

## Induction Hardened Chrome Plated (IHCP®) & Chrome Plated Only (CPO®) Steel Bars & Tubes

IHCP® and CPO® steel bars and tubes are manufactured to meet your specific needs for piston rod material in hydraulic and pneumatic cylinders. They are readily available in standard and custom sizes, chemistries and plating thicknesses to meet most piston rod applications. Niagara LaSalle Fluid Power Operations uses the most advanced techniques of surface removal, polishing, induction hardening and hard chrome plating to make IHCP® and CPO® steel bars the ideal materials for high quality piston rods. The fundamental difference between IHCP® and CPO® steel bars is that IHCP® bars are induction hardened for impact resistance prior to chrome plating. Both induction hardened and chrome plated steel bars can be processed to a variety of yield strength levels. These selective properties have helped convince many design engineers to put IHCP® and CPO® steel bars to work in construction and materials handling equipment, farm equipment, industrial machinery and almost anywhere precision, top quality piston rods are needed. Every IHCP® and CPO® product undergoes extensive electronic and visual inspection before shipping. This helps assure you of a piston rod material with consistent quality from bar to bar, end to end. Surface condition is electromechanically tested for roughness to match your most demanding hydraulic and pneumatic piston rod applications.

## CORR-GARD® Corrosion Resistance

CORR-GARD® is a patented process utilizing an organic compound containing long chain molecules and metallic oxides. The process involves the mechanical working of the surface of hard chrome plated steel bars with controlled heat and pressure. This finishing process has enabled Niagara LaSalle to quadruple the corrosion resisting capabilities of both CPO® and IHCP® steel bars and tubes. CORR-GARD® is an exclusive process of Niagara LaSalle.

CORR-GARD® combines with the plated steel bar's surface layer of chromium oxide to effectively seal the microscopic cracks that are inherent in all hard chrome plated surfaces. CORR-GARD® is not a covering or coating. The bond between the CORR-GARD® and the chromium is molecular and cannot be removed by solvents. What CORR-GARD® does is quadruple the corrosion resistance of bars tested against ASTM B-117 (Neutral Salt Spray Fog Testing). Niagara LaSalle certifies our CORR-GARD® protected bars for 48 hours or more to ASTM B-117.

## Specifications

### Standard Plate Thickness:

.0005" Minimum (.0127 mm) Hard Chrome Plated per side unless otherwise specified

### Hardness of Chrome Plate:

Rc 69-71

### Surface Finish:

16 max Ra

### Length:

Any specified length 12' to 24' (3657.6mm to 7315.20mm). Others on application. Cutting to specific rod lengths is readily available.

### Length Tolerance:

+0.060/-0.000

### Squareness of Cut:

.015 (0.381mm) per inch of diameter

### Packaging:

Collared and boxed or individually fiber tubed. Bar coding on all tags.

### Chemistry

AISI 1045/1050

### Yield Strength (psi)

50,000 psi approximate  
75,000 psi min  
100,000 psi min

### Size Range

5/8" to 6"  
5/8" to 5"  
5/8" to 4-1/2"

### Identification:

Ends can be color coded to customer requirements.

### IHCP® Surface Hardness:

Rc 50 Minimum (Other specifications on inquiry)

### IHCP® Case Depth:

.050" Minimum (1.27mm) effective case depth unless otherwise specified. (On full length bars, maximum of 1-1/2" (38.10mm) from either end is neither hardened nor plated).

### IHCP® Effective Case Depth:

Effective case depth is the perpendicular distance from the surface of a hardened case to the furthest point where a specified level of hardness is maintained. The hardness criterion is 50 Rc, except otherwise specified. Effective case depth should always be determined on the part itself, or on samples or specimens having a heat treated condition representative of the part under consideration. (SAE recommended practice - METHODS OF MEASURING CASE DEPTH - SAE J423a)

### IHCP® Selective Hardening (Cut Blanks):

12" (304.80mm) min hardened length. 3/4" (19.05mm) min unhardened length. +/- 1/4" (6.35mm) tolerance for Induction Hardened Transition Zone.

### Standard Tolerances for Carbon Steel\*

5/8" to less than 2-1/2"	.0015"
2-1/2" to 3" inclusive	.002"
Over 3" to 4" inclusive	.003"
Over 4"	.005"

\*Tolerances provide for undersize variation only.