

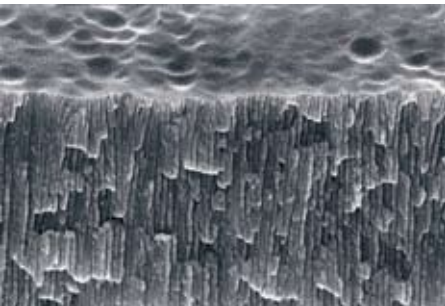
# Aluminum ...

... is a very special sort of material which has practically endless possibilities in its uses, processing and form. Besides being folded, punched, rolled, hammered and welded, it can also be printed on with excellent results. Anodized aluminum is also resistant to light, oxygen, humidity and most chemicals, fats and acids.



## Anodizing

Anodic oxidizing – also known as anodizing – is an electrolytic process by which an artificial oxide layer is produced on the aluminum surface. The coating is approx. 0.02 mm thick, is harder than glass and inseparable from the metal. Its resistance to atmospheric influences, to mechanical loads, to organic solvents and to most chemicals is tremendous. As it is transparent, the metallic character of the basic metal remains unchanged. The colors are firmly anchored and protected in this coating.



Microscopic picture of the oxide coating structure

# Research and innovation

Researching does not just mean pondering and fiddling about, it means being curious and observant and wanting to create new products and applications! The development and production of the colors is based on years of experience. Since its establishment in 1959, ALGRA has been developing colors for printing into the oxide layer of aluminum. These colors are characterized by their brilliance, intensity of color tone and their durability.



## ALGRA color range

Grey light fastness 5
Black light fastness 8
Bronze light fastness 6
Gold 263 light fastness 6
Gold 261 light fastness 6
Yellow GG light fastness 5
Yellow D light fastness 8
Orange G light fastness 6

Red G light fastness 7
Red B light fastness 8
Red 2B light fastness 7
Violet B light fastness 7
Blue D light fastness 8
Blue H light fastness 6
Green H light fastness 6
Green D light fastness 7
Brown D light fastness 8

## Printing processes

We love special things – even in printing. Whether for surface-covering colors or for fine striped and grid prints, ALGRA is an extremely versatile and flexible partner, thanks also to the various printing techniques. For large and medium-sized batches, flat bed semi-automatic and three-quarter automatic machines are ideal, and for really small batches and one-offs, Dynaprint (digital printing) is the optimal solution.



## Light fastness and fastness to weathering

ALGRA colors have been tested by the Swiss Federal Material Testing Institute according to test SN EN ISO 105-802 for light fastness and test SN EN ISO 105-804 for fastness to weathering, and they have passed these tests with excellent results.

The adjacent color range shows the marks given in the test report. The testing values for light fastness should be read as follows: highest mark = 8 / lowest mark = 1 (so-called blue standard). The marks are staggered in such a way that from level to level the light effect has to be doubled before a color change occurs.

Colors can change over time as a result of the effect of UV-light. The type of change depends on the chemical structure of the coloring pigment as well as of the light intensity.

The dimension Lux is used as a measured value. To compare: With mark 8 (excellent), it takes 80 megalux hours or 400 days of light irradiation before a change can occur; with mark 1 (very low) it only lasts 0.5 megalux hours or 2.5 days.

According to DIN 16525, light fastness means the resistance of colors to the effects of light without taking weather influences into consideration.

The composition of colors for Inkjet (dataprinter) and for Screen-print (screen printing) varies greatly. We can develop almost all the new colors on request.

# Dynaprint

With the Dynaprint process, the data is transmitted directly from the PC to the sheet (inkjet print). Your clear advantages: no film costs (digital data processing), fast delivery, series with changing text and/or graphics, colors can be selected from the ALGRA color palette or 4-color print.



## Ecology, safety, quality

Anyone manufacturing chemical specialties and operating transnationally must pay special attention to this sector.

It is not just a question of the safety of staff, but also the safety of customers and end-users, indeed the whole environment, so we are all included.

We have a responsibility to reconcile our activities in the context of our environment – meaning both nature and the population – and we take this responsibility very seriously.

Safety data sheet:

Further information regarding safety, color composition, handling and storage, etc. can be found in the relevant safety data sheets (according to 91/155/EWG) on the DYNACOLOR colors. These can be downloaded under [www.algra.ch](http://www.algra.ch) or requested from ALGRA.

Sales data sheet:

Are you interested in purchasing ALGRA colors? Relevant information can be found on the sales data sheets. These are also available under [www.algra.ch](http://www.algra.ch) or on request from ALGRA.



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ALGRA

# Printing results

Even color photos can be reproduced, as the fine pored surface of anodized aluminum renders all printing details perfectly.



## Advantages of anodized aluminum

- high degree of resistance to environmental influences
- resistance to most chemicals, fats and acids
- optimized hardness, resistance to wear and tear and corrosion
- high degree of resistance to mechanical strain
- easy to clean and disinfect
- metallic character
- high degree of resistance to scratches and abrasion

**Lacquer printing:** printing directly onto the liner, surface is not protected



**Sub-oxal printing:** printing directly into the oxide layer, surface protected against scratches/devastation



# Coating characteristics

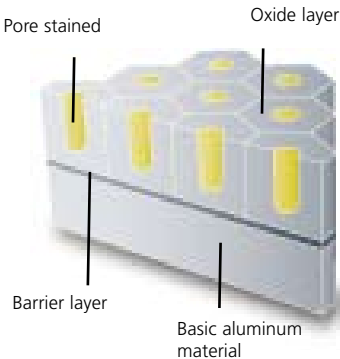
Coating formation is even across the entire surface of the work-piece. Depending on the semi-finished part, the aluminum oxide layer passes approx.  $\frac{2}{3}$  into the metal and ranges approx.  $\frac{1}{3}$  out of the metal.



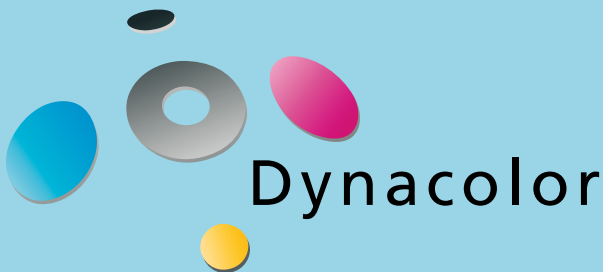
## Oxide layer

Due to its development, the oxide coating is firmly anchored in the base metal and can only be removed mechanically by destroying the coating system.

Depending on the field of application, the coating thicknesses range from  $5\mu\text{m}$ - $30\mu\text{m}$ . The standard coating thickness with natural tone anodization (GS-colorless) is  $15\mu\text{m}$ - $21\mu\text{m}$ .



GS-oxide coating, stained adsorptively (2-steps), non-compressed



DYNACOLOR – the secret lies  
in the ALGRA colors ...



ALGRA