

Chrome Plating Alternatives:

Thermal Spray, Electroless Plating, and Others

Thintri Inc. announces the release of Chrome Plating Alternatives, 2009, a new update of its study on alternatives to traditional chrome plating and their markets. This comprehensive examination of the subject discusses the various technologies, the industries in which they will, and won't, be used, and forecasts to 2014.



Thintri Inc.

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Background on Chrome Plating Alternatives

Used as a fundamental coating in a wide range of industries—aerospace, heavy equipment, automotive, paper-making, and others—chrome plating has become increasingly difficult in recent years. Regulations designed to protect against the health and environmental hazards of hexavalent chrome have increased the cost of chrome plating and burdened facilities performing plating services with extensive regulation and paperwork.

A number of alternatives to chrome plating are available. Chrome substitutes are dominated by thermal spray, in particular high-velocity oxy-fuel (HVOF), often favored due to its high strength and wear resistance, relatively low cost, and fast turnaround time. However, other interesting new technologies are now establishing their own markets as well. These include electroless nickel composite plating, which can deposit highly uniform diamond-composite coatings and is not restricted to line-of-sight geometries. Other emerging techniques include explosive bonding, which can be used to fabricate stainless-steel coatings, and electrodeposited nanocrystalline cobalt-phosphorus alloys specifically targeted at inner diameters. Plasma vapor deposition (PVD) can make thin, high quality coatings for less cost, in many cases, than decorative chrome.

At one time many predicted an abrupt changeover from chrome plating to one or more of these new technologies. This has not happened. Indeed, in some cases such as aircraft landing gear, the adoption of HVOF as an alternative to chrome has nearly stalled. A key point of dispute is the notion held by some in airline companies that as aircraft manufacturers such as Boeing and Airbus manufacture all their landing gear using thermal spray,

the coatings will outlast the aircraft themselves, thus relieving airlines of the need to invest in thermal spray shops to perform repairs. This opinion is not, of course, common among thermal spray experts but the question has not yet been resolved. In other important markets, including hydraulics and general industry, adoption of chrome alternatives continues.

And while industry downsizing and consolidation have led to the closure or offshore relocation of as many as half of the chrome plating shops in North America, the chrome plating market today is fairly stable:

- Many chrome plating shops, having accommodated new regulations, are now thriving
- Many customers have little or no interest in giving up on chrome
- Promoters of chrome substitutes still face hurdles in customer education
- The legislative push toward restricting chrome plating has stabilized in North America
- Europe is ambivalent and Asia is largely unconcerned with regulating chrome plating

Suppliers of alternative coating technologies are facing highly segmented markets where some chrome plating users are resistant to making large capital investments in new coating technologies, while others have embraced alternatives. Yet all face highly uncertain markets in the current economic climate, buffeted by wild swings in the cost of raw materials and an overall severe recession.

Understand the Markets

Success for chrome plating alternatives will depend almost completely on a balance of cost and performance that will be highly application-specific. Many, if not most, chrome substitutes like thermal spray will require higher up-front costs, usually in the form of equipment purchases. However, longer lifetimes and reduced frequency of repairs can lead to significant long-term savings, not to mention the benefits of improved performance. Other alternatives offer a crossover benefit that depends on the scale of implementation or other factors. For example, PVD is more expensive than chrome for small lots but can be significantly less expensive in large-scale production. Most alternatives also offer a large advantage in reduced hazardous waste management costs compared to hexavalent chrome. Thintri's market study *Chrome Plating Alternatives* examines each of the leading alternative technologies in detail: its capabilities, limitations and applications. The report also explores the potential in major target markets and forecasts markets to 2014.

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Chrome Plating Alternatives
\$4500



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