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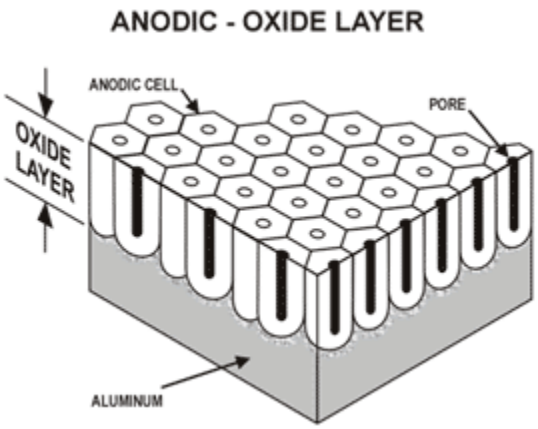
Determining Pre-Plating Dimensions with a Target Coating Thickness

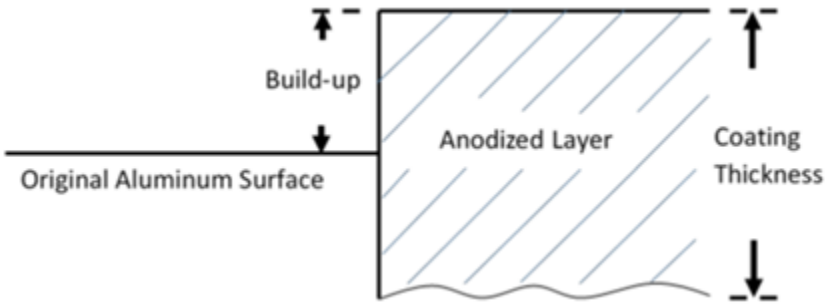
Finish	Type	Specification	Required Thickness	Target Thickness	Target Thickness in Microns (µm)
Anodizing	II	MIL-PRF-8625F	.00007 - .0010"	.0004" - .0007"	10µm – 18µm
Hardcoat Anodizing	III	MIL-PRF-8625F	.002" (+/- 20%)	.002" (.0016" - .0024"	50µm (41-62µm)

Surface Dimension

On specifying the thickness of coatings, especially for the type III coatings, allowance must be made for dimensional increase. Both a machining dimension and a coated dimension should be placed on applicable drawings. An increase in dimension, equal to one half of the thickness of the applied coating, can be expected for each surface coated due to surface growth. For example, for a 0.004 inch (4 mils) coating on close tolerance parts, a pre-machining allowance of 0.002 inch (2 mils) per surface must be made prior to hard coating. If close fits are specified in design drawings, buildup in thickness caused by anodic coatings, especially type III, may result in interference on assembly.



(Source: MIL-PRF-8625F)



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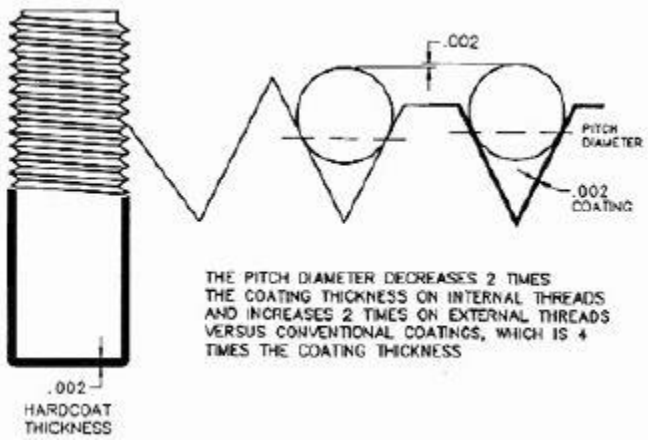
Thread Hole Dimensions

All anodic coatings will affect thread dimension for external and internal threads; the major and minor diameter will be increased 2 times the amount of growth. The pitch diameter for threads having an included angle of 60° will increase 4 times the amount of growth. For threads having an included angle other than 60°, the pitch diameter will increase 2 times the amount of growth divided by the sine of ½ the included angle.

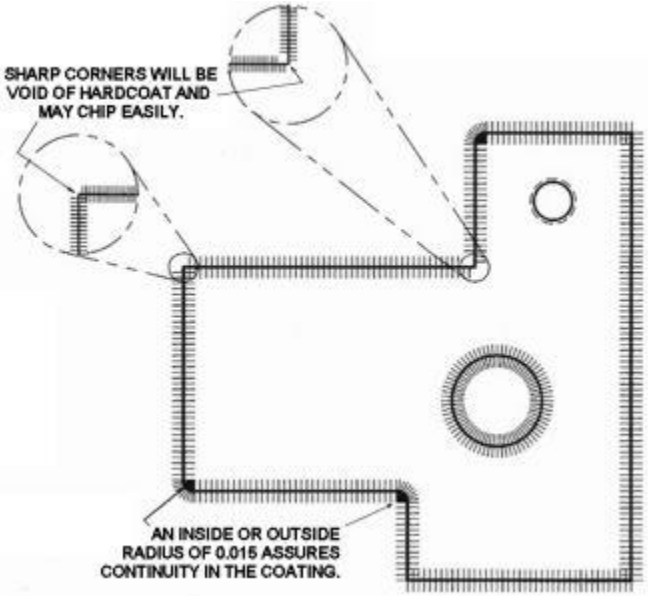
(Source: MIL-PRF-8625F)



Fabrication – Sharp Edges and Corners

Successful use of anodic coatings, especially the hard type III, depends on proper product design. Because of the manner of formation, anodic coatings will develop voids at sharp corners and edges. Sharp edges and corners are difficult to anodize satisfactorily and in general should be avoided. All edges and inside corners should be radiused prior to anodizing. Chamfering should not be used unless resulting sharp edges are radiused. In general, to avoid any uncoated edges or inside corners, the piercing and blanking operations should comply with the radii or curvature for nominal coating thickness.

(Source: MIL-PRF-8625F)



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Radii of Curvature for Nominal Coating Thickness

Nominal Coating Thickness (inch)	Radius of Curvature (Edge & Inside Corner
0.001	Approximately 1/32 inch
0.002	Approximately 1/16 inch
0.003	Approximately 3/32 inch
0.004	Approximately 1/8 inch

Minimum Thickness (typical) in inch of Anodic Coatings

Alloy Designation	Type II – Thickness of Coating (inch)
1100	0.000093
2024-T4	0.000125
2024-T6	-
3003	0.000103
5052	0.000098
5056	-
6061-T6	0.000099
7075-T6	-
Alclad 2014-T6	-
Alclad 7075-T6	-
295-T6	0.000107
356-T6	0.000102
514	0.000086

Effects on Coating Thickness

A hardcoat of 2 mils or more is extremely difficult to obtain on high silicon die casts such as 360, 380 and 383. It is recommended that this be considered when specifying a coating thickness for high silicon castings.

(Source: MIL-PRF-8625F)

Effects of Type III Coating Thickness on Abrasion Resistance

The abrasion resistance of type III coatings will decrease as the coating thickness approaches 3 mils. In general, the abrasion resistance does not increase with increasing coating thickness.

(Source: MIL-PRF-8625F)