PENNSYLVANIA MACHINE WORKS

QUALITY  ●  SERVICE  ●  PARTNERSHIP

PRESENTS

ELECTROPOLISHING
WHAT IS ELECTROPOLISHING?

THE BEST WAY TO MAKE CORROSION RESISTANT FITTINGS!
Think of peeling an onion!

Electropolishing is a chemical machining process.

FREE IRON and HYDROGEN molecules are drawn from the surface of the pipe fittings using electrical current and a mild acid solution.

This exposes the corrosion resistant CHROME and NICKEL molecules below the surface.
The fittings have a positive charge while the cathode rods are negative. Both are submerged in the solution forming a complete electrical circuit using the acid as a medium. High current areas such as iron and nickel are removed at a faster rate.

THE ELECTROPOLISH TANK
Stainless Steel fittings are placed on special racks and then dipped in the electrolytically charged solution.

After the hydrogen and iron molecules have been released, the fittings are then dipped in nitric acid, which guarantees passivation.
STAINLESS STEEL DURING ELECTROPOLISHING
WHY BOTHER ELECTROPOLISHING?

THE METAL SURFACE BECOMES SMOOTH
HIGHER SURFACE REFLECTIVITY
FITTING SURFACE IS CLEANER
HYDROGEN IS REMOVED FROM THE FITTING
INCREASED RESISTANCE TO BACTERIA
REDUCES SURFACE FATIGUE
IMPROVED CORROSION RESISTANCE
REDUCED SURFACE FRICTION
REDUCED PREP TIME IN WELDING
MEETS ALL CODE REQUIREMENTS
NO ADDITIONAL COST!
Electropolishing smooths and brightens the surface of the stainless steel fitting.
A SMOOTH CLEAN SURFACE HAS A HIGHER CORROSIVE RESISTANCE

COMPETITION'S 304L
average roughness of 350 RA
ASTM A182 CALLS FOR A MAXIMUM AVERAGE ROUGHNESS OF 250 RA

PENN MACHINE'S 304L
average roughness of 125 RA

*These photographs were taken at 8X zoom
These are the results of a two hour, 316/L salt spray test in accordance with ASTM B117.

Testing was 5% solution at 95 degrees Fahrenheit for a total of two hours.

All welding was performed by an ASME welder from an independent fabrication shop.

Before competition #1

After competition #1

Before competition #2

Penn machine
THE FEATURES OF HYDROGEN REMOVAL

- SURFACE FATIGUE IS REDUCED
- PREVENTS MICROBIOLOGICAL CORROSION
- RESISTANT TO ANAEROBIC BACTERIA

146 Angstroms 166 Angstroms

Before          After

THESE RESULTS WERE OBTAINED USING SECOND ION MASS-SPECTROSCOPY
COMPLIANT WITH:

- ASTM A380
- ASTM A967
- ASTM B117
- FEDERAL QQP-35
- MIL STD 753
WELDING FEATURES

REDUCED PREP TIME
DUE TO A CLEAN SURFACE

PREVENTION OF OXIDATION
IN THE WELD AFFECTED ZONE
DUE TO INCREASED SMOOTHNESS

SURFACE CONTAMINATION REMOVAL
EN ABLES A STRONGER WELD
ELECTROPOLISHED FITTINGS ARE USED EVERYWHERE BY EVERYONE!

- EXXON
- DOW
- SHELL
- FLUOR
- ARCO
- AMOCO
- BP OIL
- MOBIL OIL
- MW KELLOG
- NEWPORT NEWS
- BECHTEL
- GENERAL MOTORS
- ALLIED CHEMICAL
- ROHM & HAAS CO.
- ARAMCO SERVICES
For more information on why electropolished pipe fittings are the superior choice, contact your Penn Machine representative or call 1-800-PENN-USA

http://www.pennusa.com