Nurofast 52 Hardener

SECTION 1. IDENTIFICATION

Product Identifier	Nurofast 52 Hardener
Other Means of Identification	Urethane Hardener
Product Family	Aromatic isocyanate
Recommended Use	Mixed with another component to form a corrosion-resistant membrane.
Restrictions on Use	None known.
Manufacturer/Supplier Identifier	The Stebbins Engineering and Manufacturing Company, 363 Eastern Boulevard, Watertown, NY, 13601, (315) 782-3000, www.stebbinseng.com
Emergency Phone No.	Chemtrec - Within North America, 1-800-424-9300, 24 hours
	Stebbins 24 Hour Contact-, 1-315-788-6624
SDS No.	009

SECTION 2. HAZARD IDENTIFICATION

Classification

Acute toxicity (Inhalation) - Category 4; Skin irritation - Category 2; Eye irritation - Category 2B; Respiratory sensitization - Category 1A; Skin sensitization - Category 1B; Specific target organ toxicity (single exposure) - Category 3; Specific target organ toxicity (repeated exposure) - Category 2

Label Elements

Signal Word:
Danger

Hazard Statement(s):

H315 + H320 Causes skin and eye irritation.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure. (Respiratory Tract)

Precautionary Statement(s):

Prevention:

P261 Avoid breathing vapours.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves.
P284 Wear respiratory protection (NIOSH approved air-purifying respirator with an organic vapour cartridge).

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P341 IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTRE or doctor.
P363 Wash contaminated clothing before reuse.
P501 Dispose of contents and container in accordance with local, regional, national and international regulations.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal:

P501 Dispose of contents and container in accordance with local, regional, national and international regulations.

Other Hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture:

Chemical Name	CAS No.	%	Other Identifiers	Other Names
Methylenediphenyl diisocyanate (mixed isomers)	26447-40-5	100 %	MDI	Aromatic diisocyanate.

Notes

**This ingredient is a component of the complex mixture.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment).

Move to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by Poison Centre or doctor. If experiencing respiratory symptoms (e.g. coughing, shortness of breath, wheezing), call a Poison Centre or doctor.

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 5 minutes. Take off immediately contaminated clothing, shoes and leather goods (e.g. watchbands, belts). If skin irritation occurs, get medical advice or attention.

Eye Contact

Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Flush eye(s) with lukewarm, gently flowing water for 5 minutes, or until dust/particle is removed, while holding eyelid(s) open. Remove contact lenses, if present and easy to do. If eye irritation persists, get medical advice or attention.

Ingestion

Rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Get medical advice or attention if you feel unwell or are concerned. Never give anything by mouth if person is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting.

First-aid Comments

Show this safety data sheet to the doctor in attendance.

Notes to Physician:

Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress.

Most Important Symptoms and Effects, Acute and Delayed

Can irritate the nose and throat. Skin sensitizer. May cause an allergic skin reaction in some people. Respiratory sensitizer. May cause asthma or an asthma-like reaction in some people. Repeated or prolonged exposure can irritate the skin.

Immediate Medical Attention and Special Treatment

Target Organs

Respiratory system, lungs, eyes, skin.

Special Instructions

Respiratory and skin reactions may occur when mixing with Polyol.

Medical Conditions Aggravated by Exposure

Asthma, respiratory conditions, skin allergies.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Water spray Use water to keep non-leaking, fire-exposed containers cool. Carbon dioxide, dry chemical powder or appropriate foam.

Unsuitable Extinguishing Media

Do not use water jet. Use of heavy stream of water may spread fire.

Specific Hazards Arising from the Product

Can ignite if strongly heated. Heating increases the release of toxic vapour.
In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide; corrosive, oxidizing nitrogen oxides; toxic chemicals. Hydrogen cyanide Isocyanates.

Special Protective Equipment and Precautions for Fire-fighters

Evacuate area. Protection during firefighting : Do not attempt to take action without suitable protective equipment. Complete protective clothing. Self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapours or gases. Before entry, especially into confined areas, use an appropriate monitor to check for: toxic gases or vapours.
Fire-fighters may enter the area if positive pressure SCBA and full Bunker Gear is worn.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel.

Increase ventilation to area or move leaking container to a well-ventilated and secure area. Do not touch damaged containers or spilled product unless wearing appropriate protective equipment. Use the personal protective equipment recommended in Section 8 of this safety data sheet. Remove or isolate incompatible materials as well as other hazardous materials.

Environmental Precautions

It is good practice to prevent releases into the environment. If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas.

Methods and Materials for Containment and Cleaning Up

Contain and soak up spill with absorbent that does not react with spilled product. Absorb with materials such as: Dirt. Vermiculite. Sand. Clay. Do NOT use absorbent materials such as: Cement powder (Note: may generate heat). Place used absorbent into suitable, covered, labelled containers for disposal.

Neutralize spill site by adding suitable decontaminant solution: Formulation 1: sodium carbonate 5 - 10%; liquid detergent 0.2 - 2%; water to make up to 100%.

Other Information

Report spills to local health, safety and environmental authorities, as required.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Do not get in eyes, on skin or on clothing. Only use where there is adequate ventilation. Do not breathe in this product. Wash hands thoroughly after handling this product and before eating, using the washroom or leaving work area. Keep containers tightly closed when not in use or empty.

Conditions for Safe Storage

Store in an area that is: well-ventilated, separate from incompatible materials (see Section 10: Stability and Reactivity). Comply with all applicable health and safety regulations, fire and building codes. Storage temperature : 50 ° F (10 °C) - 100 ° F (38 °C).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Methylenediphenyl diisocyanate (mixed isomers)	0.005 ppm	0.02 ppm		0.02 ppm		

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

ACGIH® = American Conference of Governmental Industrial Hygienists. TLV® = Threshold Limit Value.

OSHA = US Occupational Safety and Health Administration. PEL = Permissible Exposure Limits.

Appropriate Engineering Controls

The odour and irritancy of this material are inadequate to warn of excessive exposure

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects. Provide appropriate exhaust ventilation at places where dust is formed.

Provide eyewash and safety shower if contact or splash hazard exists.
Use stringent control measures such as process enclosure to prevent product release into the workplace.

Individual Protection Measures

Eye/Face Protection

Wear safety glasses/goggles and face shield when mixing.

When there is potential for eye exposure to Liquid, vopor or mist, wear safety goggles.

Skin Protection

Wear chemical protective clothing e.g. gloves, aprons, boots.
Wear resistant gloves (consult your safety equipment supplier). Discard gloves that show tears, pinholes, or signs

of wear. Suitable materials are butyl rubber, natural rubber, neoprene rubber, nitrile rubber, polyethylene, polyvinyl, alcohol, Viton®, polyvinyl chloride, cloth, and leather.

Respiratory Protection

Wear a NIOSH approved air-purifying respirator with an organic vapour cartridge.

For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Dark brown liquid. Turns cloudy brown on exposure to moisture. Absorbs moisture from the air. Particle Size: Not applicable
Odour	Musty (Methylenediphenyl diisocyanate (mixed isomers))
Odour Threshold	Not available
pH	Not available
Melting Point/Freezing Point	Not available (melting); Not available (freezing)
Boiling point/Initial boiling point	>= 400 ºF (204 ºC)
Boiling Range	406 ºF (208 ºC)
Flash Point	> 750 ºF (399 ºC)
Evaporation Rate	Not available
Flammability (solid, gas)	Not applicable
Upper/Lower Flammability or Explosive Limit	Not available (upper); Not available (lower)
Vapour Pressure	< 0.0001 mm Hg at 25 ºC (77 ºF)
Vapour Density (air = 1)	8.5 (estimated)
Relative Density (water = 1)	1.24 at 77 ºF (25 ºC)
Solubility	Insoluble in water; Not available (in other liquids)
Partition Coefficient, n-Octanol/Water (Log Kow)	Not available
Auto-ignition Temperature	>= 1542 ºF (839 ºC)
Decomposition Temperature	Not available
Viscosity	Not available (kinematic); Not available (dynamic)

Other Information

Physical State	Liquid
Bulk Density	77 lb/ft3 (1234 kg/m3)
Other Physical Property 1	Oxidizing properties - No
Other Physical Property 2	Explosive properties - Not explosive
Other Physical Property 3	Partition coefficient: n-octanol/water - Reacts with water

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate.

Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface.
The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide

and heat.

Chemical Stability

Normally stable.

Stable under recommended storage conditions. See Storage, Section 7.

Possibility of Hazardous Reactions

Can occur. Exposure to elevated temperatures can cause product to decompose and generate gas. This can cause pressure build-up and/or rupturing of closed containers.

Polymerization can be catalyzed by: Strong bases. Water.

Conditions to Avoid

Prolonged contact with water, moisture or humidity.

Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers.

Elevated temperatures accelerate this reaction.

Incompatible Materials

Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Metal compounds. Moist air. Strong oxidizers.

Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.
Not corrosive to metals.

Hazardous Decomposition Products

Decomposition products depend upon temperature, air supply and the presence of other materials.

Gases are released during decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity: Remarks: Symptoms may be delayed.

Likely Routes of Exposure

Inhalation; skin contact; skin absorption; eye contact.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Methylenediphenyl diisocyanate (mixed isomers)	0.49 mg/L (rat) (4-hour exposure) (dust)	> 10000 mg/kg (rat)	> 9400 mg/kg (rabbit)

LC50 (Inhalation)

Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs.
May cause pulmonary edema (fluid in the lungs.) Effects may be delayed.
Decreased lung function has been associated with overexposure to isocyanates.

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50 (Oral)

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50 (Dermal)

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Skin Corrosion/Irritation

Human experience shows very mild irritation.

Prolonged contact may cause slight skin irritation with local redness. May stain skin.

Serious Eye Damage/Irritation

Human experience shows mild irritation.

May cause slight temporary corneal injury.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

May cause nose and throat irritation. At high concentrations may cause lung injury.

May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory Tract.

Skin Absorption

No information was located.

Ingestion

May cause irritation of the mouth, throat and stomach. Symptoms may include nausea, vomiting, stomach cramps and diarrhea.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Irritation of the respiratory system. May cause respiratory tract injury.

Once sensitized, an allergic reaction may occur at low exposure levels.

Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

Respiratory and/or Skin Sensitization

Skin sensitization:
Skin contact may cause an allergic skin reaction.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

Respiratory sensitization:
May cause allergic respiratory reaction.
MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Carcinogenicity

Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury.

Current exposure guidelines are expected to protect against these effects reported for MDI.

Reproductive Toxicity

Development of Offspring

Teratogenicity
For this family of materials: In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

Sexual Function and Fertility

Not known to cause effects on sexual function or fertility.
Conclusions cannot be drawn from the limited studies available.

Effects on or via Lactation

Not known to cause effects on or via lactation.

Germ Cell Mutagenicity

MDI was weakly positive in some in vitro studies; other in vitro studies were negative.
Animal mutagenicity studies were predominantly negative.
Results: Genetic toxicity data on MDI are inconclusive.

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

No known significant effects or critical hazards.

Ecotoxicity

Toxicity to bacteria:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms:
EC50, Eisenia fetida (earthworms), 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants:
EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l

EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l.

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Methylenediphenyl diisocyanate (mixed isomers)	> 1,000 mg/L (Lepomis macrochirus (bluegill); 96-hour; fresh water; static)			1,640 mg/L (Desmodesmus subspicatus (algae); 72-hour; static)

Persistence and Degradability

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent.

Bioaccumulative Potential

Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Mobility in Soil

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Fully polymerized material is considered toxicologically and ecologically inert and should be disposed of properly.

The product should not be allowed to enter drains, water courses or the soil.

Contact local environmental authorities for approved disposal or recycling methods in your jurisdiction.

SECTION 14. TRANSPORT INFORMATION

Not regulated under Canadian TDG regulations. Not regulated under US DOT Regulations. Not regulated under IATA Regulations.

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
US DOT		Non-Regulated		
IATA (Air)		Non-Regulated		
IMO (Marine)		Non-Regulated		
Canadian TDG		Non-Regulated		

Transport in Bulk according to International Maritime Organization Instruments

Not applicable

Other Information Reportable Quantity: 5435 kg (11982 lb) When this product is shipped in containers of smaller size than the product reportable quantity (RQ), this material is considered non-regulated for transport.

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

HMIS classifications:

Health 2 *
Flammability 1
Physical Hazard 1

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Reportable Quantity: 5435 kg (11982 lb) When this product is shipped in containers of smaller size than the product reportable quantity (RQ), this material is considered non-regulated for transport.

Canada

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

CEPA - National Pollutant Release Inventory (NPRI)

Part 1A. (Polymethylene polyphenyl isocyanate) Part 1A. (4,4'-Methylenediphenyl diisocyanate)

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

Additional USA Regulatory Lists

CERCLA:
C.A.S.# 26447-40-5 Methylenediphenyl diisocyanate (mixed isomers) Reportable Quantity: 5435 kg (11982 lb) When this product is shipped in containers of smaller size than the product reportable quantity (RQ), this material is considered non-regulated for transport.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-

Know Act of 1986)
SARA Title III - Section 311/312:
Acute toxicity (any route of exposure)
Respiratory or skin sensitisation
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA Title III - Section 313:
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III
of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.
(Methylenediphenyl diisocyanate (mixed isomers))

Pennsylvania Right To Know:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65:
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16. OTHER INFORMATION

NFPA Rating	**Health - 2** **Flammability - 1** **Instability - 1**
	Based on Methylenediphenyl diisocyanate (mixed isomers)
SDS Prepared By	B.E.R
Phone No.	(315) 782-3000
Date of Preparation	August 27, 2015
Date of Last Revision	June 30, 2023
Revision Indicators	Revision 6 Updated: . Toxicological, Ecological, and Exposure Controls/Personal Protection Information C.A.S.# SECTION 15. REGULATORY INFORMATION reviewed and approved
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer NFPA = National Fire Protection Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA (“BIOVIA”). Available from Canadian Centre for Occupational Health and Safety (CCOHS).
Disclaimer	NOTE: The information contained herein is, to the best of our knowledge, accurate and reliable. However, no warranty is expressed or implied regarding the accuracy of this information, or the results to be obtained from the use thereof.