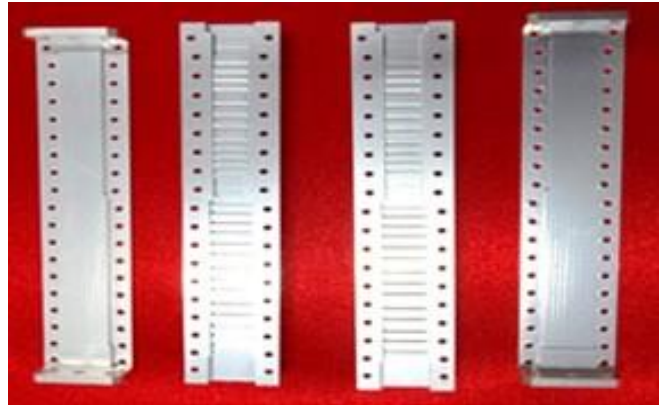


# Nanoparticle (Silver & Gold) coating on Aluminum



Space Applications Centre (SAC) has developed and qualified a robust Nanoparticle (Silver & Gold) coating on Aluminium 6061T6. The high electrical conductivity of gold, low contact resistance and good solderability combined with the consistency of these properties over wide range of environment conditions experienced by satellite makes gold plating the ideal choice for plating electronic hardware. Nano particle size is in the range of 25-50 nm. The nano silver plating on aluminum alloy components such as RF filters improves surface conductivity and hence reduces the insertion losses. The process is used for components like waveguides, adaptors, HRFs, filters etc. Silver plated waveguides are used in communication payloads of satellites. Nano Silver plating on Aluminum is optimized to give better RF performance as compared to traditional silver plating. Nano Silver coating provides high luster, electrical conductivity near to pure silver and is solderable. Indoor humid environment tarnish resistance is achieved by nano deposition.

## Applications area

- Engineering / Industrial
- To enhance the electrical conductivity of the surface

## Specifications:

Gold nano Plating on Aluminum 6061t6	
Undercoat	Nickel-Phosphorous (Electroless Nickel)
Composition of undercoat	Nickel - Phosphorous (8-12%)
Undercoat thickness	10-12 $\mu$
Topcoat	Gold (Electroplating)
Type of Gold Plating	Acidic Gold Potassium Cyanide
Purity of Gold	99.99%
Thickness of Gold plating	2.0 $\pm$ 0.5 $\mu$ or 1.0 $\pm$ 0.2 $\mu$



Silver nano Plating on Aluminum 6061t6	
Undercoat	Nickel-Phosphorous (Electroless Nickel)
Composition of undercoat	Nickel - Phosphorous (8-12%)
Undercoat thickness	8-12 $\mu$
Topcoat	Silver (Electroplating)
Type of Silver Plating	Basic Silver Potassium Cyanide
Thickness of Silver plating	7.0 $\pm$ 2.0 $\mu$

## Salient Features

- Processed developed after undergoing intense qualification plans and tests to withstand harsh space-like conditions.
- Highly stable cyanide based chemistry.
- Easy to control and maintain.
- Optimized for uniform and dense thickness with liberal process parameters range.
- Undercoat of electroless nickel for better corrosion protection of aluminum.
- Silver nano particle coating resistant to indoor humid environment tarnish effects tested as per ASTM B809.

## Technology Transfer from ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below: