

# N-BUTYL ISOCYANATE

## Section 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

Product name: N-Butyl Isocyanate  
CAS Number: 111-36-4  
EC Number: 203-862-8

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Product use: Laboratory chemicals, Industrial & for research use only

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

Company name: East Harbour Group Ltd  
20 Clough Road, Severalls Industrial Park  
Colchester, Essex, CO4 9QS  
United Kingdom

Telephone: +44 (0) 333 242 0100  
Email: [info@eastharbourgroup.com](mailto:info@eastharbourgroup.com)

### 1.4 Emergency telephone number

Emergency telephone: 0800 246 1274

## Section 2: Hazardous identification

### 2.1 Classification of the substance or mixture

Flammable liquids, Category 2  
Acute toxicity - Category 4, Oral  
Skin corrosion, Sub-category 1B  
Skin sensitization, Sub-category 1A  
Serious eye damage, Category 1  
Acute toxicity - Category 1, Inhalation  
Specific target organ toxicity – single exposure, Category 3  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3

### 2.2 Label elements

Pictograms:



Signal Word

Danger

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## Hazard statement(s)

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

## Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P280	Wear protective gloves/protective clothing/eye protection/face protection / hearing protection/...
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P271	Use only outdoors or in a well-ventilated area.
P284	[In case of inadequate ventilation] wear respiratory protection.
P273	Avoid release to the environment.

## Response

P303+P361+P353 IF ON SKIN: (or hair)	Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378	In case of fire: Use ... to extinguish.
P301+P317	IF SWALLOWED: Get medical help.
P330	Rinse mouth.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316	Get emergency medical help immediately.
P321	Specific treatment (see ... on this label).
P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352	IF ON SKIN: Wash with plenty of water/...
P333+P317	If skin irritation or rash occurs: Get medical help.
P362+P364	Take off contaminated clothing and wash it before reuse.
P305+P354+P338 IF IN EYES:	Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P317	Get medical help.
P320	Specific treatment is urgent (see ... on this label).
P319	Get medical help if you feel unwell.

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## Storage

P403+P235  
P405

Store in a well-ventilated place. Keep cool.  
Store locked up.

## 2.3 Other hazards

No data available

## Section 3: Composition/information on ingredients

### 3.1 Substances

Chemical name:	Butyl isocyanate
Common names and synonyms:	Butyl isocyanate
CAS number:	111-36-4
EC number:	203-862-8
Concentration:	100%

## Section 4: First aid measures

### 4.1 Description of first aid measures

#### If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.

#### Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible).

#### Following ingestion

Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer immediately for medical attention.

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

Excerpt from ERG Guide 155 [Substances - Toxic and/or Corrosive (Flammable / Water-Sensitive)]: TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death. Bromoacetates and chloroacetates are extremely irritating/lachrymators. Reaction with water or moist air will release toxic, corrosive or flammable gases. Reaction with water may generate much heat that will increase the concentration of fumes in the air. Fire will produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. (ERG, 2016)

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

Noncardiogenic pulmonary edema and bronchospasm are the most immediate serious clinical consequences of isocyanate exposure. Markedly symptomatic patients should receive oxygen, ventilatory support, and an intervenors line. Treatment for asthma includes inhaled sympathomimetics (salbutamol, metaproterenol), intravenous theophylline, parenteral sympathomimetics (epinephrine, terbutaline), and steroids. Isocyanates

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## Section 5: Fire-fighting measures

### 5.1 Fire Fighting Media and Instructions:

Persons involved in fighting fires should wear a self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive pressure mode. ... Methyl isocyanate

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

Excerpt from ERG Guide 155 [Substances - Toxic and/or Corrosive (Flammable / Water-Sensitive)]:

**HIGHLY FLAMMABLE:** Will be easily ignited by heat, sparks or flames. Vapors form explosive mixtures with air: indoors, outdoors and sewers explosion hazards. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapors may travel to source of ignition and flash back. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Substance will react with water (some violently) releasing flammable, toxic or corrosive gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. (ERG, 2016)

### 5.3 Special protective actions for firefighters

Use dry powder, foam, carbon dioxide. NO water. In case of fire: keep drums, etc., cool by spraying with water. NO direct contact with water. Combat fire from a sheltered position.

## Section 6: Accidental release measures

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

Evacuate danger area! Ventilation. Remove all ignition sources. Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer. Do NOT let this chemical enter the environment.

### 6.2 Environmental precautions

Evacuate danger area! Ventilation. Remove all ignition sources. Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer. Do NOT let this chemical enter the environment.

### 6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

## Section 7: Handling and storage

### 7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

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## 7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants and food and feedstuffs. Cool. See Chemical Dangers. Store in an area without drain or sewer access.

## Section 8: Exposure controls/personal protection

### 8.1 Control parameters

Occupational Exposure limit values

Component	Butyl isocyanate			
CAS No.	111-36-4			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Latvia		1		
	Remarks			

### Biological limit values

No data available

### 8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### 8.3 Individual protection measures, such as personal protective equipment (PPE)

#### Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

#### Skin protection

Protective gloves. Protective clothing.

#### Respiratory protection

Use ventilation, local exhaust or breathing protection.

#### Thermal hazards

No data available

## Section 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Physical state:

N-butyl isocyanate is a clear, colorless liquid with a pungent odor. Very toxic by ingestion, and may also be toxic by skin absorption and inhalation. Vapors heavier than air. Less dense than water and insoluble in water. Produces toxic oxides of nitrogen during combustion.

#### Colour:

Colorless liquid

#### Odour:

No data available

#### Melting point/freezing point:

315°C(lit.)

#### Boiling point or initial boiling point and boiling range

115°C

#### Flammability

Highly flammable. Heating will cause rise in pressure with risk of bursting.

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<b>Lower and upper explosion limit/flammability limit</b>	No data available
<b>Flash point:</b>	19°C(lit.)
<b>Auto-ignition temperature:</b>	425°C
<b>Decomposition temperature:</b>	No data available
<b>pH:</b>	No data available
<b>Kinematic viscosity:</b>	No data available
<b>Solubility:</b>	In water, 1.4X10+3 mg/L at 25 deg C (est)
<b>Partition coefficient: n-octanol/water</b>	log Kow = 2.26 (est)
<b>Vapour pressure:</b>	10.6 mm Hg ( 20 °C)
<b>Density and/or relative density</b>	0.88
<b>Relative vapour density:</b>	3 (vs air)
<b>Particle characteristics:</b>	No data available

## Section 10: Stability and Reactivity

### 10.1 Reactivity

The substance may polymerize due to heating. Decomposes on burning. This produces toxic gases including nitrogen oxides and hydrogen cyanide. Reacts violently with strong oxidants and water.

### 10.2 Chemical stability

No data available

### 10.3 Possibility of hazardous reactions

The vapour mixes well with air, explosive mixtures are easily formed. Isocyanates and thioisocyanates are incompatible with many classes of compounds, reacting exothermically to release toxic gases. Reactions with amines, aldehydes, alcohols, alkali metals, ketones, mercaptans, strong oxidizers, hydrides, phenols, and peroxides can cause vigorous releases of heat. Acids and bases initiate polymerization reactions in these materials. Some isocyanates react with water to form amines and liberate carbon dioxide. Base-catalysed reactions of isocyanates with alcohols should be carried out in inert solvents. Such reactions in the absence of solvents often occur with explosive violence [Wischmeyer 1969].

### 10.4 Conditions to avoid

No data available

### 10.5 Incompatible materials

No data available

### 10.6 Hazardous decomposition products

Energy of decomposition (in range 160 to 450 deg C) measured as 0.55 kJ/g

## Section 11: Toxicological Information

### 11.1 Toxicological effects:

#### Acute toxicity

Oral:	LD50 Guinea pig oral 250 mg/kg
Inhalation:	LC50 Rat inhalation 0.059 mg/L/4 hr 99.5% purity
Dermal:	No data available

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**Skin corrosion/irritation**

No data available

**Serious eye damage/irritation**

No data available

**Respiratory or skin sensitization**

No data available

**Germ cell mutagenicity**

No data available

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**STOT- single exposure**

The substance is corrosive to the eyes, skin and respiratory tract. Inhalation may cause lung oedema. See Notes.

**STOT- repeated exposure**

Repeated or prolonged contact may cause skin sensitization. See Notes.

**Aspiration hazard**

A harmful contamination of the air will be reached quickly on evaporation of this substance at 20°C.

## Section 12: Ecological Information

**12.1 Toxicity**

Toxicity to fish:	No data available
Toxicity to daphnia and other aquatic invertebrates:	No data available
Toxicity to algae:	No data available
Toxicity to microorganisms:	No data available

**12.2 Persistence and degradability**

Isocyanates undergo rapid hydrolysis under environmental conditions with half-lives of less than 10 minutes(1). Therefore, hydrolysis is expected to be the dominant fate process for n-butyl isocyanate in moist soil and water(SRC). Biodegradation is not expected to compete with hydrolysis as an important fate process(SRC).

**12.3 Bioaccumulative potential**

Isocyanates undergo rapid hydrolysis under environmental conditions with half-lives of less than 10 minutes(1). Therefore, hydrolysis is expected to be the dominant fate process for n-butyl isocyanate in water(SRC). Bioconcentration is not expected to compete with hydrolysis as an important environmental process(SRC).

**12.4 Mobility in soil**

Isocyanates undergo rapid hydrolysis under environmental conditions with half-lives of less than 10 minutes(1). Therefore, hydrolysis is expected to be the dominant fate process for n-butyl isocyanate in



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## Section 15: Regulatory Information

## 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Butyl isocyanate	Butyl isocyanate	111-36-4	203-862-8
<b>European Inventory of Existing Commercial Chemical Substances (EINECS)</b>			Listed.
<b>EC Inventory</b>			Listed.
<b>United States Toxic Substances Control Act (TSCA) Inventory</b>			Listed.
<b>China Catalog of Hazardous chemicals 2015</b>			Listed.
<b>New Zealand Inventory of Chemicals (NZIoC)</b>			Listed.
<b>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</b>			Listed.
<b>Vietnam National Chemical Inventory</b>			Listed.
<b>Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)</b>			Listed.
<b>Korea Existing Chemicals List (KECL)</b>			Listed.

## Section 16: Other Information

## Abbreviations and acronyms

CAS:	Chemical Abstracts Service
ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road
RID:	Regulation concerning the International Carriage of Dangerous Goods by Rail
IMDG:	International Maritime Dangerous Goods
IATA:	International Air Transportation Association
TWA:	Time Weighted Average
STEL:	Short term exposure limit □ LC50: Lethal Concentration 50%
LD50:	Lethal Dose 50%
EC50:	Effective Concentration 50