MATERIAL SAFETY DATA SHEET

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Uraseal Product Code(s): FOD-40 - Part A / URC7400 - Part A

Section I - Product Identification

URASEAL PRODUCT ID:
FOD-40 Kit - Part A;
URC7400 - Part A

CHEMICAL NAME & SYNONYMS:
Aromatic Isocyanates
Diphenylmethane Diisocyanate

TRADE NAME & SYNONYMS:
RU5090

FORMULA:
Not applicable to mixtures

CAS Number: **101-68-8**

CHEMICAL FAMILY:
Aromatic Isocyanate

Section II - Composition / Information on Ingredients

Hazardous Components

Weight %	Components	CAS-No.
48.0%	Diphenylmethane4,4'diisocyante (MDI)	101-68-8
<35.0%	Isocyanate Prepolymer	
<20.0%	Modified MDI	
<3.0%	Additive	
<2.0%	MDI Mixed Isomers	26447-40-5

Section III - Hazards Identification

Emergency Overview

WARNING! **Color:** Light yellow **Form:** Liquid **Odor:** Faint odor, aromatic
Contains Diphenalmethane Diisocyanate (CAS No. 101-68-8). Inhalation of MDI mists or vapor 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.
Contains material which may cause cancer.

NOTE: *This Material Safety Data Sheet is for a single component of a two part urethane kit. The hazards and warnings associated with this MSDS are for this chemical and not the reacted kit. Once the kit has been reacted the resultant product is a non-hazardous material.*

N.A. = Not Applicable ***N.E. = Not Established***

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 liquefied 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. Air-borne 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 bedelayed. Gastrointestinal symptoms include nausea, vomiting and abdominal pain.

Information on: gamma-Butyrolactone
Acute exposure to gamma butyrolactone may produce eye irritation. Repeated dermal administration in rats at 10 mg/kg has been known to produce mild metabolic acidosis. Repeated exposure at low doses (100 & 200 mg/kg) have been known to produce biphasic activity in rats(an initial reduction in activity followed by a period of hyperactivity). Increased blood pressure has also been known to occur in experimental animals after IV administration, however, this is not considered a relevant route of exposure.

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, is difficult to remove. Contact with MDI can cause discoloration.

Repeated dose toxicity:
Information on: MDI
Results from a lifetime inhalation study in rats indicate that MDI aerosol was carcinogenic at 6 mg/m3, the highest dose tested. This is well above the recommended TLV of 5 ppb (0.05 mg/m3). Only irritation was noted at the lower concentration of 0.2 and 1 mg/m3. No birth defects or teratogenic effects were reported in a teratology study with rats exposed to 1, 4, and 12 mg/m3 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.

Information on: gamma-Butyrolactone
In a 2-year NTP gavage study, there was no evidence of carcinogenic activity in Male F344/N rats at 112 or 225 mg/kg and in female rats at 225 or 450 mg/kg in corn oil. Equivocal evidence of carcinogenic activity was seen in male B6C3F1 mice and no evidence of carcinogenic activity in female B6C3F1 mice at 262 and 525 mg/kg in corn oil.

Medical conditions aggravated by overexposure:
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. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. An animal study indicated that MDI may induce respiratory hypersensitivity following dermal exposure. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum) are suggested. 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. Contact may aggravate pulmonary disorders.

N.A. = Not Applicable ***N.E. = Not Established***

Section IV - First Aid Measures

If this product is used in accordance with the directions and recommendations on the package labeling and this Material Safety Data Sheet, chance of exposure to any chemical in this kit is virtually eliminated. First aid measures are provided as a reference in the event of intentional misuse or unforeseeable event.

General advice:
Remove contaminated clothing.
If inhaled:
Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.
If on skin:
Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.
If in eyes:
In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.
If swallowed:
Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.
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.

Section V - Fire-Fighting Measures

Flash point: > 200.00 °C (open cup)

Suitable extinguishing media:
water, dry extinguishing media, carbon dioxide, foam

Hazards during fire-fighting:
nitrous gases, fumes/smoke, isocyanate, vapor

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Section VI - Accidental Release Measures

Personal precautions:
Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions:
Do not discharge into drains/surface waters/groundwater.

Cleanup:
Dike spillage.

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

For residues: The following measures should be taken for final cleanup: Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes.

Section VII - Handling and Storage

Handling - General advice:
Mix thoroughly before use. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.

Handling - Protection against fire and explosion:
No explosion proofing necessary.

Storage
General advice:
Formation of CO2 and build up of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture.

Storage stability:
Storage temperature: 16 - 27 °C

Section VIII - Exposure Controls / Personal Protection

Components with workplace control parameters
OSHA CLV 0.02 ppm 0.2 mg/m3 ; Diphenylmethane-4,4'-diisocyanate (MDI) ACGIH TWA value 0.005 ppm ;

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 facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece 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), nitrile rubber (BunaN), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, fluoroelastomer (Viton)
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.

Section IX - Physical and Chemical Properties

Form:	Liquid
Color:	Light yellow
Odor:	faintly aromatic
Boiling Point:	Approximately 200 °C
Flash Point:	200 °C (5.000000 mmHg)
Vapor Pressure:	< 0.00001 mmHg
Solubility in Water:	Reacts with water
Bulk density:	10.0000 lb/USg

Section X - Stability and Reactivity

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 alkalies. 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

Section XI - Toxicological Information

Toxicity Data for MDI

Toxicity Note	Toxicity data based on polymeric MDI.
Acute Oral Toxicity	LD50: > 2,000 mg/kg (rat, Male/Female)
Acute Inhalation Toxicity	LC50: 490 mg/m3, vapor, 4 h (rat)
Skin Irritation	rabbit, Slightly irritating

Repeated Dose Toxicity
90 Days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.
2 years, inhalation: NOAEL: 0.2 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.

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

Carcinogenicity
rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week
Exposure to a level of 6 mg/m3 polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

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

Section XII - Ecological Information

Ecological Data for MDI

Biodegradation	0 %, Exposure time: 28 Days
Bioaccumulation	Rainbow trout, Exposure time: 112 d, < 1 BCF Does not bioaccumulate.
Acute and Prolonged Toxicity to Fish	LC0: > 1,000 mg/l (Zebra fish (Brachydanio rerio), 96 hrs) LC0: > 3,000 mg/l (Killifish (Oryzias latipes), 96 h)
Acute Toxicity to Aquatic Invertebrates	EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 hrs)

Toxicity to Aquatic Plants
NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 hrs)

Toxicity to Microorganisms	EC50: > 100 mg/l, (Activated sludge microorganisms, 3 hrs)
Additional Ecotoxicological Remarks	Ecotoxicity data based on polymeric MDI

Section XIII - Disposal Considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.
Empty Container Precautions
Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

Section XIII - Disposal Considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions
Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

Section XIV - Transportation Information

Land transport (DOT)

Proper Shipping Name:	Other regulated substances, liquid, n.o.s. (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division:	9
UN/NA Number:	NA3082
Packaging Group:	III
Hazard Label(s):	Class 9

RSPA/DOT Regulated Components:
4,4'-Diphenylmethane Diisocyanate (MDI)

Reportable Quantity: 14,285 lb

Sea transport (IMDG)
Non-Regulated

Air transport (ICAO/IATA)
Non-Regulated

Additional Transportation Information
When in individual containers of less than the Product RQ, this material ships as non-regulated.

Section XV - Regulatory Information

Federal Regulations
Registration status:
TSCA, US released / listed
TSCA 12B released / listed

OSHA hazard category: Chronic target organ effects reported, ACGIH TLV established

CERCLA RQ	CAS Number	Chemical name
5,000 LBS	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)

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

SARA 313:

CAS Number	Chemical name
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)

State regulations
State RTK

CAS Number	Chemical name	State RTK
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)	MA, NJ, PA

Section XVI - Other Information

HMIS Rating		NFPA 704M Rating	
Health	2*	**Health**	2
Flammability	1	**Flammability**	1
Physical Hazard	1	**Reactivity**	1
		Other	

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

* = Chronic Health Hazard

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

The information and recommendations contained herein are based upon data believed to be correct. However, since much of the information has been received from sources outside our company, we cannot guarantee its accuracy or completeness. Health and safety precautions contained within this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this data in order to comply with all applicable laws and regulations. Additionally, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

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Uraseal Product Code(s): FOD-40 Kit Part B / URC7400 Part B

Section I - Product Identification

URASEAL PRODUCT ID:
FOD-40 Kit - Part B
URC7400-Part B

CHEMICAL NAME & SYNONYMS:
Proprietary Polyol Blend

TRADE NAME & SYNONYMS:
UR0740

CHEMICAL FAMILY:
Polyol Compounds

FORMULA:
Not applicable to mixtures

CAS Number:
Not established

Section II - Composition / Information on Ingredients

HAZARDOUS MATERIAL	% by Wt.	PEL MEASUREMENT	CAS NBR	HAZARD TYPE
1,4 - Butanediol	1 - 10	MAK Exp. TWA = 50ppm	110-63-4	OSHA Hazardous

Section III - Hazards Identification

Emergency Overview

WARNING! This material is a skin and eye irritant

Color: Translucent **Form:** Liquid **Odor:** Slight odor

NOTE: *This product contains no ingredients at or greater than 0.1% that are considered carcinogens by any regulatory agency.*

Section IV - First Aid Measures

Eye Contact
Flush with water while occasionally lifting eyelids and obtain medical attention.

Skin Contact
Wash thoroughly with soap and water.

Inhalation
Remove to fresh air.

Ingestion
Seek medical attention.

N.A. = Not Applicable ***N.E. = Not Established***

Section V - Fire-Fighting Measures

Suitable Extinguishing Media
Water spray, dry chemical, foam or carbon dioxide

Special Fire Fighting Procedures
Firefighters should be equipped with NIOSH approved SCBA and full protective clothing.

Unusual Fire/Explosion Hazards
During a fire, irritating and toxic gases may be generated during combustion.

Section VI - Accidental Release Measures

Spill and Leak Procedures
Clean up spills with absorbent materials. Dispose of as per "Section XIII - Disposal Considerations"

Section VII - Handling and Storage

Handling/Storage Precautions
Agitate before use. Keep from freezing. Avoid temperatures >180ºF

Other precautions
Follow all container label instructions. Avoid breathing heated vapors.

Section VIII - Exposure Controls / Personal Protection

Hand Protection	Permeation resistant gloves.
Eye Protection	Use splash-proof chemical resistant goggles or full-face shield.
Respiratory protection	None expected to be needed under conditions of normal use.
Ventilation	Good general ventilation, local exhaust may be needed if material is heated.
Other PPE	Protective clothing as needed

Other protective measures
Educate and train employees in safe use of product and personal protective equipment. Follow all label instructions and cautions.

Other hygienic and good work practices
Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing and wash it thoroughly before reuse. Shower after work using plenty of soap and water.

Section IX - Physical and Chemical Properties

Form:	Oily liquid, low viscosity
Color:	Translucent
Odor:	Slight odor
Boiling Point/Range:	277ºC (531ºF)
Freezing Point:	-23ºC (-10ºF)
Flash Point:	143ºC (290ºF) PMCC
Vapor Density (Air=1):	> 1.0
Specific Gravity:	1.02 @ 15.5ºC
Solubility in Water:	Primarily soluble

N.A. = Not Applicable ***N.E. = Not Established***

Section X - Stability and Reactivity

Stability
Stable

Hazardous Reactions
Not established

Materials to avoid
Strong oxidizers

Conditions to avoid
Avoid temperatures >180º

Hazardous decomposition products
Products of combustion may include carbon monoxide, carbon dioxide, and dense smoke.

Hazardous Polymerization
Will not occur

Section XI - Toxicological Information

Toxicity Data for URA8344

Acute Oral Toxicity	Not established
Acute Inhalation Toxicity	Not established
Skin Irritation	Not established
Repeated Dose Toxicity	Not established
Mutagenicity	Not established
Carcinogenicity	No known ingredients are OSHA listed as known carcinogens
Developmental Toxicity/Teratogenicity	Not established

Section XII - Ecological Information

Ecological Data for URA8344

Biodegradation	Not established
Bioaccumulation	Not established
Acute and Prolonged Toxicity to Fish	Not established
Acute Toxicity to Aquatic Invertebrates	Not established
Toxicity to Aquatic Plants	Not established
Toxicity to Microorganisms	Not established
Additional Ecotoxicological Remarks	Not established

Section XIII - Disposal Considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions
None established

Section XIV - Transportation Information

Land transport (DOT)
Not regulated

RSPA/DOT Regulated Components:
None known

N.A. = Not Applicable ***N.E. = Not Established***

Sea transport (IMDG)
Non-Regulated

Air transport (ICAO/IATA)
Non-Regulated

Additional Transportation Information
None known

Section XV - Regulatory Information

TSCA Status
All ingredients for this material are listed on the TSCA Inventory or are exempt from listing.

Section XVI - Other Information

HMIS Rating

Health	1
Flammability	1
Reactivity	0

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

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