SAFETY DATA SHEET

1. Product Identification

Product name	Flotation Foam, Part A
SDS Number	3700A00
Product type	Polyisocyanate Resin Mixture
Recommended use of the chemical and restrictions on use	Polyurethane component; Industrial chemicals
Restrictions	None known.
Manufacturer/Supplier information	
Company name	SYSTEM THREE RESINS, INC.
Address	3500 W. Valley Hwy North Suite 105 Auburn, WA 98001-2436 United States
Telephone	1-253-333-8118
Website	www.systemthree.com
Email	support-08@systemthree.com
Emergency Contact	CHEMTREC (U.S. and CANADA) 1-800-424-9300 CHEMTREC (Outside the U.S.) 1-703-527-0585

2. Hazard(s) Identification

Classification of substance or mixture/Signal word

DANGER.

ACUTE TOXICITY, INHALATION Category 4

SERIOUS EYE DAMAGE/EYE IRRITATION, Category 2B

SKIN CORROSION/IRRITATION, Category 2

SKIN SENSITIZATION Category, 1B

RESPIRATORY SENSITIZATION, Category 1

CARCINOGENICITY, Category 2

SPECIFIC TARGET ORGAN TOXICITY, SINGLE EXPOSURE (Irritating to respirator system), Category 3

SPECIFIC TARGET ORGAN TOXICITY, REPEATED EXPOSURE (by inhalation), Category 2

GHS Label Elements

Hazard Pictograms

Hazard statements	H320	Causes eye irritation.
	H315	Causes skin irritation.
	H332	Harmful if inhaled.
	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
	H317	May cause an allergic skin reaction.
	H335	May cause respiratory irritation.
	H351	Suspected of causing cancer.
	H373	May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).
Precautionary Statements		
Prevention	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P271	Use only outdoors or in a well-ventilated area.
	P260	Do no breathe dust/gas/mist/vapours.
	P201	Obtain special instructions before use.
	P261	Avoid breathing mist.
	P202	Do not handle until all safety precautions have been read and understood.
	P284	[In case of inadequate ventilation] wear respiratory protection.
	P272	Contaminated work clothing should not be allowed out of the workplace.
	P264	Wash with plenty of water and soap thoroughly after handling.
Response	P312	Call a POISON CENTER or doctor/physician if you feel unwell.
	P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P308+P311	IF exposed or concerned: Call a POISON CENTER or doctor/physician.
	P314	Get medical advice/attention if you feel unwell.
	P303+P352	IF ON SKIN (or hair): Wash with plenty of soap and water.
	P333+P311	If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.
	P362+P364	Take off contaminated clothing and wash before reuse.
	P332+P313	If skin irritation occurs: Get medical advice/attention.
	P337+P311	If eye irritation persists: Call a POISON CENTER or doctor/physician.
Storage	P403+P233	Store in a well-ventilated place. Keep container tightly closed.
	P405	Store locked up.
Disposal	P501	Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified (HNOC) None Available.

3. Composition/Information on Ingredients

Chemical Name	CAS Number	Content (%)
Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8	25 – 50
1,3-Diazetidine-2,4-dione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-	17589-24-1	1 – 3
Methylenediphenyl diisocyanate	26447-40-5	3 – 7
Isocyanic acid, polymethylenepolyphenylene ester, polymer with alpha-hydro-omega-hydroxypoly(oxy-1,2-ethanediyl)	57636-09-6	1 – 3
P-MDI	9016-87-9	50 – 75

4. First-Aid Measures

Inhalation	Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.
Skin contact	Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.
Eye contact	In case of contact with eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.
Ingestion	Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.
Most important symptoms/effects, acute and delayed	The most important symptoms and effects are described in the labeling (see section 2) and/or in section 11. Eye irritation, skin irritation, allergic symptoms. Hazards: Symptoms can appear later. Information on: Diphenylmethane-4,4'-diisocyanate (MDI) Hazards: Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.
Indication of immediate medical attention and special treatment needed	Specific antidotes or neutralizers to isocyanates do not exist. Treatment should be supportive and based on the judgement of the physician in response to the reaction of the patient.

5. Fire-Fighting Measures

Suitable extinguishing media	Water spray, dry powder, carbon dioxide, foam
Unsuitable extinguishing media	None known
Specific hazards arising from the chemical	Hazards during fire-fighting: nitrous gases, fumes/smoke, isocyanate, vapour
Special protective equipment and precautions for fire-fighters	
Fire-fighting equipment/instructions	Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.
Specific methods	Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental Release Measures

Personal precautions	Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Protective equipment	Proper PPE includes: disposable gloves, eye protection and skin protection.
Methods and materials for containment/cleanup	For small amounts: Absorb isocyanate with suitable absorbent material (see 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution:

	Mixture of 90% water, 8 % concentrated ammonia, 2% detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide. For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.
Environmental Precautions	Do no discharge into drains/surface waters/groundwater.

7. Handling and Storage

Precautions for safe handling	Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Danger of bursting when sealed gastight. Protect against moisture. If bulging of drum occurs, transfer to well ventilated area, puncture to relive pressure, open vent and let stand for 48 hours before resealing. Protection against fire and explosion: No explosion proofing necessary.
Precautions/Recommendations for safe/proper storage	Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases. Segregate from bases. Suitable materials for containers: Carbon steel (iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2). Further information on storage conditions: Formation of CO2 and buildup of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture. Storage stability: Storage temperature: 32 – 110°F Protect against moisture.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

Diphenylmethane-4,4'-diisocyanate (MDI)	OSHA PEL	CLV 0.02 ppm 0.2m mg/m3; CLV 0.02 ppm 0.2 mg/m3
	ACGIH TLV	TWA value 0.005 ppm
P-MDI	OSHA PEL	CLV 0.02 ppm 0.2m mg/m3; CLV 0.02 ppm 0.2 mg/m3
	ACGIH TLV	TWA value 0.005 ppm
Isocyanic acid, polymethylenepolyphenylene ester (P-MDI)	OSHA PEL	CLV 0.02 ppm 0.2m mg/m3; CLV 0.02 ppm 0.2 mg/m3
	ACGIH TLV	TWA value 0.005 ppm

Advice on system design: Provide local exhaust ventilation to maintain recommended P.E.L.

Individual protection measures/Personal protective equipment

Eye/face protection	Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.
Hand protection	Chemical resistant protective gloves should be worn to prevent all skin contact. Suitable materials may include, chloroprene rubber (neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, depending upon conditions of use.

Skin protection	Cover as much of the exposed skin as possible to prevent all skin contact. Suitable materials may include, saran-coated material, depending upon conditions of use.
Respiratory protection	When workers are facing concentrations above the occupational exposure limits they must use appropriate certified respirators. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place. For emergency or non-routine, high exposure situations, including confined space entry, use a NIOSH-certified full face-piece pressure demand self-contained breathing apparatus (SCBA) or a full face-piece pressure demand supplied-air respirator (SAR)
General hygiene during/after use	Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL or TLV value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or

9. Physical and Chemical Properties

Chemical family	Aromatic Isocyanates
Physical State	
Form	Liquid
Color	Dark amber
Odor	Faint odor, aromatic
Odor threshold	Not applicable
Density (Specific gravity)	1.22 g/cm3 @ 20°C
Viscosity	200 mPa s @ 20°C
pH	Data not available
Melting point/freezing point	3°C (1 ATM)
Boiling point	200°C (5 mmHg)
Flash point	220°C, Open Cup
Evaporation rate	Value can be approximated from Henry's Law Constant or vapor pressure
Flammability (solid, gas)	Not flammable
Upper/lower flammability or explosive limits	
Upper explosion limit	For liquids not relevant for classification and labeling.
Lower explosion limit	For liquids not relevant for classification and labeling. The lower explosion point may be 5-15 °C below the flash point.
Vapor density	Not applicable
Relative density	1.22 @ 25°C
Bulk density	10.17 lb/USg @ 25°C
Solubility	Reacts with water
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature	>250°C
Decomposition temperature	No decomposition if stored and handled as prescribed/indicated.

10.Stability and Reactivity

Reactivity	None
Chemical stability	The product is stable if stored and handled as prescribed/indicated.
Possibility of hazardous reactions	Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalies. Reacts with amines. Risk of exothermic reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.
Conditions to avoid	Avoid moisture.
Incompatible materials	Acids, amines, alcohols, water, alkalines, strong bases, substances/products that react with isocyanates.
Hazardous decomposition products	Carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapours.

11. Toxicological Information

Acute Toxicity/Effects

Acute Toxicity	Assessment of acute toxicity: Inhalation of vapours may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Inhalation exposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed.
Oral	Information on: Diphenylmethane-4,4’-diisocyanate (MDI) Type of value: LD50 Species: rat (male/female) Value: >2000 mg/kg (Directive 84/449/EEC, B.1)
Inhalation	Type of value: LC50 Species: rat (male/female) Value: 2.0 mg/l (OECD Guideline 403) An aerosol was tested.
Dermal	Information on: Diphenylmethane-4,4’-diisocyanate (MDI) Type of value: LD50 Species: rabbit (male/female) Value: >9400 mg/kg
Assessment other acute effects	Assessment of STOT single: Causes temporary irritation of the respiratory tract.
Irritation/corrosion	Assessment of irritating effects: Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic.
Skin	Information on: Diphenylmethane-4,4’-diisocyanate (MDI) Species: rabbit Result: Irritating Method: Draize test
Eye	Information on: Diphenylmethane-4,4’-diisocyanate (MDI) Species: rabbit Result: Irritating Method: Draize test

Sensitization

Assessment of sensitization: Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information on: Diphenylmethane-4,4’-diisocyanate (MDI)

Species: guinea pig

Result: Sensitizing

Method: Buehler test

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information on: Diphenylmethane-4,4’-diisocyanate (MDI)

Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 yrs, 6 hr/day 0, 0.2, 1, 6 mg/m3, olfactory epithelium

NOAEL: 0.2 mg/m3

LOAEL: 1 mg/m3

Genetic toxicity

Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with animals.

Carcinogenicity

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.

Experimental/calculated data: OECD Guideline 453 rat inhalation 0, 0.2, 1, 6 mg/m3

Reproductive toxicity

Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development

OECD Guideline 414 rat inhlation 0, 1, 4, 12 mg/m3

NOAEL Mat.: 4 mg/m3

NOAEL Teratog.: 4 mg/m3

The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Symptoms of Exposure

Medical conditions aggravated by overexposure	The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Pre-employment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum) are suggested. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

12. Ecological Information

Toxicity

Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.
The product may hydrolyse. The test result maybe partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

	Result	**Species**	**Exposure**
Aquatic toxicity	LC50 >1000 mg/l	Brachydanio rerio	96 h
	EC50 >1000 mg/l	Aquatic invertebrates; Daphnia magna	24 h
	EC0 1640 mg/l (growth rate)	Scenedesmus subspicatus	72 h
Toxicity to microorganisms	EC50 >100 mg/l	Aerobic bacteria from a domestic water treatment plant	3 h

Persistence and degradability

Assessment biodegradation and elimination (H2O)	Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.
Elimination information	0% BOD of the ThOD (28d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.
Assessment of stability in water	In contact with water the substance will hydrolyse slowly.
Information on Stability in Water (Hydrolysis)	$T_{1/2}$ 20 h (25°C)

Bioaccumulative potential

Significant accumulation in organisms is not to be expected.
Bioconcentration factor: 200 (28 d), Cyprinus carpio

Mobility in soil

The substance will not evaporate into the atmosphere from the water surface. Adsorption to soliid soil phase is not expected.

13. Disposal Considerations

Waste disposal of substance	Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system.
Container disposal	DRUMS: Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not resuse empty containers.

14. Transport Information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Land Transport	**US DOT**	Non-regulated
Sea Transport	**IMDG**	Non-regulated
Air Transport	**IATA/ICAO**	Non-regulated
Further information	**DOT**	This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Please refer to Section 15 of this SDS for the RQ for this product.

15. Regulatory Information

Federal Regulations

Registration status	Chemical, TSCA, US released/listed	
EPCRA 311/312 (Hazard categories)	Acute; Chronic	
EPCRA 313	**CAS Number**	**Chemical Name**
	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)
	9016-87-9	P-MDI
CERCLA RQ - 5000 LBS	101-68-8; 9016-87-9	Diphenylmethane-4,4'-diisocyanate (MDI); P-MDI
Reportable quantity for release:	13,157.9 lb	

State Regulations

State RTK	**CAS Number**	**Chemical Name**
MA, NJ, PA	9016-87-9	P-MDI
MA, NJ, PA	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)
NJ	26447-40-5	Methylenediphenyl diisocyanate

16.Other Information, Including Date of Preparation or Last Revision

HMIS Rating

Health	**2**
Flammability	**1**
Physical Hazards	**1**

Date of printing:	8/3/16
Date of issue/Date of revision:	8/3/16
Date of previous issue:	9/5/11
Prepared by:	N. Kim

The information contained herein is based on the data available to us and is believed to be correct. However, System Three Resins, Inc. makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. System Three assumes no responsibility for injury from the use of the product described herein.