

# Material Safety Data Sheet



P. O. Box 1528 • MOUNT AIRY, NC 27030-1528  
336-789-9161 • FAX 336-789-9586 • www.NCFI.com

Dalton, GA

Hickory, NC

Mount Airy, NC

Salt Lake City, UT

## PRODUCT IDENTIFICATION

**Trade Name:** NCFI 11-015 G&M-series R      **Chemical Family:** Polyol Resin System  
**Chemical Name:** Mixture      **Formula:** N/A  
**Synonyms:** Polyurethane Resin      **Date Prepared:** 04/16/2013

## INGREDIENTS-HAZARD CLASSIFICATION

Name:	CAS NO.	%	PEL
1,1,1,3,3-Penta Fluoropropane <sup>1</sup> (CF <sub>3</sub> CH <sub>2</sub> CHF <sub>2</sub> or HFC-245fa)	460-73-1	12	None Established. 300 ppm TWA recommended.
Tertiary Amine Catalysts <sup>1</sup>		< 4	None Established.
Trans-1,2-Dichloroethylene <sup>1</sup>	156-60-5	< 3	200 ppm TWA

<sup>1</sup> Not listed as a carcinogen (NTA, IARC, OSHA)

## SHIPPING INFORMATION

Not regulated when shipped domestically by land, water or air.

## PHYSICAL DATA

**Boiling Point (°F):** CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub>, 60°F      **Specific Gravity:** 1.23  
**Solubility in Water:** Slight      **% Volatile by Volume:** 14  
**Appearance and Odor:** Brown liquid, ethereal odor

## FIRE AND EXPLOSION HAZARD DATA

**Flash Point (test method):** After CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub> evaporation, >200°F (P-M)      **Flammable Limits (vapor)**  
**Extinguishing Media:** Water, dry chemicals, CO<sub>2</sub>      Lower: None; Upper: None  
**Special Fire Fighting Procedures:** A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.  
**Unusual Fire and Explosion Hazards:** Overheated containers may rupture due to pressure produced by CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub>. CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub> burns to form acids and noxious gases.

## REACTIVITY DATA

**Stability:** Stable      **Conditions to Avoid:** Temperatures over 85°F  
**Polymerization:** Will not occur      **Conditions to Avoid:** N/A  
**Incompatibility:** Isocyanates and other chemicals that react with hydroxyl groups.  
**Hazardous Decomposition Products:** When burned; CO, CO<sub>2</sub>, NO<sub>x</sub>, aliphatic fragments, halogens, halogen acids and possibly carbonyl halides.

## HEALTH HAZARD DATA

**Permissible Exposure Limit:** None established.

**Effects of Overexposure:** May cause skin or eye irritation upon contact. Avoid breathing vapors. The dense vapors can displace and reduce breathing air in confined or unventilated spaces causing asphyxiation. Overexposure may cause tremors, confusion, irritation, and may result in cardiac sensitization.

### First Aid Procedures

**Eyes:** Flush with water for at least 15 minutes. See a physician if irritation develops.

**Skin:** Wash with soap and water at first opportunity.

**Inhalation:** Move to fresh air if symptoms develop. If breathing is difficult, give oxygen and call physician.

**Ingestion:** Do not induce vomiting unless instructed to do so by a medical professional.

## SPECIAL PROTECTION INFORMATION

**Ventilation:** Local exhaust ventilation is recommended when working with this product. Uses requiring heating and/or spraying may require more ventilation or personal protective equipment.

**Respiratory Protection:** The specific respirator selected must be based on contamination levels of this material found in the workplace and the working limits of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are unknown or exceed threshold limit values. A positive pressure, self contained breathing apparatus can be used in emergencies or other unusual situations. Full-face air purifying respirators equipped with organic vapor cartridges can be used in certain situations, *see OSHA standard 29CFR 1910.134*. All equipment must be NIOSH approved and maintained.

**Eye Protection:** Goggles or chemical safety glasses.

**Gloves:** Chemically resistant rubber or plastic.

**Other:** Avoid eye and skin contact. Eye wash system and showers should be available.

## SPILL OR LEAK PROCEDURES

Remove or extinguish ignition or combustion sources.

Contain spill. Absorb with sawdust, etc., and shovel into container. Waste material should be disposed of under conditions which meet federal, state, and local environmental regulations.

Wash area with detergent and water.

## SPECIAL PRECAUTIONS

Store between 65°F and 85°F out of sunlight. Keep tightly sealed. Relieve pressure slowly when opening container.

R Component drums can be sent to drum reconditioners or disposed of as ordinary industrial waste in compliance with pertinent regulations.

**CAUTION:** Under no circumstances should empty drums be burned or cut open with an electric or gas torch.

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## PRODUCT IDENTIFICATION

**Trade Name:** NCFI 11-015 A

**Chemical Family:** Aromatic Isocyanate

**Chemical Name:** Polymethylene polyphenylisocyanate

**Formula:** N/A

**Synonyms:** Polymeric MDI

**Date Prepared:** 04/16/2013

## INGREDIENTS-HAZARD CLASSIFICATION

Name:	CAS NO.	%	PEL
Diphenylmethane diisocyanate (MDI) <sup>1</sup>	101-68-8	50	0.02 ppm ceiling
Higher polymers of similar structure	9016-87-9	50	None Established.

<sup>1</sup> Not listed as a carcinogen (NTA, IARC, OSHA)

## SHIPPING INFORMATION

Not regulated when shipped by land, water or air when packaged in single containers of 5000 pounds or less.

## PHYSICAL DATA

**Boiling Point (°F):** 625°F

**Solubility in Water:** Insoluble, reacts

**Specific Gravity:** 1.24

**% Volatile by Volume:** None

**Appearance and Odor:** Brown liquid, slight aromatic odor

## FIRE AND EXPLOSION HAZARD DATA

**Flash Point (test method):** 390°F (P-M)

**Extinguishing Media:** Water, dry chemicals, CO<sub>2</sub>

**Special Fire Fighting Procedures:** A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.

**Unusual Fire and Explosion Hazards:** At temperatures above 400°F, MDI can polymerize/decompose causing pressure build-up in closed containers and possibly rupture. Avoid water contamination in closed containers which may cause rupture (CO<sub>2</sub> is evolved).

## REACTIVITY DATA

**Stability:** Stable

**Conditions to Avoid:** Contamination with water

**Polymerization:** May occur from contact with water, alcohols, glycols or other materials containing active hydrogens.

**Incompatibility:** Water, alcohols, amines, strong bases.

**Hazardous Decomposition Products:** By high heat or fire; CO, CO<sub>2</sub>, NO<sub>x</sub>, benzene, toluene, aliphatic fragments and traces of HCN

## HEALTH HAZARD DATA

**Permissible Exposure Limit:** 0.02 ppm ceiling for MDI.

**Effects of Overexposure:** May cause skin or eye irritation upon contact. Inhalation of MDI vapors may cause breathlessness, chest discomfort, coughing and reduced pulmonary functions. Exposure may produce asthma-like symptoms, also may lead to allergic sensitivity.

### First Aid Procedures:

**Eyes:** Flush with flowing water for at least 15 minutes, then obtain medical attention.

**Skin:** Remove contaminated clothing and wash off with soap & water.

**Inhalation:** Remove to fresh air, administer oxygen if necessary.

**Ingestion:** Drink large amounts of water. See a physician.

## SPECIAL PROTECTION INFORMATION

**Ventilation:** MDI has a very low vapor pressure at room temperature. General/local ventilation typically control exposure levels very adequately. Uses requiring heating and/or spraying may require more aggressive engineering controls or personal protective equipment. Monitoring is required to determine engineering controls.

**Respiratory Protection:** The specific respirator selected must be based on contamination levels of this material found in the workplace and the working limits of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are unknown or exceed threshold limit values. A positive pressure, self contained breathing apparatus can be used in emergencies or other unusual situations. Full-face air purifying respirators equipped with organic vapor cartridges can be used in certain situations, *see OSHA standard 29CFR 1910.134*. All equipment must be NIOSH approved and maintained.

**Eye Protection:** Wear goggles or chemical safety glasses.

**Gloves:** Chemically resistant rubber or plastic.

**Other:** Avoid eye and skin contact. Eye wash system and safety showers should be available.

## SPILL OR LEAK PROCEDURES

Contain spill. Absorb with sawdust, etc., and shovel into open top drum. Decontaminate absorbent and spill area with 2% detergent/water solution. Let waste stand for 1 to 2 days, then dispose of waste in a licensed facility. Respiratory protection/ventilation is recommended during clean-up.

## SPECIAL PRECAUTIONS

Store between 65°F and 85°F out of sunlight. Keep tightly sealed to prevent moisture contamination. Relieve pressure slowly when opening container. Once opened, protect contents from water with dry atmosphere (-40°F dew point). If isocyanate becomes contaminated, do not reseal. Empty isocyanate drums or other container should be decontaminated by filling with water or decontamination solution, preferably outdoors. Allow to stand for 24-48 hours, open to the atmosphere. **DO NOT SEAL DRUMS OR CONTAINERS.** Drain the drums and puncture to prevent reuse. Dispose of as ordinary industrial waste.

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Date Prepared: 2/22/89  
Last Revision Date: 04/16/13

## SARA 313 INFORMATION

The isocyanate (A) component product of this NCFI system contains the following chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, EPCRA Section 313 (40 CFR 372) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>CERCLA RQ</u>	<u>CONCENTRATION</u>
Methylene Bis Phenylisocyanate (Same as Diphenylmethane diisocyanate (MDI))	101-68-8	5000 lbs.	See MSDS – A Component
Polymeric Diphenylmethane diisocyanate	9016-87-9		See MSDS – A Component

### IMPORTANT NOTICE

This notification is a part of the Material Safety Data Sheet document and must not be detached. Any copying and redistribution of the Material Safety Data Sheet shall include copying of this notice and attaching the copy to the redistributed Material Safety Data Sheet copies.

## NCFI SPRAY FOAM SYSTEM 11-015

**DESCRIPTION:**

NCFI 11-015 is a two component, one-to-one by volume, self-adhering, seamless, high insulating efficiency spray applied rigid polyurethane foam system. This NCFI system has been formulated with HFC-245fa as the blowing agent. NCFI 11-015 is suitable for use in the NCFI ThermalStop® and InsulBloc® insulation systems as well as other insulation applications. Complies with ASTM C1029.

**DISTINGUISHING CHARACTERISTICS:**

- High R-Value
- Zero ODP
- Class II Vapor Retarder - Semi-impermeable @2"
- High Yields
- High Closed Cell Content
- Air Barrier
- Good Dimensional Stability
- Meets ASTM E-84, FS ≤25, SD ≤450 at 4 inch Thickness
- FEMA Class 5 Flood Resistance
- Water Resistive Barrier

For proper use of this NCFI insulating material refer to the NCFI Application Information and any of the following codes or guides:

- International Building Code, (IBC), Chapter 26
- International Residential Code (IRC) Section R314 and R806
- API Fire Safety Guidelines for Use of Rigid Polyurethane and Polyisocyanurate Foam Insulation in Building Construction (AX230)

**Installation Limitations**

When covered with 1/2" gypsum board	Maximum Thickness in walls	Maximum Thickness in Ceilings
11-015	8"	12"

Limits based on NFPA 286

**TYPICAL PHYSICAL PROPERTIES:**

Core Density - ASTM 1622	2.0 pcf
Compressive Strength ASTM D 1621	27 psi
Moisture Vapor Transmission - ASTM E 96	1.3 perm-in
Closed Cell Content ASTM D6226	>90%
R value @ 1 inch ASTM C 518	6.8
Air Permeance - Infiltration ASTM E 283                      Exfiltration	0.000 cfm/ft <sup>2</sup> @ 1.57 psf 0.000 cfm/ft <sup>2</sup> @ 1.57 psf
Bacterial & Fungal Growth ASTM G 21 & E 1428	Negligible
STC - ASTM E 90 OITC	31* 24*
Flammability ASTM E-84 @ 4 inches	Flame Spread ≤25 Smoke Dev ≤450
Max Service Temperature	180°F

Note: The above values are average values obtained from laboratory experiments and should serve only as guide lines. Free rise core density should not be confused with overall density. Overall densities are always higher than free rise core densities and take into account skin formation, thickness of application, environmental conditions, etc.

\* As measured in 2" x 4" studwall assembly

Polyurethane products manufactured or produced from this liquid system may present a serious fire hazard if improperly used or allowed to remain exposed or unprotected. The character and magnitude of any such hazard will depend on a broad range of factors, which are controlled and influenced by the manufacturing and production process, by the mode of application or installation and by the function and usage of the particular product. **Any flammability rating contained in this literature is not intended to reflect hazards presented by this or any other material under actual fire conditions. These ratings are used solely to measure and describe the product's response to heat and flame under controlled laboratory conditions.** Each person, firm or corporation engaged in the manufacture, production, application, installation or use of any polyurethane product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage, and utilize all appropriate precautionary and safety measures.

## NCFI 11-015 APPLICATION INFORMATION

### EQUIPMENT AND COMPONENT RATIOS:

It is preferred that this system be processed with Graco Polyurethane Spray Equipment. 11-015R is connected to the resin pumps with 11-015A being connected to the isocyanate pumps. The proportioning pump ratio is 1 to 1. Graco preheater and hose temperature should be set at 130°F to give a good pattern. For high-pressure equipment, temperature settings may be slightly higher.

### STORAGE AND USE OF CHEMICALS:

Keep temperature of chemicals above 70°F for several days before use. Cold chemicals can cause poor mixing, pump cavitations or other process problems due to higher viscosity at lower temperatures. Storage temperature should not exceed 90°F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry air or nitrogen pressure of 2-3 psi after they have been opened. The shelf life of NCFI 11-015 is six months.

### SAFE HANDLING OF LIQUID COMPONENTS:

Use caution in removing bungs from the container. Loosen the small bung first and let any built up gas escape before completely removing. **R component will froth at elevated temperatures.** Avoid prolonged breathing of vapors. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention. For further information refer to "MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal" publication AX-119 published by the Center For The Polyurethanes Industry 1300 Wilson Blvd, Suite 800, Arlington, VA 22209.

### APPLICATION GUIDELINES:

11-015 is suitable for application to most construction materials including wood, masonry, concrete, and metal. All surfaces to be sprayed should be clean, dry, and free of dew or frost. All metal to which foam is to be applied must be free of oil, grease, etc.

The maximum thickness of each layer or pass of foam should be 2" and allow 10 minutes between each pass for cooling. Multiple layers can be applied to reach the desired R value.

### OPTIMUM ADHESION TEMPERATURE OF SURFACE TO BE SPRAYED:

On general work where the surface to be sprayed will remain at ambient temperature or cooler, the surface should be between 10°F and 120°F. In this range the warmer the surface the better the adhesion. NCFI has two grades of 11-015 foam for this application range, G-series for 50°F to 120°F and X-series for temperatures 10°F to 60°F. For best results, when surfaces to be sprayed are cooler than 60°F a flash coat should be applied with the second coat following as soon as the original coat is no longer tacky to the touch. Also, NCFI differentiates between formulas designed to be sprayed at low altitudes (below 400 ft) versus high altitudes by "L" and "H".

GL— Warm weather at low altitudes  
GH— Warm weather at high altitudes  
XL— Cold weather at low altitudes  
XH— Cold weather at high altitudes

### WEATHER PROTECTION OF FINISHED FOAM:

The finished surface of sprayed polyurethane foam should be protected from adverse effects of ultraviolet rays of direct sunlight, which can cause dusting and discoloration. Protective coatings designed for use with polyurethane foam are available.

### VAPOR BARRIER PROTECTION ON COLD STORAGE APPLICATIONS:

When NCFI sprayed polyurethane foam insulates structures subject to continuous cold temperatures, such as coolers and freezers, a Class I moisture vapor retarder ( 0.1 perm or less) is normally required on the "warm" side of the foam insulation. Contact NCFI for specific recommendations.

### CODE-COMPLIANT FIRE RESISTANCE:

Where foam is sprayed over large areas of building interiors, building codes require the installation of an approved thermal barrier between the foam plastic insulation and the occupied space. ½" gypsum board or other tested and approved material may be installed as a thermal barrier. Refer to specific building codes for details. Contact NCFI Polyurethanes for specific alternate approvals for 11-015.

The information on our data sheets is to assist customers in determining whether our products are suitable for their applications. The customers must satisfy themselves as to the suitability for specific cases. NCFI warrants only that the material shall meet its specifications; this warranty is in lieu of all other written or unwritten, expressed or implied warranties and NCFI expressly disclaims any warranty of merchantability, fitness for a particular purpose, or freedom from patent infringement. Accordingly, buyer assumes all risks whatsoever as to the use of the material. Buyer's exclusive remedy as to any breach of warranty, negligence or other claim shall be limited to the purchase price of the material. Failure to adhere strictly to any recommended procedures shall relieve NCFI of all liability with respect to the material or the use thereof.



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**\* APPLICATOR BULLETIN \***

**GENERAL GUIDELINES FOR NEW AND RETROFIT  
APPLICATIONS OF SPRAY POLYURETHANE FOAM**

We recommend the following steps to ensure a safer worksite when polyurethane foam is applied:

1. Persons handling foam system chemicals, or involved in the foam application, should always first read and understand the required Material Safety Data Sheet and Physical Property Bulletin for the system being applied.
2. Any debris, trash, etc. should be removed from the area being sprayed before application begins.
3. Schedule job so that any hot work including soldering, welding, etc. is completed before foam application. Post signs that "no hot work should be done within the vicinity of finished foam" and ensure these signs will be left in place permanently.
4. Smoking or any other ignition source should not be permitted while foam is being applied.
5. No flammable chemicals, such as wasp and hornet killer, should be sprayed in the area of the foam application 24 hours before or after foam application, and only then if the area is well ventilated.
6. For areas not covered with a walking surface, install temporary planking on the attic floors to provide attic traffic paths and working platforms. Cover exposed recessed lighting fixtures, wiring and other fixtures with masking to protect from overspray and damage. Do not apply foam directly to any recessed lighting fixtures.
7. A qualified electrician should conduct a complete electrical inspection in retrofit applications (especially when a fuse box is present instead of a breaker panel) to be sure application is safe and risk of electrical fire is avoided due to substandard, damaged, and/or improper electrical system.



8. At least one approved fire extinguisher should be present in the immediate area of the applicators while preparation and application occurs. One should also be located in the trailer or truck where the foam equipment and chemical is stored.
9. Spraying foam will generate heat. Foam which is applied too thick in single passes can build temperatures which will degrade cell structure and not produce foam with optimum properties. Individual formulations will differ in how thick specific foam may be applied and how it will react if sprayed excessively thick. In the most extreme case, some systems could reach dangerously high temperatures inside the finished foam which could lead to splitting, charring, or even spontaneous combustion.
10. NCFI recommends that spray pass thickness not exceed a maximum of two inches for closed cell foams or twelve inches for open cell foams. If multiple passes are sprayed, ten minutes should be allowed for the exothermic heat to dissipate before each additional pass is applied. For specific recommendations, contact NCFI.
11. Foam should only be applied as specified to the building envelope enclosing the conditioned space.
12. Any substandard foam applied for any reason (due to operator error, improper chemical storage, equipment malfunction, etc.) should be completely removed immediately and disposed of properly.
13. All substrates being insulated with foam must be fully ventilated for at least 24 hours after application so all heat and vapors may fully dissipate.
14. Any foam shavings or trimmings should be removed from the site after application and disposed of properly.
15. Persons involved in the application process should be outfitted with proper Personal Protective Equipment (PPE). Refer to your Contractor Product Stewardship Manual for detailed recommendations.

For any questions or more information please contact NCFI toll free at 800-346-8229.



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## **APPLICATOR BULLETIN**

### **JOBSITE SAFETY & VENTILATION**

1. Only trained applicator personnel wearing required personal protective equipment (PPE) should be allowed within 25 feet of the spray zone and for 24 hours after completion of spraying.
2. Mark the area with warning tape and signage to prevent unprotected persons from entering the work zone. This includes the area at the exhaust fan outlet.
3. Create a ventilation plan for the work zone. Homeowners should be completely evacuated during and for 24 hours after completion of spraying. Larger structures or those with multiple floors can be partitioned and isolated with plastic film so that other trades on the jobsite not wearing PPE can continue to work safely.
4. Make sure that ignition sources and HVAC systems including inlet vents are shut down and masked off to prevent accidental use during application.
5. Active ventilation should be used with fan(s) rated at a minimum 3000 cfm to exhaust vapors and odors while the foam is safely cured. Ventilation plans will vary according to size of the space, layout and scheduling.
6. Filters should be used over the exhaust fan inlet during spraying to prevent buildup of residue on fan blades which will decrease air movement substantially.
7. Optional inlet fans can be used to increase air movement, taking care that the exhaust fan is moving air at a greater rate to maintain negative pressure within the spray zone.
8. Refer to NCFI product stewardship manual, SFC guidance on best practices for application of polyurethane foam at [www.sprayfoam.org](http://www.sprayfoam.org) and EPA ventilation guidance at [www.epa.gov/dfe](http://www.epa.gov/dfe) or call NCFI at 800-346-8229 for recommendations before commencing work.