SAFETY DATA SHEET - SDS

Dynamo Polyurethane Systems - ISO Isocyanate
CLIMATEGARD CGI - ISO Isocyanate - ISO Component A

Section 1. IDENTIFICATION

Product Name	:	DYNAMO - ISO Component A / CLIMATEGARD CGI - ISO Component A
Manufacturer or supplier's details		
Company Name of Supplier	:	Dynamo Polyurethane Systems LLC
Address	:	2113 Harwood Rd Ste 309 #900 Bedford, Texas 76021 USA
Telephone	:	Tech Info (469-799-9991)
Email address for SDS responsibility	:	info@Dynamosps.com
Emergency telephone number Hazardous Materials incident, spill, leak, fire, exposure, or accidnet	:	Chemtrec - 1-800-424-9300 or outside USA - +1-703-527-3887
Product Use	:	Component of a Spray Polyurethane Foam System.
Recommended use	:	For Industrial, Commercial or Residential applications of Spray Polyurethane Foam Systems only.

Section 2. HAZARDOUS IDENTIFICATION

GHS Classification:

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

GHS label elements

Hazard Pictograms:

Single Word	:	**Danger**
Hazard Statements	:	Harmful if Inhaled May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes skin irritation. May cause an allergic skin reaction. Causes eye irritation. Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.
Precautionary statements	:	Precautionary statements: Prevention: Avoid breathing dust, mist, gas, vapors or spray. Do not eat, drink or smoke when using this product. Wash skin and face thoroughly after handling. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves. In case of inadequate ventilation wear respiratory protection. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134) or regional standards. For additional details, see section 8 of the SDS.

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Weight Percent	Components	Cas Number	Classification
50-60%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9	Acute toxicity Category 4 Inhalation. Skin irritation Category 2. Eye irritation Category 2B. Respiratory sensitization Category1 Skin sensitization Category 1. Specific target organ toxicity - single exposure Category 3 Respiratory system. Specific target organ toxicity - repeated exposure Category 1 Respiratory Tract
35-45%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8	Acute toxicity Category 4 Inhalation. 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. Specific target organ toxicity - repeated exposure Category 1 Respiratory Tract.
1-5%	2,4'-Diphenylmethane Diisocyanate (MDI)	5873-54-1	Acute toxicity Category 4 Inhalation. 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. Specific target organ toxicity - repeated exposure Category 1 Inhalation Respiratory Tract.
0.1 - 1%	2,2'-Diphenylmethane Diisocyanate	2536-05-2	Acute toxicity Category 4 Inhalation. 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. Specific target organ toxicity - repeated exposure Category 1 Inhalation RespiratoryTract.

Section 4. First Aid Measures

Description of necessary first aid measures

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

Skin : Clean exposed area with soap and plenty of lukewarm water. Remove contaminated clothing. Seek medical attention. Wash contaminated clothes before re-use. Call a physician if irritation develops or persist.

Eyes : Immediately flush thoroughly with water for at least 15 minutes lifting eye lids occasionally. If easy to do, remove contact lens, if worn. Protect unharmed eye. Keep eye wide open while rinsing. Get medical attention.

Inhalation : Remove victim to fresh air; extreme asthmatic reactions that may occur in sensitized persons can be life threatening. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asth matic symptoms may develop and may be immediate or delayed up to several hours. Consult a physician immediately if symptoms such as shortness of breath or asthma are observed

Ingestion : Do Not induce vomiting. Wash mouth out with water. Remove victim to fresh air and keep at rest in a posi tion comfortable for breathing. **Seek medical attention immediately.**

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

Most important symptoms/effects, acute and delayed

Potential acute health effects

Severe allergic skin reactions, bronchiospasm and anaphylactic shock
This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. 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 sensitised persons. Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symp toms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible. Causes skin irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove. Contact with MDI can cause discoloration.

Causes eye irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing. May cause irritation of the digestive tract. Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Protection of first-aiders : 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 specific personal protective equipment. First Aid responders should pay attention to self-protection and use the recommended protective clothing

Notes to physician : Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours. The first aid procedure should be established in consultation with the doctor responsible for industrial medicine

Section 5. FIREFIGHTING MEASURES

Means of Extinction : Suitable extinguishing media:
Dry chemical, Carbon dioxide (CO2), Foam, water spray for large fires.
Use extinguishing measures that are appropriate to localcircumstances and the surrounding environment

Specific hazards arising from the chemical : During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

Special protective equipment and precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk without suitable training. Fire fighters should wear appropriate protective equipment and self contained breathing apparatus. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Further information : Standard procedure for chemical fires.Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.Prevent fire extinguishing water from contaminating surface water or the ground water system. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local/state regulations.

Section 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials.Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Only qualified personnel equipped with suitable protective equipment may intervene. For additional precautions and advice on safe handling, see section 7. Never return spills in original containers for re-use. Make sure that there is a sufficient amount of neutralizing/ absorbent material near the storage area. The danger areas must be delimited and identified using relevant warning and safety signs. Treat recovered material as described in the section “Disposal considerations”. For disposal considerations see section 13.

Spill Procedure : Clean up personnel must wear protective equipment to prevent contact with the product. Evacuate the area of all unnecessary personnel. Stop spill at source. Ventilate and remove ignition sources. Control the source of the leak. Contain the released material by damming, diking, retaining, or diverting into an appropriate containment area. Absorb or pump off as much of the spilled material as possible. When using absorbent, completely cover the spill area with suitable absorbent material (e.g., vermiculite, kitty litter, Oil-Dri®, etc…). Allow for the absorbent material to absorb the spilled liquid. Shovel the absorbent material into an approved metal container (i.e., 55-gallon salvage drum).

Do not fill the container more than 2/3 full to allow for expansion, and do not tighten the lid on the container. Repeat application of absorbent material until all liquid has been removed from the surface.

Decontaminate the spill surface area using a neutralization solution (see list of solutions on the SDS); scrubbing the surface with a broom or brush helps the decontamination solution to penetrate into porous surfaces. Wait at least 15 minutes after first application of the neutralization solution. Cover the area with absorbent material and shovel this into an approved metal container.

Neutralization solutions include: Easy Off Grill and Oven Cleaner or Easy Off Fume Free oven cleaner-A mixture of 90% Fantastic Heavy Duty All Purpose Cleaner and 10% household ammonia. It may take 2 or more applications of the neutralization solution to decontaminate the surface.

Personal Precautions, protective equipment and emergency procedures:

Wear suitable protection clothing, gloves and eye/face protection. Ventilate the area.

Environmental precautions	:	Should not be released into the environment. Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.
Methods and material for containment and cleaning up	:	Suitable material for taking up: inert absorbing material, e.g., vermiculite, kitty litter, Oil-Dri®, etc. Pick up and transfer to properly labelled containers. Ventilate the area.

Section 7. HANDLING AND STORAGE

Precautions for safe handling

Protective Measures	:	Put on appropriate personal protective equipment. Do not handle until all safety precautions have been read and understood. Avoid contact with skin and eyes, inhalation of vapors and mists. Use only with adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear appropriate respirator when ventilation is inadequate. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Keep in the original container and keep tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands before, eating, drinking. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage: Store product in accordance with local regulation. Store product at room temperature away from heat and moisture. Store product in original container protected from direct sunlight in a dry, cool, and well ventilated area with local exhaust. Keep away from direct

sunlight in a dry, cool, and well ventilated area with local exhaust. Keep away from incompatiable materials and food and drink. Keep container tightly closed and sealed until ready for use.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Component	Cas Number	Exposure	Concentration
4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8	ACGIH	TWA 0.005ppm

Appropriate Engineering Controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc) below recommended exposure limits. Handle in accordance with good industrial hygiene and safety practice.

Personal protective equipment

Respiratory protection : Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 0.134).

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychlorprene (Neoprene*), Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyvinyl chloride ("PVC" or "vinyl"), Fluoroelastomer (Viton*).

		When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended. When only brief contact is expected, a glove with protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN374) is recommended. Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to : other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier By industrial use of aprotic polar solvents for cleaning : Butyl rubber (0.7mm), Nitrile rubber (0.4mm), Chloroprene (0.5mm)
Eye protection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Chemical splash goggles. Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded. Please follow all applicable local/national requirements when selecting protective measures for a specific workplace. Ensure that eyewash stations and safety showers are close to the workstation location.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place. Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek Pro 'F' disposable coverall.
Protective measures	:	Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Ensure that eye flushing systems and safety showers are located close to the working place.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Colour: Brown Liquid	Vapour Pressure: < 0.0001 mmHg @ 25 °C (77 °F)
Physical State: Liquid	Vapour Density: Not available
Odour: Musty	Relative Density: 1.234 g/cm^3 @ 20°C (68°F)
Odour Threshold: Not available	Solubility in water: Insoluble - Reacts slowly with water to liberate CO2 gas
pH: Not applicable	Partition coefficient: Not available
Melting Point/Freezing Point: Not applicable	Auto Ignition Temp: Not available
Initial Boiling Point: 208°C (406.4°F)	Decomposition Temp: Not available
Flash Point: 198°C (388.4°F)	Dynamic Viscosity: 150 - 250 mPa.s @ 25°C (77°F)
Evaporation Rate: Not available	Specific Gravity: 1.24 @ 25°C (77°F)
Lower Flammable Limit: Not available	Explosive Properties: Not available
Upper Flammable Limit: Not available	

Section 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	This is a stable material at room temperature.
Possibility of hazardous reactions	:	Contact with moisture, other materials that react with isocyanates, or temperatures above 350°F(177°), may cause polymerization.
Conditions to avoid	:	Extremes of temperature and direct sunlight. Exposure to air or moisture over prolonged periods.
Incompatible materials	:	Water Amines Strong Bases Alcohols Copper Alloys
Hazardous decomposition products:		By Fire and high heat: Carbon dioxide, carbon monoxide, oxides of nitrogen, dense black smoke, isocyanate, isocyanic acid, other undetermined compounds.

Section 11. TOXICOLOGICAL INFROMATION

Information on toxicological effects

Toxicological Information of the mixture:

Acute Oral Toxicity: LD50: > 2000 mg/kg (rat, male/female)

Acute Inhalation Toxicity:
LC50: 0.49 mg/l, 490 mg/m3, 4 h, aerosol (rat)
The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Acute Dermal Toxicity:
LD50: > 9400 mg/kg (rabbit, male/female) (OECD Test Guideline 402)

Skin Irritation: rabbit, slightly irritating.

Repeated Dose Toxicity: 90 Days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week). Irritation to lungs and nasalcavity.

2 years, inhalation: NOAEL: 0.2, (rat, Male/Female, 6 hrs/day 5 days/week). Irritation to lungs and nasal cavity.

Mutagenicity:
Genetic Toxicity in Vitro:
Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity:
Rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week
LOAEL: 6mg/l
Polymeric MDI has been classified as IARC Group 3 (“Not classifiable as to its carcinogenicity to humans”) (1999) indicating there is inadequate evidence available to describe the carcinogenic potential. Epidemiological studies found no association between isocyanates and cancer. In chronic exposure studies in rodents, pMDI produced tumors only at the highest exposure level of 6 mg/m3. This exposure level is significantly above the TLV for MDI (0.051 mg/m3). Based on the weight of the evidence, a determination of not classified for carcinogenicity is justified.

Developmental Toxicity/Teratogenicity:
Rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL
(teratogenicity): 12 mg/m3, NOAEL (maternal): 4 mg/m3
No Teratogenic effects observed at doses tested., Fetotoxicity seen only with maternal toxicity.

Toxicological Information of 4,4’-Diphenylmethane Diisocyanate (MDI):

Acute Oral Toxicity: LD50:>7616 mg/kg(rat) (OECD Test Guideline 401)
LC50: 0.368 mg/l, 4 h, dust/mist(rat, male) (OECD Test Guideline 403) The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Acute Dermal Toxicity:
LD50: > 9400 mg/kg (rabbit, male/female) (OECD Test Guideline 402) Studies of a comparable product.

Skin Irritation:
rabbit, Draize Test, Slightly irritating human, irritating

Eye Irritation: rabbit, Draize, Moderately irritating human, irritating

Sensitization:
Skin sensitization (local lymph node assay (LLNA)):: positive (Mouse, OECD Test Guideline 429)
Respiratory sensitization: positive (Guinea pig)

Repeated Dose Toxicity:
90 Days, inhalation: NOAEL: 0.3 mg/m3, (rat, Male/Female, 18 hrs/day, 5 days/week)
Irritation to lungs and nasal cavity.
(Human)
Irritation to lungs and nasal cavity.

Mutagenicity:
Genetic Toxicity in Vitro:
Ames: (Salmonella typhimurium, Metabolic Activation: with/without) Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.

Genetic Toxicity in Vivo:
Micronucleus Assay: (Mouse)negative
Micronucleus test: negative (rat, male, Inhalative
(exposure period: 3x1h/day over 3 weeks)) negative

Carcinogenicity:
rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week negative

Other Relevant Toxicity Information:
May cause irritation of respiratory tract

Section 12. ECOLOGICAL INFROMATION

Ecotoxicity effects:

Acute and prolonged Toxicity to Fish: LC0: > 1,000 mg/l (Danio rerio (zebra fish), 96 h)
LC0: > 3,000 mg/l (Oryzias latipes (Orange-red killifish), 96 h)
Acute toxicity to aquatic invertebrates:
EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 h)
Toxicity to Aquatic Plants:
NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus),72 h)
Toxicity to microorganisms:
EC50: > 100 mg/l, (activated sludge, 3 h)
Biodegradation: 0%, Exposure time: 28 days, ie. Not degradable
Bioaccumulative Potential: Oncorhynchus mykiss (rainbow trout), exposure time: 112 days, <1, BCF does not bioaccumulate.
Mobility in Soil: Not available
Other adverse effects: Not available

Section 13. DISPOSAL CONSIDERATIONS

Disposal Procedure:
Comply with Federal, provincial, and local regulations on reporting releases.

Section 14. TRANSPORTATION INFORMATION

TDG (TRANSPORATION OF DANGEROUS GOODS) CLASSIFICATION: Not regulated

Class: Not regulated

Environmental Hazards: Not available

Special Precautions: Not available

Section 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture:
This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Section 16. OTHER INFORMATION

References: Canadian Guide of the Law and Regulations of the Transportation of Dangerous Goods. Controlled products regulations. Manufacturer's Safety Data Sheet.
Regulatory Affairs Department: 519-754-1678
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Prepared by Dynamo Polyurethane Systems LLC
PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.