

ANODIZED ALUMINIUM IN ARCHITECTURE



WE MAKE ALUMINIUM PERFECT!

KTM 2000



THE KEY ADVANTAGES OF ANODIZING IN COMPARISON WITH OTHER TECHNOLOGIES OF COLOURING OF ALUMINIUM ELEMENTS



Company JV "KTM-2000" Ltd was founded in 2000. For the last years we created strong steadily growing production company.

Today in our factory with area over 6000 m², we have modern engineering-technical and constructive base, workshop of mechanical treatment and one of the most progressive on the territory of CIS countries galvanic lines for application of anodic coatings on aluminium alloys.

While engineering and construction of the line, we used the most advanced international experience, technological processes were developed by German experts in this sphere. Fully automated line and usage of exclusively European chemicals and dyes for anodizing ensures always stable result for our customers. Quality of anodizing meets the requirements of European certificate Qualanod (license № 3001 from 05.08.2015).

TECHNICAL PARAMETERS OF THE LINE:

- maximum parameters of elements for anodizing – 3x1,5x0,28 m;

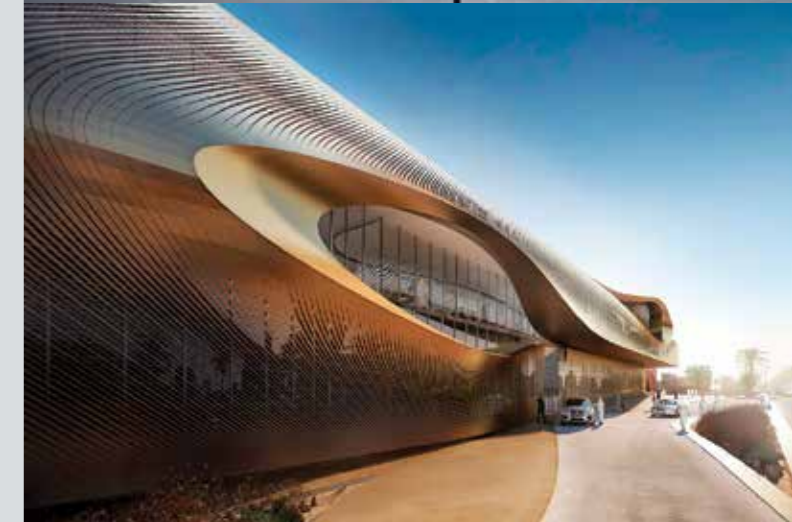


- thickness of anodized layer – from 5 to 25 mcm, depends on the demands of our clients;
- capacity of the line – 300 000 m² per year;
- anodizing in different colours according to our colour scheme and also possibility of anodizing in special colours by the samples of our clients;
- methods of colouring: electrochemical and chemical colouring by technology ClassicELOX, organic and combined colouring by technology ColourELOX, application of full-colour image by technology DigitELOX, technology ArtELOX.

This information will help developers, architects, customers and contractors fully appreciate the benefits of anodized aluminium and explain why this material is the best choice for the construction of future buildings.

THE 16 KEY ADVANTAGES OF ANODIZED ALUMINIUM:

1. Natural metallic sheen and respectable aspect
2. Excellent corrosion resistance
3. Flammability group – nonflammable
4. Over 40 years of proven lifetime
5. Exceptional abrasion resistance
6. No risk of adhesion failure of the anodic film
7. No risk of fading
8. No risk of chalking
9. No risk of filiform corrosion
10. Preservation of the original surface texture and design
11. Optimal surface coverage
12. Anodic film is totally transparent
13. On-site quality control possible without creating surface damage in testing
14. 100% recyclable
15. Production process can be carried out in accordance with latest environmental standards
16. Lifetime Guarantee available (see guarantee)





*Palace of rhythmic gymnastics. Minsk.
Opening took place in 2018.*

AUTHENTIC METALLIC LUSTRE AND FEEL

The anodic layer is transparent and integrated in the surface of the metal; the natural metallic appearance and feel of the aluminium are fully preserved.

The anodized finish will enhance and reinforce the natural beauty of aluminium to create a living surface constantly interacting with the natural or artificial light playing across its surface.

Regardless of the substrate material – aluminium, steel, plastic – a painted surface always has the same, flat appearance. In trying to achieve the authentic metallic lustre of anodized aluminium, painted aluminium uses multi-layer systems with metallic pigments with the risk of creation of colour variations.

EXCELLENT CORROSION RESISTANCE

Even in its natural state, aluminium does not corrode in the same, destructive, way as iron or steel. On the contrary, its natural oxide layer provides a self-defense against corrosion.

Anodizing creates a perfectly formed and controlled oxide layer, which ensures a surface of unparalleled corrosion resistance and locks in the pure and natural metallic aspect of the metal. It has been used for external building applications for over 80 years. With an appropriate anodic layer thickness for external use, anodized aluminium will perform without problem, even in the most severe environments.

In particular, anodized finishes are highly durable in city and marine environments, due to their resistance to chlorides and sulphates.

FLAMMABILITY GROUP – NONFLAMMABLE

On the molecular level anodic layer is completely unit with aluminium base. Since aluminium is flame-resistant material and its melting point is 650 °C anodized aluminium has also group of flammability – nonflammable.

PROVEN DURABILITY

The technology of anodizing has been established for almost 100 years. Whilst the process has been continuously refined, especially in terms of quality, the chemical and technological fundamentals remain unchanged.

The on-site behaviour of the anodized surfaces produced today is fully predictable, based on the proven, long term, service experience. Independent inspection commissioned by our company has confirmed that the anodic protection remains undiminished after more than 40 years.

Sandalor technology was developed in Europe to improve the results of using of wide colour palette of organic dyes. The main feature of this technology is two-step colouring of aluminium. Firstly electrocolouring is carried out, which is characterized by high resistance to light, and afterwards, organic colouring is produced. In such a way you can get wide colour range of coatings with good colour stability.

ABRASION RESISTANCE

Aluminium oxide is a very hard compound, which is second only to diamond, on the Mohs scale of mineral hardness. Anodized aluminium surfaces therefore offer superior scratch and abrasion resistance than coated surfaces.





Yevgeny Primakov Gymnasium. Moscow.
Opening took place in 2017.



NO RISK OF ADHESION FAILURE

Anodizing is an electrolytic process, which transforms the surface of the metal into an oxide layer integral with the metal itself. It is not a coating applied to the surface of the metal.

There is, therefore, no risk of adhesion failure such as peeling, blistering, cracking, splitting or chipping which may occur with surface coatings, such as painting. There will be no adhesion failure, even on cut edges or joints.

NO POSSIBILITY OF FADING

Natural silver, champagne, bronze and black colours contain no organic elements. No colour fading is possible during the service life of these finishes.

In comparison organic powder coatings are always subject to fading in varying degrees over the lifetime of a building.

NO CHALKING

Chalking is the formation of a fine powder on the surface of the paint film during weathering (grains carried by wind). It can cause significant deterioration in surface appearance, with a reduction in the gloss level, surface lustre and colour.

Anodized aluminium does not suffer from this disfiguring condition, even when exposed to difficult exterior environmental conditions, such as marine locations or very sunny and/or humid climates.

NO RISK OF FILIFORM CORROSION

Filiform corrosion is an attack on the hidden inter-layer between the aluminium and the surface finish which results in the propagation of corrosion under the surface finish.

With anodizing the oxide (anodic) layer is integral with the aluminium. There is no inter-layer between the metal and this protective oxide layer. As a result, the finish will remain free from filiform corrosion. If the surface is punctured or damaged, the aluminium will simply repair itself through natural oxidation.

UNIFORM SURFACE FINISH FOR ALL METAL SHAPES AND TEXTURES

Anodizing is a process which can be carried out prior to or after the transformation of the metal. Since it is an immersion process rather than an applied finish, anodizing provides a particularly uniform and regular finish on most metal shapes and textured surfaces such as perforated sheets, tread plates, polished or brushed metal, mesh material, stucco surfaces, etc.

Anodizing avoids the risk of localized high coating thickness or orange peel effect, typically associated with organic coatings on such surfaces.

OPTIMAL COVERAGE

Anodizing, as an immersion process, achieves a more uniform surface coverage, especially for extruded sections.

With spray paint processes and, especially with powder-coating, the non-visible surface is often not coated.

Office building of the 3rd metro line.
Minsk. Object of the year 2017.



Our stands at exhibitions.



ANODIC FILM IS TOTALLY TRANSPARENT

A properly sealed anodic layer is totally transparent. Furthermore, when severe environmental temperature fluctuations occur, the anodic layer is not subject to damaging physical changes and consequential embrittlement.

When polymer coating is exposed by the effects of temperature (below glass transition temperature) destructive changes can occur with it – it can lose its elasticity, become brittle, glass-like.

QUALITY CONTROLS

The tightly controlled quality assurance in the anodizing process can be followed up on site without damage to the anodized surface.

ENVIRONMENTAL BENEFITS OF ANODIZED ALUMINIUM

One of the key advantages of aluminium over other materials is that it can be recycled repeatedly through simple re-melting with minimal loss on each cycle. In Europe, more than 30% of aluminium consumption is satisfied with recycled aluminium and over 90% of the aluminium used in buildings is recycled at the end of the building's life.

The recycling process requires only 5% of the energy required for the production of primary aluminium – a significant contribution to environmental sustainability.

Anodized aluminium is unique, comprising only pure aluminium, its alloying elements and oxygen. As pure aluminium, it is fully recyclable without intervening chemical processes and emissions. Because of this and the ready market for quality aluminium scrap, the

anodized aluminium will have a cash value to offset the cost of demolition at the end of the useful life of the building.

ENVIRONMENTALLY FRIENDLY PRODUCTION PROCESS

Modern architectural anodizing plants are capable of responding to the most stringent environmental standards with full chemical recycling and a large recovery of waste water. Anodizing does not require environmentally sensitive pre-treatment like chromating. The anodizing process does not produce CO₂ or solvent emissions.

GUARANTEES

Guarantees are often considered by specifiers or building owners to provide reassurance about the long-term performance of a surface finish. We can offer following guarantees on our anodized covering:

Guarantee on absence of adhesion failure of the anodic film — lifetime.

Guarantee on absence of corrosion:

- for thickness 25 micron – 40 years,
- for thickness 20 micron – 20 years,
- for thickness 15 micron – 10 years,
- for thickness 10 micron – 5 years.

Guarantee on colour resistance to fading (change of delta E according to scale LAB – not more than 3 units during the warranty period for Belarus):

- for C0 – lifetime,
- for C31, C32, C33, C34, C35 – 15 years,
- for other colours – 5 years.





ClassicELOX®

CLASSICAL ANODIZING



Sports and entertainment complex
Falcon Club and Marriott Hotel. 2016

SUMMARY

POWDER COATING

Powder coating is being used on many major building projects as it is cheaper and thought to be the equivalent of architectural anodizing.

HOWEVER

Powder coating is softer, less durable, and unless done perfectly can peel. Neither can it exhibit the natural metallic lustre of anodizing.

Architectural anodizing is harder than glass which means it is less prone to damage, wear and tear and can be, if neglected, abrasively cleaned to restore it to its original lustre.

Powder coating is soft, prone to scratching and cannot be abrasively cleaned.

All organic coatings in time lose gloss and colour. Anodizing has been used in architecture for more than 80 years; powder coating was introduced in the late 1970's, much less than 40 years ago.

Anodizing is a process where the coating is grown on the surface of the aluminium and cannot ever peel off. Powder coating is an applied paint that can peel in service.

CONCLUSION

If you want peace of mind and a building exterior that will really last, anodizing is the only choice.

THE ADVANTAGES OF ALUMINIUM

Aluminium is a metal which allows endless opportunities for design and creativity but which, at the same time, responds fully to modern demands in terms of environment and sustainability.

THE 10 KEY ADVANTAGES OF ALUMINIUM:

1. Elegant, modern, natural aspect
2. Numerous possibilities of textures, colours and surface finishes
3. Very durable over the long term
4. Requires minimal maintenance
5. Light weight
6. High strength-to-weight ratio
7. Does not burn and is not noxious in case of fire
8. Can be totally and repeatedly recycled through simple re-melting
9. Available in many different forms to suit a diverse range of applications
10. Aluminium creates an impermeable barrier to air, water and wind

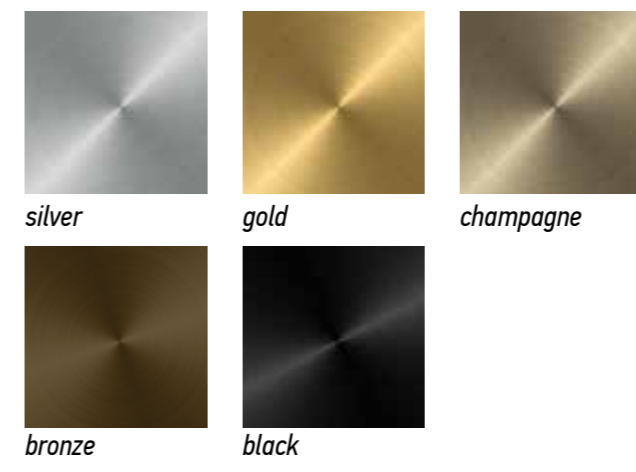
Classical anodizing is a galvanic process of growing of anodic film on the surface of aluminium.

It has been known for over 100 years. Over the last years the industry has learned how to manage perfectly all stages of the process.

Firstly the element passes through the bath of degreasing, which removes all dirt from the surface, afterwards it enters etching bath in which natural oxide layer is removed, and only then the process of growing of the anodic film starts. Quality control of this step ensures that uniform coating of a given thickness will be formed.

Colouring of grown anodic film is the next step. You can colour it in the bath with chemical dyes (golden shades), or you can process it in the bath of electrocolouring with dissolved salts of tin (shades from light gray to black). The final step is sealing during which pores with colourant are closing.

Quality coating has high hardness and excellent light fastness. Discreet colours emphasize generosity and beauty of aluminium.



ColorELOX®

COLOUR ANODIZING BY SANDALOR TECHNOLOGY



Colour anodizing by Sandalor technology differs from classical anodizing by the way of colouring of anodic film. With this technology colouring is carried out in baths with dissolved organic dyes.

Sandalor system initially selected from the variety of dyes only such which are the most resistant to fading. Two-step colouring allows achieving the widest colour scheme of coatings with high light fastness.

Firstly details are coloured by electrochemical method and afterwards pores are filled in with organic dyes.



OLIVE



S100-0 S100-1 S100-2 S100-3 S100-4

OLD GOLD



S120-0 S120-1 S120-2 S120-3 S120-4

ORANGE



S130-0 S130-1 S130-2 S130-3 S130-4

RED



S140-0 S140-1 S140-2 S140-3 S140-4

BLUE



S150-0 S150-1 S150-2 S150-3 S150-4

TURQUOISE



S160-0 S160-1 S160-2 S160-3 S160-4

GREEN



S170-0 S170-1 S170-2 S170-3 S170-4

ColorELOX®

COLOUR ANODIZING BY TECHNOLOGY SANDALOR



Colour scheme offered by our company will not leave indifferent neither architects nor their customers and will allow to realize the most daring and ambitious projects.



DigitELOX®

DIGITAL ANODIZING



ArtELOX®

ARTISTIC ANODIZING



The technology of digital anodizing reminds the tattooing process when colouring pigments are placed under the skin.

It is possible to use such technology only on aluminium because while its anodizing the surface is converted to a transparent aluminium oxide. During formation of this oxide pores are growing.

Special industrial printer injects dye inside pores. Hot sealing is the last operation completing the process of anodizing. Ready element is placed in water with temperature of not less than 96 °C for 40–60 minutes.

As a result of sealing pores are closed with aluminium hydroxide, colouring pigments stay within the aluminium oxide layer and the aluminium surface obtains a number of unique properties. This technology allows to achieve full colour images.



Artistic anodizing allows to receive on the surface of the product any two-colour vector image. Firstly element is anodized in any given colour. Then special mask is applied on the surface of the element with the help of silk printing method. Afterwards element is placed in the bath with caustic soda and part of the anodic layer which was not covered by mask is removed. The next step is to grow new anodic film on the part of the element where it was removed and then to colour it in the desired colour. As a result you can receive beautiful vector image in which you can combine any two colours from the colour scheme offered by our company. You can also make an image with a single colour but with combination of texture of aluminium. For example, the combination of glossy and matte anodizing looks great. The possibilities offered by this technology to architects and designers are endless. Now you can create a completely unique and unrepeatable facade or interior.





ClassicELOX®
CLASSICAL ANODIZING



ColorELOX®
COLOUR ANODIZING
BY **SANDALOR** TECHNOLOGY



DigitELOX®
DIGITAL ANODIZING



ArtELOX®
ARTISTIC ANODIZING