



Anodize Color Variation

What causes color variation in the anodize process?

"All Aluminum can be Anodized." This is a valid statement but only to the extent it is understood that only the aluminum gets anodized while the other metal constituents (zinc, magnesium, silicon) present in the alloy do not respond in the same manner. The variance of metal constituents in an alloy is the major reason for color variation. Other variables affecting color variation in the anodize process include temper, anodize tank chemistry, shape geometry, and material load size.

Anodizers have control over their tank chemistry, including temperatures, solution concentrations and the time material spends in each tank, but they have no control over the alloy, temper, or shape of the aluminum parts. These variables can make it extremely difficult to achieve an exact color from run-to-run and load-to-load.

How to minimize color variation?

- Maintain Metal Consistency. The easiest way to ensure metal consistency is to work with one metal source/extruder per project and request that all metal come from one "lot" of material.
- Do not mix aluminum alloys. Mixed alloys, or even mixed tempers, will not produce uniform results. For best results use 6063 alloys for extrusions and 5005 for flat sheet stock and fabricated parts. (6061 and 5052 can be used if structural alloy is required, but will not give similarly acceptable results.)
- Perform as much bending and forming as possible prior to finishing. Anodic films are very hard, and as a result most post-production bending causes the film to "craze," which produces a series of small cracks in the finish, giving it a spider-web like appearance.
- Be aware of anodizing's effect on welds. The heat developed from the welding process will change the metallurgy on nearby metal or heat-affected zone (HAZ), and cause localized discoloration, often referred to as a "halo" effect, after anodizing. Use the proper 5356 alloy welding wire and the lowest heat possible.
- Select an anodizer who utilizes automation to reduce inconsistencies in the anodize process.

What are anodize range samples?

The amount of variables in the anodize process make it necessary to use range samples rather than a single sample commonly used with a painted finish.

An anodize range sample is a set of two anodize color chips for a single color. The set includes a light sample and a dark sample which provides you with a visual reference to represent the extremes of appearance to be expected on the finished parts. [View sample of Linetec range sample](#)

Range samples aren't always from the same alloy, temper and shape that will be used on your project, therefore they are meant as an illustration of the degree of possible color variation and may not be an exact representation of the color achieved for your project.

When should I request a range sample?

A set of anodize range samples can be requested prior to sending material for finishing to an anodizer. Since anodize color is affected by the alloy, requesting a custom set of range samples using your project material will give you the most representative set of range samples.

Why choose Linetec?

Linetec's automated system controls and monitors product through the entire anodizing process. It tracks all aspects of the process including tank sequencing, voltage, current, time and temperature, ensuring the most consistent anodize finish available.

Linetec has one of the tightest ranges in the industry. Per AAMA specification the range shall not differ by more than 5 Delta E and when various suppliers, alloys, etc. are used color uniformity may vary in excess of 5 Delta E.

Linetec strives to keep its range from 1 to 3 Delta E. The lighter the anodize finish - the more noticeable the range; a champagne color variation is more noticeable than a dark bronze finish would be. [View samples of Linetec range samples](#)

For more information on Linetec anodize visit our website at www.linetec.com or contact us at sales@linetec.com.

Linetec's Anodize Range Samples

Champagne Anodize



Light Range

Dark Range

Dark Bronze Anodize



Light Range

Dark Range

The range samples shown are representations of the actual samples.
For an actual anodize range sample please contact Linetec.