SPIRAWELD
STAINLESS LIMITED

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This document is intended as a guide to assist our customers in understanding the requirements for the process of electropolishing stainless-steel goods.

1. Considerations for Electropolishing

Not all Stainless-Steel grades respond the same to pickling and electropolishing. A good example is castings where areas have been ground to a fine finish. Electropolishing will often "clean" the area so well that the grain boundaries in the metal become visible. In terms of Duplex Stainless Steels, they require more bath time, which is a consequence of their higher Pitting Resistance Equivalent rating.

The acid used in Electropolishing is 1.8 x denser, therefore 1.8 x more buoyant than water, so "sealed" items are likely to float.

2. Electrode Connections

Most jobs can be hung on hooks via holes in the job or by the geometry itself. All parts need a point for electrical connection – the type of connection needed depends on the job size.

- A through hole that a copper hook can be passed through.
- A blind tapped hole then a M5, M6, M8 or M10 bolt can be used.

Note: these attachment points will, in most cases, hold the part's weights, and the strength of these needs to be considered. Also, this point will pass all the current for the polishing process, so poor connections will result in poor polishing. Please discuss this with us when preparing a job.

Larger jobs that are approximately >0.8m^2 surface area will require attaching large electrical cables. At least 4 good-sized holes (8mm diameter) are required.

3. Drainage

All enclosed cavities need an inlet and an outlet hole at opposite ends of the cavity so acid can be flushed through. The size of the holes depends on the size of the cavities. For small rails and pipes, holes no smaller than 5mm at one end and 8mm at the other end are required.

For larger jobs, the bigger the holes, the better, as you will be charged for extra cleaning or drilling of new holes where insufficient drainage is present. You also run the risk of not all the acid being flushed out, which will then leach out over a period of months, spoiling your work and whatever it is attached to. We will not accept responsibility for trapped acid in a job. Our recommendation is good drainage for all cavities, so we can flush these cavities thoroughly.

4. Cracks & Pinholes

Many "sealed" cavities turn out not to be sealed and have tiny cracks or pinholes that acid will get into during polishing and leach out from the item over a period of months, spoiling your work and whatever it is attached to. With some items, we can work with sealed cavities, but there is always a risk that acid will get inside.

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This is a risk the customer sometimes chooses to take after discussing the work with us. We are not responsible for acid leaching out of work supplied to us. There is also a risk that acid can get trapped in cracks between welded plates. Acid will work its way out over time, but it is often very difficult to force it out.

5. Marking

When the work items are finished and installed, sometimes there is marking from handprints. Our suggestion is a gentle wash with warm water and a clean cloth in the first instance, and Autosol for more stubborn marks. If acid has leached out from pin holes or tiny cracks, we can supply a neutralising agent like soda ash to neutralise the acid. Remember to rinse and wash thoroughly with water.

6. Complex Geometries

There can be whitish areas that appear on a job that has complex geometries, particularly recesses. This is a result of the electrical current being obscured in the areas. We try to minimise this, but it cannot always be eliminated. Please discuss this with us if you have an item that could fall into this category

7. Tide Marks

If the item is large and cannot be fully submerged in one go for polishing, it will need to be double-dipped, which can sometimes leave a tide mark. We strive to make this mark undetectable, but it is not always possible, and further manual polishing by the customer may be desired. Please note that manually polishing will negate some of the corrosive properties gained by electropolishing.

8. Collection of Goods

Electropolished items should be collected as soon as possible after completion of the work. Due to minimal storage space, large items are stored outside and are exposed to weather and dust.