SECTION 1. IDENTIFICATION

Product name : Tri-N-Butylamine
Product code : 51179-00, P5117916, N5117911, N5117910, P5117914, P5117913, P5117915, P5117912, P5117901

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 : Intermediate
Restrictions on use : None known.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids : Category 4
Acute toxicity (Oral) : Category 4
Acute toxicity (Inhalation) : Category 1
Acute toxicity (Dermal) : Category 2
Skin irritation : Category 2

GHS label elements
Hazard pictograms :  

Signal Word : Danger
Hazard Statements : H227 Combustible liquid.
H302 Harmful if swallowed.
H310 + H330 Fatal in contact with skin or if inhaled.
H315 Causes skin irritation.
Precautionary Statements:
   **Prevention:**
   P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
   P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
   P262 Do not get in eyes, on skin, or on clothing.
   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/ eye protection/ face protection.
   P284 Wear respiratory protection.

   **Response:**
   P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
   P302 + P350 + P310 IF ON SKIN: Gently wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/physician.
   P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
   P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
   P332 + P313 If skin irritation occurs: Get medical advice/attention.
   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>
<tbody>
<tr>
<td>tributylamine</td>
<td>102-82-9</td>
<td>&gt;= 98.5</td>
</tr>
</tbody>
</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: Dizziness Headache Nausea Vomiting Tiredness Harmful if swallowed. Fatal in contact with skin or if inhaled. Causes skin irritation.

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.

Hazardous combustion products: Nitrogen oxides (NOx) Carbon monoxide Ammonia

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 an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.
SECTION 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures:**
Use personal protective equipment. Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains.

**Environmental precautions:**
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:**
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/PERSOINAL PROTECTION

**Ingredients with workplace control parameters:**
Contains no substances with occupational exposure limit values.

**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

Remarks : Rubber gloves Neoprene gloves The exact breakthrough 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 : alkaline

Melting point/range : < -130 °F / < -90 °C

Boiling point/boiling range : 406 °F / 208 °C

Flash point : 167 °F / 75 °C

Method: Pensky-Martens closed cup

Evaporation rate : not determined

Self-ignition : 410 °F / 210 °C

Upper explosion limit / Upper flammability limit : not determined

Lower explosion limit / Lower flammability limit : not determined

Vapor pressure : 0.18 hPa (68 °F / 20 °C)
Relative vapor density : not determined
Relative density : No data available
Density : 0.7768 g/cm³ (68 °F / 20 °C)
Solubility(ies)
Water solubility : 0.08 g/l (68 °F / 20 °C)
Partition coefficient: n-octanol/water : Pow: 3.34 (77 °F / 25 °C)
Autoignition temperature : 410 °F / 210 °C
Decomposition temperature : not determined
Viscosity
Viscosity, dynamic : not determined
Viscosity, kinematic : not determined
Explosive properties : Not explosive
Oxidizing properties : Not classified
Surface tension : 55 mN/m, 68 °F / 20 °C
Molecular weight : 185.36 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.
Incompatible materials : Strong oxidizing agents
                           Strong acids
                           Copper
Hazardous decomposition products : Carbon monoxide
                                  Carbon dioxide (CO2)
                                  Ammonia
                                  Nitrogen oxides (NOx)
SECTION 11. TOXICOLOGICAL INFORMATION

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

Components:
tributylamine:
Acute oral toxicity: LD50 Oral (Rat): 420 mg/kg
Acute dermal toxicity: LD50 Dermal (Rabbit): 195 mg/kg

Skin corrosion/irritation
Causes skin irritation.

Components:
tributylamine:
Species: Rabbit
Exposure time: 1 h
Result: Irritating to skin.

Serious eye damage/eye irritation
Not classified based on available information.

Components:
tributylamine:
Remarks: May cause eye irritation with susceptible persons.

Respiratory or skin sensitization
Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Components:
tributylamine:
Test Type: Skin sensitization
Species: Guinea pig
Result: non-sensitizing

Germ cell mutagenicity
Not classified based on available information.

Components:
tributylamine:
SAFETY DATA SHEET

Tri-N-Butylamine

Genotoxicity in vitro
Test Type: Mutagenicity - Bacterial
Metabolic activation: +/- activation
Result: negative
Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Result: negative

Carcinogenicity
Not classified based on available information.

Product:
Remarks: This information is not available.

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.

STOT-repeated exposure
Not classified based on available information.

Repeated dose toxicity

Components:
tributylamine:
Species: Rabbit
NOAEL: 0.61 mg/kg
Application Route: Oral
Exposure time: 180 d

Aspiration toxicity
Not classified based on available information.

Product:
No data available
Information on likely routes of exposure

Product:
Inhalation : Remarks: Fatal if inhaled.
Skin contact : Remarks: Fatal in contact with skin. Causes skin irritation.
Eye contact : Remarks: None known.
Ingestion : Remarks: Harmful if swallowed.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
tributylamine:
Toxicity to fish : LC50 (Oryzias latipes (Japanese medaka)): 16.3 mg/l
Exposure time: 96 h
LC50 (Danio rerio (zebra fish)): > 10 mg/l
Exposure time: 28 d
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 8 mg/l
Exposure time: 48 h
Toxicity to algae/aquatic plants : EC50 (Scenedesmus subspicatus): 8.2 mg/l
Exposure time: 72 h
Toxicity to microorganisms : EC5 (Bacteria): 100 mg/l
Exposure time: 7 d

Persistence and degradability

Components:
tributylamine:
Biodegradability : Result: Readily biodegradable.

Bioaccumulative potential

Components:
tributylamine:
Bioaccumulation : Bioconcentration factor (BCF): 12
Mobility in soil

**Components:**

**tributylamine:**
Distribution among environmental compartments: Koc: 46993, log Koc: 4.67

**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).

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**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.

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**SECTION 14. TRANSPORT INFORMATION**

**International Regulations**

**IATA-DGR**
- UN/ID No.: UN 2542
- Proper shipping name: Tributylamine
- Class: 6.1
- Packing group: II
- Labels: Division 6.1 - Toxic substances
- Packing instruction (cargo aircraft): 662
- Packing instruction (passenger aircraft): 654

**IMDG-Code**
- UN number: UN 2542
- Proper shipping name: TRIBUTYLAMINE
- Class: 6.1
- Packing group: II
- Labels: 6.1
- EmS Code: F-A, S-A
- 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 2542
Proper shipping name : Tributylamine

Class : 6.1
Packing group : II
Labels : Division 6.1 - Toxic substances
ERG Code : 153
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></td>
<td>Acute Health Hazard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire Hazard</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:
SAFETY DATA SHEET

Tri-N-Butylamine

Version 1.3
Revision Date: 08/29/2019
SDS Number: 150000103704
Date of last issue: 10/31/2017
Date of first issue: 09/06/2016

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:
Flammability
Health 3 2 0
Instability
Special hazard

HMIS® IV:
HEALTH 3
FLAMMABILITY 2
PHYSICAL HAZARD 0

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
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;
SAFETY DATA SHEET

Tri-N-Butylamine

Revision Date: 08/29/2019
SDS Number: 150000103704
Date of last issue: 10/31/2017
SDSUS / ZB / 0001
Date of first issue: 09/06/2016

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 / ZB