

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Version: 8.0

Page: 1/19

(30087192/SDS\_GEN\_US/EN)

### 1. Identification

#### Product identifier used on the label

## LUPRANATE®8020 ISOCYANATE

#### Recommended use of the chemical and restriction on use

Recommended use\*: Chemical, Raw material

Recommended use\*: polyurethane component; industrial chemicals

Unsuitable for use: Uses other than recommended

Suitable for use in industrial sector: Polymers industry; chemical industry

\* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

#### Details of the supplier of the safety data sheet

##### Company:

BASF CORPORATION  
100 Park Avenue  
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

#### Emergency telephone number

##### 24 Hour Emergency Response Information

CHEMTREC: 1-800-424-9300

BASF HOTLINE: 1-800-832-HELP (4357)

#### Other means of identification

Chemical family:

Preparation based on: aromatic isocyanates

Synonyms:

TOLUENE DIISOCYANATE/POLYMETHYLENE

POLYPHENYLISOCYANATE

TDI/MDI BLEND

### 2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

#### Classification of the product

Acute Tox.

1 (Inhalation - vapour) Acute toxicity

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Page: 2/19

Version: 8.0

(30087192/SDS\_GEN\_US/EN)

Skin Corr./Irrit.	2	Skin corrosion/irritation
Eye Dam./Irrit.	2A	Serious eye damage/eye irritation
Resp. Sens.	1	Respiratory sensitization
Skin Sens.	1	Skin sensitization
Carc.	2	Carcinogenicity
STOT SE	3 (irritating to respiratory system)	Specific target organ toxicity — single exposure
STOT RE	2 (by inhalation)	Specific target organ toxicity — repeated exposure
Aquatic Acute	3	Hazardous to the aquatic environment - acute
Aquatic Chronic	3	Hazardous to the aquatic environment - chronic

### Label elements

Pictogram:



Signal Word:

Danger

Hazard Statement:

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H330	Fatal if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing and eye protection or face protection.
P260	Do not breathe mist or vapour or spray.
P201	Obtain special instructions before use.
P284	In case of inadequate ventilation wear respiratory protection.
P273	Avoid release to the environment.
P202	Do not handle until all safety precautions have been read and understood.
P272	Contaminated work clothing should not be allowed out of the workplace.
P264	Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Page: 3/19

Version: 8.0

(30087192/SDS\_GEN\_US/EN)

P310	Immediately 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.
P304 + P341 + P311	IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P333 + P313	If skin irritation or rash occurs: Get medical attention.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P337 + P313	If eye irritation persists: Get medical attention.
P308 + P313	IF exposed or concerned: Get medical attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

### Precautionary Statements (Storage):

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

### Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.
------	---

### Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

### Labeling of special preparations (GHS):

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHELESSNESS, 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 INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

## 3. Composition / Information on Ingredients

### According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

toluene-2,4-diisocyanate

CAS Number: 584-84-9

Content (W/W): >= 50.0 - < 75.0%

Synonym: 2,4-Diisocyanatotoluene; 2,4-Toluene diisocyanato, 2,4-TDI

toluene-2,6-diisocyanate

CAS Number: 91-08-7

Content (W/W): >= 15.0 - < 20.0%

Synonym: 1,3-Diisocyanato-2-methylbenzene

P-MDI

CAS Number: 9016-87-9

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 4/19  
(30087192/SDS\_GEN\_US/EN)

Content (W/W):  $\geq 10.0$  -  $< 15.0\%$   
Synonym: Isocyanic acid polymethylenepolyphenylene ester; Polymethylene polyphenylene isocyanate

Diphenylmethane-4,4'-diisocyanate (MDI)  
CAS Number: 101-68-8  
Content (W/W):  $\geq 7.0$  -  $< 10.0\%$   
Synonym: Diphenylmethane diisocyanate; 4,4'-Methylenediphenyl diisocyanate

Methylenediphenyl diisocyanate  
CAS Number: 26447-40-5  
Content (W/W):  $\geq 0.3$  -  $< 3.0\%$   
Synonym: 1,1'-Methylenebis[isocyanatobenzene]; Methylenediphenyl diisocyanate

Isocyanic acid, polymethylenepolyphenylene ester, polymer with.alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl)  
CAS Number: 57636-09-6  
Content (W/W):  $\geq 0.3$  -  $< 1.0\%$   
Synonym: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl)

1,3-Diazetidinedione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-  
CAS Number: 17589-24-1  
Content (W/W):  $\geq 0.2$  -  $< 0.3\%$   
Synonym: 1,3-Diazetidinedione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-

---

## 4. First-Aid Measures

### Description of first aid measures

#### General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

#### If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

#### If on skin:

Immediately wash thoroughly with soap and water, seek medical attention.

#### If in eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

Remove contact lenses, if present.

#### If swallowed:

Rinse mouth and then drink 200-300 ml 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.

### Most important symptoms and effects, both acute and delayed

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Version: 8.0

Page: 5/19

(30087192/SDS\_GEN\_US/EN)

Symptoms: The most important known symptoms and effects are described in section 2 and/or in section 11., eczema, asthma, lung oedema

*Information on: toluene-2,4-diisocyanate*

*Symptoms: Overexposure may cause: Eye irritation, skin irritation, erythema, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps*

*Information on: toluene-2,6-diisocyanate*

*Symptoms: Overexposure may cause: Eye irritation, skin irritation, erythema, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Symptoms: Overexposure may cause: Eye irritation, skin irritation, erythema, chest discomfort, dyspnea, asthma, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps, Inhalation may provoke the following symptoms: irritation of respiratory tract, coughing, wheezing*

*Information on: Methylenediphenyl diisocyanate*

*Symptoms: Overexposure may cause: Eye irritation, skin irritation, erythema, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps, Inhalation may provoke the following symptoms: irritation of respiratory tract, coughing*

*Information on: P-MDI*

*Symptoms: No data available.*

-----  
Hazards: Symptoms can appear later. In sensitized individuals, sensitization reactions may be elicited by structurally similar substances. Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.

*Information on: TDI*

*Hazards: In sensitized individuals, sensitization reactions may be elicited by structurally similar substances. Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Hazards: Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.*

### Indication of any immediate medical attention and special treatment needed

#### Note to physician

Antidote:

Specific antidotes or neutralizers to isocyanates do not exist.

Treatment:

Treatment should be supportive and based on the judgement of the physician in response to the reaction of the patient.

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 6/19  
(30087192/SDS\_GEN\_US/EN)

### 5. Fire-Fighting Measures

#### Extinguishing media

Suitable extinguishing media:  
water spray, foam, carbon dioxide

Unsuitable extinguishing media for safety reasons:  
water jet

#### Special hazards arising from the substance or mixture

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

#### Advice for fire-fighters

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

---

### 6. Accidental release measures

#### Personal precautions, protective equipment and emergency procedures

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

#### Environmental precautions

Do not discharge into drains/surface waters/groundwater.

#### Methods and material for containment and cleaning up

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 5-8 % household ammonia, 2-5 % detergent. Allow solution to stand for at least 10 minutes. Pick up with suitable absorbent material. Place into appropriately labeled waste containers. Do not make container pressure tight. Move container to a well-ventilated area (outside). Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide. Dispose of absorbed material in accordance with regulations.

For large amounts: For spills, stop leaks and provide diking to contain the material. Prevent entry into sewage systems, ground and surface waters. 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: Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 5-8 % household ammonia, 2-5 % detergent. Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes. Pick up with suitable absorbent material. Place into appropriately labeled waste containers. Do not make container pressure tight. Move container to a well-ventilated area (outside). Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide. Dispose of absorbed material in accordance with regulations.

---

### 7. Handling and Storage

#### Precautions for safe handling

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.

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Version: 8.0

Page: 7/19

(30087192/SDS\_GEN\_US/EN)

Protection against fire and explosion:

No special precautions necessary.

### Conditions for safe storage, including any incompatibilities

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases.

Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: Formation of CO<sub>2</sub> 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

Protect against moisture.

The stated storage temperature is noted for health and safety in the workplace. With regard to Quality, please refer to the product specific Technical Bulletin.

## 8. Exposure Controls/Personal Protection

### Components with occupational exposure limits

toluene-2,6-diisocyanate

ACGIH TLV

STEL value 0.005 ppm Inhalable fraction and vapor ; Skin Designation Inhalable fraction and vapor ;  
The substance can be absorbed through the skin.  
TWA value 0.001 ppm Inhalable fraction and vapor ; Skin Designation Inhalable fraction and vapor ;  
Danger of cutaneous absorption

Diphenylmethane-4,4'-diisocyanate (MDI)

OSHA PEL

CLV 0.02 ppm 0.2 mg/m<sup>3</sup> ; CLV 0.02 ppm 0.2 mg/m<sup>3</sup> ;

ACGIH TLV

TWA value 0.005 ppm ;

toluene-2,4-diisocyanate

OSHA PEL

CLV 0.02 ppm 0.14 mg/m<sup>3</sup> ;

ACGIH TLV

TWA value 0.001 ppm Inhalable fraction and vapor ; Skin Designation Inhalable fraction and vapor ;  
The substance can be absorbed through the skin.  
STEL value 0.005 ppm Inhalable fraction and vapor ; Skin Designation Inhalable fraction and vapor ;  
Danger of cutaneous absorption

### Advice on system design:

Provide local exhaust ventilation to control vapours/mists.

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Version: 8.0

Page: 8/19

(30087192/SDS\_GEN\_US/EN)

### Personal protective equipment

#### **Respiratory protection:**

Respiratory protection in case of vapour/aerosol release. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Particle filter with high efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P3 or FFP3).

When workers are facing concentrations above the occupational exposure limits they must use appropriate certified respirators. 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. Wear a NIOSH-certified (or equivalent) TC19C positive pressure air supplied respirator. For emergency or non-routine, high exposure situations, including confined space entry, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.

#### **Hand protection:**

Chemical resistant protective gloves should be worn to prevent all skin contact., Suitable materials may include, chloroprene rubber (Neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, fluoroelastomer (Viton), depending upon conditions of use.

#### **Eye protection:**

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

#### **Body protection:**

Cover as much of the exposed skin as possible to prevent all skin contact., Suitable materials may include, saran-coated material, depending upon conditions of use.

#### **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. Remove contaminated clothing immediately and clean before re-use or dispose it if necessary.

---

## 9. Physical and Chemical Properties

Form:	liquid	
Odour:	strong, pungent odour, faintly aromatic	
Odour threshold:	not applicable	
Colour:	dark brown	
pH value:	not applicable	
Freezing point:	10.00 °C	
Melting point:	No data available.	
Boiling point:	> 250.00 °C ( 760.000000 mmHg)	
Sublimation point:	No applicable information available.	
Flash point:	132.00 °C	(open cup)
Flammability:	not flammable	(derived from flash point)
Lower explosion limit:	0.90 %(V)	
Upper explosion limit:	9.50 %(V)	
Autoignition:	> 470.00 °C	
Vapour pressure:	0.025 mmHg ( 25.00 °C)	
Density:	1.2200 g/cm3 ( 25.00 °C)	



# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Page: 9/19

Version: 8.0

(30087192/SDS\_GEN\_US/EN)

Bulk density:	10.2000 lb/USg
Vapour density:	not applicable
Partitioning coefficient n-octanol/water (log Pow):	Unspecified
Self-ignition temperature:	Based on its structural properties the product is not classified as self-igniting.
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated.
Viscosity, dynamic:	7 mPa.s ( 25.00 °C)
Viscosity, kinematic:	No applicable information available.
Solubility in water:	Reacts with water.
Miscibility with water:	Reacts with water.
Solubility (quantitative):	No applicable information available.
Solubility (qualitative):	No applicable information available.
Molar mass:	No data available.
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.

## 10. Stability and Reactivity

### Reactivity

Corrosion to metals:  
No corrosive effect on metal.

Oxidizing properties:  
Not an oxidizer.

Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.
-------------------------------	----------	--

### Chemical stability

The product is stable if stored and handled as prescribed/indicated.

### Possibility of hazardous reactions

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 polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

### Conditions to avoid

> 40 degrees Celsius

### Incompatible materials

copper, zinc, Tin, acids, alcohols, amines, water, Alkalines, copper alloys, aluminum compounds, strong oxidizing agents

### Hazardous decomposition products

Decomposition products:

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 10/19  
(30087192/SDS\_GEN\_US/EN)

toluene-2,4-diisocyanate, carbon monoxide, hydrogen cyanide, toluene-2,6-diisocyanate, nitrogen oxides, aromatic isocyanates, gases/vapours

Thermal decomposition:  
No decomposition if stored and handled as prescribed/indicated.

### 11. Toxicological information

#### Primary routes of exposure

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

#### Acute Toxicity/Effects

##### Acute toxicity

Assessment of acute toxicity: Of very high toxicity after short-term inhalation. Virtually nontoxic after a single ingestion. Virtually nontoxic after a single skin contact.

##### Oral

Type of value: LD50  
Species: rat (male/female)  
Value: > 2,000 mg/kg (Directive 84/449/EEC, B.1)

##### Inhalation

Type of value: LC50  
Species: rat  
Value: 0.1 mg/l  
Exposure time: 4 h  
Highly toxic.

##### Dermal

Type of value: LD50  
Species: rabbit (male/female)  
Value: > 9,400 mg/kg  
Practically nontoxic.

##### Assessment other acute effects

Assessment of STOT single:  
Causes temporary irritation of the respiratory tract.

##### Irritation / corrosion

Assessment of irritating effects: Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic.

-----

##### Skin

Species: rabbit  
Result: Irritant.  
Literature data.

*Information on: toluene-2,6-diisocyanate*

*Species: rabbit*  
*Result: Irritant.*  
*Method: other*

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 11/19  
(30087192/SDS\_GEN\_US/EN)

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. Literature data.*

*Information on: toluene-2,4-diisocyanate*

*Species: rabbit*

*Result: Irritant.*

*Method: OECD Guideline 404*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Species: rabbit*

*Result: Irritating.*

*Method: Draize test*

-----  
Eye

*Species: rabbit*

*Result: Irritant.*

*Literature data.*

*Information on: toluene-2,6-diisocyanate*

*Species: rabbit*

*Result: Irritant.*

*Method: other*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. Literature data.*

*Information on: toluene-2,4-diisocyanate*

*Species: rabbit*

*Result: Irritant.*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Species: rabbit*

*Result: Irritating.*

*Method: Draize test*

-----  
Sensitization

Assessment of sensitization: Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. 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. 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 vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

*Information on: toluene-2,6-diisocyanate*

*Assessment of sensitization:*

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Page: 12/19

Version: 8.0

(30087192/SDS\_GEN\_US/EN)

*The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible.*

*Information on: toluene-2,4-diisocyanate*

*Assessment of sensitization:*

*The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Assessment of sensitization:*

*Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. 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. 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 vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.*

-----  
Guinea pig maximization test

Species: guinea pig

Result: sensitizing

Literature data.

*Information on: toluene-2,6-diisocyanate*

*Information on: toluene-2,4-diisocyanate*

*Species: guinea pig*

*Result: sensitizing*

*Method: other*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Buehler test*

*Species: guinea pig*

*Result: sensitizing*

*Mouse Local Lymph Node Assay (LLNA)*

*Species: mouse*

*Result: sensitizing*

*Can cause skin sensitization*

*other*

*Species: guinea pig*

*Result: sensitizing*

*Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.*

-----  
Aspiration Hazard

No aspiration hazard expected.

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 13/19  
(30087192/SDS\_GEN\_US/EN)

### Chronic Toxicity/Effects

#### Repeated dose toxicity

Assessment of repeated dose toxicity: The substance may cause damage to the lung even after repeated inhalation of low doses, as shown in animal studies.

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.*

-----

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 yrs, 6 hr/day 0, 0.2, 1, 6 mg/m<sup>3</sup>, olfactory epithelium*

*NOAEL: 0.2 mg/m<sup>3</sup>*

*LOAEL: 1 mg/m<sup>3</sup>*

*The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.*

-----

#### Genetic toxicity

Assessment of mutagenicity: The substance was mutagenic in various test systems with bacteria and cell cultures; however, these results could not be confirmed in tests with mammals.

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium: with and without metabolic activation ambiguous*

-----

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative No clastogenic effect reported.*

-----

#### Carcinogenicity

Assessment of carcinogenicity: IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans). NTP listed carcinogen

*Information on: toluene-2,4-diisocyanate*

*Assessment of carcinogenicity: IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans). NTP listed carcinogen*

*Information on: toluene-2,6-diisocyanate*

*Assessment of carcinogenicity: Indication of possible carcinogenic effect in animal tests.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure. IARC Group 3 (not classifiable as to human carcinogenicity).*

*Information on: P-MDI*

*Information on: Methylenediphenyl diisocyanate*

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29

Page: 14/19

Version: 8.0

(30087192/SDS\_GEN\_US/EN)

*Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure. IARC Group 3 (not classifiable as to human carcinogenicity).*

*Information on: Isocyanic acid, polymethylenepolyphenylene ester, polymer with.alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediy)*

*Information on: 1,3-Diazetidone-2,4-dione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-  
Assessment of carcinogenicity: The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.*

### Reproductive toxicity

Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect. Literature data.

### Teratogenicity

Assessment of teratogenicity: No indications of a developmental toxic / teratogenic effect were seen in animal studies. The product has not been tested. A mixture of isomers has been tested.

### 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. Preemployment 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.

---

## 12. Ecological Information

### **Toxicity**

#### Aquatic toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. The product may hydrolyse. The test result maybe partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

#### Toxicity to fish

LC50 (96 h) 164.5 mg/l, Pimephales promelas (static)

The details of the toxic effect relate to the nominal concentration. Literature data.

#### Aquatic invertebrates

EC50 (48 h) 12.5 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 15/19  
(30087192/SDS\_GEN\_US/EN)

### Toxicity to fish

*Information on: toluene-2,4-diisocyanate*

*LC50 (96 h) 133 mg/l, Oncorhynchus mykiss (OECD Guideline 203, static)*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*LC0 (96 h) > 1,000 mg/l, Brachydanio rerio (OECD Guideline 203, static)*

-----

### Aquatic invertebrates

*Information on: toluene-2,4-diisocyanate*

*EC50 (48 h) 12.5 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)*

*The details of the toxic effect relate to the nominal concentration. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*EC50 (24 h) > 1,000 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)*

-----

### Aquatic plants

*Information on: toluene-2,4-diisocyanate*

*EC50 (96 h) 3,230 mg/l (growth rate), Skeletonema costatum (OECD Guideline 201)*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

*EC50 (96 h) 1,790 mg/l (biomass), Skeletonema costatum (OECD Guideline 201)*

*The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*EC0 (72 h) 1,640 mg/l (growth rate), Scenedesmus subspicatus (OECD Guideline 201, static)*

-----

### Chronic toxicity to fish

*Information on: toluene-2,4-diisocyanate*

*Study does not need to be conducted. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

*Study scientifically not justified.*

-----

### Chronic toxicity to aquatic invertebrates

*Information on: toluene-2,4-diisocyanate*

*No observed effect concentration (21 d) 1.1 mg/l, Daphnia magna (OECD Guideline 211, static)*

*Nominal concentration. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.*

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 16/19  
(30087192/SDS\_GEN\_US/EN)

### Microorganisms/Effect on activated sludge

#### Toxicity to microorganisms

OECD Guideline 209 static

activated sludge/EC20 (180 min): > 100 mg/l

Nominal concentration. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

*Information on: toluene-2,4-diisocyanate*

OECD Guideline 209 static

activated sludge/EC50 (3 h): > 100 mg/l

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

OECD Guideline 209 aquatic

aerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

### Persistence and degradability

#### Assessment biodegradation and elimination (H2O)

Poorly biodegradable. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The product is unstable in water. The elimination data also refer to products of hydrolysis.

#### Elimination information

0 - 10 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge, domestic)

#### Assessment biodegradation and elimination (H2O)

*Information on: Diphenylmethane-4,4'-diisocyanate (MDI)*

Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

#### Assessment of stability in water

In contact with water the substance will hydrolyse rapidly.

#### Information on Stability in Water (Hydrolysis)

50 - 90 % (2 h)

In contact with water the substance will hydrolyse rapidly.

### Bioaccumulative potential

#### Bioaccumulation potential

Bioconcentration factor: < 50 (42 d), Cyprinus carpio (OECD Guideline 305 C)

Does not significantly accumulate in organisms. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

### Mobility in soil

#### Assessment transport between environmental compartments

Adsorption to solid soil phase is not expected.



# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 17/19  
(30087192/SDS\_GEN\_US/EN)

### Additional information

Adsorbable organically-bound halogen (AOX):  
This product contains no organically-bound halogen.

Other ecotoxicological advice:  
Do not release untreated into natural waters. Do not allow to enter soil, waterways or waste water channels. The product has not been tested. The statement has been derived from the properties of the individual components.

---

### 13. Disposal considerations

#### Waste disposal of substance:

TDI is listed as a hazardous waste under Section 261.33 (f) of EPA's RCRA regulations and requires special handling for disposal. Incinerate waste containing TDI in a RCRA-licensed facility.

#### 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. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

RCRA: U223

---

### 14. Transport Information

#### Land transport

USDOT

Hazard class: 6.1  
Packing group: II  
ID number: UN 2078  
Hazard label: 6.1  
Proper shipping name: TOLUENE DIISOCYANATE

#### Sea transport

IMDG

Hazard class: 6.1  
Packing group: II  
ID number: UN 2078  
Hazard label: 6.1  
Marine pollutant: NO  
Proper shipping name: TOLUENE DIISOCYANATE

#### Air transport

IATA/ICAO

Hazard class: 6.1  
Packing group: II  
ID number: UN 2078  
Hazard label: 6.1  
Proper shipping name: TOLUENE DIISOCYANATE

#### Further information

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 18/19  
(30087192/SDS\_GEN\_US/EN)

DOT: 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.

### 15. Regulatory Information

#### Federal Regulations

##### **Registration status:**

Chemical TSCA, US released / listed

TSCA § 5(a) proposed Significant New Use Restriction (SNUR)  
listed on TSCA-Inventory with S-flag  
This product contains a substance subject to a pending SNUR.  
40 CFR 721.10789

**EPCRA 311/312 (Hazard categories):** Refer to SDS section 2 for GHS hazard classes applicable for this product.

##### **EPCRA 313:**

###### CAS Number

101-68-8  
91-08-7  
584-84-9

###### Chemical name

Diphenylmethane-4,4'-diisocyanate (MDI)  
toluene-2,6-diisocyanate  
toluene-2,4-diisocyanate

###### CERCLA RQ

5000 LBS  
100 LBS

###### CAS Number

101-68-8  
584-84-9; 91-08-7

###### Chemical name

Diphenylmethane-4,4'-diisocyanate (MDI)  
toluene-2,4-diisocyanate; toluene-2,6-diisocyanate

#### State regulations

##### State RTK

NJ

##### CAS Number

91-08-7  
101-68-8  
584-84-9  
9016-87-9

##### Chemical name

toluene-2,6-diisocyanate  
Diphenylmethane-4,4'-diisocyanate (MDI)  
toluene-2,4-diisocyanate  
P-MDI

PA

91-08-7  
101-68-8  
584-84-9

toluene-2,6-diisocyanate  
Diphenylmethane-4,4'-diisocyanate (MDI)  
toluene-2,4-diisocyanate

#### **Safe Drinking Water & Toxic Enforcement Act, CA Prop. 65:**

**WARNING:** This product can expose you to chemicals including TOLUENE DIISOCYANATE, which is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

##### **NFPA Hazard codes:**

Health: 3 Fire: 1 Reactivity: 1 Special:

##### **HMIS III rating**

Health: 3 $\alpha$  Flammability: 1 Physical hazard: 1

### 16. Other Information

##### **SDS Prepared by:**

BASF NA Product Regulations

# Safety Data Sheet

## LUPRANATE®8020 ISOCYANATE

Revision date : 2020/10/29  
Version: 8.0

Page: 19/19  
(30087192/SDS\_GEN\_US/EN)

SDS Prepared on: 2020/10/29

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

LUPRANATE is a registered trademark of BASF Corporation or BASF SE  
IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE , IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY OUR COMPANY HEREUNDER ARE GIVEN GRATIS AND WE ASSUME NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK. BASF CORPORATION WILL NOT MAKE ITS PRODUCTS AVAILABLE TO CUSTOMERS FOR USE IN THE MANUFACTURE OF MEDICAL DEVICES WHICH ARE INTENDED FOR PERMANENT IMPLANTATION IN THE HUMAN BODY OR IN PERMANENT CONTACT WITH INTERNAL BODILY TISSUES OR FLUIDS.

END OF DATA SHEET