

PROCESSING PARAMETERS

SUGGESTED INITIAL PROCESSING PARAMETERS

Drum Storage Temperature	50° – 75°F (10° – 24°C)
Drum Temperature During Application	65° – 80°F (18° – 27°C)
Proportioner Preheat Temperature	Side A 95°F – 120°F (35°C – 49°C) Side B 105°F – 125°F (40°C – 52°C)
Hose Temperature	100° – 125°F (38° – 52°C)
Dynamic Pressures During Application	Min. 1100 psi/7,584 kPa
Surface Temperature	35° – 120°F (2° – 49°C)
Viscosity at 75°F	A: 250 cps B: 650 cps

STORAGE

DO NOT MIX ANY OTHER PRODUCTS INTO A SIDE OR B SIDE DRUMS. Materials should be stored in their original containers, away from heat and moisture, between 50-75°F. Side A has a 12 month shelf life, and Side B has a 6 month shelf life, when properly stored. Storage below 50°F may result in stratification of the Side B and/or crystalline formation in the Side A. Temperatures above 75°F may decrease 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. Both components are adversely affected by water and humidity. 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 ½ inch and 8 inches or less across. Recyclers require drums to be "drip-dried" before accepting them.

DRUM TEMPERATURE DURING APPLICATION

Material will perform better when between 65°– 80°F during application. Drums may be placed into a heated room for two days before use to acclimate.

MIXING/RECIRCULATION

Mixing or recirculating JM MCS+ will lead to loss of blowing agent. JM MCS+ should NOT be mixed or recirculated.

TEMPERATURE SETTINGS

See chart above. The temperature settings are a guideline and ambient and substrate temperatures may require settings outside of the suggested window.

PRESSURE SETTINGS

The finished foam properties are affected by both temperature and pressure settings. The goal of 1100 psi minimum at the gun when the trigger is pulled is an important part of proper mix. To achieve, adjust for the pressure drop from the machine to the gun. A rough rule of thumb (depending on several parameters) is that the pressure will drop approximately 1 psi per foot of hose. Therefore, set the pressure at the machine so that when the trigger is pulled, the pressure maintained is the target gun pressure plus the pressure drop across the hose length. For example, a machine with 260 feet of hose should have a dynamic spray pressure of 1360 psi. Additionally, it should be understood that proportioners vary and while pressure readings are typically representative of the pressure at the machine, there are some pieces of equipment that monitor pressure at the gun and thus the pressure setting would be different.

Example Calculation:

$$\begin{aligned}
 \text{Pressure Setting (psi)} &= \text{Gun Pressure Target (psi)} + \left| \frac{1.0 \text{ psi}}{\text{ft}} \right| * \left| \frac{\text{length of hose in ft}}{\text{ft}} \right| \\
 &= 1100 \text{ psi} + \left| \frac{1.0 \text{ psi}}{\text{ft}} \right| * \left| \frac{260 \text{ ft}}{\text{ft}} \right| \\
 &= 1100 \text{ psi} + 260 \text{ psi} \\
 &= 1360 \text{ psi}
 \end{aligned}$$

STROKE COUNTER SETTINGS

Adjust drum pump stroke count to 42 gallons for both A and B drums.

HUMIDITY

Care should be taken if the relative humidity is greater than 80%. Excessive humidity will adversely affect system performance and physical properties.

PASS THICKNESS

JM MCS+ may be applied in a single pass from a minimum of 0.5" to a maximum of 3.0". (Exceptions may exist with sheet metal or gypsum wallboard substrates. Please see Application Guide below, or consult JM Field Technical Services). To avoid fire risk and adverse product quality, do not exceed 3.0" in a single pass. Wait until first pass cools before applying a second pass. A wait time of 10 to 20 minutes is recommended. On cold surfaces, passes less than 1" thick should be avoided and may result in loss of adhesion of subsequent passes and yield.

SHUT DOWN

For breaks in application longer than 60 minutes:

- 1) Park the proportioner according to the manufacturer's instructions.
- 2) Close the fluid shut off valves on the gun and grease the gun according to the manufacturer's instructions when applicable.

PARTIAL DRUM POUR-UP

Residual materials should be properly handled and transferred to a new drum immediately for use within 3-5 days. Collecting multiple partially full drums for combining later is not a recommended practice and may result in poor quality foam.

CLEANUP

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

APPLICATION GUIDE

DESCRIPTION

JM MCS+ SPF is an all-season, sprayable, rigid, closed-cell polyurethane plastic foam insulation designed to insulate buildings. The product is generated onsite by combining an isocyanate and a polymeric resin through a dual-component proportioner. The proportioner should be capable of metering the A and B component at a 1:1 ratio by volume within a tolerance of 2%. When properly installed, the finished product is seamless, monolithic, durable, and fully adhered to the substrate. JM MCS+ SPF spray systems are technologically advanced, sophisticated materials and must be applied by experienced contractors certified by JM or SPFA.

WALLS

JM MCS+ SPF may be applied to the exterior or interior of walls in both commercial and residential buildings. It may be applied between studs or in open spaces to a variety of substrates including but not limited to plywood, OSB (oriented strand board), foam sheathing with or without foil facers, rock, brick, CMU (concrete masonry units), concrete and steel. The use of primers may be evaluated to improve adhesion when needed.

CATHEDRAL ROOFS

JM MCS+ SPF 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 IRC and section 1203.3 of the IBC).

VAPOR RETARDERS

A separate vapor retarder is typically not required when JM MCS+ SPF has been installed greater than 1.5" thick. JM MCS+ SPF's low water-vapor permeance and excellent sealing characteristics allow it to function as its own vapor retarder. The elimination of a second vapor retarder will avoid the creation of what is commonly known as a water vapor "trap." The use of JM MCS+ SPF 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 MCS+ SPF technical personnel.

CLEARANCES TO HEAT SOURCES

A minimum of 3" of clearance is required between JM MCS+ SPF 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.

FIRE, THERMAL AND IGNITION BARRIER WARNING: POLYURETHANE FOAMS WILL BURN WHEN EXPOSED TO FIRE

Always follow local building codes. The use of polyurethane foam in interior applications on walls or ceilings may present a fire risk unless protected by an approved thermal or ignition barrier. Please consult UES ER-546, a Johns Manville technical representative, or local building code official for further information.

COMPATIBILITY WITH CPVC AND PEX PIPING

A study completed by the Spray Polyurethane Foam Alliance in 2009 concluded that there is no chemical incompatibility with SPF and CPVC piping.* Further, JM is not aware of any chemical incompatibility issues with JM MCS+ on CPVC pipe or PEX tubing. There are no solvents in JM MCS+ that will attack CPVC or PEX tubing. To avoid softening the surface of the CPVC or PEX material, follow MCS+ pass thickness instructions and also limit the first two passes to 1" thick.

SUBSTRATE PREPARATION

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

DRYWALL SUBSTRATES AND METAL BUILDINGS

The first pass of JM MCS+ SPF applied to drywall should be 1" thick. The material should cool for a minimum of 10 minutes before additional passes are applied. Lift thicknesses exceeding 1½ inches to drywall may deform the drywall. Drywall requires no priming. Similar precautions may apply to pre-engineered metal buildings.

*Industry Study of Compatibility of Spray Foam with CPVC - Part II v2, 2009, Spray Polyurethane Foam Alliance.

SUBSTRATE TEMPERATURE AND MOISTURE

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 substrates 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. During application, water reacts with the mixed foam components, seriously affecting the foam's physical properties.

INDOOR APPLICATION PRECAUTIONS

See SAFETY, HEALTH AND TOXICITY INFORMATION below. Additional precautions include, but are not limited to:

- 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 non-application personnel.
- Provide ventilation as needed.

OUTDOOR APPLICATION PRECAUTIONS

See SAFETY, HEALTH AND TOXICITY INFORMATION below. The area surrounding the spray operation should be protected from overspray and exposure of individuals not involved in the spray operations. Additional precautions include, but are not limited to:

- 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.
- Move vehicles out of area.
- Do not apply when the wind velocity is greater than 10 mph to avoid over spraying 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 MCS+ SPF to the substrate or to itself.

SAFETY, HEALTH AND TOXICITY INFORMATION

JM MCS+ must be applied by installers certified by JM or by the Spray Polyurethane Foam Alliance (SPFA). Safety Data Sheets on product components are available from JM. Installers of this product should read and understand the SDS before use.

REENTRY AND REOCCUPANCY

- All occupants must vacate the building or the spray area must be cordoned off and remain separated from the occupied space for 24 hours after application
- The application area should be properly ventilated during application and for 24 hours post application
- Re-entry time for non-SPF trade workers: 12 hours
- Re-entry time for building occupants: 24 hours

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. All personnel in the spray area must use personal protective equipment recommended by the Center for Polyurethanes Industry for use in high pressure spray foam application. Precautions include, but are not limited to:

- Full-face mask or hood with fresh air source, or air purifying respirator with appropriate cartridge and written respirator program.
- Dabric coveralls
- Non-permeable gloves
- Solvent-resistant 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 employment. 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 (A) or (B) 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 material. 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 SDS for more complete raw material handling information.

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.

Please visit www.spraypolyurethane.org for additional information on appropriate PPE selection and use.

Visit our website at www.JM.com or call **800-654-3103** | **Building Insulation Division** P.O. Box 5108 | Denver, CO 80217-5108

Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The physical and chemical properties of JM MCS+ SPF insulation 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 regional sales office nearest you for current information.

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