



# MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

Date Issued: 16/06/2014

## REACTOR PEMEX RA-28 MODIFICADO NORMA

### I. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

TRADE NAME: REACTOR PEMEX RA-28 MODIFICADO NORMA  
PRODUCT CLASS: ALIPHATIC POLYISOCYANATE (HDI)  
CHEMICAL FAMILY: POLYISOCYANATE  
HEALTH: WARNING

INFORMATION ON  
MANUFACTURER/SUPPLIER:

EL NERVION S.A DE C.V.  
ALDAMA # 5, COL. LA ESCUELA,  
TLALNEPANTLA, EDO. MÉXICO, 54090  
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### II. COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	COMPONENTS	CAS NUMBER	CONCENTRATION [%]
01	ALIPHATIC POLYISOCYANATE RESIN	CONFIDENTIAL	100,00

Residual content of diisocyanate monomer: <0.15%, during the six months, especially if stored at temperatures near the upper limit recommended storage temperature, the HDI monomer content can be increased to a maximum of 0.70%.

### III. HAZARDS IDENTIFICATION

#### Emergency Overview

#### **Physical Appearance**

Form: Liquid  
Colour: Clear to pale yellow  
Odour: solvent  
Water solubility: Insoluble, reacts slowly with water to liberate CO<sub>2</sub> gas.  
pH: Not applicable

**EXPOSURE EFFECTS:** Flammable. They can be released gases/fumes during combustion or thermal decomposition. A closed container can burst under extreme or when the content has been contaminated with water heat. Use cold water spray to cool fire exposed containers to minimize risk of rupture. Vapors or mist may present a risk of fire and explosion if exposed to high temperatures or ignition. Vapors may travel to areas outside the workplace before igniting/receding vapor source. Ground containers and equipment before making the transfer to avoid static sparks. Has been associated prolonged occupational overexposure to solvents and repeated with permanent brain damage and nervous system. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal. Causa irritación de las vías respiratorias.



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

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### REACTOR PEMEX RA-28 MODIFICADO NORMA

Causes irritation of the respiratory tract. May cause allergic respiratory reaction. Harmful if inhaled respiratory sensitizer damage to the lungs and respiratory sensitization may be permanent cause skin irritation May cause allergic skin reaction. Experiments skin sensitizer animal and other research indicates that diisocyanates contact with skin may play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation May cause lung damage can affect the nervous system. It can cause brain damage.

#### Potential health effects

**OVER-EXPOSURE (prolonged or repeated use): CAN AGGRAVATE OR ACCENTUATE ANY OF THESE EFFECTS.**

**SKIN CONTACT:** Causes irritation with symptoms of redness, itching and inflammation. May cause sensitization. Persons previously sensitized can experience allergic skin reactions with redness, itching, swelling and rashes. Cured material is difficult to remove.

Prolonged contact can cause reddening, swelling, rash, and in some cases, skin sensitization. Animal experiments and other research indicates that diisocyanates contact with skin may play a role in causing isocyanate sensitization and respiratory reaction. These data reinforce the need to prevent direct skin contact with isocyanates.

**INHALATION:** Vapors or mist diisocyanate or polyisocyanate concentrations above the limits or guidelines Exposure can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) with symptoms of runny nose, sore throat, cough, chest discomfort, shortness of breath and reduced lung function (breathing difficulty). People with non-specific bronchial hyperreactivity preexisting can respond to concentrations below the exposure limits or guidelines with similar symptoms as well as asthma attacks or asthma-like symptoms. Exposure far above the permitted limits or guidelines, can induce bronchitis spasm bronchial and pulmonary edema (fluid in the lungs). There have been reports of hypersensitivity or chemical pneumonitis, with flu-like symptoms (eg, fever, chills). These symptoms may occur up to several hours after exposure. These effects are usually reversible.

Inhaling solvents can cause depression of the central nervous system, with symptoms of nausea, confusion, drowsiness, dizziness and incoordination. As a result of overexposure previous repeated or a single large dose, certain individuals may develop sensitization to diisocyanates or polyisocyanates (asthma or similar symptoms) that may cause them subsequently react to diisocyanates or polyisocyanates at levels well below the limits or exposure guidelines. These symptoms, which can include chest tightness, wheezing, coughing, shortness of breath or asthma attack, may be delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, it has been reported 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 some cases for several years.

Sensitization can be permanent. It has been reported that chronic overexposure to diisocyanates cause lung damage (including fibrosis, decrease in lung function) which may be permanent. Has been associated prolonged occupational overexposure to solvents and repeated with permanent brain damage and nervous system. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal.



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

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### REACTOR PEMEX RA-28 MODIFICADO NORMA

**EYES CONTACT:** Causes irritation with symptoms of reddening, tearing, stinging, and inflammation. May cause temporary corneal injury. Vapor may cause irritation with symptoms of burning and tearing. Prolonged contact may cause conjunctivitis vapors.

**INGESTION:** Ingestion and/or vomiting may cause aspiration into the lungs, resulting in chemical pneumonitis (inflammation of the lungs). Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system.

**PRIMARY ROUTE(S) OF ENTRY:** SKIN CONTACT, INHALATION, INGESTION EYE CONTACT.

**CARCINOGENICITY:** No carcinogenic substances as defined by IARC, NTP and / or OSHA.

#### IV. FIRST AID MEASURES

##### GENERAL ADVICE

Remove contaminated or saturated clothing immediately and dispose of safety.

##### Inhalation

If aerosol or mists are inhaled, take affected persons out into the fresh air. Possible discomforts include severe irritation of mucus lining (nose, throat, eyes), cough, sneezing and flow of tears. In case of persistent discomfort, obtain medical attention immediately.

##### Skin contact

Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Obtain medical attention immediately if symptoms occur. Wash clothing before reuse.

##### Eye contact

In case of contact, immediately flush eyes with plenty of water, or if necessary, with eye rinsing solution. In case of persistent discomfort, consult an ophthalmologist.

##### Ingestion

If accidentally swallowed, rinse mouth thoroughly with water and afterwards, drink plenty of water. In case of discomfort, obtain medical attention. DO NOT INDUCE TO VOMIT.

##### Notes to physician

After absorbing large amount of substance, apply therapy for irritative effects. If substance has been swallowed, early endoscopy is recommended in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, suck away leftover substance. Allergic reactions cannot be excluded. Apply treatment of allergic reaction if necessary.

Eyes: Stain for evidence of injury to the cornea. If the cornea has burns, apply a preparation of antibiotic/steroid, as needed. The vapors in the workplace also produce reversible corneal epithelial affecting vision.

Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn.

Ingestión: Treat symptomatically. There is no specific antidote. Induce vomiting is contraindicated because of the irritating nature of the compound.



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

Date Issued: 16/06/2014

### REACTOR PEMEX RA-28 MODIFICADO NORMA

Inhalation: Treatment is essentially symptomatic. A person with a dermal sensitization reaction to this material or lung should be removed from subsequent exposure to any diisocyanate.

#### V. FIRE-FIGHTING MEASURES

FLASH POINT: 122°F approx. (50°C) DIN 53213  
LOWER EXPLOSIVE LIMIT: 1.0 %  
UPPER EXPLOSIVE LIMIT: 7.5 %  
AUTOIGNITION TEMPERATURE: 878°F (470°C)  
FLAMMABILITY-OSHA: COMBUSTIBLE - CLASS II  
OSHA FLAMMABILITY CLASSIFICATION: FLAMMABLE LIQUID

**SUITABLE EXTINGUISHING MEDIA:** Foam, carbon dioxide, dry powder, water fog (water spray for large fires).

**SPECIFIC HAZARDS DURING FIRE FIGHTING:** In case of fire cool endangered containers with water. Closed container may rupture if strongly heated. Flammable liquid. Vapors may reach an ignition source and flash back. Explosive mixtures may form at temperatures at or above the flash point.

**EXTINGUISHING MEDIA WHICH MUST NOT BE USED FOR SAFETY REASONS:** Not applicable.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS:** As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), dense black smoke, isocyanate, isocyanic acid and other undetermined compounds.

**OSHA FLAMMABLE CLASS:** Combustible Liquid, Class II.

#### VI. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS:** Wear suitable protective clothing, gloves and eye/face protection. Use self-contained breathing apparatus and chemically protective clothing. Evacuate personnel to safe areas.

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Ventilate area, remove sources of spark or flame, and remove with inert absorbent.

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**

• **SMALL SPILL:** ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

• **LARGE SPILL:** ELIMINATE ALL IGNITION SOURCES. PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE DIKE AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

Date Issued: 16/06/2014

### REACTOR PEMEX RA-28 MODIFICADO NORMA

LIQUID MAY BE TAKEN UP ON SAND CLAY, EARTH, FLOOR ABSORBENT AND SHOVEL INTO CONTAINERS. PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER, BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED THAT A SPILL HAS OCCURED.

#### WASTE DISPOSAL METHOD:

• **SMALL SPILL:** ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPOURS TO COMPLETELY CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

• **LARGE SPILLS:** DESTROY BY LIQUID INCINERATION. CONTAMINATED ABSORBENT MAY BE DEPOSITED IN LANDFILL IN ACCORDANCE WITH LOCAL STATE AND FEDERAL REGULATIONS.

#### Additional Procedures / Spill Neutralization

#### Neutralizing solution:

(1) decontaminant solution Colorimetric Laboratories Inc. (CLI).

(2) A mixture of 75% water, 20% of a nonionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10), and 5% n-propanol.

(3) A mixture of 80% water and 20% of a nonionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).

(4) A mixture of 90% water, 3-8% concentrated ammonium hydroxide or ammonia, and 2% of liquid detergent.

## VII. HANDLING AND STORAGE

### HANDLING

#### General Procedures Handling

Advice on Safe Handling: Wear respiratory protection when spraying.

Ensure adequate ventilation.

Use only in well-ventilated areas. Avoid breathing vapors and/or aerosols. Avoid contact with skin and eyes. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid contact with eyes. Use personal protective equipment. When using, DO NOT EAT, DRINK OR SMOKE.

Advice on protection against fire and explosion: Take precautionary measures against static charges; keep away from sources of ignition.

### STORAGE

#### Requirements for storage areas and containers

Keep containers tightly closed in cool, well-ventilated place.



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

Date Issued: 16/06/2014

### REACTOR PEMEX RA-28 MODIFICADO NORMA

#### Storage Temperature:

Minimum: -29.2°F (-34°C)

Maximum: 113°F (45°C)

#### Shelf life:

6 months @ 77°C (25°C): After the date of manufacture.

#### Further Information

Keep sealed in its original packaging and stored separately from foodstuffs.

### VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Engineering measures

Provide for good ventilation if vapours/aerosol are formed.

Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

#### Personal protective equipment

**General protective measures:** Avoid contact with eyes and skin.

**Hygiene measures:** No smoking, eating or drinking allowed when using this product. Wash hands before breaks and at end of work shift or using the toilet.

**Respiratory protection:** Wear appropriate respirator when ventilation is inadequate. In case of formation of vapors/aerosols: respiratory protective equipment, cartridge for organic gases and vapors.

**Hand protection:** Gloves made of nitril (NBR)  
Gloves made of butyl (IIR)  
Neoprene gloves  
The breakthrough time of the selected glove(s) must be greater than the intended use period.

**Eye protection:** Chemical resistant goggles must be worn.

**Protective clothing:** Light protective clothing is required.

### IX. PHYSICAL AND CHEMICAL PROPERTIES

**Form:** Liquid  
**Colour:** Clear to pale yellow  
**Odour:** solvent  
**Water solubility:** Insoluble  
**pH:** Not applicable  
**Melting temperature:** Not measured  
**Boiling temperature:** approx. 320°F (160°C) @ 1,013 hPa



## MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

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### REACTOR PEMEX RA-28 MODIFICADO NORMA

**Vapour pressure:** Not measured  
**Flash point:** 122°F approx. (50°C) DIN 53213  
**Density:** 1.1000 - 1.1500 g/cm<sup>3</sup>  
**Viscosity:** 16.0 - 20.0 seconds Ford Cup 4.

#### X. STABILITY AND REACTIVITY

**Thermal decomposition:** Not measured

**Hazardous reactions:** No hazardous reactions know with proper storage and handling.

**Hazardous polymerization:** No

**Stability:** This product is stable under normal storage conditions.

**Hazardous decomposition products:** (BY FIRE, BURNING OR WELDING): Carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), dense black smoke, hydrogen cyanide, isocyanate, isocyanic acid, other compounds not determined.

**Materials to avoid:** water, amines, strong bases, alcohols, copper alloys.

**Conditions to avoid:** Heat, open flame, arc or sparks.

**Dangerous reactions:** Contact with moisture, other materials that react with isocyanates, or temperatures above 350°F (177°C) may cause polymerization.

#### XI. TOXICOLOGICAL INFORMATION

**LD50 (ACUTE ORAL TOX):** Estimated to be greater than 5000 mg/kg (rats)

**LD50 (ACUTE DERMAL TOX):** Estimated to be greater than 5000 mg/kg (rabbits)

**LD50 (ACUTE INHALATION TOX):** CL50: 390-453 mg/m<sup>3</sup>, 4 h (rat, male/female)

**EFFECTS OF CHRONIC EXPOSURE:** Not available.

**SENSITIZATION:** dermal: sensitizer (guinea pig maximization test)  
Skin: Non-sensitizer (guinea pig, Buehler)  
Inhalation: Non-sensitizer (guinea pig)

**CARCINOGENICITY:** Not available.

**REPRODUCTIVE TOXICITY:** Not available.

**TERATOGENICITY:** Not available.

**MUTAGENECITY:** Genetic Toxicity in Vitro:  
Ames: negative (Salmonella typhimurium, Metabolic Activation: with/without)



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## REACTOR PEMEX RA-28 MODIFICADO NORMA

### XII. ECOLOGICAL INFORMATION

No ecotoxicological studies are available. The product is considered to be water pollutant. Do not allow to enter soil, waterways or waste water canal.

#### Ecotoxicity effects

##### Aquatic toxicity:

##### Biodegradation

0% Exposure time: 28 days, is not readily biodegradable.

##### Toxicity to fish:

CL0:> 100 mg / l (Zebra fish (Brachydanio rerio, 96 h)

##### Acute toxicity to aquatic invertebrates:

CE0:> 100 mg / L (water flea (Daphia magna), 48 h)

##### Toxicity to aquatic plants:

EC50:> 1.000 mg / L, (Green algae (Scenedesmus subspicatus), 72 h)

##### Toxicity to microorganisms

EC50:> 1.000 mg / L, (Microorganisms in Activated Sludge, 3 h)

##### Toxicity to other organisms:

No data available.

#### Persistence and degradability

##### Mobility:

No data available.

##### Bioaccumulation:

No data is available on the product itself.

### XIII. DISPOSAL CONSIDERATIONS

The arrangement shall be in accordance with federal environmental control laws, state and local existents. Incineration is the preferred method.

#### Product disposal and Disposal requirements:

In accordance with local authority regulations, take to special waste incineration plant.

#### Contaminated packaging:

Empty containers are waste product, observe all precautions for the product. Do not heat or cut empty containers with electric or gas welding because they form highly toxic vapors and gases. If empty contaminated containers are recycled or disposed of, the receiver must be informed about potential hazards.

**DO NOT HEAT OR CUT THE EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH.**





# MATERIAL SAFETY DATA SHEET

Revision Date: 16/06/2014

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## REACTOR PEMEX RA-28 MODIFICADO NORMA

### XIV. TRANSPORT INFORMATION

#### DOT

Proper Shipping name: Reactor PEMEX RA-28 MODIFICADO NORMA  
Class: 3  
UN/ID No: 1263  
Packing Group: III

#### IATA

Proper Shipping name: Reactor PEMEX RA-28 MODIFICADO NORMA  
Class: 3  
UN/ID No: 1263  
Packing Group: III

#### IMDG

Proper Shipping name: Reactor PEMEX RA-28 MODIFICADO NORMA  
Class: 3  
UN/ID No: 1263  
Packing Group: III

### XV. REGULATORY INFORMATION

#### Federal regulations of the United States

Standard Classification Hazard Communication OSHA: **dangerous**

### XVI. OTHER INFORMATION

#### NFPA RATINGS 704M

HEALTH: 2  
FLAMMABLE: 2  
REACTIVITY: 1  
OTHER: G

#### HMIS RATING

HEALTH: 2\*  
FLAMMABILITY: 2  
PHYSICAL HAZARD: 1

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

0 = Insignificant  
1 = Slight  
2 = Moderate  
3 = High  
4 = Extreme  
\* = Chronic Hazard for Health.



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### REACTOR PEMEX RA-28 MODIFICADO NORMA

THE INFORMATION PROVIDED IN THIS SAFETY DATA SHEET IS CORRECT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF AT THE DATE OF ITS PUBLICATION. THE INFORMATION GIVEN IS DESIGNED ONLY AS A GUIDANCE FOR SAFE HANDLING, USE, PROCESSING, STORAGE, TRANSPORTATION, DISPOSAL AND RELEASE AND IS NOT TO BE CONSIDERED A WARRANTY OR QUALITY SPECIFICATION. THE INFORMATION RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS, UNLESS SPECIFIED IN THE TEXT.

<END OF MSDS>