



SAFETY DATA SHEET According to GHS

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Dalton, GA

Hickory, NC

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Salt Lake City, UT

Section 1: Identification

Product Identifier

Trade Name: R-27-004
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
460-73-1	<5	1,1,1,3,3-Pentafluoropropane (CF ₃ CH ₂ CHF ₂ or HFC-245fa)
Proprietary	<1	Tertiary amine catalysts
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:	Induce vomiting; get medical attention.
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 ₃ CH ₂ CHF ₂ . CF ₃ CH ₂ CHF 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
1,1,1,3,3-Pentafluoropropane (CF ₃ CH ₂ CHF ₂ or HFC-245fa)	TWA	300ppm recommended
Tertiary Amine Catalysts ¹	TWA	None established
Trans-1,2-Dichloroethylene	TWA	200ppm

¹Not 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, <i>see OSHA standard 29CFR 1910.134</i> . 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:	1.09g/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

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
Persistence 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
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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:	06/26/2014
Revision Date:	

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Section 1: Identification

Product Identifier

Trade Name: A-27-004
Chemical Name: Diphenylmethane Diisocyanate (MDI)
Recommended Use: Component for production of polyurethanes
Restrictions on Use:

Chemical Manufacturer Information

Name: NCFI Polyurethanes Phone: (800) 346-8229
Address: 1515 Carter St Mount Airy, NC 27030 Fax: (336) 789-9586
Website: www.NCFI.com 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:	Carbon dioxide, foam, dry powder, water spray
Unsuitable extinguishing media:	High volume water jet
Special hazards arising from the chemical:	Burning releases CO, CO ₂ , oxides of nitrogen, isocyanate vapors and traces of hydrogen cyanide.
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 CO ₂ ?). 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 dense): 20 ml; Water: 700 ml; Polyethylenglycol (PEG 400): 350 ml



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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/m ³
Diphenylmethane-4,4'-diisocyanate (MDI)	OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³

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	earthy, musty	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	> 300° C	Partition coefficient (n-octanol/water)	not established
Flash point	> 250° C	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 CO ₂
Possibility of hazardous reactions:	Exothermic reaction with amines and alcohols; reacts with water forming CO ₂ ; in closed containers, risk of bursting owing to increase of pressure
Conditions to avoid:	Avoid moisture
Incompatible materials:	water, alcohols, strong bases



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Hazardous decomposition products: carbon monoxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors

Section 11: Toxicological Information

Acute toxicity (inhalation):	LC50: 490mg/kg , vapor, 4hr rat
Chronic toxicity:	2 years, inhalation; NOAEL: 0.2mg/m ³ , (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)
Persistence 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.
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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
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Air transport

IATA/ICAO	Not classified as dangerous good
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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:	06/26/2014
Revision Date:	

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27-004 Low Density Rigid Foam System

Technical Data Sheet

NCFI 27-004 is a two-component, HFC blown, all PMDI based rigid pour foam designed for flotation applications requiring a high degree of flow.

Typical Properties of Components

Component	R-27-004	A-27-004
Appearance	Transparent amber liquid	Transparent brown liquid
Brookfield Viscosity @ 50 rpm	450 cps at 72°F	200 cps at 72°F
Specific Gravity	1.09	1.24
Storage Temperature	40°F – 90°F	40°F – 90°F

Mix Ratio

By weight.....100 parts poly : 112 parts iso
 By volume.....100 parts poly : 100 parts iso

Typical Properties of Mixed System at 72°F

	Regular	Slow
Cream Time	34 seconds	45 seconds
Gel Time	180 seconds	225 seconds
Rise Time	290 seconds	375 seconds
Free Rise Core Density	2.0 pcf	2.0 pcf

Process Parameters

Iso Temperature	75°F to 85°F
Poly Temperature	70°F to 95°F
Mold Temperature	95°F to 125°F
Demold Time	7 to 9 minutes*

* Demold time is dependent on shot size, and material and mold temperatures. NCFI recommends using a high-quality, properly applied wax or silicone release agent to prevent cured material from sticking to mold surfaces.

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Typical Physical Properties

Molded Density (ASTM D1622)	3.0 lb/ft ³
Compressive Strength (ASTM D1621)	34 psi
Aged k-factor (ASTM C518)	0.21 BTU·in/(hr·ft ² ·°F)
Closed Cell Content (NCFI TM-300)	> 94%
Water Absorption (ASTM D2842)	≤ 0.10 lbs/ft ²
Moisture Vapor Transmission (ASTM E96)	2 – 4 perm·in
Resistance to Solvents	Excellent
Resistance to Mold & Mildew	Excellent
Maximum Service Temperature	180 °F
USCG Title 33, Chapter 1, Part 183	Pass
Flammability	Pass UL-94 HBF

Other Properties

Meets what were the requirements of the superceded Military Specification 21929 B. (Mil Spec 21929 B was superceded by 21929 C in 1991.)

Storage and Handling

Avoid entraining air during mixing. Store the poly from 65°F to 85°F. Avoid moisture contamination during storage, handling, and processing. For both components, pad containers and day tanks with either nitrogen or dry air (desiccant cartridge or air dryer @ -40°F dew point). For optimum shelf life, the recommended storage temperature for iso is 64°F to 86°F. Do not expose iso to lower temperatures – freezing may occur. Shelf life is 6 months for factory sealed containers.

Original: 052011
Modified (3): 042014