

The 411 on Anodizing



Aluminum must be anodized in order for dye to adhere to the surface. Anodizing is the process where a thin layer of oxidized aluminum is produced. This is achieved by placing the aluminum in an electrolytic bath consisting of an acid solution. An electric current is passed through the solution using the aluminum as the anode (positively charged) and a negatively charged cathode. This causes a layer of aluminum oxide to develop on the surface of the aluminum. This layer

can range in thickness from 0.5 microns for surface coloring or 150 microns where high light fastness and durability is required such as in architectural applications. Microscopically, this layer almost looks like a “honeycomb” surface into which dyes, such as our **OrcoAluminum™** dyes, or corrosion inhibitors are applied. Sealants are used after the aluminum is dyed to prevent leaching or bleeding out of the dye—think of bees applying wax to the top of the honeycomb cavity.

The three basic types of Anodized Aluminum are **Type I, Type II, and Type III**. Type I is chromic anodizing which creates a very thin coating of 0.5-7.6 microns, which is great for corrosion resistance and minimal dimensional change in the aluminum part, but difficult to dye. Type II anodizing is your typical anodizing process using a sulfuric acid bath developing coatings in the thickness range of 1.8 – 25 microns. A typical product which uses Type II anodizing would be the common flashlight. Type III anodizing, or hardcoat anodizing, have coating thicknesses ranging from 13 to 150 microns, and is performed at a lower temperature with a higher electrical current. The thicker the aluminum oxide coating, the better the wear/corrosion resistance and lubricant retention is achieved.

To learn more about Organic Dyes and Pigment’s anodized aluminum dye product line, **OrcoAluminum™** dyes, please visit our website. We specialize in custom shade-matching and technical support including production trouble-shooting. If you would like to request a sample, please call (800)556-6785 or email us at info@organicdye.com .



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