Super Alloy 5 Instructions

Metal Preparation

Thoroughly clean the aluminum repair area with a stainless-steel brush until bright and oxide free. Cleaner surfaces reduce flux consumption and increase metallurgic bonding.

Torch Selection

You can use oxyacetylene, propane, or MAPP torches—each provides enough heat to bring aluminum to its bonding temperature. For most of our demonstrations, we used the Bernzomatic BZ8250-HT torch. We do not recommend using the brass-tipped torches commonly sold at hardware stores, as they do not provide adequate control or consistent heat output.

Flame Adjustment

Set a slightly carburizing (fuel-rich) flame by reducing the oxygen or compressed air. This produces a softer flame that heats the work area efficiently while minimizing surface oxidation and reducing the risk of damage.

Torch Distance

Maintain a stand-off distance of 4–6 inches, sweeping the torch linearly across the joint while incorporating a gentle circular motion to bring the parent metal to the proper working temperature.

Torch Angle

Hold the torch perpendicular to the joint; for thick sections, bias the flame slightly toward the crack to drive heat into the mass.

Torch Angle on Thick Aluminum

On thicker sections, bias heat toward the crack or mass-heavy regions to drive heat into the thicker mass.

Flame Consistency

Use broad, continuous motion—aluminum dissipates heat rapidly. Maintain temperature above ~600°F (316°C) by distributing the flame evenly.

Heat Requirement

The parent metal must reach a minimum temperature of 600°F (315°C) for proper results when working with thin aluminum. For larger or thicker sections—such as aluminum castings or boat hulls—a higher temperature of at least 800°F (425°C) is required to achieve proper flow. Use an oxyacetylene torch for these heavier applications, as it provides the heat intensity needed to bring the metal to bonding temperature.

Preheating Strategy

Keep the flame moving continuously across the repair area to prevent hot spots. The goal is to heat the parent metal so it draws the filler rod in—do not attempt to melt the rod directly into place.

Flux Proximity

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

Flux Application

Using the torch, heat the tip of the filler rod, then dip it into the flux container. The flux will bond to the rod tip, enabling transfer to the weld area.

Flux Adhesion

If the flux does not adhere, reheat the rod tip and dip again. Always apply fresh flux to the rod prior to deposition.

Flux Transfer

Melt the flux off the rod onto the weld area and remove the rod without removing the flame from the work surface.

Temperature Indicator

The flux turns to a liquid and becomes clear, and aluminum looks bright and shiny — this indicates readiness to apply rod.

Applying the Rod

WITHOUT pulling the flame away, apply the rod softly onto the repair area — do not press down. Watch for the filler rod to begin flowing smoothly. Once it starts to flow, pull the flame away to prevent overheating. If the weld solidifies too soon and you need to flow the deposit further, apply additional flux.

Rod Balls Up

If the rod balls up, your base metal is too cold. Knock off the ball, re-flux, and reheat until flux liquifies.

Flux Reinforcement

To increase bonding strength, always apply flux each time you add filler rod. The flux improves bonding and helps prevent oxidation. Remove heat immediately once the rod begins to flow to avoid overheating and ensure a clean, strong joint.

Cooling

Allow joints to cool naturally. Forced cooling induces stress and weakens the bond.

Post-Weld Cleaning

After cooling, remove residual flux with warm water and a wire brush; proper cleanup enhances appearance and reduces corrosion risk.

Flux Care & Storage

Reseal the flux jar immediately after use to prevent moisture absorption.

If the flux in the jar becomes a paste, it has absorbed moisture, but can still be used. Simply apply as usual, watch for the flux to change from liquid to powder, and then back to liquid while heating. You may replace the flux if it has turned completely liquid in the jar.

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

When using oxyacetylene, approach the repair from the side to prevent overheating and melting the thin aluminum. Instead of applying continuous heat, periodically move the torch away from the base metal to let it cool and solidify slightly before continuing to build up the weld.

Hole Repair

For large holes, wet the perimeter first and work inward to bridge the opening. Reapply flux and gently reheat to achieve a pressure-tight seal.

Heating Thick Aluminum

Use oxyacetylene, oxypropane, oxynatural gas, or oxyMAPP to heat thick aluminum to a minimum of 600°F. If flux isn't liquefying, the parent metal isn't hot enough.

Thin Aluminum Adjustment

Reduce oxygen flow when working on thin aluminum to avoid overheating. Apply 80% of heat to the thicker side when working on thick-to-thin sections.

Crack Beveling

Bevel all cracks thicker than 1/8 inch before beginning repair. Use extra flux and gentle heat to seal small holes.

Cast Aluminum Tips

Use a size 3 or larger oxyacetylene tip for cast aluminum over 1/4 inch. Use caution with thin cast aluminum to avoid overheating. Cast aluminum cannot be repaired with propane or MAPP gas unless you are using oxygen as well.

Torch Use on Boats

An oxyacetylene torch is required when repairing aluminum boats. Cast aluminum requires this method as well.

Pot Metal Warning

If white metal melts before the flux liquifies, it's likely pot metal. Pot metal cannot be repaired with this process.

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.

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