NOVA Chemicals®

Material Safety Data Sheet

Material Name: **Expandable Polystyrene - Modified Grade** MSDS ID: NOVA-0052

Section 1 - Product and Company Identification

Synonyms: Foamable Polystyrene with brominated flame-retardants, EPS with brominated flame-retardants
Chemical Name: Expandable Polystyrene
Chemical Family: Plastic
Material Use: Plastics Industry.
Chemical Formula: Mixture

NOVA Chemicals
1550 Coraopolis Heights Road
Moon Township, Pennsylvania, USA 15108

Product Information #: 1-412-490-4063

In Case of Emergency:

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)
1-800-424-9300 (CHEMTREC-USA) (24 hours)
1-613-996-6666 (Canutec-Canada) (24 hours)

Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent by Wt.
9003-53-6	Polystyrene	92-97
109-66-0	n-Pentane	3-8*
78-78-4	Isopentane	0-3*
287-92-3	Cyclopentane	0-3*
	*All pentanes (normal-, iso-, and cyclo-) combined	3-8

Additional Information

According to 29 CFR 1910.1200 (Hazard Communication), polystyrene polymer product is not hazardous.
The blowing agent used in the product is considered hazardous.
This product is regulated as hazardous material/ dangerous goods for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 3 - Hazards Identification

HMIS Ratings: Health: 1 **Fire:** 3 **Physical Hazard:** 0 **Personal Protection:** Safety Glasses, Gloves
*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard*

NFPA Ratings: Health: 1 **Fire:** 3 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Emergency Overview

DANGER! FLAMMABLE! Product is a white bead (0.25 - 2.0mm diameter) with a slight hydrocarbon odor. This product can release a gas that is highly flammable in the presence of open flames, lit cigarettes, sparks, static electricity discharges, or heat. The blowing agent may be irritating to the eyes, respiratory system and skin. Not resistant to oxidizing agents, dissolves in organic solvents. When heated to decomposition, product emits acrid smoke and irritating fumes. Slipping hazard.

Potential Health Effects: Eyes

This product may cause eye irritation. Contact with hot or molten material may cause severe thermal injury, including in extreme contact possible blindness. Contact of powder or fines with eye may cause mechanical irritation.

Potential Health Effects: Skin

This product may cause irritation to the skin from repetitive handling. Contact with hot or molten material may cause severe thermal burns. Contact of powder or fines with skin may cause mild irritation, that is increased by mechanical rubbing or if skin is dry.

Potential Health Effects: Ingestion

This product may be harmful if it is swallowed. Mechanical irritation and blockage of the digestive tract are possible.

Potential Health Effects: Inhalation

This product may cause irritation to the respiratory system. Overexposure may be harmful.

Section 4 - First Aid Measures

First Aid: Eyes

Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.

First Aid: Skin

For skin contact, wash immediately with soap and water. Seek medical attention if symptoms develop or persist.

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist.

First Aid: Ingestion

Material is not expected to be absorbed from the gastrointestinal tract. DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682, 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). After adequate first aid, no further treatment is required unless symptoms reappear.

Section 5 - Fire Fighting Measures

See Section 9: Physical Properties for flammability limits, flash point and autoignition information.

General Fire Hazards

Dangerous fire and explosion risk. Vigorously supports combustion. When heated to decomposition, product emits acrid smoke and irritating fumes. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. Move containers from the fire area if this can be done without risk. High concentration of airborne powders or dust may form explosive mixture with air.

Explosion Hazards

Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. Accumulated fine dusts may form an explosive mixture with air. Take precautionary measures to prevent contact with electrostatic discharges. Risk of dust-air explosion is increased if flammable vapors are present.

Hazardous Combustion Products

Styrene, Hydrogen Bromide, oxides of carbon, and other toxic gases at elevated temperatures.

Extinguishing Media

Dry chemical, foam, carbon dioxide, or water fog or spray. Use water to cool fire-exposed containers and to protect personnel. Do not use direct water stream.

Fire Fighting Equipment/Instructions

Reference the 2004 Emergency Response Guidebook, Guide #133. Position upwind. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk. For massive fire, use unmanned holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Cool containers with flooding quantities of water until well after the fire is out. ALWAYS stay away from containers engulfed in fire. Fire fighters should wear full-face, self-contained breathing apparatus and thermal protective clothing. Avoid inhaling any smoke and combustion products. Control runoff waters to prevent entry into sewers, drains, underground or confined spaces and waterways.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. Alert stand-by emergency and fire fighting personnel.

Small Spills

Spilled product may create a dangerous slipping hazard. Eliminate all sources of ignition. Consider isolating the spill or leak area immediately until ambient air sampling results indicate that the pentane vapor concentration is below the flammable range. Use appropriate non-sparking tools to put the spilled solid in an appropriate waste disposal container.

Large Spills

Flammable vapors are released from spills. Use water spray curtain to divert vapor drift. Eliminate all sources of ignition. Consider evacuating the spill or leak area immediately until ambient air sampling results indicate that the pentane vapor concentration is below the flammable range. Prevent entry into sewers, basements, or confined areas; dike if needed.

Special Procedures

Contact local police/emergency services and appropriate emergency telephone numbers provided in Section 1. Ensure that statutory and regulatory reporting requirements in the applicable jurisdiction are met.
Wear appropriate protective equipment and clothing during clean-up. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup has been completed.

Damaged or Suspected Damaged Containers

If EPS containers are damaged or suspected to have been damaged during transit, open the truck trailer door slowly and ventilate for 15 minutes. Never permit smoking. Test the atmosphere to ensure the air is free of pentane before entering.

See Section 8 for recommended Personal Protective Equipment and see Section 13 for waste disposal considerations.

Section 7 - Handling and Storage

Handling Procedures

Handle in contained and properly designed equipment systems. Use with adequate ventilation. Avoid ingestion and inhalation. Keep this product from heart, sparks, lit cigarettes, static electricity discharges or open flame Ground all material handling and transfer equipment to dissipate build-up of static electricity. Keep handling areas free of loose beads and dust accumulation. Mechanical operations involving this material should be done in such a manner as to prevent or minimize dust generation. Small amounts of fines or dust contained in granular resins may accumulate in material handling systems. If permitted to accumulate, these fines or dust can, under certain conditions, pose an explosion hazard. Every effort should be made to prevent suspension, concentration or accumulation of fines or dusts in, or around, material handling systems. For additional information on control of static and minimizing potential dust and fire hazards, refer to NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, 2006 Edition." Spilled product may create a dangerous slipping hazard. Keep away from incompatibles such as oxidizing agents, and organic materials. Keep this material in a cool, well-ventilated place.
After opening the container in a well-ventilated area, allow 15 minutes for the accumulated pentane to dissipate. Partially opened containers represent a potentially serious hazard because the insides of the container permit a space for the pentane to accumulate. When partially filled containers have to be used, direct a stream of air into the container for 15 minutes after opening to ensure no accumulation of pentane in the container. Maintain sufficient air circulation and ventilation to prevent flammable concentrations from forming, especially in low-lying areas.

Storage Procedures

Storage area should be clearly identified, well-illuminated, and clear of obstruction. Adequate security must be provided so that unauthorized personnel do not have access to product/ material. Store in grounded, properly designed and approved vessels and away from incompatible materials. Store and use away from heat, sparks, lit cigarettes, static electricity discharges, open flame, or any other ignition source. Store according to applicable regulations for flammable materials for storage tanks, containers, piping, buildings, rooms, cabinets, allowable quantities and minimum storage distances. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers, flammable gas detectors). A refrigerated room is generally recommended for warehouse storage of materials with a flash point lower than 37.8°C (100°F). DO NOT enter filled bulk containers and attempt to walk over product, due to risk of slipping and possible suffocation. Use a fall arrest system when working near open bulk storage containers.

For additional handing and storage information, refer to the NOVA Chemicals Expandable Polystyrene Storage and Handling Safety Guide.

See Section 8: Exposure Controls/Personal Protection for appropriate Personal Protective Equipment.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Refer to published exposure limits - use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are proximal to work locations.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, Alberta, and Ontario exposure limit lists have been checked for major components listed with CAS registry numbers. Other exposure limits may apply, check with proper authorities.

n-Pentane (109-66-0)

ACGIH: 600 ppm TWA
OSHA: 600 ppm TWA; 1800 mg/m3 TWA
750 ppm STEL; 2250 mg/m3 STEL
NIOSH: 120 ppm TWA; 350 mg/m3 TWA
610 ppm Ceiling (15 min); 1800 mg/m3 Ceiling (15 min)
1500 ppm IDLH
Alberta: 600 ppm TWA; 1770 mg/m3 TWA
Ontario: 600 ppm TWAEV; 1770 mg/m3 TWAEV
750 ppm STEV; 2210 mg/m3 STEV

Cyclopentane (287-92-3)

ACGIH: 600 ppm TWA
OSHA: 600 ppm TWA; 1720 mg/m3 TWA
NIOSH: 600 ppm TWA; 1720 mg/m3 TWA
Alberta: 600 ppm TWA; 1720 mg/m3 TWA
Ontario: 600 ppm TWAEV; 1720 mg/m3 TWAEV

Isopentane (78-78-4)

ACGIH: 600 ppm TWA (listed under Pentane, all isomers)
Alberta: 600 ppm TWA; 1770 mg/m3 TWA

ENGINEERING CONTROLS

Maintain worker exposure below recommended exposure limits by providing adequate local exhaust ventilation. Use non-sparking, grounded ventilation systems separate from other exhaust systems. Ensure that eyewash stations and safety showers are proximal to the workstation location.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles are recommended to prevent eye irritation from vapors.

Personal Protective Equipment: Skin/Hands/Feet

Use impervious gloves when handling product. Wear safety footwear with good traction to prevent slipping. Footwear with conductive soles is also recommended. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants. Fire resistant (i.e., Nomex) or natural fiber clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where flammable vapors release may occur.

Personal Protective Equipment: Respiratory

If engineering controls and ventilation is not sufficient to prevent buildup of aerosols, vapors or dusts, appropriate NIOSH approved air-purifying respirators or self-contained breathing apparatus (SCBA) appropriate for exposure potential should be used. Air supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

Personal Protective Equipment: General

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain, and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical State and Appearance:	Solid white beads.	**Color:**	White
Odor:	Slight hydrocarbon	**pH:**	Not applicable
Vapor Pressure:	400 mmHg @ 20°C (based on blowing agent)	**Vapor Density @ 0°C (Air=1):**	2.5 (Air = 1)
Boiling Point:	Not available	**Solubility (H2O):**	Non-soluble; Soluble in methanol, methylethylketone, benzene, toluene, or xylene; Partially soluble in diethyl ether, n-octanol, acetone.
Specific Gravity (Water=1):	Approx. 0.525 to 1.05	**Dispersion Properties:**	Not dispersed in cold/hot water.
Auto Ignition:	427°C (800.6°F) (For Polystyrene)	**Softening Point:**	Approx 50°C - 75°C (122°F - 167°F)
Flash Point:	-49°C (-56°F) (For Pentane**)	**Flash Point Method:**	** Closed Cup (Tagliabue)
Upper Flammable Limit (UFL):	8.3% (based on blowing agent)	**Lower Flammable Limit (LFL):**	1.4% (based on blowing agent)
Flammability Classification:	Extremely Flammable (based on pentane)		

Section 10 - Stability & Reactivity Information

Chemical Stability

This product is stable under normal use conditions for shock, vibration, pressure, or temperature.

Chemical Stability: Conditions to Avoid

Keep this product from heat, ignition sources, static electricity discharges, and incompatible materials.

Incompatibility

Not resistant to oxidizing agents, dissolves in organic solvents.

Hazardous Polymerization

Will not occur.

Hazardous Decomposition

Styrene, Hydrogen Bromide, oxides of carbon, and other toxic gases at elevated temperatures.

Special Remarks

Strong oxidizers can increase fire and explosion hazard.

Section 11 - Toxicological Information

A: Acute Toxicity - General Material Information

This product has not been tested. Exposure to high levels of dusts may be irritating to the eyes. Skin/eye contact with molten or heated material may cause burns. Vapors/heated fumes may be irritating to the respiratory system.

Pentanes and Pentenes, mixed - Contact can irritate the eyes and skin causing a rash and a burning sensation. Inhalation can irritate the nose, throat, and lungs causing coughing, wheezing, and/or shortness of breath. Inhalation of high concentrations may result in central nervous system (CNS) depression, causing headache, dizziness, nausea, loss of coordination, unconsciousness, and in extreme conditions coma and possibly death. Very high levels of vapors in an enclosed space will decrease the amount of available oxygen and may cause suffocation. Ingestion and subsequent aspiration into the lungs may cause chemical pneumonitis.

B: Acute Toxicity - LD50/LC50

n-Pentane (109-66-0)

Inhalation LC50 Rat: 364 g/m3/4H; Dermal LD50 Rabbit: 3000 mg/kg; LD50 (Intravenous) Mouse: 446 mg/kg

Cyclopentane (287-92-3)

Oral LD50 Mouse: 12800 mg/kg

C: Chronic Toxicity - General Material Information

Pentanes and Pentenes, mixed - Prolonged and repeated skin contact can cause defatting dermatitis with dryness and cracking, redness, and blisters. Chronic pentane exposure may damage the nervous system causing numbness, "pins and needles", and weakness in the arms and legs.

D: Chronic Toxicity - Carcinogenic Effects

ACGIH, EPA, IARC, OSHA, and NTP carcinogen lists have been checked for selected similar materials or those components with CAS registry numbers.

Polystyrene (9003-53-6)

IARC: Supplement 7, 1987; Monograph 19, 1979 (Group 3 (not classifiable))

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

The information below is based on knowledge of the components and the ecotoxicity of similar products. Sewer/waterway obstruction; marine life may ingest beads, which may obstruct their digestive tract. Product is expected to be non-toxic, but small particles may have physical effects on aquatic and terrestrial organisms. Blowing agents may be hazardous to aquatic life.

B: Component Analysis - Ecotoxicity - Aquatic/Terrestrial Toxicity

n-Pentane (109-66-0)

96 Hr LC50 Oncorhynchus mykiss: 9.87 mg/L; 96 Hr LC50 Pimephales promelas: 11.59 mg/L; 96 Hr LC50 Lepomis macrochirus: 9.99 mg/L; 48 Hr EC50 water flea: 9.7 mg/L

Cyclopentane (287-92-3)

48 Hr EC50 Daphnia magna: 10.5 mg/L

Isopentane (78-78-4)

Air:

When released into the air, isopentane is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals, with half-life between 1 and 10 days.

Aquatic:

When released into water, isopentane may biodegrade to a moderate extent. When released to water, isopentane is expected to quickly evaporate. Into the water, isopentane is expected to have a half-life of less than 1 day. Isopentane has an estimated bioconcentration factor (BCF) of less than 100. Isopentane has a log octanol-water partition coefficient greater than 3.0. Isopentane is not expected to significantly bioaccumulate.

Soil (micro- and macro-organisms): Not Available.

Inhibitory effects on the activity of microorganisms and impact on sewage treatment plants: Not Available.

Environmental Fate/Mobility

This product has not been tested. Depending on the resin grade's specific gravity, this product may sink or float in freshwater and/or seawater. May be persistent in aquatic and terrestrial systems. Product should be recovered from water and land following spills.

Persistence/Degradability

This product has not been tested. Expected to be inherently non-biodegradable. Integrated environmental half-life expected to be >= 100 days. Do not allow product to enter sewer or waterways. Blowing agents are expected to rapidly volatize from soil and water.

Bioaccumulation/Accumulation

This material has not been tested. It is considered to have little potential for bioaccumulation or food chain concentration.

Section 13 - Disposal Considerations

Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Waste Disposal

This product, if discarded, is not expected to be a hazardous waste according to US or Canadian regulations. Check Local, State, Federal, and Provincial Environmental Regulations prior to disposal. Preferred disposal methods for polymers in order of preference are: 1) clean and reuse if possible; 2) contact resin broker; 3) contact plastic recycler; 4) incinerate with waste heat recovery and/or 5) landfill. Reuse, recycling, storing, transportation, and disposal must be in accordance with applicable federal, state/provincial and local regulations. DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED IGNITION.

See Section 7: Handling and Storage and Section 8: Exposure Controls/Personal Protection for additional handling information that may be applicable for safe handling and the protection of employees.

Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste

Section 14 - Transportation Information

US DOT Information

Shipping Name: Polymeric beads, expandable
UN# 2211 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): Class 9: Miscellaneous
Additional Information: 2004 Emergency Response Guidebook, Guide #133

Canadian TDG Information

Shipping Name: Polymeric beads, expandable
UN# 2211 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): Class 9: Miscellaneous
Additional Information: 2004 Emergency Response Guidebook, Guide #133.

International Air Transport Association (IATA) and ICAO Regulations

Shipping Name: Polymeric beads, expandable
UN# 2211 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): Class 9: Miscellaneous

International Maritime Dangerous Goods (IMDG) Regulations

Shipping Name: Polymeric beads, expandable
UN# 2211 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): Class 9: Miscellaneous
Additional Information: EmS Code: F-A, S-I
Identified as a Marine Pollutant: No

Section 15 - Regulatory Information

A: International Regulations

The monomer is listed by EINECS for polystyrene homopolymer.

Component Analysis - International Inventory Status

Component	CAS #	US - TSCA	CANADA - DSL	EU - EINECS
Polystyrene	9003-53-6	Yes	Yes	Exempt
n-Pentane	109-66-0	Yes	Yes	Yes
Cyclopentane	287-92-3	Yes	Yes	Yes
Isopentane	78-78-4	Yes	Yes	Yes

B: USA Federal & State Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or State regulations. Check for applicable regulations.

USA OSHA Hazard Communication Class

According to 29 CFR 1910.1200 (Hazard Communication), polystyrene polymer product is not hazardous. The blowing agent used in the product is considered hazardous.

USA Right-to-Know - Federal

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

USA Right-to-Know - State

The following components appear on one or more of the following state hazardous substances lists. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right To Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals representative or NOVA Chemicals' Product Integrity group for further U.S. State Right To Know information.

Component	CAS	NJ	PA
Polystyrene	9003-53-6	Yes	No
n-Pentane	109-66-0	Yes	Yes
Cyclopentane	287-92-3	Yes	Yes
Isopentane	78-78-4	Yes	Yes

C: Canadian Regulations - Federal and Provincial

Canadian Environmental Protection Act (CEPA): All components of this product are either on the Domestic Substances List (DSL), or have been properly notified under the New Substance Notification Regulations and the product is acceptable for use under the provisions of CEPA.

WHMIS Ingredient Disclosure List (IDL)

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List (IDL):

Component	CAS #	Minimum Concentration
n-Pentane	109-66-0	1 %
Cyclopentane	287-92-3	1 %

WHMIS Classification

Workplace Hazardous Materials Information System (WHMIS): This product/material has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.

Provincial Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or Provincial regulations. Check for applicable regulations.

Section 16 - Other Information

Label Information

PRECAUTIONS:
DANGER FLAMMABLE Product is a white bead (0.25 - 2.0 mm diameter) with a slight hydrocarbon odor. This product can release a gas that is highly flammable in the presence of open flames, sparks, static electricity discharges, or heat. The blowing agent may be irritating to the eyes, respiratory system and skin. Not resistant to oxidizing agents, dissolves in organic solvents. When heated to decomposition, product emits acrid smoke and irritating fumes. Slipping hazard.

FIRST AID:
SKIN: For skin contact, wash immediately with soap and water. Seek medical attention if symptoms develop or persist.
EYES: Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.
INHALATION: Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist.
INGESTION: Material is not expected to be absorbed from the gastrointestinal tract. DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.
IN CASE OF A SPILL: Eliminate all sources of ignition. Use appropriate non-sparking and grounded tools and equipment to put the spilled solid in an appropriate waste disposal container. Prevent entry into sewers, basements, or confined areas; dike if needed.

References

Available on request.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; BLEVE = Boiling Liquid Expanding Vapor Explosion; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Substances; EPA = Environmental Protection Agency; EU = European Union; FDA = Food and Drug Administration; IARC = International Agency for Research on Cancer; IDL = Ingredient Disclosure List; Kow = Octanol/water partition coefficient; LEL = Lower Explosive Limit; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; RCRA = Resource Conservation and Recovery Act; SARA = Superfund Amendments and Reauthorization Act; TDG = Transportation of Dangerous Goods; TSCA = Toxic Substances Control Act.

MSDS Prepared by: NOVA Chemicals

MSDS Information Phone Number: 1-412-490-4063

Other Information:

Notice to Reader

ALTHOUGH THE INFORMATION CONTAINED IN THIS DOCUMENT IS PRESENTED IN GOOD FAITH, BASED ON AVAILABLE INFORMATION BELIEVED TO BE RELIABLE AT THE TIME OF PREPARATION OF THIS DOCUMENT, **NOVA CHEMICALS MAKES NO WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION OR THE PRODUCT/MATERIALS DESCRIBED HEREIN, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES AND CONDITIONS (INCLUDING ALL WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE). NO FREEDOM FROM INFRINGEMENT OF ANY PATENT OWNED BY NOVA CHEMICALS OR OTHERS IS TO BE INFERRED. THIS INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE CONTACT NOVA CHEMICALS FOR THE MOST CURRENT VERSION OF THIS MSDS. NOVA CHEMICALS DOES NOT ASSUME RESPONSIBILITY FOR MSDS OBTAINED FROM THIRD PARTY SOURCES.**

RESPONSIBILITY FOR USE, STORAGE, HANDLING AND DISPOSAL OF THE PRODUCT/MATERIALS DESCRIBED HEREIN, WHETHER ALONE OR IN COMBINATION WITH ANY OTHER SUBSTANCE, IS THAT OF THE PURCHASER AND/OR END USER

This is the end of MSDS # NOVA-0052.