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Galvanized Surface Repair with Lead-free Galvanite™

Step 1 Pre-clean the parent metal. Use a grinder, emery cloth, a wire brush, sandblasting, etc. Cleaning galvanized steel surfaces in the field is often done with a stainless steel wire brush. Surface coatings such as phosphate, chromate, oil, or lubricant must be removed with solvent and/or agitation. To ensure a smooth surface result, surface preparation should extend into the surrounding undamaged galvanized coating. Breaking the oxide layer on the steel surface is an important key to successful Galvanite™ application.

Step 2 If the area to be repaired includes welds, all weld flux residue and weld spatter shall be removed by wire brush, chipping, grinding or power scaling.

Step 3 Use a soft flame, heat gun or soldering iron to heat the parent metal repair area to at least 600°F/315°C. Do not heat the surface over 750°F/400°C or allow the surrounding galvanized coating to burn. The existing coating will turn yellow as it begins to overheat, and will turn brown to black when burnt. If you use a direct flame, please keep it moving. A direct flame held on the repair area is likely to overheat the solder. Wire brush the surface during heating. Pre-flux using Kapp CopperBond™ flux if there is an adhesion problem. NOTE: Most applications do not require flux.

DO NOT DIRECTLY HEAT THE SOLDERING ROD!

Step 4 Hold the torch tip 4 to 6 inches away from the parent metal. If it is necessary to apply the flame directly to the rod to get it started, pull the torch tip back even farther from the work surface and keep it moving.

Step 5 Drag the rod over the area to be soldered, until it begins to flow. **ONCE THE ROD FLOWS, STOP APPLYING THE HEAT!** Deposit the desired thickness of Galvanite™. The stainless steel brush works well to spread the solder and ensure it is adhering. If additional layers are needed, continue to drag the rod over the area. Bring back the heat only to keep the surface, NOT the rod hot enough to push the solder around to where you want it. The solder will be lumpy, rather than smooth, due to its wide plastic range of 390°F - 570°F / 200°C - 300°C.

Step 6 Sometimes it is necessary to heat the tip of the rod with the flame to help the solder flow more easily onto the repair area. **DO NOT HEAT THE ROD TO THE MELTING POINT!**

Step 7 **Blend the repair into the undamaged galvanized coating.** The most common oversight in repairing galvanized is failing to feather the Galvanite™ layer into the undamaged galvanized coating. If they don't join in sufficient thickness to form a seamless barrier (skin), corrosion will next occur right where they meet.

Step 8 Observe the solder deposit. The solder should bond smoothly. **DO NOT OVERHEAT!** The solder rod will melt if overheated, but will not bond properly. Spread the solder deposit evenly over the repair area. A stainless steel brush works well for this step.

Step 9 If you stopped soldering and want to apply more solder or flow out the deposit more, let the area cool below the solid temperature of 390°F/200°C for Galvanite™, and reheat. The existing coating will help the bonding process, whether adding more solder or just flowing out the previous deposit. If substantial time has elapsed since the original repair layer was applied, pre-clean the repair area again to remove any oxide coating that will impair bonding. Again, a Stainless Steel brush works well for this step.

Step 10 Smooth the repair area and remove any excess solder with a wire brush.

Step 11 Repeat these steps to build up additional layers of protection.

Galvanite™ Physical Properties & Technical Data	
Melting Range	390°F - 570°F / 200°C - 300°C
Tensile Strength	39,000 psi
Compression Strength	60,000 to 75,000 psi
Shear Strength	34,000 psi
Impact Strength (Charpy)	4 ft.lbs. to break 1/4" bar
Hardness (Brinell-500 kg. load)	100
Ductility	Good
Density	.2612 lbs./cu. in.
Elongation	3% in 2 inches
Linear Expansion Coefficient	15.4 x 10^{-6} in/ in°F
Electrical Conductivity	24.9 (%IACS)
Thermal Conductivity	.24 cal / cm^3 / °C
Corrosion Penetration	300 x 10^{-6} in 1 1 / R
Flux	Kapp Copper Bond Flux
ASTM Specifications	Exceeds A780-09