PROCESSING PARAMETERS

SUGGESTED INITIAL PROCESSING PARAMETERS

Drum Storage Temperature	50°– 90°F (10° – 32°C)
Hose Temperature	120° – 145°F (49° – 63°C)
Proportioner Pre Heat Temperature	A-side 120° – 145°F (49° – 63°C)
	B-side 120° – 145°F (49° – 63°C)
Proportioner Pressure (Dynamic)	1100 – 1400 psi
Surface Temperature	45°– 95°F (7° – 35°C)

The initial settings are a guideline and ambient and substrate temperatures may require settings outside of the suggested range. Under no circumstances should a temperature of (140°F) be exceeded without contacting a JM technical expert.

STORAGE

JM No Mix Open Cell (NMOC) Spray Polyurethane Foam (SPF) Part A and Part B should be stored betwen 50-90°F. JM NMOC has a six month shelf life when properly stored.

DRUM TEMPERATURE DURING APPLICATION

JM NMOC will perform better when material temperatures in the drum are between 50°- 100°F. While placing the drums into a heated room for two days before use is an effective means of doing this, many applicators find it easier to simply recirculate the material during the 20-25 minute mixing stage of jobsite setup. This is done by setting the machine heaters at 135° F and then pumping the material through the proportioner and back to the drums via circulation lines or a recirculation manifold. Extreme caution must be used to avoid cross-contamination. See "JM Change-Over Procedure" for more information.

MIXING/RECIRCULATION

JM NMOC continuous mixing during application is not necessary. If recirculation is being used as a means of heating the material in the drum, the drum may be agitated for 1-2 minutes before commencing with recirculation.

TEMPERATURE SETTINGS

See table 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:

Pressure Setting (psi) = **Gun Pressure Target (psi)** + $\frac{\text{1.0 psi}}{\text{ft}}$ * **length of hose in ft**

= **1100 psi** + $\frac{\text{1.0 psi}}{\text{ft}}$ * **260 ft**

= **1100 psi** + **260 psi**

= **1360 psi**

HUMIDITY

Care should be taken if the relative humidity is greater than 80%. Excessive humidity will adversely affect system performance and physical properties. Ambient temperatures need to be at least 5°F warmer than the dew point temperature.

PASS THICKNESS

JM NMOC may be applied in passes of uniform thickness from a minimum of 1". Open cell spray foam is very different from closed cell spray foam. Because the cells are open, the finished product doesn't retain heat and the need to limit pass thickness goes away. The greatest limiting factor in pass thickness with open cell is that if the applicator attempts to spray back into the rising foam, the foam will blow out of the cavity. Given the right conditions a pass thickness of as much as 6" may be possible. Cooling time between passes is not necessary.

STANDARD APPLICATION

JM NMOC should be applied with the gun held approximately 18" from and perpendicular to the substrate being sprayed.

LONG RANGE APPLICATION

JM NMOC may be applied in long-range overhead applications up to a maximum range of 12 feet when using a cannon or extension tip. This can eliminate the need for scaffolding or a ladder when spraying the underside of the roof deck, which can save time and minimize safety concerns. As with standard application technique, the spray gun should be held perpendicular the substrate. Start spraying at the bottom of the roof deck (nearest to you) and work your way up to the highest point. Contact your JM Technical Representative for specific application details or questions.

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 NMOC insulation is a two component, low-density, Class 1 rated, nonstructural insulation system designed for interior commercial, residential and industrial applications. JM NMOC is 100% water blown. Its high yield, superior performance, and exceptional sprayability make it an ideal choice for high-performing energy efficient buildings.

WALLS

JM NMOC may be applied to the 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 NMOC 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 required. Please consult JM NMOC technical personnel.

CLEARANCES TO HEAT SOURCES

A minimum of 3" of clearance is required between JM NMOC 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 R0971, a Johns Manville technical representative, or local building code official for further information.

SUBSTRATE PREPARATION

For optimum results, surfaces receiving JM NMOC 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 NMOC 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 epoxymide 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 NMOC. Consult your primer manufacturer and JM for a specific recommendation. Acid wash or other pre-wash may also be needed.

SUBSTRATE TEMPERATURE AND MOISTURE

JM NMOC 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 NMOC to the substrate or to itself.

SAFETY, HEALTH AND TOXICITY INFORMATION

JM NMOC 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.

RENTRY 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: 1 hour
- 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 solvent.

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 and 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.