



# Scientific Documentation

TR143, Trolamine, NF

Not appropriate for regulatory submission.  
Please visit [www.spectrumchemical.com](http://www.spectrumchemical.com) or  
contact Tech Services for the most up-to-date  
information contained in this information  
package.

**Spectrum Chemical Mfg Corp**

769 Jersey Avenue  
New Brunswick, NJ 08901  
Phone 732.214.1300

Ver4.04 8.October.2018



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In the following pages, we have designed and prepared documented scientific information to aid you in your initial qualification or your continual use of our products. Please do not hesitate to contact us if further information or the most up-to-date documentation is desired from any of the covered areas.

We appreciate your business and we look forward to hearing from you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Dang", with a stylized flourish at the end.

Michael Dang  
Director, Quality Systems & GMP Compliance  
[mdang@spectrumchemical.com](mailto:mdang@spectrumchemical.com)

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Item Number	TR143
Item	Trolamine, NF
CAS Number	102-71-6
Molecular Formula	$C_6H_{15}NO_3$
Molecular Weight	149.19
MDL Number	
Synonyms	2,2,2-Nitritotriethanol ; TEA ; Triethanolamine

Test	Specification	
	Min	Max
ASSAY TOTAL ALKANOLAMINES, AS $N(CH_2CH_2OH)_3$	99.0	107.4 %
SPECIFIC GRAVITY @ 25°C	1.120	1.128
REFRACTIVE INDEX @ 20°C	1.481	1.486
WATER DETERMINATION		0.5 %
RESIDUE ON IGNITION		0.05 %
ELEMENTAL IMPURITIES		AS REPORTED
IDENTIFICATION (A)	SPECTRUM MATCHES	
IDENTIFICATION (B)	BLUE COLOR REMAI	
IDENTIFICATION (C)	CARMINE RED COLO	
RETEST DATE		
DATE OF MANUFACTURE		
APPEARANCE		
RESIDUAL SOLVENTS	AS REPORTED	

## Spectrum Chemical Mfg Corp

**Corporate Headquarters:**  
769 Jersey Ave.  
New Brunswick, NJ 08901  
732.214.1300

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14422 S. San Pedro St.  
Gardena, CA 90248  
310.516.8000

# SAFETY DATA SHEET

Preparation Date: 2/17/2015

Revision Date: 2/27/2015

Revision Number: G1

**Product identifier**

**Product code:** TR143  
**Product Name:** TROLAMINE, NF

**Other means of identification**

**Synonyms:** Tri(2-hydroxyethyl)amine; Triethanolamine; Triethylolamine;  
TEA (amino alcohol); Tri(hydroxyethyl)amine;  
Tri-beta-hydroxyethylamine; Triethylamine, 2,2',2"-trihydroxy-;  
Trihydroxytriethylamine  
Trolamine  
Triethanolamine  
**CAS #:** 102-71-6  
**RTECS #** KL9275000  
**CI#:** Not available

**Recommended use of the chemical and restrictions on use**

**Recommended use:** Intermediate, in making emulsions, solvent, mfr of synthetic resins; pharmaceutic aid (alkalizing agent); increasing penetration of organic liquids into wood and paper; in prodn of lubricants for textile industry; intermediate in mfr of surface active agents, textile specialties, waxes, polishes, herbicides, petroleum demulsifiers, toilet goods, cement additives, cutting oils. In making emulsions with mineral & vegetable oils, paraffin and waxes. Solvent for casein, shellac, dyes. Fatty acid soaps used in dry-cleaning, cosmetics, household detergents, and emulsions. Wool scouring, textile; antifume agent and water-repellent, dispersion agent; corrosion inhibitor; softening agent, emulsifier, humectant and plasticizer, chelating agent; and rubber accelerator..

**Uses advised against** No information available

**Supplier:** Spectrum Chemicals and Laboratory Products, Inc.  
14422 South San Pedro St.  
Gardena, CA 90248  
(310) 516-8000

**Order Online At:** <https://www.spectrumchemical.com>

**Emergency telephone number** Chemtrec 1-800-424-9300  
**Contact Person:** Martin LaBenz (West Coast)  
**Contact Person:** Ibad Tirmiz (East Coast)

## 2. HAZARDS IDENTIFICATION

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Skin sensitization	Category 1B

## Label elements

### Warning

#### Hazard statements

Causes skin irritation  
Causes serious eye irritation  
May cause an allergic skin reaction



#### Hazards not otherwise classified (HNOC)

Not Applicable

#### Other hazards

Not available

#### Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling  
Avoid breathing dust/fume/gas/mist/vapors/spray  
Contaminated work clothing should not be allowed out of the workplace  
Wear protective gloves  
Wear eye/face protection

#### Precautionary Statements - Response

Specific treatment (see .? on this label)  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.  
IF ON SKIN: Wash with plenty of soap and water  
Take off contaminated clothing and wash before reuse  
If skin irritation or rash occurs: Get medical advice/attention

#### Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
Triethanolamine 102-71-6	102-71-6	99-100	*
Diethanolamine 111-42-2	111-42-2	0.1-0.9	*

## 4. FIRST AID MEASURES

#### First aid measures

##### General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126).

#### 4. FIRST AID MEASURES

<b>Skin Contact:</b>	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention. If skin irritation persists, call a physician.
<b>Eye Contact:</b>	Flush eye with water for 15 minutes. Get medical attention.
<b>Inhalation:</b>	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Ingestion:</b>	Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.
<b>Most important symptoms and effects, both acute and delayed</b>	
<b>Symptoms</b>	Causes eye irritation. Contact causes skin irritation. May cause allergic skin reaction. Ingestion may cause nausea, vomiting, and diarrhea. May affect the cardiovascular system. May affect the liver. It may affect the kidneys. Central nervous system effects.

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

**Notes to Physician:** Treat symptomatically

#### Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

#### 5. FIRE-FIGHTING MEASURES

##### Extinguishing Media

<b>Suitable Extinguishing Media:</b>	Use dry chemical, CO <sub>2</sub> , water spray or "alcohol" foam.
<b>Unsuitable Extinguishing Media:</b>	High volume water jet. Do not use a solid (straight) water stream as it may scatter and spread fire.

##### Specific hazards arising from the chemical

<b>Hazardous Combustion Products:</b>	Carbon monoxide; Carbon dioxide; nitrogen oxides; ammonia; hydrogen cyanides
<b>Specific hazards:</b>	May be combustible at high temperatures. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated.

##### Special Protective Actions for Firefighters

<b>Specific Methods:</b>	For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out. Dike fire-control water for later disposal; do not scatter the material.
<b>Special Protective Equipment for Firefighters:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Remove all sources of ignition.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth).

**Methods for cleaning up** Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Clean contaminated surface thoroughly.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

#### **Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials.

#### **Safe Handling Advice:**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. Handle in accordance with good industrial hygiene and safety practice.

### Conditions for safe storage, including any incompatibilities

#### **Technical Measures/Storage Conditions:**

Hygroscopic. Air sensitive. Protect from light. Sensitive to light. Store in light-resistant containers. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store away from incompatible materials.

#### **Incompatible Materials:**

Oxidizing agents. Acids. Metals.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### **National occupational exposure limits**

**U.S Occupational Exposure Limits:** Not determined

#### **United States**

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Triethanolamine - 102-71-6	None	None	5 mg/m <sup>3</sup> TWA	None
Diethanolamine - 111-42-2	None	3 ppm TWA 15 mg/m <sup>3</sup> TWA	1 mg/m <sup>3</sup> TWA inhalable fraction and vapor	None

#### **Canada**

**Canada Occupational Exposure Limits:** Not determined



Components	Alberta	British Columbia	Ontario	Quebec
Triethanolamine - 102-71-6	5 mg/m <sup>3</sup> TWA	5 mg/m <sup>3</sup> TWA	0.5 ppm TWA 3.1 mg/m <sup>3</sup> TWA	5 mg/m <sup>3</sup> TWAEV
Diethanolamine - 111-42-2	2 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA	1 mg/m <sup>3</sup> TWA inhalable fraction and vapor	3 ppm TWAEV 13 mg/m <sup>3</sup> TWAEV

## Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

Components	Australia	Mexico
Triethanolamine 102-71-6	5 mg/m <sup>3</sup> TWA	None
Diethanolamine 111-42-2	3 ppm TWA 13 mg/m <sup>3</sup> TWA	None

## Appropriate engineering controls

### Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

## Individual protection measures, such as personal protective equipment

### Personal Protective Equipment

**Eye protection:** Goggles.

**Skin and body protection:** Long sleeved clothing. Chemical resistant apron. Gloves.

**Respiratory protection:** Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. .

**Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b> Liquid.	<b>Appearance:</b> Viscous.	<b>Color:</b> Colorless. Light yellow.
<b>Odor:</b> Slight. Ammonia.	<b>Taste</b> No information available	<b>Formula:</b> C6H15NO3
<b>Molecular/Formula weight:</b> 149.19	<b>Flash point (°C):</b> 179	<b>Flashpoint (°C/°F):</b> 179°C/354.2°F 190.5°C/374.9°F
<b>Flash Point Tested according to:</b> Closed cup Open cup	<b>Lower Explosion Limit (%):</b> No information available	<b>Upper Explosion Limit (%):</b> No information available
<b>Autoignition Temperature (°C/°F):</b> 324°C/615.2°F	<b>pH:</b> No information available	<b>Melting point/range(°C/°F):</b> 17.9-21°C/64.2-69.8 °F
<b>Boiling point/range(°C/°F):</b> 335°C/635 °F	<b>Decomposition temperature(°C/°F):</b> No information available	<b>Specific gravity:</b> 1.120-1.128
<b>Bulk density:</b> No information available	<b>Vapor pressure @ 20°C (kPa):</b> No information available	<b>Density (g/cm3):</b> 1.124 @ 20 deg. C
<b>Evaporation rate:</b> No information available	<b>Vapor density:</b> 5.14	<b>VOC content (g/L):</b> No information available
<b>Odor threshold (ppm):</b> No information available	<b>Partition coefficient (n-octanol/water):</b> -2.53	<b>Viscosity:</b> No information available
<b>Miscibility:</b> Miscible with Methanol Miscible with water Miscible with Acetone	<b>Solubility:</b> Completely soluble in water Solubility in Water: 149g/l @ 20 °C Soluble in Chloroform Soluble in Benzene Slightly soluble in Petroleum Ether Soluble in Ether Slightly soluble in Carbon Tetrachloride Solubility in Carbon tetrachloride: 0.4% Solubility in Ether: 1.6% Solubility in Benzene: 4.2%	

## 10. STABILITY AND REACTIVITY

### Reactivity

Reactive with oxidizing agents  
Reactive with acids  
Reactive with metals

### Chemical stability

#### **Stability:**

Stable at normal conditions. Hygroscopic. Sensitive to light. Exposure to light accelerates decomposition. Sensitive to air..

#### **Possibility of Hazardous Reactions:**

Hazardous polymerization does not occur

#### **Conditions to avoid:**

Heat. Ignition sources. Exposure to light. It darkens on exposure to light. Exposure to air. Becomes yellow on exposure to air. Exposure to moist air. Exposure to moisture. Incompatible materials.

#### **Incompatible Materials:**

Oxidizing agents. Acids. Metals.

**Hazardous decomposition products:** Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx). Ammonia. Hydrogen cyanides.

#### Other Information

**Corrosivity:** No information available

**Special Remarks on Corrosivity:** No information available

### 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

##### **Principal Routes of Exposure:**

Ingestion. Skin. Eyes.

#### Acute Toxicity

##### **Component Information**

###### *Triethanolamine - 102-71-6*

**LD50/oral/rat** = 4190 mg/kg Oral LD50 Rat

**LD50/oral/mouse** = No information available

**LD50/dermal/rabbit** = 20 mL/kg Dermal LD50Rabbit

**LD50/dermal/rat** = > 16 mL/kg Dermal LD50 Rat

**LC50/inhalation/rat** = No information available

**LC50/inhalation/mouse** = No information available

**Other LD50 or LC50information** = 7300-11260 mg/kg LD50 Oral Rat (European Commission IUCLID dataset)  
2200 mg/kg LD50 Oral Rabbit (RTECS)

###### *Diethanolamine - 111-42-2*

**LD50/oral/rat** = 0.62 mL/kg Oral LD50 Rat [LOLI; RTECS]

780-2830 mg/kg [European Chemicals Bureau IUCLID dataset]

**LD50/oral/mouse** = 2200 mg/kg [European Chemicals Bureau IUCLID dataset]

3300 mg/kg [RTECS; European Chemicals Bureau IUCLID dataset]

**LD50/dermal/rabbit** = 12200-12970 mg/kg [European Chemicals Bureau IUCLID dataset]

**LD50/dermal/rat** = No information available

**LC50/inhalation/rat** = No information available

**LC50/inhalation/mouse** = No information available

**Other LD50 or LC50information** = No information available

##### **Product Information**

**LD50/oral/rat** =

**VALUE- Acute Tox Oral** = 4190mg/kg

**LD50/oral/mouse** =

**Value - Acute Tox Oral** = No information available

**LD50/dermal/rabbit**

**VALUE-Acute Tox Dermal** = 20mL/kg

**LD50/dermal/rat**

**VALUE -Acute Tox Dermal** = >16ml/kg

**LC50/inhalation/rat**

**VALUE-Vapor** = No information available

**VALUE-Gas** = No information available

**VALUE-Dust/Mist** = No information available

**LC50/Inhalation/mouse**

**VALUE-Vapor** = No information available

**VALUE - Gas** = No information available

**VALUE - Dust/Mist** = No information available

**Symptoms**

**Skin Contact:** Contact causes skin irritation. Mildly to moderately irritating to the skin. May cause burning sensation, itching, redness. It may be absorbed through the skin. May cause allergic skin reaction.

**Eye Contact:** Causes serious eye irritation. Causes lacrimation. Causes a burning sensation or pain. May cause transient corneal injury.

**Inhalation** Due to the low vapor pressure, inhalation is not likely to be a significant route of exposure. Inhalation of mist may cause respiratory tract irritation.

**Ingestion** Ingestion: Causes gastrointestinal (digestive) tract irritation with nausea, vomiting, hypermotility, and diarrhea. May also affect behavior/central nervous system (convulsions), urinary system

**Aspiration hazard** No information available

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Chronic Toxicity** Prolonged or repeated skin contact may cause allergic contact dermatitis  
Prolonged or repeated skin absorption may affect the liver and kidneys  
Prolonged or repeated inhalation may affect the liver, blood, urinary system and cardiovascular system  
Prolonged or repeated ingestion may affect the liver, and kidneys  
Prolonged or repeated skin contact/absorption may affect behavior/central nervous system (irritability)

**Sensitization:** May cause sensitization by skin contact

**Mutagenic Effects:** No information available

**Carcinogenic effects:** Not considered carcinogenic

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Triethanolamine	Not listed	Group 3 - Monograph 77 [2000]	Not listed	Not listed	Not listed	Not listed
Diethanolamine	A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans	Group 2 B - Monograph 101 [2012] Monograph 77 [2000]	Not listed	Present	Not listed	Not listed

*IARC (International Agency for Research on Cancer)  
Group 3 - Not classifiable as to its carcinogenicity to humans*

**Reproductive toxicity** No data is available

**Reproductive Effects:** No information available

**Developmental Effects:** No information available  
**Teratogenic Effects:** No information available

### Specific Target Organ Toxicity

**STOT - single exposure** No information available  
**STOT - repeated exposure** No information available  
**Target Organs:** Skin.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

**Ecotoxicity effects:** Aquatic environment.

*Triethanolamine - 102-71-6*

**Freshwater Algae Data:** 169 mg/L EC50 *Desmodesmus subspicatus* 96 h  
216 mg/L EC50 *Desmodesmus subspicatus* 72 h  
**Freshwater Fish Species Data:** 10600 - 13000 mg/L LC50 *Pimephales promelas* 96 h flow-through 1  
450 - 1000 mg/L LC50 *Lepomis macrochirus* 96 h static 1  
1000 mg/L LC50 *Pimephales promelas* 96 h static 1

*Diethanolamine - 111-42-2*

**Freshwater Algae Data:** 2.1 - 2.3 mg/L EC50 *Pseudokirchneriella subcapitata* 96 h  
7.8 mg/L EC50 *Desmodesmus subspicatus* 72 h  
**Freshwater Fish Species Data:** 1200 - 1580 mg/L LC50 *Pimephales promelas* 96 h static 1  
4460 - 4980 mg/L LC50 *Pimephales promelas* 96 h flow-through 1  
600 - 1000 mg/L LC50 *Lepomis macrochirus* 96 h static 1  
**Water Flea Data:** 55 mg/L EC50 *Daphnia magna* 48 h

**Persistence and degradability:** No information available

**Bioaccumulative potential:** Potential for bioconcentration in aquatic organisms is low.

**Mobility:** It is expected to have very high mobility based on estimated Koc.

## 13. DISPOSAL CONSIDERATIONS

### Disposal Methods

#### **Waste from residues / unused products:**

Waste must be disposed of in accordance with Federal, State and Local regulation.

#### **Contaminated packaging:**

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Triethanolamine	None	None	None	None
Diethanolamine	None	None	None	None

## 14. TRANSPORT INFORMATION

## 14. TRANSPORT INFORMATION

### DOT

UN-No:	Not Regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	Not applicable
Packing Group:	None
ERG No:	No information available
Marine Pollutant	No data available
DOT RQ (lbs):	No information available
Transport Regulation Logo:	

### TDG (Canada)

UN-No:	Not regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	No information available
Packing Group:	No information available
Description:	No information available

### ADR

UN-No:	Not regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Packing Group:	No information available
Subsidiary Risk:	No information available
Classification Code:	No information available
Description:	No information available
CEFIC Tremcard No:	No information available

### IMO / IMDG

UN-No:	Not regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	No information available
Packing Group:	No information available
Description:	No information available
IMDG Page:	No information available
Marine Pollutant	No
MFAG:	No information available
Maximum Quantity:	No information available

### RID

UN-No:	Not regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	No information available
Packing Group:	No information available
Classification Code:	No information available
Description:	No information available

### ICAO

UN-No:	Not regulated
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## 14. TRANSPORT INFORMATION

**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Subsidiary Risk:** No information available  
**Packing Group:** No information available  
**Description:** No information available

### IATA

**UN-No:** Not regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Subsidiary Risk:** No information available  
**Packing Group:** No information available  
**Description:** No information available

## 15. REGULATORY INFORMATION

### International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Triethanolamine	Present	Present KE-25940	Present	Present (2)-308	Present[29507]	Present	Present 203-049-8
Diethanolamine	Present	Present KE-20959	Present	Present (2)-354 (2)-302	Present[11481]	Present	Present 203-868-0

### U.S. Regulations

#### Triethanolamine

**Massachusetts RTK:** Present  
**New Jersey RTK Hazardous Substance List:** Present  
**Pennsylvania RTK:** Present  
**RI RTK - Hazardous Substances List:** Present  
**Minnesota - Hazardous Substance List:** Present

#### Diethanolamine

**Massachusetts RTK:** Present  
**New Jersey RTK Hazardous Substance List:** Present  
**New Jersey (EHS) List:** Present  
**New Jersey - Discharge Prevention - List of Hazardous Substances:** Present  
**Pennsylvania RTK:** Environmental hazard  
**Pennsylvania RTK - Environmental Hazard List:** Present  
**RI RTK - Hazardous Substances List:** Present  
**Minnesota - Hazardous Substance List:** Present  
**New York Release Reporting - List of Hazardous Substances:**  
1 lb RQ  
**Louisiana Reportable Quantity List for Pollutants:** 100lbfinal RQ  
45.4kgfinal RQ  
**California Directors List of Hazardous Substances:** Present

### California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

#### Chemicals Known to the State of California to Cause Cancer:

WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

#### Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Triethanolamine	Not Listed	Not Listed	Not Listed	Not Listed
Diethanolamine	carcinogen	Not Listed	Not Listed	Not Listed

### CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
Triethanolamine	None	None	None	None	None
Diethanolamine	100 lb final RQ 45.4 kg final RQ	None	None	None	1.0 % de minimis concentration

## U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Triethanolamine	Not Applicable	04/13/1989 12/19/1995
Diethanolamine	Not Applicable	04/13/1989 06/30/1998

## Canada

### WHMIS hazard class:

Non-controlled

### Triethanolamine

Uncontrolled product according to WHMIS classification criteria

### Diethanolamine

D2A D2B

### Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
Triethanolamine	1 %
Diethanolamine	1 %

## Inventory

Components	Canada (DSL)	Canada (NDSL)
Triethanolamine	Present	Not Listed
Diethanolamine	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Triethanolamine	Not listed	Not listed
Diethanolamine	Not listed	Not listed

## EU Classification

### R-phrase(s)

not determined

### S -phrase(s)

none

Components	Classification	Concentration Limits:	Safety Phrases
Triethanolamine		No information	



Diethanolamine	Xi;R38-41 Xn;R22-48/22	No information	S(2)-S26-S36/37/39-S46
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The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**

None.

## 16. OTHER INFORMATION

**Preparation Date:** 2/17/2015  
**Revision Date:** 2/27/2015  
**Prepared by:** Sonia Owen

**Disclaimer:**

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

**End of Safety Data Sheet**



## **Manufacturer**

Product Covered: TR143, Trolamine, NF

Spectrum takes ownership as the manufacturer for the Spectrum product listed above and provides full quality assurance, customer service, and technical product support.

While information concerning the raw material manufacturer of our starting materials is considered proprietary, such information can be made available upon request contingent on demonstration of business volume justification and successful execution of confidential disclosure agreement (CDA).

Requests for disclosure of proprietary raw material manufacturer information may be submitted to the assigned account representative for consideration.

Sincerely,

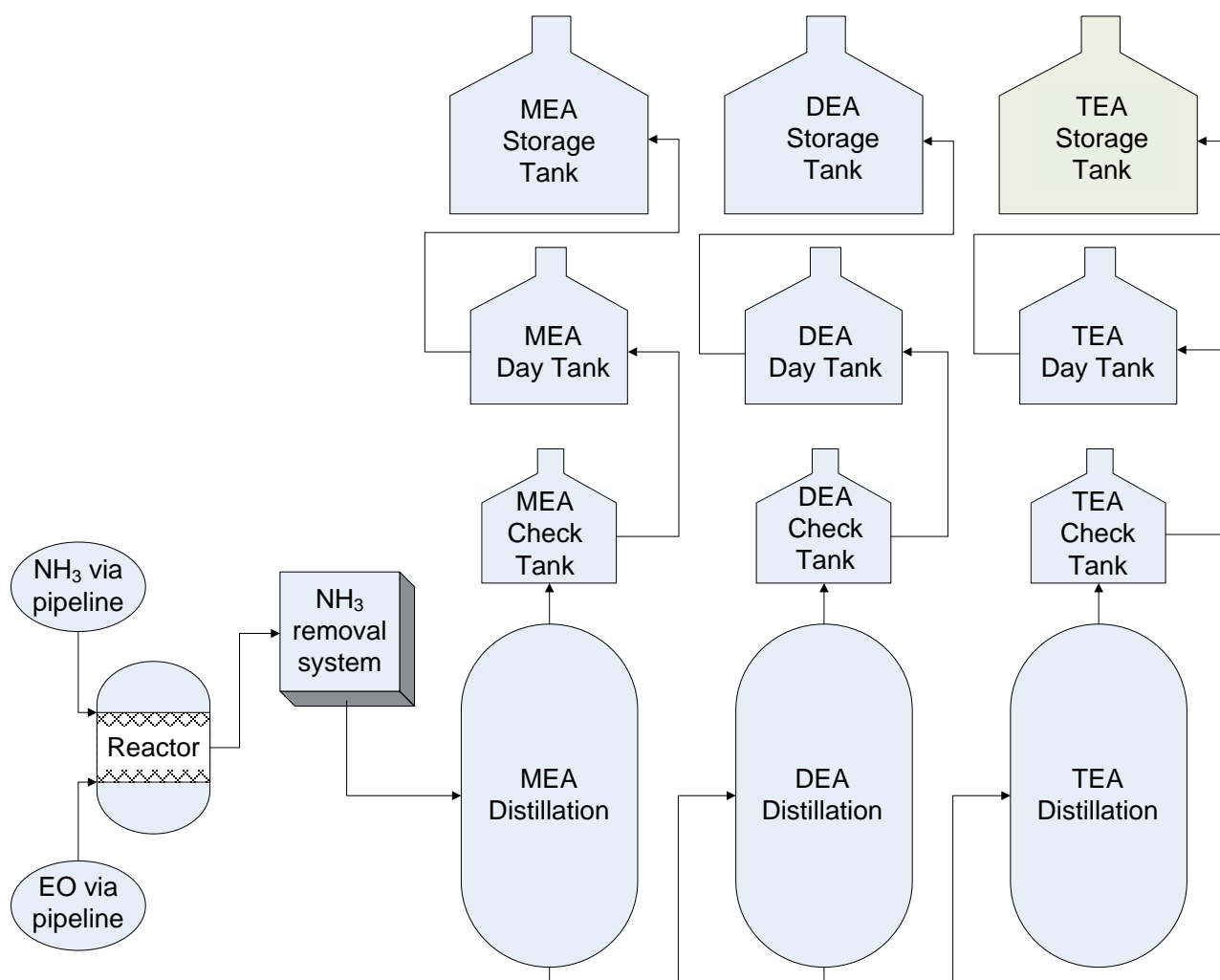
A handwritten signature in blue ink, appearing to read "Michael Dang", with a long horizontal flourish extending to the right.

Michael Dang  
Director, Quality Systems & GMP  
Compliance  
[mdang@spectrumchemical.com](mailto:mdang@spectrumchemical.com)

8.October.2018

## Manufacturing Process Flowchart

### Trolamine, NF - TR143



#### ***Spectrum Chemical Mfg Corp***

##### **Corporate Headquarters:**

769 Jersey Ave.  
New Brunswick, NJ 08901  
732.214.1300

##### **West Coast Facility:**

14422 S. San Pedro St.  
Gardena, CA 90248  
310.516.8000

# CERTIFICATE OF REGISTRATION

This is to certify that the quality management system of:

## Spectrum Chemicals and Laboratory Products, Inc.

Main Site: 14422 South San Pedro Street, Gardena, California, 90248,  
USA,

Additional sites: 13915 South Main Street, Los Angeles, California,  
90061, USA

769 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

755 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

777 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

400 N. Oracle, Suite 221, Tucson, Arizona, 85704, USA, USA

has been assessed and registered by Intertek as conforming to the  
requirements of:

## ISO 9001:2015

The quality management system is applicable to:

Main Site: The manufacture and distribution of specialty fine  
chemicals, solutions, equipment, supplies and products for the  
laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance,  
biotechnology, environmental and process industries.

**Certificate Number:**

94-316m-03

**Initial Certification Date:**

27 December 1994

**Certificate Issue Date:**

31 July 2017

**Certificate Expiry Date:**

28 January 2019



A handwritten signature in black ink, appearing to read 'Calin Moldovean', written over a horizontal line.

**Authorized Signature**

**Calin Moldovean**

President Business Assurance

Intertek Testing Services NA, Inc. dba Intertek  
900 Chelmsford Street, Lowell, MA, USA



# APPENDIX TO CERTIFICATE OF REGISTRATION

This appendix identifies the locations by the management system of

## Spectrum Chemicals and Laboratory Products, Inc.

755 and 769 Jersey Avenue: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.

777 Jersey Avenue: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for Compounding Pharmacies.

7400 N. Oracle: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.



# 管理体系认证 注册证书

兹证明，以下组织：

## 斯百全化学（上海） 有限公司

上海市松江区申港路3802弄A20

的管理体系，符合以下标准要求并予以注册：

### ISO 9001:2015

此管理体系适用于：

药用辅料销售，化学品销售

统一社会信用代码：

91310000777627048K

证书编号：

111310001

首次认证日期：

2015年11月17日

认证决定日期：

2017年12月26日

签发日期：

2017年12月26日

有效期至：

2018年11月10日



014

**Calin Moldovean**

President, Business Assurance

Intertek Certification Limited, 10A Victory  
Park, Victory Road, Derby DE24 8ZF, United  
Kingdom

Intertek Certification Limited  
是 UKAS 认可的认证机构，  
注册号为 014



# CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

## Spectrum China Ltd.

Building A20, No. 3802, Shengang Road, Songjiang District, Shanghai, China

has been registered by Intertek as conforming to the requirements of:

## ISO 9001:2015

The management system is applicable to:

Sales for Pharmaceutical Excipients, Sales for Chemicals

**Unified Social Credit Identifier:**

91310000777627048K

**Certificate Number:**

111310001

**Initial Certification Date:**

17 November 2015

**Date of Certification Decision:**

26 December 2017

**Issuing Date:**

26 December 2017

**Valid Until:**

10 November 2018



014

**Calin Moldovean**

President, Business Assurance

Intertek Certification Limited, 10A Victory  
Park, Victory Road, Derby DE24 8ZF, United  
Kingdom

Intertek Certification Limited is a  
UKAS accredited body under  
schedule of accreditation no. 014.



July 13, 2017

**Certification of Compliance with current Good Manufacturing Practices**

Dear Valued Customer:

Spectrum Chemical Mfg Corp certifies that our USP, NF, FCC, EP, BP, JP and food grade products are produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Spectrum is an FDA registered and inspected Drug Establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA:	<u>2020632</u>
Spectrum-New Brunswick, NJ:	<u>2246824</u>
Spectrum-Shanghai, China:	<u>3006174778</u>

Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at [qualityassurance@spectrumchemical.com](mailto:qualityassurance@spectrumchemical.com)

Sincerely,



Oralia Chavez  
Quality Assurance Specialist



October 8, 2018

**Certification of Compliance with current Good Manufacturing Practices**

Dear Valued Customer:

Spectrum Chemical Mfg Corp certifies that the following product(s) is produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Catalog Number	Product Name
TR143	Trolamine, NF

Spectrum is an FDA registered and inspected Drug Establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA: 2020632  
Spectrum-New Brunswick, NJ: 2246824  
Spectrum-Shanghai, China: 03006174778

Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at [qualityassurance@spectrumchemical.com](mailto:qualityassurance@spectrumchemical.com)

Sincerely,



Oralia Chavez  
Quality Assurance Specialist



March 31, 2016

Re: Trolamine, NF- TR143

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding Bovine Spongiform Encephalopathy (BSE). Please be assured that the chemical

Trolamine, NF- TR143

is BSE/TSE free.

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at [techservices@spectrumchemical.com](mailto:techservices@spectrumchemical.com).

Sincerely,

Darlene Dagdag- Lyudmirskiy  
Technical Services  
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



March 31, 2016

Re: Trolamine, NF – TR143

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding the presence of allergens in raw materials. Please be assured that the following chemical does not contain (Milk & derivatives, Egg & Egg products, Fish, Shellfish and other seafood, Tree Nut and tree nut oil products, Wheat, Peanut and peanut products, Soy products, soybean products & oil, Cereals such as rye, oats, containing Gluten, Celery, Animal fats & oils, Antibiotics, Autolyzed yeasts and extracts, Beef products & derivatives, Chocolate & derivatives, Citrus or Citric acid, Corn & Corn products, Dairy products, FD&C, Yellow #5 & #6, Artificial coloring, Glyceryl Monostearate, Monosodium Glutamate, Pork products & derivatives, Preservatives (BHA, BHT, antimicrobial agents), Rice & Rice products, Starch, Sulfur, Sulfates, Sulfites and Sulfur Dioxide, Sweeteners, Vegetable proteins and Seeds (Poppy, Sunflower, Cottonseed, Sesame Seed).

Trolamine, NF – TR143

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at [techservices@spectrumchemical.com](mailto:techservices@spectrumchemical.com).

Sincerely,

Darlene Dagdag- Lyudmirskiy  
Technical Services  
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



April 1, 2016

Re: Trolamine, NF-TR143

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfg. Corp. understand the concern regarding Aflatoxins in raw materials. To the best of our knowledge, the product listed below is not contaminated with Aflatoxins. Aflatoxins are not used in the production. The following product does not come in contact with Aflatoxins at any stage of production.

Trolamine, NF-TR143

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at [techservices@spectrumchemical.com](mailto:techservices@spectrumchemical.com).

Sincerely,

Darlene Dagdag- Lyudmirskiy  
Technical Services  
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature

Item Number	TR143	Lot Number	1HH0982
Item	Trolamine, NF		
CAS Number	102-71-6		
Molecular Formula	C <sub>6</sub> H <sub>15</sub> NO <sub>3</sub>	Molecular Weight	149.19

Test	Specification		Result
	min	max	
ASSAY TOTAL ALKANOLAMINES, AS N(CH <sub>2</sub> CH <sub>2</sub> OH) <sub>3</sub>	99.0	107.4 %	105.33 %
SPECIFIC GRAVITY @ 25°C	1.120	1.128	1.120
REFRACTIVE INDEX @ 20°C	1.481	1.486	1.48500
WATER DETERMINATION		0.5 %	0.01 %
RESIDUE ON IGNITION		0.05 %	0.00 %
ELEMENTAL IMPURITIES		AS REPORTED	COMPLIES WITH STANDARD
IDENTIFICATION		TO PASS TEST	PASSES TEST
RETEST DATE			31-AUG-2019
DATE OF MANUFACTURE			20-FEB-2018
APPEARANCE			CLEAR, COLORLESS LIQUID
RESIDUAL SOLVENTS		TO PASS TEST	NO RESIDUAL SOLVENTS USED

Spectrum Chemical Mfg Corp  
14422 South San Pedro Street  
Gardena 90248 CA



Certificate of Analysis Results Certified By:



Adan Hernandez  
Quality Control Manager  
Spectrum Chemicals & Laboratory Products

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Read and understand label and SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personnel only. It is the customer's responsibility to provide adequate hazardous material training and ensure that appropriate Personal Protective Equipment (PPE) is used before handling any chemical.

Item Number	TR143	Lot Number	2HH0329
Item	Trolamine, NF		
CAS Number	102-71-6		
Molecular Formula	C <sub>6</sub> H <sub>15</sub> NO <sub>3</sub>	Molecular Weight	149.19

Test	Specification		Result
	min	max	
ASSAY TOTAL ALKANOLAMINES, AS N(CH <sub>2</sub> CH <sub>2</sub> OH) <sub>3</sub>	99.0	107.4 %	105.33 %
SPECIFIC GRAVITY @ 25°C	1.120	1.128	1.120
REFRACTIVE INDEX @ 20°C	1.481	1.486	1.48500
WATER DETERMINATION		0.5 %	0.01 %
RESIDUE ON IGNITION		0.05 %	0.00 %
ELEMENTAL IMPURITIES		AS REPORTED	COMPLIES WITH STANDARD
IDENTIFICATION (A)	SPECTRUM MATCHES REFERENCE		SPECTRUM MATCHES REFERENCE
IDENTIFICATION (B)	BLUE COLOR REMAINS		BLUE COLOR REMAINS
IDENTIFICATION (C)	CARMINE RED COLOR PRODUCED		CARMINE RED COLOR PRODUCED
RETEST DATE			31-AUG-2019
DATE OF MANUFACTURE			20-FEB-2018
APPEARANCE			COLORLESS LIQUID
RESIDUAL SOLVENTS	AS REPORTED		NO RESIDUAL SOLVENTS USED

Spectrum Chemical Mfg Corp  
755 Jersey Avenue  
New Brunswick 08901 NJ



Certificate Of Analysis Results Certified by



Ibad Tirmizi  
Director of Quality  
Spectrum Chemical Mfg. Corp.

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Read and understand label and SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personnel only. It is the customer's responsibility to provide adequate hazardous material training and ensure that appropriate Personal Protective Equipment (PPE) is used before handling any chemical.

## Label Information


The Spectrum label presents technical and safety information in an easily understood format. Our technical specialists stay abreast of the latest requirements of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), as well as the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and other government regulatory agencies in order to ensure compliance, accuracy and concise hazard communication.

**WARNING**

- Causes serious eye irritation • Causes skin irritation • May cause an allergic skin reaction.
- Wear protective gloves, eye protection, face protection • Avoid breathing mist or vapors • Wash face, hands and any exposed skin thoroughly after handling • Contaminated work clothing must not be allowed out of the workplace.

**FIRST AID:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical attention.

**KEEP FROM CHILDREN**



**TR143** **20 L**

**Trolamine**  
(2,2',2''-Nitrilotriethanol;  
Triethanolamine)

N.F.  
CAS 102-71-6

**CAUTION:** For manufacturing, processing or repacking.  
**Read and understand the label and Safety Data Sheet (SDS) prior to use.**

**Chemical Emergency: (800)424-9300**  
[www.SpectrumChemical.com](http://www.SpectrumChemical.com)

$C_6H_{15}NO_3$  **F.W. 149.19**

Also contains Mono- and Diethanolamine.

Assay [Total Alkanolamines, as  $N(C_2H_4OH)_3$ ] ..... 99.0-107.4%  
Specific Gravity @ 25°C ..... 1.120-1.128  
Refractive Index @ 20°C ..... 1.481-1.486

**MAXIMUM LIMITS**

Water ..... 0.5%  
Residue on Ignition ..... 0.05%  
Residual Solvents ..... To pass test

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

**LIGHT SENSITIVE:** Keep tightly closed in light-resistant containers.

**Lot No. 062233**

**SPECTRUM CHEMICAL MFG. CORP.**

**Gardena, CA 90248 • New Brunswick, NJ 08901**

- |  |  |  |
|--|--|--|
| <p><b>A</b> Bar Code</p> <p><b>B</b> GHS Hazard Pictograms</p> <p><b>C</b> Warning, Safety Data and Precautionary Information</p> <p><b>D</b> Product Catalog Number</p> <p><b>E</b> Item Name, Form, Grade</p> <p><b>M</b> Storage Color Band</p> | <p><b>F</b> Size/Quantity</p> <p><b>G</b> Chemical Abstracts Service (CAS) Registry Number</p> <p><b>H</b> Caution Information</p> <p><b>I</b> Toll-Free 24-Hour Chemical Emergency Telephone Number</p> | <p><b>J</b> Empirical Formula, Formula Weight and Technical Specifications Panel</p> <p><b>K</b> Expiration Information</p> <p><b>L</b> Lot Number</p> |
|--|--|--|

This color-coded band indicates the hazard most likely to be posed by that material under storage conditions. The criteria used to assign band colors have been established by the Storage Code working group of the Society for Chemical Hazard Communication (SCHC). It is recommended that like colors be stored together, unless otherwise stated, based on the color codes indicated to the right. However, it is the responsibility of the customer to check with their local fire department for possible conflicts with our recommendations when storing hazardous chemicals.

- YELLOW:** Oxidizer
- RED:** Flammable
- GREEN:** General Storage
- BLUE:** Health Hazard
- WHITE:** Corrosive

### Spectrum Chemical Mfg Corp

**Corporate Headquarters:**

769 Jersey Ave.  
New Brunswick, NJ 08901

732.214.1300

**West Coast Facility:**

14422 S. San Pedro St.  
Gardena, CA 90248

310.516.8000

June 15, 2018

**RE: Lot Numbering System**

Dear Valued Customer:

This letter is to inform you of Spectrum Chemicals and Laboratory Products' Lot Numbering System. The system is based on an alpha-numerical sequence which provides the month, year and location of production.

The lot numbering system utilized until 2010 is a sequence of **six characters**, two letters followed by four numbers. The first letter represents the year, for example, Y denotes 2009 and Z denotes 2010. The second letter represents the month and site, for example, A-L denotes January through December at Spectrum's Gardena, CA facility, while M-X denotes January through December at the New Brunswick, NJ facility. The following four numbers are sequentially assigned.

**Example:** ZI0928 = The 928<sup>th</sup> material produced in California in September 2010

The lot numbering system utilized for 2011 and forward, is a sequence of **seven characters**. The first character, a number, represents the production facility:

- 1 = Gardena, CA Facility
- 2 = New Brunswick, NJ Facility
- 3 = China Facility

The second character, a letter, represents the year. For example, A denotes 2011 and B denotes 2012. The third character, a letter, represents the month, with A denoting January and L denoting December. The following four numbers are sequentially assigned.

**Example:** 2AA0706 = The 706<sup>th</sup> material produced in New Jersey in January 2011

Thank you for your interest with Spectrum products. Please feel free to contact us at 310-516-8000 or via email at [qualityassurance@spectrumchemical.com](mailto:qualityassurance@spectrumchemical.com) if we may be of further assistance.

Sincerely,



Michael Dang  
Director, Quality Systems & GMP Compliance  
[mdang@spectrumchemical.com](mailto:mdang@spectrumchemical.com)





## **Stability – Shelf Life Guidance**

Product Covered: TR143, Trolamine, NF

Spectrum Chemical's manufacturing partner has assigned the following shelf life guidance for the product listed above.

The product, TR143, Trolamine, NF, is assigned a 18 months shelf life from date of manufacturing. The quality and integrity of the chemical depends on the handling and storage conditions. Please refer to the Safety Data Sheet for proper storage and handling procedures.

Adan R. Hernandez  
Quality Control Manager

A handwritten signature in grey ink, appearing to read "Adan R. Hernandez".

Corporate Headquarters  
769 Jersey Avenue  
New Brunswick, NJ 08901-3605