SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dragonshield-BC™ -Ultra High Strength Polyurea Elastomer (Base Coat)
Component: "A"

Company: **Specialty Products, Inc.**
2410 104th Street Ct S
Ste D
Lakewood, WA 98499

EMERGENCY CONTACT: For Spills, Leaks, Fire or Exposure call **CHEMTREC**
Toll Free: 800.627.0773
International Calls: 800.627.0773
Fax: 253-588-7196

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Name	CAS#	% W
Isocyanates, reaction product of polyol with methylenediphenyl diisocyanate	157905-72-1	30-60
Chemical Identity is Proprietary	N/A	30-70
Propylene carbonate	N/A	5-15

SECTION 3: HAZARDS IDENTIFICATION

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

Emergency Overview: WARNING
Harmful by inhalation. Irritating to eyes and respiratory system. May cause sensitization by inhalation and skin contact. 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. A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitized persons. The onset of the respiratory symptoms may be delayed for several hours after exposure.

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

General Information: **Read the entire MSDS for a more thorough evaluation of the hazards.**

SECTION 4: FIRST AID MEASURES

Eye Contact:	In case of contact, immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Remove any contact lenses that might be worn by the victim. Obtain medical attention immediately.
Skin Contact:	After contact with skin, remove contaminated clothing; wash affected areas thoroughly with warm soapy water. If irritation, redness, or a burning sensation develops and persists, obtain medical attention immediately. Contaminated clothing and shoes should be properly laundered before reusing. An MDI study has demonstrated that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water.
Ingestion:	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash out mouth with water. Get medical attention if symptoms appear.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is labored, oxygen should be given by administered by qualified personnel.
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

Flash Point:	Closed cup: >230°F (110°C) (Setaflash).
Products of Combustion:	Combustion products may include: carbon oxides (CO, CO_2), nitrous oxides (NO, $NO_{2....}$), hydrocarbons and HCN.
Extinguishing Media Suitable:	Use an extinguishing agent suitable for the surrounding fire.
Not Suitable:	None known.
Special Exposure Hazards:	No specific hazard.
Special Protective Equipment for Fire-fighters:	Fire-fighters should wear appropriate protective equipment and If-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.
Unusual Fire and Explosion Hazards:	Due to reaction with water producing CO_2-gas, a hazardous build-up pressure could result if contaminated containers are resealed. Containers may burst if overheated.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures:	For major spills call **CHEMTREC** Toll Free 1.800.434.9300 or for International call 1.703.527.3887.
Personal Precautions:	Immediately contact emergency personnel. Evacuate the area. Keep upwind to avoid inhalation of vapors. Clean-up should only be performed by trained personnel. People dealing with major spillages should wear full protective clothing including respiratory protection. Use suitable protective equipment (See SECTION 8-Exposure Controls for details).
Environmental Precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Methods for Cleaning Up:	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-Regulatory Information).
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 carbonate 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

General:	Ideal storage temperature is 60-100°F (16-38°C). Handling and storage should be in accordance with Local, State/Provincial or Federal regulations.
Handling:	Before opening this package, read and follow warning labels on all components. Avoid personal 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 breathing aerosols, mists and vapors. (See SECTION 8—Exposure Control/Personal Protection for details.) Keep stocks of decontaminate readily available.
Storage:	Keep containers properly sealed and when stored indoors, in a dry and well-ventilated area. Keep contents away from moisture. Due to reaction with water, producing CO_2 gas, a hazardous build-up of pressure could result if contaminated containers are resealed. 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 alloys or galvanized surfaces.
Other Precautions:	Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Keep out of the reach of children.
Decontamination Solution:	Keep stocks of decontaminate readily available. (See SECTION 6—Accidental Release Measures for details).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Product Name & Exposure Limits: Diphenylmethane 4,4' Dissocyanate

Exposure Limits
ACGIH TLV (United Sates, 1/2006)
TWA: 0.051 mg/m^3 8 hour/hours
TWA: 0.005 ppm 8 hour/hours
NIOSH REL (United Sates, 12/2001)
CEIL: 0.2 mg/m^3 10 minute/minutes
CEIL: 0.02 ppm 10 minute/minutes
CEIL: 0.05 mg/m^3 10 hour/hours
CEIL: 0.005 ppm 10 hour/hours
OSHA PEL (United States, 8/1997)
CEIL: 0.2 mg/m^3
CEIL: 0.02 ppm
OSHA PEL 1989 (United States, 3/1989)
CEIL: 0.20 mg/m^3
CEIL: 0.02 ppm

Consult local authorities for acceptable exposure limits.

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. Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Persons with respiratory problems including asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or skin allergies should be evaluated for their suitability of working with this product. Once a person is diagnosed as sensitized, no further exposure to the material that caused the sensitization should be permitted.

Engineering Controls: Use local exhaust ventilation to maintain airborne concentrations below the TVL. Suitable respiratory equipment should be used in cases of insufficient ventilation or where operational procedures demand it. For general guidance on engineering control measures refer to the ACGIH current edition of 'Industrial Ventilation, a manual of Recommended Practice.' Eyewash fountain and safety shower should be accessible; impervious protective clothing.

Personal Protection:
Eye Protection: Chemical safety goggles. If there is a potential for splashing, use a full-faced shield.

Hands Protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Skin Protection: The following protective materials are recommended: Gloves—neoprene, nitrile rubber, and butyl rubber. Thin latex disposable gloves should be avoided for repeated or long-term use. Use barrier cream on exposed skin. Protective clothing should be selected and used in accordance 'Guidelines for the Selection of Chemical Protective clothing published by ACGIH.

Respiratory Protection: When the product is sprayed or heated without adequate ventilation, an approved MSHA/NIOSH positive-pressure, supplied-air respirator may be required. Air purifying respirators equipped with organic vapor 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).
Work Hygienic Practices:	Follow the usual precautionary measures for handling chemicals. Keep away from food and beverages. Immediately remove all soiled and contaminated clothing. Avoid contact with eyes, skin and clothing. Wash hands after use. Wash all contaminated clothing and shoes before reuse.
Other Protection:	Consult your supervisor or S.O.P. for special handling instructions.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

General Information

Physical State:	Liquid.
Color:	Clear yellow.
Odor:	Slightly musty.
Odor Threshold:	Not available.

Important Health, Safety and Environmental Information

pH:	Not applicable.
Boiling Point:	>300°C (>572°F) Decomposes.
Melting/Freezing Point:	Not available.
Flash Point:	Closed cup: >110°C (230°F) (Setaflash).
Explosive Properties:	Not explosive.
Oxidizing Properties:	Not available.
Vapor Pressure:	0.000004 mmHg
Vapor Density (AIR=1):	8.5

Other Information

Auto-ignition temperature:	>316°C (>600°F)
Volatile Organic Compounds (VOC):	0 grams/liter

SECTION 10: STABILITY AND REACTIVITY

Stability & Reactivity:	Stable at room temperature. Reaction with water (moisture) produces CO_s-gas. Exothermic reaction with materials containing active hydrogen groups. 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 of solvents. MDI is insoluble with and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insouluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.
Incompatibility with Various Substances:	Water, Alcohols, Amines, Bases, and Acids.
Hazardous Decomposition or by-Products:	Carbon Monoxide., Carbon Dioxide., Nitrous Oxide and HCN.
Hazardous Polymerization:	Polymerization may occur at elevated temperatures in the presence of alkalis, tertiary amines and metal compounds.
Conditions of Instability:	Avoid high temperatures.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicity to Animals	Test	Result	Route	Species
Diphenylmethane 4,4'-d	LD50	>5000 mg/kg	Oral	Rat
diisocyanate	LD50	>5000 mg/kg	Dermal	Rabbit
	LD50	0.49 mg/l (4 hour/hours)	Inhalation	Rat
	LD50	490 mg/m^3 (4 hour/hours)	Inhalation	Rat
	LD50	2240 mg/m^3 (1 hour/hours)	Inhalation	Rat
Propylene carbonate	LD50	>5000 mg/kg	Oral	Rat
	LD50	>2000 mg/kg	Dermal	Rabbit

Acute Toxicity

Ingestion: Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

Inhalation: This product is a respiratory irritant and potential respiratory sensitizer. Repeated inhalation of vapor or aerosol at levels about the occupational exposure limit could cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat, and lungs, possibly combines 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.

Eyes: Irritating to eyes.

Skin: Irritating to skin. May cause sensitization by skin contact animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

Potential Chronic Health Effects

Carcinogenic Effects: Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m3), there was a significant incidence of a benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). There were no lung tumors at 1 mg/m^3 and no effects at 0.2 mg/m^3. Overall, the tumor incidence, both benign and malignant, and the number of animals with the tumors were not different from controls. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. 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.

Mutagenic Effects: There is no substantial evidence of mutagenic potential.

Teratogenicity/ Reproductive Toxicity: No birth defects were seen in two independent animal (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, which are well in excess of defined occupational exposure limits.

SECTION 12: ECOLOGICAL INFORMATION

Diphenylmethane 4,4'-diisocyante:	Zebra Fish (LC50)	96 hour/hours	>1000 mg/l
	Daphnia Magna (EC50)	48 hour/hours	>1000 mg/l

Other Ecological Information

Persistence/Degradability	Aquatic half-life	Photolysis	Biodegradability
Propylene Carbonate: (ingredient name)	-	-	Readily

Bioaccumulative Potential			
Propylene Carbonate: (ingredient name)	$LogP_{ow}$	BCF	Potential
	-0.41	-	Low

Mobility: By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino-diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

Other Adverse Effects: By comparison with an analogous product, the following values are anticipated. The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Even so, the observed ecotoxicity is low/very low. A pond study showed gross contamination caused no significant toxic effects on a wide variety of flora in all tophic levels (including fish), no detectable diaminophenylmethane (MDA), and no evidence of bioaccumulation of MDI or MDA.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Empty containers should be decontaminated and either passed to an approved drum recycler or destroyed.

SECTION 14: TRANSPORTATION INFORMATION

EMERGENCY CONTACT: For Spills, Leaks, Fire or Exposure call **CHEMTREC**
Toll Free: 800.424.9300
International Calls: 703.527.3887

U.S. DOT:
Proper Shipping Name: MDI – Not Regulated.

TDG Classification: Not regulated.
IMO/IMDG Classification: Not regulated.
ICAO/IATA Classification: Not regulated.

SECTION 15: REGULATORY INFORMATION

United States

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

HCS Classification: Toxic material.
Irritant material.
Sensitizer material.

U.S. Federal Regulations: TSCA 8(b) inventory: All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory. This Product does not contain nor is it manufactured with ozone depleting substances.

SARA 313

	Product Name	CAS Number	Concentration
Form R – Reporting Requirements:	Diphenylmethane 4,4'-diisocyanate	101-68-8	22%
Supplier Notification:	Diphenylmethane 4,4'-diisocyanate	101-68-8	22%

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State Regulations California Prop 65: No ingredients listed.

Canada

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulations) and the MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

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

CEPA DSL/NDSL: All ingredients listed.

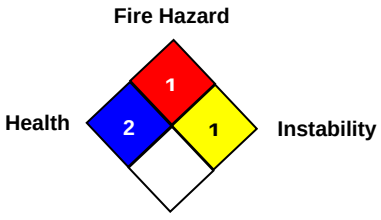
SECTION 16: OTHER INFORMATION

Label requirements: Harmful by inhalation. Irritating to eyes and respiratory system. May cause sensitization by inhalation and skin contact. 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. A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitized persons. The onset of the respiratory symptoms may be delayed for several hours after exposure.

HAZARDOUS MATERIAL INFORMATION SYSTEM (U.S.A.)

Health	2
Fire Hazard	1
Reactivity	1

NATIONAL FIRE PROTECTION ASSOCIATION (U.S.A.)



For Your Protection:

The information and recommendations in this publication is to the best of our knowledge, reliable. The toxicity and risk characteristics of products made by SPI will necessarily differ from the toxicity and risk characteristics that occur when such products are used with other materials during a manufacturing process. The resulting risk characteristics should be determined and made known to ultimate end-users and processors. The user is responsible to comply with all applicable federal, provincial or municipal laws and regulations. SPI MAKES NO WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Preparation Information:

This MSDS supersedes ALL previous MSDS versions.