CROWN ALLOYS COMPANY

SAFETY DATA SHEET

Section 1 – PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Inorganic Acid Soldering Flux**

PRODUCT IDENTIFICATION: **#95 LIQUID SOLDERING FLUX**

SPECIFICATION: N/A

RECOMMENDED USE: For use in soldering (S) applications of all metals except aluminum and magnesium.

SUPPLIER: Crown Alloys Company
30105 Stephenson Hwy.
Madison Heights, MI. 48071

TELEPHONE NUMBER: (248) 588-3790

EMERGENCY NUMBER: **Call CHEMTREC Day or Night 1-800-424-9300 / +1 703-527-3887**

WEBSITE: www.crownalloys.com

Section 2 – HAZARDS IDENTIFICATION

2.1 Classification of the mixture

This product is placed on the market in liquid form

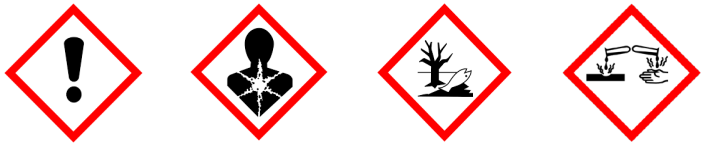
2.1.1 Classification in accordance with GHS-US

Acute Tox., oral 4	H302	Eye Dam. 1	H318	STOT SE 3	H335
Acute Tox., dermal 4	H312	Acute Tox., inhalation 4	H332	Aquatic Acute 2	H401
Skin Corr. 1A	H314	Eye Irrit. 2	H319	Aquatic Chronic 2	H411
Skin Irrit. 2	H315				

2.2 Label elements

GHS-US labelling

Hazard Pictograms (GHS-US):



GHS07 GHS08 GHS09 GHS05

Signal word (GHS-US): Danger

Hazard statements (GHS-US):

H302 – Harmful if swallowed
H312 – Harmful in contact with skin
H314 – Causes severe skin burns and eye damage
H315 – Causes skin irritation
H318 – Causes serious eye damage
H319 – Causes serious eye irritation
H332 – Harmful if inhaled
H335 – May cause respiratory irritation
H401 – Toxic to aquatic life
H411 – Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US):

P102 – Keep out of reach of children
P202 – Do not handle until all safety precautions have been read and understood
P260 – Do not breathe dust/fume/gas/mist/vapors/spray

P261 – Avoid breathing dust/fume/gas/mist/vapors/spray
P262 – Do not get in eyes, on skin, or on clothing
P264 – Wash thoroughly after handling
P270 – Do not eat, drink or smoke when using this product
P273 – Avoid release to the environment
P280 – Wear protective gloves/protective clothing/eye protection/face protection
P281 – Use personal protective equipment as required
P301 + P312 – IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell
P302 + P352 – IF ON SKIN: Wash with plenty of soap and water
P303+P361+P353 – If on skin or hair, remove/takeoff 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
P308 + P313 – IF exposed or concerned: Get medical advice/attention
P314 – Get medical advice and attention if you feel unwell
P337 + P313 – If eye irritation persists: Get medical advice/attention
P362 – Take off contaminated clothing and wash before reuse
P405 – Store locked up
P501- Dispose of contents/container in accordance with local / regional / national / international regulations

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2.3 Other hazards

No additional information available

2.4 Unknown acute toxicity (GHS-US)

No data available

Other hazards which do not result in GHS classification:
(When product is used in conjunction with soldering/brazing)

Heat rays (infrared radiation) from flame or hot metal can injure eyes. Overexposure to soldering/brazing fumes and gases can be hazardous.
Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this flux. Refer to Section 8.

Substance(s) formed under the conditions of use:

The soldering/brazing fumes produced from this soldering flux may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below:

Chemical Identity	CAS-No.	Chemical Identity	CAS-No.	Chemical Identity	CAS-No.
Carbon Dioxide	124-38-9	Ozone	10028-15-6	Nitrogen Dioxide	10102-44-0
Carbon Monoxide	630-08-0				

Section 3 – COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

Full text of H-phrases: See section 16

3.2 Mixture

Reportable Hazardous Ingredients:

Hazardous components 1% or greater; Carcinogens 0.1% or greater

Chemical Identity	CAS-No.	Weight Percent (%)	GHS-US Classification
Ammonium bifluoride	1341-49-7	3.0 – 10.0	H314
Ammonium chloride	12125-02-9	4.0 – 22.0	Not classified
Hydrochloric acid	7647-01-0	3.0 – 19.0	H314
Zinc chloride	7646-85-7	30.0 – 50.0	H314

Section 4 – FIRST AID MEASURES

4.1 Description of first aid measures

Ingestion: Call a physician or Poison Control Center. Advise of chemical composition (Section 3). Do not induce vomiting. Give large quantities of water, milk or 5% sodium bicarbonate solution.

Inhalation: Terminate exposure and remove to fresh air. Call physician; advise of chemical composition (Section 3). Provide oxygen.

Skin Contact: Promptly flush with water to remove any residue. If a rash or burn develops, consult a physician. Product is corrosive.

Eye Contact: Flush with water for at least 15 minutes to remove irritant. Remove contact lenses, if present and easy to do. Continue rinsing. Consult a physician.

4.2 Most important symptoms/effects, acute and delayed

Medical Conditions Aggravated by Exposure: May aggravate existing eye, skin, or upper respiratory conditions.

Symptoms/injuries after inhalation: High vapor/mist concentration exposure can cause pulmonary edema. Irritates respiratory system; coughing and sneezing. Aggravates existing lung disorders. Can cause severe burns to the respiratory system.

Symptoms/injuries after skin contact: Can cause severe burns to the skin. Can cause contact burns or irritation to the skin (scarring).

Symptoms/injuries after eye contact: Can cause irritation to the eyes, tearing, burning of the eye surface. Corrosive to eyes. May cause blindness.

Symptoms/injuries after ingestion: Can cause abdominal pain and vomiting. Can have possible liver and kidney effects. Can cause damage to digestive system. Corrosive to mucous membranes.

4.3 Indication of immediate medical attention and special treatment needed

No additional information available

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Section 5 – FIRE-FIGHTING MEASURES

General Fire Hazards:
(When product is used in conjunction with welding)

Welding arc and sparks can ignite combustibles and flammable products. Read and understand American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" before using this product.

5.1 Extinguishing media

Suitable extinguishing media: Use film forming foam, dry chemical powder, water fog or carbon dioxide (CO_2). DO NOT USE WATER ON MOLTEN METAL; LARGE FIRES MAY BE FLOODED WITH WATER FROM A DISTANCE

Unsuitable extinguishing media: None known

5.2 Special hazards arising from the substance

Fire hazard: None known

Flammability Limits in Air by Volume: LOWER: N/A UPPER: N/A

Products of Combustion: Carbon monoxide and carbon dioxide. When heated to decomposition, it emits acrid smoke and irritating fumes.

Incompatibility: Incompatible with strong oxidizing agents, strong acids, cyanides and strong alkalis. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Unusual Fire and Explosion hazard: Dense smoke may be generated. Will release small amounts of HCl and zinc oxide upon decomposition. Toxic metal halide fumes produced. Application to hot surfaces requires special precautions. Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable.

5.3 Special protective equipment and precautions for firefighters

Special firefighting procedures: Use water spray to cool containers exposed to heat or fire to prevent pressure build-up. In the event of a fire, wear full protective clothing and NIOSH approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

Special protective equipment for firefighters: Firefighters should wear full protective gear.

Section 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear the appropriate protective equipment as conditions warrant. Do not touch or walk through spilled material.

6.2 Environmental precautions

Contain spill to prevent material from entering sewage or ground water systems.

6.3 Methods and material for containment and cleaning up

Contain, absorb, sweep-up and dispose. Flush area to a chemical sewer. First neutralize with soda ash or sodium bicarbonate, dilute with water and dispose of in accordance with EPA regulations.

Section 7 – HANDLING AND STORAGE

7.1 Precautions for safe handling

Do not eat, drink or smoke while working with the #95 Liquid Soldering Flux. Wash hands thoroughly after handling. Wash hands before eating. Avoid breathing vapor or mist. Avoid contact of raw material with eyes, skin and clothing. Professionally wash contaminated clothing before re-use. Follow all SDS/label precautions even after container is emptied because it may retain product residues. Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the American Welding Society, http://pubs.aws.org and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, www.gpo.gov.

7.2 Conditions for safe storage, including any incompatibilities

Store flux in a plastic, well-sealed container at ambient conditions, with temperatures between 35º to 80ºF (2º to 27ºC). Keep containers tightly closed. Store away from incompatible materials. Store in accordance with local/regional/national regulations.

7.3 Specific end use(s)

The #95 Liquid Soldering Flux cleans metals and removes oxides in order to produce strong soldered joints.

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Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Chemical Identity (CAS-No.)	ACGIH TLV (TWA)	OSHA PEL (TWA)	ACGIH TLV (STEL)	NIOSH	SARA SEC. 313*
Ammonium bifluoride (1341-49-7)	2.5 mg/m^3 (as F)	2.5 mg/m^3 (as F) 2.5 mg/m^3 (dust)	N/A	N/A	YES
Ammonium chloride (12125-02-9)	10.0 mg/m^3	10.0 mg/m^3	N/A	10.0 mg/m^3	
Hydrochloric acid (7647-01-0)	2.0 ppm (ceiling)	5.0 ppm (ceiling) 7.0 mg/m^3 (ceiling)	N/A	5.0 ppm (ceiling) 7.0 mg/m^3 (ceiling) IDLH: 50.0 ppm	YES
Zinc chloride (7646-85-7)	1.0 mg/m^3	1.0 mg/m^3	N/A	N/A	YES

*Ingredients marked "YES" are subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.

8.2 Exposure controls

Appropriate Engineering Controls: (When used in conjunction with soldering/brazing)

Use enough ventilation or local exhaust, or both to keep the fumes and gases from the worker's breathing zone & the general area. Remove decomposition products formed during soldering/brazing with this product. Maintain exposures below acceptable exposure levels (see Section 8.1). Use industrial hygiene air monitoring to ensure that your use of this product does not create exposures that exceed the recommended exposure limits. Always use exhaust ventilation in user operations such as soldering/brazing. Train the welder to keep his head out of the fume plume. Confined spaces require adequate ventilation and/or air supplied respirators. Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society, 8669 Doral Blvd. Suite 130, Doral, FL 33166 and OSHA Publication 2206 (29CFR1910), US Government Printing Office, Washington, D.C. 20402 for more details on many of the following.

Eye/face protection: At a minimum, always wear safety glasses with side shields. Additional protection such as welding goggles, face shields or respirators may be required. Shield others by providing screens safety glasses.

Skin/Hand Protection: Wear protective gloves. Chemically resistant gloves (neoprene, butyl or nitrile rubber) are recommended.

Respiratory Protection: **General Respiratory Welding Controls:**
Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV's (see Section 8.1). Use only NIOSH approved respirators in accordance with 29 CFR 1910.134 – Respiratory Protection. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998) and ANSI Z88.2.

Hygiene Measures: **DO NOT EAT, DRINK OR SMOKE WHEN USING THE PRODUCT. ALWAYS OBSERVE GOOD PERSONAL HYGIENE MEASURES, SUCH AS WASHING AFTER HANDLING THE MATERIAL AND BEFORE EATING, DRINKING, AND/OR SMOKING. COSMETICS SHOULD NOT BE APPLIED IN AREAS WHERE EXPOSURES EXIST! ROUTINELY WASH WORK CLOTHING AND PROTECTIVE EQUIPMENT TO REMOVE CONTAMINANTS.**

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Salmon colored transparent liquid
Physical state	Liquid
Color	Salmon
Odor	No significant odor
Specific gravity (H_2O=1)	1.50
Water reactive	None
Evaporation rate (Butyl Acetate=1)	0.6
Percent volatile by volume	55%

Active temperature range	Between 350º-550ºF (177º-288ºC)
Boiling point	220ºF/104ºC
Vapor pressure	Not established
Vapor density (Air=1)	Not established
Solubility in water	Appreciable
Partition coefficient (n-octanol/water)	Not established
Auto-ignition temperature	Not established
Decomposition temperature	Not established

Section 10 – STABILITY AND REACTIVITY

10.1 Reactivity

This product is non-reactive under normal conditions of use, storage and transport.

10.2 Chemical stability

This product is stable under normal conditions.

10.3 Possibility of hazardous reactions (hazardous polymerization)

Will not occur under normal conditions.

10.4 Conditions to avoid

Avoid ignition sources, open flames, temperatures above 120ºF, strong acids and strong bases.

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10.5 Incompatible materials

Incompatible with strong oxidizing or reducing agents, strong acids, strong alkalis, cyanides or combustible materials.

10.6 Hazardous decomposition products

Zinc chloride, zinc oxide, ammonium and HCl.

Note the below likely hazardous decomposition products from general soldering/brazing operations:

Soldering/brazing fumes & gases can't be classified simply. The composition & quantity of both are dependent upon the metal being soldered/brazed & the rods used. Coatings on the metal being soldered/brazed (such as paint, plating, or other coating), the number of welders, the volume of the work area, the quality & the amount of ventilation, the position of the welder's head with respect to the gas plume, the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning & degreasing activities) as well as the process & procedures. Ozone & nitrogen oxides may be formed by the radiation from an arc, in addition to the shielding gases like argon & helium, whenever they are employed.

Section 11 – TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Ingestion: Not an anticipated route of exposure during normal product handling. However, ingestion can cause damage to the digestive system and it is corrosive to the mucous membranes. Harmful if swallowed.

Inhalation: Avoid breathing fumes, spray, vapors or mist. High vapor concentrations are irritating to the eyes, nose, throat and lungs. Can cause coughing and sneezing. Aggravates existing lung disorders. Prolonged or excessive inhalation may cause respiratory tract irritation.

Skin Contact: Can cause severe burns to the skin. Can cause contact burns or irritation to the skin (scarring).

Eye contact: Can cause irritation to the eyes, tearing, burning of the eye surface. Corrosive to eyes. May cause blindness.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure): Harmful if swallowed

Specified substance: ZINC CHLORIDE LD50 (acute oral toxicity, rat) = 350 mg/kg	**Specified substance: AMMONIUM BIFLUORIDE** LD50 (acute oral toxicity, rat) = 130 mg/kg
Specified substance: AMMONIUM CHLORIDE LD50 (oral, rat) = 1650 mg/kg	**Specified substance: HYDROCHLORIC ACID** LD50 (oral, rat) = 238 - 277 mg/kg LD50 (dermal, rabbit) > 5010 mg/kg LC50 (inhalation, rat) = 1.68 mg/l /1h

Skin corrosion/irritation (product): Burns; immediate hazard.

Serious eye damage/irritation (product): Irritation to eyes, tearing, burns eye surfaces, corrosive to eyes. May cause blindness.

Respiratory or skin sensitization (product): Irritates respiratory system, coughing and sneezing. Aggravates existing lung disorders.

Germ cell mutagenicity (product): Not classified

Carcinogenicity (product):

NTP: N/A
IARC: N/A
OSHA: N/A

Reproductive toxicity (product): Not classified

Genetic Toxicity (product): Negative results from animal studies

Specific target organ toxicity - single exposure (product): Not classified

Specific target organ toxicity - repeated exposure (product): Not classified

Aspiration hazard (product): Not classified

Other Effects: Not classified

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use: Not classified

Additional toxicological information under the conditions of use:

Acute toxicity: Not classified

Section 12 – ECOLOGICAL INFORMATION

Product is a mixture of listed components (see Section 3)

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Specified substance: HYDROCHLORIC ACID LC50 (Gambusia affinis), 96 h): 282 mg/l	**Specified substance: ZINC CHLORIDE** LC50 (Cyprinus carpio), 96 h): 0.4 – 2.2 mg/l EC50 (Daphnia magna), 48 h): 0.2 mg/l
Specified substance: AMMONIUM CHLORIDE LC50 (Cyprinus carpio), 96 h): 209 mg/l	LC50 (Oncorhynchus mykiss), 96 h): 3.98 mg/l NOEC (Oncorhynchus mykiss), 96 h): 57 mg/l

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Aquatic Invertebrates

Specified substance: HYDROCHLORIC ACID EC50 (Daphnia), 72 h): 56 mg/l	**Specified substance: ZINC CHLORIDE** EC50 (Daphnia magna), 48 h): 0.2 mg/l
Specified substance: AMMONIUM CHLORIDE LC50 (Daphnia magna), 48 h): 161 mg/l	Growth inhibition NOEC (Daphnia magna), 216 h): 0.1 mg/l

Algae

Specified substance: ZINC CHLORIDE Growth inhibition LOEC (Pseudokirchneriella subcapitata), 96 h): 12.5 mg/l

This product poses a slight ecological hazard. In high concentrations, this product may be dangerous to plants, wildlife, and/or aquatic life.

General notes: Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. There could be a danger to drinking water if large quantities leak into the ground.

Chronic hazards to the aquatic environment:

Fish (product): Not classified

Aquatic Invertebrates (product): Not classified

Persistence and Degradability
Biodegradation (product): This product will not biodegrade.

Bioaccumulative Potential: No Data Available

Mobility in Soil: No Data Available

Octanol/Water partition coefficient: No Data Available

Organic carbon/Water partition coefficient: No Data Available

Atmospheric half-life: No Data Available

PBT assessment: Not applicable

vPvB assessment: Not applicable

Other Adverse Effects: No Data Available

Section 13 – DISPOSAL CONSIDERATIONS

Product Disposal Method: Must NOT be disposed of together with household garbage. Collect and reclaim or dispose in sealed containers at a licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Under RCRA, it is the responsibility of the user of the final product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This product should be disposed of in accordance with all applicable federal, state and local regulations.

Do not discard into any sewers, on the ground or into any bodies of water.

Contaminated Container or Packaging: Since emptied containers may retain product residue, follow label warnings even after container is emptied. Dispose of spent plastic bottles and packaging in accordance with all federal, state, regional and/or local regulations.

Section 14 – TRANSPORT INFORMATION

In accordance with DOT (Ground) and IATA (Air)

14.1 UN number

UN 3264

14.2 UN proper shipping name

Corrosive liquid, N.O.S. (Zinc Chloride, Hydrochloric Acid)

14.3 Additional information

DOT Shipping Information:

DOT Shipping Name: Corrosive liquid

Hazard Class or Division: 8

UN Number: 1993

Packing Group: III

ERG Guide Number: 60

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Section 15 – REGULATORY INFORMATION

15.1 US Federal regulations

Toxic Substances Control Act
The product on this SDS, or all of its components, is listed under TSCA.

Workplace classification
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Section 313

Zinc chloride (7646-85-7)	**Hydrochloric acid (7647-01-0)**
Listed on SARA Section 313 of Title III (Specific toxic chemical listings) CERCLA Hazardous Substance List (40 CFR part 372)	Listed on SARA Section 313 of Title III (Specific toxic chemical listings) CERCLA Hazardous Substance List (40 CFR part 372)

CERCLA – SARA Hazard Category
This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Immediate Health Hazard – YES	Fire Hazard – NO
Chronic Health Hazard – YES	Reactivity Hazard – YES

SARA requires reporting any spill of any hazardous substance

RoHS, REACH and REACH-SVHC Compliance:
This product is RoHS and REACH Compliant. This product is free of REACH-SVHC substances.

15.2 US State regulations

California Proposition 65:

Chemicals known to cause cancer:
None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed

Chemicals known to cause developmental toxicity:
None of the ingredients is listed

Zinc chloride (7646-85-7)	
U.S. - Massachusetts - Right To Know List U.S. - Rhode Island - Right To Know List	U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Hydrochloric acid (7647-01-0)	
U.S. - Massachusetts - Right To Know List U.S. - Rhode Island - Right To Know List U.S. - Illinois - Right To Know List	U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Ammonium bifluoride (1341-49-7)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List	U.S. - Pennsylvania - RTK (Right to Know) List

Section 16 – OTHER INFORMATION

SUPERSEDES LAST REVISION: 03/02/2018 (SDS)

HMIS RATING (Hazardous Materials Information System)			
Health (blue) - 1	**Flammability (red) - 0**	**Reactivity (yellow) - 1**	**Protective Equipment - X** (See Sections 4, 8 & 10)

Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; one time overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal).

Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93ºC [100-200ºF]); **3** (Class IB and IC flammable liquids with flash points below 38ºC [100ºF]); **4** (Class IA flammable liquids with flash points below 23ºC [73ºF] and boiling points below 38ºC [100ºF].

Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDS's under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used only in conjunction with a fully implemented HMIS® program by workers who have received appropriate HMIS® training. HMIS® is a registered trade and service mark of the NPCA.

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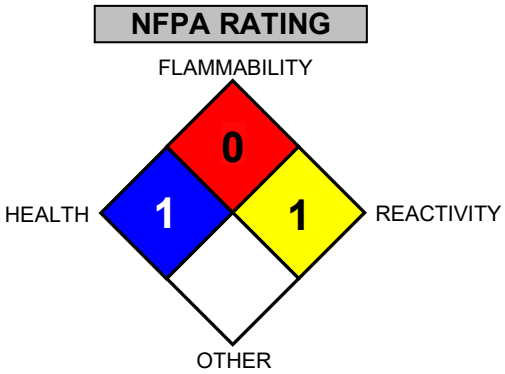
Section 16 – OTHER INFORMATION (continued)

NATIONAL FIRE PROTECTION ASSOCIATION:

Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury).
Flammability Hazard: Refer to definitions for "HMIS RATING (Hazardous Materials Information System)"
Reactivity Hazard: Refer to definitions for "HMIS RATING (Hazardous Materials Information System)"



DEFINITIONS OF TERMS

ACGIH - American Conference of Governmental Industrial Hygienists
CAS No. - Chemical Abstracts Service Number
EPA - Environmental Protection Agency
GHS - Globally Harmonized System
IARC - International Agency for Research on Cancer
LC50 - Lethal Concentration (50 percent kill)
LCLO - Lowest published lethal concentration
LD50 - Lethal dose (50 percent kill)
LDLO - Lowest published lethal dose
NIOSH - National Institute of Occupational Safety and Health
NTP - National Toxicology Program
OSHA - U.S. Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
SARA - Superfund Amendments and Reauthorization Act
STEL - Short Term Exposure Limit
TCLo - the lowest concentration to cause a symptom
TDLo - the lowest dose to cause a symptom
TLV - Threshold Limit Value
TSCA - Toxic Substances Control Act
TWA - Time Weighted Average

Full text of H-phrases (from Section 2)

Acute Tox. 4 (oral)	Acute toxicity (oral), Category 4
Acute Tox. 4 (dermal)	Acute toxicity (dermal), Category 4
Skin Corr. 1A	Skin corrosion/irritation, Category 1A
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Acute Tox. 4 (inhalation)	Acute toxicity, Category 4
STOT SE 3	Specific target organ toxicity (single exposure), Category 3
Aquatic Acute 2	Hazardous to the aquatic environment, Acute Category 2
Aquatic Chronic 2	Hazardous to the aquatic environment, Chronic Category 2

H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H401	Toxic to aquatic life
H411	Very toxic to aquatic life with long lasting effects

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES: Crown Alloys Company urges each end user and recipient of this SDS to study it carefully. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from the potential hazards associated with the handling or use of this product. The information in this document is believed to be correct as of the date issued. However, this information is provided without any representation or warranty, expressed or implied, regarding accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons we do not assume responsibility and expressly disclaim liability of loss, damage, or expense arising from it or any way connected with the handling, storage, use, or disposal of this product. Data may be changed from time to time. Be sure to consult the latest edition of the SDS. Compliance with all applicable Federal, State, Provincial and local laws and regulations remain the responsibility of the user.