers are seeing the difference for themselves. Most recently, in blind tests consisting of membranes from four leading TPO manufacturers, contractors evaluated all of the properties and performance characteristics that make a TPO membrane the best, such as weld window, ability to lay flat, workability and texture. After more than 56 challenges across the country, 90% of expert installers have chosen JM TPO as the best.



Mechanically fastened, JM TPO or JM PVC single ply roofing system. For use over JM-approved decks or other approved insulation.

JM PVC is a flexible, thermoplastic membrane manufactured using an ultraviolet-resistant polyvinyl chloride and DuPont™ Elvaloy® KEE (ketone ethylene ester) formulation.

The formulation delivers:

- Twenty years of proven roofing performance with nearly 600 million square feet installed.
- One of the lowest life cycle costs of all installed roofing systems.
- High resistance to chemical exposure.
- High initial and three-year reflectivity for white JM PVC membrane at 86% and 70%, respectively.
- Nonwicking polyester reinforcement has a superior balance of physical properties for mechanically fastened or fully adhered systems.

JM PVC is available in 50-mil, 60-mil, 60-mil MIN*, 72-mil MIN* and 80-mil thicknesses with 39 inch, 60 inch, 78 inch and 120 inch widths. Stocked standard colors are white, grey and sandstone, with other colors available upon request.

*MIN is minimum thickness where no data points are lower than the listed thickness.

JM PVC Fleece Back membranes are manufactured with a JM polyester fleece embedded into the sheet during the extrusion process. As an integral component to the membrane, the fleece provides:

- Protection of the back side of the membrane from exposed fasteners.
- Masking of surface imperfections in the substrate.
- Additional reinforcement consisting of discontinuous fibers to enhance physical properties.
- Ability to use as an asphalt-applied cap sheet in some multi-ply systems.

JM PVC Fleece Back is available in 50-mil, 60-mil, 60-mil MIN*, 72-mil MIN* and 80-mil thicknesses with 76 inch and 144 inch width. White membrane is stocked as a standard and other colors are available on request.

JM PVC and PVC Fleece Back membranes are formulated to have long-term durability, and up to 25-year guarantees are available.

A Smart Solution for the Environment

The formulation of our white single ply membranes enables Johns Manville to be a partner in the U.S. Environmental Protection Agency's ENERGY STAR® program. These highly reflective surfaces help reduce electricity and natural gas consumption when specified with ENRGY 3® polyisocyanurate roofing insulation. The membranes can also help minimize the "heat island" effect in metropolitan areas. Testing on white membranes showed initial reflectivity values that exceed ENERGY STAR's guidelines.

JM EPDM Single Ply Roofing Systems

The JM thermoset single ply membrane is called JM EPDM (ethylene propylene diene monomer). JM EPDM has superior weatherability through a wide range of temperatures and conditions and it demonstrates superior ozone resistance.

JM EPDM nonreinforced membranes are available in 45-mil, 60-mil and 90-mil thicknesses. Membrane widths of up to 40 feet (12.19 m) and lengths up to 100 feet (30.48 m) are available.

With the appropriate JM single ply system, you will be able to meet industry approvals such as UL®, FM Global® and Miami-Dade County. Complete lines of accessory products are available, including seam tapes, adhesives, caulk, termination bars and flashings.

*MIN is minimum thickness where no data points are lower than the listed thickness.

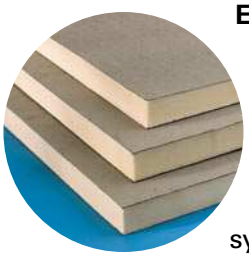
Johns Manville

There's a JM Roof Insulation Product to Fit Every Roofing System and Meet Every Thermal Requirement.

Whether your needs are high or low thermal, or if your project calls for a BUR, modified bitumen or single ply system, JM offers the most advanced insulation technology available. Before selecting a product, be sure to review the performance, design and installation requirements of the total roofing system to ensure compatibility of all components.

Thermal Products

Johns Manville offers a high-thermal roof insulation product composed of closed-cell polyisocyanurate foam, bonded to universal fiber glass-reinforced facers.



ENRGY 3 is a rigid roof insulation panel designed for direct application over metal, nailable and non-nailable deck types. ENRGY 3 may be used with BUR or modified bitumen systems. It meets the physical property requirements of ASTM C 1289, Type II, Class 1, Grade 2 and CAN/ULC S704 Type 2, Class 2. ENRGY 3 is also available in a higher compressive strength of 25 psi (172 kPa), which meets ASTM C 1289, Type II, Class 1, Grade 3 and CAN/ULC S704 Type 3, Class 2.

Tapered products offered by JM include Tapered ENRGY 3® and Tapered ENRGY 3® Plus, sloped polyisocyanurate foam core roof insulation boards.

ENRGY 3 is a state-of-the-art product manufactured with pentane. These polyiso foams have zero ozone depletion potential.

ENRGY 3 Values

Standard Thicknesses (nom.)*		R-Value (LTTR)		Total Recycled Content
in.	mm	(hr•ft²•°F)/BTU	m²•°C/W	(%)
1.0	25	6.0	1.05	40.1
1.5	38	9.0	1.59	30.9
1.7	43	10.3	1.81	28.8
2.0	51	12.1	2.14	26.7
2.3	58	14.0	2.47	23.6
2.5	64	15.3	2.69	23.1
2.8	71	17.2	3.03	21.7
3.0	76	18.5	3.26	21.1
3.1	79	19.0	3.33	20.6
3.3	84	20.4	3.60	20.0
4.0	102	25.0	4.40	17.8

*Other thicknesses available.

Roof Boards

Fesco® Board is an expanded perlite board blended with selected binders and fibers. It is used as a general purpose cover board over closed-cell foam insulation boards and as a low-thermal insulation board. It can be used in BUR, modified bitumen and some single ply roofing systems. A special TopLoc® coating prevents excessive absorption of asphalt during installation. The air cells within the expanded perlite provide insulating efficiency. Fesco Boards are noncombustible with very low moisture absorption.

JM also offers Tapered Fesco® Foam, FesCant™ Plus Cant Strips and Tapered Fesco® Edge Strip products to promote positive drainage and assist with roof transitions.

Fesco Board Values

Thickness (nom.)		Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
in.	mm			
0.75	19	32	2.08	0.37
1.0	25	32	2.78	0.49
1.5	38	27	4.17	0.73
2.0	51	27	5.56	0.98

This recycling symbol indicates that JM has joined other manufacturers of commercial and consumer goods throughout the United States in the utilization of recyclable materials.

½" Retro-Fit® Board is used in both retrofit and overlay applications. It is composed of expanded perlite, blended with selected binders and fibers. The primary function is to provide an improved substrate for the roofing membrane. It may be applied with cold adhesive, mechanical fasteners or hot asphalt. It is not for use directly over steel decks. ½" Retro-Fit Boards are noncombustible with very low moisture absorption.

½" Retro-Fit Board Values

Thickness (nom.) in.	mm	Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
0.5	12.70	30	1.32	0.23

Fesco® Board HD (High Density) is a 1-inch (2.54-cm) thick, homogeneous rigid insulation board, composed of expanded perlite, blended with selected binders and cellulosic fibers. The top surface is sealed with a special TopLoc coating to prevent excessive absorption of asphalt during the installation process. Fesco Board HD is a special, made-to-order product for use directly over a wide flute or metal deck application. It is stronger than normal Fesco Board and can span spaces up to 2½ inches (6.35 cm). It can be used under BUR, modified bitumen and select single ply roofing systems. It works with cold adhesives, mechanical fasteners or hot asphalt. Fesco Board HD is noncombustible with very low moisture absorption.

Fesco Board HD Values

Thickness (nom.) in.	mm	Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
1.0	25	30	2.78	0.49*

DuraBoard® is a high-density rigid insulation board, composed primarily of expanded perlite with reinforcing fibers and selected binders. The top surface is sealed with a special polymerized asphalt emulsion coating that enhances adhesion of the covering membrane, especially in cold-applied and self-adhered membrane systems. DuraBoard is used in new and re-cover applications or over closed-cell foam insulations. It is designed specifically for direct application of heat-weldable SBS or APP modified bitumen membrane systems. Since a base sheet is not required in heat-weldable applications using DuraBoard, fastener quantity and labor time are both reduced. DuraBoard is noncombustible with very low adhesive and moisture absorption.

DuraBoard Values

Thickness (nom.) in.	mm	Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
0.5	13	28	1.2	0.21
0.75	19	25	1.8	0.32
1.0	25	25	2.3	0.41

Invinsa Roof Board is one of the toughest ¼-inch, lightweight roof boards in the market. It provides a protective layer for the insulation, while working with the membrane above to ensure maximum performance and longevity. This patent-pending, high-density polyisocyanurate technology is bonded in-line to mineral-surfaced, fiber glass-reinforced facers. In all single ply and bituminous cold-applied and self-adhered roof systems, Invinsa enhances water and hail resistance and will not support mold growth.

Invinsa Values

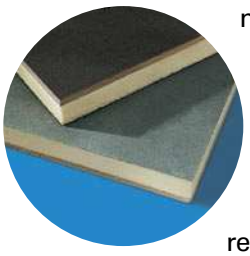
Thickness (nom.) in.	mm	Weight* lb	kg	Compressive Strength psi/psf	kPa/Pa
0.25	6	12	5.4	150 / 21,600	1034 / 1,034,200

*Per 4' x 8' (1.22 m x 2.44 m) board

WATER FIRE HAIL WIND

Johns Manville

Composite Products



Fesco Foam® is a rigid insulation board for use over metal, nailable and non-nailable decks in BUR, modified bitumen and certain single ply roofing systems. It is composed of a polyisocyanurate foam core, bonded to a ½ inch (127 mm) Fesco laminator board on one side and a universal fiber glass-reinforced facer on the other. It meets the physical property requirements of ASTM C 1289, Type III.

Fesco Foam Values

Thickness (nom.) in.	mm	Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
1.5	38.10	34	7.4	1.30
2.0	50.80	33	10.4	1.83
2.5	63.50	31	13.5	2.38
3.0	76.20	30	16.7	2.94
4.0	101.60	27	23.1	4.07

*Other thicknesses available.

DuraFoam® is a high-thermal rigid roof insulation board composed of polyisocyanurate foam core bonded in the foaming process to DuraBoard, an expanded perlite mineral aggregate board. The top surface of DuraFoam is sealed with a special polymerized asphalt emulsion coating to allow for the direct application of SBS or APP membranes using heat-weld application techniques.

DuraFoam Values

Thickness (nom.). in.	mm	Total Recycled Content (%)	R-Value (LTTR) (hr•ft²•°F)/BTU	m²•°C/W
1.5	38.10	39	7.2	1.27
2.0	50.80	36	10.2	1.80
2.5	63.50	35	13.3	2.34
3.0	76.20	33	16.5	2.90
3.5	88.90	31	19.7	3.47
4.0	101.60	29	22.9	4.03

Nailboard® is a rigid roof insulation board composed of a closed-cell polyisocyanurate foam core bonded to 7⁄16 inch (1.11 cm) oriented strand board (OSB) on one side and a universal fiber glass-reinforced facer on the other. It is used as an insulation/nailbase underlayment for a variety of roofing systems. It meets the physical requirements of ASTM C 1289, Type V. Nailboard also is available with ⅝ inch (1.59-cm) OSB.

Nailboard Values

7/16" (11 mm) OSB

Thickness (nom.) in.	mm	R-Value (LTTR*) (hr•ft²•°F)/BTU	m²•°C/W	Weight lb/ft²	kg/m²
1.5	38.10	6.6	1.2	1.75	8.54
2.0	50.80	9.6	1.7	1.80	8.78
2.5	63.50	12.7	1.5	1.85	9.03
3.0	76.20	15.9	2.8	1.90	9.27
3.5	88.90	19.1	3.4	1.95	9.51
4.0	101.60	22.3	3.9	2.00	9.76
4.5	114.30	25.6	4.5	2.05	10.01

5/8" (16 mm) OSB

Thickness (nom.) in.	mm	R-Value (LTTR*) (hr•ft²•°F)/BTU	m²•°C/W	Weight lb/ft²	kg/m²
1.5	38.10	6.6	1.2	2.25	10.97
2.0	50.80	9.6	1.7	2.30	11.22
2.5	63.50	12.7	1.5	2.35	11.47
3.0	76.20	15.9	2.8	2.40	11.72
3.5	88.90	19.1	3.4	2.45	11.97
4.0	101.60	22.3	3.9	2.50	12.22
4.5	114.30	25.6	4.5	2.55	12.45

*The Long-Term Thermal Resistance (LTTR) values were determined in accordance with CAN/ULC S770.

JM Specialty Roofing Products are Designed for Total Integration of Systems.

JM Specialty Roofing Products provide designers and specifiers with a single source of supply, assuring the compatibility of components and, ultimately, the integrity of the finished roofing system. All of JM's Specialty Roofing Products can be included in a JM Peak Advantage® Guarantee.

Expand-O-Flash®
A patented, watertight roof expansion joint cover for a wide variety of applications.

Expand-O-Flash® EJ/WC
Attachment flanges are concealed with rubber cover of sufficient width to cover bellows and flanges. Also available in rigid PVC-concealed flanges with a PVC cover that can be heat welded to the PVC membrane.

Expand-O-Flash® INS
A patented, factory-prefabricated, insulated expansion joint cover. It is formed using any Expand-O-Flash cover and JM Microlite® "L" fiber glass insulation.

Factory-Fabricated Intersections
Designed for maximum flexibility and produced using special fabrication techniques to ensure watertight, clean seam lines.

Expand-O-Gard®
Vertical wall flexible closures for a wide variety of applications.

Presto Lock™ Fascia System
FM 1-90 fascia for BUR, modified bitumen and single ply membrane systems.

Presto Lock™ Coping System
FM 1-90 coping for BUR, modified bitumen and single ply membrane systems.

Presto-Tite™ Fascia Systems
For maximum wind uplift protection. FM 1-165 and Miami-Dade approved. Available for BUR, MBR and single ply applications.

Flex-I-Drain®
Flexible bellows drain to accommodate movement between drain and plumbing.

RetroDrain®*
Spun aluminum, copper or co-polymer retrofit drain with cast aluminum or co-polymer dome.

*RetroDrain is a registered trademark of OMG Roofing Products.

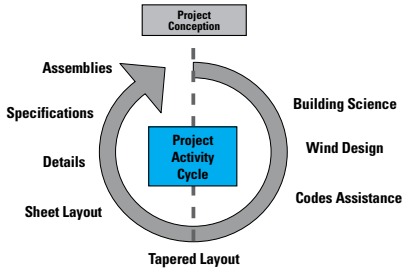
"If You Can Draw It, We Can Make It."

Johns Manville has established a reputation based on our ability to custom design and fabricate special systems to solve building movement and closure problems. No matter how unusual your roofing challenge, we can turn your rough sketches into a custom manufactured Expand-O-Flash, Expand-O-Gard, Presto Lock Fascia or Coping System or Presto-Tite Fascia System. Call your JM Specialty Roofing Products Technical Services representative at (800) 445-1500.

This brief section cannot include information, data or pictures on every specialty roofing product JM offers. For complete details, please call your Technical Services representative or refer to the JM Specialty Roofing Products brochure (RS-6002).

Johns Manville

Helping to Specify the Complete Roofing System



Specifying and designing today's roofing systems can be a complicated process. As the industry has evolved, so have the expectations for a roofing system. The vast amount of information surrounding products, national codes, qualifications and trades has led to requirements beyond waterproofing for both the design professional and roofing contractor.

At JM, we emphasize the roof as a complete system. Our highly skilled technicians and engineers provide diverse and essential support services to the contractor and design professional throughout the project life cycle – from conceptual product information, which may be required in the early design stages, all the way to the completion of a bid package. It is important to note that JM does not practice either engineering or architecture; be sure to consult your local design professional for architectural and/or engineering services.

Fastening Patterns and Sheet Layouts

With increased importance placed on the roof's uplift forces, JM provides fastening pattern diagrams and sheet layouts, illustrating how to positively attach each component of the roofing system to include perimeter and corner areas that often require special attention. These tools optimize the roofing system to work in conjunction with the roofing substrate.

Details

Details are a critical component of a successful roofing system. JM has a vast database of flashing details available to assist with product installation.

Specifications

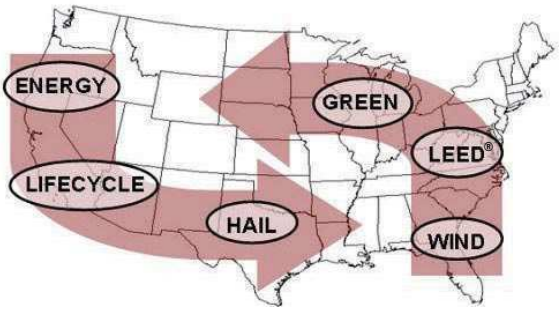
In order to deliver quality product information and installation, JM offers architects various project solutions and roofing system installation guidelines.

Tapered Insulation

The dedicated Tapered Insulation Team takes into consideration roofs with limitations in slope, edge conditions, maximum thickness or minimum thermal-resistance value. This experienced group maximizes the tapered layout to propose thermal and drainage solutions for review by the architect and engineer. Contact the JM Tapered Insulation Team at (800) 341-8032 or taperdesign@jm.com.

Governing Codes

National code requirements are constantly changing in scope and complexity. JM delivers technical product assistance to address FM Global and UL regulations in both the United States and Canada.



JM Roofing Institute — Better Roofing Through Education

Johns Manville wants to provide the most value possible to our customers and contractors. To help accomplish that, we have developed an education and development initiative that builds on over 150 years of our experience in low-slope commercial/industrial roofing. Under the umbrella of the JM Roofing Institute, we created a program to build on the strength of JM's experience and knowledge to meet the specific needs of our customers.

The Better Understanding of Roofing Systems Institute (BURSI) has focused on educating architects, consultants, roofing contractors and building owners on the materials, technology and design of roofing systems. In 35 years, more than 50,000 roofing professionals have been educated through the BURSI curriculum.

JM has built a training center and a robust class offering for roofing system application, and highly recommends these workshops for superintendents and crew leaders. They can then give on-site training to other employees, and quickly multiply the benefit of their experience.

Practical Knowledge for Use Every Day to Improve Your Business

Courses are designed to provide practical experience that will enhance your day-to-day operations. This hands-on experience is designed to improve techniques, understanding and good working practices. These sessions will go beyond installation procedures to address business issues such as improving productivity.

Areas of focus include:

- Materials
- Design
- Safety
- Productivity
- Technology
- Installation
- Quality

Peak Advantage Contractors and Peak Advantage Guarantees Offer Peace of Mind

Whether it's today's installation or next year's performance, you can rest assured, we have you covered. For quality workmanship and top-notch installation, choose a Peak Advantage Contractor. They're best in class, having lived up to the highest performance standards.

And only a Peak Advantage Contractor can offer a Peak Advantage Guarantee — a significant advantage for building owners. A Peak Advantage Guarantee is one of the most respected in the industry. It is available only on qualified JM roofing systems with JM roofing products. This added assurance, plus JM's technical expertise and financial strength give our guarantee real value.

We Continue to Look Forward

JM understands the continuously changing nature of the roofing business.

As the building industry becomes increasingly sophisticated, the reasons for working with Johns Manville become even more important. With more than 150 years in the building products industry, and with the financial strength of a Berkshire Hathaway company, the Johns Manville name is synonymous with quality, stability and peace of mind. We are dedicated to being the leading resource and your choice for industry knowledge, roofing systems, products and support at every level. We invite you to learn more about all the advantages of a Johns Manville roof.

PRODUCT WARRANTIES

Johns Manville designs roofing products that work together to provide a one-source comprehensive roofing system solution. Total roofing system guarantees are available under the JM Peak Advantage Guarantee Program. To learn more about our standard guarantee terms and conditions, visit our Web site at www.jm.com or talk to your local JM sales representative.

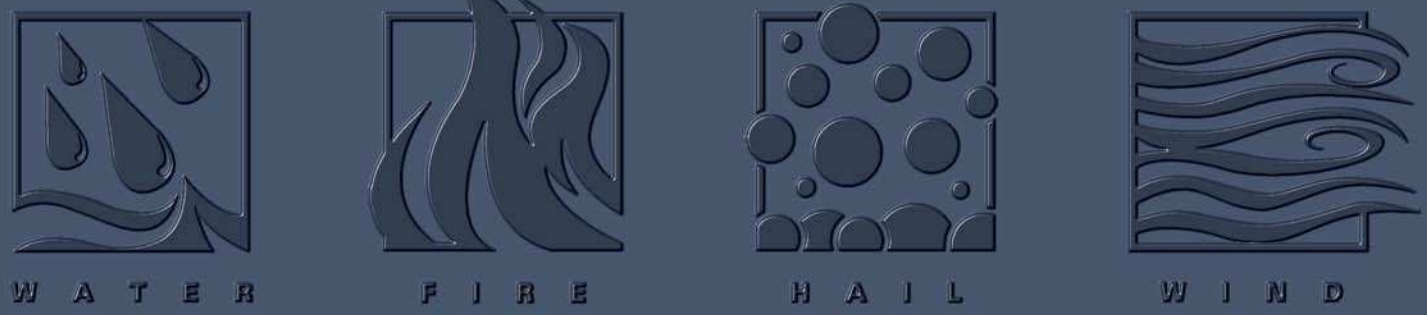
JM Peak Advantage Guarantees are available only on qualified JM roofing systems containing JM roofing products. JM standard product terms and conditions will apply to include a one-year limited product warranty. Limited product warranty information is available at www.jm.com/roofing/About JM/Terms and Conditions.

Peak Advantage Contractor Program

To ensure quality workmanship and top-notch installation, JM offers its Peak Advantage Contractor Program. Contractors selected to participate are proven to be best of class, having lived up to the highest performance standards. These contractors have access to JM's strongest guarantees. To be assured of the best possible results on the roofing system you specify, make sure it's installed by a JM Peak Advantage contractor.

For additional technical or guarantee information:

Roofing Services
P.O. Box 625001
Littleton, CO 80162-5001
(800) 922-5922



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