

Super Alloy 1 Instructions



Metal Preparation

Thoroughly clean the parent metal prior to soldering. Suitable methods include sand paper, emery cloth, wire brush, Dremel tool, steel wool, a sander, or a wire wheel. Proper cleaning ensures optimal bonding and minimizes contamination.

Oxidation

Oxidation is the most common cause of failure. **Prepare and solder the part immediately after cleaning to avoid re-oxidation.**

Bonding Issues

Bonding failures may result from insufficient cleaning, oxidation, or overheating.

Torch Selection

Super Alloy 1 is compatible with propane, butane, MAPP gas, acetylene, and oxyacetylene torches. Select the heat source based on the size and thickness of the work piece.

Flame Adjustment

Utilize a soft flame, heat gun, or soldering iron to heat the parent metal adjacent to the repair area. Do not direct the flame onto the repair zone, as this may overheat the solder and flux.

When using oxyacetylene, reduce oxygen flow to minimize overheating.

Torch Distance

Maintain a torch distance of 4–6 inches from the parent metal. If direct application to the rod or flux is necessary, increase the distance further and ensure continuous motion to avoid overheating.

Heat Requirement

Super Alloy 1 melts at 350°F (167°C), a sufficiently low temperature to allow melting with a lighter or match. Excessive heat is unnecessary.

Beveling Cracks

For cracked or fractured components, bevel ('V out') the cracks and both sides of the fracture. This preparation provides enhanced structural integrity following repair.

Preheating Strategy

For larger work pieces, lightly preheat the tip of the rod (without reaching its melting point) after heating the parent metal. This technique promotes efficient solder flow and bonding.

Flux Proximity

Keep the flux bottle positioned near the repair area. Aluminum loses approximately 100°F (37°C) per second once the torch is removed.

Flux Application

Apply the non-corrosive liquid flux directly to the repair area. A recommended method is to dip the end of the rod into the flux. The flux will adhere to the rod and can then be evenly applied to the joint.

Temperature Indicator

White metal does not change color during heating. Use flux as a guide.

During heating, the flux will bubble and transition to a light brown color. This indicates the correct working temperature. If the flux turns black, remove it with warm water and a wire brush, then restart.

Adding Flux

Reapply flux with each addition of rod to maintain consistent flow and bond quality.

Apply flux prior to soldering, during soldering, and at completion. When adding flux at the end, ensure the parent metal remains sufficiently hot to facilitate flow and bonding.

Applying the Rod

Once the flux has turned brown, apply the rod by dragging it across the repair area until it flows. Immediately remove the heat source once flow begins.

Avoid direct flame application to the rod. If unavoidable, limit direct heating to short intervals.

Restarting the Process

If soldering is interrupted prematurely, reapply flux and reheat the joint to restore solder flow.

Bond Observation

Examine the deposit carefully. The solder should flow smoothly and form a uniform bond. Excessive heat will cause the rod to melt without bonding.

Cooling

Allow the repaired component to cool naturally. Do not quench with water, as rapid cooling weakens the solder joint.

Flux Removal

After cooling, clean thoroughly with a wire brush and warm water to remove flux residues.

Flux Care

Reseal the flux jar immediately after use. Replace the flux if it liquefies in the container.

SPECIAL CONSIDERATIONS

Technique Practice

Practice on scrap of similar alloy and thickness before critical repairs; allow the flux to activate before introducing filler.

Building Up Pot Metal

To build up pot metal, reduce heat input or increase flame distance to prevent the rod from flowing too thin.

Pot Metal vs. Cast Aluminum

If the alloy does not bond, confirm the material is not cast aluminum. Super Alloy 1 is incompatible with cast aluminum; use Super Alloy 5 instead.

Pitting in Pot Metal

When repairing pot metal containing pits, thoroughly clean the surface and drill into the pits to eliminate oxidation.

Remelt Point

Super Alloy 1 has a remelt point of about 450 °F (232 °C). Once the solder has been applied and hardened, it will melt again if reheated to this temperature. This means any future heating near 450 °F can cause the bond to soften or re-flow.

Chrome Plating

Before plating, request a slow copper charge beneath nickel and chrome. For chrome removal, request a dip-and-strip process from the plater.

Cracks

Clean cracks thoroughly, ensuring removal of oxidation from both the surface and internal crevices.

Stainless Steel

When soldering stainless steel, roughen the surface with a sanding disc or abrasive before soldering.

Aluminum Boats

Super Alloy 1 is not suitable for aluminum boats, diamond plate aluminum, or cast aluminum. For these, use Super Alloy 5 with an oxyacetylene torch.

SAFETY GUIDELINES

Respiratory Protection

Use an air purifying dust respirator when welding or brazing in a confined space, or when local exhaust or ventilation is not sufficient to keep exposure values within safe limits.

Hands Protection

Wear appropriate gloves to prevent skin contact.

EN 12477: Protection gloves for welders

Type B gloves are recommended when high dexterity is required as for TIG welding, while type A gloves are recommended for other welding processes. The contact temp (°C) is 100 and the threshold time (seconds) >15.


Eyes Protection

Welder's helmet or face shield with color absorbing lenses. Shield and filter to provide protection from harmful UV radiation, infra red and molten metal approved to standard EN379. Filter shade to be a minimum of shade 9.

Skin Protection

Heat-resistant protective clothing. Wear safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry. Clothing should be selected to suit the level, duration and purpose of the welding activity.

California Proposition 65

 **WARNING:** This product contains chemicals including [Cadmium], which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

Ventilation

Work in ventilated spaces to disperse flux fumes. Avoid confined areas without extraction.

Fire Safety

Keep a fire extinguisher nearby when working around flammable surroundings.

Liability

Follow AWS-compliant brazing safety standards.

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FIRST AID MEASURES

Inhalation

Remove to fresh air immediately or administer oxygen. Get medical attention immediately.

Skin

Flush skin with large amounts of water and soap. If irritation develops and persists, get medical attention.

Eyes

Flush eyes with water for at least 15 minutes. Get medical attention.

Ingestion

Obtain medical attention immediately if ingested. Rinse mouth.

FIREFIGHTING MEASURES

Suitable Extinguishing Media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning material and fire situation.

Unsuitable Extinguishing Media

Do not use water on molten metal. Large fires may be flooded with water from a distance.

Specific Hazards Arising From Chemical

Cadmium oxides, tin oxides, carbon oxides, zinc oxides.

Protective Equipment

Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

ACCIDENTAL RELEASE MEASURES

Cleaning Measures

Solid objects may be picked up and placed into a container. Liquids or pastes should be scooped up and placed into a container. Wear proper protective equipment while handling these materials. Do not discard as refuse.

HANDLING AND STORAGE

Precautions for Safe Handling

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk; evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents, acids, alkalis. Dispose of according to Federal, State, Local and OSHA regulations.

Conditions for Safe Storage

Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

EXPOSURE CONTROLS/ PERSONAL PROTECTION

Engineering Controls

The usual precautionary measures for handling chemicals should be followed. Keep away from food, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before break and at the end of the work. Store all protective clothing separately. Maintain an ergonomically appropriate working environment. Wear protective equipment. Keep unprotected persons away. Avoid causing dust.

Exposure Limits

Use industrial hygiene equipment to ensure that exposure does not exceed applicable national exposure limits. Unless noted, all values are for 8 hour time weighted average.

Biological Limits

No available data