NCFI POLYURETHANES

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Dalton, GA Hickory, NC Mount Airy, NC Salt Lake City, UT

SAFETY DATA SHEET According to GHS

Section 1: Identification

Product Identifier

Trade Name: R-20-016
Chemical Name: Polyurethane Resin
Recommended Use: Component for the manufacture of Polyurethanes
Restrictions on Use:

Chemical Manufacturer Information

Name: NCFI Polyurethanes
Address: 1515 Carter St Mount Airy, NC 27030
Website: www.NCFI.com
Phone: (800) 346-8229
Fax: (336) 789-9586
Emergency Phone: CHEMTREC: 800-968-793 (Toll Free)

Section 2: Hazard Identification

Classification of the substance or mixture:

GHS Classification:	
• Skin irritation, Category 3	• Eye irritation, Category 2

GHS Labeling:

Hazard Statements:	
• May cause skin irritation	• May cause eye irritation
• May cause respiratory irritation	•

Precautionary Statements:	
• Do not breathe fume/gas/mist/vapors/spray	• Wear protective gloves/eye protection/face protection
• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
• IF ON SKIN: Wash with plenty of soap and water	

Other Hazards:

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Section 3: Composition

Hazardous Components

Type of product: Mixture

CAS#	Weight %	Name
Proprietary	<1.5	Tertiary amine catalysts
460-73-1	10%	1,1,1,3,3-Penta Fluoropropane (CF3CH2CHF2 or HFC-245fa)
156-60-5	3%	Trans-1,2-Dichloroethylene

Section 4: First Aid Measures

Inhalation:	Move to fresh air if symptoms develop. If breathing is difficult, give oxygen and call physician.
Eye Contact:	Flush with water for at least 15 minutes. See a physician if irritation develops.
Ingestion:	Do not induce vomiting unless told to do so by a medical professional
Most Important symptoms and effects, acute and delayed:	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.
Indication of immediate medical attention and special treatment, if applicable:	N/A
Skin Contact:	Wash with soap and water at first opportunity.

Section 5: Fire-Fighting Measures

Suitable extinguishing media:	Water, dry chemicals, CO_2
Unsuitable extinguishing media:	None
Special hazards arising from the chemical:	Overheated containers may rupture due to pressure produced by $CF_3CH_2CHF_2$. $CF_3CH_2CHF_2$ burns to form acids and noxious gases.
Precautions for fire-fighters:	A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.

Section 6: Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures:	Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental precautions:	Do not discharge into drains/surface waters/groundwater
Methods and material for containment and cleanup:	Absorb with sawdust, etc., and shovel into container. Waste material should be disposed of under conditions which meet federal, state, and local environmental regulations.

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Section 7: Handling and Storage

Precautions for safe handling:	Store between 65°F and 85°F out of sunlight. Relieve pressure slowly when opening container. Under no circumstances should empty drums be burned or cut open with an electric or gas torch.
Conditions for safe storage, including any incompatibilities:	Keep tightly sealed.

Section 8: Exposure Controls and PPE

Exposure Limits

Component:	Type	Value
Tertiary Amine Catalysts[1]	TWA	None established
1,1,1,3,3-Penta Fluoropropane [1] (CF3CH2CHF2 or HFC-245fa)	TWA	500 ppm TWA and 800 ppm STEL recommended
Trans-1,2-Dichloroethylene	TWA	200 ppm recommended

[1]Not listed as a carcinogen (NTA, IARC, OSHA)

Exposure 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.
Hand, eye, skin, body protection:	Wear goggles or chemical safety glasses and chemically resistant rubber or plastic gloves. Avoid eye and skin contact. Eye wash system and showers should be available.

Section 9: Physical and Chemical Properties

Basic chemical and physical properties

Appearance:	Liquid	**Flammability:**	N/A
Color:	Amber	**Upper/lower flammability or explosive limits:**	N/A
Odor:	Ethereal odor	**Vapor pressure:**	N/A
Odor threshold:	N/A	**Vapor density:**	N/A
pH:	N/A	**Relative density:**	1.11g/mL
Melting pt/freezing pt:	<32°F	**Solubility(ies):**	Slightly soluble in water
Boiling pt/boiling range:	60°F	**Partition coefficient (n-octanol/water):**	N/A
Flash point:	>200°F	**Auto-ignition temperature:**	>500°F
Evaporation rate:	Slower than ether	**Decomposition temperature:**	>500°F

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Section 10: Stability and Reactivity

Chemical stability:	Stable
Possibility of hazardous reactions:	N/A
Conditions to avoid:	Temperatures over 85°F
Incompatible materials:	Isocyanates and other chemicals that react with hydroxyl groups.
Hazardous decomposition products:	When burned, CO, CO_2, NO_x aliphatic fragments, halogens, halogen acids and possibly carbonyl halides.

Section 11: Toxicological Information

Acute toxicity:	May cause skin irritation
Chronic toxicity:	Not available
Likely routes of exposure:	Skin
Symptoms related to physical, chemical and toxicological characteristics:	May cause skin irritation
Delayed and immediate effects and chronic effects from short and long-term exposure:	May cause skin irritation; avoid contact with eyes
Numerical toxicity measures:	Not available

Section 12: Ecological Information

Ecotoxicity:	Not a marine pollutant
Persistance and degradability:	No known significant effects
Bioaccumulative potential:	Does not bioaccumulate
Mobility in soil:	

Section 13: Disposal

Waste disposal:	R component drums can be sent to drum reconditioners or disposed of as ordinary industrial waste in compliance with pertinent regulations

Section 14: Transport

UN number:	Not regulated
UN Proper shipping name:	Not regulated
Transport Hazard class(es):	Not regulated
Packing group, if applicable:	Not regulated
Marine pollutant (YorN):	N
Special precautions:	None

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Section 15: Regulatory

Relevant safety, health, and environmental regulations

Inventory Status:	All components TSCA listed
US Regulations:	No ingredients listed
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information:	No ingredients listed

Section 16: Other

MSDS Preparation Date:	06/25/2014
Revision Date:	

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Section 1: Identification

Product Identifier

Trade Name: A-20-016
Chemical Name: Diphenylmethane Diisocyanate (MDI)
Recommended Use: Component for production of polyurethanes
Restrictions on Use:

Chemical Manufacturer Information

Name: NCFI Polyurethanes
Address: 1515 Carter St Mount Airy, NC 27030
Website: www.NCFI.com
Phone: (800) 346-8229
Fax: (336) 789-9586
Emergency Phone: CHEMTREC: 800-968-793 (Toll Free)

Section 2: Hazard Identification

Classification of the substance or mixture

GHS Classification:	
• Skin irritation, Category 2	• Acute toxicity, Inhalative, Category 4
• Sensitization of respiratory airways, Category 1	• Eye irritation, Category 2
• Carcinogenicity, Category 2	• Sensitization of the skin, Category 1
• Specific target organ toxicity (repeated exposure), Category 2	• Specific target organ toxicity (single exposure), Category 3

GHS Labeling:

Danger

Hazard Statements:	
• May cause an allergic skin reaction	• Causes skin irritation
• Harmful if inhaled	• Causes serious eye irritation
• May cause respiratory irritation	• May cause allergy or asthma symptoms or breathing difficulties if inhaled
• May cause damage to organs through prolonged or repeated exposure	• Suspected of causing cancer

Precautionary Statements:	
• Do not breathe dust/fume/gas/mist/vapors/spray	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
• Wear protective gloves/eye protection/face protection	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
• IF ON SKIN: Wash with plenty of soap and water	

Other Hazards: Persons with respiratory conditions should avoid handling this product.

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Section 3: Composition

Hazardous Components

Type of product: substance

CAS#	Weight %	Name
101-68-8	38.0%	Diphenylmethane-4,4'-diisocyanate (MDI)
26447-40-5	< 10.0%	MDI Mixed Isomers
9016-87-9	< 55.0%	P-MDI

Section 4: First Aid Measures

General:	Remove contaminated clothing
Inhalation:	Remove affected individual to fresh air and keep person calm. Assist in breathing if necessary. Immediate medical attention required.
Skin Contact:	Wash affected areas with soap and water. Seek medical attention for irritation.
Eye Contact:	Rinse for at least 15 minutes with water. Immediate medical attention required.
Ingestion:	Rinse mouth and drink plenty of water. Do not induce vomiting. Immediate medical attention required.

Section 5: Fire-Fighting Measures

Suitable extinguishing media:	Water, dry chemicals, CO_2
Unsuitable extinguishing media:	High volume water jet
Special hazards arising from the chemical:	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 (CO2 is evolved).
Precautions for firefighters:	Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Section 6: Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures:	Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental precautions:	Do not discharge into drains/surface waters/groundwater
Methods/material for containment and cleanup:	Remove mechanically; cover remainder with wet, absorbent material **(e.g.** sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO2?). Keep damp in a safe ventilated area for several days.

Spill area can be decontaminated with the following recommended decontamination solution:

Decontamination Solution #1: 8-10% sodium carbonate and 2% liquid soap in water

Decontamination Solution #2: Liquid/yellow soap (potassium soap with ~15% anionic denside): 20 ml; Water: 700 ml; Polyethylenglycol (PEG 400): 350 ml

Section 7: Handling and Storage

Precautions for safe handling:	Provide sufficient air exchange and/or exhaust in work rooms. Occupational exposure limits should not be exceeded (refer to Section 8). Contact with skin and eyes and inhalation of vapors must be avoided. Keep away from foodstuffs, drinks, and tobacco. Wash hands before breaks and at end of work.
Conditions for safe storage, including any incompatibilities:	Keep container tightly closed and protect against moisture. Segregate from bases. Store from 32F – 110F.

Section 8: Exposure Controls and PPE

Exposure Limits

Component	Type	Value
P-MDI	OSHA PEL	CLV 0.02 ppm 0.2 mg/m3
Diphenylmethane-4,4'-diisocyanate (MDI)	OSHA PEL	CLV 0.02 ppm 0.2 mg/m3

Exposure Controls

Respiratory Protection:	Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.
Hand, eye, skin, body protection:	Chemical resistant protective gloves should be worn to prevent all skin contact. Wear eye/face protection. Wear suitable protective clothing

Section 9: Physical and Chemical Properties

Basic chemical and physical properties

Appearance:	liquid	**Flammability**	not applicable
Color	dark amber	**Upper/lower flammability or explosive limits**	
Odor	Slightly aromatic	**Vapor pressure**	0.00016 mmHg
Odor threshold	not established	**Vapor density**	not established
pH	not established	**Relative density**	1.24
Melting pt/freezing pt	3°C	**Solubility(ies)**	Reacts with water
Boiling pt/boiling range	625°F	**Partition coefficient (n-octanol/water)**	not established
Flash point	390°F	**Auto-ignition temperature**	not applicable
Evaporation rate	not established	**Decomposition temperature**	not established

Section 10: Stability and Reactivity

Chemical stability:	Polymerises at about 200°C with evolution of CO2
Possibility of hazardous reactions:	Exothermic reaction with amines and alcohols; reacts with water forming CO2; in closed containers, risk of bursting owing to increase of pressure
Conditions to avoid:	Avoid moisture
Incompatible materials:	water, alcohols, strong bases, amines

Hazardous decomposition products:	By high heat or fire; CO, CO2, NOx, benzene, toluene, aliphatic fragments and traces of HCN

Section 11: Toxicological Information

Acute toxicity (inhalation):	LC50: 490mg/kg , vapor, 4hr rat
Chronic toxicity:	2 years, inhalation; NOAEL: 0.2mg/m3, (rat, Male/Female, 6hrs/day 5 days/week)
Likely routes of exposure:	Skin, inhalation
Symptoms related to physical, chemical and toxicological characteristics:	Minor skin irritation; asthma-like symptoms
Delayed and immediate effects and chronic effects from short and long-term exposure:	Possible sensitization
Numerical toxicity measures:	

Section 12: Ecological Information

Ecotoxicity:	LC0: >1,000mg/l (Zebra fish 96 hrs) LC0: >3,000mg.l (Killifish 96hrs)
Persistance and degradability:	0%
Bioaccumulative potential:	Does not bioaccumulate
Mobility in soil:	

Section 13: Disposal

Waste disposal:	Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system. Do not burn empty drums or cut open with gas or an electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

Section 14: Transport

Land transport

USDOT	Not classified as dangerous good
China	Not classified as dangerous good

Sea transport

IMDG	Not classified as dangerous good

Air transport

IATA/ICAO	Not classified as dangerous good

Further information
DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Refer to Section 15 for the RQ of this product.

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Section 15: Regulatory

Relevant safety, health, and environmental regulations:	
Inventory Status:	TSCA listed
US Regulations:	Not regulated
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information:	Methylene Bis Phenylisocyanate 101-68-8 5000 lbs. See MSDS – A Component (Same as Diphenylmethane diisocyanate (MDI) Polymeric Diphenylmethane diisocyanate 9016-87-9 See MSDS – A Component

Section 16: Other

MSDS Preparation Date:	06/25/2014
Revision Date:	

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NCFI POLYURETHANES

TECHNICAL DATA SHEET

NCFI Polyurethanes
Div. of Barnhardt Manufacturing Co.
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800-346-8229 www.NCFI.com

NCFI POUR SYSTEM 20-016

DESCRIPTION:

NCFI 20-016 is a two component, HFC-245fa blown, all PMDI based pour-in-place polyurethane foam system designed as a taxidermy foam for molding animal forms. This system represents the mid-range of the density spectrum for animal form molding. NCFI 20-016 is available in various reactivity profiles.

DISTINGUISHING CHARACTERISTICS:

- Excellent Flow
- Light Colored Blemish Free Surface
- Thin Non-glassy Skin
- Low Density Non-friable Core

TYPICAL RESIN PROPERTIES:

	20-016 R	20-016 A
Viscosity	370 cps	200 cps
Lbs./Gallon	9.3 lbs.	10.2 lbs.
Appearance	transparent, amber liquid	transparent, brown liquid
Shelf Life	6 months	6 months

MIX RATIO:

	20-016 R	20-016 A
By Weight	100 parts	110 parts
By Volume	100 parts	100 parts

TYPICAL REACTION PROPERTIES:

Hand Mix @ 72°F

	Fast	Regular	Slow
Cream (sec)	15	26	37
Gel (sec)	40	110	150
Tack Free (sec)	50	135	190
Rise (sec)	65	165	220
Density (FRC)		3.0 pcf	

TYPICAL PHYSICAL PROPERTIES:

Core Density	5 pcf
Compressive Strength	65 psi
Closed Cell Content	>90%
Water Absorption, ASTM D2842	≤0.06 lbs/ft^2
Resistance to Solvents	Excellent
Resistance to Mold and Mildew	Excellent
Maximum Service Temperature	180°F
Initial k-factor As with all insulating materials, the k-factor will vary with age and use conditions.	0.144 Btu•in/ (hr•ft^2•°F)

*The above values are average values obtained from laboratory experiments and should serve only as guide lines.

NCFI 20-016 APPLICATION INFORMATION

EQUIPMENT AND COMPONENT RATIOS:

NCFI 20-016 should be mixed by pour machines designed to mix urethane chemicals. It is recommended that this system be processed with either HPIM machines or low pressure equipment with mechanical mix heads, both with the capability of controlling component temperatures to 60°F - 90°F. NCFI 20-016 **R** is connected to the **resin/polyol** pumps with NCFI 20-016 **A** being connected to the **isocyanate** pumps.

MOLDING RECOMMENDATION:

To obtain optimum yield, consistent part quality and quick demold times, the mold temperature must be 80°F or higher. Recommended temperature is 100°F. Heating molds with radiant or convection heat sources should be accomplished without producing 'hot spots'. Molds may be constructed of fiberglass, aluminum, epoxy or other thermal conductive material. Mold surfaces must be coated with a suitable release agent and dried before molding. Follow the recommendations of the mold release supplier. The mold design should offer adequate clamping pressure and allow trapped air to escape through vent holes in the top or the parting lines of the mold.

STORAGE AND USE OF CHEMICALS:

Keep temperature of chemicals at 70°F for several days before use. Cold chemicals can cause poor mixing, pump cavitation or other process problems due to higher viscosity at lower temperatures. Storage temperature should not exceed 80°F. Prolonged exposure to temperatures below 35°F can cause the 'A' component to freeze. Do not store in direct sunlight. Keep drums tightly closed when not in use and under nitrogen pressure of 2 - 3 psi after they have been opened.

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. 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.

Caution:

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

Orig. Date: 12/2004 Update: 12/2013