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# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Cadmium Plated Steel Caps Seal Anodized Aluminum Fittings

Electroplated cadmium on stainless steel (MC177CRES) caps provides an effective seal when the caps are assembled to anodized aluminum alloy fittings. The cadmium prevents fracturing of the hard anodic coating under torquing to system specification requirements, prevents galvanic coupling, and eliminates the need for crush washers, which, though commonly used in industry, do not correct the leakage problem experienced when anodized aluminum fittings and anodized aluminum cap assemblies are joined. Ten such test units leaked at the junction of the conical sealing surface and fitting end at pressures between 2,313 kN/m<sup>2</sup> and 3,448 kN/m<sup>2</sup> (350 to 500 psi).

The stainless steel caps are prepared in the following manner:

1. Vapor blast the sealing surfaces with glass shot (200-325 mesh) to promote good adhesion between the basic metal and a nickel flash coating.
2. Apply a nickel flash coating.
3. Apply cadmium plating to a thickness of 0.0020 to 0.0025 cm (0.0008 to 0.001 in.) according to

specified procedures and follow with a dichromate treatment.

#### Notes:

1. The cadmium plated CRES caps, installed on anodized aluminum alloy fittings, formed effective seals at 20,685 kN/m<sup>2</sup> (3,000 psi).
2. Requests for further information may be directed to:

Technology Utilization Officer  
Code A&TS-TU  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
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#### Patent status:

No patent action is contemplated by NASA.

Source: J. Padden of  
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