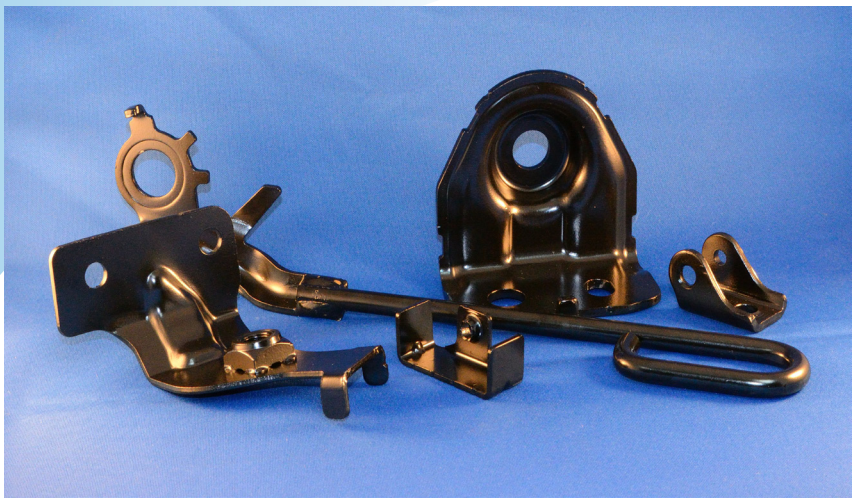
Electrocoating



The fundamental principle that makes electrocoating work is that opposite charges attract each other. In the electrocoat process a DC rectifier is used to create a voltage potential between a conductive part and an oppositely charged electrode that is immersed in the electrocoat paint tank. The electrocoat paint particles are also capable of being electrically charged are deposited out of a water suspension to coat the conductive part when the rectifier is turned on.

The voltage from the DC rectifier is used to control the amount of paint that is deposited onto the part. As the voltage is increased, the amount of paint deposited will also increase. The deposition is self-limiting and slows down as the applied coating electrically insulates the part. Electrocoat solids deposit initially in the part areas that are closest to the counter electrode and as these areas become insulated to the current, solids are forced into more recessed bare metal areas to provide complete coverage. This phenomenon is known as throwpower and is a critical aspect of the electrocoat process.

Depending on the polarity of the part and paint particles, electrocoating is classified as either anodic or cathodic.

The Anochrome group offer cathodic electrocoating, here the part to be coated is the cathode which is negativly electrical charged, this attracts positively charged paint particles in the paint bath. By reversing the polarities used in the anodic process, the amount of soluble iron that enters the paint film during the cathodic process is greatly reduced and the corrosion resistance properties of the paint film are improved. Cathodic coatings are high-performing coatings with excellent corrosion resistance that can also be formulated to meet tough exterior durability requirements.

Why choose E-Cote

Process Overview:

The electrocoat process can be divided into four distinct sections:

Pretreatment: Parts are cleaned and pretreated with a conversion coating to prepare the part for electrocoating.

Electrocoat Tank: Direct current is applied between the parts and a “counter” electrode. Paint is attracted by the electric field to the part where it is deposited.

Post Rinses: Parts are rinsed to reclaim undeposited paint solids.

Bake Oven: Paint is thermally cross-linked or cured The parts are transported through the system, hung from programmed indexing devices which are used to move the parts from stage to stage and in and out of tanks.

The choice of electrocoat over other coating technologies is usually driven by the lower total applied cost of electrocoat. The low total applied cost is made possible because electrocoating is an automated process, which gives precise film builds and high paint transfer efficiencies. The process yields a consistent part-to-part, high performing coating, with no need to inspect or re-work parts due to paint defects such as runs, sags and voids.

The key to electrocoat’s high paint transfer efficiency can be summarized in two parts:

The process automatically limits the amount of paint being applied. As paint film builds upon the surface, an insulating layer is built which resists the deposition of excess paint.

By using ultrafiltration the process can recover over 98% of all paint that is carried out of the paint tank and into the rinse stages.

The process also provides the end user withthe ability to coat complex parts or hard to reach surfaces, while still hanging parts very densely. Combined with the fact that manual labour is not needed to apply paint, the electrocoat system becomes a fast moving and highly productive coating process.

Environmental advantages include products with low or zero VOC and HAPs, often eliminating the need for costly air abatement equipment that is present with many solvent based liquid spray or dip processes. Electrocoat products are heavy metal-free and have low BOD/COD if introduced to waste streams. Products are water-based, thus reducing fire hazards and worker exposure to hazardous materials.

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Electrocoating

Advantages of Selecting Electrocoating Technology

Application & Performance

- Outstanding Film Uniformity: Consistent film on all part-to-part surfaces. No sags, runs, or drips.
- Total Coverage of Complex Part Configurations: Coating on all recessed areas and sharp edges.
- Precise Film Build Control: Uses DC voltage to deposit paint only where it is needed.
- Pre-assembly Before Coating: Less post paint rejects.
- Wide Range of Products: Formulated to meet corrosion, durability and other performance specifications.
- Flexibility: Multiple part configurations can be coated in one tank, without having to change the application equipment.

Economics

- Totally Automated Process: No direct labour.
- Very High Productivity: Dense and non-uniform line loading.
- Very High Transfer Efficiency: Closed-loop rinse system approaches 100%.
- Lower Energy Requirements: No dry-off oven; minimal exhaust and air make-up.
- Minimal Maintenance: Minimal hook cleaning; no “booth” maintenance.
- Lower Insurance Rates: No specific fire or health hazards.

Typical Perfomance of Cathodic E-cote

TEST	Specification	Performance
Hardness	Pencil Buchholz	6H >100
Scratch Resistance	BS 3900 E2	2000g
Abrasion Resistance	Taber CS17	
Crosshatch Adhesion	DIN53151	Gt0
Mandral Flexibility	BS 3900 E11	6mm
Erichen Indent	DIN53156	> 4mm
Impact Resistance	Honda 5100Z-SEOV-0000 (B801)	50cm RT
Humidity Resistance	Honda 5100Z-SEOV-0000 (B801) Nissan NES M0007	Pass240hrs, no adhesion loss
Salt Spray Resistance	DIN 50021, ASTM B117	1000hrs <2mm creap
Cyclic Corrosion	Honda 5100Z-SEOV-0000 (B801) Nissan NES M0007 VDA 621 415	Pass 50 cycles Pass 150 cycles 10 cycles 0.5mm creep
Hot Salt Immersion	Honda 5100Z-SEOV-0000 (B801)	240hrs <2mm creep
Water Resistance Boiiling Room temp	Honda 5100Z-SEOV-0000 (B801)	 Pass 3hrs Pass 240hrs
Stone Chip Resistance	Ford FLTM EU BI-7-1 Ford FLTM EU BI-57-2 Honda Gravelometer Nissan Gravelometer	Pass Pass Pass Pass
Chemical Resistance Acid (10% sulphuric) Alkali (5% sodium hydroxide) Petrol Power Steering Fluid Brake Fluid Coolant Cutting oils Engine oil Gearbox oil	Nissan 54400899900 S4 4hr room temperature	 No film deterioration
Other	Throwing power Heat resistance 15minutes at 450oc	>20cm OK