



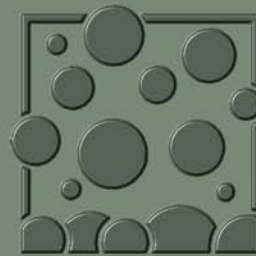
Defy the Elements



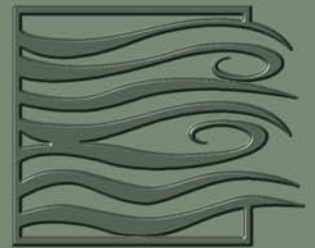
W A T E R



F I R E



H A I L



W I N D

JM PVC Systems Single Ply Roofing



Johns Manville PVC

Elvaloy®-based formulation. Proven performance. Lowest life-cycle cost. Energy efficiency. These are the driving attributes of JM PVC that make it the PVC membrane of choice. Born of the perfect combination of two robust polymers, PVC (polyvinyl chloride) and Dupont's Elvaloy® KEE (Ketone Ethylene Ester), JM PVC is no less than a membrane masterpiece that delivers long-term performance.

JM PVC Brings Proven Performance

Elvaloy – the Secret Ingredient

Johns Manville's PVC formulation uses Elvaloy KEE. Elvaloy is an advanced thermoplastic, solid-phase polymer with tough, yet flexible, properties. It is the workhorse that ensures plasticizer retention. This is critical because plasticizer retention equals a pliable and durable sheet in even the most extreme environments, which is essential to long-term roof life.



Long-term performance and quality come first with JM, and that is why we teamed up with leading manufacturing experts and scientists to deliver a formulation that has more than 20 years of proven effectiveness.



Chemically, Elvaloy is what's known as a "polar polymer," which means its molecules have a natural affinity (miscibility) with other polar polymers such as PVC. When the Elvaloy and PVC molecules melt together into a roofing compound, they stay together naturally, without phase separation problems. Putting Elvaloy into a harder plastic such as PVC makes the resulting compound flexible, and permanently so. Because it's a solid, high-molecular-weight polymer, Elvaloy simply can't migrate out or cause the PVC to become harder and more brittle over time.

Source: Article on "PVC-Introducing Stability at the Molecular Level" by Elizabeth R. Griffin, roofing industry specialist, DuPont Industrial Polymers.

Twenty Years of Performance

JM's PVC with Elvaloy formulation has been installed on more than 500 million square feet of roofing systems in the last 20 years. Aside from a small change in fire retardants in the 1990s, the same basic formulation has been in use the entire 20 years. We have covered everything from airports to manufacturing facilities, to educational buildings to stadiums and retail structures.

Exceptional Weathering Capabilities

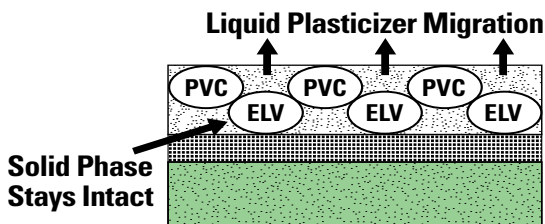
When tested in accordance with ASTM G 53 Accelerated Weathering Test, the JM PVC formulation exceeded 12,000 hours (minimum requirement is 5,000 hours).



Bank of Oklahoma (BOK) Center, Tulsa, Okla.
220,000 square feet of JM PVC-60
Roofing Contractor: Oklahoma Roofing & Sheet Metal Inc., Oklahoma City, Okla.
Owner: City of Tulsa

"Since the roof is visible on this high-profile project, appearance was very important. That was the reason the renowned architect Cesar Pelli selected a JM PVC membrane, which looks very clean after installation. The JM PVC-60 is also exceedingly durable and easy to weld."

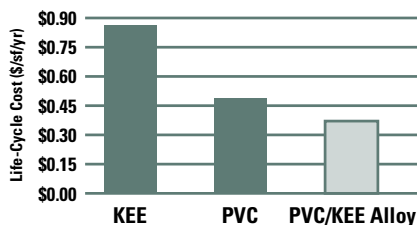
Earl Craig, project manager, Oklahoma Roofing & Sheet Metal Inc.
Oklahoma City, Okla.



JM PVC Brings Lower Life-Cycle Costs

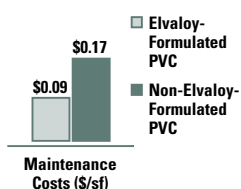
Lowest Commercial Roofing Life-Cycle Cost

When it comes to roofing, building owners have a list of high priorities, and rightfully so. JM PVC addresses all the concerns building owners are faced with when making a decision to roof their building. In a Durability and Cost survey performed by Carl Cash, Elvaloy PVC had a life-cycle cost of \$0.37/sf per year.* What does this mean? It means the formulation used in JM PVC was compared to other PVC products in the industry, and when considering initial installation cost, maintenance cost over the life of the roof and longevity of the membrane, JM offers the most practical solution.



Lower Maintenance Costs

Based on third-party market research, building owners found that membranes manufactured with Elvaloy are less costly to maintain.



*Source: 2005 Life-Cycle Durability Study conducted by Carl Cash.

JM PVC Brings Chemical Resistance

Recognized as Being the Most Chemically Resistant

According to a study conducted by Simpson Gumpertz & Heger Consulting Engineers, the PVC/KEE (JM PVC) membrane is the most resistant to the chemicals tested.*

Chemicals Tested

HVAC Oil
Canola Oil (Restaurants)
Dry Heat (Arid Climate)
Water (Humid Climate)
1N Acid (Acid Rain)
pH11 Base (Cleaning Solution)



Physical Properties

Mass Loss
Puncture Resistance
Dimensional Stability

While PVC roofing systems can be used in nearly all roofing applications, they are perfect for the food manufacturing, restaurant and aviation industries. They hold up to fatty oil exhaust, acids and jet fuel better than any other roofing product.

*Study presented to ASTM, 2008.

JM PVC Brings Quality by Process Control

Integrated Manufacturing Process

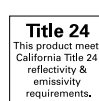
Our fully integrated process includes the weaving of a reinforcing polyester fabric with anti-wicking properties and an enhanced, aramid-reinforced edge. In FM Global® tests conducted on mechanically fastened PVC systems, the reinforcing fabric improved the fastener pull-out resistance by 17%. When JM PVC Fleece-Backed Membrane is manufactured, the polyester fleece, also manufactured by JM, is embedded during the manufacturing process to provide one integrated sheet.



JM PVC Brings Energy Efficiency

Conserve energy in a cleaner environment

Energy efficiency is one of the primary factors in the specification of PVC systems. JM PVC exceeds this requirement with its White, Grey ES and Sandstone ES membranes, which reflect solar energy away from buildings, reducing air-conditioning energy loads and costs. The white membranes meet the ENERGY STAR®, LEED® and Cool Roof Rating Council® (CRRC) requirements for reflectivity and emissivity, and are California Title 24 compliant.



	Reflectivity		Emissivity		SRI	
	Initial	3-Year Aged	Initial	3-Year Aged	Initial	3-Year Aged
White	0.86	0.70	0.86	0.82	107	106.86
Grey ES	0.67	pending	0.85	pending	80	pending
Sandstone ES	0.73	pending	0.82	pending	88	pending

Use JM PVC to Earn LEED® Credits

In addition to the energy savings gained by white or light-colored membranes, JM offers vegetative systems containing 80-mil JM PVC membrane with Invinsa® Roof Board and/or ENRGY 3® roof insulation. This system qualifies for a 20-year guarantee and has the potential to contribute up to 10 points toward the achievement of LEED certification.

Options for Photovoltaic Systems

JM is affiliated with best-in-class photovoltaic solutions integrators. These partnerships enable JM to provide customized turnkey solutions to protect your building from the elements and actually help generate a renewable energy source. These systems have the potential to help you achieve credit from your provider, or to help provide for the energy needs of your building.



JM PVC Brings One-Stop Shopping

Our Comprehensive Product Offering Fits Your Needs

JM PVC is available in numerous colors, offers a vast array of accessories and boasts several roll sizes to fit any project. JM offers a number of roof constructions that can qualify for 10-, 15-, 20- or 25-year (for 80 mil only) NDL Peak Advantage® Guarantees.

Multiple Color Choices

White	Grey
Grey ES (Cool Roof color option)	Sandstone
Sandstone ES (Cool Roof color option)	*Copper Brown
	*Patina Green
	*Blue
	*Evergreen
	*Charcoal

*Minimum order quantities required.

JM PVC membranes are available in 6-foot and 10-foot (1.83 m and 3.05 m) widths to offer a broader range of installation options. By using JM's new 10-foot (3.05 m) membrane, contractors can save

even more time and labor, and building owners can enjoy reduced down time due to roofing projects. The wider sheet reduces the number of rolls needed and decreases the number of heat-welded seams by approximately 33% versus 6-foot (1.83 m) wide sheets. JM PVC Fleece-Backed Membrane is available in 12-foot (3.66 m) wide sheets for fully adhered systems. Contractors have up to 50% fewer seams when using the 12-foot (3.66 m) sheet versus the traditional 6-foot (1.83 m) sheet. The 12-foot (3.66 m) fleece-backed sheet is not intended for hot asphalt applications.

Thickness	50 mil, 60 mil, 60 mil Minimum and 72 mil Minimum*	80 mil
Standard Sheet Size	120" x 100' (3.05 m x 30.48 m) 78" x 100' (1.98 m x 30.48 m) 60" x 100' (1.52 m x 30.48 m) 39" x 100' (1.0 m x 30.48 m)	120" x 75' (3.05 m x 22.86 m) 78" x 75' (1.98 m x 22.86 m) 60" x 75' (1.52 m x 22.86 m) 39" x 75' (1.0 m x 22.86 m)
Fleece-Backed Sheet Size	144" x 90' (3.66 m x 27.43 m) – 60 mil only 76" x 90' (1.93 m x 27.43 m)	76" x 75' (1.93 m x 22.86 m)
Color	50 and 60 mil – White, Grey, Grey ES, Sandstone and Sandstone ES. Colors other than white may require 2- to 6-week lead times. 10' (3.05 m) Sheets, 80 mil and Fleece Backed – White only.	
Special Orders	Nonstandard colors and sizes are available with extended lead times and minimum order quantities may apply.	

*Minimum products are manufactured no less than the thickness listed.

The Best of Both Worlds

JM offers PVC Fleece-Backed Membrane for redundant built-up and SBS modified bitumen hot asphalt applications. It is the perfect solution for roofing projects that require the added protection of a redundant system and the energy savings a white membrane provides. Hot-moppable fleeced systems offer extended guarantee terms (contact your JM sales representative for more information). These systems also provide a great advantage to contractors who are versed in the application of asphalt-applied systems and looking to enter the single ply market.

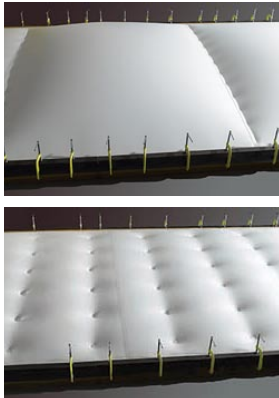




Southwest High School, El Centro, Calif.
76,000 square feet of JM PVC-60
Roofing Contractor: Roof Construction, Escondido, Calif.
Owner: Central Union High School District

For Added Savings Use the JM RhinoPlate™ System

Metal roof retrofit projects with single ply systems can be tricky. A common application is to mechanically fasten the membrane to the purlins, which are typically spaced 5' (1.52 m) on center. This means that contractors either have to purchase special widths of membrane for the application, or use a wider material (i.e., 6' (1.83 m) or 6.5' (1.98 m) wide) and leave extra material buried in the seam. In addition, the membrane has to be installed parallel to the purlins. JM RhinoPlate is an alternative attachment solution. The advanced induction welding technology bonds the membrane directly to specially coated plates that are installed to secure the insulation or cover board to the roof or purlins. The result is a nonpenetrating installation with enhanced wind resistance. RhinoPlate offers a solution where contractors do not need narrow or special width materials to match the purlin spacing, and the membrane can be oriented either parallel or perpendicular to the ridge, which makes the installation process easier. RhinoPlate is perfect for new construction too, and JM has best-in-class codes in the industry with the JM RhinoPlate System. For metal retrofit projects, when the fasteners rows are spaced 5' (1.52 m) apart, the fasteners can be installed 18" (46 cm) on center, giving extremely high wind uplifts with the fewest fasteners possible.



Excellent Code Approvals Offered

JM PVC membranes meet or exceed all the requirements of ASTM D 4434 Type III. In addition, JM PVC mechanically fastened and fully adhered roof systems are classified by Underwriters Laboratories Inc., Underwriters Laboratories of Canada and FM Global. JM membranes meet the material requirements of the International Building Code, Miami-Dade County and the Florida Building Code. Current code information is available on the Web at www.jm.com/roofing, or contact your JM sales representative for more details.

Johns Manville Is Dedicated to Providing Service

Johns Manville Roofing Systems helps you defy the elements with the industry's most comprehensive portfolio of commercial roofing solutions. Our single ply, built-up and modified bitumen systems are complemented by a complete line of insulations, cover boards, coatings and specialty products for single-source convenience. JM supports every installation with the most effective advice and support from our technical center. JM's customer service leads the industry in professionalism and responsiveness. And, our guarantees are among the strongest in the industry.

We have maintained our legacy of excellence for more than 150 years by investing in products that address unique building requirements and advances in roofing technology. With nearly 30 years of experience in high-performance single ply roofing systems, we continue to help our customers succeed in this demanding marketplace.

Use JM Training for Even Greater Productivity

To complement the greater efficiency of our products, JM provides installer training through the JM Roofing Institute™. This education and development program builds on the strength of JM's experience and knowledge to meet the needs of JM Peak Advantage® roofing contractors. Courses are designed to provide hands-on experience that will enhance day-to-day operations and improve productivity.



Helping to Specify the Complete Roofing System

The Technical and Support Services Group at Johns Manville emphasizes the roof as a complete system. These highly skilled technicians and engineers provide diverse and essential support services to the design professional throughout the project life cycle — from conceptual information and analysis, which may be required in the early design stages, all the way to the completion of a bid package. To learn more about JM's comprehensive services, visit www.jm.com/roofing.

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/About Us/US Terms and Conditions.

Peak Advantage Contractor Program



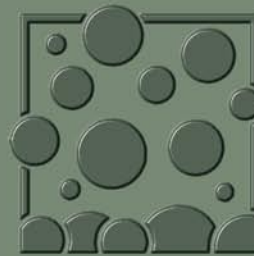
To ensure quality workmanship and top-notch installation, JM offers its Peak Advantage Contractor Program. Contractors selected to participate are proven to be best of class, having lived up to the highest performance standards. These contractors have access to JM's strongest guarantees. To be assured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



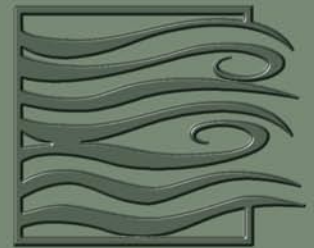
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