Johns Manville

LEED CREDITS GUIDE TO JM PRODUCTS

Together, we're building a sustainable future.

Products as innovative as your designs.

You want to create sustainable buildings—structures that preserve the natural environment, use less energy, last longer and are more comfortable to be in and around. Perhaps your next project will be certified under the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™. We can help.

WHAT IS JM DOING TO HELP YOU BUILD GREEN?

We make roofing systems, thermal and acoustical building and mechanical insulations, interior wall coverings and materials used in carpets, ceiling tiles, and acoustic wall panels and partitions. Many of our products are fundamental to energy efficiency, an aspect of sustainable design that is becoming more and more important as the global demand for energy grows. But we're busy making our products and processes even better—for example using more recycled content and developing formulations that improve indoor air quality.

A BRIEF OVERVIEW OF WHAT WE CONTRIBUTE:

- Cool roofing products that reduce energy costs and mitigate the "heat island" effect of development
- The only complete line of Formaldehyde-free™ fiber glass building insulation that improves indoor air quality while it saves energy and controls sound
- Energy conservation and acoustic comfort solutions for air handling systems and commercial interiors
- Insulation with more certified post-consumer recycled content than that of other fiber glass insulation manufacturers
- Research and engineering support in partnership with other building product manufacturers to develop more sustainable, better performing interior finish materials
- Programs that teach architects, specifiers and builders about products and methods that conserve resources, lower costs, enhance the built environment and preserve the natural environment

DEDICATED TO DEVELOPING SUSTAINABLE PRODUCTS.

Our commitment doesn't stop here. As a charter member of the USGBC, JM will continue developing better products to help you build green. Think of JM when you think of sustainable building. Together, we're building a greener future.

LEED-NC v2.2 Credit Opportunities

For credit opportunities under other LEED programs, ***contact us at JM.com/buildgreen****.*

Cover Case Study

Building:
RadioShack Riverfront Campus World Headquarters

Location:
Fort Worth, Texas

LEED certification level:
Silver

Architect:
HKS Inc.

Construction:
The Beck Group

Photograph by:
Blake Marvin, HKS Architecture

Located on 34 acres, the RadioShack Riverfront Campus World Headquarters is the largest project in Texas to qualify for LEED certification. Indoor air quality was a major concern, so the architects used JM Formaldehyde-free™ fiber glass insulation to help minimize the amount of volatile organic compounds and promote the well-being and productivity of employees in the workplace.

Sustainable Sites *(LEED-NC 2.2)*

JM IS YOUR PARTNER IN PROTECTING HABITAT AND MAXIMIZING OPEN SPACE.

Use Johns Manville's many roofing products when you need to contribute to Sustainable Sites credits. Whether you are planning a vegetated or reflective roof, we can help you meet regulations, lower building operation costs and achieve environmental goals.

SS Credit 5.1:
Site Development: Protect or Restore Habitat
1 Point

Intent:
Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements:
OPTION 2 – Use native or adapted vegetation over 50% of the previously developed site area, including vegetated roof surface area

SS Credit 5.2:
Site Development: Maximize Open Space
1 Point

Intent:
Provide a high ratio of open space to development footprint to promote biodiversity.

Requirements:
OPTION 1 – Reduce the development footprint–exceed local zoning open space requirement by 25% within project boundary
OPTION 2 – Provide vegetated open space adjacent to the building equal to the building footprint
OPTION 3 – Provide vegetated open space equal to 20% of the project's site area

All Options:
- For projects located in urban areas that earn SS Credit 2 (Development Density and Community Connectivity), vegetated roof areas can contribute to credit compliance.

SS Credits 7.1 and 7.2:
Heat Island Effect: Non-roof and Roof
1 Point Each

Intent:
Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements:
SSc7.1
OPTION 2 – Place a minimum of 50% of parking spaces under cover (defined as underground, under deck, under roof or under a building); any roof used to shade or cover parking must have an SRI of at least 29

SSc7.2
OPTION 1 – Use roofing materials with a Solar Reflectance Index (SRI) of 78 for low-sloped roofs and 29 for steep sloped roofs
OPTION 2 – Install a vegetated roof over 50% of the roof area
OPTION 3 – Install a combination of high albedo and vegetated roof surfaces with the above SRI rating requirements

JM products that help earn Sustainable Sites credits

When used as a part of a vegetated roof system, these JM products contribute to SSc5.1 Protect or Restore Habitat and SSc5.2 Maximize Open Space. And the reflective roofing membranes can be used to earn SSc7.1 Heat Island Effect: Non-roof and SSc7.2 Heat Island Effect: Roof.

Components of Vegetated and Reflective Roofs
½" Retro-Fit™ Board
DuraBoard™ Cover Board
ENRGY 3® (ENRGY 3® Foil Face Roof Insulation, ENRGY 3® Roof Insulation, ENRGY 3® Plus Roof Insulation or ENRGY 3® 25 PSI)
FesCant Plus Cant Strip
Fesco® Board
Fesco® Board HD
Invinsa™ Cover Board
Tapered ENRGY 3® Roof Insulation
Tapered Fesco® Board
Tapered Fesco® Edge Strip

Reflective Roofing Membranes	Solar Reflectance Index
GlasKap® CR	SRI 93
JM PVC 50, 60, 80 mil	SRI 111
JM PVC Fleece-Backed 50 and 60 mil Single-Ply Systems	SRI 112
JM TPO 45, 60 mil	SRI 96
TopGard® 4000	SRI 104
TopGard® 5000	SRI 104

Did You Know?

If you're planning a vegetated roof to help earn SSc5.1 and SSc5.2, you can use modular planted trays over JM's built-up and modified bitumen cap sheets. The modular trays make maintenance easy.

Case Study

Building:
Solano County Government Center

Location:
Fairfield, California

LEED certification level:
Certified

Architect:
Kaplan McLaughlin Diaz Architects

Construction:
Clark Design/Build of California, Inc.

Solano County officials knew what they wanted for their new government center—a building constructed with energy-efficient and sustainable materials that were feasible, proven and cost-effective.

They selected a hot-applied Johns Manville four-ply, built-up roof system, GlasKap CR, that is Title 24-compliant and contributed toward LEED credits. The county and contractor worked with the Johns Manville Tapered Design Center to achieve maximum insulation value and positive drainage over a 64,000-square-foot roofing surface with a variety of configurations.

Energy and Atmosphere *(LEED-NC 2.2)*

JM IS YOUR SOURCE FOR PRODUCTS THAT CONSERVE ENERGY.

We are experts in making products that optimize energy efficiency. Look to JM for a wide variety of roofing system, building insulation and mechanical insulation products that will contribute to LEED Energy and Atmosphere points.

EA Prerequisite 2:
Minimum Energy Performance

Required

Intent:
Establish the minimum level of energy efficiency for the proposed building and systems.

Requirements:
Design the building project to comply with both—
- The mandatory provisions of ASHRAE/IESNA Standard 90.1-2004 (without amendments); and
- The prescriptive requirements or performance requirements of ASHRAE/IESNA Standard 90.1-2004 (without amendments).

EA Credit 1:
Optimize Energy Performance

1-10 Points

Intent:
Achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements:
OPTION 1 – Whole Building Energy Simulation **(1-10 Points)**
OPTION 2 – Comply with ASHRAE Advanced Energy Design Guide for Small Office Buildings 2004 **(4 Points)**
OPTION 3 – Comply with the required sections of the Basic Criteria and Prescriptive Measures of the Advanced Building Benchmark v1.1 **(1 Point)**

How do I promote energy efficiency in my building and systems?

Maximizing the R-values of your building insulation, roofing system and mechanical insulation is one of the most cost-effective ways to optimize your building's energy performance.

How do I document the improved energy efficiency of added mechanical insulation?

Exceeding code requirements for mechanical insulations can significantly improve the energy efficiency of buildings. To demonstrate the benefits of added mechanical insulation during LEED certification, you can supplement the Whole Building Energy Simulation with other modeling, like 3E Plus® from the North American Insulation Manufacturers Association.

JM products that help earn Energy and Atmosphere credits

Using JM products that contribute to a reduced energy load for indoor HVAC equipment can help satisfy Energy and Atmosphere Prerequisite 2 Minimum Energy Performance and help earn EAc1 Optimize Energy Performance.

Building Insulation
Batt and Roll Insulation
ComfortTherm® Plastic-wrapped Fiber Glass Insulation Batts and Rolls
Foil-Faced Fiber Glass Insulation Batts
FSK-25 Faced Fiber Glass Insulation Batts
Kraft-Faced Fiber Glass Insulation Batts and Rolls
MR® Faced Mold- and Mildew-resistant Fiber Glass Insulation Batts
Panel Deck FSK-25 & PSK Faced Fiber Glass Insulation Batts
Unfaced Fiber Glass Insulation Batts and Rolls
Blow-in and Spray-in Insulation
Climate Pro® Loose Fill Fiber Glass Insulation
Spider™ Spray-in Custom Fiber Glass Insulation and Delivery System
Rigid and Semi-rigid Boards and Rolls
Insul-SHIELD® FSK-25 & PSK Panel Boards
Insul-SHIELD® Unfaced Boards

Roofing System Products
Roof Membranes
GlasKap® CR
JM PVC 50, 60, 80 mil
JM PVC Fleece-Backed 50 and 60 mil Single-Ply Systems
JM TPO 45, 60,72 and 80 mil
TopGard® 4000
TopGard® 5000
Roof Insulations and Cover Boards
½" Retro-Fit™ Board
DuraBoard™ Cover Board
ENRGY 3® (ENRGY 3® Foil Face Roof Insulation, ENRGY 3® Roof Insulation, ENRGY 3® Plus Roof Insulation or ENRGY 3® 25 PSI)
Fesco® Board
Fesco® Board HD
Invinsa™ Cover Board
Tapered ENRGY 3® Roof Insulation
Tapered Fesco® Board

Mechanical Insulation
Pipe, Tank and Equipment Insulation
Micro-Flex® Large Diameter Pipe & Tank Insulation
Micro-Lok® HP Pipe Insulation
Micro-Lok® Pipe Insulation
Spin-Glas® 800 Series Duct & Equipment Insulation
Spin-Glas® 1000 Series High Temperature Equipment Insulation
Insulation for Rectangular Steel Ducts
Linacoustic™ RC Duct Liner
Linacoustic™ R-300 Rigid Duct Liner
LinaTex™ Duct Liner
Microlite® Duct Wrap
Microlite® XG™ Duct Wrap
Spin-Glas® 800 Series Duct Wrap
Insulation for Round and Spiral Steel Ducts
Microlite® Duct Wrap
Microlite® XG™ Duct Wrap
Spiracoustic® Plus Duct Liner
Self-insulated Duct Products
EnviroAire® Duct Board
Mat-Faced Micro-Aire® Duct Board
SuperDuct® Duct Board

JM Formaldehyde-free™ products

Fiber glass is safe.

In October 2001, the World Health Organization's International Agency for Research on Cancer removed fiber glass insulation from its list of possible carcinogens.* Their action is consistent with the conclusion reached by the U.S. National Academy of Sciences, which in 2000 found "no significant association between fiber exposure and lung cancer or nonmalignant respiratory disease in the MVF [man-made vitreous fiber] manufacturing environment." Fiber glass is also safe for workers who make or install the product when they follow appropriate work practices to avoid mechanical irritation. Fiber glass insulation is one of the most thoroughly tested building materials in use today. Over 50 years of research by government and independent research organizations support the conclusion that fiber glass building insulation is safe for use in your commercial and residential buildings.

*IARC Monograph, Man-Made Vitreous Fibres. International Agency for Research on Cancer, Vol. 81, 23 August 2002.

Materials and Resources *(LEED-NC 2.2)*

AT JM, WE MAKE IT OUR BUSINESS TO USE RECYCLED CONTENT IN REGIONAL FACILITIES ACROSS THE U.S. AND CANADA.

Across our product lines, you'll find we incorporate substantial amounts of post-consumer and pre-consumer recycled content. With 20 manufacturing locations across the United States and Canada, we can help you purchase materials locally. And we use rapidly renewable materials in our innovative woven glass wall coverings.

MR Credit 4.1: Recycled Content: 10% (post-consumer + 1/2 pre-consumer)

1 Point

Intent:
Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirements:
Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

MR Credit 4.2: Recycled Content: 20% (post-consumer + 1/2 pre-consumer)

1 Point
in addition to MR Credit 4.1

Intent:
Increase demand for building products that incorporate recycled content materials, thereby reducing the impacts resulting from extraction and processing of virgin materials.

Requirements:
Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1.

MR Credit 5.1: Regional Materials: 10% Extracted, Processed & Manufactured Regionally

1 Point

Intent:
Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements:
Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% (based on cost) of the total materials value.

LEED-NC 2.1 or 2.2?

To contribute toward Materials and Resources credits under LEED v2.1, products must be manufactured within 500 miles of your project site. But under v2.2, the product must be extracted, processed and manufactured within 500 miles of your project site to be considered a regional material. Contact JM for extraction, processing and manufacturing details on products available near your project site. Make sure your vendors know which certification you are seeking.

Rapidly renewable materials in JM's woven glass wall coverings.

JM's woven glass textiles—Tassoglas,® Scandatex® and Textra™ wall coverings—are strong, lightweight decorative wall coverings that contribute to MRc6 because they're made with 15 to 20 percent potato starch, a rapidly renewable material. In addition, about 70 percent of these wall coverings is glass made from sand, an abundant resource that is naturally replenished. And JM wall coverings are durable—they remain breathable even after several re-paintings, they strengthen the walls they cover, and they are easy to maintain and repair.

MR Credit 5.2: *Regional Materials: 20% Extracted, Processed & Manufactured Regionally*

1 Point
in addition to MR Credit 5.1

Intent:
Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements:
Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for an additional 10% beyond MR Credit 5.1 (total of 20%, based on cost) of the total materials' value.

MR Credit 6: *Rapidly Renewable Materials*

1 Point

Intent:
Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

Requirements:
Use rapidly renewable building materials and products (made from plants that are typically harvested within a 10-year cycle or shorter) for 2.5% of the total value of all building materials and products used in the project, based on cost.

JM products that help earn Materials and Resources credits

Building Insulation

The recycled content of these JM products contributes to LEED MRc4.1 Recycled Content 10% and 4.2 Recycled Content 20%.

	Post-consumer Recycled Content	Post-industrial (Pre-consumer) Recycled Content
Batt and Roll Insulation		
ComfortTherm® Plastic-wrapped Fiber Glass Insulation Batts and Rolls	20	5
Foil-Faced Fiber Glass Insulation Batts	20	5
FSK-25 Faced Fiber Glass Insulation Batts	20	5
Kraft-Faced Fiber Glass Insulation Batts and Rolls	20	5
MR® Faced Mold- and Mildew-resistant Fiber Glass Insulation Batts	20	5
Panel Deck FSK-25 & PSK Faced Fiber Glass Insulation Batts	20	5
Unfaced Fiber Glass Insulation Batts and Rolls	20	5
Blow-in and Spray-in Insulation		
Climate Pro® Loose Fill Fiber Glass Insulation	20	5
Spider™ Spray-in Custom Fiber Glass Insulation and Delivery System	20	5
Rigid and Semi-rigid Boards and Rolls		
Insul-SHIELD® Coated Black Rolls	Varies*	Varies*
Insul-SHIELD® FSK-25 & PSK Panel Boards	Varies*	Varies*
Insul-SHIELD® Unfaced Boards	Varies*	Varies*

* Contact JM for recycled content of these products in your area.

Commercial Building Wrap

The recycled content of these JM products contributes to LEED MRc4.1 Recycled Content 10% and 4.2 Recycled Content 20%.

Gorilla Wrap™	3 - 30	

JM Formaldehyde-free™ products

SCS Certified

At least 20% Post-Consumer Glass and the balance pre-consumer recycled glass (North-American plant wide average)

25% Recycled Content

SCS-RRC-01073 www.scscertified.com

JM Formaldehyde-free™ building insulation contains 20% post-consumer recycled glass.

Roofing System Products

The recycled content of these JM products contributes to LEED MRc4.1 Recycled Content 10% and 4.2 Recycled Content 20%.

	Post-consumer Recycled Content	Post-industrial (Pre-consumer) Recycled Content
½" Retro-Fit™ Board	37	0 - 3
DuraBoard™ Cover Board	30 - 38	0 - 3
ENRGY 3® (ENRGY 3® Foil Face Roof Insulation, ENRGY 3® Roof Insulation, ENRGY 3® Plus Roof Insulation or ENRGY 3® 25 PSI)	23 - 44	8.1 - 13.4
Fesco® Board	28 - 31	2
Fesco® Board HD	30	3
FesCant Plus Cant Strip	33	2
JM PVC 50, 60, 80 mil		2.5
JM PVC Fleece-Backed 50 and 60 mil Single-Ply Systems		2.5
JM TPO 45, 60, 72 and 80 mil		3 - 5
Tapered ENRGY 3® Roof Insulation	28 - 31	2
Tapered Fesco® Board	28 - 31	2
Tapered Fesco® Edge Strip	28 - 31	2

Wall Coverings

JM glass textile decorative wall coverings can contribute to LEED MR Credit 6: Rapidly Renewable Materials.

	Rapidly Renewable Materials Content
Scandatex® Wall Covering	15 - 20
Tassoglas® Wall Covering	15 - 20
Textra™ Wall Covering	15 - 20

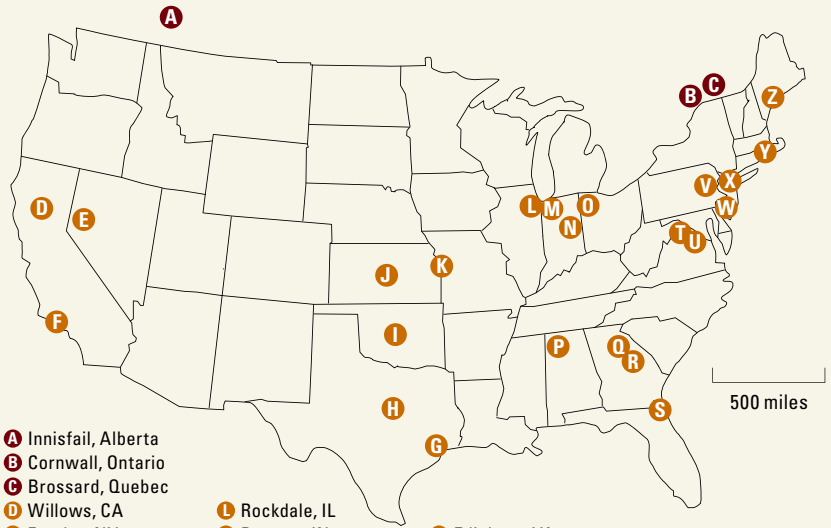
Mechanical Insulation

Currently, insulation for mechanical systems does not contribute to MR credits under LEED, but these JM products do contribute to a more sustainable project.

	Post-consumer Recycled Content	Post-industrial (Pre-consumer) Recycled Content
Pipe, Tank & Equipment Insulation		
Micro-Flex® Large Diameter Pipe & Tank Insulation	16 - 17.5	4
Insulation for Air Handling Ducts		
LinaTex™ Duct Liner		69 - 75
Spin-Glas® 800 Series Ductwrap (Faced)	15.5 - 17.5	3.5 - 4
Microlite® XG™ Duct Wrap	14 - 16.5	3.5 - 4

Manufacturing Locations

JM products are manufactured at locations across the U.S. and Canada, helping you earn MRc5.1 and 5.2.



- A Innisfail, Alberta
- B Cornwall, Ontario
- C Brossard, Quebec
- D Willows, CA
- E Fernley, NV
- F South Gate, CA
- G Houston, TX
- H Cleburne, TX
- I Oklahoma City, OK
- J McPherson, KS
- K Kansas City, KS
- L Rockdale, IL
- M Bremen, IN
- N Richmond, IN
- O Defiance, OH
- P Tuscumbia, AL
- Q Winder, GA
- R Macon, GA
- S Jacksonville, FL
- T Edinburg, VA
- U Woodstock, VA
- V Hazleton, PA
- W Penbryn, NJ
- X Edison, NJ
- Y Pawtucket, RI
- Z Lewiston, ME

Visit **JM.com/buildgreen** for more information on where JM products are extracted, processed and manufactured near your project site.

Innovation and Design Process *(LEED-NC 2.2)*

Acoustic Comfort: Noise Pollution Reduction

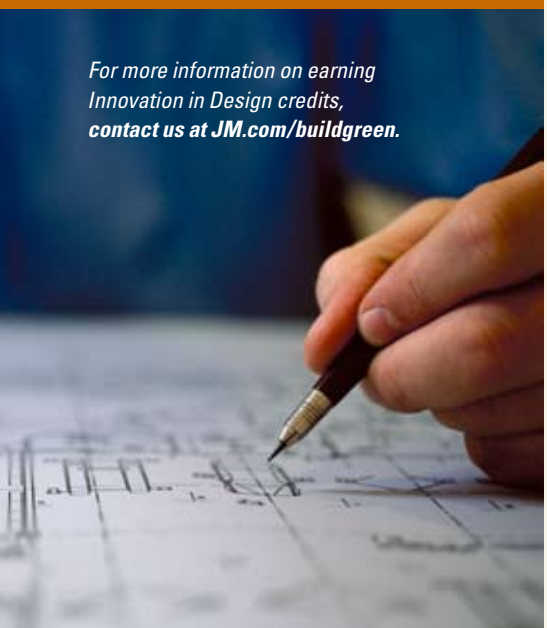
According to Innovation in Design CIR Ruling dated 4/5/2004:

"A point in innovation may be available if the project team demonstrates that they have significantly exceeded standard practice for acoustic comfort within this building type. Please provide standards used as a baseline if applicable. All occupied building spaces should be included in this strategy, including corridors, break rooms, etc."

In office and educational environments, the HVAC system may be a significant contributor to noise. A critical strategy for noise reduction is to specify fiber glass acoustical duct liners or duct board to reduce noise transmission resulting from:

- *Fans, dampers and equipment*
- *"Crosstalk" traveling from room to room*
- *Sheet metal contraction and expansion*

Fiber glass duct insulation delivers superior control of mechanical noise, especially when you provide an increased liner thickness in the 20 feet of the duct leading to the vent or diffuser.



For more information on earning Innovation in Design credits, ***contact us at JM.com/buildgreen.***

JM HELPS YOU EXCEED EXPECTATIONS.

To earn Innovation in Design LEED points, you need building materials that go beyond required performance minimums. At JM, we strive to develop next-generation products, such as our insulation made without formaldehyde, our factory-applied cool roof coating that reduces emissions during the construction process and our many products that provide acoustic comfort. Trust JM products to contribute to your innovative design strategies.

ID Credit 1.1–1.4:
Innovation in Design

1-4 Possible Points

Intent:
To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED-NC Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED-NC Green Building Rating System.

Suggested Strategy:
Comprehensive Formaldehyde Reduction

Intent:
Provide a safe and healthy environment for both construction teams and building occupants.

Requirements:
Meet the requirements of existing LEED credits associated with formaldehyde reduction AND comply with the additional measures outlined below in order to obtain a comprehensive formaldehyde reduction in the building. To accomplish this, the following are required:

- Specify no- or low-formaldehyde-emitting products/appliances for each of the following if/as incorporated in the project:
  - Composite wood and agrifiber—meet LEED-NC EQc4.4 credit requirements
  - Insulation made without formaldehyde
- Environmental Tobacco Smoke (ETS) Control—meet LEED EQp2 credit requirements
- Thermal Comfort Design—meet LEED-NC EQc7.1 credit requirements
- Monitor Air Quality—install indoor VOC/formaldehyde sensor

Suggested Strategy:
Comprehensive Exterior VOC-emitting Materials Reduction

Intent:
Provide a safe and healthy outdoor environment for both construction teams and building occupants. Reduce outdoor pollution resulting from construction practices and material selection.

Requirements:
Significantly reduce the amount of VOCs released to the outdoor air through construction practices and materials selection by specifying low-VOC-emitting products for each of the following if/as incorporated in the project:

- Factory-applied cool roof coating (rather than field applied)
- No added urea-formaldehyde composite wood exterior doors
- Low-VOC siding materials (composite wood and cement products)
- Low-VOC pesticides and vegetation care products
- Heat island effect: roof—meet LEED-NC SS7.2 credit requirements
- VOC limits for concrete sealants and caulks, exterior paints, wood stains and sealers, and metal stains and sealers
- Describe the regional air quality context to justify the restriction of outdoor emissions of VOCs

Indoor Environmental Quality *(LEED-NC 2.2)*

JM FORMALDEHYDE-FREE™ FIBER GLASS BUILDING INSULATION IMPROVES INDOOR AIR QUALITY.

A logical way to reduce indoor air quality problems is to reduce sources of formaldehyde. We offer an entire line of fiber glass building insulation that improves indoor air quality because it's made without formaldehyde. No formaldehyde was detected in our Formaldehyde-free™ building insulation during testing by Berkeley Analytical Laboratories. And JM is working to expand Formaldehyde-free™ insulation offerings throughout our product line.

EQ Credit 3.2:
Construction IAQ Management Plan: Before Occupancy

1 Point

Intent:
Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

Requirements:
Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:
OPTION 2 – Air Testing (maximum LEED-allowed formaldehyde air concentration: 50 ppb)

INDOOR AIR QUALITY AND FIBER GLASS DUCT LINERS AND DUCT BOARD.

Many Johns Manville air duct products incorporate our exclusive Permacote® airstream surface system. This acrylic polymer surface helps guard against incursion of dust or dirt into the substrate, minimizing the potential for biological growth. Permacote coating is also formulated with an immobilized, U.S. EPA-registered agent to protect the coating from the potential growth of fungus and bacteria. Products incorporating the Permacote coating pass ASTM C 1071 fungi testing, as well as the more stringent ASTM G 21 test.

According to the U.S. EPA, "Duct board and duct liner are widely used in duct systems because of their excellent acoustic, thermal, and condensation control properties. If the HVAC system is properly designed, fabricated, installed, operated and maintained, these duct systems pose no greater risk of mold growth than duct systems made of sheet metal or any other materials."*

Studies of fiber glass duct liner and fiber glass duct board conducted over the last three decades demonstrate no significant fiber erosion on surfaces in typical HVAC systems. When properly installed, operated and maintained, these products do not increase airborne fiber levels in buildings.

*epa.gov/iaq/schooldesign/hvac.html

JM products that help earn Indoor Environmental Quality credits

Earn IEQc3.2 Construction IAQ Management Plan, Option 2-Air Quality Testing, by using low-emitting building materials. Specifying JM Formaldehyde-free™ products means fewer sources of formaldehyde.

Building Insulation

Batt and Roll Insulation

- ComfortTherm® Plastic-wrapped Fiber Glass Insulation Batts and Rolls
- Foil-Faced Fiber Glass Insulation Batts
- FSK-25 Faced Fiber Glass Insulation Batts
- Kraft-Faced Fiber Glass Insulation Batts and Rolls
- MR® Faced Mold- and Mildew-resistant Fiber Glass Insulation Batts
- Panel Deck FSK-25 & PSK Faced Fiber Glass Insulation Batts
- Unfaced Fiber Glass Insulation Batts and Rolls

Blow-in and Spray-in Insulation

- Climate Pro® Loose Fill Fiber Glass Insulation
- Spider™ Spray-in Custom Fiber Glass Insulation and Delivery System

Mechanical Insulation

Insulation for Air Handling Ducts

- EnviroAire™ Duct Board
- Microlite® XG™ Duct Wrap

Wall Coverings

- Scandatex® Wall Covering
- Tassoglas® Wall Covering
- Textra™ Wall Covering

JM Formaldehyde-free™ products

LEED FOR SCHOOLS.

In April 2007, the USGBC launched the LEED for Schools program, basing it on LEED for New Construction certification. It addresses issues specific to K-12 schools, such as classroom acoustics, master planning, mold prevention and environmental site assessment. Several JM products can contribute toward Indoor Environmental Quality (EQ) credits.

Did You Know?

JM Formaldehyde-free™ insulation improves indoor air quality because it's made without formaldehyde. JM Formaldehyde-free™ products can be used to eliminate or reduce VOCs in other manufacturers' products, too. Our Formaldehyde-free™ fiber glass is used to eliminate a potential source of formaldehyde from acoustic panels, partitions, carpeting, kitchen ranges, water heaters and air conditioners.

EQ Credit 4:
Low-Emitting Materials

1 Point

Intent:
Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements:
OPTION 6 - CEILING AND WALL SYSTEMS **(1 Point)** All gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior shall meet the testing and product requirements of the California Department of Heath Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.

EQ Credit 9:
Enhanced Acoustical Performance

1-2 Points

Intent:
Provide classrooms that facilitate better teacher-to-student and student-to-student communications.

Requirements:
Design classrooms and other core learning spaces to meet the Reverberation Time (RT) requirements of ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools. Also design classrooms and other core learning spaces to meet the Sound Transmission Class (STC) requirements, excepting windows, which must meet an STC rating of at least 35.

Future LEED and building science.

FORMALDEHYDE REDUCTION.

JM is working to have formaldehyde reduction recognized as a sustainability measure that is eligible for credit under the LEED certification program. We believe formaldehyde reduction is important because:

- *U.S. Environmental Protection Agency cautions against formaldehyde*[1] The U.S. EPA recommends limiting exposure to formaldehyde as much as possible.
- *California EPA recommends using building materials made without formaldehyde*[2] The California Air Resources Board (CARB), a division of California's EPA, found that the air in most homes contains too much formaldehyde. CARB advises that homeowners, builders and architects use building materials made without formaldehyde when building or remodeling a home.

ACOUSTIC COMFORT.

In future LEED certification, your project may also be eligible for credit for increased acoustic comfort, depending on your building type. The new LEED for Schools Program recognizes that student academic performance may be significantly enhanced if noise is reduced to meet definable building acoustic performance levels. For this reason, the Collaborative for High Performance Schools specifically recommends the use of acoustic duct liners. Similarly, recent studies and surveys of noise reduction in office environments support incorporating acoustic performance into other LEED programs. Johns Manville has noise reduction solutions to address sources of noise throughout the building, and we believe that introducing acoustic performance for future LEED program versions is a critical next step.

BUILDING SCIENCE AND ENGINEERED MATERIALS.

In 2002, when JM eliminated formaldehyde from our fiber glass building insulation, we also developed a full line of other Formaldehyde-free™ materials. Some of these materials are used to reinforce carpet tiles, office panels, office furnishings, ceiling tiles and wall coverings. Others add cushioning or acoustical properties. Still other JM materials help make products that don't support mold growth.

1 Comments of U.S. EPA on LEED-NC Version 2.2; Response to Comments on Draft Standard for Indoor Environmental Quality, Indoor Environmental Quality Prerequisite 1 at pp 71-72, Issue EQc4.3.14, Exhibit 3 (emphasis added). See usgbc.org.

2 California Air Resources Board *Report on Air Pollution in California*, www.arb.ca.gov/research/indoor/ab1173/ab1173.htm, and *Guideline: Formaldehyde in the Home*, www.arb.ca.gov/research/indoor/formaldehyde.htm.

Did You Know?

For years, Environment Canada's Environmental Choice Program (ECP) has awarded its EcoLogo℠ to environmentally responsible products and services. Starting in 2005, only fiber glass insulation made without formaldehyde and with a high recycled content (our Canadian building insulation is at least 45% post-consumer glass) can earn the EcoLogo. JM Formaldehyde-free™ fiber glass insulation is the only bonded fiber glass insulation that meets these more stringent requirements.

Certified Climate Protection

Case Study

Building:
U.S. Environmental Protection Agency's Region 8 Headquarters

Location:
Denver, Colorado

LEED certification level:
Silver required; Gold expected

Architect:
Zimmer-Gunsul-Frasca

Construction:
OPUS Northwest, LLC

The U.S. EPA's Region 8 Headquarters is required to qualify for a Silver-level certification but is expected to receive a LEED 2.0 Gold rating. The U.S. EPA demands that the building be energy-efficient and also obtain an ENERGY STAR label. The 250,000 gross-square-foot building contains a variety of JM Formaldehyde-free™ fiber glass building and duct insulation products in addition to JM pipe insulation and jacketing. JM products contributed to increased energy efficiency, recycled content, reduced VOCs and other building features that will support its LEED certification.

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JM products can also help earn credits under other LEED programs.
*For more information, **visit JM.com/buildgreen**.*

LEED-NC v2.2 Criteria Prerequisites or Credits Where JM Products Contribute		SS				EA		MR						IEQ		ID
		CREDIT 5.1	CREDIT 5.2	CREDIT 7.1	CREDIT 7.2	PREREQUISITE 2	CREDIT 1	CREDIT 4.1	CREDIT 4.2	CREDIT 5.1	CREDIT 5.2	CREDIT 6	CREDIT 3.2	CREDIT 4.1	CREDITS 1.1-4
ROOFING SYSTEMS															
Roofing Membranes															
GlasKap® CR	SRI 93 Reflective, emissive white mineral-surfaced acrylic-coated, fiber glass cap sheet that is CA Title 24-compliant and is eligible for LEED credits.	●	●	●	●	●	●			○	✚				●
JM PVC 50, 60, 80 mil	SRI 111 Flexible, thermoplastic membrane of UV-resistant PVC and Elvaloy® ketone ethylene ester. Reinforced with non-wicking polyester fabric (needs no edge sealant).	●	●	●	●	●	●	●	●	○	✚				
JM PVC Fleece-Backed 50 and 60 mil Single-Ply Systems	SRI 112 Flexible, thermoplastic membrane of UV-resistant PVC and Elvaloy® ketone ethylene ester, reinforced with polyester fabric and backed with lightweight polyester fleece.	●	●	●	●	●	●	●	●	○	✚				
JM TPO 45, 60, 72 and 80 mil	SRI 112 Thermoplastic polyolefin (TPO) membranes reinforced with polyester fabric, and designed for use in mechanically fastened and adhered roofing applications.	●	●	●	●	●	●	●	●	○	✚				
TopGard® 4000	SRI 104 Reflective, 100% acrylic, elastomeric, bleed-blocking coating for use over asphalt, single-ply and metal roofing.	●	●	●	●	●	●			○	✚				
TopGard® 5000	SRI 104 Reflective, 100% acrylic, elastomeric coating for smooth or granulated surfaced roofing systems in colder climates.	●	●	●	●	●	●			○	✚				
Roof Insulation															
½" Retro-Fit™ Board	High-density board made of expanded perlite and cellulosic fibers. Top surface is sealed with TopLoc® coating to ensure good attachment in bituminous applications.	●	●			●	●								
DuraBoard™ Cover Board	High-density, low thermal rigid insulation board. For new and recover applications or over closed cell foam insulations using SBS or APP membrane roofing systems with torch application.	●	●			●	●	●	●	○	✚				
ENRGY 3® (ENRGY 3® Foil Face Roof Insulation, ENRGY 3® Roof Insulation, ENRGY 3® Plus Roof Insulation or ENRGY 3® 25 PSI)	Rigid insulation board that provides high thermal insulation value over metal, nailable and non-nailable roof decks in built-up, modified bitumen and single-ply membrane roofing systems. Polyisocyanurate foam factory-bonded to fiber glass reinforced facers.	●	●			●	●	●	●	○	✚				
FesCant Plus Cant Strip	High-density, laminated board that provides an excellent way to transition from the deck to the wall of the roof.	●	●					●	●	○	✚				
Fesco® Board	Expanded perlite rigid insulation board. Ideal as a low-thermal roof insulation board and general-purpose cover board over closed cell-foam insulation boards in some roofing systems.	●	●			●	●	●	●	○	✚				
Fesco® Board HD	High-density expanded perlite rigid insulation board. Ideal to use over wide flute or metal deck applications.	●	●			●	●	●	●	○	✚				
Invinsa™ Cover Board	Resilient, lightweight polyisocyanurate roof board that maximizes membrane performance and protects insulation below.	●	●			●	●								
Tapered ENRGY 3® Roof Insulation	Rigid polyisocyanurate insulation board designed to be directly applied to and promote positive drainage for steel and other roof decks.	●	●			●	●	●	●	○	✚				
Tapered Fesco® Board	Expanded perlite panel that's pre-cut to several slopes.	●	●			●	●	●	●	○	✚				
Tapered Fesco® Edge Strip	Ideal for transitioning from membrane to nailer or transitioning from Tapered Fesco, Tapered ENRGY 3 or Tapered Fesco.	●	●					●	●	○	✚				
BUILDING INSULATION															
Batts and Rolls															
ComfortTherm® Plastic-wrapped Fiber Glass Insulation Batts and Rolls	Wrapped in plastic for twice the moisture control of kraft facings.					●	●	●	●	○	✚		●		●
Foil-Faced Fiber Glass Insulation Batts	Foil facing acts as an excellent vapor retarder in concealed applications.					●	●	●	●	○	✚		●		●
FSK-25 Faced Fiber Glass Insulation Batts	Foil-scrim kraft-faced insulation provides superior moisture control and light reflectivity.					●	●	●	●	○	✚		●		●
Kraft-Faced Fiber Glass Insulation Batts and Rolls	Kraft facing serves as a vapor retarder to control moisture in concealed wall applications.					●	●	●	●	○	✚		●		●
MR® Faced Mold- and Mildew-resistant Fiber Glass Insulation Batts	Facing treated with a U.S. EPA-registered agent to protect the insulation from mold and mildew.					●	●	●	●	○	✚		●		●
Panel Deck FSK-25 & PSK Faced Fiber Glass Insulation Batts	Foil-scrim kraft-faced or polypropylene-scrim kraft-faced insulation with extended side tabs for use beneath roofing panel decks.					●	●	●	●	○	✚		●		●
Unfaced Fiber Glass Insulation Batts and Rolls	Bonded fiber glass building insulation for use where no vapor retarder is needed or where a separate vapor barrier is applied.					●	●	●	●	○	✚		●		●
Blow-in and Spray-in Insulation															
Climate Pro® Loose Fill Fiber Glass Insulation	Blow-in fiber glass for attics and other hard-to-reach areas. Can be used in walls and ceilings as part of the Blow-in-Blanket System®.					●	●	●	●	○	✚		●		●
Spider™ Spray-in Custom Fiber Glass Insulation	Spray-in fiber glass achieves up to R-15 in 2x4 framing and up to R-25 in 6-inch steel framing. Treated with a U.S. EPA-registered agent to protect the insulation against mold.					●	●	●	●	○	✚		●		●
Rigid and Semi-rigid Boards															
Insul-SHIELD® Unfaced Boards	Fiber glass insulation boards designed for curtain wall applications.					●	●	○	○	○	✚				
Insul-SHIELD® FSK-25 & PSK Panel Boards	Faced boards for applications where a vapor barrier is needed. FSK facing is fire-resistant and helps maximize lighting efficiency.					●	●	○	○	○	✚				
COMMERCIAL BUILDING WRAP															
Gorilla Wrap™	Translucent non-perforated, non-woven polymeric material designed to reduce air and water infiltration.							●	●	○	✚				

● JM products contribute to this prerequisite or credit. ○ Contact JM to find out how JM products can contribute to credits at your project site. ✚ JM is in the process of auditing material extraction locations. May apply under LEED-NC v2.1.

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JM products can also help earn credits under other LEED programs.
*For more information, **visit JM.com/buildgreen**.*

	LEED-NC v2.2 Criteria	SS				EA		MR						IEQ		ID
	Prerequisites or Credits Where JM Products Contribute	CREDIT 5.1	CREDIT 5.2	CREDIT 7.1	CREDIT 7.2	PREREQUISITE 2	CREDIT 1	CREDIT 4.1	CREDIT 4.2	CREDIT 5.1	CREDIT 5.2	CREDIT 6	CREDIT 3.2	CREDIT 4.1	CREDITS 1.1-4
MECHANICAL INSULATION																
Pipe, Tank & Equipment Insulation																
Micro-Lok® Pipe Insulation	Reinforced vapor retarder facing. Ideal for piping systems with operating temperatures up to 850°F.					●	●									
Micro-Lok® HP Pipe Insulation	The next generation of Micro-Lok pipe insulation.					●	●									
Micro-Flex® Large Diameter Pipe & Tank Insulation	High-temperature, semi-rigid fiber glass blanket bonded to a flexible facing. Ideal for pipes, tanks, ducts, vessels, and other round or irregular shapes.					●	●									
Spin-Glas® 800 Series Duct & Equipment Insulation	Can be used in plain or faced form to insulate commercial and industrial heating, air conditioning, power and process equipment.					●	●									
Spin-Glas® 1000 Series High Temperature Equipment Insulation	Semi-rigid board insulation ideal for insulating furnaces, boilers, heated vessels, ducts, tanks and other heated equipment operating at temperatures up to 850°F.					●	●									
Zeston® PVC Fitting Covers & Jacketing	Heavy-duty fitting covers and jacketing with Formaldehyde-free™ fiber glass inserts for chilled water, hot water, steam and other piping systems.															
Ceel-Co® PVC Fitting Covers & Jacketing	Heavy-duty fitting covers and jacketing with Formaldehyde-free™ fiber glass inserts for chilled water, hot water, steam and other piping systems.															
Insulations for Rectangular Steel Ducts																
Linacoustic™ RC Duct Liner	Flexible duct liner featuring JM's exclusive Reinforced Coating System to protect the airstream surface.					●	●						●		●	
Linacoustic™ R-300 Rigid Duct Liner	Airstream surface and long edges are coated with a tough, smooth, acrylic polymer. Designed for HVAC plenums and air distribution ductwork with air velocities up to 6,000 fpm and temperatures up to 250°F.					●	●								●	
LinaTex™ Duct Liner	Flexible liner with airstream surface protected by a black, high-density glass mat. For lining sheet metal ducts with air velocity up to 6,000 fpm and operating temperatures up to 250°F.					●	●								●	
Microlite® Duct Wrap	Lightweight, highly resilient blanket-type thermal and acoustical insulation available plain or with factory-applied foil-skrim-kraft facing and white Class 1 vinyl.					●	●									
Microlite® XG™ Duct Wrap	Made without formaldehyde, this is a lightweight, highly resilient blanket-type thermal and acoustical insulation for the exterior of HVAC systems or other spaces or surfaces.					●	●						●		●	
Spin-Glas® 800 Series Duct Wrap	Can be used in plain or faced form to insulate commercial and industrial heating, air conditioning, power and process equipment.					●	●									
Insulations for Round & Spiral Steel Ducts																
Spiracoustic® Plus Duct Liner	This system is a comprehensive group of duct lining products engineered to provide very high acoustical and thermal performance in round air ducts of virtually any size.					●	●								●	
Microlite® Duct Wrap	Lightweight, highly resilient blanket-type thermal and acoustical insulation available plain or with factory-applied foil-skrim-kraft facing and white Class 1 vinyl.					●	●									
Microlite® XG™ Duct Wrap	Made without formaldehyde, this is a lightweight, highly resilient blanket-type thermal and acoustical insulation for the exterior of HVAC systems or other spaces or surfaces.					●	●						●		●	
Self-Insulated Duct Products																
Formaldehyde-free™ Duct Board	The only fiber glass duct board for residential and commercial air handling systems that is made without formaldehyde is scheduled for launch in Q4 2006.					●	●						●		●	
Mat-Faced Micro-Aire® Duct Board	Airstream side features a fiber glass mat for use at velocities up to 5,000 fpm. The opposite side features a fire-resistant foil-skrim-kraft facing. Ideal for fabrication into rectangular ductwork.					●	●								●	
SuperDuct® Duct Board	Male/female joints are factory-made on the traverse edges of each board and a tough foil-skrim-kraft facing is laminated to the exterior surface of the board.					●	●								●	
Duct Adhesives & Sealants																
SuperSeal® Duct Butter	Black aerosol foam that's ideal for spot or edge repair. Easy to use and clean up in the shop or the field.													●		
SuperSeal® Edge Treatment	Sprayable liquid for high-volume shop applications. May also be applied with a brush.													●		
SuperSeal® HV	High viscosity version of the Permacote® coating, for spot or edge repair.													●		
WALL COVERINGS																
Scandatex® Wall Covering	Durable woven glass textile in an extensive range of textures and patterns. Easy to clean, repaint and repair.											●	●			
Tassoglas® Wall Covering	Glass textile with fine or heavy textures and Jacquard-woven, classic-woven and relief-printed patterns. Available pre-primed, pre-glued and strippable and for wet rooms and shower rooms.											●	●			
Textra™ Wall Covering	Woven glass textile in a variety of textures that can be repainted up to 10 times. Breathable when painted with a low-sheen latex paint.											●	●			

Currently, mechanical systems, components and associated pipe, duct and HVAC equipment thermal and acoustical insulations are excluded from MR credit calculations under LEED-NC.

● JM products contribute to this prerequisite or credit.

LEED-NC v2.2 Criteria.

SUSTAINABLE SITES (SS)				ENERGY AND ATMOSPHERE (EA)		MATERIALS AND RESOURCES (MR)					INDOOR ENVIRONMENTAL QUALITY (IEQ)		INNOVATION & DESIGN (ID)
CREDIT 5.1 Site Development – Protect or Restore Habitat	**CREDIT 5.2** Site Development – Maximize Open Space	**CREDIT 7.1** Heat Island Effect – Non-Roof	**CREDIT 7.2** Heat Island Effect – Roof	**PREREQUISITE 2** Minimum Energy Performance	**CREDIT 1** Optimize Energy Performance	**CREDIT 4.1** Recycled Content: 10% (Post-consumer + ½ pre-consumer)	**CREDIT 4.2** Recycled Content: 20% (Post-consumer + ½ pre-consumer)	**CREDIT 5.1** Regional Materials: 10% Extracted, Processed, and Manufactured Regionally	**CREDIT 5.2** Regional Materials: 20% Extracted, Processed, and Manufactured Regionally	**CREDIT 6** Rapidly Renewable Materials	**CREDIT 3.2** Construction IAQ Management Plan OPTION 2: Air Quality Testing	**CREDIT 4.1** Low-emitting Materials	**CREDITS 1.1-4** Innovation in Design

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