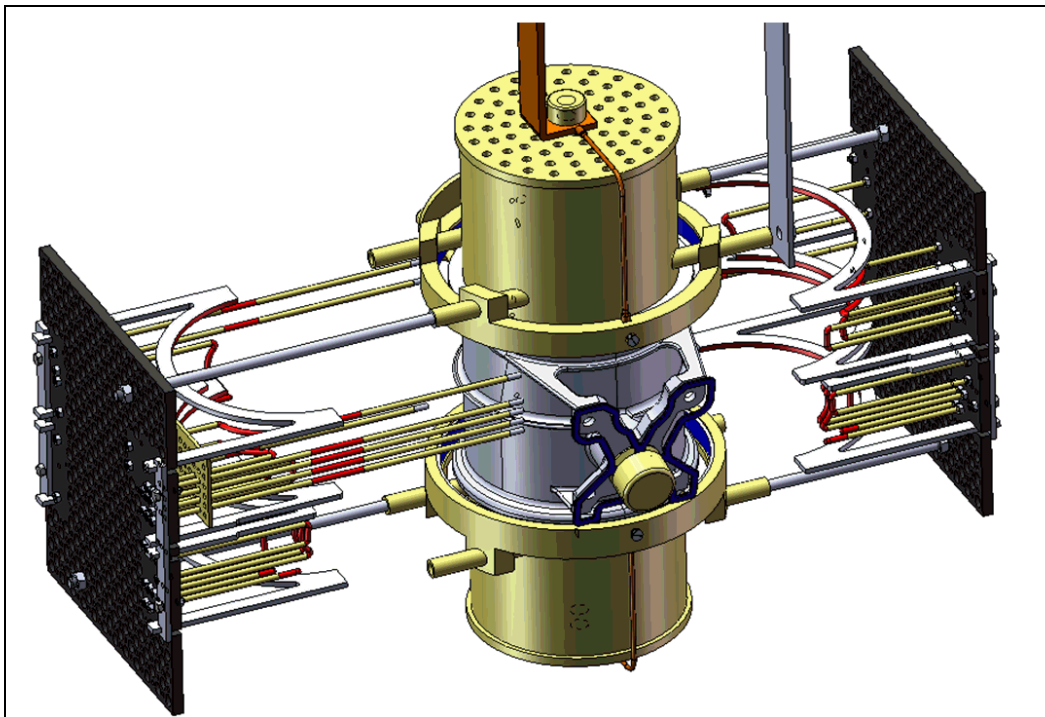
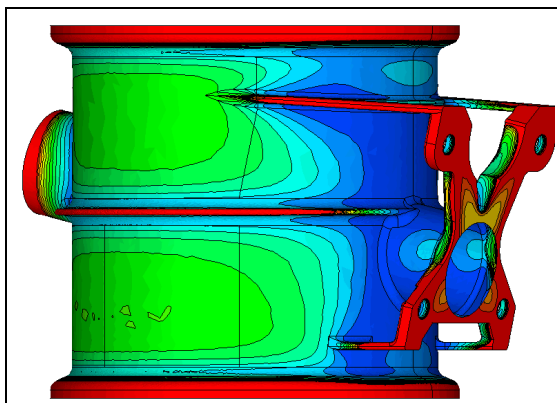


Dedicated tooling for enabling flash chrome plating of a valve component

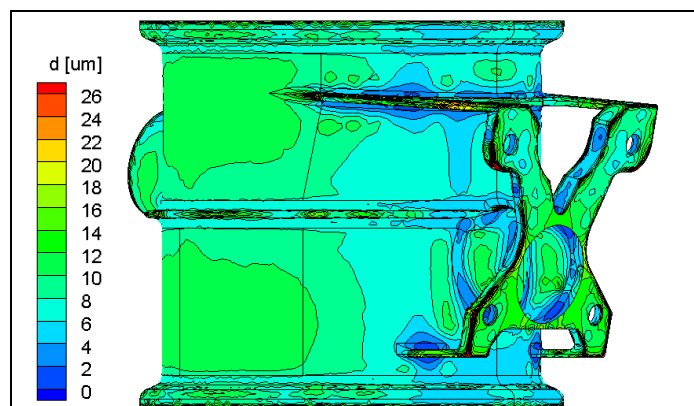
Aerospace Solutions applied with Electrochemical Intelligence



Dedicated conforming tooling



Cr layer thickness – no tooling



Cr layer thickness – with tooling

The Need

Suppliers to aircraft manufacturing industry are often faced with tight layer thickness specifications for parts to be plated. On the other hand, allowable lead times for new part types have been drastically reduced over the last decade, due to increasingly complex supply chains spanning continents. This leaves little or no time frame to design and optimize dedicated plating tooling components by trial and error wet runs. In addition, aircraft manufacturing suppliers are now more commercially exposed. OEMs are continually demanding a downward pressure on prices, competition is fiercer and lower cost economies not only compete on price but are clearly following initiatives to acquire technology. This seriously limits the manpower and hardware efforts that can be consumed in trial and error runs for optimizing dedicated plating tooling components.

The Challenge

Landing gear components are nickel and hard chrome plated to provide long-term resistance to wear and corrosion. It is well known that flash Cr plating processes produce non-uniform deposit thickness distributions. Recessed areas will not plate up to specifications even for drastically enlarged plating times.

The Solution

The task for the project was to design a conforming tooling set (comprising shields, auxiliary anodes and current robbers) that meets several requirements:

- Rule out waxing operations for surfaces not to be plated
- One single plating operation
- Plate the entire exterior valve surface up to specifications
- Easy assembly and mounting of tooling kit to the part
- Easy replacement of tooling components
- Hardware rationalised with respect to manufacturability and cost

The tooling design was enabled by a Computer Aided Engineering approach (using Elsyca in house plating simulation technology), allowing a fast sequence of trial and error dry runs for designing and optimising the tooling components.

The Benefits

The benefits were immediate and measurable. The following results were obtained:

- Waxing process step plus associated labour completely removed
- Lead time reduced by several months
- Costs for trial and error wet runs reduced by at least 20 k€