SAFETY DATA SHEET

Date Prepared: 5/28/2021 Date Modified: 00/00/0000 Date Printed: 6/18/2025

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

MATERIAL IDENTITY:
NOVOC 600, 606,610 A (ISO)
Catalyst

INFORMATION TELEPHONE:
swatkins@innovationsam.com

COMPANY:
Innovations Amplified
2627 N Emerson Avenue
Indianapolis, IN 46218

EMERGENCY TELEPHONE:
CHEMTREC: 800-424-9300

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

OSHA HAZARDOUS

Skin sensitizer, Skin, Eye, Respiratory Irritant,

Target Organs: Respiratory, Eyes, Skin,

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Health		Environmental	Physical
Acute Toxicity	Category 4	Not Classified	Not Classified
Skin Irritation	Category 2		
Eye Irritation	Category 2B		
Respiratory Sensitization	Category 1		
Skin Sensitization	Category 1		
Specific target organ toxicity- single exposure	Category 3 (Respiratory system)		

Pictogram:

Signal Word **Danger**

Hazard Statements	Precautionary Statements
H315 Causes skin irritation	**Prevention:**
H317 May cause an allergic skin reaction	P261 Avoid breathing dust/fume/gas/mist/vapours/ spray.
H319 Causes serious eye irritation	P264 Wash thoroughly after handling.
H332 Harmful if inhaled	P271 Use only outdoors or in a well ventilated area.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled	P272 Contaminated work clothing should not be allowed out of the workplace.
H335 May cause respiratory irritation.	P280 Wear protective gloves/eye protection/face protection.
	P285 In case of inadequate ventilation wear respiratory protection.
	Response:
	P302+P352 IF ON SKIN: Wash with plenty of soap and water.
	P304+P340+P312 IF INHALED: Remove person to freash air and keep comfortable for breathing. Call POISON CENTER or doctor 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. P333 + P313 If skin irritation or rash occurs get medical advice/ attention. P337 + P311 If eye irritation persists: Get medical advice/ attention. P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician P363 Wash contaminated clothing before reuse. **Storage:** P403+233 Store in well ventilated place. Keep containr tightly closed P405 Store locked up **Disposal:** P501 Dispose of containers in accordance with local/regional/national/international requirements.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
4,4'-methylenediphenyl diioscyanate	101-68-8	30-50
Poly(oxy(methyl-1,2-ethanediyl)), alpha-hydro-omega-hydroxy-'polymer with 1,1'-methylenebis (isocyanatobenzene)	93420-98-9	20-30
Benzene, 1,1'-methylenebis(isocyanato-homopolymer	39310-05-9	10-20
2,4'-methylenediphenyl diisocyanate	5873-54-1	10-20

4. FIRST AID MEASURES

General Advice: Move out of dangerous area. Do not leave victim unattended. Get medical attention immediately if symptoms occur. Show this safety sheet to doctor in attendance.

If Inhaled: If breathed in, move person into fresh air. Call a physician or poison control center immediately. Keep patient warm and at rest. Keep respiratory tract clear. If breathing is difficult, give oxygen. If breathing is irregular or stopped, administer artificial respiration. If unconscious, place in recovery position and seek medical advice. Consult a physician immediately if symptoms such as shortness of breath or asthma are observed. A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitized persons. The exposed person may need to be kept under medical surveillance for 48 hours. LC50 (rat) : ca. 490mg/m3 (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter 5 microns.

Eyes Contact: Immediately flush eyes gently with large amounts of water for at least 15 minutes. Retract eyelids often. If easy to do, remove contact lens, if worn. Protect unharmed eye. Keep eye wide open while rinsing. Seek medical advice.

Skin Contact: Thoroughly wash the exposed area with mild soap and water. Remove contaminated clothing and launder contaminated clothing before re-use. Seek medical attention if exposure symptoms develop. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-Tam, PEG-400 or corn oil may be more effective than soap and water.

Ingestion Gently wipe or rinse the inside of the mouth with water.DO NOT induce vomiting unless directed to do so by a physician. Keep respiratory tract clear. Keep at rest. If a person vomits when lying on his back, place in recovery position. Never give anything by mouth to an unconscious person. Take victim immediately to the hospital. If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : Severe allergic skin reactions, bronchiospasm and anaphylactic shock. This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of throat, tightness of chest and difficulty breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Protection of first responders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If potential for exposure exists refer to section 8 for personal protective equipment. First aid responders should pay attention to self-protection and use recommended protective clothing

Advice to physicians: All treatment should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Exposure may aggravate asthma and other respiratory disorders (bronchitis, emphysema, and hyperactivity) skin allergies and eczema. Following severe exposure medical follow-up should be monitored for at least 48 hours.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Dry Chemical, CO2, Foam.

Unsuitable extinguishing media Water may be used if no other is available. and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.

Specific hazards during firefighting Do not allow run-off from the fire fighting to enter drains or water courses. The pressure in sealed containers can increase under the influence of heat. Exposure to decomposition products may be a hazard to health.

Hazardous Decomposition Products
Thermal decomposition may produce nitrogen oxides, carbon oxides, hydrocarbons and HCN. In the event of extreme heat (.500 C) an aniline is suspected of being formed.

Fire Fighting Instructions
Do not enter fire area without proper protection. Wear self contained breathing apparatus (pressure-demand MSHA/NIOSH) approved or equivalent. See Section 10 - decomposition products possible. Fight fire from safe distance/protected location. Use water spray/fog for cooling tightly sealed containers. Notify authorities if liquid enters sewer/public waters.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective equipment and emergency procedures:
Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialized clothing is required to deal with the spill, take note of any information in section 8 on suitable and unsuitable materials. Ensure adequate ventilation. Keep people away and upwind of spill/leak. Only qualified personnel with proper protective equipment may intervene. For additional precautions and advice on safe handling see sec. 7. Never return spills to original container for re-use. Make sure there is enough neutralizing/absorbent material near the storage sit. The danger areas must be marked off and identified using relevant warning and safety signs. Treat recovered material as described in section 13
Environmental Precautions

Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers. Notify authorities of any releases to sewers, soils, waterways or air. Prevent runoff from entering drains, sewers, or streams. Dispose/report per regulatory requirements. See Section 1 for emergency contact information and Section 13 for waste disposal.

Methods and Materials for Containment and Cleaning Up

Cover spills and soak up small spill with inert solids (such as vermiculite, clay) and sweep/shovel into disposal container. Pump free liquid into an appropriate closed container. Clean up spill area with a decontamination solution made up of 50% isopropanol, 45% water and 5% concentration ammonia solution (% by Weight). The solution should cover the area for at least one hour. Absorb with an inert absorbent. Collect washing for disposal. Dispose/report per regulatory requirements. **Do not** flush into drains.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Open drum carefully as contents may be under pressure. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Industrial use of aprotic solvents for cleaning can release hazardous primary aromatic amines (.0.1%)

Conditions for Safe Storage

This material is stable under normal handling and storage conditions. Maximum storage temperature is < 40 C (104 F). Store in a dry, well ventilated area. Store, transfer and handle under a blanket of nitrogen. Before closing partially empty containers, blanket with dry nitrogen. Replace damaged gaskets.

Store in tightly closed containers. Store in original container. Recommended container material: aluminum, epoxy coated steel, stainless steel, plastic. Container material to avoid, copper, tin.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

HAZARDOUS COMPONENT	CAS Number	Value type	Control parameters/ Permissible concentration	Basis
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	.005 ppm	ACGIH
		TWA	0.005 ppm 0.05MG/M3	NIOSH REL
		C	0.02ppm 0.2mg/m3	NIOSH REL
		C	0.02ppm 0.2mg/m3	OSHA Z-1
2,4'-methylenediphenyl diisocyanate	5873-54-1	C	0.02ppm 0.2mg/m3	OSHA Z-1
		TWA	0.005ppm 0.05mg/m3	NIOSH REL
		C	0.02ppm 0.2mg/m3	NIOSH REL

Respiratory Protections

Where respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations. Full-face air purifying respirators are required in work environments where isocyanate airborne concentrations exceed the action level but are significantly lower than the IDLH provided that the cartridges are changed daily. Use combination HEPA Filter for the polyisocyanate aerosol and an organic vapor cartridge for the solvents used. Full face supplied air respirators (SAR) are required in work environments where isocyanate airborne concentrations have not been characterized or are expected to exhibit considerable and sudden variations such as in spray type application. Curing ovens must be ventilated to prevent emissions to the workplace.

Eye Protection
Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles or vapor. Contact lenses should not be worn.

Skin and Body Protection
When skin contact is possible, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn.

Hand Protection
The suitability for a specific workplace should be discussed with the producers of protective gloves. Gloves should be worn when handling freshly made polyurethane products ro avoid contact with trace residual materials which my be hazardous in contact with skin. Gloves should be impervious neoprene, rubber, polyethylene, nitrile or Viton.

Other hygienic practices
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

OTHER WORK PRACTICES
Precautions must be taken so that persons handling this product do not allow contact with eyes or skin. In spray operations protection must be afforded against exposure to both vapor and spray mists.

Use good personal hygiene practices. Do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is being used. Wash hands before eating, drinking, smoking or using toilet facilities. Wash exposed skin promptly to remove accidental splashes or contact with these materials. Promptly remove soiled clothing and wash thoroughly before reuse. Shower after work using plenty of soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Form	Viscous Liquid
Color	Pale yellow to Amber/brown
pH	Not available
Melting/Freezing Temperature	Not available
Boiling Point	Not available
Flash Point	>230F/ >110 C
Ignition Temperature	Not available
Autoignition Temperature	Not available
Lower explosive limit; na	Upper explosive limit: na
Vapor Pressure	Not available
Specific Gravity (water=1 @39.2F)	1.1842 at 20 C/68F
Evaporation Rate (Bac=1)	Not available
Odor	Odorless
Odor threshold	Not available

10. STABILITY AND REACTIVITY

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
Stable under normal processing conditions.

Conditions to Avoid
Reacts violently with common materials including water, alcohols, bases and amines. Reaction with water produces CO2 gas. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence or solvents

Materials to Avoid
Store away from water, alcohols, bases, metals and amines.

Hazardous Decomposition Products
Thermal decomposition may produce nitrogen oxides and carbon oxides.

11. TOXICOLOGY INFORMATION

Acute Toxicity 4,4'-methylenediphenyl diisocyanate

Oral LD50 – lethal concentration 50% of test species	Rat	>10,000 mg/kg
Dermal LD50 – lethal concentration 50% of test species	Rabbit	> 9,400 mg/kg

Inhalation Assessment: The substance/mixture is not toxic as defined by dangerous goods regulations

Acute Toxicity 2,4'-methylenediphenyl diisocyanate

Dermal LD50 – lethal concentration 50% of test species	Rabbit	> 9,400 mg/kg

Inhalation Assessment: The substance/mixture is not toxic as defined by dangerous goods regulations

Acute Toxicity Benzene, 1,1'-methylenebis(isocyanato-homopolymer

Dermal LD50 – lethal concentration 50% of test species	Rabbit	> 9,400 mg/kg

Inhalation Assessment: The substance/mixture is not toxic as defined by dangerous goods regulations

Skin Corrosion/Irritation 4,4'-methylenediphenyl diisocyanate

Skin	Rabbit	Irritating to skin

Skin Corrosion/Irritation 2,4'-methylenediphenyl diisocyanate

Skin	Rabbit	Irritating to skin

Skin Corrosion/Irritation 1,1'-methylenebis(isocyanato-homopolymer

Skin	Rabbit	Skin irritation

Serious Eye Damage/Eye Irritation 4,4'-methylenediphenyl diisocyanate

Eye	Rabbit	Mild eye irritation

Serious Eye Damage/Eye Irritation 2,4'-methylenediphenyl diisocyanate

Eye	Humans	Irritation to eyes reversing within 7 days.	Mild eye irritation

Serious Eye Damage/Eye Irritation 1,1'-methylenebis(isocyanato-homopolymer

Eye	Rabbit	Mild eye irritation

Respiratory or Skin Sensitization 4,4'-methylenediphenyl diisocyanate

Skin	Mouse	May cause sensitization by skin contact
Respiratory tract	Guinea Pig	May cause sensitization by inhalation

Respiratory or Skin Sensitization 2,4'-methylenediphenyl diisocyanate

Skin	Mouse	May cause sensitization by skin contact
Respiratory tract	Guinea Pig	May cause sensitization by inhalation

Respiratory or Skin Sensitization 1,1'-methylenebis(isocyanato-homopolymer

Skin	Mouse	May cause sensitization by skin contact
Respiratory tract	Guinea Pig	May cause sensitization by inhalation

Germ Cell Mutagenicity 4,4'-methylenediphenyl diisocyanate

Genotoxicity in vitro 200ug/plate Result: Negative
Genotoxicity in vivo, inhalation 118mg/m3, 3 weeks Results: Negative

Germ Cell Mutagenicity 2,4'-methylenediphenyl diisocyanate

Genotoxicity in vitro 200ug/plate Result: Negative
Genotoxicity in vivo, inhalation 118mg/m3, 3 weeks Results: Negative

Germ Cell Mutagenicity 1,1'-methylenebis(isocyanato-homopolymer

Genotoxicity in vitro 200ug/plate Result: Negative
Genotoxicity in vivo, inhalation 118mg/m3, 3 weeks Results: Negative

Carcinogenicity

IARC: During normal processing, no component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: During normal processing, no component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.

OSHA: During normal processing, no component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

NTP: During normal processing, no component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

Reproductive Toxicity

Effects on Fertility 2,4'-methylenediphenyl diisocyanate

Rat Female inhalation	Result Testing showed no effects on fertility
Rate Male and Female inhalation	Result Testing showed no effects on fertility

Effects on fetal development 4,4'-methylenediphenyl diisocyanate

Rat Female inhalation	No observed adverse effects level:4mg/m3

Effects on fetal development 2,4'-methylenediphenyl diisocyanate

Rat Female inhalation	No observed adverse effects level:4mg/m3

Effects on fetal development 1,1'-methylenebis(isocyanato-homopolymer

Rat Female inhalation	No observed adverse effects level:4mg/m3

12. ECOLOGICAL INFORMATION

Aquatic Ecotoxicity

Component	Species	Exposure time	Test type	Test substance	Toxic concentration
4,4'-methylenediphenyl diisocyanate	Zebra fish	96h	Static		>1,000mg/l
	Daphnia	24h	Static	Fresh water	>1,000mg/l

	Magna				
	Daphnia Magna	21d	Semi-Static	Fresh water	NOEC >=10mg/l
2,4'-methylenediphenyl diisocyanate	Zebra fish	96h	Static		>1,000mg/l
	Daphnia Magna	24h	Static	Fresh water	>1,000mg/l
	Daphnia Magna	21d	Semi-Static	Fresh water	NOEC >=10mg/l
1,1'-methylenebis(isocyanato-homopolymer	Zebra fish	96h	Static		>1,000mg/l
	Daphnia Magna	24h	Static	Fresh water	>1,000mg/l
	Daphnia Magna	21d	Semi-Static	Fresh water	NOEC >=10mg/l
	Green Algae	72h	Static	Fresh water	EC50 >1,640mg/l

Toxicity to microorganisms

Component	Species	Exposure time	Test type	Test substance	Toxic concentration
2,4'-methylenediphenyl diisocyanate	Activated Sludge	3h	Static	Fresh water	EC50>100mg/l
1,1'-methylenebis(isocyanato-homopolymer	Activated Sludge	3h	Static	Fresh water	EC50>100mg/l

Toxicity to soil dwelling organisms

Component	Species	Exposure time	Test type	Test substance	Toxic concentration
4,4'-methylenediphenyl diisocyanate	Earthworms	336h			NOEC >=1,000mg/l
2,4'-methylenediphenyl diisocyanate	Earthworms	336h			NOEC >=1,000mg/l
1,1'-methylenebis(isocyanato-homopolymer	Earthworms	336h			EC50 >=1,000mg/l

Biodegradability

Component	Inoculum	Exposure time	Concentration	Biodegradation	Result
4,4'-methylenediphenyl diisocyanate	Domestic Sewage	28d	30 mg/l	0%	Not biodegradable
2,4'-methylenediphenyl diisocyanate	Domestic Sewage	28d	30 mg/l	0%	Not biodegradable
1,1'-methylenebis(isocyanato-homopolymer	Domestic Sewage	28d	30 mg/l	0%	Not biodegradable

Bioaccumulative potential

Bioaccumulation is unlikely

Mobility in soil

No data available

13. DISPOSAL CONSIDERATIONS

Waste Disposal

Disposal Methods

Waste from residues – Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to licensed waste management company.

Contaminated packaging = Empty remining contents. Dispose of as unused product. Do not re-use containers.

14. TRANSPORTATION INFORMATION

DOT Classification

UN/ID/NA number	NA 3082
Proper shipping name	Other Regulated substances, Liquid, N.O.S. (methylene Diphenyl Diisocyanate)
Class	9
Packing group	III
Labels	Class 9 miscellaneous dangerous substances and articles
ERG code	171
Marine Pollutant	No

Transport classifications provided herein are for informational use only, and solely based on the properties of the unpackaged material as it is described. Transportation classifications may vary based on mode of transportation, package sizes and variations in regional or country regulations.

IMDG

Not regulated by IMDG

IATA

Not regulated by IATA

15. REGULATORY INFORMATION

TSCA INVENTORY STATUS

All components are listed or exempt

OSHA HAZARDS

Skin Irritant, Skin Sensitizer, Eye Irritant, Respiratory Irritant, Digestive Tract Irritant

	HMIS Classification	NFPA Rating
Health Hazard;	2	2
Flammability	1	1
Physical Hazards	0	0

SARA TITLE III: Section 311/312 Hazards

Acute Toxicity (any route of exposure), Skin corrosion or irritation, Serious eye damage or eye irritation, Respiratory or skin sensitization.

SARA TITLE III: Section 313 (40CFR370)

CERCLA/SARA RQ

4,4'-methylenediphenyl diisocyanate 5000 lbs. (calculated product RQ 12,056lbs.)

CERCLA Information (40CFR302.4)

This material contains 4,4'-methylenediphenyl diisocyanate and releases in excess of CERCLA thresholds are reportable.

California Proposition 65 Information:

This product does not contain, or may contain substance(s) known to the state of California to cause cancer and/or reproductive toxicity.

16. OTHER INFORMATION

Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. The information in this SDS was obtained from sources, which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable. This SDS has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).