



SURFACE TREATMENT ENGINEERING FOR INDUSTRY

Machining and finishing of aluminium



OBERFLÄCHENTECHNIK



THE ADVANTAGES OF ANODISING



The BWB anodising procedures (electrolytic oxidation) combine the advantages of the electrochemically produced aluminium oxide layer with the technical properties of aluminium applications in industry.



Corrosion resistance

Anodising the aluminium produces a resilient and corrosion-resistant protective layer. This enables value to be retained over decades.

Colour design

The colouration procedures used in industry are suitable for indoor applications. Despite what in some cases is a very modern design, the industrial colours exhibit lightfastness. Preliminary clarification with our experts is advisable.

Coating characteristics

Coating characteristics are developed for a very wide range of application areas by means of special procedures or procedural parameters.

- Hardness
- Electrical insulation
- Thermal insulation
- Dimensional accuracy
- Sliding characteristic
- Wear resistance
- Corrosion resistance
- Gloss level
- Mattness

Investment in the future

The mechanical strength of anodised aluminium is very high. Even during slightly abrasive cleaning of the anodised aluminium component, the surface is not damaged.

Anodised aluminium components retain their functional properties, decorative appearance and metallic nature for years.

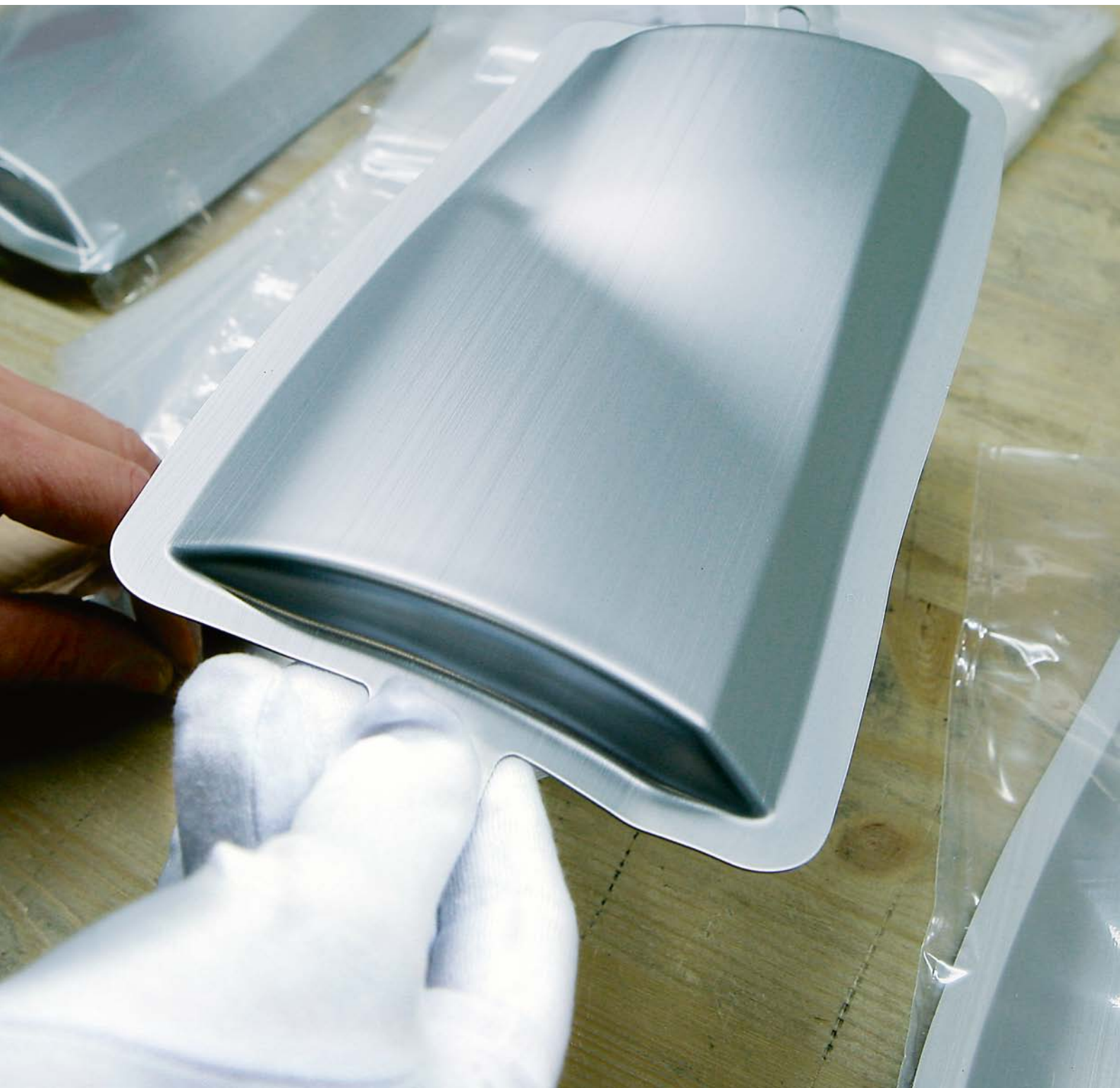
Ecology

Comprehensive evaluation of economic and ecological aspects speaks in favour of the use of anodised aluminium as a material in industry.

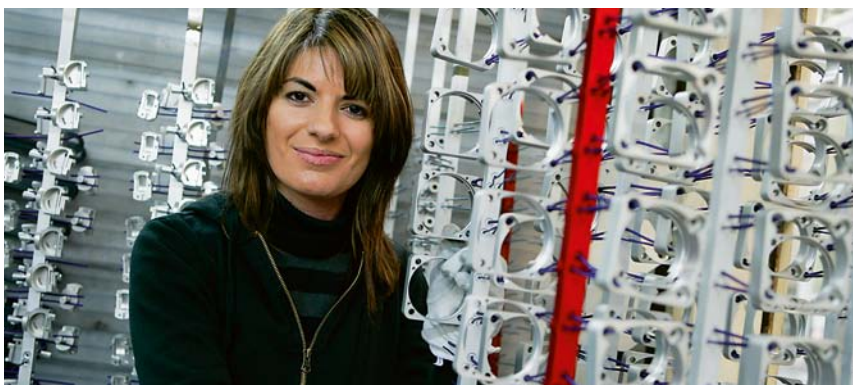
Anodised aluminium also stands out due to low-emission colouration techniques, the high degree of recyclability and the very high stability of value.

FOR INDUSTRY

SURFACE CONVERSION PROCEDURES



BWB carries out a very wide range of surface finishing procedures for industrial components in order to satisfy a variety of requirements regarding function, aesthetics and corrosion protection – in the automotive industry, for aviation, medical technology and the consumer goods sector.



Anodising

Electrolytic oxidation – also known as anodising – is an electrochemical process: the surface of the aluminium is converted into aluminium oxide from the inside out. This oxide layer is solidly attached to the base material; to use a metaphor, it “gets under its skin”. An accurate topographical copy of the original structure is created, and the surface retains its metallic look.

With the multitude of anodising procedures offered by BWB, it is possible to produce oxide layers with very different properties. Thus, procedure-specific anodised layers with different thicknesses can be manufactured to satisfy the respective requirements.

- Anodising / electrolytic oxidation (GS)
- Hard anodising / hard electrolytic oxidation (GSX)
- Chromic acid anodising
- Permalux anodising
- Ematal anodising
- Hard ematal anodising
- Bilatal anodising
- Colouration / Sanodal

Chromating

Chemical conversion layers form through treatments in aqueous solutions containing chromic acid or free of chromic acid (RoHS-compliant). The conversion layers are very thin and cause no changes in dimensions. According to the process selected, the chemical layers are transparent to yellowish in colour – they offer an outstanding key for coatings on the metal surface. This procedure guarantees electrical conductivity. Various conversion processes are available:

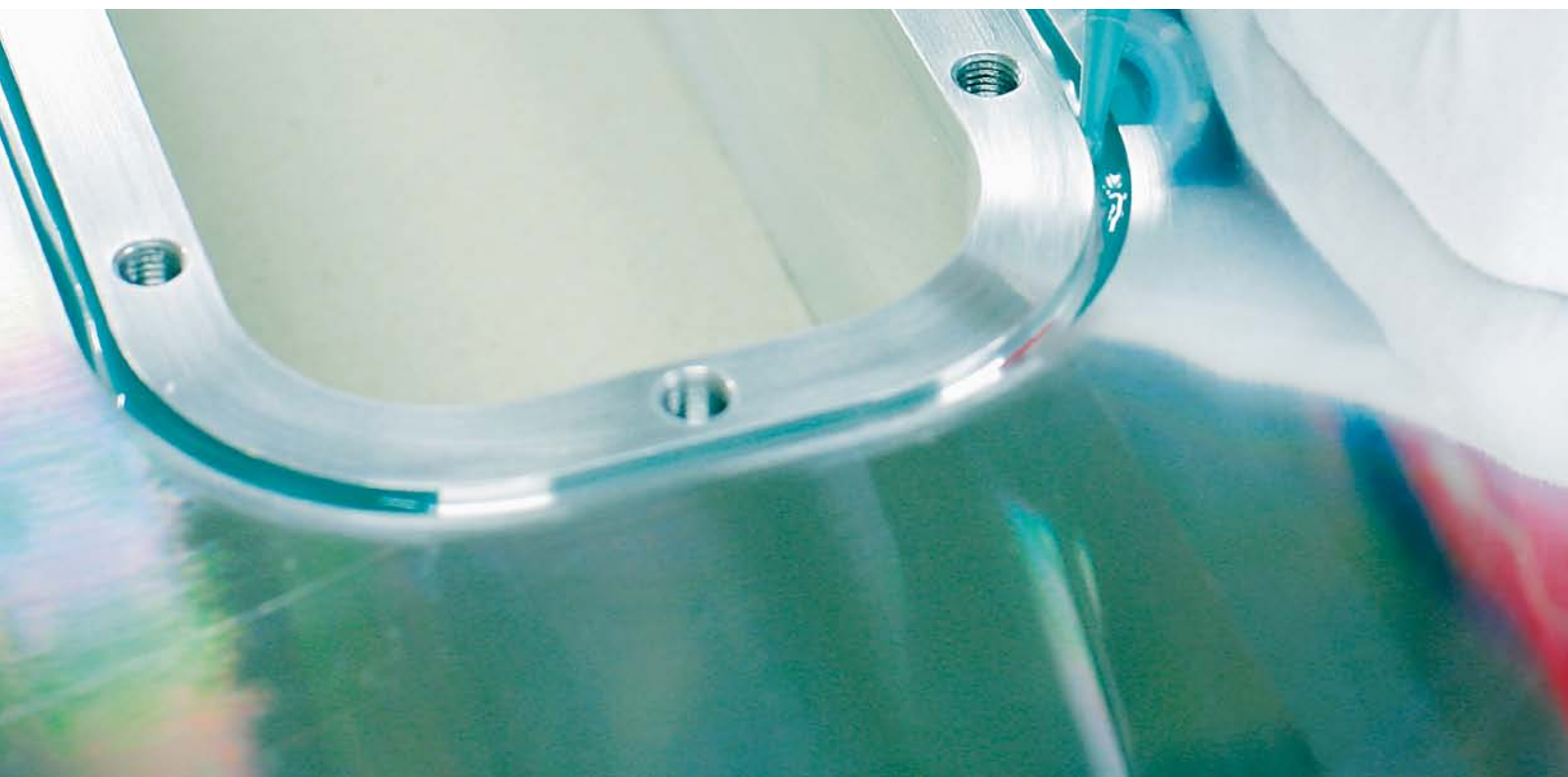
- Chromating (Alodine)
- Chromating (RoHS-compliant)

Detailed info
can be found at www.bwb-group.com





PRE-TREATMENTS AND
POST-TREATMENTS
FOR ANODISING - ALL FROM A SINGLE SOURCE



A clean surface on the work piece is a precondition for an even and stable surface finish. BWB offers competent advice, for optimal fulfilment of the customer's wishes and ideas.



Mechanical pre-treatments

In order to achieve special effects/finishes and for the correction of irregularities in a surface, we recommend mechanical pre-treatment. The surface finish ranges from matt to fully polished, depending on the selected procedure:

- Grinding / grinding-brushing
- Brushing / scotching
- Polishing
- Glass bead and fused alumina blasting
- Vibratory grinding / rotofinishing

Chemical pre-treatments

Chemical or electrochemical finishing of aluminium surfaces requires a suitable pre-treatment. Contamination or residues of processing oils must be removed in a chemical pre-treatment. In addition, a chemical pre-treatment enables an even matt or polished surface finish. To this end, the BWB Group offers the following pre-treatment procedures:

- Degreasing
- Etching / matt etching
- Chemical polishing
- Electrolytic polishing

Post-treatment

Alongside pre-treatment and anodising, BWB also offers you various post-treatment methods for components:

- Teflon impregnation
- Printing

Sealing

With electrochemically produced oxide layers, the pores of the oxide layer are closed in a subsequent operation. This makes it very difficult for foreign matter, such as dust or dirt, to adhere to the surface, and causes the surface to become tack-free. The well-sealed oxide layer is enormously important for a top-quality surface on the work piece (weather resistance, etc.). For this reason, sealing is monitored in a correspondingly strict manner.

- Sealing (hot water sealing)
- Sodium dichromate sealing

The image shows a close-up of industrial machinery, likely a conveyor system or a sorting mechanism, with a semi-transparent text overlay. The machinery consists of a series of metal frames and rollers, arranged in a row. The text is centered and reads: "YOUR PARTNER" in a large, white, sans-serif font, followed by "COMPETENT, RELIABLE, EXPERIENCED" in a smaller, black, sans-serif font. The background is a blurred view of the machinery, with a blueish tint. The overall composition is clean and professional, emphasizing the company's expertise in surface treatment engineering.

YOUR PARTNER
COMPETENT, RELIABLE, EXPERIENCED



As a construction engineer, designer or product manager, your requirements vary with regard to surfaces. Whether for purely functional aspects, aesthetic criteria, or both combined: BWB offers you comprehensive advice on material, colour, machining and structural design.

Material selection and structural design

Selection and procurement of the right material for demanding industrial projects. Early integration of BWB experts into the project guarantees a more successful implementation of surface finishing. This enables typical peculiarities of the respective procedures to be accounted for in the structural design and integrated into the project in good time.

The bath sizes limit the dimensions of the work pieces to be finished. The BWB sales team provides you with competent advice in this regard. Special attention is also paid to welded structures.

Treatment procedures

BWB offers various surface finishing procedures. We analyse your requirements with regard to the components and suggest suitable procedures, as well as appropriate pre-treatments and post-treatments.

Special effects

With the interplay between mechanical and chemical pre-treatments and the different anodising procedures, various special effects can be achieved.

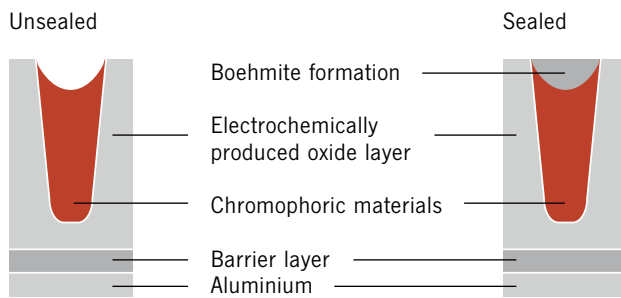
The BWB advisors are happy to help you.

Sampling

The colour chart on the next page can be used for initial colour selection. For specific component sampling, it is advisable to define not only the mechanical and chemical pre-treatment, but also the anodising and colouration with the designated original aluminium alloy.

We advise you on our procedural options, the colour palette and the characteristics of surface treatment engineering.

The procedural principle (schematic)



Natural-colour anodising is a precondition for colouration. The colouration takes place in additional procedural steps.

Colouration

The actual colouring of the original sample is influenced by various factors:

- The type of semi-finished product, the composition of the alloy and the composition of the material's structure
- The mechanical processing and surface roughness
- The mechanical and/or chemical pre-treatment
- The layer thickness

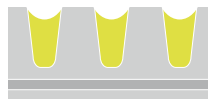
Due to their layer structure, GS-anodised layers form an excellent basis for colouration. The colouration procedure takes place between the anodising and the final sealing. Here, the dye is embedded in the pores and the sealing process gives it optimal protection.

BWB Natural Colour (Colourless)



- Layer thicknesses 10, 15, 20, 25 µm
- Maximum durability, environmentally friendly procedure

BWB Colour Anodising



Adsorptive colouration procedure

- Layer thicknesses 15, 20, 25 µm
- Bright colours, no chalking

Colour selection

The BWB Group provides you with a broad palette of colours to choose from. The colour palette is shown in our colour chart for industry. For correct evaluation of colours, we recommend that you get us to carry out sampling with original parts.

BWB 210 – Black Schlierholz 16 Black	BWB 321 Grey	BWB 320 – Grey Schlierholz 15a Dark Grey	Schlierholz 15 Light Grey	BWB 340 – Violet Schlierholz 13 Violet
				
BWB 220 – Dark Blue Schlierholz 12 Dark Blue	BWB 221 – Medium Blue	BWB 222 – Light Blue Schlierholz 11 Light Blue	BWB 230 Turquoise	BWB 313 Dark Green
				
Schlierholz 10 Green	BWB 314 Light Green	BWB Bronze 21 Schlierholz 14b Bronze 21	BWB Bronze 5 Schlierholz 14a Dark Bronze	BWB Bronze 3 Schlierholz 14 Light Bronze
				
BWB 250 – Dark Red Schlierholz 8 Fire Red	BWB 251 – Light Red Schlierholz 7 Signal Red	BWB 240 Orange	BWB 241 Orange Schlierholz 6 Orange	Schlierholz 5 Gold
				
BWB 260 – Brass Schlierholz 4 Brass	BWB 270 Sunflower Yellow	Schlierholz 9 Lemon Yellow	BWB 280 Yellow	BWB 281 Light Yellow
				
BWB 261 – Argentan Schlierholz 3 Dark Argentan	Schlierholz 2 Light Argentan	BWB 200 – Colourless Schlierholz 1 Colourless		
				

The colour samples shown in this colour chart serve only as orientation. For technical reasons, it is impossible to print an exact reproduction of how the material appears after anodising and colouration of the aluminium. For correct evaluation of the colour tone, please use the original aluminium alloy designated for manufacture. For sampling of coloured aluminium components, contact our sales advisors.

Do you have any questions?

You will find answers at www.bwb-group.com by selecting a site under “Contact details” and clicking on “Range of services”.



YOUR CONTACT PARTNERS

BWB is happy to advise you on material selection and procedures

The BWB Group is your partner for the machining and finishing of aluminium

Due to our wealth of experience in surface treatment engineering, we offer economical all-in-one solutions for architecture, industry and design – from competent advice, to material procurement, right through to implementation, delivery and assembly. With our production sites, we have good regional support and are always where you need us.



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