

Procedure for Determining Coating Weights on Aluminum (mg/ft²) Chrome Phosphate

Initial Set-Up:

Heater

1. Fill the 1200 ml. Stainless Steel beaker with 98 parts Sodium Nitrate (500 grams) and 2 parts Sodium Hydroxide beads (10 grams).
2. Place beaker in heating mantle with splash guard. (Should just fit)
3. Turn heater on and rotate dial around face until it reads between 70 and 80; allow approximately 2 hours for the Sodium Nitrate/Sodium Hydroxide mixture to melt. **(Be aware this solution is EXTREMELY HOT)**

Cleaning

1. Fill a 600 ml. Nalgene beaker with acetone or IPA.
2. Use stainless steel tongs to handle pieces through out entire procedure.

Weighting and Stripping Extrusions:

Preparing the extrusion

1. Cut extrusion to desired length but not over 3 inches. (depends on size of beaker)
2. Remove any burrs.
3. Clean parts with acetone or IPA.
4. Blow dry.

Weighting extrusions – gross weight

1. Place clean extrusion on the scale
2. Record the weight as your gross weight. Reading should be to 4 decimal points.

Stripping the extrusion

1. Place the extrusion in the molten salt bath.
2. Leave the extrusion in the bath for 3 – 4 minutes.

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3. Remove the extrusion and quench it in a bath of 50% Nitric Acid. (Do not allow acid to get in the molten salt bath as splattering will occur and cause severe burns.)
4. Place extrusions in beaker of ambient water to rinse.
5. Place extrusions in beaker of acetone.
6. Blow dry.

Weighting extrusion – net weight

1. Place extrusion on the scale
2. Record the weight as the tare weight. Reading should be to 4 decimal points.
3. Gross weight – tare weight = net weight.

Weight Determination:

Variables:

1. Determine the net weight by using the formula above.
2. Determine the surface area by multiplying the length (inches) by the perimeter inch of the extrusion. (Note: The perimeter inch is found on the print for each die)

Formula:

$$\frac{\text{Net weight} \times 144,000}{\text{Surface Area}} = \text{coating weight (mg/ft}^2\text{)}$$

Example:

$$\begin{aligned}\text{Net weight} &= 0.0045 \\ \text{Perimeter inch} &= 7.432'' \\ \text{Length of sample} &= 2'' \\ \text{Surface area} &= 7.432 \times 2 = 14.864\end{aligned}$$

$$\frac{0.0045 \times 144,000}{14.864} = 43.61 \text{ mg/ft}^2$$

Note: The 144,000 is a constant.