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MATERIAL SAFETY DATA SHEET

Product Name: **Base Seal® (Component 'A', Isocyanate)**

MSDS A-004

Section 1: Chemical, Product and Company Information

Product Name: Base Seal® (Component 'A', Isocyanate)
Base Seal® is a registered trademark of Icyne Inc.

Product Use: SPRAY-ON AND POUR-IN COMPONENT "A" POLYMERIC MDI. A component of The Icyne Insulation System® (Spray and Pour Foam Insulation)

Product Code: COMPONENT "A"

Revision Date: June 5, 2014

Section 2: Composition and Ingredient Information

<u>Ingredient</u>	<u>CAS No.</u>	<u>Wt.%</u>
Methylenediphenyldiisocyanate, isomers and homologues	009016-87-9	30-70
4,4'Methylene bisphenyl isocyanate	000101-68-8	30-70

Note: See Section 8 for exposure limits.

Section 3: Hazards Identification

This material is classified as hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200)

Emergency Overview: Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures. Inhalation at levels above the occupational exposure limit could cause respiratory sensitization and risk of serious damage to respiratory system. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitized persons.

Potential Acute Health Effects:

Eyes: Hazardous in case of eye contact (irritant).

Skin: Hazardous in case of skin contact (irritant, sensitizer). Skin inflammation is characterized by itching, scaling or reddening.

Inhalation: Hazardous in case of inhalation (lung irritant, lung sensitizer).

Ingestion: Slightly hazardous in case of ingestion.

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CHRONIC: (long term): see Section 11 for additional toxicological data

Medical Conditions Aggravated by Over-Exposure May cause or aggravate dermatitis or asthma.

GENERAL INFORMATION: Read the entire MSDS for a more thorough evaluation of the hazards.

Section 4: First Aid Measures

Eye Contact: Immediately flush eyes with running water continuously for 15 minutes, keeping eyelids open. Seek immediate medical attention.

Skin Contact: Remove contaminated clothing. After contact with skin, immediately wash with plenty of warm, soapy water. If symptoms develop, obtain medical attention. Contaminated clothing should be thoroughly cleaned. An MDI study has demonstrated that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water.

Inhalation: Remove patient from exposure; keep warm and at rest. Obtain immediate medical attention. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is laboured, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing.

Ingestion: Do not induce vomiting. Provided the patient is conscious, wash out mouth with water. Obtain immediate medical attention.

Notes to Physician: Symptomatic and supportive therapy as needed. Following severe exposure, medical follow-up should be monitored for at least 48 hours.

Section 5: Fire Fighting Measures

FLAMMABLE PROPERTIES

Auto-ignition Temperature: >600C

Flash Points: Closed cup: >110°C (230°F). Open cup: 230°C (446°F).

Flammable Limits: Not available

Explosion Hazard Not sensitive to static or mechanical impact. Other conditions that may cause explosions are not available.

Fire Fighting Media and Instructions: SMALL FIRE: Use dry chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Keep people away. Isolate fire area and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water is not recommended but may be applied in very large quantities as a fine spray when other extinguishing agents are not available. Contain fire water run-off if possible. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire exposed containers and fire affected zone until fire is out. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration

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of the container. Move container from fire area if this is possible without hazard.

Protective Equipment for Fire Fighters:

Wear positive-pressure Self-Contained Breathing Apparatus, "SCBA" and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant clothing with SCBA. This will not provide sufficient fire protection; consider fighting fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Products of Combustion:

Carbon Monoxide, Carbon Dioxide, Nitrogen Oxides of the form NOx and HCN.

Protective Clothing (Fire):

Splash goggles. Full suit. Boots. Gloves. Self-Contained Breathing Apparatus, "SCBA", should be used to avoid inhalation of the product.

Special Remarks on Fire Hazards:

Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures.

Section 6:	Accidental Release Measures
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SEE MATERIAL SAFETY DATA SHEET Section 8. Exposure controls, personal protection

Small Spill and Leak:

Clean-up should only be performed by trained personnel. People dealing with major spillages should wear full protective clothing including appropriate respiratory protection. Evacuate the area. Prevent further leakage, spillage or entry into drains.

Large Spill and Leak:

Contain and absorb large spillages onto an inert, non-flammable adsorbent carrier (such as earth or sand). Shovel into open-top drums or plastic bags for further decontamination, if necessary. Wash the spillage area clean with liquid decontaminant. Test atmosphere for MDI. Neutralize small spillages with decontaminant. Remove and properly dispose of residues. (See Section 13 for disposal considerations). Notify applicable government authorities if release is reportable. The CERCLA RQ for 4,4-MDI is 5,000 lbs. (see CERCLA in Section 15).

Decontaminant:

Preparation of Decontamination Solution: Prepare a decontamination solution of 0.2 – 0.5% liquid detergent and 3-8% concentrated ammonium hydroxide in water (5-10% sodium bicarbonate may be substituted for the ammonium hydroxide). Follow the precautions on the supplier's material safety data sheets when preparing and using solution. Use of Decontamination Solution: Allow deactivated material to stand for at least 30 minutes before shoveling into drums. Do not tighten the bungs. Mixing with wet earth is also effective, but slower.

Section 7:	Handling and Storage
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Handling:

Avoid contact with the product or reaction mixture. Use only with adequate ventilation to ensure that the occupational exposure limit is not exceeded. The efficiency of the ventilation system must be monitored regularly because of the possibility of blockage. Avoid

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breathing aerosols, mists and vapours. (See Section 8 – Exposure Control for details).

Storage:

Keep containers properly sealed and when stored indoors, in a well-ventilated area. Keep contents away from moisture. Due to reaction with water, and producing CO₂ gas, a hazardous buildup of pressure could result if contaminated containers are re-sealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in containers made of copper, copper alloy or galvanized surfaces.

Ideal storage temperature is 16-38°C (60-100°F).

Keep stocks of decontaminant (See Section 6) readily available.

Section 8:	Exposure Controls and Personal Protection
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<u>Ingredient:</u>	<u>ACGIH TLV (8-hr. TWA) ppm</u>	<u>U.S. OSHA PEL (8 hr. TWA) mg/m³</u>
Methylene bisphenyl isocyanate (MDI):	0.005 ppm TWA	0.02 ppm Ceiling
PEL's are in accord with those recommended by OSHA.		

Preventive Measures:

Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls:

Use local exhaust ventilation to maintain airborne concentrations below the TLV. Suitable respiratory equipment should be used in cases of insufficient ventilation or where operational procedures demand it. For guidance on engineering control measures, refer to publications such as the ACGIH current edition of 'Industrial Ventilation, a manual of Recommended Practice.'

Personal Protection:

Eyes: Chemical Safety goggles. If there is a potential for splashing, use a full face shield.

Body and Hands: The following protective materials are recommended: Gloves (neoprene, nitril rubber or butyl rubber). Thin latex disposable gloves should be avoided for repeated or long term use. Protective clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH.

Respiratory: When the product is sprayed or heated without adequate ventilation, an approved MSHA/NIOSH positive-pressure, supplied air respirator must be used. Air purifying respirators equipped with organic vapour cartridges and a HEPA (P100) particulate filter may be used under certain conditions when a cartridge change-out schedule has been developed in accordance with the OSHA respiratory protection standard (29 C.F.R. 1910.134).

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Consult your supervisor or S.O.P, for special handling instructions.

Splash goggles. Full suit. Vapour respirator or self-contained breathing apparatus (SCBA). Boots. Gloves. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

Personal Protection in Case of a Large Spill:

Section 9: Physical and Chemical Properties

<u>Appearance/Physical State:</u>	Liquid	<u>Vapour Pressure:</u>	0.000004 mmHg
<u>Odour:</u>	Slightly musty	<u>Vapour Density:</u>	8.5
<u>Colour:</u>	Brown	<u>pH:</u>	Not applicable
<u>Evaporation Rate:</u>	Not available	<u>Specific Gravity:</u>	1.23 (Water = 1)
<u>Boiling Point/Condensation Point:</u>	>300°C decomposes		
<u>Melting/Freezing Point:</u>	15°C		
<u>Coefficient of Water/Oil Distribution</u>	Not available		

Section 10: Stability and Reactivity

Stability and Reactivity: Stable at room temperature.

Conditions of Instability: Avoid high temperatures. Avoid freezing.

Incompatibility with Various Substances: This product will react with any materials containing active hydrogens such as water, alcohol, amines, bases and acids. The reaction with water is very slow under 50°C (122°F) but is accelerated at higher temperatures. Some reactions may be violent.

Hazardous Decomposition Products: Reacts slowly with water to generate CO₂ which could cause pressure buildup in a closed container. By Fire and High Heat: hydrogen cyanide, carbon dioxide, carbon monoxide, oxides of nitrogen, isocyanate, isocyanic acid, and other undetermined compounds.

Hazardous Polymerization: Polymerization may occur at elevated temperatures in the presence of alkalis, tertiary amines and metal compounds.

Section 11: Toxicological Information

Toxicity to Animals:

LD50 Rat Oral: >5000 mg/kg
LD50 Rabbit Dermal: >5000 mg/kg
LC50 Rat Respirable aerosol: 2240 mg/m³ 1 hours
LC50 Rat Respirable aerosol: 490 mg/m³ 4 hours

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<u>Inhalation:</u>	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 the throat, tightness of chest and difficulty in 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.
<u>Skin Contact:</u>	Moderate irritant. Repeated and/or prolonged contact may cause skin sensitization. There is limited evidence from animal studies that skin contact may play a role in respiratory sensitization. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
<u>Eye Contact:</u>	The vapour, aerosol, and liquid are irritants.
<u>Ingestion:</u>	Ingestion may cause irritation of the gastrointestinal tract. Based on the acute oral LD50, this product is considered practically non-toxic by ingestion.
<u>Carcinogenic Effects:</u>	The ingredients of this product are not classified as carcinogenic by ACGIH or IARC, not regulated as carcinogens by OSHA, and not listed as carcinogens by NTP.
<u>Mutagenic Effects:</u>	There is no substantial evidence of mutagenic potential.
<u>Reproductive Effects:</u>	No adverse reproductive effects are anticipated.
<u>Teratogenic Effects:</u>	No birth defects were seen in two independent (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal respirable concentrations well in excess of the defined occupational limits.
<u>Remark:</u>	A study was conducted where groups of rats were exposed for 6 hours/day, 5 days/week for a lifetime to atmospheres of respirable polymeric MDI aerosol at concentrations of 0.2, 1 or 6 mg/m ³ . No adverse effects were observed at 0.2 mg/m ³ . At the 1 mg/m ³ concentration, minimal nasal and lung irritant effects were seen. Only at the top concentration (6.0 mg/m ³) was there an increased incidence of a benign tumor of the lung (adenoma). One malignant pulmonary tumor (adenocarcinoma) was seen in the 6.0 mg/m ³ group. MDI administration to rats in this study did not change the distribution and incidence of tumors from those seen in control animals. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur. (MDI). There are reports that chronic exposure to diisocyanates by inhalation

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may result in permanent decreases in lung function.

Section 12: Ecological Information/Environmental Fate

<u>Ecotoxicity:</u>	Polymeric MDI. LC50 (Zebra Fish) >1000 mg/l. EC50 (Daphnia Magna) (24 hour) >1000 mg/l EC50 (E. Coli) >100 mg/l
<u>Environmental Fate and Distribution:</u>	It is unlikely that significant environmental exposure in the air or water will arise based on consideration of the production and use of the substance.
<u>Degradation & Persistence:</u>	Immiscible with water, but will react with water to produce inert and non-biodegradable solids.

Section 13: Disposal Considerations

See Section 15 for Regulatory Information.

<u>Waste Information:</u>	The generation of waste should be avoided or minimized wherever possible. Disposal should be in accordance with local, state, provincial or national regulations. This material is not a hazardous waste under RCRA 40 CFR 261. Small quantities should be treated with a decontaminant solution (See Section 6). The treated waste is not a hazardous material under RCRA 40 CFR 261. Chemical waste, even small quantities, should never be poured down drains, sewers or waterways. Empty containers should be decontaminated and either passed to an approved drum recycler or destroyed.
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Section 14: Transport Information

<u>U.S. Hazardous Materials Regulation (DOT 49CFR) DOT Classification:</u>	Not regulated in drums of totes, less than 5000 lbs per container.
<u>Canadian Transportation of Dangerous Goods (TDG) Classification:</u>	Not regulated.
<u>IMO/IMDG Classification:</u>	Not regulated.
<u>ICAO/IATA Classification:</u>	Not regulated.

Section 15: Regulatory Information

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NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

REGULATORY INFORMATION (Not meant to be all-inclusive-selected regulations represented).
This material is classified as hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200).

US FEDERAL REGULATIONS

This material is classified as hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200).

HCS Classification:

Toxic
Irritating Material
Sensitizing material
TSCA 8(b) inventory: All Ingredients Listed.
TSCA 12(b) one-time export notification:

SARA Title III Section 313 (40 CFR Part 372):

EPCRA Section 313 (40 CFR 372)
Diisocyanate Compounds (Category Code N120) 98%

EPCRA Section 313 (40 CFR 372) CERCLA (Comprehensive Environmental Response, Compensation and Liability Act): 4,4-Methylene diphenyl Diisocyanate (CAS 101-68-8) has a 5,000 lb. RQ (reportable quantity). Any spill or release above the RQ must be reported to the National Response Center (800-424-8802)

This product does not contain nor is it manufactured with ozone depleting substances.

State Regulations:

California Prop. 65: No ingredients listed.

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (material Safety Data Sheet) contains all the information required by the CPR.

WHMIS Canada: Class D-1A – Material causing immediate and serious toxic effects (very toxic).
Class D-2A – Material causing other toxic effects (Very toxic).
Class D-2B – Material causing other toxic effects (Toxic).

CEPA: DSL/NDSL: All Ingredients Listed.

Section 16:

Other Information

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CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, SKIN, EYES. MAY BE HARMFUL IF INHALED. MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION.

HAZARDOUS MATERIAL INFORMATION SYSTEM (U.S.A.): Health 2
Fire Hazard 1
Reactivity 1

NATIONAL FIRE PROTECTION ASSOCIATION (U.S.A.): Fire Hazard 2
Health 2
Reactivity 1

Manufacturer Disclaimer:

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION, WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity, and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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Revision Date: June 5, 2014
Prepared By: Icynene
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HEALTH AND SAFETY STATEMENT FOR CERTIFIED ICYNENE SPRAYERS

Icynene products have an excellent health and safety record spanning more than 350,000 insulation projects over more than 25 years. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others. Severe asthma attacks have been reported in some sensitized workers exposed repeatedly to isocyanates while not wearing proper protective equipment. Some reports indicate a reaction and sensitization can occur following a single, sustained occupational exposure to isocyanates without proper protective equipment above the OSHA permissible exposure limit. But sensitization might not occur immediately in some individuals. Consistent use of personal proper protective equipment to prevent exposure during spraying and within the 24 hour-period after spraying is completed is critical to eliminating the health hazard. Once sensitization has occurred, a worker might not be able work safely with spray foam insulation again.

Sprayers, sprayer helpers, and anyone else present during spraying or within 24 hours after spraying is complete: You must wear proper Personal Protective Equipment (PPE) at all times during spray, including full-body-coverage, chemical-protective clothing and a NIOSH-certified respirator with fresh air supply. While spraying and for 24 hours after spraying is completed, no one must be allowed within 50 feet of the sprayed foam without wearing this type of PPE at all times. Adequate active, negative pressure ventilation (exhaust fans) of the job site must be in place during spray and for 24 hours after spray is complete.

Independent studies indicate that with 24 hours' active ventilation after spraying is completed, Icynene spray foam insulation is safely cured.

