

Electropolishing

HC4 Diaphragm Valves

Saunders' tests have determined that electropolishing can result in up to 50% improvement in the surface finish of machined or mechanically polished surfaces.

The inherent benefits of electropolishing subsequent to mechanical polishing are as follows:

- Superior surfaces for cleaning and sterilization
- Passivated surfaces for corrosion resistance
- High luster reflective appearance
- Elimination of smeared or torn surfaces caused by abrasive finishing
- Removal of inclusions and entrapped contaminants such as lubricants and grit particles

Mechanical polishing or machining may leave numerous microscopic surface imperfections which cause areas of differing electrical potential due to surface stresses. An electropolished surface is essentially balanced. Local corrosive cells cannot be set up, because galvanic differences caused by polishing stresses in the stainless surface have been eliminated.

The most effective method of eliminating burrs, folds inclusions and other abnormalities is through electropolishing. This electrolytic process, the opposite of the plating process, is designed to remove metal without smearing or folding. 'Peaks' are dissolved more quickly than 'valleys' as a result of the greater concentration of current over the protuberances. This action produces a smoothing and rounding of the surface profile. Due to the rounded profile, electropolished surfaces are far easier to clean than surfaces mechanically polished alone. Electropolishing also greatly reduces the total surface area to be cleaned and sterilized.

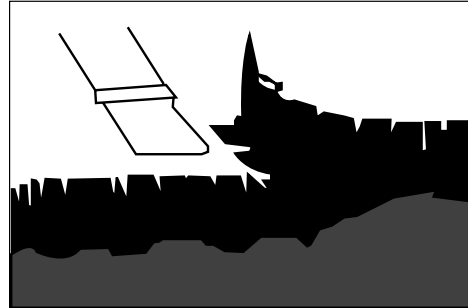


Diagram showing metal surface profile produced by machining

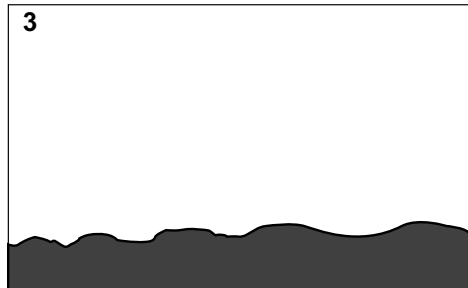
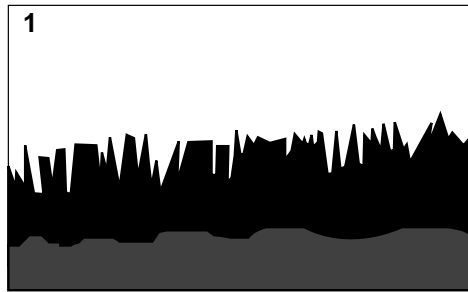


Diagram showing the progressive removal of metal by electropolishing to produce an even surface profile

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