



SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 PUBLIC LAW 99-499. STANDARD SHOULD BE CONSULTED FOR SPECIFIC REQUIREMENTS.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

NAME OF PRODUCT: US FORGE – Aquabond® Lead Free Solder
DESCRIPTION: Tin (Sn) / Copper (Cu) / Antimony (Sb) / Silver (Ag) Solder
PART NUMBERS: 03054, 03055

**MANUFACTURER/
SUPPLIER:** US FORGE
N94 W14355 GARWIN MACE DRIVE
MENOMONEE FALLS, WI 53051 USA

TELEPHONE NUMBER (262) 255-5157 or Toll Free (800) 343-3758
FAX NUMBER: (262) 255-2374
US FORGE WEBSITE: www.us-forge.com

PRODUCT CLASSIFICATION: Lead Free Solder - For plumbing and refrigeration applications

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Odorless solid. Chemically stable and inert. Does not pose a fire hazard. **Non-Flammable:** Flames used for brazing and soldering can ignite combustibles. Molten metal can burn skin. Refer to American National Standard Z49.1 for fire prevention during welding.

ROUTES OF ENTRY: Primary route of entry is the respiratory system. Other possible routes are eyes, ingestion, and/or skin contact.

POTENTIAL HEALTH EFFECTS:

EYES: Inert foreign body hazard only.
SKIN: Prolonged contact may result in rashes/irritations due to drying of the skin and/or mechanical abrasion related to skin-to-clothing contact or skin-to-skin contact. May cause allergic skin reaction.
INGESTION: No adverse health effects anticipated by this route during proper industrial handling.
INHALATION: Exposure to fumes may aggravate pre-existing respiratory conditions.

ACUTE HEALTH HAZARDS: see Section 11

CHRONIC HEALTH HAZARDS: see Section 11

WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer. (California Health & Safety Code 25249.5 et seq.).

WARNING: avoid breathing welding fumes and gases; they may be dangerous to your health. Always use adequate ventilation and use appropriate personal protection equipment.

CARCINOGENICITY

WELDING FUMES (not otherwise specified) are considered to be carcinogenic defined with no further categorization by NIOSH and IARC.

Package Labeling:

The product does not require a hazard warning label in accordance with EC directives/the relevant national laws. Although this product does not require a hazard warning label, we recommend that the safety advice should be observed.

This mixture is not classified as dangerous according to Regulation (EC) No. 1272/2008.



CAUTION:

Limited evidence of carcinogenic effect (welding fumes).

May cause sensitization by skin contact

Brazing/welding fumes and vapors may cause metal fume fever (headache, dizziness, dryness, cough, nausea, and fever) and these symptoms may appear 4-12 hours after exposure

Precautionary Statements:

- P285 In case of inadequate ventilation wear respiratory protection
- P314 Get medical advice if you do not feel well
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P202 Do not handle until all safety precautions have been read and understood
- P260 Do not breathe dust/fume/gas/mist/vapors/spray
- P501 Dispose of contents/container to waste treatment facility in accordance with local and national regulations

Before using this product, contact your doctor to determine if exposure to product or use of this product will aggravate your medical conditions.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

IMPORTANT: This section covers the materials from which these products are manufactured. Any of the chemicals or compounds subject to reporting under Title III, in Section 313, of the Superfund Amendments and Reauthorization Act (SARA) are marked by the symbol #.

Exposure Limit (mg/m³)

INGREDIENTS	CAS NUMBER	OSHA PEL	ACGIH-TLV	Percent Ingredients by Weight
Tin	7440-31-5	2	2	96 – 98
Copper #	7440-50-8	0.1	0.2	1 – 3
Antimony #	7440-36-0	0.5	0.5	0.6 – 1.0
Silver #	7440-22-4	0.01	0.1	0.1 – 0.3

CAS / EINECS NUMBER / HAZARD CLASSIFICATION FOR ABOVE INGREDIENTS

INGREDIENTS	CAS NUMBER	EINECS NUMBER	Hazard Classification per ECD 67/548/EEC
Tin	7440-31-5	231-141-8	No
Copper #	7440-50-8	231-159-6	No
Antimony #	7440-36-0	231-146-5	No
Silver #	7440-22-4	231-131-3	No

Exposure limits are subject to change. Contact ACGIH and OSHA for current values. See Section 16 for European Council Directive 67/548/EEC R-phrases and S-phrases if applicable.

SECTION 4: FIRST AID MEASURES

EMERGENCY & FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by The American Red Cross.

EYES: Flush with a large amount of fresh water for at least 15 minutes. Get medical attention.

SKIN: Wash affected area with soap and water to remove dust or particles. If rash develops, see a physician. Get medical attention for irritations that persist.

INGESTION: Seek medical attention.

INHALATION: Remove to fresh air. If breathing is difficult administer oxygen. If breathing has stopped, begin artificial respiration and obtain medical assistance immediately.

GENERAL: Move to fresh air and call for medical aid.

SECTION 5: FIRE FIGHTING MEASURES

Flammable: No

NFPA HAZARD CLASSIFICATION:

Health: 1 Flammability: 0 Reactivity: 0 Other:

HMS HAZARD CLASSIFICATION:

Health: 1 Flammability: 0 Reactivity: 0 Protection:

EXTINGUISHING MEDIA: In case of fire, use dry chemical, CO₂ or halon extinguisher.

SPECIAL FIRE FIGHTING PROCEDURES: In case of fire wear suitable respiratory equipment with positive air supply.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Never drop or use water on or liquids on molten metal. Do not plunge damp or wet solder bars/pieces into molten solder

HAZARDOUS DECOMPOSITION PRODUCTS: Not applicable

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Avoid generating dust. Solder may be swept up and placed in a container for proper disposal.

PERSONAL PRECAUTIONS: If dust is present, use particle filter dust mask. Wear personal protective clothing and ensure adequate ventilation.

ENVIRONMENTAL PRECAUTIONS: Do not discharge powder residue into drains or bodies of water.

SECTION 7: HANDLING AND STORAGE

HANDLING: Avoid exposure to dust and do not ingest. Avoid contact with skin, eyes, and clothing. Some individuals can develop and allergic reaction to certain materials. See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954

STORAGE: Keep material sealed and dry before use and store a cool location and in the original labeled container. After using, keep remaining product sealed and dry and keep solder in original labeled container and store in a cool and dry location.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION



Read and understand the manufacturer's instructions and precautionary label on this product.

Always use adequate ventilation and wear appropriate personal protection. Do not breathe welding fumes and gases; they are dangerous to your health.

ENGINEERING CONTROLS: Proper ventilation must be maintained.



VENTILATION: Use enough ventilation, local exhaust at the spray area, or both, to keep the fumes and gases below the TLV's in the workers breathing and the general area. Train the worker to keep his head out of the fumes. Monitor fume levels and do not exceed permissible exposure limits or values.

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when soldering in a confined space or where local exhaust or ventilation does not keep exposure below the TLV's.

EYE PROTECTION: Wear safety glasses with side shields, face shield, and/or goggles.

PROTECTIVE CLOTHING: Wear gloves when using or prolonged contact with skin or repeated contact with skin is likely. Wear hand and body protection to prevent injury. See ANSI Z49.1 for further information.

OTHER PROTECTIVE EQUIPMENT: Full protective equipment normally used in soldering / brazing operation so as to prevent any contact. Review operations to avoid contact with hazardous gas, liquid, or solid. See also:

29CFR 1910.132 - 29 CFR 1910.140 Personal Protective Equipment
29 CFR 1910.251 - 29 CFR 1910.257 Welding, Cutting and Brazing

SKIN PROTECTION: Individuals having sensitive skin may find it beneficial to use a barrier cream or moisturizer when excessive or prolonged contact with skin is likely.

WORK HYGIENIC PRACTICES: Do not eat or consume beverages in the work area.

EXPOSURE GUIDELINES: Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits.

EFFECTS OF OVEREXPOSURE - soldering may create one or more of the following health hazards:

Soldering fumes cannot be classified simply. The composition and quantity of both are dependent upon the metal being soldered, the process, procedure, and the solder used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being brazed (such as paint, plating, or galvanizing), the volume of the work area, the quality and the amount of ventilation, position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the material is consumed, fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Fume and decomposition products, not the ingredients in the powder, are important. Decomposition products include those originating from the volatilization, reaction, or oxidation of materials in Section 3, plus those from the base metal and coating, etc., as noted above. These components are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society).

Gaseous reaction products may include carbon monoxide and carbon dioxide. Monitor fume levels. One recommended way to determine the composition and quantity of fumes and gas to which workers are exposed is to take an air sample in the worker's breathing zone (see ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Solid. No odor. **pH:** not applicable **Flash Point:** not applicable **Boiling Point:** not applicable

SECTION 10: STABILITY AND REACTIVITY

GENERAL: This item is only intended for use in soldering applications.

STABILITY: Product is chemically stable and non-reactive.

HAZARDOUS POLYMERIZATION: Will not occur.

MATERIALS TO AVOID: Strong acids and bases.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Metallic oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

Threshold Limit Value: The ACGIH recommended general limit for welding fume NOS (not otherwise specified) is 5 mg/m³. The ACGIH 1999 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section 8 for specific fume constituents that may modify the TLV.

FUMES AND GASES can be dangerous to your health.

PRIMARY ROUTES OF ENTRY are the respiratory system. Other possible routes are eyes, ingestion, and/or skin contact.

Molten metal can burn skin.

PREEXISTING respiratory or allergic conditions may be aggravated in some individuals (i.e. asthma, emphysema).

SHORT TERM (ACUTE) OVEREXPOSURE to soldering fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. **TIN & TIN COMPOUNDS** – can affect the body if inhaled or if they make contact with eyes or skin. Short term overexposure toxicity is low. **ANTIMONY** - Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. Inhalation of fumes may cause metal-fume fever. Target Organs: Kidneys, liver, cardiovascular system. Copper fumes produce **METAL FUME FEVER** which may result in severe tracheobronchitis, pneumonitis, pulmonary edema (throat dryness, cough, headache, vomiting, chest pains, and chills). Typically metal fume fever begins four to twelve hours after sufficient exposure to freshly formed fumes. First symptoms are a metallic taste, dryness, and irritation of the throat. Cough and shortness of breath may occur along with a headache, fatigue, nausea, vomiting, diarrhea, and painful spasms of the limbs. Copper poisoning can result in hemolytic anemia and kidney, liver, and spleen damage. **SILVER:** Overexposure to silver dusts or fumes may cause a permanent grayish pigmentation of the skin and can cause irritation of the skin and mucous membranes.

LONG TERM (CHRONIC) OVEREXPOSURE is believed by some investigators to affect pulmonary functions. Target organs are eyes, skin, and respiratory system. **TIN & TIN COMPOUNDS** – Long term overexposure affects are not known. **ANTIMONY** - Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause dizziness, dry throat, sleepiness, anorexia, and nausea. Chronic inhalation may result in liver, kidney, and cardiac changes. **COPPER** may damage the liver, kidney, spleen, pancreas, and brain. Copper poisoning can result in hemolytic anemia and kidney, liver, and spleen damage. Ingestion of large amounts may be fatal. **SILVER:** Chronic exposure via inhalation may cause argyria.

See Section 2 for any carcinogenic effects. **Avoid direct inhalation of fumes during heating and use. Monitor fume levels.**

SECTION 12: ECOLOGICAL INFORMATION

Contaminated Packaging: Empty containers should be taken for local recycling, recovery, or waste disposal. Solder may be recycled. Do not flush solder into surface water or sanitary sewers.

SECTION 13: DISPOSAL CONSIDERATION

WASTE DISPOSAL METHOD: Dispose of any powder and waste residues in accordance with EPA or local regulations. Where possible, recycling is the preferred method of disposal.

Review U.S. Federal Hazardous Waste Regulations §40 CFR261 to determine if this is hazardous in USA. Please be advised that state and local requirements, or other country requirements, for waste disposal may be more restrictive or otherwise different than U.S. Federal regulations.

SECTION 14: TRANSPORTATION INFORMATION

DOMESTIC TRANSPORT REGULATIONS (USA): DOT - not regulated.

DOMESTIC TRANSPORT REGULATIONS (CANADA): TDG - not regulated.

DOMESTIC TRANSPORT REGULATIONS (MEXICO): MEX - not regulated.



INTERNATIONAL TRANSPORT REGULATIONS:

ICAO – not regulated
IATA – not regulated
IMDG / IMO – not regulated

OTHER AGENCIES: No international regulations or restrictions are applicable.

Handle with care to avoid damaging the product. Keep product dry and in original labeled container.

SECTION 15: REGULATORY INFORMATION

Read and understand the manufacturer's instructions and precautionary label on this product.

See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on safe use of product when used in welding applications.

U.S. EPA TSCA (TOXIC SUBSTANCE CONTROL ACT): All constituents of these products are on the TSCA inventory list or are excluded from listing.

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to our Local Emergency Planning Committee.

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS:

The following metallic components are listed as SARA 313 "TOXIC CHEMICALS" and are potentially subject to annual SARA 313 reporting. See Section 3 if the ingredient is present and for percent.

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>DISCLOSURE THRESHOLD</u>
Chromium & chromium compounds	7440-47-3	1.0 % de minimis concentration
Chromium VI	Not listed	0.1 % de minimis concentration
Barium compounds	Not listed	1.0 % de minimis concentration
Cobalt	7440-48-4	0.1 % de minimis concentration
Copper	7440-50-8	1.0 % de minimis concentration
Manganese	7439-96-5	1.0 % de minimis concentration
Nickel	7440-02-0	0.1 % de minimis concentration
Aluminum (fume or dust)	7429-90-5	1.0 % de minimis concentration
Antimony	7440-36-0	1.0 % de minimis concentration
Silver	7440-22-4	1.0 % de minimis concentration

Package Labeling:

Additional advice on labeling:

As a finished article the product does not need to be labeled in accordance with EC-directives or respective national laws.

International rules may vary and the appropriate regulations should be followed as defined by the country where the product is used.

SECTION 16: OTHER INFORMATION

This Safety Data Sheet has been revised due to modifications to several paragraphs and/or new format.
Prepared by: US Forge, USA

SUPPLEMENTAL INFORMATION – DEFINITIONS:

IARC: International Agency for the Research on Cancer
NIOSH: National Institute for Occupational Safety and Health
OSHA: U.S. Occupational Safety and Health Administration
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service Registry Number
EINECS: European Inventory of Existing Chemical Substances

PEL: Permissible Exposure Limit
NTP: National Toxicology Program
TLV: Threshold Limit Value
ECD: European Council Directive
GHS: Globally Harmonized System

The information in this SDS was obtained from sources we believe are reliable. 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 the product.