



Hard Chrome Barrels

Introduction

Quinn's Chrome plating is a product of the substantial advancements the hard chrome plating industry has made over the last decade. Our new plating methods and chemicals provide us with a harder, smoother, more corrosion resistant, and durable coating than previously available in the industry. This enables Quinn's to run our barrels where chrome plated product have traditionally not performed well.

Description

Quinn Chrome plated barrels are a high quality hexavalent hard chrome plate with significant improvements over other types of chrome plated barrels. Quinn's uses a catalyzed chromic acid bath and a traveling anode to produce a 70 Rockwell C hardness chromium plate with a minimum thickness of 0.003".

The process employs a proprietary high speed catalyst which has significant benefits over conventional or mixed catalyst chromic acid baths. This leading edge process provides a high microcrack density which means that microcracks are shorter and shallower and do not extend through to the substrate. Porosity is also reduced from 25-50% to less than 15%. These two factors provide for extended chrome life in corrosive conditions.

The high speed catalyst allows for higher current densities and higher temperatures at a higher plating speed. This gives a more uniform, defect free plate at a higher hardness than other processes.

Quinn's keep even tighter parameters on chemistry ranges than the solution supplier recommends and employ a continuous electrolyzing technique and special filters to maintain solution purity. All barrels are specially honed, chemically cleaned, and pre-etched to ensure optimal bond line integrity. Solution chemistry and actual chrome plated samples are tested on a regular basis in accordance with Quinn's ISO 9000 quality system to maintain a consistently high quality product.

Because chrome has a low coefficient of friction, Chrome plated barrels are recommended for high water cut wells and the high hardness make them ideal for extremely abrasive conditions. As well, the high surface lubricity means that gyp and other scales do not readily adhere to the chrome plated surface.



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Products

Quinn's manufactures two different types of chrome plated barrels. One has a carbon steel substrate while the other is brass.

SupraChrome Barrels

Quinn's standard carbon steel chrome ID barrel is made from grade 1026 carbon steel and meets the API Specification 11AX and NACE Standard MR0176 for A1 chrome plate on steel pump barrel material.

SupraChrome Brass Barrels

The Quinn brass chrome ID barrel also meets both API and NACE under the A2 plating identification. The brass barrels use the same plating process as carbon steel, but the 443 Admiralty brass barrel tube provides a much higher level of corrosion resistance. The brass substrate is virtually impervious to any kind of down-hole corrosion.

Brass is a more noble metal than steel and the potential difference between brass and chrome is significantly less than the potential difference between steel and chrome. This means that the galvanic reaction between the brass substrate and the chrome plate will be less aggressive than with steel, and the service life of a brass chrome barrel will be significantly longer. Brass chrome barrels can be used at lower pH levels and should be considered where steel chrome is flaking or where the steel is experiencing severe general corrosion.

The brass tubing used is a hard drawn grade which has mechanical properties almost equivalent to carbon steel. All Chrome plated brass barrels are manufactured to the same rigorous quality standard as the steel chrome.

Duplex Chrome

Quinn's also offers duplex chrome plating on both of the above barrel materials. Duplex chrome provides even more wearability and corrosion resistance with an increase in thickness from 0.003" to 0.006" .

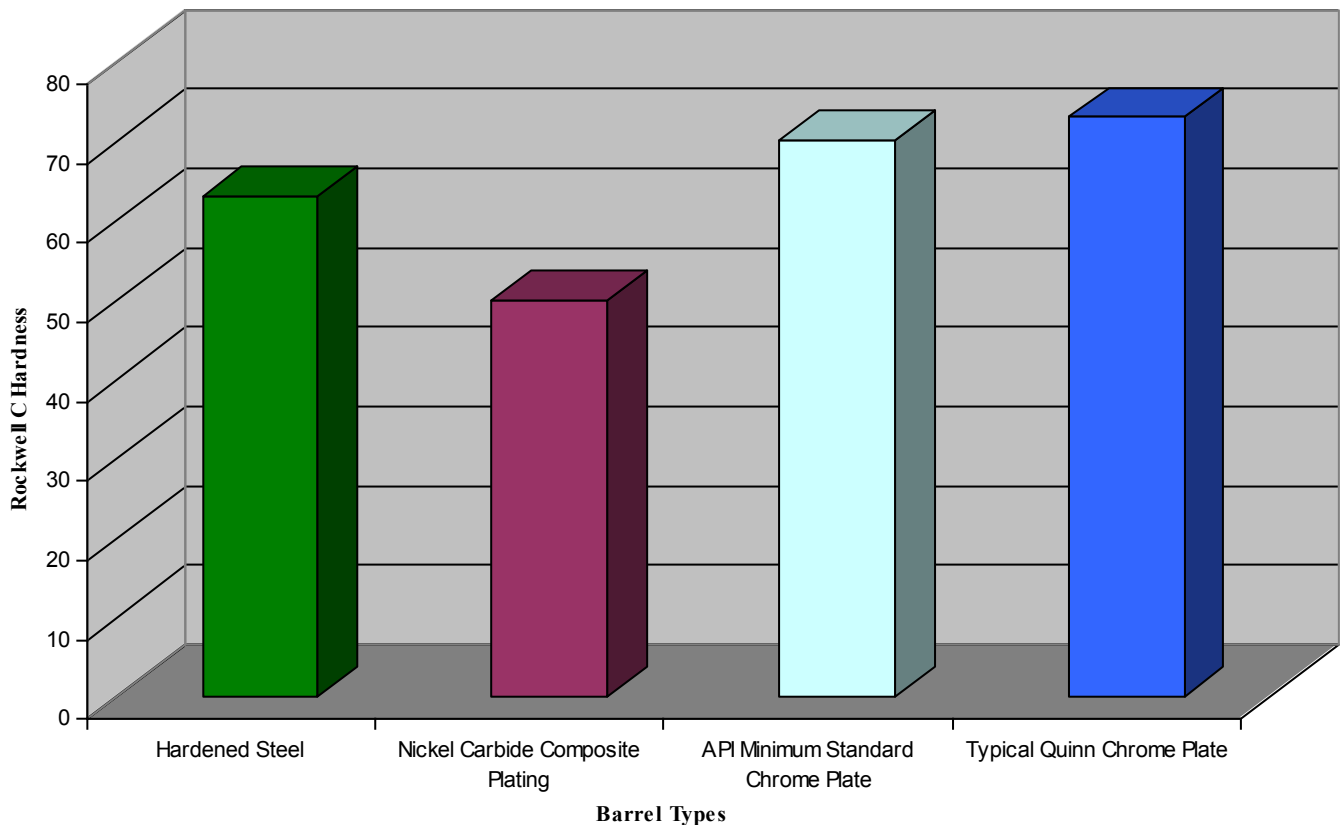


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Wearability

Hard chrome plating has a two-fold approach to its superior wearability. First of all it is essentially the hardest material that is plated, which generally corresponds to better wear resistance. The other is its extremely low coefficient of friction. A low coefficient of friction enables materials to slide rather than wear the chrome surface. The hexavalent hard chrome plate is deposited at a higher temperature and current density than the standard chrome plating. This results in Quinn's chrome plated barrels having superior hardness values as compared to other available pump barrels.

Hardness Value Comparison



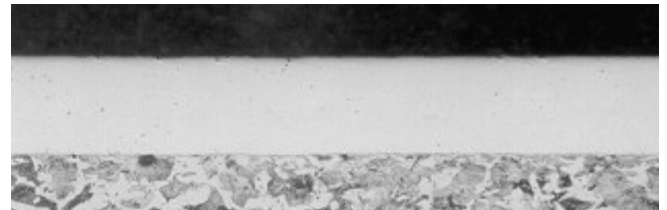


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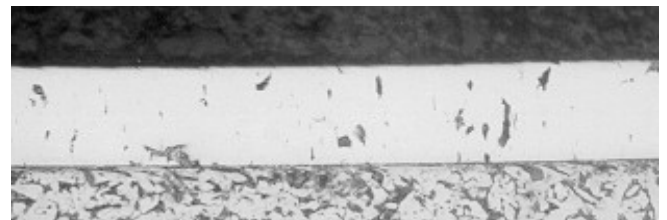
Corrosion Resistance

Corrosion resistance is the summation of the quality of substrate material, pre-plating, plating, post-plating, bath chemistry and deposit thickness. Micro-crack and porosity are the two plating factors affecting corrosion resistance. Generally deposits with low microcrack densities have microcracks that are longer and tend to extend to the substrate. Quinn's chromium plate has higher microcrack counts. This results in shorter, shallower cracks that are a lot tighter, providing superior protection of the substrate under corrosive conditions.

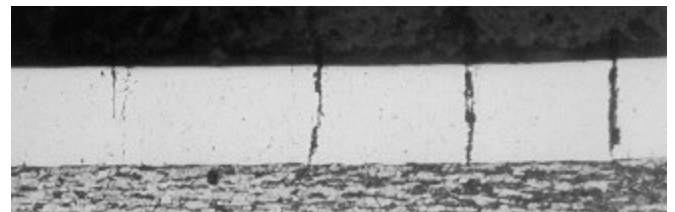
Quinn's chrome plating. Microcrack density is so tight that they are barely visible. Porosity is well below 15%.



Typical hard chrome plating. Large porosity and microcracks decrease corrosion resistance.



Traditional chrome plating. Note that the microcracks in the plating extend thru to the substrate allowing for accelerated corrosion to occur.



All photomicrographs were taken at 200X magnification and the samples were etched with a 2% Nital solution