SAFETY DATA SHEET

Di-N-Butylamine

SECTION 1. IDENTIFICATION

Product name: Di-N-Butylamine
Product code: 51176-00, P5117610, P5117615, N5117611, N5117610, P5117614, P5117612, P5117601

Manufacturer or supplier’s details
Company name of supplier: Eastman Chemical Company
Address: 200 South Wilcox Drive
Kingsport TN 37660-5280
Telephone: (423) 229-2000
Emergency telephone: CHEMTREC: +1-800-424-9300, +1-703-527-3887 CCN7321

Recommended use of the chemical and restrictions on use
Recommended use: Chemical intermediate
Restrictions on use: None known.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids: Category 3
Acute toxicity (Oral): Category 4
Acute toxicity (Inhalation): Category 2
Acute toxicity (Dermal): Category 3
Skin corrosion: Category 1A
Serious eye damage: Category 1

GHS label elements
Hazard pictograms:

Signal Word: Danger
Hazard Statements: H226 Flammable liquid and vapor.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
Di-N-Butylamine

Precautionary Statements:

Prevention:
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Wear respiratory protection.

Response:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal:
P501 Dispose of contents/container to an approved waste disposal plant.

Other hazards:
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Pure substance

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
</table>
SECTION 4. FIRST AID MEASURES

General advice : Show this material safety data sheet to the doctor in attendance. Call a physician immediately.

If inhaled : Move to fresh air. If symptoms persist, call a physician.

In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash off immediately with plenty of water for at least 15 minutes. Wash contaminated clothing before re-use.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If swallowed : Clean mouth with water and drink afterwards plenty of water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Irritating to eyes, respiratory system and skin. May cause an allergic skin reaction. Harmful if swallowed. Toxic in contact with skin. Causes serious eye damage. Fatal if inhaled. Causes severe burns.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use water spray to extinguish. Carbon dioxide (CO2) Alcohol-resistant foam Dry chemical

Unsuitable extinguishing media : Do NOT use water jet.

Specific hazards during fire fighting : Take precautionary measures against static discharges. Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous combustion products : Carbon oxides Nitrogen oxides (NOx)
Further information: Prevent fire extinguishing water from contaminating surface water or the ground water system. Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions: Avoid release to the environment. Do not flush into surface water or sanitary sewer system. Prevent product from entering drains. Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up: Eliminate all ignition sources if safe to do so. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Large spills should be collected mechanically (remove by pumping) for disposal. Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion: Keep product and empty container away from heat and sources of ignition. Take precautionary measures against static discharges.

Advice on safe handling: Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Conditions for safe storage: Keep containers tightly closed in a cool, well-ventilated place. Protect against light.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
</table>

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Engineering measures: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment
Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Hand protection

Hand protection

Remarks: Rubber gloves Neoprene gloves The exact break through time can be obtained from the protective glove producer and this has to be observed.

Eye protection: Safety glasses with side-shields Face-shield

Skin and body protection: Complete suit protecting against chemicals

Protective measures: Ensure that eye flushing systems and safety showers are located close to the working place.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: liquid

Color: colorless

Odor: ammoniacal

Odor Threshold: not determined

pH: 12.5

Melting point/freezing point: -75.1 °F / -59.5 °C

Boiling point/boiling range: 320 °F / 160 °C
Flash point : 104.9 °F / 40.5 °C
  Method: closed cup

Evaporation rate : not determined

Self-ignition : 491 °F / 255 °C

Upper explosion limit / Upper flammability limit : not determined

Lower explosion limit / Lower flammability limit : not determined

Vapor pressure : 2.2 hPa (68 °F / 20 °C)

Relative vapor density : 4.5
  (Air = 1.0)

Relative density : No data available

Density : 0.76 g/cm³ (73.2 °F / 22.9 °C)

Solubility(ies)
  Water solubility : 3.8 g/l (68 °F / 20 °C)

Partition coefficient: n-octanol/water : log Pow: 2.06 (77 °F / 25 °C)

Autoignition temperature : 491 °F / 255 °C

Decomposition temperature : Thermal stability not tested. Low stability hazard expected at normal operating temperatures.

Viscosity
  Viscosity, dynamic : 0.85 mPa.s (68 °F / 20 °C)
  Viscosity, kinematic : not determined

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Surface tension : 50.6 mN/m, 68 °F / 20 °C

Molecular weight : 129.25 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity : None reasonably foreseeable.
Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions: Hazardous decomposition products formed under fire conditions.

Conditions to avoid: Heat, flames and sparks. Exposure to air or moisture over prolonged periods.


Hazardous decomposition products: Carbon monoxide. Carbon dioxide (CO2). Nitrogen oxides (NOx).

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity
Harmful if swallowed. Toxic in contact with skin. Fatal if inhaled.

Components:

di-n-butylamine:
Acute oral toxicity : LD50 Oral (Rat): 550 mg/kg
Acute dermal toxicity : LD50 Dermal (Rabbit): 768 mg/kg

Skin corrosion/irritation
Causes severe burns.

Components:

di-n-butylamine:
Species : Rabbit
Result : Corrosive

Serious eye damage/eye irritation
Causes serious eye damage.

Components:

di-n-butylamine:
Species : Rabbit
Result : Corrosive
Respiratory or skin sensitization

**Skin sensitization**
Not classified based on available information.

**Respiratory sensitization**
Not classified based on available information.

**Product:**
Remarks: No data available

Germ cell mutagenicity
Not classified based on available information.

**Carcinogenicity**
Not classified based on available information.

**Product:**
Remarks: This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

**IARC**
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA**
No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**NTP**
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity
Not classified based on available information.

**Product:**
Effects on fertility: Remarks: No data available

STOT-single exposure
Not classified based on available information.

**Product:**
Remarks: No data available

STOT-repeated exposure
Not classified based on available information.

**Product:**
Remarks: No data available

Aspiration toxicity
Not classified based on available information.
Information on likely routes of exposure

**Product:**
No data available

**Product on likely routes of exposure**

**Inhalation:**
Remarks: Fatal if inhaled.

**Skin contact:**
Remarks: Toxic in contact with skin. Causes severe skin burns.

**Eye contact:**
Remarks: Causes serious eye damage.

**Ingestion:**
Remarks: Harmful if swallowed.

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**di-n-butylamine:**

**Toxicity to fish:**
Remarks: LC50 (Oncorhynchus mykiss (rainbow trout)): 37 mg/l
Exposure time: 96 h

**Toxicity to daphnia and other aquatic invertebrates:**
Remarks: EC50 (Daphnia magna (Water flea)): 8.4 mg/l
Exposure time: 48 h

**Toxicity to algae/aquatic plants:**
Remarks: EC50 (Chlorella pyrenoidosa): 16.91 mg/l
Exposure time: 72 h

**Persistence and degradability**

**Components:**

**di-n-butylamine:**

**Biodegradability:**
Remarks: Result: Readily biodegradable.

**Bioaccumulative potential**

**Components:**

**di-n-butylamine:**

**Partition coefficient: n-octanol/water:**
Remarks: log Pow: 2.06 (77 °F / 25 °C)

**Mobility in soil**
No data available
Other adverse effects

Product:
Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues : Dispose of in accordance with local regulations.
Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR
UN/ID No. : UN 2248
Proper shipping name : Di-n-butylamine
Class : 8
Subsidiary risk : 3
Packing group : II
Labels : Class 8 - Corrosive substances, Class 3 - Flammable liquids
Packing instruction (cargo aircraft) : 855
Packing instruction (passenger aircraft) : 851

IMDG-Code
UN number : UN 2248
Proper shipping name : DI-N-BUTYLAMINE

Class : 8
Subsidiary risk : 3
Packing group : II
Labels : 8 (3)
EmS Code : F-E, S-C
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

49 CFR
UN/ID/NA number : UN 2248
Proper shipping name : Di-n-butylamine
Di-N-Butylamine

Class: 8
Subsidiary risk: 3
Packing group: II
Labels: Class 8 - Corrosive substances, Class 3 - Flammable liquids
ERG Code: 132
Marine pollutant: no

Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know
SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component TPQ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 311/312 Hazards</td>
<td>Fire Hazard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute Health Hazard</td>
<td></td>
</tr>
</tbody>
</table>

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act
This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307.

The ingredients of this product are reported in the following inventories:
TSCA: On TSCA Inventory
DSL: All components of this product are on the Canadian DSL
AICS: On the inventory, or in compliance with the inventory
ENCS: On the inventory, or in compliance with the inventory
ISHL: On the inventory, or in compliance with the inventory
KECI: On the inventory, or in compliance with the inventory
PICCS: On the inventory, or in compliance with the inventory
IECSC: On the inventory, or in compliance with the inventory

**TSCA list**
No substances are subject to a Significant New Use Rule.
No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

**Further information**

**NFPA 704:**

![NFPA 704 Ratings](image)

**HMIS® IV:**

![HMIS® IV Ratings](image)

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

**Full text of other abbreviations**

US WEEL: USA. Workplace Environmental Exposure Levels (WEEL)
US WEEL / CEIL: Ceiling

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals
in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 08/29/2019

The information provided in this Material 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.

US / Z8