SAFETY DATA SHEET

1. Identification

Product identifier **Copper Buffer**

Product code R-0642

Recommended use Use as directed by manufacturer for purposes directly related to water testing.

Recommended restrictions None known

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Taylor Technologies, Inc.

Address 31 Loveton Circle
Sparks, MD 21152
United States

Telephone (410) 472-4340 Monday—Friday, 8:00 a.m.–4:30 p.m.

Website www.taylortechnologies.com

E-mail Not available

Emergency phone number (800) 837-8548

2. Hazard(s) identification

Physical hazards This mixture does not meet the classification criteria according to OSHA HazCom 2012.

Health hazards

Eye damage/irritation	Category 1
Skin corrosion/irritation	Category 1
Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

Environmental hazards Not currently regulated by OSHA; refer to section 12 of the SDS for additional information.

Label elements

Signal word Danger

Hazard statement Causes severe skin burns and eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe mists. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area.

Response IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water.

Wash contaminated clothing before reuse.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Immediately call a physician or poison control center.

Storage Store locked up. Store in a well-ventilated place keep container tightly closed.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified None

Supplemental information None

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Deionized water	Dihydrogen oxide	7732-18-5	85–95
Ammonium chloride	Ammonium muriate	12125-02-9	5–10
Ammonium hydroxide	Aqueous ammonia	1336-21-6	0.1–5

4. First-aid measures

Inhalation Move to fresh air. Give oxygen or artificial respiration if needed. Get medical attention immediately.

Skin contact Immediately flush skin with running water for at least 20 minutes. Immediately take off all contaminated clothing. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 20 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Never give anything by mouth to a person who is unconscious or is having convulsions. Do NOT induce vomiting unless directed by physician. If vomiting occurs, keep head low so that stomach content does not get into the lungs.

Most important symptoms/effects, acute and delayed Direct skin contact may cause corrosive skin burns, deep ulcerations, and possibly permanent scarring. Direct contact with concentrated solutions may be corrosive to the eyes and may cause severe damage, including blindness. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Inhalation of mists can cause severe respiratory irritation. Symptoms may include coughing, choking, and wheezing. Inhalation could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed.

Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus, and possibly the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations, bleeding.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically.

Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep person under observation. Symptoms may be delayed.

General information Ensure medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Firefighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Firefighting equipment/instructions Firefighters should wear full protective gear. Evacuate the area promptly. Fight fire from upwind to avoid exposure to combustion products. Cool containers/tanks with water spray. Do not get water inside container. Move containers from fire area if it can be done without risk. Prevent fire-extinguishing water from contaminating surface water or the ground water system.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards Not combustible; however, the product can react with metals to form flammable and explosive hydrogen gas.

Hazardous combustion products Ammonia. Hydrogen chloride. Nitrogen oxide. Other irritating fumes and smoke.

6. Accidental release measures

Personal precautions, protective equipment, and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during cleanup. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protective equipment, refer to section 8 of the SDS.

Methods and materials for containment and cleaning up

This product is miscible in water.

Large Spills: Dike the spilled material where this is possible. Stop leak if it can be done without risk. Absorb spillage to prevent material damage. Absorb in vermiculite, dry sand or earth, and place into containers. Prevent entry into waterways, sewer, basements, or confined areas. Following product recovery, flush area with water.

Small Spills: Absorb spillage with noncombustible, absorbent material. Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for reuse. For waste disposal, refer to section 13 of the SDS. Dilute acid with water and neutralize with dilute base. If not recoverable, dilute with water or flush to holding area and neutralize. Contaminated absorbent material may pose the same hazards as the spilled product.

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

Environmental precautions

Avoid discharge into drains, watercourses, or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. For personal protective equipment, refer to section 8 of the SDS. Keep away from metals and other incompatibles. Observe good industrial hygiene practices. Label containers appropriately.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in corrosive-resistant container with a corrosive-resistant inner liner. Store in original tightly closed container. Keep only in the original container. Store in a cool, dry place out of direct sunlight. Store away from incompatible materials (refer to section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

U.S. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Ammonium hydroxide (CAS1336-21-6)	PEL	35 mg/m^3	Not applicable
		50 ppm	Not applicable

U.S. ACGIH Threshold Limit Values

Components	Type	Value	Form
Ammonium chloride (CAS 12125-02-9)	STEL	20 mg/m^3	Fume
	TWA	10 mg/m^3	Fume
Ammonium hydroxide (CAS1336-21-6)	STEL	35 ppm	Not applicable
	TWA	25 ppm	Not applicable

U.S. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Ammonium chloride (CAS 12125-02-9)	STEL	20 mg/m^3	Fume
	TWA	10 mg/m^3	Fume
Ammonium hydroxide (CAS1336-21-6)	STEL	27 mg/m^3	Not applicable
		35 ppm	Not applicable
	TWA	18 mg/m^3	Not applicable
	TWA	25 ppm	Not applicable

Biological limit values

No biological exposure limits noted for the ingredient(s)

Appropriate engineering controls

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. Eyewash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles) and a face shield. Provide an emergency eyewash fountain and quick-drench shower in the immediate work area.
Skin protection	
Hand protection	Wear appropriate chemical-resistant gloves. Advice should be sought from glove suppliers.
Other	Wear appropriate chemical-resistant clothing.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fumes at levels exceeding the exposure limits. Advice should be sought from respiratory protection suppliers.
Thermal hazards	When necessary, wear appropriate thermal protective clothing.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking and/or smoking. Routinely wash work clothing and protective equipment to remove contamination.

9. Physical and chemical properties

Appearance	
Physical state	Liquid
Form	Liquid
Color	Clear, colorless, or nearly colorless
Odor	Ammonical
Odor threshold	Not available
pH	9
Melting point/freezing point	Not available
Initial boiling point and boiling range	110–140°F (43.3–60°C)
Flash point	Not applicable (does not burn)
Evaporation rate	Not available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits	
Flammability limit, lower (%)	Not applicable
Flammability limit, upper (%)	Not applicable
Explosive limit, lower (%)	16% as NH_3
Explosive limit, upper (%)	27% as NH_3
Vapor pressure	143 mm Hg
Vapor density	0.6
Relative density	1.00 g/cm^3
Solubility(ies)	
Solubility (water)	Soluble in all proportions
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not applicable
Decomposition temperature	Not available
Viscosity	Not available
Other information	
Explosive properties	Not applicable
Oxidizing properties	Not applicable

Percent volatile	80%
Specific gravity	1.00

10. Stability and reactivity

Reactivity	This product is stable and nonreactive under normal conditions of use, storage, transport.
Chemical stability	Material is stable under normal conditions. Ammonia gas may be liberated at high temperatures.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use
Conditions to avoid	Contact with incompatible materials. Direct sunlight. Do not use in areas without adequate ventilation.
Incompatible materials	Halogens. Metal compounds. Oxidizing agents. Strong acids.
Hazardous decomposition products	None known. For hazardous combustion products, refer to section 5 of the SDS.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system
Skin contact	Causes severe skin burns
Eye contact	Causes serious eye damage
Ingestion	Causes digestive tract burns
Most important symptoms/effects, acute and delayed	Direct skin contact may cause corrosive skin burns, deep ulcerations, and possibly permanent scarring. Direct contact with concentrated solutions may be corrosive to the eyes and may cause severe damage, including blindness. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Inhalation of mists can cause severe respiratory irritation. Symptoms may include coughing, choking, and wheezing. Inhalation could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus, and possibly the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations, bleeding.
Acute toxicity	This product is not classified as an acute toxicity hazard. See below for individual ingredient acute toxicity data.

Components	Species	Test Results
Ammonium chloride (CAS 12125-02-9)		
Acute		
Dermal		
LD_{50}	Rabbit	Not available
Inhalation		
LC_{50}	Rat	Not available
Oral		
LD_{50}	Rat	1650 mg/kg
Ammonium hydroxide (CAS 1336-21-6)		
Acute		
Dermal		
LD_{50}	Rabbit	Not available
Inhalation		
LC_{50}	Rat	Not available
Oral		
LD_{50}	Rat	350 mg/kg
Deionized water (CAS 7732-18-5)		
Acute		
Dermal		
LD_{50}	Rabbit	Not available

Inhalation		
LC_{50}	Rat	Not available
Oral		
LD_{50}	Rat	>89840 mg/kg

Skin corrosion/irritation Causes severe skin burns

Serious eye damage/eye irritation Causes serious eye damage

Respiratory sensitization Not expected to be a respiratory sensitizer

Skin sensitization Not expected to be a skin sensitizer

Germ cell mutagenicity Not expected to be mutagenic

Carcinogenicity This product is not considered to be a carcinogen by IARC, NTP, OSHA, or U.S. ACGIH.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1096)

Not regulated

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity, single exposure May cause respiratory irritation

Specific target organ toxicity, repeated exposure Not classified as a specific target organ toxicity – repeated exposure

Aspiration toxicity Not expected to be an aspiration hazard

Chronic effects Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

12. Ecological information

Ecotoxicity This product is not classified as environmentally hazardous; however, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results
Ammonium chloride (CAS 12125-02-9) – Aquatic		
Acute		
Crustacea		
EC_{50}	Water flea *(Daphnia magna)*	101 mg/L, 48 hours
Fish		
LC_{50}	Carp *(Cyprinus carpio)*	209 mg/L, 96 hours
Chronic		
Crustacea		
EC_{50}	Water flea *(Daphnia magna)*	14.6 mg/L, 21 days
Fish		
LC_{50}	Carp *(Cyprinus carpio)*	11.8 mg/L, 28 days
Ammonium hydroxide (CAS 1336-21-6) – Aquatic		
Acute		
Crustacea		
EC_{50}	Water flea *(Daphnia magna)*	0.66 mg/L, 48 hours
Fish		
LC_{50}	Fathead minnow *(Pimephales promelas)*	8.2 mg/L, 96 hours

Persistence and degradability Not available

Bioaccumulative potential

Partition coefficient n-octanol / water (log K_{ow})

Ammonium chloride (CAS 12125-02-9)	-4.73

Mobility in soil High water solubility indicates a high mobility in soil.

Other adverse effects No other adverse environmental effects (e.g., ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose of in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose of in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion with the user, the producer, and the waste disposal company.
Waste from residues/unused products	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (refer to Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste-handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transportation information

DOT

UN number	UN2762
UN proper shipping name	Ammonia solution
Transport hazard class(es)	
Class	8
Subsidiary risk	Not listed
Label(s)	8
Packing group	III
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.
Special provisions	IB3, IP8, T7, TP1
Packaging exceptions	154
Packaging, non-bulk	203
Packaging, bulk	241

IATA

UN number	UN2762
UN proper shipping name	Ammonia solution
Transport hazard class(es)	
Class	8
Subsidiary risk	Not listed
Packing group	III
Environmental hazards	Not listed
ERG code	8L
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed
Cargo aircraft only	Allowed

IMDG

UN number	UN2762
UN proper shipping name	Ammonia solution
Transport hazard class(es)	
Class	8
Subsidiary risk	Not listed
Packing group	III
Environmental hazards	
Marine pollutant	Not listed
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

This substance/mixture is not intended to be transported in bulk.

DOT

IATA; IMDG

15. Regulatory information

U.S. federal regulations

This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory list.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated

CERCLA Hazardous Substance (40 CFR 302.4)

Ammonium chloride (CAS 12125-02-9)

Ammonium hydroxide (CAS 1336-21-6)

SARA 304 Emergency Release Notification

Not regulated

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1096)

Not regulated

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate hazard ─ yes
Delayed hazard ─ no
Fire hazard – no
Pressure hazard ─ no
Reactivity hazard – no

SARA 302 Extremely Hazardous Substance

Not regulated

SARA 311/312 Hazardous Chemical

Listed

SARA 313 (TRI reporting)

Chemical name	CAS number	% by weight
Ammonium chloride	12125-02-9	0.1–5
Ammonium hydroxide	1336-21-6	5–10

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs)

Not regulated

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated

Safe Drinking Water Act (SDWA)

Not regulated

U.S. state regulations

California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not regulated

Massachusetts Right-to-Know Act

Ammonium chloride (CAS 12125-02-9)
Ammonium hydroxide (CAS 1336-21-6)

New Jersey Worker and Community Right-to-Know Act

Ammonium chloride (CAS 12125-02-9)
Ammonium hydroxide (CAS 1336-21-6)

Pennsylvania Worker and Community Right-to-Know Act

Ammonium chloride (CAS 12125-02-9)
Ammonium hydroxide (CAS 1336-21-6)

Rhode Island Right-to-Know Act

Ammonium chloride (CAS 12125-02-9)
Ammonium hydroxide (CAS 1336-21-6)

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International inventories

Country(ies) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	yes
Canada	Domestic Substances List (DSL)	yes
Canada	Non-Domestic Substances List (NDSL)	no
China	Inventory of Existing Chemical Substances Produced or Imported in China (IECSC)	yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	yes
Europe	European List of Notified Chemical Substances (ELINCS)	no
Japan	Existing and New Chemical Substances (ENCS)	yes
Korea	Existing Chemicals List (ECL)	yes
New Zealand	New Zealand Inventory of Chemicals (NZIoC)	yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA)	yes

*A “yes” indicates that all components of this product comply with the inventory requirements administered by the governing country(ies).

A “no” indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(ies).

16. Other information, including date of preparation or last revision

List of abbreviations

ACGIH: American Conference of Governmental Industrial Hygienists
AICS: Australian Inventory of Chemical Substances
CAA: Clean Air Act
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
CFR: Code of Federal Regulations
CSA: Canadian Standards Association
DEA: Drug Enforcement Agency
DOT: Department of Transportation
DSL: Domestic Substances List
EC: effective concentration
ECL: Existing Chemicals List
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
ENCS: Existing and New Chemical Substances
EPA: Environmental Protection Agency
HAP: hazardous air pollutants
HMIS: Hazardous Materials Identification System
HNOC: hazards not otherwise classified
HPA: Hazardous Products Act
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
ICAO: International Civil Aviation Organization
IECSC: Inventory of Existing Chemical Substances Produced or Imported in China
IMDG: International Maritime Dangerous Goods
IUCLID: International Uniform Chemical Information Database
LC: lethal concentration
LD: lethal dose
MARPOL: marine pollution
MSHA: Mine Safety and Health Administration

NDSL: Non-Domestic Substances List
NFPA: National Fire Protection Association
NIOSH: National Institute of Occupational Safety and Health
NOEC: no observable effect concentration
NTP: National Toxicology Program
NZIoC: New Zealand Inventory of Chemicals
OECD: Organisation for Economic Co-operation and Development
OEL: occupational exposure limits
OSHA: Occupational Safety and Health Administration
PEL: permissible exposure limits
PICCS: Philippine Inventory of Chemicals and Chemical Substances
PPE: personal protective equipment
RCRA: Resource Conservation and Recovery
Act RQ: reportable quantity
RTECS: Registry of Toxic Effects of Chemical Substances
RTK: right to know
SARA: Superfund Amendments and Reauthorization Act
SDS: Safety Data Sheet
SDWA: Safe Drinking Water Act
STEL: short-term exposure limit
TLV: threshold limit values
TSCA: Toxic Substances Control Act
TWA: time-weighted average
VOC: volatile organic compounds
WEL: workplace exposure limit

Disclaimer

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