Application-specific processes for metal finishing

The surface finish of our products reflects the level of our commitment
KESSEBÖHMER: PREMIUM QUALITY MADE IN HOUSE.
...headquartered in Bad Essen, Germany, has two of the largest and most efficient electroplating plants in the world for chrome-plating ferrous and non-ferrous metals.

In two separate plants at the same location, beyond covering our own electroplating needs, we undertake contract processing for the office and residential furniture industry, for product presentation systems, for the automotive industry, for camping and caravan equipment, and for the sanitary ware and healthcare sectors.

Our machinery and systems incorporate the engineering know-how and experience of over 60 years in electroplating. Maintaining our lead in innovation, our second electroplating plant, with the most advanced and reliable systems engineering, is scheduled to go into operation in 2015.

As an accredited vocational training company for surface coaters/electroplaters, we can rely on a pool of highly trained staff who have qualified in house.
From A to Z –
a focus on technical and decorative surface finishes.

Achieving the perfect surface finish demands carefully selected raw materials and meticulous processing. We can call on decades of experience in electroplating steel, stainless steel, copper and brass.

Skills and services:
- Electroplating: bright chrome, matt chrome, bright gold, matt gold, bright nickel, matt nickel, copper and (from 2015) black chrome
- Coating thicknesses to customer specifications
- Daily output: 30,000 parts; from 2015: 60,000 parts (electroplated area: 7500 m²)
- 3600 x 1400 x 600 mm electroplating bath for chrome-plating larger components
- Chrome finishes (using hexavalent and trivalent electrolytes)
- Transparent protective coating on nickel, copper or gold to customer requirements
- Use of MPS and MR nickel in microporous and microfissure processes for improved corrosion protection for exterior applications
- Nickel strike for plating stainless steel
CUSTOMER EXPECTATIONS: FOR US THE MEASURE OF ALL THINGS.

The best answers to the toughest demands.

Technical features of our plant:
- 3D parts agitation in all metal-deposition baths and during preprocessing
- Electrolyte agitation in all metal-deposition baths and during preprocessing
- Online monitoring of all process-relevant parameters
- Kavitec degreasing – Venturi system
- Highly effective flushing technologies
- Symmetrical current control for optimal coating distribution
- Process-optimised filtration systems
- Hot degreasing, electrolytic degreasing and pickling
Optional use of MPS and MR nickel in microporous and microfissure processes for improved corrosion protection for exterior applications, eg, automotive applications, and for export.

Nickel strike for plating stainless steel.

3D parts agitation in bright nickel, semi-bright nickel and copper.

Online monitoring of electrolytes.

Process-optimised filtration techniques.

Kavitec degreasing – Venturi system.

Hot degreasing and electrolytic degreasing.

The parts window, measuring 3600 x 1400 x 600 mm, sets the limits for the largest part that can be processed:
- Nickel-chrome
- Cathodic dip painting
- Electropolishing
CUSTOMER EXPECTATIONS: FOR US THE MEASURE OF ALL THINGS.

- Optimal rack design for every product
- Symmetrical current control
- Electrolyte agitation in all metal-deposition baths and during pretreatment
- Layer thicknesses to customer specifications
- 3D parts agitation in all metal-deposition baths and during pretreatment
- Ultra-modern, highly effective flushing technologies

600 x 1400
**CDP**

**Cathodic dip painting**

**Pretreatment:**
- Variant using Zn phosphating:
  - Degreasing, pickling, activation, Zn phosphating, passivation
- Variant using zirconium-based conversion process:
  - Degreasing, pickling, zirconium-based conversion

**Coating:**
DCDP coating is an electrochemical process.

Paint deposition is powered by the flow of an electric current from an outer electrode (anode) via the conductive paint to the items to be painted (cathode) – similar to electrolytic coating.

The result is a highly homogenous coating on metal surfaces and cavities with a uniform layer thickness from 10 to 40 µm and good surface finish qualities.

The final thermal treatment between 175 and 195 °C results in bonding.

The coating meets all current test requirements, including those of the automotive, agricultural machinery and other industries (e.g., salt spray tests, VDA cyclic corrosion tests).

**Resistance:**
The coating is corrosion-resistant to acids and alkalis and is oil- and solvent-resistant.

**Suitable materials:**
Steel, galvanised steel and aluminium

**Machine technology:**
Intermittent pass-over system with variable furnace times

**Benefits:**
- Uniformly distributed coatings
- High corrosion protection
- Environment-friendly process (highly efficient immersion process, water-soluble painting system with only approx. 2.5% concentration of organic solvents)
- Cost-effective process
- Uniform thin coating and good flow characteristics (no drops and runs)
- Very good process for coating cavities
- Good overpaintability, high-quality priming for subsequent painting
**Powder coating**

Powder coating – or powder spray painting – is a coating process whereby an electrically conductive material is coated with powder paint. A typical powder coating plant consists of pretreatment and intermediate drying facilities, an electrostatic coating cabin and a curing oven. Parts are transported through the processes on a conveyor system.

**Pretreatment:**
During pretreatment the parts are cleaned by means of aqueous media applied via spray nozzles and a conversion layer is applied to improve paint adhesion.

**Powder application:**
The paint in powder form is supplied through hoses to automatic spray guns and atomised to a powder cloud via a nozzle system. An electrode integrated in the nozzle system charges the paint particles, now smaller than 100 µm, electrostatically. The charge causes the paint particles to be deposited on and to adhere to the grounded parts. Paint overspray is recovered by means of suction systems.

**Curing oven:**
At an oven temperature of approx. 200°C the paint particles melt and bond to form a continuous layer of paint 60 to 100 µm thick.

**Application (powder coating only):**
Parts for interior and occasional exterior use.

**Application (cathodic dip painting + powder coating):**
The coating meets all current test requirements, including those of the automotive, agricultural machinery and other industries (e.g., salt spray tests, VDA cyclic corrosion tests).

**Suitable materials:**
Steel, galvanised steel and aluminium

**System technology:**
Overhead conveyor system

**Pretreatment:**
Alkaline degreasing and zirconium-based conversion process

**Benefits:**
- Easy on the environment, no solvents involved
- Easy on resources and cost-effective, high material yield
- Decorative, corrosion- and UV-resistant and mechanically resilient surface
- Available in any colour tone and gloss
Electropolishing
Electrolytic polishing

Das Electropolishing is an ablative process in which minute amounts of metal are removed, electrochemically and without stress, from the surface of the workpiece.

The micro-roughness of the effective surface is reduced by up to 80% (see diagram). The process is able to remove small “defects” and ablate changes in the edge layers. The result is a high-gloss, mirror-like surface.

Benefits:
- High corrosion resistance
- Deburring at micro range
- Levelling of surfaces
- Metallic purity
- High-gloss surfaces
- Reduced risk of contamination
Quality management and **operational reliability**

- Permanente Permanent online monitoring of all process parameters
- Two independent electroplating plants – at separate locations – will make sure we can meet all delivery schedules
- Extensive preventive measures for fire safety
- The entire production area is designed as an acid-proof chemical collection sump according to the German Water Resources Act
- Certified to DIN EN ISO 9001:2008
  - Certified to DIN EN ISO 14001
  - Certified to DIN EN ISO 50001
  - Certified to TS 16949 (summer 2015)
- We can switch between two independent energy sources (wood and gas) to guarantee supply security

**ENVIRONMENTAL PROTECTION: THE QUALITY CONTINUES!**
Our chrome is shiny clean green!

All our processes are optimised to ensure sparing and environmentally friendly use of valuable raw materials and resources. At the same time, careful selection of materials and responsible processing produce products with a long service life.

- Recirculation of flushing water and treatment of circulating water
- Mono-sludge production for recovery of recyclable materials (e.g., nickel, copper, chrome)
- We use hexavalent and trivalent electrolytes for chrome-plating
- Evaporation system for recirculation of the hexavalent chrome electrolyte
- Intake air is heated by heat recovered from waste air
- Extensive preventive measures for fire safety