

# Product Technology Overview

## Decorative Technologies

Copper, Nickel, Chrome

				
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## Preface

COVENTYA, Inc. offers a full range of decorative products including high performance acid and alkaline non-cyanide copper processes, nickel technologies (bright, sulfur-free and satin), and the latest trivalent chrome plating processes. Additionally, in the support of the successful application of these deposits over various substrate types, we offer a complete line of cleaners and activators that will further assure the quality of the coating is right every time.

## Copper Plating Technologies and Additives

### Cyanide Based Processes

- **TASPLEX CU ADDITIVE:** Liquid that can be added to cyanide copper plating baths to improve anode corrosion and to provide grain refinement of the deposit.
- **TASPLEX BCC Process:** A high performance decorative process for bright cyanide copper plating. For use when extremely bright, ductile, and leveled cyanide copper deposits are required.

**TARGET MARKET:** *Conventional installations where cyanide copper is required for specific base metal and part configurations.*

### Alkaline Non-Cyanide

- **DIASTAR 100 Process:** An alkaline non-cyanide process for plating copper directly on carbon steel, aluminum, and zinc die castings. The process provides a uniform, semi-bright, ductile, deposit that is free from porosity. The deposition rate is similar to cyanide based systems operating at 30 g/l (4 opg) of copper metal.

**TARGET MARKET:** *Cyanide replacement for rack and barrel steel parts, rack zinc die castings, and rack plating of zincated aluminum.*

### High Performance Decorative- Non Dye Based

- **CUBRAC 200 Process:** A *non-dye* addition system specifically formulated for decorative applications. Used where extremely bright, ductile, and level acid copper deposits are required. The process is based on formulation ingredients that are easy to use in production and are effective over a wide operating range. Also, the process is unusually tolerant to production abuses and can be used in a variety of different types of plating operations.

**TARGET MARKET:** *Plastic, fixed cycle production lines, polished or buffed parts.*

- **ACCLAIM Bullet Process:** A versatile, high performance, *non-dye*, addition agent system specifically formulated for heavy-build barrel plating of munitions applications where bright, ductile acid copper deposits are required.

### High Performance Decorative- Dye Based

- ACCLAIM MARQUEE Process:** A versatile, high performance *dye-based* addition agent system designed for decorative applications requiring extremely bright, ductile, and leveled acid copper deposits. The process is especially suitable for parts that exhibit low current density areas, such as aluminum wheels. The performance is accomplished without compromising the “softness” of the deposit. If required, softness becomes important when polishing/buffing, also referred to as “moving the copper” deposit, in order to cover up (fill in) surface porosity – e.g., wheels.

**TARGET MARKET:** Aluminum Wheels, Exterior Auto Trim, Plumbing Fixtures, Motorcycle Parts.

- ACCLAIM ULTRA Process:** A *dye-based* process that operates with a single replenishment component. The system produces excellent performance where bright acid copper plating is needed for a decorative finish. The deposit is extremely bright, ductile, and offers leveling.



### Specialty

- ACCLAIM STRIKE Additive:** A single additive, *non-dye*, addition agent system specifically formulated to produce a highly conductive copper strike deposit over electroless copper, electroless nickel, or direct plate technologies that have been applied to plastic parts.
- ACCLAIM GR Process:** A versatile, high performance, *non-dye*, addition agent system specifically formulated for high-speed applications where extremely bright, ductile and level acid copper deposits are required. The addition agent system is non-foaming, making the process perfectly suited for high agitation/high current density plating applications.

## Nickel Plating Technologies and Additives

### Sulfur-Free Nickel

- **CRITERION INTRIGUE LG Process:** A high performance, *coumarin-free* addition agent system for depositing nickel coatings that are at or below 0.005% by weight sulfur content. The process differs from other similar type systems by providing unusually bright and leveled deposits and was developed specifically to meet automotive duplex and triplex specifications.
- **CRITERION SB 100 Process:** A production proven process that is a non-coumarin, multi-component addition agent system for depositing nickel coatings that are at or below 0.005% by weight sulfur content. Deposits exhibit superior leveling and brightness, while maintaining T/2R ratio numbers of 0.22 to 0.25.

### High Performance Decorative Nickel-Rack

- **CRYSTAL 301:** A process that utilizes both index and leveler (non-index) technology providing a deposit that exhibits excellent brightness, leveling, and low organic content. The system also utilizes a new brightener component that greatly enhances the bright throwing power (low current density), while exhibiting superior deposit ductility and tolerance to metallic contamination.
- **CRITERION MAXIMA ANTHEM Process:** A high performance, leveler only based process specifically formulated to plate where a high percentage of the surface area will be at either relatively high or relatively low current densities. Examples include: hand tools, shaped wire goods, such as baskets, shopping carts, etc., or parts fabricated from tubing, such as off-road equipment, exhaust stacks, etc.
- **CRITERION MAXIMA AP Process:** An economical, leveler based process for those applications requiring bright and leveled deposits. The system is designed to meet the versatile production demands of job shop plating facilities.

### High Performance Decorative Nickel-Barrel

- **CRYSTAL BARREL 210:** An index and leveler (non-index) based process designed specifically for barrel applications. The resulting deposit exhibits excellent brightness and leveling, even at minimal thicknesses. The electrolyte is tolerant to copper and zinc contamination making the system an excellent choice for processing zinc die cast based parts.

### High Sulfur Strike for TriPlex Nickel Deposits

- **CRITERION HS<sup>2</sup> Process:** A high performance addition agent system for depositing a high sulfur nickel coating when required for multilayer deposits. This process is ideally used in conjunction with duplex nickel plating applications to provide improved, superior corrosion resistance.

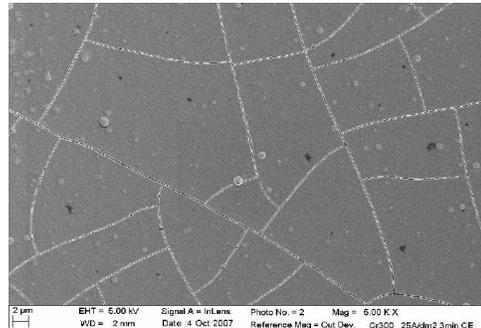
### Micro-Structured Nickel Deposits

- **CRITERION MP 200:** A process for extending the corrosion protection provided by a bright nickel deposit in a duplex nickel plating application. The resulting deposit introduces a high degree of micro-porosity in the subsequent chromium deposit, providing for an overall nickel deposit with superior corrosion protection.
- **CRITERION MC 300:** A process for creating micro-cracks in the subsequent chrome deposit for enhanced corrosion protection in multilayer plating applications.

MP 200  
Surface Photomicrograph



MC 300  
Surface Photomicrograph



- **CRITERION EFN Process:** A versatile process that produces high purity, low stress, columnar nickel deposit from a Sulfamate electrolyte that provides a uniform barrier nickel layer applicable to many engineering and functional applications. The system provides superior coverage over a wide range of current density and can be effectively utilized for plating zincated aluminum, for example in wheel plating, or where a barrier layer is required prior to plating acid copper or acid tin over aluminum substrates.

### Satin Nickel Processes

COVENTYA offers a wide range of high performance addition agent systems for producing decorative satin nickel deposits. The distinguishing features of these processes are their ability to provide uniform satin/matte, fine-grained decorative nickel deposits, even on polished base materials. The processes offer deposits that exhibit properties of low reflectivity while providing superior fingerprint and abrasion resistance. In addition, the deposits readily accept subsequent coatings of decorative chrome, black nickel, black chrome, and gold.



Process	Ra (nm)	Glossmeter value (Brilliance)
SATIN CRYSTAL V - Velour	94	247
SATIN CRYSTAL 960	162	144
SATIN CRYSTAL 230	164	136
SATIN CRYSTAL ST	191	128
SATIN CRYSTAL GFS	184	125

Brilliant



Matte

### Nickel Plating Wetting Agents

- **CRITERION AIR WETTER:** Non-foaming wetting agent designed for addition to any nickel plating process.
- **CRITERION AIR WETTER SPECIAL:** Specially formulated surfactant package intended for *occasional* use to control micro-roughness caused by the presence of un-dissolved iron particles.
- **CRITERION MECHANICAL WETTER:** A foaming type wetter package for use in mechanically agitated and barrel nickel plating installations.
- **CRITERION AIR WETTER LF:** An improved non-foaming wetter package that has been formulated for installations that use high amounts of air agitation and requires a quick dissipating foam.
- **CRYSTAL SURFACT 47 G:** Wetting agent system specific for **CRYSTAL** systems operating with air agitation ideally to control the surface tension between 35 and 45 dynes/cm<sup>2</sup>.
- **CRYSTAL SURFACT 46 M:** Wetting agent system specific for **CRYSTAL** systems operating with mechanical agitation to control the electrolyte surface tension between 30 to 35 dynes/cm<sup>2</sup>.

### Nickel Plating Supplementary Additives

- **CRITERION LEVELER:** A high performance additive to improve leveling that can be used in any **CRITERION** or **CRYSTAL** process. Recommended for use when the brightness of the deposit is satisfactory, but when additional deposit leveling is required.
- **CRITERION QRD ADJUSTER:** An auxiliary additive designed for occasional use with the **CRITERION "ANTHEM"** and **"AP" Processes** intended to boost the performance of operating solutions after long idle periods at operating temperature.
- **CRITERION CORRECTING SOLUTION:** An additive intended to improve low current density deposit performance by masking the effect of heavy metal contamination. Unlike conventional "purifiers" that complex the impurities, **CORRECTING SOLUTION** promotes the deposition of the contaminants.

- **CRITERION NICKEL PURIFIER:** A conventional type purifier for nickel plating baths. Especially useful for baths contaminated with certain types of organic materials.
- **CRITERION COMPLEXER:** A liquid additive for nickel plating baths designed to complex dissolved iron so it plates out without causing shelf roughness while keeping anode bags clean and unclogged.

### **Decorative Hexavalent Chrome Plating Additives**

- **COVENTYA SUPER-CAT Process:** A liquid catalyst system for use in both decorative and hard chrome electrolytes.
- **COVENTYA CHROME DISMIST:** Concentrated liquid additive used in decorative chromium plating baths. By creating and maintaining a foam blanket, spray and mist emissions are controlled from entering the atmosphere. Additionally, the additive lowers the surface tension of the chromium plating solution, which reduces the solution losses through drag-out.



### **Decorative Trivalent Chrome Plating Additives**

#### **Conventional Color Deposits**

- **TRISTAR 310 Process:** A “chloride based” trivalent chrome plating technology. The resulting deposit closely matches the color from Hexavalent Chrome processes, which allows the system to be an alternative or direct replacement to Chrome VI. Deposits will pass 22-66 hours CASS with appropriate process sequence and conditions.

**TARGET MARKET:** *Aftermarket Automotive, Store Fixtures, Door and Cabinet hardware, electronic hardware, hand tools, Any Cr+6 replacement applications.*

- **TRISTAR 300 AF Process:** The process electrolyte is sulfate-based and free of ammonium salts. The system is designed to provide uniform performance and economy over a wide range of current densities and operating conditions versus many competitive sulfate processes.



### **Black Deposits**

- **TRISTAR 710 Process:** A high performance addition agent system designed for producing a “black” trivalent chrome deposit from a chloride based electrolyte. The process has been developed to provide a uniform transparent black appearance over all current densities. The process provides superior corrosion protection by the deposit through the achievement of up to 66 hours of CASS.

### **Misc. Products and Technologies**

- **COVENTYA TASORB System:** This process has been developed specifically to replace out-of-tank carbon treatments for nickel, zinc, and many other electroplating processes by allowing for on-line, in-process treatment of organic contamination; either from additive breakdown products or organic contamination due to drag-in.
- **COVENTYA TASORB Powder:** A regenerable treatment technology for use in removing organic impurities directly from electroplating processes. The technology is used in systems that utilize a filtration/carbon chamber combination or with
- **COVENTYA’s TASORB UNIT** which not only filters the solution but to carbon polish/treat the working solution on a periodic or ongoing basis.

## *Surface Prep and Strippers*

**PRESOL, PRELIQ and PICKLANE Surface Preparation:** Our Decorative Technologies and their unlimited applications can be further enhanced by utilizing our complete line of cleaners and activators designed to support the plating of any type of substrate including ferrous, non-ferrous, light metals, non-conductors, plastics and ceramics. Your local COVENTYA representative can review the application and help choose the right **PRESOL** or **PRELIQ** cleaner, or **PICKLANE** activation to get the maximum performance from the COVENTYA plating system.

Especially plating on aluminum substrates can be challenging but utilizing our **OPTIBOND** non-chromium deoxidizers and **OPTIBOND** non-cyanide or cyanide zincate technologies provide the assurance backed by a high level of performance that the job will be done right every time.