1 Identification
Product identifier
Product name: Phenyl isocyanate
Stock number: A12808, L06169
CAS Number: 103-71-9
EC number: 203-137-6

Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com
Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification
Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS02 Flame
Flam. Liq. 3  H226 Flammable liquid and vapour.

GHS06 Skull and crossbones
Acute Tox. 1  H330 Fatal if inhaled.

GHS08 Health hazard
Resp. Sens. 1  H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

GHS05 Corrosion
Skin Corr. 1B  H314 Causes severe skin burns and eye damage.
Eye Dam. 1  H318 Causes serious eye damage.

H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
Skin Sens. 1  H317 May cause an allergic skin reaction.
H314 Causes severe skin burns and eye damage.
H330 Fatal if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P303+P361+P338 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320 Specific treatment is urgent [see on this label].
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
Product name: Phenyl isocyanate

Classification system
HMIS ratings (scale 0-4) (Hazardous Materials Identification System)

Health (acute effects) = 4
Flammability = 2
Physical Hazard = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients
Chemical characterization: Substances
CAS# Description:
103-71-9 Phenyl isocyanate
Identification number(s):
EC number: 203-137-8

4 First-aid measures
Description of first aid measures
General information
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing
Seek medical treatment.

Information for doctor
Most important symptoms and effects, both acute and delayed
Causes severe skin burns.
Causes serious eye damage.
Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Fire-fighting measures
Extinguishing media
Suitable extinguishing agents
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures
Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.
Keep away from ignition sources.
Environmental precautions: Do not allow product to reach sewage system or any water course.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.
Prevention of secondary hazards: Keep away from ignition sources.
Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage
Handling
Precautions for safe handling
Handle under dry protective gas.
Keep container tightly sealed.
Ensure good ventilation at the workplace.
Open and handle container with care.
Only handle and refill product in closed systems.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Keep ignition sources away.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Protect from heat.
Store away from water/moisture.
Store away from oxidizing agents.
Further information about storage conditions:
Store under dry inert gas.
This product is moisture sensitive.
8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>103-71-9 Phenyl isocyanate (100.0%)</td>
<td></td>
</tr>
<tr>
<td>TLV (USA)</td>
<td>Short-term value: NIC-0.1 mg/m³, NIC-0.02 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: NIC-0.024 mg/m³, NIC-0.008 ppm</td>
</tr>
<tr>
<td>EL (Canada)</td>
<td>Short-term value: C 0.01 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 0.005 ppm</td>
</tr>
</tbody>
</table>

Additional information: No data

Exposure controls

General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Do not inhale dust / smoke / mist.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use self-contained respiratory protective device in emergency situations.

Recommended filter device for short term use:
Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

Protection of hands:
Impervious gloves

Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Material of gloves Fluorocarbon rubber (Viton)

Penetration time of glove material (in minutes) 480

Glove thickness 0.7 mm

Eye protection:
Tightly sealed goggles

Full face protection

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General information

Appearance:
Form: Liquid
Color: Colorless
Odor: Pungent
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: -33 °C (-27 °F)
Boiling point/Boiling range: 62-64 °C (144-147 °F) (11mm)

Sublimation temperature / start: Not determined

Flash point: 51 °C (124 °F)
Flammability (solid, gaseous) Not determined.
Ignition temperature: 645 °C (1193 °F)
Decomposition temperature: Not determined

Auto igniting: Not determined.

Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures is possible.

Explosion limits:
Lower: 1.2 Vol %
Upper: Not determined

Vapor pressure at 20 °C (68 °F): 2.5 hPa (2 mm Hg)
Density at 20 °C (68 °F): 1.094 g/cm³ (3.129 lbs/gal)
Relative density Not determined.

Vapor density Not determined.

Evaporation rate Not determined.

Solubility in / Miscibility with Water at 20 °C (68 °F): 0.62 g/l
Partition coefficient (n-octanol/water): Not determined.

Viscosity:
dynamic: Not determined.
kinematic: Not determined.

Other information: No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.

Chemical stability: Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions Reacts with strong oxidizing agents

Conditions to avoid: No further relevant information available.

Incompatible materials: Water/moisture.
Product name: Phenyl isocyanate

Oxidizing agents
Heat

Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Nitrogen oxides

11 Toxicological information

Information on toxicological effects

Acute toxicity:
Harmful if swallowed.
Fatal if inhaled.
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>800 mg/kg (rat)</td>
</tr>
<tr>
<td>Inhalative LC50/4H</td>
<td>22 mg/m^3/4H (rat)</td>
</tr>
</tbody>
</table>

Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.

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

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.

Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.

Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.

Additional ecological information:
General notes:
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

UN-Number
DOT, IMDG, IATA: UN2487

UN proper shipping name
DOT, IMDG, IATA: Phenyl isocyanate

Transport hazard class(es)

DOT

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
<th>Description</th>
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<tbody>
<tr>
<td>6.1</td>
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IMDG, IATA

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<tbody>
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<td></td>
<td>Toxic substances</td>
</tr>
</tbody>
</table>

Packing group
DOT, IMDG, IATA: I

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

Transport/Additional information:

DOT

Marine Pollutant (DOT): No

Warning: Toxic substances
Yes
EMS Number: F,E,S,D
### 15 Regulatory information

**Safety, health and environmental regulations/legislation specific for the substance or mixture**

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

**Hazard pictograms**

<table>
<thead>
<tr>
<th>GHS02</th>
<th>GHS05</th>
<th>GHS06</th>
<th>GHS08</th>
</tr>
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</table>

**Signal word** Danger

**Hazard statements**

- H226 Flammable liquid and vapour.
- H302 Harmful if swallowed.
- H330 Fatal if inhaled.
- H314 Fatal if inhaled.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H317 May cause an allergic skin reaction.

**Precautionary statements**

- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P303+P361+P338 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Remove contact lenses, if present and easy to do. Continue rinsing.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**National regulations**

- All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
- All components of this product are listed on the Canadian Domestic Substances List (DSL).
- SARA Section 313 (specific toxic chemical listings) Substance is not listed.
- California Proposition 65
  - Prop 65 - Chemicals known to cause cancer Substance is not listed.
  - Prop 65 - Developmental toxicity, female Substance is not listed.
  - Prop 65 - Developmental toxicity, male Substance is not listed.
- Other regulations, limitations and prohibitive regulations
  - Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.
- The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
- Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

**Chemical safety assessment** A Chemical Safety Assessment has not been carried out.

### 16 Other information

**Employers** should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS** Global Marketing Department

**Date of preparation / last revision** 11/23/2015

**Abbreviations and acronyms:**

- ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- EINECS: European Inventory of Existing Commercial Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- HIMS: Hazardous Materials Identification System (USA)
- HMIS: Hazardous Materials Information System (Canada)
- LCS50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACCI: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)