

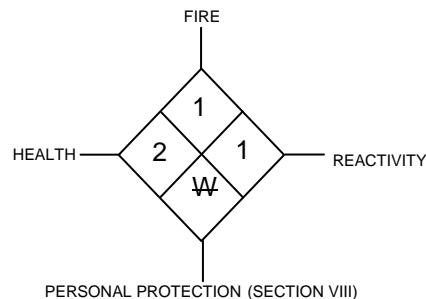
**PRODUCT NAME: Rhino Hybrid™ HP 11-50 Iso**DATE: December 15, 2011  
SUPERSEDES:**SECTION 1 – MANUFACTURER IDENTIFICATION**

MANUFACTURER'S NAME: Rhino Linings Corporation

ADDRESS: 9151 Rehco Road, San Diego, CA, 92121

INFORMATION PHONE: 858-450-0441

EMERGENCY CONTACT: (CHEMTREC): 800-424-9300



HMIS HAZARD RATING	
LEAST---0	SLIGHT---- 1
MODERATE --- 2	HIGH ----- 3
	EXTREME ---- 4

**SECTION 2 – Chemical Composition**

<u>Percent By Weight</u>	<u>Ingredients</u>	<u>CAS #</u>	<u>ACGIH TLV</u>
45 – 55%	4,4'-Diphenylmethane Diisocyanate	101-68-8	0.005ppm
35 – 45%	Polyurethane Prepolymer	59675-67-1	Not listed
≤ 1%	Diphenylmethane Diisocyanate Mixed Isomers	26447-40-5	Not listed

## Section 313 Supplier Notification

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372): Diisocyanate Compounds (Category Code N120)

4,4' - MDI	101-68-8	45-55%	0.005 ppm
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**SECTION 3 - HAZARDOUS INGREDIENTS****Emergency overview**

**CAUTION: CONTAINS DIPHENYLMETHANE DIISOCYANATE (CAS No. 101-68-8). INHALATION OF MDI MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING, SHORTNESS OF BREATH AND DIFFICULTY BREATHING.**

**Potential health effects****Primary routes of exposure**

Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

**Acute toxicity:***Information on: MDI*

*Inhalation of MDI vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Airborne overexposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed. Gastrointestinal symptoms include nausea, vomiting and abdominal pain.*

**Irritation:***Information on: Diisocyanates*

*Eye contact with isocyanates may result in conjunctival irritation and mild corneal opacity. Skin contact may result in dermatitis, either irritative or allergic.*

**Repeated dose toxicity:** *Information on: MDI*

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SUPERSEDES:****SECTION 3 - HAZARDOUS INGREDIENTS Continued**

Results from a lifetime inhalation study in rats indicate that MDI aerosol was carcinogenic at 6 mg/m<sup>3</sup>, the highest dose tested. This is well above the recommended TLV of 5 ppb (0.05 mg/m<sup>3</sup>). Only irritation was noted at the lower concentration of 0.2 and 1 mg/m<sup>3</sup>. No birth defects or teratogenic effects were reported in a teratology study with rats exposed to 1, 4, and 12 mg/m<sup>3</sup> polymeric MDI for 6 hr/day on days 6-15 of gestation. Embryotoxicity and fetotoxicity was reported at the top dose in the presence of maternal toxicity.

**Information on: Isocyanates**

As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent.

Sensitization may be either temporary or permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapor-only exposure.

**Medical conditions aggravated by overexposure:**

Medical supervision of all employees who handle or come into contact with isocyanates is recommended. The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing.

Pre-employment and periodic medical examinations with respiratory function tests (FEV<sub>1</sub>, FVC as a minimum) are suggested. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended. An animal study indicated that MDI may induce respiratory hypersensitivity following dermal exposure.

**SECTION 4 – FIRST AID MEASURES**

**General advice:** Remove contaminated clothing. Wash clothes and clean shoes prior to re-use. In case of accident or if you feel unwell, seek medical advice IMMEDIATELY (show the label where possible).

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

**If on skin:** Remove contaminated clothing. Wash affected areas thoroughly with soap and lukewarm water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice. Contaminated clothing should be thoroughly cleaned before reuse.

**Note to physician:** Antidote: Specific antidotes or neutralizers to isocyanates do not exist. Treatment: Treatment should be supportive and based on the judgment of the physician in response to the reaction of the patient.

**Health Hazards:** Irritating to eyes, respiratory system and skin. Inhalation at levels above the occupational exposure limit could cause respiratory sensitization. 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 MDI may develop in sensitized persons. Sensitized persons should not be exposed to any mixture containing unreacted MDI.

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

General: Polymeric MDI:	Test	Result	Route	Species
	LD50	> 5,000 mg/kg	Oral	(Rat)
	LD50	> 5,000 mg/kg	Dermal	(rabbit)
	LC50	490 mg/m <sup>3</sup> 4 hour (respirable aerosol)	Inhalation	(rat)

**Inhalation:** This product is a respiratory irritant and potential respiratory sensitizer. Inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitization and lung injury. Symptoms may include irritation to the eyes, nose,

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SUPERSEDES:****SECTION 4 – First Aid (Continued)**

throat, and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing and/or flu-like symptoms. 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.

**Skin Contact:** 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.

**Eye Contact:** The aerosol, vapor or liquid will irritate human eyes following contact.

**Ingestion:** Ingestion may cause irritation of the gastrointestinal tract. Based on the acute oral LD50, this product is considered practically non-toxic by ingestion.

**Chronic Effects:** A study was conducted where groups of rats were exposed for 6 hours a day, 5 days a week for a lifetime to atmospheres of respirable polymeric MDI aerosol either at concentrations of 0, 0.2, 1, 6 mg/m<sup>3</sup>. No adverse effects were observed at 0.2 mg/m<sup>3</sup> concentrations. At the 1 mg/m<sup>3</sup> concentrations, minimal nasal and lung irritant effects were seen. Only at the top concentration (6.0 mg/m<sup>3</sup>) there was an increased incidence of a beginning tumor of the lung (adenoma) and on malignant tumor (adenocarcinoma). Overall, the tumor incidence, both benign and malignant, and the number of animals with tumors were not different. 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 a tumor formation will occur.

There are reports that excessive chronic exposure to diisocyanates may result in permanent decrease in lung function.

**Carcinogenicity:** 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.

**Mutagenicity:** There is no substantial evidence of mutagenic anticipated.

**Reproductive Effects:** No adverse reproductive effects are anticipated.

**Teratogenicity & Fetotoxicity:** 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 well in excess of the defined occupational limits.

**First Aid Procedures**

**General: Inhalation: Skin Contact: Eye Contact:** Immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing eyes. Obtain medical attention IMMEDIATELY.

**Ingestion:** Do not induce vomiting. Provided the patient is conscious, wash out mouth with water, then give 1 or 2 glasses of water to drink. Refer person to medical personnel for immediate attention.

**Note 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:** > 200 ° F (93° C)      **Flammable Limits (Lower):** Not available.      **Flammable Limits (Upper):** Not available.

**Auto Ignition Temperature:** 464° F (240° C) 4,4'-Diphenylmethane Diisocyanate

**Decomposition Temperature:** Not available      **Rate of Burning:** Not available.

**Explosive Power:** None

**Sensitivity to Mechanical Impact:** None

**Sensitivity to Static Discharge:** None

**Combustion Products:** Carbon monoxide, carbon dioxide, nitrogen oxides and some HCN.

**Fire & Explosion Hazards:** Containers may burst under intense heat. Due to reaction with water, a hazardous build up of pressure could result if contaminated containers are re-sealed.

**Extinguishing Media:** Carbon dioxide, dry chemical, or appropriate foam. If water is used, very large quantities are required. Reaction between water and hot isocyanate may be vigorous. Contain run-off water with temporary barriers.

**Fire Fighting Procedures:** As appropriate for surrounding materials/equipment.

**Fire Fighting Protective Equipment:** Use self-contained breathing apparatus & full protective clothing (Bunker gear).

**SECTION 6 – SPILLAGE, ACCIDENTAL RELEASE MEASURES**

For major spills call CHEMTREC (800) 424-9300

**Spills, Leaks, or Release:** Clean-up should only be performed by trained personnel. People dealing with major spillages should wear full protective clothing including full air supplied respirator. Evacuate the area. Prevent further leakage, spillage or entry into drains. Contain and absorb large spillages onto an inert, non-flammable absorbent 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

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SUPERSEDES:****SECTION 6 – SPILLAGE, ACCIDENTAL RELEASE MEASURES CONTINUED**

MDI. Neutralize small spillages with decontaminant. Remove and properly dispose of residue. Notify applicable government authorities if release is reportable. The CERCLA RQ for MDI is 5,000 lbs (see CERCLA in section 15).

**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 sheet 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 bungs or seal drums. Mixing with water is also effective, but slower.

**SECTION 7 – HANDLING AND STORAGE**

**Handling:** 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 possibility of blockage. Avoid breathing aerosols, mists and vapors. When the product is sprayed or heated, an approved MSHA/NIOSH positive-pressure supplied air respirator may be required.

**Storage Requirements:** Keep containers properly sealed. When stored indoors, keep in well ventilated area. Keep contents away from moisture due to reaction with water, producing CO<sub>2</sub> – gas, a hazardous build-up 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 alloys, or galvanized surfaces.

**Storage Temperature:** Ideal storage temperature is 60 - 100° F (16 - 38° C). Keep stocks of decontaminant (see section 8).

**Container Disposal:** 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 8). 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 destroyer.

**SECTION 8 – EXPOSURE CONTROLS AND PROTECTION INFORMATION****Components with workplace control parameters****Hazardous Ingredient(s):**

4,4'-Diphenylmethane Diisocyanate:

ACGIH TLV 0.005 ppm (8 hour, 40 hours/week)

OSHA PEL CEILING 0.02 ppm, 0.2 mg/m<sup>3</sup>

NIOSH REL/TWA 0.005 ppm (10 hour, 40 hours/week)

NIOSH REL/CEILING 0.002 ppm (10 minutes)

**Note:** The Occupational Exposure Limit listed for isocyanates do not apply to previously sensitized individuals.

**Advice on system design:** Provide local exhaust ventilation to maintain recommended P.E.L.

**Personal protective equipment**

**Respiratory protection:** For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH certified full face piece pressure demand self-contained breathing apparatus (SCBA) or a full face piece pressure demand supplied-air respirator (SAR) with escape provisions. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place.

**Hand protection:** Chemical resistant protective gloves, Suitable materials, chloroprene rubber (Neoprene), chlorinated polyethylene, polyvinyl chloride (Pylox), butyl rubber, fluoroelastomer (Viton), nitrile rubber (Buna N)

**Eye protection:**

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

**Body protection:** Suitable materials, saran-coated material

**General safety and hygiene measures:** Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or disposed of.

**PRODUCT NAME: Rhino Hybrid™ HP 11-50 Iso****DATE: December 15, 2011  
SUPERSEDES:****SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES****Appearance:** Yellow or clear colored liquid.**Odor:** Aromatic, Slightly misty.**Odor Threshold (ppm):** 0.4 mg/ m<sup>3</sup> (4,4' Diphenylmethane Diisocyanate)**pH:** Not applicable**Flash Point:** > 200° F (93° C) Pinsky-Martens Closed Cup**Vapor Pressure (mm Hg at 20° C):** Approx. 0.0001 mmHg @ 77° F**Vapor Density (air = 1):** 8.5 approx.**Boiling Point:** 406 ° F estimated**Melting Point:** Not available**Solubility (Water):** Reacts with water.**Solubility (Other):** Soluble in most organic solvents.**Specific Gravity:** 1.16 @ 77° F**Viscosity:** 180 – 250 cps @ 25° C**V.O.C.s:** None**Freezing Point:** 41 ° F**SECTION 10 – STABILITY AND REACTIVITY****Conditions to avoid:** Avoid moisture.**Substances to avoid:** water, alcohols, strong bases, Substances/products that react with isocyanates.**Hazardous reactions:** The product is chemically stable. Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalis. Reacts with amines. Risk of exothermic reaction. Risk of violent reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.**Decomposition products:** Hazardous decomposition products: carbon monoxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors**Thermal decomposition:** No data available.**Corrosion to metals:** No corrosive effect on metal.**Stability:****SECTION 11 – TOXICOLOGICAL INFORMATION****Acute toxicity**

Test	Results	Route	Species	Results
LD50	> 10,000 mg/kg	Oral	rat	Practically nontoxic.
LC50	2.240 mg/l	Inhalation	rat	Moderately toxic

**SECTION 12 – ECOLOGICAL INFORMATION****Environmental toxicity**

Acute and prolonged toxicity to fish:	Test	Results	Conclusion	Species
	LC50	<500mg/l	Practically nontoxic	Zebra Fish
	EC50	500mg/l	Practically nontoxic	Daphnia magna

**Chronic toxicity to aquatic invertebrates:**

EC50	> 500 mg/l	Practically nontoxic	Daphnia magna
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**SECTION 13 – DISPOSAL CONSIDERATIONS****Waste disposal of substance:**

Incinerate or dispose of in a licensed facility.

Do not discharge substance/product into sewer system.

**Container disposal:**

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Refer to 40 CFR § 261.7 (residues of hazardous waste in empty containers).

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SUPERSEDES:****SECTION 13 – DISPOSAL CONSIDERATIONS Continued**

Decontaminate containers prior to disposal. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

Decontamination solution: Mixture of 90% water, 8% ammonia and 2% liquid soap. Mix the solution and mist into empty container using hand sprayer. Leave screw caps off to avoid any pressure build from CO<sub>2</sub> release.

**SECTION 14 – TRANSPORTATION INFORMATION****Land transport***USDOT*

Not classified as a dangerous good under transport regulations

**Sea transport***IMDG*

Not classified as a dangerous good under transport regulations

**Air transport***IATA/ICAO*

Not classified as a dangerous good under transport regulations

**DOT:** Single containers less than 5,000 lbs are not regulated. Single containers with 5,000 lbs or more of 4,4'-MDI are regulated as Other Regulated Substances, Liquid, N.O.S. (Methylene Diphenyl Diisocyanate), 9, NA3082, PGIII, RQ.

**SECTION 15 – NATIONAL REGULATIONS AND REFERENCES****USA CLASSIFICATION**

**OSHA Classification:** This product is classified as a hazardous material under the criteria outlined in the OSHA Communication Standard (HCS) (29 CFR 1910.1200).

**TSCA (Toxic Substance Control Act) Regulations:** All ingredients are on the TSCA Chemical Substance Inventory.

**EPCRA Section 313 (40 CFR 372):** This product contains the following chemical(s) subject to reporting requirements: 49% 4,4'-MDI (Cas No 101-68-8)..

**SARA hazard categories (EPCRA 311/312):** Chronic, Acute

**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). The % of 4,4'-MDI in this product is listed in Section 2 of this MSDS.

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

**Other Regulations/Legislation which apply to this product:** Massachusetts Right-to-Know, Pennsylvania Right-to-Know, New Jersey Right-to-Know, CERCLA.

**CANADIAN CLASSIFICATION**

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.

**Controlled Products Regulations (WHMIS) Classifications:** D-1A: Very toxic (acute effects) D-2A: Very toxic D-2B: Toxic

**CEPA/Canadian Domestic Substances List (DSL):** The substance(s) in this product is/are on the Canadian Domestic Substances List (CEPA DSL).

**SECTION 16 – DISCLAIMER**

**Disclaimer:** The data set forth in this sheet are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. Rhino Linings USA, Inc. makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof.