

## Aluminum Anodizing Considerations

What information is required to do the job? The anodizer may not know enough about what was done to the part before sending out for anodize. As much history and information as possible should be provided on the prints and in supporting documentation to help predict the end result to the maximum extent possible. Some important requirements include:

1. Provide information on alloy and temper
2. Define finish as received and as desired in anodized product
3. Establish sample finish and color to match if available
4. Provide blueprints and/or other processing details
5. The technical process sheet must allow for different parameters.

### Alloy Considerations

**2011** - High lead content causes difficulties in the anodize process. Generally OK with type II finishes. Type III very susceptible to burning. The savings in material cost in selection of 2011 may be offset by a noticeably inferior looking part when anodized.

**2024** - Easy to work with, susceptible to corrosion. Must not be left wet when in process. Anodizes well with type II finishes. Type III very susceptible to burning. Must be concerned with sharp edges.

**6061** - One of the easiest of materials to anodize. Some of the problems encountered with parts include:

- Not enough material removed in machining to fully remove the mill scale or surface contaminants imbedded during cold working or extrusion. Can result in a pitted anodized finish... usually caused by corrosion.
- Apparent differences in the cooling rate of extruded stock may cause variation in the microstructure. This is evident as an "alloy pattern" or mosaic, "splotchy look" after anodize.
- Inconsistent temper, even within the same designation may show up in anodized parts as a variation in color due to the

range of tensile properties for a given temper...noted most often with clear anodize.

**7075** - Many of the same concerns as with 6061 as detailed above are applicable to 7000 series alloys. In addition, the anodizer must be more concerned about coating thickness than with 6061. 7075 is highly susceptible to corrosion. It will blister if left in the dye too long when hard anodized. Also, an "orange peel" phenomenon occurs when you go from the cold anodize tank to the hot dye tank without a proper cycle through the room temp rinse tank to stabilize and outgas the parts. Another process defect can be seen as crazing or cracking.

### Die Cast Parts

Die-castings do not generally anodize well because of the high silicon content of the material. Best results (cosmetically) are attained by light bead blasting then type II, class 1 (clear) or class 2, dyed black.

### Other Concerns

1. Surface finish incoming may look worse after anodizing
2. Sharp edges can cause problems...burning
3. Machining marks left by dull tooling are more noticeable after anodizing
4. Uneven finishing from blasting or graining apparent after anodizing
5. Poor tumbling or vibratory deburring...soap residue or other contaminants left on parts...parts packed or left wet
6. Part on part impingement may result in nicks and dings
7. Pre-polished, grained or blasted parts from the customer
8. Chips in blind holes
9. Oil residue in deep, blind holes
10. Parts washers contaminated or inadequate, incomplete drying of parts
11. Lapped surfaces very difficult to get coating buildup
12. Parts wrapped in newspaper can "etch" material