



Operating Data

317 North Mechanic Street, Jackson, MI 49201
 Voice: 517-783-4776 Fax: 517-783-5875
<http://www.mechanicalplating.com>

PS&T Brand Hyperguard™ 326™ New Trivalent Passivate No. 326™

General Description

PS&T Brand Hyperguard™ 326™ is a proprietary post-plate protective finish commonly called a trivalent passivate or a trivalent chromate. Generally, Hyperguard 326 should add at least 240 hours of salt spray (ASTM B-117) resistance to a zinc coating.

Features, Advantages, and Benefits

Hyperguard 326 provides superior performance when compared with prior art trivalent passivate conversion coatings. Hyperguard 326 offers these important features, advantages, and benefits:

- Hyperguard 326 adds at least 240 hours to the salt spray protection offered by the underlying zinc coating.
- Unlike conventional yellow or olive drab chromates, Hyperguard 326 does not lend any color to the underlying deposit. This is important for such applications as automotive underhood requirements, or any application in which end user resistance to colored finishes is high.
- Hyperguard 326 eliminates the development of white corrosion products for approximately 240 hours in the ASTM B-117 Salt Spray test.
- Hyperguard 326 can be applied easily using readily available equipment.
- Compared with zinc or cadmium with a clear hexavalent chromate, Hyperguard 326 - protected coatings offer more corrosion protection for an equivalent deposit thickness, thus offering the end user improved thread fit.

Features, Advantages, and Benefits (continued)

- Unlike other passivates, Hyperguard 326 is not rinsed from the part. This means there is no chromium to be treated as part of the waste treatment process. It also means that all of the chromium in the product goes to protect the part treated.
- The reduction of white corrosion products improves the applicability of zinc plating to environments in which the chief corrosive agent is chloride (such as automotive applications, highway applications, and marine environments).
- Hyperguard 326 provides an excellent base for paint adhesion due to the insolubility of the applied film.
- For mechanically plated deposits, Hyperguard 326 acts to bind loosely deposited particles in thread roots or deep recesses.
- Hyperguard 326 does not reduce the amount of zinc on the surface of the part during application. Traditional hexavalent and trivalent conversion coatings remove zinc from the surface of the part, replacing it with compounds of zinc and chromium. Because Hyperguard 326 does not remove zinc from the surface of the part, productivity is improved and zinc usage is reduced, with a commensurate reduction in zinc discharged to the waste treatment system.
- Hyperguard 326 contains no chelators or complexing agents, thus simplifying waste treatment.
- Hyperguard 326 may be recoated upon itself to improve the corrosion protection even further.

Features, Advantages, and Benefits (continued)

- The Hyperguard 326 application process is resistant to the buildup of iron.
- The Hyperguard 326 application process is resistant to the buildup of zinc, and zinc does not have an adverse effect on film build. Further, the reduction in salt spray hours due to zinc buildup in the coating bath is minimal. Generally there is never a need to dump baths of Hyperguard 326.
- Hyperguard 326 coatings are resistant to physical damage.
- Hyperguard 326 may be coated with conventional silicated sealants for greatly improved corrosion protection. PS&T's line of HypersealTM sealants is the largest line of sealants and leachant-sealants in the plating industry.
- The Hyperguard 326 coating process is operated at room temperature. The most effective prior art trivalent passivat conversion coatings on the market are operated at an elevated temperature, which is a disadvantage for many platers. In addition, the high temperature results in increased attack on the zinc substrate, resulting in increased zinc levels in the passivating bath; this, in turn, results in decreased performance.
- Often, the only corrective action that may be taken is dumping the bath and making a new solution.
- The Hyperguard 326 coating may be applied over many active metal surfaces; e.g., aluminum, zinc, (whether electrodeposited, hot-dip galvanized or mechanically plated), zinc-nickel (e.g., some hot-dip galvanizing and electroplated zinc-nickel), zinc-cobalt, zinc-iron, zinc-lead (e.g., some hot-dip galvanizing), cadmium or magnesium or alloys of these compositions with other metals.
- The Hyperguard 326 new trivalent passivate gives the corrosion-protective performance of hexavalent chromates without handling hexavalent chromium at the coatings manufacturer or the applicator level.
- The Hyperguard 326 reduced Hexavalent Chromium Elution - This trivalent passivate, like all other high-performance trivalent passivates, functions by generating hexavalent chromium during the corrosion cycle. This new passivate, however, elutes less hexavalent chromium (68% less) than prior art processes.

Features, Advantages, and Benefits (continued)

- Hyperguard 326 is available in a variety of colors for article identification. This is done in a one-step process with a single dip.
- Unlike conventional trivalent or hexavalent chromium conversion coatings, Hyperguard 326's coating weight is not dependent on the activity of the surface. (In zinc alloy deposits, prior art conversion coatings are thinner due to the passivity of the surface.)

Application

Hyperguard 326 may be applied at full strength to parts, at room temperature, and the excess removed by draining or spinning. Excess material should be reused. If excess material is removed by draining, vigorous shaking will assist in removal of excess material. Drying should proceed immediately after application of Hyperguard. Hyperguard 326 can be applied over dry or wet parts. Hyperguard 326 should not be applied over previously chromated parts or parts with any organic coating. Hyperguard 326 can also be applied over cadmium plated articles, cleaned aluminum parts, magnesium parts or zinc die castings.

If a sealant, leachant-sealant, lacquer or paint is to be applied over the Hyperguard 326, the Hyperguard 326 should be completely dry before topcoating.

How Hyperguard 326 and other Trivalent Passivates Work

Trivalent passivates consist of trivalent chromium compounds and/or complexes affixed in some manner to a zinc substrate. In conversion coatings, the chromium compounds are affixed to the substrate by virtue of their application as a conversion coating; e.g., the coating is a precipitate of chromium and zinc salts, oxides, and hydrated oxide. In Hyperguard 326, the chromium compounds are affixed to the surface by virtue of an aqueous binder which holds the compounds to the surface. Trivalent passivates, whether conversion coatings or this new Hyperguard 326 technology, function by generating hexavalent chromium during the corrosion process.

**For further information, visit
www.trivalentpassivates.com**

Coverage

Typical coverage of the Hyperguard 326 coating is approximately 1200 - 1500 square feet per gallon when applied without dilution. This results in a coating thickness of 1800 - 2000 nm or 1.8 - 2.0 micrometers or 0.0700 - 0.0780 mils. Dilution (as described below) results in a proportionate reduction in coating thickness or weight.

Performance Parameters for Diluted Solutions

Hyperguard 326 may be diluted with water to provide less corrosion protection. The incremental corrosion protection provided by this system can be roughly estimated as follows:

Neat (100%)	240 hours to 5% white rust
80%	192 hours to 5% white rust
60%	144 hours to 5% white rust
40%	96 hours to 5% white rust
20%	48 hours to 5% white rust
10%	24 hours to 5% white rust

Articles to be post-plate passivated using Hyperguard 326 should be tested; there is some variation due to the geometry of the parts being post-plate finished and the exact process being utilized to perform the coating.

Physical Description

Hyperguard 326 is an aqueous solution containing chromium (III) salts and polymeric binders. It is dark green in color with little odor. It has a specific gravity of approximately 1.09, a boiling point of 220⁰ F., and is non-flammable.

Precautions

Avoid contact with the eyes, skin, or clothing; the use of chemical eye goggles, acid-resistant gloves, and protective clothing is encouraged. Accidental spills may be controlled with lime or soda ash.

Packaging

Hyperguard is available in 5 gallon plastic containers (DOT 34), net weight 43.0 pounds, and in 55 gallon plastic drums (DOT 34), net weight 472.0 pounds.

Handling Equipment

This product is best handled with corrosion-resistant plastic volumetric equipment.

Shipping

National Motor Freight Classification: Chemicals, N.O.I. This product is not hazardous. It is therefore possible to ship this product by air without extensive paperwork or documentation.

Variations on a Theme

Hyperguard 326 is a valuable multifunction technology. PS&T can provide a great number of variations on this base technology to meet specific customer demand. Variations on this theme include:

Hyperguard 326Y - A yellow deposit which has an appearance similar to that of a conventional hexavalent chromate.

Hyperguard 326B - A slightly blue deposit for article identification and other uses.

Hyperguard 326V - A purple or violet deposit for article identification and other uses.

Hyperguard 326G - A green deposit for article identification and other uses.

Hyperguard 326R - A red deposit for article identification and other uses.

Hyperguard 326 Nitrate-Free - While little of the Hyperguard 326 ultimately ends up in the applicator's wastewater stream, this product is available for those who wish to remove nitrates from the operations in their plant.

Hyperguard 326 Nano - The incorporation of a nanoparticulate silicate polymer in the Hyperguard 326 formulation significantly improves the corrosion protection. (Available as a two-part system.)

Hyperguard 326 Cobalt-Free. Nickel has been restricted by the European Union purportedly as a health issue, although it is obvious that there is very little nickel produced in the EU. For those who wish to remove cobalt (which is next to Nickel in the Periodic Table, and shares many properties with Nickel), PS&T can provide this formulation at a reduced cost. There is some indication that this passivating formulation is especially effective over mechanically deposited zinc.

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