



**DMK**

## Processes Specialities

For more than 100 years already, Kampschulte's processes for the electroplating industry offer the complete range of products which are necessary for the most important ways of surface treatment.

Permanent in-house development, international exchange of experience, and a grown and accrued know - how will give you the high efficiency of our processes. They offer the better surfaces for a wide range of applications.

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### DEGREASING

For our wide range of soak and electrolytical cleaners as well as for our descaling, pickling and acid degreasing products for zinc, copper, iron, their alloys and further materials we do have an extra overview which will be send to you on request.

### ANTI CORROSION ADDITIVES

#### **Ferroseal 49**

Added to the final rinse this product prevents rust formation on metal parts. Can be used for untreated as well as plated products.

#### **Ferroseal 48**

Prevents from rusting during water evaporation after rinsing without leaving a film. Suitable for cast iron and sintered metals.

### RINSE AIDES

#### **Dekaseal 6**

An organic rinsing additive with corrosion inhibitor for all metals, for drying electroplated or cleaned surfaces. Forms a protective film on the metal surface with an excellent adhesion.

#### **Dekaseal 12**

A corrosion inhibitor for copper and brass, forming an invisible film which prevents from tarnishing, pitting and spotting.

### ANTISPRAY ADDITIVES

#### **Spruehex**

An anti - foam agent for almost all alkaline baths common in electroplating ( but except for copper and brass solutions ). A non-visible film on the solution will be formed.

### COLORING

#### **Dekacolor 80 MS**

This is a vastly improved product for a uniform burnishing of copper, brass and their plating deposits. A brief dip at room temperature is sufficient to form a constant brown color. Will work under automatic conditions.

#### **Dekacolor 63 MS**

A concentrated and stabilized version of a solution to make deeply dark brown deposits on of copper, brass and their plating deposits with a constant coloring effect. Especially suited for a following bronzing or antique brushing - even in automatic installations.

#### **Dekacolor CL**

Black colouring process for copper and copper alloys, gives rugged, all black coats with high chemical and thermic resistance.

#### **Dekacolor ZN**

Produces black coatings on all kinds of zinc deposits and zinc die casts.

### CHROMATE CONVERSION

#### **Saphirblue FF**

A fluid, chromVI - free passivation to give blue coatings on zinc deposits as well as on zinc - cobalt - alloys. As it is fluoride-free, it does not etch iron, thus it has an extremely long operational life.

#### **Saphirblue FFK**

A really blue passivate without chromium – VI. Apart from being fluoride-free ( which has real advantages for the lifetime and sensitivity to iron ) it will give superior corrosion resistance results.

#### **Passive-Enhancer FF**

Additive for remarkably rising the corrosion resistance of conventional passivates.

#### **Citrin 510**

produce a yellow-gold, slightly iridescent chromate coat with an excellent corrosion resistance on all electroplated zinc- and zinc - cobalt - deposits.

#### **Citrin 350 ( fluid )**

Produces a soft, gold toned colour on zinc and cadmium deposits as well as zinc die casts. Excellent corrosion protection.

#### **Iris 351 ( fluid )**

Produce a bright, uniform gold-yellow colour on zinc- and zinc - cobalt deposits and zinc die casts with an unsurpassed corrosion protection.

#### **Univers S**

Produces on all zinc deposits black, corrosion inhibiting chromate coatings with an extreme uniformity.

#### **Univers GB**

Suitable for all zinc- and zinccobalt - treatments. Produces deeply black chromate deposits relatively insensitive to bleeding. With proper maintenance, the formation of dry stains is put to zero. The possible throughput of this black chromate seems to be unprecedented.

#### **Topal 10 - 32**

Produce dark olive coatings on zinc deposits from cyanide and chloride electrolytes. The protection against corrosion is excellent.

### HEAVY PASSIVATES

#### **Eloc - 6**

That product meets with the corrosion resistance of yellow chromate conversion coatings ( without additional sealing ) on zinc, zinc-iron and zinc-cobalt, gives a transparent to bluish outlook but does not use any hexavalent chrome.

Operation is done at room temperature. Performance is given on zinc, zinc-iron and zinc-cobalt.

It meets with the highest standards of the EC.

#### **Eloc DBR**

In a solution based solely on trivalent chromium, blue resp. colorless-transparent passivation layers are performed on zinc layers even at conventional dwelling times ( 30 – 60 sec ).

#### **Neropass / Preto**

In a solution based solely on trivalent chromium, black passivation layers are performed on zinc layers from alkaline solutions of the "HC"-type with a certain anti-corrosion effect. In the version of the "Preto"-process, this will be performed on zinc layers from chloride solutions.

#### **Helios**

In a solution based solely on trivalent chromium, heavily iridescent yellowish passivation layers are performed on zinc layers.

#### **Nano Top**

Additive for all passivations that are based on trivalent Chromium. It will increase the corrosion characteristics of the passivating deposit especially at the edges.

### SEALING

#### **Aquaplat # 47**

An alkaline clear solution of copolymers, forming a layer which reliably will prevent from bleeding. In addition to that, an additional corrosion protection of a dried chromate film is achieved at.

#### **Enhancer Nano**

Additive for all passivations that are based on trivalent Chromium. It will increase the corrosion characteristics by an extremely uniform embedding of silicon even into depths of the passivating deposit.

#### **Aquatop W**

An alkaline polymeric sealer based on waxes; the S- version contains also nanoscale additives. The layer on top of the passivation will have much better corrosion resistance.

### STRIPPER

#### **Stripper A –V**

Removes remnants from so-called “Top-Coats” from racks and reject parts, even if they had been dried already.

### **COPPER PLATING** **Alkaline Copper Plating**

#### **High Efficiency Bright Copper Electrolyte" EUROPA "**

A cyanide potassium based electrolyte for iron, steel and zinc die-casts, gives very bright deposits in all current density ranges. Simple to run, simple to control.

### **COPPER PLATING** **Acid Copper Plating**

#### **Bright Acid Copper Bath " Maroon 208 "**

Rather improved acid bright copper electrolyte with distinctively improved performance. Produces over a wide range of the current distribution very bright, ductile and levelling copper deposits with perfect corrosion characteristics. Well suited for the plating on plastics, plating of zinc die cast - and steel, of course.

### **BRASS PLATING**

#### **Bright Brass Electrolyte " Victor "**

A new kind of brass plating : The electrolyte works without ammonia, but on the basis of organic additives. A very stable operation is accomplished by this; conversion from conventional brass solutions are possible.

### **TIN and TIN-ALLOY PLATING**

#### **Dekatinn 19**

A sulphuric acid bright tin electrolyte with up to date characteristics: excellent throwing power, levelling, soldering quality, brightness, and grip. The organic components permit a safe operation under various conditions. Operating temperature and metal contents can vary over a wide range. Most important, the solderability is excellent; the danger of whiskers is reduced to a minimum.

#### **Tinnilloy**

Gives Tin-Nickel Alloys of 65/35% with a rather decorative, stainless-steel like look. The corrosion resistance is superior and can be compared even with that of titanium.

### NICKEL Bright Nickel Processes

#### **Bright Nickel Bath Ultraglanz 1**

The classic bright nickel electrolyte of extreme reputation, robust and of universal capabilities. It will meet every normal requirement with an outstanding corrosion resistance: Suitable for either barrel and rack plating, for air agitation or cathode movement, in bright or double nickel plating processes.

#### **High-Levelling Bright Nickel Process " Superior "**

Most modern bright nickel plating processes especially for air-agitated baths to give brilliant surfaces on racked ground iron and steel parts, as well as brass parts. The process is non-sensitive to a reduced filtration. The deposits will show an outstanding brightness, and levelling which can be controlled separately ( as well as the throwing power ). Absolutely ductile, free from stain after proper chrome plating, fast and uniform dispersion over the whole range of the current density have created this processes to one of the leading processes in the world. Furthermore, it is insensitive to overdosing, thus simple to maintain. There are no break down products giving brittleness during the lifetime of the bath, even with recycling techniques.

#### **High-Levelling, High-Efficiency Nickel Electrolyte Ultraglanz 71 G**

Exclusively developed for rack plating, either for mechanical or air agitation. High brilliance and with excellent levelling properties in the whole area of the current density. No break-down products will form irreversibly brittle deposits; thus contaminated baths can be repaired by this process also.

#### **High - Levelling Bright Nickel Process " Premium "**

A very economic alternative for baths with cathode movement developed for parts ground and polished before electroplating; steel pipes, tubes and wires. When a system is needed to vary from technical to extremely brilliant nickel surfaces within a short time, this is the perfect brightener system which easily can be controlled as to individual requirements.

### Barrel Nickel Plating Processes

#### **Rotoglanz 50 - 93**

This electrolyte produces deposits of high brightness and excellent levelling on steel, zinc die casts, copper and its alloys in barrel plating. Excellent ductility, free from strain on the deposits, thus permitting subsequent mechanical treatment. Unsurpassed throwing power provides also regular brightness with relatively thin layer thickness also on complicated shaped bulk parts. No irreversible hardness, which means no increasing consumption of brightener. Peeling will be avoided.

### Special Products for Nickel Electrolytes to Adjust them to Your Specific Production

#### **Carrier Ultraglanz 81**

Class 1 brighteners which have class - 2 properties.

#### **Wetting Agent Ultraglanz M**

for baths with cathode movement.

#### **Wetting Agent Ultraglanz NLI**

Wetting agents with accelerated anti-pitting capabilities.

#### **Leveller Ultraglanz**

To adjust the levelling strength of the electrolyte.

#### **Additive Ultraglanz ZM**

To brighten up the deposits in the low current density area

#### **Additive Ultraglanz WN**

To brighten up the deposits over all the current density area

#### **Additive Ultraglanz SV**

To increase the throwing power

### **Semi Bright Nickel Processes**

#### **Janus 4**

The semi bright deposit from the sulphur- and cumarine-free electrolyte is absolutely uniform and highly levelled. The coatings have a column - to -mixed structure, the difference in the potential can be balanced out by a special additive. In any case, the adhesion of a succeeding bright nickel layer is perfect. These superb functions render the electrolyte to one of the absolute top - processes.

### **Decorative Nickel Plating**

#### **Anthracite Nickel " Arranha "**

A completely surprising pure nickel finish. The deposits are of a warm, optically very becoming, anthracite colour. Especially suitable in combination with brass or gold; suitable for barrel and rack plating.

#### **Matte Nickel " Sedoso "**

This process will yield uniformly anti-glare, silk-matte and very decorative surfaces. Sandblasting, grinding, rough polishing becomes avoidable. Grinding grooves on the base material will be covered by the nickel surface at least partially. Other than cluster - forming emulsifying agents will give this effect even on wide areas. Without any special equipment, the range of applicable current densities is comparable to that of bright nickel.

#### **Matte Nickel " Ultrasamt "**

Since decades, this process has gained wide acceptance in the field of decorative electroplating. By aid of a special recovering device, non-glare nickel deposits are produced continuously.

### **Nickelsulphamate Plating**

#### **Nickel-Sulphamate Electrolyte**

Yields strong but ductile nickel deposits. Hardness is absoluteley even and can be controlled between 200 and 550 VH. These characteristics make the process ideal for diamond embedding, plating on stainless steel and for parts which undergo a heat - treatment succeedingly.

### ELECTROLESS NICKEL PROCESSES

#### **Electroless Nickel Bath " Enigma 1020 "**

A process for the deposition of lead - free nickel-phosphorus layers with a high resistance to wear and tear, with a content of phosphorus of 7 - 9 %. Due to its composition, this process harmonizes with all known dosing and control systems. Since it is possible to add the required proportion of stabilizing agent separately, an extremely high stability of the bath is achieved both in automatically controlled dosing systems, as well as in manually controlled baths. Up to 20 MTO's have been achieved at constantly with an even P - contents. Ideal process for the embedding of particles such as diamonds with abrasive tools or PTFE.

#### **Electroless Nickel Bath " Enigma 1520 "**

Very rapidly working process, with a high P-contents. Compressive stress is achieved at even at higher nos. of MTO, thus especially suited for the deposition on aluminium. Only three components. Ammonia-free operation possible.

#### **Electroless Nickel Bath " Enigma 1613 "**

Three parts, simple in operation and reliable in production. A lead-free process.

#### **Electroless Nickel Bath " Enigma HP "**

High-Production process for the deposition with a high phosphoric contents. Does not contain poisonous heavy metals. Extremely user-friendly operation with extended regeneration-cycles. Improved performance against irregular deposition in areas of high turbulence and / or wild deposition. Ammonia-free operation is possible.

#### **Brightener " Enigma "**

Universal brightener to produce mirror-like bright deposits from electroless nickel baths.

### CHROMIUM Bright Chromium Plating

#### **Dekachrome**

Mixed acid, self - regulating electrolyte. Depending on the application, suitable for decorative bright chromium plating, micro cracked double chrome plating or technical hard chrome plating. The superb throwing power is achieved without preliminary high current switching. The wide range of brightness between 4 - 60 A/dm<sup>2</sup> and 22 - 55 ° C ( according to the type of electrolyte) with an efficiency of up to 25 to 28 % are outstanding.

#### **Dekachrome 540**

A unique new development in high - speed decorative chrome plating. A low concentration bath with organic catalysts. Even with passive nickel, white clouds will be avoided with proper handling. Make-up with dissolved chromic-acid solution ( instead of dusty salts ) is available.

### **Black Chromium Plating**

#### **Black Chrome " Mimas "**

A well established electrolyte to create uniform black chrome deposits, these are resistant to abrasion, temperature resistant, insensitive to light and give increased corrosion protection. A post - treatment with a special emulsion will give a rather decorative outlook.

### **Hard Chromium Plating**

#### **Cygnus 27**

The Hard Chromium Process Cygnus 27 is a fluoride-free process working at a high efficiency level. Nearly all base materials can be plated with a rather wide range of thicknesses, so that a wide variety of parts can be hard chromium plated.

Etching is minimized by the process working without fluorides. A good metal distribution, optimum covering and a high rate of deposition with simple handling and an optimum of reliability are additional characteristics of this process.

The finely micro-cracked deposits are well resistant against wear and have a hardness of appr. 1.050 HV 0,1.

### ZINC Cyanide Processes

#### **ACZ 54**

Brightener for cyanide zinc electrolytes with an excellent throwing power with regard to brightness. Low consumption and excellent metal distribution, particularly in low current density areas.

#### **ACZ 96**

The newest product from our research. With new ingredients, the decisive breakthrough was done : Top brightness with a certain levelling in alkaline - cyanide zinc plating.

### Alkaline Cyanide-Free Processes

#### **HC**

This newest result of our research gives a very high efficiency , a much better ductility of the layer and the capability of a good brightness over a wide range of current density. The metal distribution is uncomparably good ( 1,4 : 1 (!)). All kinds of passivates and chromates can be applied.

### ZINC PLATING Chloride Zinc

#### **Quasar 90**

A low chloride bright zinc electrolyte without ammonia, for barrel and rack plating with mechanical agitation, avoiding any components that may increase the AOX. Outstanding properties are its throwing power and ductility of the deposits even if they are thicker than 25  $\mu$ . Containing alcohols, the additives will not freeze out even at lower temperatures. The uniform solution of the agents in the bath itself is supported by this, too.

#### **Quasar 2001**

Specifically designed for extreme brightness plus extreme ductile deposits with working temperatures even above 50 deg C. at a constant consumption rate. This unusual combination of brighteners without acetone and other solvents gives a high clouding point which avoids the oiling out of unused brighteners, breakdown - products etc. Uniform, mirror-like brightness over the whole current density area is achieved. Intelligent single-additives are available.

#### **Quasar 3000**

The process Quasar 3000 is our most modern chloride zinc process. Specifically designed for extremely good metal distribution, it can be run at low metal concentration with relatively high levels of applicable current density. The high clouding point allows for a high level of conducting salt which, in its combination, gives an extreme throwing power and uniformity in thickness distribution.

#### **Quasar 3 L**

The process Quasar 3000 specifically designed for permanent air injection. From the composition of its ingredients and the design, the development of foam on top of the solution is avoided.

### ZINC - ALLOY PLATING

#### **Eskudo**

The new bright Zinc-Nickel alloy plating process with an extremely rapid rate of deposition when the nickel contents remains within narrow limits of 12 - 15 % Ni. Stable in operation, this process allows for a high efficiency of deposition with a unique acceptability for chromate dipping ( black, yellow and white ). The deposits will stay ductile over a wide range of application.

#### **Ziniplat**

Acid Zinc-Nickel plating especially for direct plating on parts from cast iron. When the proper chromate dipping is applied, the stringent norms of the VdA 237-299 can be achieved at. The nickel contents will be appr. 12 - 15 % with a very uniform deposition over the current range.

### STRIPPING Chemical Stripping

#### **Dekastrip MC**

Alkaline stripper for the chemical stripping of nickel, copper, brass, zinc, cadmium, and silver deposits from iron and steel parts without attacking the base material.

#### **Dekastrip AT**

An alkaline, non cyanide stripper for stripping plated nickel deposits from steel, copper and copper alloy parts without attack on the same base material, - or even from solder, brass solder, and silver solder.

#### **Dekastrip Z**

A neutral additive for acids for chemical stripping of nickel, tin, zinc and lead deposits from copper and copper alloy parts without attack on the base material.

### **Electrolytic Stripping**

( no hard complexing agents will be used in these processes )

#### **Electrolytic Stripper Sedimet G-Uni**

For stripping copper, nickel, chrome, zinc and brass deposits from racks with hooks from stainless steel, preferably 1.4310 (German standard).

#### **Dekastrip ULN**

A weakly acid bath for electrolytical stripping of chrome, nickel, gold, silver, copper, zinc, brass, cadmium, tin and lead deposits from iron and steel.

### ELECTROLYTIC POLISHING

#### **Dekapolish CR**

These non - hydrophobic electrolytes, containing chromic acid, are used for the polishing and chemical grinding of chrome-nickel steels. The surface will be smooth, free from any enclosures, not depending from the size or the design of the part. The rate of polishing is appr. 1 micron per min.

Preferred in the offshore - technology.

#### **Dekapolish CS**

This electrolyte is designed for the electrochemical polishing and grinding of stainless steels with a contents of chromium of more than 13 %.

As with all Dekapolish - solutions, this bath is delivered as a ready-to-use product.

With this survey, we have not been able to show you all of our processes and specialities for the electroplating industry which have grown for more than 100 years of experience. More details and more processes are ready for you.

We are ready to excel what you think to be good enough