



(Magnetron sputtering system)

CR-CU-AU METALLISATION FOR HI-REL MIC FABRICATION

Space Applications Centre of Indian Space Research Organisation (ISRO) is in the field of Microwave Integrated Circuits fabrication for communication, remote sensing and navigational payloads. SAC has developed the process of Cr-Cu-Au (Chromium-Copper-Gold) metallisation on both sides (top and bottom side) of Alumina substrates using Magnetron sputtering techniques. The base material for MIC fabrication is dielectric ceramic viz. alumina on which the metallisation is to be carried out for MIC patterning.

Preferable Infrastructure

Requirements:

- Thin film characterisation tools like
- High resolution Microscope up to 1000X magnification
- Four probe Sheet Resistivity meter
- Muffle Furnace
- Adhesion tester

Salient Features

The salient features of the technology include process repeatability, adhesion, uniformity, and compact structure of deposited thin film. The metallisation is expected to withstand environmental tests and demonstration of compatibility with further processes like pattern engraving and assembly and packaging. Presently, the developed process is utilised for fabrication of subsystems for ongoing IRNSS, GEOSAT and SCATSAT project activity.

Infrastructure Requirements

- Clean room of Class 100 type
- Magnetron sputtering system with three cathode/sputter gun configuration,
- Ultrasonic cleaner,
- Vapour degreaser,
- Stereo Zoom Microscope up to 100X magnification, DI water plant.

Technical Specifications

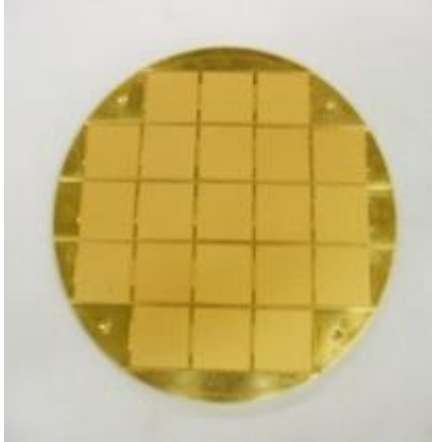
- Substrate: Alumina substrates
- Metallisation scheme:
 - Cr : ~ 300 Angstrom
 - Cu: 4 to 4.5 micrometer
 - Au : 2 to 2.5 micrometer
- Total thickness: 5 to 7 microns
- Uniformity : $\pm 10\%$ on single substrates
- $\pm 20\%$ batch to batch
- Metallisation required on both sides of substrates
- Sheet Resistivity: < 0.006 ohms/square



Material Requirements

- Alumina substrates (Coorstek make superstrate-996 or equivalent),
- High purity sputtering Targets of Cr, Cu & Au, High purity Argon gas

The developed product has to undergo extensive testing as per ISRO qualification standards for space use.

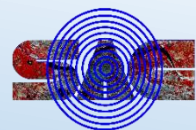


Technology Transfer

SAC/ISRO offers to transfer this technology of the **Cr-Cu-Au Metallisation for Hi-Rel MIC Fabrication** developed by SAC to industries in India with adequate experience and facilities. Enterprises interested in obtaining knowhow may register and submit their proposal to IN-SPACE, Ahmedabad at www.inspace.gov.in

For more details, Contact:

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