

Aerospace Metals Plating Specifications

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The Best Customer is an Educated Customer

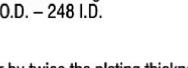
Important Hints To Remember Before And During Design of Product

1. Electroplating has irregular plating distribution, be sure to make allowances for edge and corner buildup.

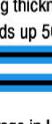


The BlackSteel Plated Rod is .001" thick - Note the irregularity of plating thickness on ends of rod. The plating is .001" thick, the end plating is .002" - .003" thicker due to edge and corner buildup.

Electroplating will not plate all the way into blind holes and will not cover uniformly through, or through threaded holes in excess of $\frac{1}{2}$ " depth and .100 diameter as illustrated. As hole becomes larger, coverage will increase.

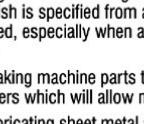


Electroless Plating plates uniformly within .000020 of an inch or less on all surfaces it comes in contact with. It will not plate in blind areas or blind holes unless constant turnover of solution is maintained. eg.



Steel tubing .500 O.D. - .250 I.D.
.001 thk. Electroless Nickel Plating
After plating: .5002 O.D. - .248 I.D.

3. Make allowances on all diameter to increase outside diameter by twice the plating thickness and to decrease the inside diameter by twice the plating thickness. Also make allowances to decrease threaded pitch diameters by 4 times the plating thickness. Please ask for our precise illustration on tapped holes.



4. Hardcoating builds up 50% into alloy (penetration) and 50% out on surfaces. eg., .002 thk hardcoating 6061 Al. 1" O.D. - 750 I.D. After Anodize - 1" O.D. 1.002-.750 I.D. .748. Notice you have decreased I.D. and increased O.D. by .002

Rule of thumb coverage in I.D. hardcoatings will go in to each end of the tube three times I.D. opening. In this case, .750 x 3 = 2.250 into I.D. Caution: when stripping you will lose all material buildup into part by 50%. When possible, try not to use 2024 alloy. Always specify hardcoating requirement in thickness (.001 thk, .002thk, etc.).

5. Anodizing: When fabricating any assembly consisting of two or more parts, make certain the same alloy and same finish is specified from all vendors. If this is not precisely followed, finish will not match when parts are assembled, especially when a color anodize is used. Note: always put hardware into part after anodizing or chromating.

6. When making machine parts try to eliminate blind tapped and straight diameter holes. Radius all inside and outside corners which will allow more uniform plating over all.

7. When fabricating sheet metal allow enough relief on lapped bends and all seams tack welded. For proper rinsing of plating solutions, entrapped chemicals cause numerous problems later in production with the integrity of the parts and with subsequent painting procedures.

8. Do not overlook baking specification prior to and after plating operations of steel alloy 40RC and over. Also alloys with tensile strength of 1000 MPA and over, these baking procedures are mostly for relief of hydrogen embrittlement.

IMPORTANT: PLEASE READ ABOVE

Please allow us to assist your company prior to new product design by reviewing existing product specifications.

There could be appreciable time and money to be saved. Contact us at info@aerospacemetalsllc.com

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9. When painting is necessary, please remember some Military specifications of Flight Programs that require as much as .003 total thickness of primer and paint which does not include build up on edges.

- a. Corrosion Resistance
- b. Surface Hardness
- c. Ductility
- d. Solderability
- e. Conductivity
- f. Lubricity
- g. Esthetics of Product
- h. Plating and Painting Tolerances
- i. Base material best for application;
- j. Operating & Temperature environment

10. Try to design the most important finish requirement first, then work down a list in priority sequence:

11. Substantial cost savings can be achieved by utilizing various metal alloys and various combinations of plating finishes to substitute for using very expensive and hard to machine alloys. eg. Using cold rolled steel with .001-.002 Electroless Nickel will give you excellent corrosion resistance and the hardness of tool steel.

12. Always keep communication lines open between Machining, Fabricating, Electroplating and Painting Vendors. This will save unlimited amounts of time and money which in turn produces a more timely and superior product.

(1) Look for best material suppliers, availability, cost, certification if needed, and hard copy confirmation of such.

(2) Always review Plating Spec for material you are having processed - don't ask for cold rolled steel to be passivated or any material other than aluminum or magnesium or titanium to be anodized, or your parts will disappear. Any questions, please call Vendor.

(3) Always review final tolerance of your parts to see if they will be in tolerance after the final process you require.

(4) When preparing your quotation, you should find the necessary vendors you will need. Make sure that they are in compliance with all State and Federal regulations that are required for their process and that they are approved for all Military and Federal Specifications - O.Q., Mil, AMS and ASTM requirements. If approved for IS09001:2000 and AS9100 or Nadcap AC7108 - make sure they are in conformance - it would be a terrible and costly situation if your vendor can't complete your job because of compliance problems.

(5) Get prints out or discuss your requirements to vendor before drawing up blueprints. Always send the latest print revision for quotation or when sending your final machined parts to vendor. Inquire as to necessary time and cost to do your work if any special materials are needed so they can be ordered - the job will proceed much smoother if these things are in place.

(6) If you have any questions regarding your material, please call our engineering people and we can discuss materials, tolerances, or how new prints should be drawn up.

(7) Before you send your parts out, be sure parts are not damaged, count is correct all the paperwork and specifications are in order when packaging your parts. Use white gloves. Some people have more acid in their system than others, which can leave deep finger-prints on your finished parts, which means re-working your parts before plating - especially steel, aluminum and magnesium parts.

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17. When fabricating sheet metal allow enough relief on lapped bends and all seams tack welded. For proper rinsing of plating solutions, entrapped chemicals cause numerous problems later in production with the integrity of the parts and with subsequent painting procedures.

18. Do not overlook baking specification prior to and after plating operations of steel alloy 40RC and over. Also alloys with tensile strength of 1000 MPA and over, these baking procedures are mostly for relief of hydrogen embrittlement.

19. Rule of thumb coverage in I.D. hardcoatings will go in to each end of the tube three times I.D. opening. In this case, .750 x 3 = 2.250 into I.D. Caution: when stripping you will lose all material buildup into part by 50%. When possible, try not to use 2024 alloy. Always specify hardcoating requirement in thickness (.001 thk, .002thk, etc.).

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