



JM Corbond MCS™

Closed-cell Spray Polyurethane Foam
ICC-ESR 3159

INSULATE WITH THE CLIMATE ISOLATION SYSTEM®

Johns Manville Corbond Multi-Climate Solution (MCS) is the ultimate insulation solution. It acts as a barrier to keep the indoors from the outside climate, creating thermal, air and moisture isolation. Because it will not shrink or settle, its incredible thermal and acoustical performance lasts the life of a structure. JM Corbond MCS and its unique Lavender® color have become a symbol of uncompromising quality and standards and a mark of environmental commitment.

PRODUCT DESCRIPTION

JM Corbond MCS is a premium spray polyurethane foam building insulation. The product is generated on site by combining an isocyanate and a polymeric resin through a dual-component proportioner. Fast, easy and adaptable, it can achieve an R-value of 19 in 2x4 construction. JM Corbond MCS is well suited for residential, commercial and industrial applications. As one of the most advanced insulation solutions, it offers climate isolation between indoor and outside environments.

APPLICATIONS

This system is a sprayable, rigid, closed-cell polyurethane cellular plastic foam insulation designed to insulate buildings. The sprayed product, properly installed, results in a seamless, monolithic and durable insulation fully adhered to the substrate, which is Lavender in color.

- Walls – JM Corbond MCS may be applied to the exterior or interior of walls in residential or commercial buildings to the desired thickness and R-value. Suitable substrates include but are not limited to plywood, oriented strand board (OSB), any foam sheathing with or without foil facers, rock, brick, concrete masonry units (CMU), and painted or primed steel. JM Corbond MCS may be applied to these substrates with or without studs.
- JM Corbond MCS may be used as nonstructural thermal insulating material in Types I, II, III, IV, and V construction.
- Cathedral roofs – JM Corbond MCS may be applied directly to the underside of roof sheathing between the rafters to the desired thickness. Traditional venting is not necessary and should be avoided (section 806.4 of the 2006 IRC).
- Hybrid solutions – Combine JM Corbond MCS with certified JM Formaldehyde-free™ building insulation to create a custom insulation solution.

The JM Corbond MCS spray systems are technologically advanced, sophisticated materials and should be applied only by trained, qualified, experienced polyurethane spray applicators.

INSTALLATION

This spray system may be applied in passes of uniform thickness from a minimum of a half inch to a maximum of two inches. For maximum yield and productivity, the product may be applied in a single pass to the specified thickness or up to a maximum of two inches per pass. (Exceptions may exist when sheet metal or gypsum wallboard substrates are encountered. Refer to Application Guide.)

RECOMMENDED STORAGE AND TRANSPORT

Shelf Life and Storage of Raw Materials

All materials should be stored in their original containers and away from heat and moisture, especially after the seals have been broken and the containers have been opened. Shelf life is six months when stored indoors at a temperature between 60°F and 70°F. Storage below 60°F may result in compound stratification of the B and/or crystalline formation in the A component. Temperatures above 75°F may decrease the shelf life. Containers should be opened carefully to allow any pressure buildup to be vented safely. Extensive venting of the B component may result in loss of blowing agent, higher-density foam and reduced yield. Temperatures below 65°F will increase the viscosity of the components making them difficult to pump. Both components are adversely affected by water and humidity.

- Freight class 55 (A or B)
- Resin compounds item 46030
- N01BN non-hazardous

SPECIFICATION COMPLIANCE

See following page for a complete list of test results.



PERFORMANCE ADVANTAGES

- Unique Climate Isolation System – creates a thermal, air and moisture barrier.
- Retrofit applications – examples of retrofit applications include basements, new additions, attics and commercial buildings.
- Flexible hybrid system – JM Spider® Custom Insulation System can be applied over JM Corbond MCS in exposed attic spaces for increased R-value.
- Air impermeable – when tested in accordance with ASTM E283, JM Corbond MCS is air impermeable when installed at a thickness of 1½ inches or more.
- Energy efficient – reaches R-19 when installed at a thickness of three inches, and up to R-38 when installed at six inches.
- Superior moisture performance – resists mold growth and meets all current vapor retarder codes. When tested in accordance with ASTM E96, JM Corbond MCS has a vapor permeance of less than one perm at 1-½ inches thick.
- Covers completely – integrally attaches to cavity spaces, will not shrink or settle.
- Application temperature range – can be applied to substrates at temperatures between 45°F and 90°F.
- High-quality raw materials – create a consistent, easy-to-spray product without an offensive odor and no ozone-depleting chemicals.
- Meets incombustible exterior commercial wall requirements in accordance with NFPA 285.

TYPICAL PHYSICAL PROPERTIES

	ASTM Method	JM Corbond MCS
Nominal Density	D-1622	2.0 lb/cu ft
Compressive Strength (1")	D-1621	18 psi
Compressive Strength (3")	D-1621	20 psi
Closed-cell Content	D-1940	>90%
K-factor	C-518 (initial)	0.15
	C-1029-07 (180-day aged)*	0.16
R-value	C-518 (initial)	6.6
	C-1029-07 (180-day aged)*	6.3 at 1 inch, 25.3 at 4 inches
Water Absorption	D-2842	0.020 (gm/cc)
Water Vapor Transmission	E-96	0.7 perms @ 1.5"
Air Infiltration	E-283-04	75 Pa 0.006 L/S/m ² (1.57 psf) (<0.006 cfm/ft ²)
		300 Pa 0.006 L/S/m ² (6.24 psf) (<0.006 cfm/ft ²)
Air Permeance	E-2178-03	75 Pa 0.000055 L/S.m ² .Pa 0.000117 ft ³ /min.m ² .Pa
		300 Pa 0.000024 L/S.m ² .Pa 0.000051 ft ³ /min.m ² .Pa
Recycled Content of Side B		13% (pre- and post-consumer)

*Aged 180 days per Federal Trade Commission 16CFR Part 460.

FIRE TEST RESULTS:

NFPA 286 – Compliant with Chapter 2603.9 of the IBC and AC377, appendix X for use in attics and crawl spaces – PASS

NFPA 285 – Compliant with IBC Chapter 2603.5, exterior walls of Type I, II, III and IV buildings – PASS

NFPA 286 – Compliant with IBC Chapter 803.1.2, Interior Finish without a 15-minute thermal barrier when covered with 22 wet mils of International Fireproof Technology, Inc. DC coating – PASS

NOTES:

1. This information is intended only as a guide for design purposes. The values shown are the average values obtained from sprayed laboratory samples. The test methods were performed per the ASTM Standards.
2. Thermal performance (K-factor and R-value) varies depending on age and use conditions.

The information herein is to assist customers in determining whether our products are suitable for their applications. We request that customers inspect and test our products before use and satisfy themselves as to content and suitability. Our products are intended for sale to industrial and commercial customers for processing. We warrant that our products will meet our written specifications. Nothing herein shall constitute any other warranty express or implied, including any warranty of merchantability or fitness, nor is protection from any law or patent to be inferred. The exclusive remedy for all proven claims is replacement of raw materials and in no event shall we be liable for special, incidental or consequential damages.

Properties and Processing Characteristics

Liquid Component Properties Viscosity

Component A (cps)	190
Component B (cps)	1100 cps @ 72°F
Specific Gravity @ 70°F	1.2
Mixing Ratio Component A and B	1:1

Flammability Characteristics

Surface Burning Characteristics: ASTM E84

Flame Spread: <25

Smoke: <450

Note: This numerical flame spread and all other data presented are not intended to reflect the hazards presented by this or any other material in actual fire situations. The use of polyurethane foam in interior applications on walls or ceilings presents a fire risk unless protected by an approved thermal barrier. One building code definition of an approved thermal barrier is a material equal to half-inch gypsum wallboard. Consultation with building code officials before application is recommended.

Caution: Polyurethane foam produced from these materials is a fire hazard if exposed to fire or excessive heat (e.g., cutting torches, soldering torches, etc.). Each firm, person or corporation engaged in the use, manufacture, production or application of the polyurethane foams produced from these resins should carefully examine construction sequencing and end-use to determine any potential fire hazard associated with such product and to utilize appropriate precautionary and safety measures during construction.

Equipment

Proportioning equipment shall be manufactured by Graco/Gusmer or Glasscraft and shall be capable of metering each component within $\pm 2\%$ of the metering ratio previously noted. The gun should be of the internal mix type, which provides thorough blending of the two components. The equipment shall be of the heated airless type capable of maintaining 125°F at the gun by use of both primary heaters and heated hoses. Hose thermal sensor in B side. The use of 2:1 feeder pumps is recommended for supplying the liquid components to proportioner, especially during winter operations.

Processing Characteristics and Recommendations

	Preheater	Hose
Component A	90–120°F	110–125°F
Component B	110–125°F	
Gun Pressure at Tip (static)	min 1100 psi	

These temperatures are typical of those required to produce mixed product using conventional Graco/Gusmer equipment under various conditions. Environmental conditions may dictate the use of other temperature ranges. However, under no circumstances should a temperature of 130°F be exceeded. It is the responsibility of the applicator to determine the specific temperature settings to match the environmental conditions, his own equipment and these materials.

Machine Mix at Recommended Temperatures

Rise/Tack-Free Time	4–5.5 sec.
Cure Time	4 hours

Characteristics

Reaction times are affected by ambient temperature and the temperature of the substrate. Sprayed through Gusmer Model H-II proportioner, Gap Pro Gun with O1 chamber at recommended processing temperatures and pressures.

Recommended Substrate Temperatures at Time of Application

Minimum	45°F
Maximum	90°F

Spraying

This spray system may be applied in passes of uniform thickness from a minimum of a half inch to a maximum of two inches. For maximum yield and productivity, the product may be applied in a single pass to the specified thickness or up to a two-inch maximum pass. (Exceptions may exist when sheet metal or gypsum wallboard substrates are encountered. Consult Application Guide on page 4.) "Flash" passes or a thin pass of less than one inch on cold surfaces is to be avoided and may result in loss of adhesion of subsequent passes and yield. Thicknesses over two inches require multiple passes. Allow product curing and cooling between each pass; over pass cure time minimum 10 minutes per inch, two-inch pass requires minimum 20 minutes. (Hot substrates may require more time, see Application Guide on page 4. JM Corbond MCS must not be applied in a thickness exceeding two inches in a single pass. If this thickness is exceeded, it will seriously affect the quality and physical properties of the finished product and the internal temperature building up within the foam may cause charring inside the foam bun and bread loafing. (Under certain conditions, applications exceeding this thickness may cause spontaneous combustion of the foam to occur, even hours after product was applied.)

Cleanup Liquids

Nonflammable solvents should be used for cleanup. Consult your solvent manufacturer MSDS for handling precautions.

Protective Equipment

Spraying of polyurethane foam results in the atomizing of the components to a fine mist. Inhalation and exposure to the atomized particles must be avoided.

The following protective equipment is recommended:

- Full-face mask or hood with fresh air source
- Fabric coveralls
- Fabric or rubber gloves

Empty Drum Storage

Store empty drums on their sides with bungs in to avoid moisture entering. "Empty" is defined as product residue at the bottom of the drum no deeper than a half inch and eight inches or less across. Recyclers require drums to be "drip-dried" before accepting them.

APPLICATION GUIDE

Description

This system is sprayable, rigid, closed-cell polyurethane cellular plastic foam insulation designed to insulate buildings. The sprayed product, properly installed, results in a seamless, monolithic and durable insulation fully adhered to the substrate. JM Corbond MCS spray systems are technologically advanced, sophisticated materials and should be applied only by trained, qualified, experienced polyurethane spray applicators.

Walls

JM Corbond MCS may be applied to the exterior or interior of walls in residential or commercial buildings to the desired thickness and R-value. Suitable substrates include but are not limited to plywood, OSB, any foam sheathing with or without foil facers, rock, brick, CMU, concrete, and painted or primed steel. JM Corbond MCS may be applied to these substrates with or without studs.

Cathedral Roofs

JM Corbond MCS may be applied directly to the underside of roof sheathing between the rafters to the desired thickness. Traditional venting is not necessary and should be avoided (section 806.4 of the 2006 IRC).

Vapor Retarders

Typically, no additional vapor retarder need be installed over a cavity wherein JM Corbond MCS has been installed at two inches or greater. Because of JM Corbond MCS's low water-vapor permeance and excellent sealing characteristics, it functions as its own vapor retarder. (See Physical Properties.) The elimination of a second vapor sheet will avoid the creation of what is commonly known as a water vapor "trap." The use of JM Corbond MCS in conjunction with other insulation products or in special environments such as freezers, swimming pools or other special environments may require specific technical attention to vapor retarders. Please consult JM technical personnel.

Clearances to Heat Sources

A minimum of three inches of clearance is required between JM Corbond MCS and combustion appliance flues, fireplace flues, recessed can lights, including IC-rated fixtures, heat lamps and other heat-producing sources.

Combustion Air to Combustion Appliances

Modern construction techniques of house tightening require that outside air inlets be provided to deliver combustion air to natural gas, propane or oil-fired appliances such as furnaces, boilers, water heaters, space heaters, etc., including gas or wood-burning fireplaces. Backdraft dampers or positive pressure venting may be needed on combustion appliance vents to prevent negative air pressures developed by bath or kitchen vent fans from backdrafting combustion effluent into the building interior.

Warning: Polyurethane Foams Will Burn When Exposed to Fire

The use of polyurethane foam in interior applications on walls or ceilings presents a fire risk unless protected by an approved fire-resistant thermal barrier with a finish rating of not less than 15 minutes. Polyurethane foam produced from these materials may present a fire hazard if exposed to fire or excessive heat (e.g., cutting torch or soldering torch, construction heater). Each firm, person or corporation engaged in the use, manufacture, production, processing or application of the polyurethane foam produced from these resins should carefully examine the end-use and construction sequencing to determine any potential fire hazard associated with such product and utilize appropriate design and safety measures.

Substrate Preparation

For optimum results, surfaces receiving JM Corbond MCS should be clean and dry, free of dirt, oil, solvent, grease, loose particulate, peeling coating or other foreign matter. Untreated wood, plywood and OSB typically do not need primer. JM Corbond MCS also adheres well without primer to expanded polystyrene, extruded polystyrene, foil-faced insulation boards, CMU and cured concrete. Ferrometallic substrates (especially mild steel) should be sand-blasted in accordance with SSPC-SP6. Sand-blasted surfaces should be immediately primed with an epoxy primer as recommended by the primer manufacturer. Galvanized and stainless steel, and aluminum substrates should be treated with an appropriate wash primer or adhesive prior to application of JM Corbond MCS. Consult your primer manufacturer and JM for a specific recommendation. Acid wash or other pre-wash may also be needed.

Drywall Substrates

Drywall substrates to which JM Corbond MCS is to be applied in thicknesses over 1½ inches require a first pass thickness at and not to exceed 1½ inches with an appropriate cure time before full thickness pass is applied. Lift thicknesses exceeding 1½ inches to drywall may deform the drywall. Similar precautions may apply to pre-engineered metal buildings. Drywall requires no priming.

Substrate Temperature and Moisture

This spray system is provided in different reactivity profiles to meet varying substrate temperatures as noted in Processing. Substrates over 90°F, such as decks of cathedral roofs with sunshine above, require longer than minimum cooling time between passes. Flash passes at cold substrate are to be avoided. JM technical personnel should be consulted in all cases where application conditions are marginal. Moisture in the form of rain, dew, frost or other sources can seriously affect the adhesion of urethane foam to the substrate or to itself. Water reacts with the mixed foam components, seriously affecting the foam's physical properties.

Indoor Application Precautions

All personnel in the spray area must be equipped with a fresh-air-supplied face mask or hood. Additional precautions include:

- Post warning signs at all work area entrances. (Available from JM at no charge.)
- No welding, smoking or open flame.
- Seal off the work area from adjacent rooms and ventilation ducts.
- Mask areas required to prevent overspray such as windows, doors, tubs and showers, etc.
- Restrict access of nonapplication personnel.
- Provide ventilation as needed.
- Provide breathing and eye protection to both workers and spectators.

Outdoor Application Precautions

The area surrounding the spray operation should be protected from overspray and exposure of individuals not involved in the spray operations as follows:

- Post warning signs a minimum of 100 feet from all work areas.
- No welding, smoking or open flame.
- Close all air-intake vents on air-handling equipment on the building.
- Provide breathing and eye protection for spectators.
- Move vehicles out of area.
- Do not apply when the wind velocity is greater than 10 mph to avoid overspraying of perimeter areas.

Climatic Conditions

Cold temperatures and high wind speeds retard the exothermic reaction of foam and can lead to poor adhesion, increased density and loss of yield, as well as thermal shock. Avoid moisture in the form of rain, dew, frost or other sources, which can seriously affect the adhesion of JM Corbond MCS to the substrate or to itself. Water reacts with the mixed foam components, seriously affecting the foam's physical properties.

PROCESS SAFETY, HEALTH AND TOXICITY INFORMATION

Material Safety Data Sheets on product components and the finished product are available from JM. Installers of this product should read and understand the MSDS before use.

Protective Equipment

Spraying of polyurethane foam results in the atomizing of the components to a fine mist. Inhalation and exposure to the atomized droplets must be avoided.

The following protective equipment is recommended:

- Full-face mask or hood with fresh air source
 - Fabric coveralls
 - Fabric gloves
 - Rubber gloves when handling new materials and cleaning solvents.
- WARNING: Exposure may occur even when no noticeable odor is encountered.

Physical Examinations of Personnel

All personnel to be employed in the spraying of these materials should have a complete physical examination prior to starting spray operations. Periodic checkups are recommended if the personnel continue to spray these materials. Personnel with the following conditions should avoid the spraying of these components:

- Asthma or chronic bronchitis
- Chronic respiratory disorders
- Sensitization to chemical substances including polymeric isocyanates

Dermal Exposure

If a major splash or spill of the raw material isocyanate (A) component comes in contact with the skin, the affected area should immediately be washed with generous amounts of water from a safety shower or other water source. Contaminated clothing should be removed and the skin wiped with a clean dry cloth to remove residual isocyanate. The affected area should then be wiped with a 70% solution of rubbing alcohol (isopropyl) followed by repeated washing with soap and water. If a rash develops, a physician should be consulted immediately.

Eye Exposure

Splashes of either component into the eyes should be flushed immediately with generous amounts of water for at least 15 minutes. **CONSULT TRAINED MEDICAL PERSONNEL IMMEDIATELY.**

Inhalation

Symptoms of vapor inhalation are characterized by coughing, tightness in the chest and shortness of breath. Excessive exposure can produce serious, possibly irreversible lung damage. Smoking in the area of application increases the risk of pulmonary injury and must be prohibited. High concentrations of isocyanate may cause symptoms and problems to appear immediately. However, chronic exposure may also lead to the same symptoms and problems. **IF BREATHING HAS STOPPED, ARTIFICIAL RESPIRATION MUST BE PROMPTLY APPLIED.** If breathing is short, oxygen (if available) should be administered by trained medical personnel. **OBTAIN MEDICAL ATTENTION IMMEDIATELY.**

Applicators

See the A&B component MSDS for more complete raw material handling information.

Cleanup

Nonflammable solvents should be used for cleanup. Consult your solvent manufacturer for handling precautions.

Incompatible Materials

The isocyanate component (A) is incompatible with strong bases, tertiary amines or water. These materials may cause rapid, spontaneous polymerization with subsequent generation of heat and gas.

Decontamination of Spills

In the event of a major isocyanate (A) spill, the area should be immediately evacuated. Only personnel equipped with appropriate respiratory and eye protection equipment should remain. If the spill occurs indoors, the area should be ventilated and leaking containers should be taken outdoors and the remaining isocyanate transferred to other containers.

The spill should be covered with sawdust, ekoperl, vermiculite, fuller's earth or other oil-absorbing material and should then be treated with a dilute solution of ammonium hydroxide/detergent. The neutralized material should be swept up and placed in a suitable container. The material should then be disposed of by a standard method consistent with good industrial practice and in accordance with environmental protection regulations in your area. Where permissible, sanitary landfill disposal is recommended.

Technical specifications as shown in this literature are intended to be used as general guidelines only. The physical and chemical properties of JM Corbond MCS listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the sales office nearest you for current information. All Johns Manville products are sold subject to Johns Manville's Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville Limited Warranty and Limitation of Remedy or for information on other Johns Manville thermal and acoustical insulation and systems, call or write to the 800 number or address listed.

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