SUPERCHROME PVD Coating

A green alternative for chromium-galvanized plastic components

automotive interiors EXPO 2015


Automotive Coatings
We are there for you.
Worldwide
It just
takes two
CYCON
VCI
jobaTEC
PVD Process Technology &
Thin Film Coating Equipment
SUPER
CHROME
PVD COATING

Vergason Technology, Inc.

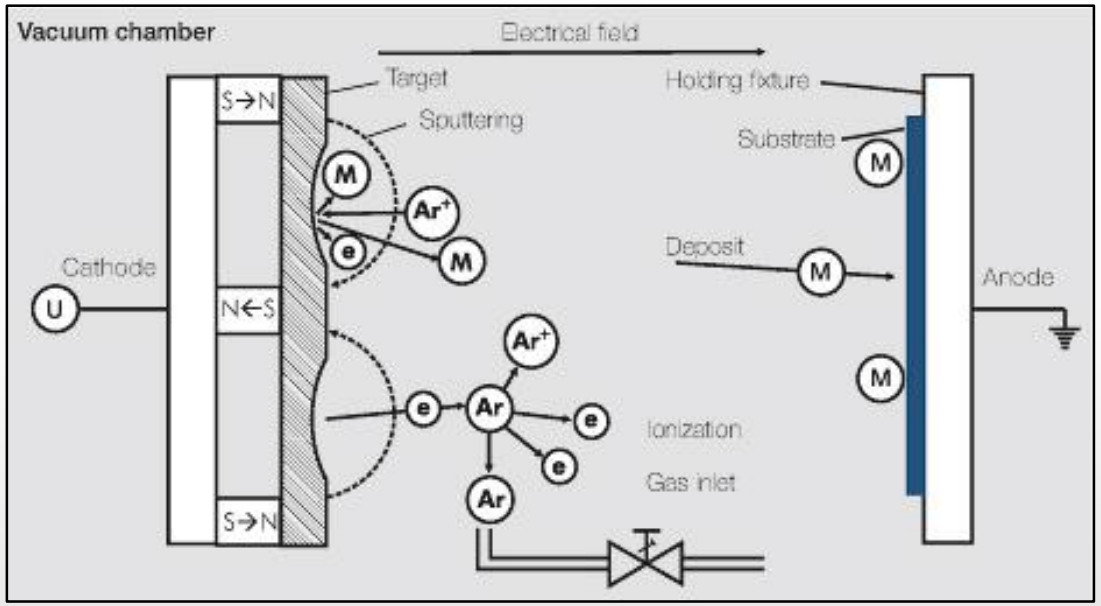
- Design, assembly, process development and commissioning of PVD/PECVD plasma equipment and turn key solutions
- Service and Distribution partners in Europe, Asia, Central/South America
- Job Coating Services available in USA
- First Rapid Cycle Coater built: 1988
  - 37 second cycle time, LEAN manufacturing
- > 200 Systems installed worldwide
- 35 Years experience in PVD technology
  - Tribological, shielding, reflective, decorative coatings
- Sales & Service in Europe provided by jobaTEC GmbH

Vergason Technology, Inc.
Van Etten, New York

Introduction to PVD Technology

Physical vapor deposition (**PVD**) describes deposition methods used to deposit thin films by the condensation of a vaporized form of the desired film material (e.g. aluminum, chrome) onto the substrate surfaces (e.g., automotive plastic parts).

The coating method involves physical processes such as high-temperature vacuum evaporation with subsequent condensation, or plasma sputter bombardment. Includes: thermal, sputtering and cathodic arc deposition.



Advantages of PVD Coating

- **REACH-conform:**
  both in production and disposal avoiding Cr3+, Cr6+ and Ni
- **Environmentally-friendly:**
  clean technology, few waste issues
- **Color flexibility:**
  broad spectrum of color shades and effects in chrome from bright chrome to dark chrome and colored PVD
- **Corrosion resistance:**
  applies to automotive test requirements in combination with or without top coat
- **Safety aspect:**
  The thin PVD coating and the use of flexible substrates enables safety-relevant applications e.g. impact protection airbag emblems and others

Advantages of PVD Coating



- **Large variety on substrate materials:**
  PC/ABS, PC, ABS, PPE, PA, ASA, PC/PBT, BMC
- **Day/Night Design**
  with Laser etching
- **Radar-Transparency**
  metalized components to not block crash avoidance and lane changing monitoring systems

- **Light Transparency:** based on partially transparent PVD coatings
- Integration of **Capacitance Sensing**
- **Temperature range:** 40° to 85°C
- **Full integration** into paint lines using UV-cured base and top coat
- **Variety of metal targets:**
  aluminum, chrome, titanium, stainless steel, nickel chrome, copper, silver, gold, brass etc.

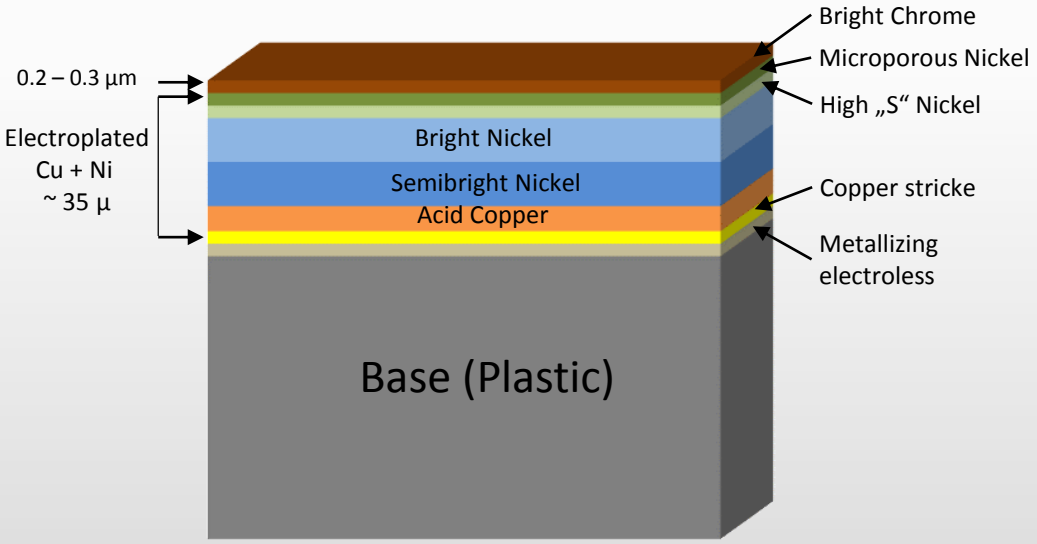
Applications for PVD Coating

Our PVD Coating Systems are operating globally in a variety of applications and industries:

- Vehicle Lighting, Components, Wear Parts
- Appliance Components
- Display Items
- EMI/RFI/ESD Shielding
- Consumer Products:
  - Flashlight Components
  - Cosmetic and Product Packaging
  - Sporting Goods and Toys
  - Glassware and Mirrors
- Vapor Barrier Protection with PECVD
- Commercial, Industrial and Residential Lighting

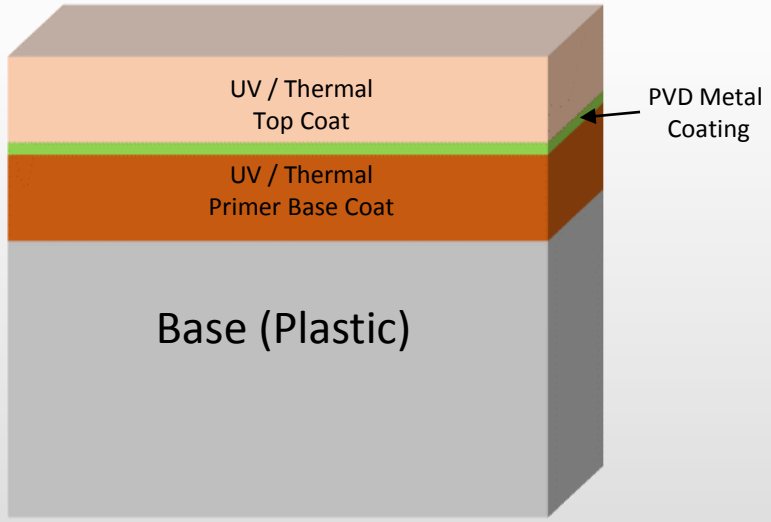
PVD Metallizing versus Chrome Plating

Chrome Plating



PVD Metallizing

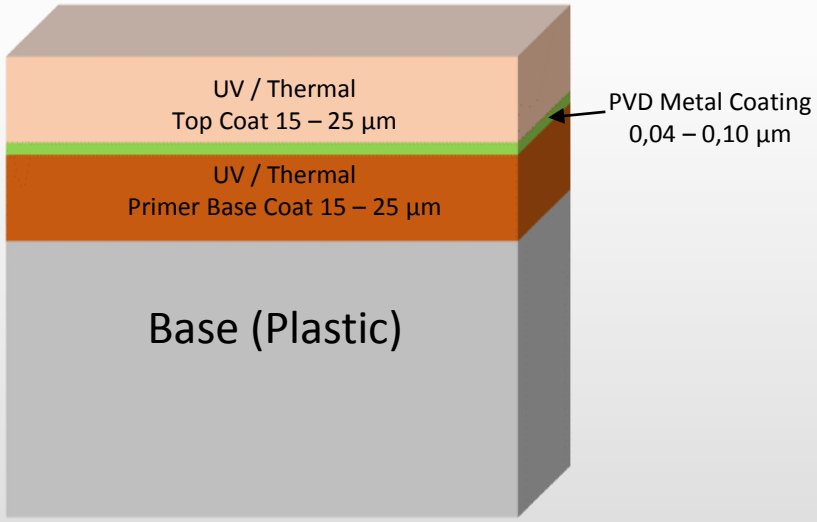
Traditional Triple Stack:
Base Coat/PVD/Top Coat



SUPERCHROME PVD versus Triple Stack Coating

PVD Metallizing

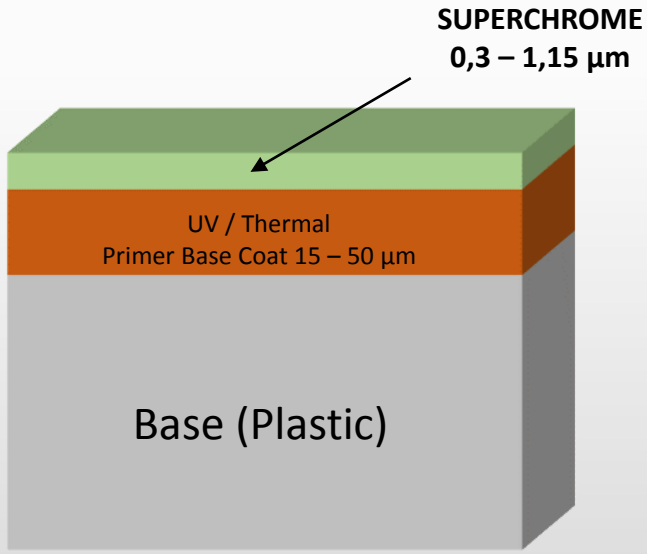
Traditional Triple Stack:
Base Coat/PVD/Top Coat



Top Coat Darkens, Color Loses Depth

SUPERCHROME PVD Coating

Double Stack:
Base Coat/PVD
No Top Coat necessary

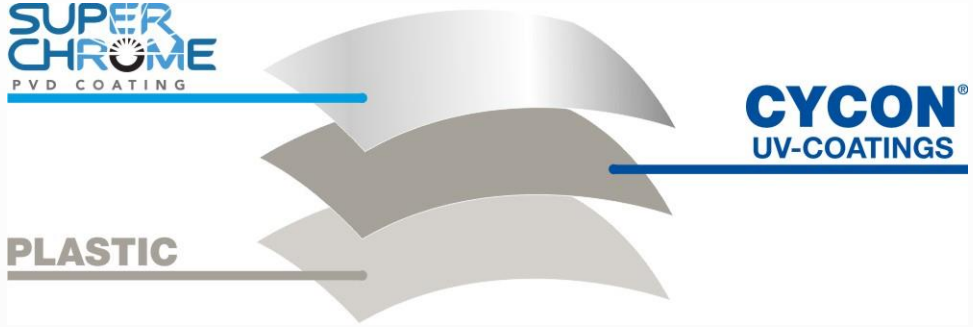


True Deep Chrome Color

SUPERCHROME PVD Coating

Two Layer Decorative Coating for Automotive Interior/Exterior Parts

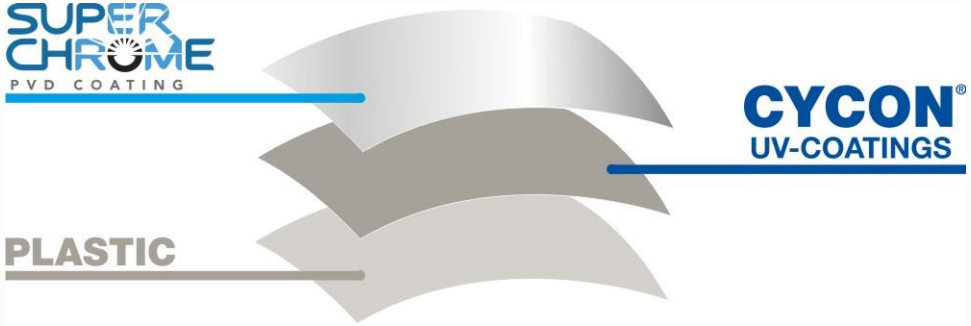
- Substrate + UV-Base Coat + SUPERCHROME PVD Coating: No top coat necessary
- Possibility to apply on different plastics and metal alloys
- Several UV-cured base coats (Mankiewicz) for different SUPERCHROME PVD Coating finishes tested and approved
- No corrosion risk, excellent adhesion, thermal stability and humidity resistance



SUPERCHROME PVD Coating

Two Layer Decorative Coating for Automotive Interior/Exterior Parts

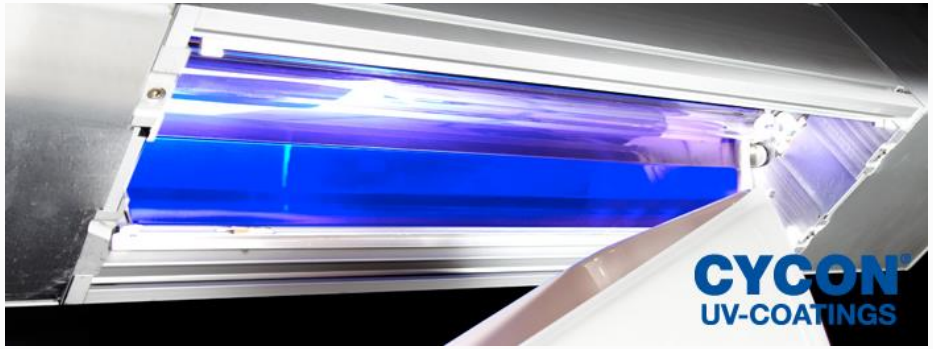
- Can be altered in appearance to achieve certain design effects (bright/medium/dark Chrome)
- Environmentally compatible alternative to galvanic Chrome (REACH – conform)
- SUPERCHROME PVD Coating meets major test requirements for automotive interior and exterior parts, such as: AUDI/Volkswagen, BMW, Renault, PSA, Ford …



UV Base Coat for SUPERCHROME PVD COATING

UV curing coating systems combine superior product properties with short process times at low capital expenditure requirements:

- Complete elimination of oven drying
- Low VOC
- CYCON® UV coatings are fully cured within seconds
- Coated components attain their specification-compliant properties, with very good mechanical and chemical resistance values
- Requires less production floorspace
- Shorter processing saves energy and investment costs
- Excellent surface for support and adhesion of PVD coatings



UV Base Coat for SUPERCHROME PVD Coating

3 – 5 min

Cleaning → Spraying UV paint → Flash-off → UV Curing → PVD Coating

- Short, fast processing time
- Low scrap rate
- Smaller footprint than thermal cure paint lines
- Integrates into LEAN synchronous manufacturing

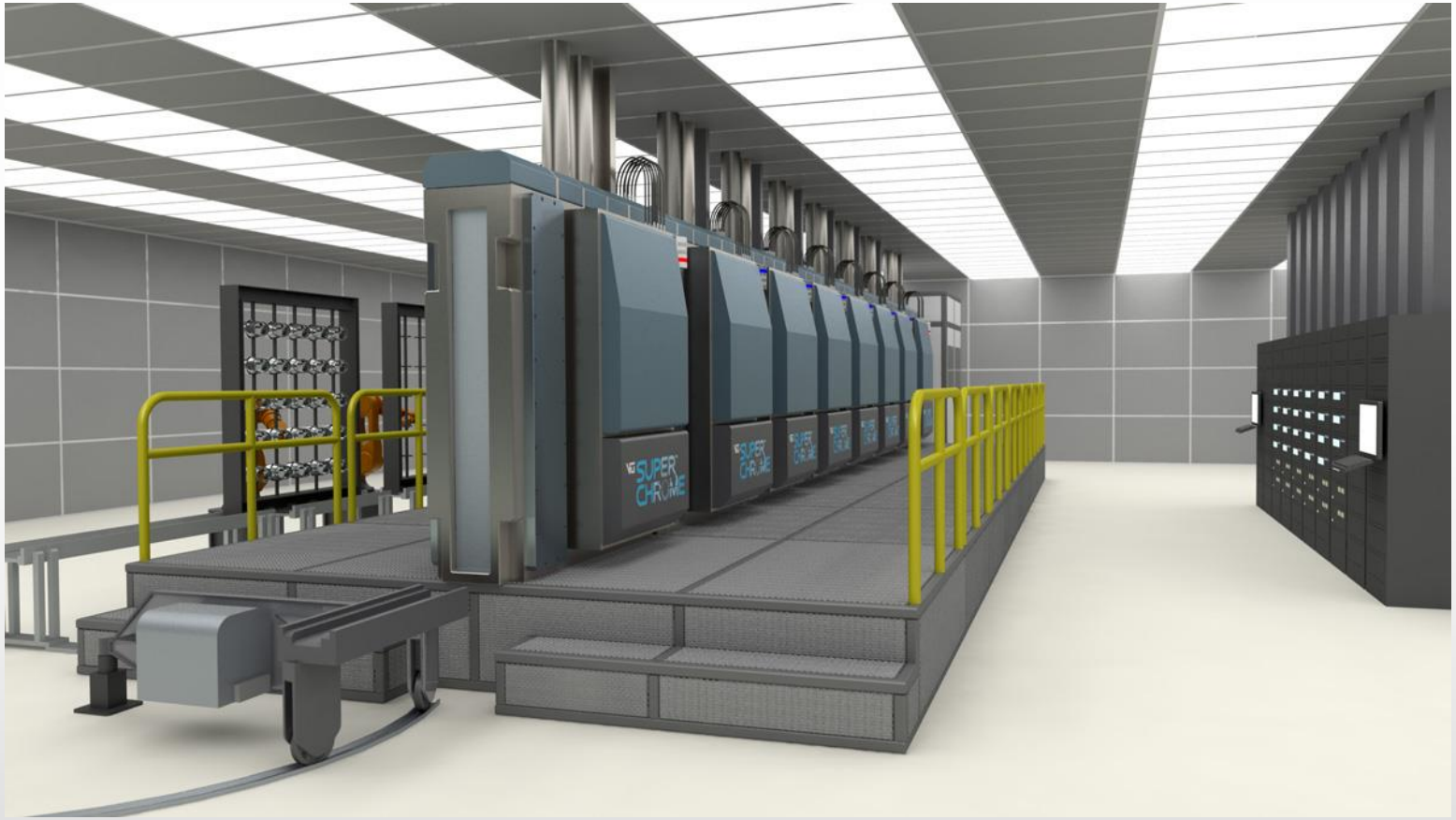
SUPERCHROME PVD Coating System
Integrated production - Batch

SC 660 PVD Coating System

Single-point loading and safety enclosure

Molding → Cleaning → CYCON UV-Coating Paint Line → SUPERCHROME PVD Batch System

SUPERCHROME PVD Coating System
Integrated production - Inline



Layout:

- load lock entry chamber
- plasma pre-clean chamber
- process chambers
- Load lock exit chamber
- conveyor return system
- robotic loading and un-loading station
- Heated de-stat before vacuum

Molding → Cleaning → CYCON UV-Coating Paint Line → SUPERCHROME PVD Inline System

Conclusions

- PVD process and equipment technology is making strong headway for safe replacement of some applications of electroplated chromium on plastic substrates
- Key work for chromium coatings on plastic substrates with no top coating was started four decades ago
- SUPERCHROME PVD Coatings are gaining acceptance for internal and external automotive applications as well as for use in sanitary and appliance markets
- Batch and Inline-Systems available
- Job coating services available in USA

Please contact us for further information

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