

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

### Product identifier

**Product name:** AMCO 2213

### Other means of identification

**Product code:** 113

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

**Recommended use:** General purpose low temperature aluminum soldering flux

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

**Manufacturer:** Force Industries Division.  
28 Industrial Blvd. Paoli, PA 19301.

### Emergency Telephone number

For hazardous materials incidents only, call CHEMTREC Emergency Response Number: 1-800-424-9300.

For all other inquiries about this product, call Force Industries Division at 610-647-3575

**Revision Date: October 10, 2015**

**Supersedes: January 15, 2015**

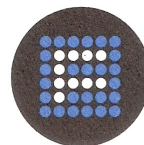
## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### **GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Corrosive to metals (Category 1)  
Acute toxicity, Oral (Category 3)  
Skin corrosion (Category 1B)  
Skin sensitization (Category 1)  
Serious eye damage (Category 1)  
Acute aquatic toxicity (Category 1)  
Chronic aquatic toxicity (Category 1)

For the full text of the H-Statements mentioned in this Section, see Section 16. Classification

**Hazard statement(s)**

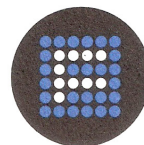
H290: May be corrosive to metals.  
H301: Toxic if swallowed.  
H302 + H312 + H332: Harmful if swallowed, in contact with skin or if inhaled  
H314: Causes severe skin burns and eye damage.  
H317: May cause an allergic skin reaction.  
H400: Very toxic to aquatic life.  
H410: Very toxic to aquatic life with long lasting effects.

**2.2 GHS Label elements, including precautionary statements****Emergency overview**

<b>Appearance:</b>	Amber
<b>Physical state:</b>	Viscous Liquid
<b>Odor:</b>	Ammoniac
<b>Signal Word:</b>	<b><u>DANGER</u></b>

**Precautionary statement(s)**

P234: Keep only in original container.  
P260: Do not breathe dust or mist.  
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.  
P273: Avoid release to the environment.  
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P301 + P330 + P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353: IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310: Immediately call a POISON CENTER or doctor/ physician.  
P321: Specific treatment (see supplemental first aid instructions on this label).  
P363: Wash contaminated clothing before reuse.



P390: Absorb spillage to prevent material damage.  
 P391: Collect spillage.  
 P405: Store locked up.  
 P406: Store in corrosive resistant stainless steel container with a resistant inner liner.  
 P501: Dispose of contents/ container to an approved waste disposal plant.

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Lachrymator.

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

### SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	EINECS No.	Weight %
Triethanolamine	102-71-6	203-049-8	20-30
Diethanolamine	111-42-2	203-868-0	0-10
Aminoethanolamine	111-41-1	203-867-5	25-35
Zinc oxide	1314-13-2	215-222-5	0-10
Ammonium Fluoroborate	13826-83-0	237-531-4	10-20
Fluoroboric Acid	16872-11-0	240-898-3	0-10
Stannous Fluoroborate	13814-97-6	237-487-6	0-5
Zinc Fluoroborate	13826-88-5	237-534-0	0-10

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of first aid measures

#### General advice

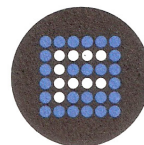
Consult a physician. Show this safety data sheet to the doctor in attendance.  
 Move out of dangerous area.

#### If inhaled

If breathed in, remove person to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.

#### In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

**If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

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

No data available

## SECTION 5: FIRE-FIGHTING MEASURES

**5.1 Extinguishing media**

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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

Ammonia, Hydrogen fluoride, Borane/boron oxides

**5.3 Advice for firefighters**

In the event of fire, wear self-contained breathing apparatus. Fire fighters must wear fire resistant personnel protective equipment. Wear chemical resistant over suit.

**5.4 Further information**

Hydrofluoric acid solution may be formed within water run off.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

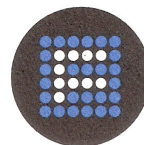
Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

**6.2 Environmental precautions**

Do not let product enter drains.

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



In case of accidental release or spill, immediately notify the appropriate authorities if required by Federal, State/Provincial and local laws and regulations. Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. Keep in properly labeled containers. Prevent product from entering drains. Clean spill area thoroughly. Local authorities should be advised if significant spillages cannot be contained.

#### **6.4 Reference to other sections**

For disposal see section 13. Personal precautions, protective equipment and emergency procedures

## **SECTION 7: HANDLING AND STORAGE**

#### **7.1 Precautions for safe handling**

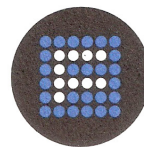
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.  
For precautions see section 2.2.

#### **7.2 Conditions for safe storage, including any incompatibilities**

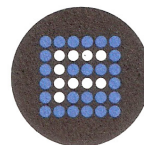
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Hygroscopic.

#### **7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.


**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**
**8.1 Control parameters**
**Components with workplace control parameters**

Component	CAS-No.	Value	Control parameters	Basis
Triethanolamine	102-71-6	TWA	5 mg/m <sup>3</sup>	ACGIH Threshold Limit Values (TLV)
N,N-Diethanolamine	111-42-2	TWA	5 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
N,N-Diethanolamine	111-42-2	TWA	1 mg/m <sup>3</sup>	SKIN
2-(2-aminoethylamino)ethanol	111-41-1	none	none	none
Zinc oxide	1314-13-2	TWA	2 mg/m <sup>3</sup>	TWA USA. ACGIH Threshold Limit Values (TLV)
Ammonium Fluoroborate	13826-83-0	TWA	2.5 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants USA. Occupational Exposure Limits (OSHA) - Table Z2
Fluoroboric Acid	16872-11-0	TWA	2.5 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants USA. Occupational Exposure Limits (OSHA) - Table Z2
Stannous Fluoroborate	13814-97-6	TWA	2.0 mg/m <sup>3</sup> (as Sn) 2.5 mg/m <sup>3</sup> (as F)	ACGIH Threshold Limit Values (TLV)



## 8.2 Exposure controls

### Appropriate engineering controls

General industrial hygiene practice.

### Personal protective equipment

#### Eye/face protection

Tightly fitting safety goggles or face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Body Protection

Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Control of environmental exposure

Do not let product enter drains.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

<b>Physical state:</b>	Viscous Liquid
<b>Odor:</b>	Ammoniac
<b>Color:</b>	Amber
<b>Flash point:</b>	>275 °F
<b>Vapor pressure:</b>	N/A
<b>Vapor density:</b>	N/A
<b>Specific gravity:</b>	1.30
<b>Water solubility:</b>	Complete
<b>pH:</b>	10-11

**9.2 Other safety information**

VOC content by volume: 8.6

## SECTION 10: STABILITY AND REACTIVITY

**10.1 Reactivity**

No data available

**10.2 Chemical stability**

Stable under recommended storage conditions

**10.3 Possibility of hazardous reactions**

No data available

**10.4 Conditions to avoid**

Avoid moisture.

**10.5 Incompatible materials**

Strong acids, bases cyanides, sulfides and oxidizing agents.

**10.6 Hazardous decomposition products**

Other decomposition products – no Reactivity

No dangerous reaction known under conditions of normal use

## SECTION 11: TOXICOLOGICAL INFORMATION

**Component toxicity**

Components	LC50/Inhalation/1h/Rat	LD50/Rabbit	LD50/Oral/Rat
Triethanolamine	No Data	No Data	5530 mg/kg
N,N-Diethanolamine	No Data	2000 mg /kg	4000 mg/kg
2-(2-aminoethylamino)ethanol	No data	2200 mg/kg	3000 mg/kg

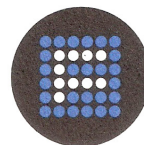
**Reproductive toxicity**

No data available

**Chronic Toxicity and Carcinogenicity**

Based on information for component(s): Triethanolamine. Findings from a chronic skin painting study by NTP include liver tumors in mice. Mechanistic studies indicate that tumor formation is of questionable relevance to humans. Findings





from a chronic diethanolamine skin painting study by NTP include liver and kidney tumors in mice; no tumors were observed in rats. Mechanistic studies indicate that tumor formation is of questionable relevance to humans. A number of factors may have influenced the results and are being considered in their interpretation.

### **Carcinogenicity:**

Triethanolamine - IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (2,2',2''-Nitrilotriethanol)  
N,N-Diethanolamine- IARC Possibly carcinogenic to humans.; 2B ACGIH  
Confirmed animal carcinogen with unknown relevance to humans.; Group A3

### **Developmental Toxicity**

For the major component(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. However, the relevance of this to humans is unknown. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

### **Reproductive Toxicity**

For the minor component(s): In animals, effects have been reported on the following organs: Male reproductive organs. Repeated excessive exposures to high amounts may cause effects on testes and fertility in males.

### **Genetic Toxicology**

Based on information for component(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

### **Specific target organ toxicity - single exposure**

No data available

### **Specific target organ toxicity - repeated exposure**

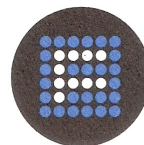
No data available

### **Aspiration hazard**

No data available

### **Additional Information**

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea

**SECTION 12: ECOLOGICAL INFORMATION****12. ECOLOGICAL INFORMATION****12.1 Toxicity**

Toxicity to fish LC50 - Danio rerio (zebra fish) - 2,600 mg/l - 96 h  
(OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates

EC50 - Daphnia magna (Water flea) - > 100 mg/l

Remarks: Information given is based on data on the components and the ecotoxicology of similar products.

Toxicity to algae NOEC - Pseudokirchneriella subcapitata (green algae) - > 100 mg/l  
– 72 hr Remarks: Information given is based on data on the components and the eco-toxicology of similar products.

**12.2 Persistence and degradability**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Indirect Photo degradation with OH Radicals

Rate Constant Atmospheric Half-life Method

1.20E-10 cm<sup>3</sup>/s 1.1 h Estimated OECD Biodegradation Tests: Biodegradation Exposure Time Method > 97 % 28 d OECD 301F Test

**12.3 Bio-accumulative potential**

No data available

**12.4 Mobility in soil**

Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 8.8E-10 atm\*m<sup>3</sup>/mole; 25 °C Estimated

Partition coefficient, n-octanol/water (log Pow): -1.46 Measured

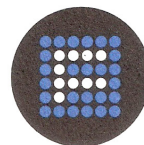
Partition coefficient, soil organic carbon/water (Koc): 3.5 Estimated

**12.5 Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Other adverse effects**

No data available

**SECTION 13: DISPOSAL CONSIDERATIONS****13.1 Waste treatment methods****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

**SECTION 14: TRANSPORT INFORMATION****U.S. Department of Transportation Ground (49CFR)**

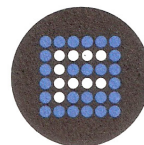
**Proper shipping name:** Corrosive Liquid NOS (aminoethylethanolamine, ammonium fluoroborate)  
**UN No.:** 1760  
**Packing Groups:** II  
**Hazard Class:** 8  
**Reportable Quantity (RQ):** None  
**Marine Pollutant:** No

**International Air Transportation (ICAO/IATA):**

**Proper shipping name:** Corrosive Liquid NOS (aminoethylethanolamine, ammonium fluoroborate)  
**UN No.:** 1760  
**Packaging Groups:** II  
**Hazard Class:** 8  
**Hazard labels:** **Corrosive**  
**IATA PKG Inst#** **855**  
**Cargo aircraft only**  
**ERG Guide Number:** **154**

**International Maritime Organization (IMO/IMDG):**

**Proper Shipping name:** Corrosive Liquid NOS aminoethylethanolamine, ammonium fluoroborate)  
**UN No.:** 1760  
**Packaging Groups:** II  
**Hazard Class:** 8  
**Hazard labels:** Corrosive  
**IMDG – Marine Pollutant:** No



## SECTION 15: REGULATORY INFORMATION

### International Inventories

USA (TSCA):                      Complies

### Federal Regulations

#### SARA Title III 313 Reportable Substances

This product contains the following chemicals which are subject to the reporting requirements of the Act and of Title 40 of the Code of Federal Regulations, Part 372

Chemical	CAS #	% by Weight
Zinc Compounds	N982	11
N,N-Diethanolamine	111-42-2	5

#### SARA Title III Section 311/312 Hazard Categories:

Acute Health Hazard

#### CERCLA Section 103

This product contains the following substances which are subject to CERCLA Section 103 reporting requirements and which are listed on 40 CFR 302.4

N,N-Diethanolamine 111-42-2

#### Toxic Substance Control Act (TSCA)

If listed below, non-proprietary substances are subject to export notification Section 12 (b) of TSCA:

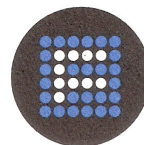
None listed

### State Regulations (RTK)

#### Pennsylvania Right to Know Components

Component	CAS No.
Fluoroboric Acid	16872-11-0
Ammonium Fluoroborate	13826-83-0
N,N-Diethanolamine	111-42-2
Triethanolamine	102-71-6
Zinc Oxide	1314-13-2
2-(2-aminoethylamino)ethanol	111-41-1

# SAFETY DATA SHEET



FORCE  
INDUSTRIES  
DIVISION

## New Jersey Right to Know Components

Component	CAS No.
Fluoroboric Acid	16872-11-0
Ammonium Fluoroborate	13826-83-0
N,N-Diethanolamine	111-42-2
Triethanolamine	102-71-6
Zinc Oxide	1314-13-2
2-(2-aminoethylamino)ethanol	111-41-1

## California Proposition 65

This product contains a chemical known in the State of California to cause cancer.  
N,N-Diethanolamine 111-42-2

## SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam. Serious eye damage

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

Skin corrosion

Skin sensitization

### HMIS:

**Health:** 3

**Flammability:** 0

**Reactivity:** 0

**PREPARATION INFORMATION:** Technical Service Department,  
Force Industries Division

**DISCLAIMER:** The data set forth in these sheets are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. Force Industries makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereon. Force Industries warrants only that its products conform to their published specifications and no other express warranty is made with regards thereof. We do not guarantee favorable results, and we assume no liability in connection with the use of the products. They are intended for use by persons having technical skill and knowledge, at their own discretion and risk.