

## Armor Top Hardener, Armor Top LH Hardener SAFETY DATA SHEET

### 1. IDENTIFICATION

**Product Identifier:** Armor Top Hardener, Armor Top LH Hardener

**Recommended use:** Floor Surfacing

**Manufacturer Name:** Dur-A-Flex, Inc.  
95 Goodwin Street  
East Hartford, CT 06108

**Telephone number:** 860-528-9838

**Emergency phone number:** 1-800- 424-9300 (CHEMTREC)

**Date of Preparation:** January 30, 2014

### 2. HAZARD(S) IDENTIFICATION

This product is one part of a 4 part product. Read and understand the hazard information on the SDS for Armor Top Resin, Armor Top Colorant and Armor Top Grit before using this product.

**Classification:**

Physical	Health
Flammable Liquid Category 3	Acute Toxicity Category 4 – Inhalation Eye Irritation Category 2A Skin Sensitization Category 1 Respiratory Sensitization Category 1 Specific Target Organ Toxicity – Single Exposure Category 3 (Respiratory Irritation)

**Labeling:**

**Danger!**



**Hazard statement(s)**

Flammable Liquid and vapor.  
Harmful if inhaled.  
Causes serious eye irritation.  
May cause an allergic skin reaction.  
May cause allergy or asthma symptoms or

**Precautionary statement(s)**

Keep away from heat, sparks, open flames, and hot surfaces.  
No smoking.  
Keep container tightly closed.  
Ground and bond container and receiving equipment  
Use explosion-proof electrical, ventilating and lighting

breathing difficulties if inhaled.  
May cause respiratory irritation.

equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Avoid breathing mist, vapors or spray.  
Wash thoroughly after handling.  
Use only outdoors or in a well-ventilated area.  
Contaminated work clothing should not be allowed out of the workplace.  
Wear protective gloves and eye protection.  
In case of inadequate ventilation wear respiratory protection.  
IF IN EYES: Rinse cautiously with water for several minutes.  
Remove contact lenses, if present and easy to do. Continue rinsing.  
If eye irritation persists: Get medical attention.  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.  
If skin irritation or rash occurs: Get medical attention.  
Take off contaminated clothing and wash it before reuse.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
If experiencing respiratory symptoms: Call a POISON CENTER or doctor.  
In case of fire: Use dry chemical, carbon dioxide and foam to extinguish.  
Store in a well-ventilated place. Keep cool.  
Store locked up.  
Dispose of contents and container in accordance with local and national regulations.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Concentration
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	70-90%
Dimethyl Ester	Proprietary	5-20%
Propylene Carbonate	108-32-7	5-15%
UV Absorber	Proprietary	1-5%
Hexamethylene-1,6-Diisocyanate	822-06-0	<0.55%

**The specific identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.**

### 4. FIRST-AID MEASURES

**Inhalation:** Immediately remove to fresh air. If breathing is difficult have qualified personnel administer oxygen. If breathing has stopped, administer artificial respiration. Get immediate medical attention. Asthma-like symptoms may develop immediately or delayed up to several hours.

**Skin contact:** Immediately remove contaminated clothing. Wash skin thoroughly with soap and water. If rash or irritation develops, get medical attention. Launder clothing before re-use.

**Eye contact:** Immediately flush with large quantities of water for 15 minutes, holding the eyelids apart. Get medical attention if irritation develops.

**Ingestion:** If conscious, rinse mouth with water. Never give anything by mouth to an unconscious or convulsing person. DO NOT INDUCE VOMITING. Get medical attention.

**Most important symptoms/effects, acute and delayed:** May be irritating to eyes, skin and respiratory system. May cause allergic skin and respiratory reaction. If an allergic respiratory reaction occurs, get immediate medical attention. Symptoms may be delayed. Individuals sensitized to isocyanates may have a life-threatening allergic reaction.

**Indication of immediate medical attention and special treatment, if necessary:** If skin or respiratory sensitization occurs, get immediate medical attention. Symptoms may be delayed for several hours after exposure. Respiratory sensitization may be life threatening.

**Notes to Physicians:** If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Inducing vomiting is contraindicated because of the irritating nature of the compound. There is no specific antidote for ingestions. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate. Treatment is essentially symptomatic.

## 5. FIRE-FIGHTING MEASURES

**Suitable (and unsuitable) extinguishing media:** Use foam, carbon dioxide and dry chemical. Cool fire exposed containers with water.

**Specific hazards arising from the chemical:** Flammable liquid and vapors. Vapors are heavier than air and will travel along surfaces to remote ignition sources and flash back. This product reacts with water producing heat and gases. Reaction may be violent. Closed containers may rupture when exposed to extreme heat or contaminated with water. Combustion may produce isocyanate vapors and other irritating, highly toxic gases. Exposure to heated diisocyanates can be extremely dangerous.

**Special protective equipment and precautions for fire-fighters:** Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing. Do not allow run-off from fire fighting to enter drains or water courses. Decontaminate equipment and protective clothing before reuse.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment, and emergency procedures:** Evacuate spill area and keep unprotected personnel away. Remove all sources of ignition. Ventilate area with explosion proof equipment. Wear appropriate protective clothing as described in Section 8.

**Environmental Precautions:** Avoid release into the environment. Do not flush to sewer! Report releases as required by local, state and federal authorities.

**Methods and materials for containment and cleaning up:** Contain and collect with an inert absorbent. Use non-sparking tools and equipment. Neutralize with a decontamination solution made up of 80% water and 20% non-ionic surfactant (such as Plurafac SL-60 or Tergitol TMN-10) or 90% water and 3-8% ammonium hydroxide or concentrated ammonia and 2% detergent. Wait 15 minutes. Collect into an open-head metal

container. Repeat until the surface is completely decontaminated. Cover loosely with lid and allow container to vent for 72 hours to allow carbon dioxide to escape.

## 7. HANDLING AND STORAGE

**Precautions for safe handling:** Do not breathe vapors or mists. Use only with adequate ventilation. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties are not adequate to prevent overexposure from inhalation. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating.

Keep product away from heat, sparks, flames and all other sources of ignition. Do not permit smoking in use or storage areas. Use with non-sparking tools and explosion proof equipment. Electrically bond and ground containers for transfer.

**Conditions for safe storage, including any incompatibilities:** Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Protect from physical damage.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure guidelines:

Homopolymer of Hexamethylene Diisocyanate	0.5 mg/m <sup>3</sup> TWA Manufacturer 1.0 mg/m <sup>3</sup> STEL Manufacturer
Dimethyl Ester	None Established
Propylene Carbonate	None Established
UV Absorber	None Established
Hexamethylene-1,6-Diisocyanate	0.005 ppm TWA ACGIH TLV 0.02 ppm Ceiling Manufacturer

**Appropriate engineering controls:** Use with adequate general or local exhaust ventilation to maintain exposures below the occupational exposure limits.

### Individual protection measures, such as personal protective equipment:

**Respiratory protection:** If the exposure limits are exceeded or if exposure levels are unknown, a NIOSH approved positive pressure air supplied respirator with a full facepiece or air supplied hood should be used. In some situations where exposure levels are known to be below 10 times the exposure limit an air purifying respirator (organic vapor with particulate prefilter) can be used. A change schedule for cartridges is required. Selection and use of respiratory equipment must be in accordance with OSHA 1910.134 and good industrial hygiene practice.

**Skin protection:** Wear impervious gloves such as butyl rubber, neoprene or nitrile rubber.

**Eye protection:** Chemical safety goggles recommended.

**Other:** Impervious clothing as needed to prevent contact. An eye wash should be available in the immediate work area.

**Medical Surveillance:** A pre-placement physical should be given to all employees that will work with isocyanates. Employees with a prior isocyanate sensitization should be excluded from working with this product. A history of adult asthma, eczema and respiratory allergies are possible reasons for excluding or restricting the employee from working with this product. A comprehensive annual medical surveillance

program should be instituted for all employees who work with isocyanates. Once a worker has been diagnosed as sensitized, no further exposure can be permitted.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance (physical state, color, etc.):** Clear liquid  
**Odor:** Ester-like odor

<b>Odor threshold:</b> 0.01 (HDI)	<b>pH:</b> Not applicable
<b>Melting Point/Freezing Point:</b> Not available	<b>Boiling Point:</b> 392°F / 200°C (dimethyl ester)
<b>Flash point:</b> 110 °F / 43.3°C	<b>Evaporation rate:</b> 0.015
<b>Flammability (solid, gas):</b> Not flammable	
<b>Flammable limits: LEL:</b> 4.22% (dimethyl ester)	<b>UEL:</b> 12.87% (dimethyl ester)
<b>Vapor pressure:</b> 0.00000047 (HDI)	<b>Vapor density:</b> 6.6
<b>Relative density:</b> 1.11	<b>Solubility(is):</b> Insoluble in Water
<b>Partition coefficient: n-Octanol/water:</b> Not available	<b>Auto-ignition temperature</b> Not available
<b>Decomposition temperature:</b> Not available	<b>Viscosity:</b> Not available

## 10. STABILITY AND REACTIVITY

**Reactivity:** None known.

**Chemical stability:** Stable

**Possibility of hazardous reactions:** Contact with water or temperatures above 350°F may cause polymerization.

**Conditions to avoid:** Keep away from heat, sparks and flames.

**Incompatible materials:** Avoid contact with water, alcohols, amines, oxidizing agents, reducing agents, acids and bases.

**Hazardous decomposition products:** Thermal decomposition may produce carbon and nitrogen oxides, hydrogen cyanide and isocyanate vapors.

## 11. TOXICOLOGICAL INFORMATION

**Inhalation:** Inhalation of vapors or mists may cause mucous membrane and respiratory irritation. Homopolymer of hexamethylene diisocyanate has been shown to cause respiratory sensitization. Symptoms include dryness of the throat, tightness of chest and difficulty in breathing. Symptoms may be delayed for several hours after exposure. This product can produce asthmatic sensitization upon a 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. The allergic respiratory reaction may be life threatening.

**Ingestion:** Swallowing may cause gastrointestinal irritation abdominal pain, nausea, vomiting and diarrhea.

**Skin contact:** Skin contact may cause mild irritation with redness, itching and swelling. May cause allergic skin reaction. Homopolymer of hexamethylene diisocyanate has been shown to be mildly irritating to rabbit skin. Animal tests have indicated that respiratory sensitization can result from skin contact with isocyanates.

**Eye contact:** May cause mild irritation with redness, tearing, stinging and swelling. Homopolymer of hexamethylene diisocyanate has been shown to be slightly irritating to rabbit eyes.

**Chronic effects from short- and long-term exposure:** Prolonged exposure to diisocyanates or polyisocyanates may cause chronic irritation, decreased lung function and lung damage and conjunctivitis.

**Reproductive Toxicity:** This product is not expected to cause adverse reproductive or developmental effects.

**Sensitization:** Hexamethylene-1,6-diisocyanate has been shown to cause sensitization in a guinea pig maximization test.

**Mutagenicity:** Homopolymer of hexamethylene diisocyanate was negative the in the AMES test (with/without metabolic activation)

**Carcinogenicity:** None of the components are listed as a carcinogen by IARC, NTP, ACGIH or OSHA.

**Acute Toxicity Values:** Not acute toxicity data for the product. Acute Toxicity Estimate (ATE) Oral LD50 5614 mg/kg; Derma; 5135 mg/kg; Inhalation 1.91 mg/L

Homopolymer of hexamethylene diisocyanate: Oral rat LD50 >5,000 mg/kg; Inhalation rat LC50 1.5 mg/L/4h hr (acute toxicity point estimate); Dermal rabbit LD50 >5,000 mg/kg.

Dimethyl Ester: Oral rat LD50 6 g/kg; Dermal rat LD50 >2500 mg/kg; Inhalation rat LC50 >140 mg/L/4 hr.

Propylene Carbonate: Oral rat LD50 > 5000 mg/kg; Dermal rabbit LD50 >2000 mg/kg.

UV Absorber: Oral rat LD50 >2000 mg/kg

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Homopolymer of hexamethylene diisocyanate: 96 hr LC0 Brachydanio rerio >100 mg/L; 48 hr EC0 daphnia magna >100 mg/L; 72 hr EC50 Scenedesmus subspicatus >1,000 mg/L

Dimethyl Ester: No data available

Propylene Carbonate: 96 hr LC50 Cyprinus carpio > 1000 mg/L; 48 hr EC50 daphnia magna > 1000 mg/L; 72 hr EC50 desmodesmus subspicatus > 900 mg/L

UV Absorber: No data available

**Persistence and degradability:** Homopolymer of hexamethylene diisocyanate is not readily biodegradable. Dimethyl Ester is readily biodegradable.

**Bioaccumulative potential:** Not expected to bioaccumulate. Dimethyl Ester has a BCF of 3.

**Mobility in soil:** Dimethyl Ester is highly mobile in soil.

**Other adverse effects:** None known.

## 13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all local, state and federal regulations. Incineration is the preferred method.

## 14. TRANSPORT INFORMATION

	UN Number	Proper shipping name	Hazard Class	Packing Group	Environmental Hazard
<b>DOT</b>	None	Exempted from HazMat Regulations (49CFR 173.150f) *	None	None	None
<b>TDG</b>	None	Exempted from Regulation	None	None	None

		(Section 1.33) *			
<b>IMDG</b>	UN1993	Flammable Liquid n.o.s. (Dimethyl Ester)	3	PG III	None
<b>IATA</b>	UN1993	Flammable Liquid n.o.s. (Dimethyl Ester)	3	PG III	None

\* **Containers Not Over 450 Liters (119 gal):**

**Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code):** Not applicable – product is transported only in packaged form.

**Special precautions:** None known.

<b>15. REGULATORY INFORMATION</b>
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**CERCLA:** This product has a Reportable Quantity (RQ) of 18,182 lbs. based on the RQ for Hexamethylene-1,6-Diisocyanate of 100 lbs. Releases above the RQ must be reported to the National Response Center. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

**SARA Hazard Category (311/312):** Acute Health, Chronic Health

**SARA 313 Information: This product contains the following chemicals subject to Annual Release Reporting Requirements Under SARA Title III, Section 313 (40 CFR 372):**

Hexamethylene-1,6-Diisocyanate	822-06-0	<0.55%
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**California Proposition 65**

This product contains the following chemicals known to the State of California to cause cancer or reproductive toxicity (birth defects): None

**EPA TSCA Inventory:** All of the ingredients in this product are listed on the EPA TSCA Inventory.

**CANADA:**

**Canadian WHMIS Classification:** Class B Division 3 (Combustible Liquid), Class D Division 2 Subdivision A (Very Toxic Material Causing other Toxic Effects), Class D Division 2 Subdivision B (Toxic Material Causing other Toxic Effects)

This product has been classified under the CPR and this MSDS discloses information elements required by the CPR.

<b>16. OTHER INFORMATION</b>
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**NFPA Rating:** Health = 2      Flammability = 2      Instability = 1

**HMIS Rating:** Health = 2      Flammability = 2      Physical Hazard = 1

**SDS Revision History:** Converted to GHS format. All sections revised.

**Date of preparation:** January 30, 2014

**Date of last revision:** New SDS

The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse, are beyond our control, Dur-A-Flex, Inc. MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND USE.