Safety Data Sheet

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Initial Preparation Date: 09.14.2021

Revision date: 10.20.2023

DuraCoat 11-60 Isocyanate

SECTION 1: Identification

Product Identifier

Product Name: DuraCoat 11-60 Isocyanate

Synonyms: MDI Prepolymer / Aromatic Isocyanate

Product code: 60290

Recommended Use of the Product and Restriction on Use

Relevant Identified Uses: POLYURETHANE SPRAY ELASTOMER SYSTEM - ISO Component

Uses Advised Against: Not determined or not applicable.

Reasons Why Uses Advised Against: Not determined or not applicable.

Manufacturer or Supplier Details

Manufacturer:

United States

Rhino Linings Corporation
9747 Businesspark Avenue
San Diego, CA 92131
858-450-0441
www.rhinolinings.com

Emergency Telephone Number:

North America

CHEMTREC
800-424-9300 (24/7)

SECTION 2: Hazard(s) Identification

GHS Classification:

Acute toxicity (inhalation), category 4
Skin irritation, category 2
Eye irritation, category 2A
Respiratory sensitization, category 1
Skin sensitization, category 1
Carcinogenicity, category 2
Specific target organ toxicity - single exposure, category 3, respiratory tract irritation
Specific target organ toxicity - repeated exposure, category 2

Label elements

Hazard Pictograms:

Signal Word: Danger

Hazard statements:

H315 Causes skin irritation
H319 Causes serious eye irritation
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 May cause an allergic skin reaction
H351 Suspected of causing cancer.
H335 May cause respiratory irritation
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.
H332 Harmful if inhaled

Precautionary Statements:

P201 Obtain special instructions before use
P202 Do not handle until all safety precautions have been read and understood
P260 Do not breathe dust, fumes, gas, mist, vapors or spray.
P264 Wash any exposed skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area
P280 Wear protective gloves/protective clothing/eye protection/face protection
P272 Contaminated work clothing must not be allowed out of the workplace
P284 In case of inadequate ventilation wear respiratory protection.
P302+P352 IF ON SKIN: Wash with plenty of water and soap.
P362 Take off contaminated clothing and wash it before reuse
P321 Specific treatment (see Sections 4-8 of this SDS and any supplemental information on the product label).
P333+P313 If skin irritation or rash occurs: Get medical advice or attention.
P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 If eye irritation persists: Get medical advice or attention.
P308+P313 If exposed or concerned: Get medical advice or attention.
P312 Call a POISON CENTER if you feel unwell.
P403+P233 Store in a well-ventilated place. Keep container tightly closed
P405 Store locked up
P501 Dispose of contents and container in accordance with local, regional, national, and international regulations.

Hazards Not Otherwise Classified:

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE 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 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. ANIMAL TESTS AND OTHER RESEARCH INDICATE THAT SKIN CONTACT WITH MDI MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

SECTION 3: Composition/Information on Ingredients

Identification	Name	Weight %

CAS Number: 101-68-8	4,4'-methylenediphenyl diisocyanate	55-75
CAS Number: 5873-54-1	o-(p-isocyanatobenzyl)phenyl isocyanate	10-20
CAS Number: 25686-28-6	4,4'-Methylenediphenyl diisocyanate, oligomers	5-15
CAS Number: 9016-87-9	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	1-5
CAS Number: 17589-24-1	2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	0.1-2

Additional Information:

Specific chemical identity and/or exact percentage (concentration) of each ingredient may be held as confidential business information (CBI). Any ingredient not disclosed in this section may have been determined not to be hazardous to health or the environment, or it may be present at a level below its disclosure threshold.

SECTION 4: First Aid Measures

Description of First Aid Measures

General Notes:

Show this Safety Data Sheet to the doctor in attendance.

After Inhalation:

If inhaled, remove person to fresh air and place in a position comfortable for breathing. Keep person at rest. If breathing is difficult, administer oxygen. If breathing has stopped, provide artificial respiration. If exposed, seek medical advice/attention.

After Skin Contact:

Remove contaminated clothing and shoes. Rinse skin with copious amounts of water [shower] for several minutes. Launder contaminated clothing before reuse. If symptoms develop or persist, seek medical advice/attention.

After Eye Contact:

Rinse eyes with plenty of water for several minutes. Remove contact lenses if present and easy to do so. Protect unexposed eye. If symptoms develop or persist, seek medical advice/attention.

After Swallowing:

If swallowed, DO NOT induce vomiting unless told to do so by a physician or poison control center. Rinse mouth with water. Never give anything by mouth to an unconscious person. If spontaneous vomiting occurs, place on the left side with head down to prevent aspiration of liquid into the lungs. If symptoms develop or persist, seek medical advice/attention.

Most Important Symptoms and Effects, Both Acute and Delayed

Acute Symptoms and Effects:

Eye contact may result in irritation, redness, pain, inflammation, itching, burning and tearing.

Inhalation exposure may cause allergy, asthma symptoms or breathing difficulties. Symptoms may include cough, chronic phlegm, shortness of breath, wheezing and chest tightness. Symptoms may be delayed.

Dermal exposure may cause an allergic skin reaction. Symptoms may include irritation, redness, pain, rash, inflammation, itching, burning and dermatitis.

Delayed Symptoms and Effects:

Suspected of causing cancer. Effects are dependent on exposure (dose, concentration, contact time).

May cause damage to organs through prolonged or repeated exposure. Effects are dependent on exposure (dose, concentration, contact time).

Symptoms of exposure may be delayed.

Immediate Medical Attention and Special Treatment

Specific Treatment:

If respiratory symptoms persist, seek medical attention.

Notes for the Doctor:

Treat symptomatically.

SECTION 5: Firefighting Measures

Extinguishing Media

Suitable Extinguishing Media:

Water mist/fog, carbon dioxide, dry chemical or alcohol resistant foam.

Unsuitable Extinguishing Media:

Do not use water jet.

Specific Hazards During Fire-Fighting:

Thermal decomposition may produce irritating/toxic fumes/gases.

Special Protective Equipment for Firefighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full-face piece operated in positive pressure mode.

Special precautions:

Avoid contact with skin, eyes, hair and clothing. Do not breathe fumes/gas/mists/aerosols/vapors/dusts. Move containers from fire area if safe to do so. Use water spray/fog for cooling fire exposed containers. Avoid unnecessary run-off of extinguishing media which may cause pollution.

SECTION 6: Accidental Release Measures

Personal Precautions, Protective Equipment, and Emergency Procedures:

Evacuate unnecessary personnel. Ventilate area. Extinguish any sources of ignition. Wear recommended personal protective equipment (see Section 8). Avoid contact with skin, eyes and clothing. Avoid breathing mist, vapor, dust, fume and spray. Do not walk through spilled material. Wash thoroughly after handling.

Environmental Precautions:

Prevent further leakage or spillage if safe to do so. Prevent from reaching drains, sewers and waterways. Discharge into the environment must be avoided.

Methods and Material for Containment and Cleaning Up:

Do not touch damaged containers or spilled material unless wearing appropriate personal protective clothing. Stop leak if you can do it without risk. Contain and collect spillage and place in suitable container for future disposal. Dispose of in accordance with all applicable regulations (see Section 13).

Reference to Other Sections:

For personal protective equipment see Section 8. For disposal see Section 13.

SECTION 7: Handling and Storage

Precautions for Safe Handling:

Use appropriate personal protective equipment (see Section 8). Use only with adequate ventilation. Avoid

breathing mist/vapor/spray/dust. Do not eat, drink, smoke, or use personal products when handling chemical substances. Avoid contact with skin, eyes and clothing. Wash affected areas thoroughly after handling. Keep away from incompatible materials (See Section 10). Keep containers tightly closed when not in use.

Conditions for Safe Storage, Including Any Incompatibilities:

Store in cool, dry, well-ventilated location out of direct sunlight. Keep away from food and beverages. Protect from freezing and physical damage. Store away from heat, open flames and other sources of ignition. Keep container tightly sealed. Store away from incompatible materials (See Section 10). Recommended storage temperature: 60 - 90°F (16 - 32°C)

SECTION 8: Exposure Controls/Personal Protection

Only those substances with limit values have been included below.

Occupational Exposure Limit Values:

Country (Legal Basis)	Substance	Identifier	Permissible concentration
ACGIH	4,4'-methylenediphenyl diisocyanate	101-68-8	8-Hour TWA: 0.005 ppm
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	8-Hour TWA: 0.005 mg/m³ (as Methylene bisphenyl isocyanate)
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	8-Hour TWA: 0.005 ppm (as diphenylmethane diisocyanate)
NIOSH	4,4'-methylenediphenyl diisocyanate	101-68-8	IDLH: 75 mg/m³
	4,4'-methylenediphenyl diisocyanate	101-68-8	Ceiling Limit: 0.2 mg/m³ (0.020 ppm [10-min])
	4,4'-methylenediphenyl diisocyanate	101-68-8	REL-TWA: 0.05 mg/m³ (0.005 ppm [up tp 10 hr])
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	REL-TWA: 0.05 mg/m³ ([0.005 ppm] as Methylene bisphenyl isocyanate [up to 10 hr])
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	Ceiling Limit: 0.2 mg/m³ ([0.02 ppm] as Methylene bisphenyl isocyanate [10 min])
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	IDLH: 75 mg/m³ (as Methylene bisphenyl isocyanate)
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	REL-TWA: 0.05 mg/m³ ([0.005 ppm] as diphenylmethane diisocyanate [up to 10 hr])
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	Ceiling Limit: 0.2 mg/m³ ([0.02 ppm] as diphenylmethane diisocyanate)
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	IDLH: 75 mg/m³ (as diphenylmethane diisocyanate)
OSHA	4,4'-methylenediphenyl diisocyanate	101-68-8	PEL Ceiling: 0.2 mg/m³ (0.02 ppm)
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	PEL Ceiling: 0.2 mg/m³ ([0.02 ppm] as Methylene bisphenyl isocyanate)
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	PEL Ceiling: 0.2 mg/m³ ([0.02 ppm] as diphenylmethane diisocyanate)

Country (Legal Basis)	Substance	Identifier	Permissible concentration
United States(California)	4,4'-methylenediphenyl diisocyanate	101-68-8	8-Hour TWA-PEL: 0.051 mg/m³ (0.005 ppm)
	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	8-Hour TWA-PEL: 0.051 mg/m³ ([0.005 ppm] as Methylene bisphenyl isocyanate)
	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6	8-Hour TWA-PEL: 0.051 mg/m³ ([0.005 ppm] as diphenylmethane diisocyanate)
	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	9016-87-9	REL: 12 ug/m³ (Acute Inhalation)
	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	9016-87-9	REL-TWA: 0.08 ug/m³ (Chronic Inhalation)
	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	9016-87-9	8-Hour TWA: 0.16 ug/m³

Biological Limit Values:

No biological exposure limits noted for the ingredient(s).

Information on Monitoring Procedures:

Not determined or not applicable.

Appropriate Engineering Controls:

Emergency eye wash stations and safety showers should be available in the immediate vicinity of use or handling. Provide adequate ventilation to maintain the airborne concentrations of vapor, mists, and/or dusts below the applicable workplace exposure limits, while observing recognized national standards (or equivalent).

Personal Protection Equipment

Eye and Face Protection:

Safety glasses or goggles. Use eye protection equipment that has been tested and approved by recognized national standards (or equivalent).

Skin and Body Protection:

Chemical resistant, impervious gloves approved by the appropriate standards. Gloves must be inspected prior to use. Avoid skin contact with used gloves. Appropriate techniques should be used to remove used gloves and contaminated clothing. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Ensure that all personal protective equipment is approved by recognized national standards (or equivalent).

Respiratory Protection:

If engineering controls do not maintain airborne concentrations below the applicable workplace exposure limits, or to an acceptable level (if exposure limits have not been established), a respirator approved by recognized national standards (or equivalent) must be worn.

General Hygienic Measures:

When handling chemical products, do not eat, drink or smoke. Wash hands after handling, before breaks, and at the end of the workday. Avoid contact with skin, eyes and clothing. Wash contaminated clothing before reuse. Perform routine housekeeping.

SECTION 9: Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Appearance	Amber/Brown
Odor	Musty
Odor threshold	Not determined or not available.
pH	Not determined or not available.
Melting point/freezing point	Not determined or not available.
Initial boiling point/range	>200°C (>392°F)
Flash point (closed cup)	>200°C (>392°F)
Evaporation rate	Not determined or not available.
Flammability (solid, gas)	Not determined or not available.
Upper flammability/explosive limit	Not determined or not available.
Lower flammability/explosive limit	Not determined or not available.
Vapor pressure	~ 0.00001 mmHg @ 25°C (77°F)
Vapor density	Not determined or not available.
Density	Not determined or not available.
Relative density	Not determined or not available.
Solubilities	Insoluble
Partition coefficient (n-octanol/water)	Not determined or not available.
Auto/Self-ignition temperature	Not determined or not available.
Decomposition temperature	Not determined or not available.
Dynamic viscosity	Not determined or not available.
Kinematic viscosity	Not determined or not available.
Explosive properties	Not determined or not available.
Oxidizing properties	Not determined or not available.

SECTION 10: Stability and Reactivity

Reactivity:

Not reactive under recommended handling and storage conditions.
MDI is insoluble in and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface accompanied by carbon dioxide release. This can lead to container bursting, if tightly closed. There is a risk of 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. Contact with certain rubbers and plastics can cause brittleness of the product with subsequent loss in strength.

Chemical Stability:

Stable under recommended handling and storage conditions.
Product is hygroscopic; contamination with moisture will negatively affect product performance. Avoid unintended contact with incompatible chemicals; the reaction will generate heat

Possibility of Hazardous Reactions:

Hazardous reactions are not anticipated under recommended conditions of handling and storage.
Contact with moisture, alcohols, amines, bases and acids or temperatures above 350°F (177°C) can cause hazardous polymerization.

Conditions to Avoid:

Extreme heat, open flames, hot surfaces, sparks, ignition sources and incompatible materials.

Incompatible Materials:

Strong oxidizing agents. Water, alcohols, amines, bases, acids, copper, aluminum and zinc alloys.

Hazardous Decomposition Products:

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.

SECTION 11: Toxicological Information

Acute Toxicity

Assessment:

Harmful if inhaled.

Product Data: No data available.

Substance Data:

Name	Route	Result
4,4'-methylenediphenyl diisocyanate	oral	LD50 Rat: 9200 mg/kg
	inhalation	LC50 Rat: 368 mg/m³ (4 hr [Aerosol])
	dermal	LD50 Rabbit: >7940 mg/kg
o-(p-isocyanatobenzyl)phenyl isocyanate	oral	LD50 Rat: >2000 mg/kg
	inhalation	LC50 Rat: 387.46 mg/m³ (4 hr - Aerosol)
	dermal	LD50 Rabbit: >9400 mg/kg
4,4'-Methylenediphenyl diisocyanate, oligomers	oral	LD50 Rat: >2000 mg/kg
	inhalation	LC50 Rat: 559 mg/m³ (4 hr)
	dermal	LD50 Rabbit: >9400 mg/kg
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	inhalation	LC50 Rat: 368 mg/m³ (4 Hour [Mist])
	oral	LD50 Rat: >2000 mg/kg
	dermal	LD50 Rabbit: >9400 mg/kg
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	Inhalation ATE	LC50 Rat: 11 mg/L (4 hr [Vapor])

Skin Corrosion/Irritation

Assessment:

Causes skin irritation.

Product Data:

No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Causes skin irritation.
o-(p-isocyanatobenzyl)phenyl isocyanate	Causes skin irritation.

Name	Result
4,4'-Methylenediphenyl diisocyanate, oligomers	Causes skin irritation.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Causes skin irritation.
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	Causes skin irritation.

Serious Eye Damage/Irritation

Assessment:

Causes serious eye irritation.

Product Data:

No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Causes serious eye irritation.
o-(p-isocyanatobenzyl)phenyl isocyanate	Causes serious eye irritation.
4,4'-Methylenediphenyl diisocyanate, oligomers	Causes serious eye irritation.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Causes serious eye irritation.

Respiratory or Skin Sensitization

Assessment:

May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.

Product Data:

No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
	May cause an allergic skin reaction.
o-(p-isocyanatobenzyl)phenyl isocyanate	May cause an allergic skin reaction.
	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
4,4'-Methylenediphenyl diisocyanate, oligomers	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
	May cause an allergic skin reaction.

Name	Result
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
	May cause an allergic skin reaction.
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	May cause an allergic skin reaction.
	May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Carcinogenicity

Assessment:

Suspected of causing cancer.

Product Data: No data available.

Substance Data:

Name	Species	Result
4,4'-methylenediphenyl diisocyanate		Suspect of causing cancer.
4,4'-Methylenediphenyl diisocyanate, oligomers	Rat	Suspected of causing cancer.
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate		Suspected of causing cancer.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate		Suspected of causing cancer by inhalation.

International Agency for Research on Cancer (IARC):

Name	Classification
4,4'-methylenediphenyl diisocyanate	Group 3
o-(p-isocyanatobenzyl)phenyl isocyanate	Group 3
4,4'-Methylenediphenyl diisocyanate, oligomers	Group 3
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	Not Applicable
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Group 3

National Toxicology Program (NTP):

Name	Classification
4,4'-methylenediphenyl diisocyanate	Not Applicable
o-(p-isocyanatobenzyl)phenyl isocyanate	Not Applicable
4,4'-Methylenediphenyl diisocyanate, oligomers	Not Applicable
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	Not Applicable
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Not Applicable

OSHA Carcinogens: Not applicable

Germ Cell Mutagenicity

Assessment: Based on available data, the classification criteria are not met.

Product Data:

No data available.

Substance Data: No data available.

Reproductive Toxicity

Assessment: Based on available data, the classification criteria are not met.

Product Data:

No data available.

Substance Data: No data available.

Specific Target Organ Toxicity (Single Exposure)

Assessment:

May cause respiratory irritation.

Product Data:

No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	May cause respiratory irritation.
o-(p-isocyanatobenzyl)phenyl isocyanate	May cause respiratory irritation.
4,4'-Methylenediphenyl diisocyanate, oligomers	May cause respiratory irritation.

Name	Result
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	May cause respiratory irritation.
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	May cause respiratory irritation.

Specific Target Organ Toxicity (Repeated Exposure)

Assessment:

May cause damage to organs through prolonged or repeated exposure.

Product Data:

No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Prolonged or repeated exposure may damage the respiratory system and lungs, including fibrosis. Long-term exposure may result in restriction of pulmonary function and a decrease in CO single breath transfer factor.
o-(p-isocyanatobenzyl)phenyl isocyanate	May cause damage to respiratory system through repeated or prolonged exposure via inhalation.
4,4'-Methylenediphenyl diisocyanate, oligomers	May cause damage to the respiratory system and lungs through prolonged or repeated exposure.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	May cause damage to respiratory system through prolonged or repeated inhalation.
2,4-dioxo-1,3-diazetidine-1,3-diylbis[p-phenylenemethylene-p-phenylene] diisocyanate	Causes damage to organs (nose/sinuses) through prolonged or repeated inhalation exposure.

Aspiration toxicity

Assessment: Based on available data, the classification criteria are not met.

Product Data:

No data available.

Substance Data: No data available.

Information on Likely Routes of Exposure:

No data available.

Symptoms Related to the Physical, Chemical, and Toxicological Characteristics:

No data available.

Other Information:

No data available.

SECTION 12: Ecological Information

Acute (Short-Term) Toxicity

Assessment: Based on available data, the classification criteria are not met.

Product Data: No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Fish EC50 Danio rerio: >1000 mg/L (96 h)
o-(p-isocyanatobenzyl)phenyl isocyanate	Fish LC50 Danio rerio: >1000 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: 129.7 mg/L (24 hr [mobility])
4,4'-Methylenediphenyl diisocyanate, oligomers	Fish LC50 Danio rerio: >1000 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: >1000 mg/L (24 hr [mobility])
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Fish LC50 Freshwater Fish: >100 mg/L (96 hr [read-across])
	Aquatic Plants EC50 Scenedesmus subspicatus: >100 mg/L (72 hr)

Chronic (Long-Term) Toxicity

Assessment: Based on available data, the classification criteria are not met.

Product Data: No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Aquatic Invertebrates NOEC Daphnia magna: ≥10 mg/L (21 d)
o-(p-isocyanatobenzyl)phenyl isocyanate	Aquatic Plants EC50 Scenedesmus subspicatus: >1640 mg/L (3 days)
	Aquatic Invertebrates NOEC Daphnia magna: >10 mg/L (21 days)
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Aquatic Invertebrates NOEC Daphnia magna: >10 mg/L (21 d)

Persistence and Degradability

Product Data: No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	The substance is not readily biodegradable. 0% degradation, measured by BOD, after 28 days.
o-(p-isocyanatobenzyl)phenyl isocyanate	The main hydrolysis products of the MDI substances are inert and insoluble polyurea with high molecular weights. Based on structural activity relationship for biodegradability, the polyurea, having increased molecular weight and reduced water solubility, are expected to be hydrolytically stable and not biodegradable in the environment.

Name	Result
4,4'-Methylenediphenyl diisocyanate, oligomers	The main hydrolysis products of the MDI substances are inert and insoluble polyurea with high molecular weights. Based on structural activity relationship for biodegradability, the polyurea, having increased molecular weight and reduced water solubility, are expected to be hydrolytically stable and not biodegradable in the environment.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is not readily biodegradable.

Bioaccumulative Potential

Product Data: No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	Due to the fast hydrolysis, exposure of the environment to the substance is unlikely or very low. The log Kow of MDA, the expected hydrolysis product, is 1.55.
o-(p-isocyanatobenzyl)phenyl isocyanate	The substance has low potential for bioaccumulation. BCF (aquatic species): 200 dimensionless
4,4'-Methylenediphenyl diisocyanate, oligomers	The substance has a low potential for bioaccumulation. BCF (aquatic species): 200 dimensionless
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Due to the fast hydrolysis, exposure of the environment to the substance is unlikely or very low. The log Kow of MDA, the expected hydrolysis product, is 1.55.

Mobility in Soil

Product Data: No data available.

Substance Data:

Name	Result
4,4'-methylenediphenyl diisocyanate	The substance is immobile to hardly mobile in soil with a strong potential for adsorption to soil and sediment. Estimated Log Koc: 5.5- 18.0 L/kg
o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is hardly mobile in soil with a high potential for adsorption to soil and sediment.
4,4'-Methylenediphenyl diisocyanate, oligomers	The substance is hardly mobil in soil with a high potential for adsorption to soil and sediment. Log Koc: 4.5 L/kg
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is hardly mobile in soil with a high potential for adsorption to soil and sediment. Log Koc: 4.5 L/kg

Results of PBT and vPvB assessment

Product Data:

PBT assessment: This product does not contain any substances that are assessed to be a PBT.
vPvB assessment: This product does not contain any substances that are assessed to be a vPvB.

Substance Data:

PBT assessment:

4,4'-methylenediphenyl diisocyanate	The substance is not PBT.
o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is not PBT.
4,4'-Methylenediphenyl diisocyanate, oligomers	This substance is not PBT.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is not PBT.

vPvB assessment:

4,4'-methylenediphenyl diisocyanate	The substance is not vPvB.
o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is not vPvB.
4,4'-Methylenediphenyl diisocyanate, oligomers	This substance is not vPvB.
Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	The substance is not vPvB.

Other Adverse Effects: No data available.

SECTION 13: Disposal Considerations

Disposal Methods:

The generation of waste should be avoided or minimized wherever possible. If product becomes a waste, it does not meet criteria of hazardous waste as defined in 40 CFR 261, Subpart C and D. Do not discharge into sewer system. Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose waste in compliance with local, state and federal regulations via licensed waste disposal contractor.

Contaminated packages:

Even after emptying, container may retain residues. Containers should be completely emptied and safely stored until appropriately reconditioned or disposed through licensed contractor in accordance with government regulation. This material and its container must be disposed of in a safe way.

SECTION 14: Transport Information

United States Transportation of Dangerous Goods (49 CFR DOT)

UN Number	Not regulated
UN Proper Shipping Name	Not regulated

UN Transport Hazard Class(es)	None
Packing Group	None
Environmental Hazards	None
Special Precautions for User	None
Additional Information	This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Please refer to Section 15 of this SDS for the RQ for this product. NOTE: This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

International Maritime Dangerous Goods (IMDG)

UN Number	Not regulated
UN Proper Shipping Name	Not regulated
UN Transport Hazard Class(es)	None
Packing Group	None
Environmental Hazards	None
Special Precautions for User	None

International Air Transport Association Dangerous Goods Regulations (IATA-DGR)

UN Number	Not regulated
UN Proper Shipping Name	Not regulated
UN Transport Hazard Class(es)	None
Packing Group	None
Environmental Hazards	None
Special Precautions for User	None

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	
Bulk Name	NA3082, Other regulated substances, liquid, n.o.s. (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Ship Type	None
Pollution Category	None

SECTION 15: Regulatory Information

United States Regulations

Inventory Listing (TSCA): All ingredients are listed-active or exempt.

Significant New Use Rule (TSCA Section 5): None of the ingredients are listed.

Export Notification under TSCA Section 12(b): None of the ingredients are listed.

SARA Section 302 Extremely Hazardous Substances: None of the ingredients are listed.

SARA Section 313 Toxic Chemicals:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed
9016-87-9	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Listed

CERCLA:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed	5000 Lbs

RCRA: None of the ingredients are listed.

Section 112(r) of the Clean Air Act (CAA): None of the ingredients are listed.

Massachusetts Right to Know:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed

New Jersey Right to Know:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed
5873-54-1	o-(p-isocyanatobenzyl)phenyl isocyanate	Listed
25686-28-6	4,4'-Methylenediphenyl diisocyanate, oligomers	Listed
9016-87-9	Reaction mass of 4,4'-methylenediphenyl diisocyanate and 2,2'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Listed

New York Right to Know:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed

Pennsylvania Right to Know:

101-68-8	4,4'-methylenediphenyl diisocyanate	Listed

California Proposition 65: None of the ingredients are listed.

Additional information: Not determined.

SECTION 16: Other Information

Abbreviations and Acronyms: None

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 Corporation makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof. Sections 11/12 Disclaimer (Toxicity/Ecotoxicity): This product itself has not been tested. Information given is based on data on the components and the toxicology of similar products. Section 14 (Transport Information): Information provided in Section 14 is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

NFPA: 2-1-1

HMIS: 2*-1-1

Initial Preparation Date: 09.14.2021

Revision date: 10.20.2023

Revision Notes:

Revision Date	Notes
2021-09-14	Internal Review

2023-10-20	Internal Review / New SDS Software Program Implementation

End of Safety Data Sheet