

Space Grade Traveling Wave Tube

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Space Applications Centre (SAC) has successfully developed Traveling Wave Tube (TWT) and is qualified for space application. The TWT is the most efficient of the existing High Power Amplifier technologies available for space application. The technology is such that, globally only few vendors supply TWTs for space application.

The TWT mainly consists of 4 sub-assemblies namely- Electron Gun, Slow Wave Structure, Periodic Permanent Magnet Stack and Collector.

More than 25 different materials, 20 different processes are involved in the development. The TWT is an assembly formed by brazing/welding of 250 piece parts with more than 100 leak-proof joints. It requires very high precision in piece parts fabrication & alignments using specially designed jigs during sub-assembly & assembly level brazing. The assembly is processed to create Ultra High Vacuum (UHV) of 10^{-10} mbar in it. The UHV processed TWT goes through rigorous tuning, testing, Burn-in to be ready for packaging.



Piece-parts of TWT

The yearly production capacity is dependent on the availability of no. of TWT test power supplies. The technology is generic across the frequency bands from L to Q bands and out power. The jigs and piece parts change as per design however, the whole infrastructure can be used across the designs.

Applications

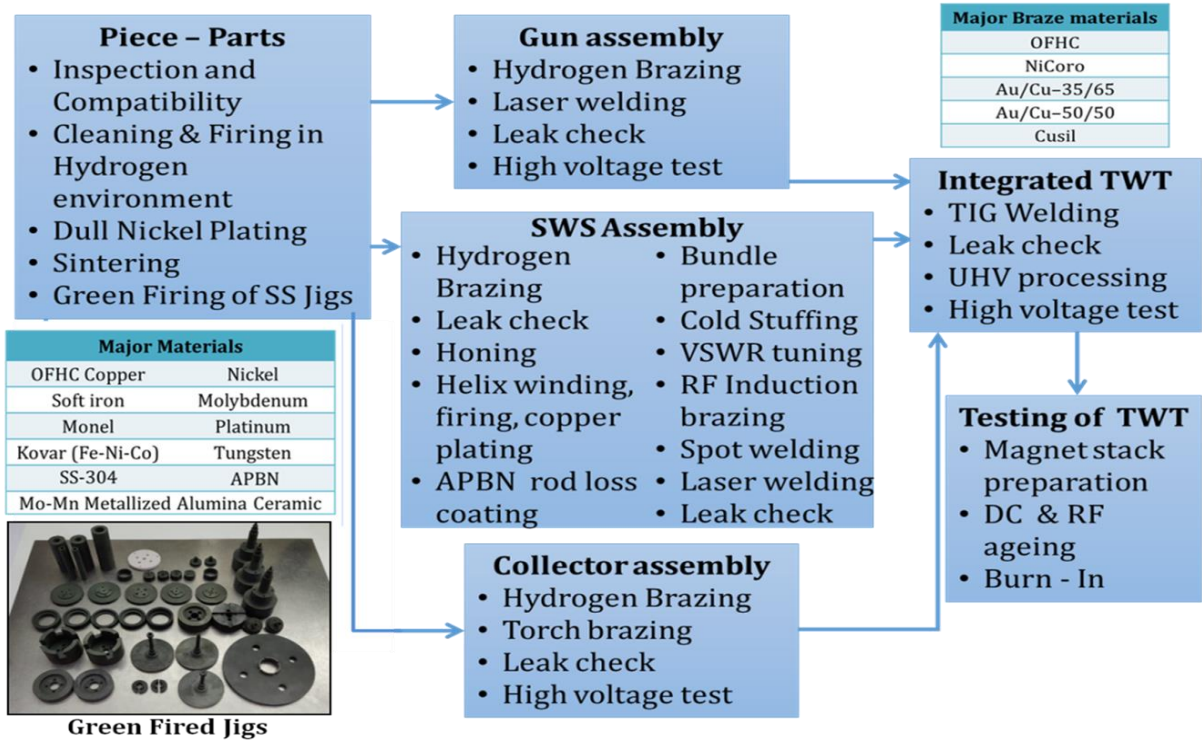
The TWTs will be integrated with respective EPCs to be used as Traveling Wave Tube Amplifier (TWTA) in satellite payloads. For a typical 24-transponder communication payload, 30 TWTAAs are required.



Specifications

TWTs in frequency bands ranging from L to Q band at various power levels (40 – 440 W).

TWT Development Cycle



Technology Transfer

SAC/ISRO, offers technology transfer of the **Space Grade Traveling Wave Tube** developed by SAC to potential industries in India. Enterprises meeting the following pre-requisites and interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities.

Pre-requisites

1. An Indian company registered for development of space/defense/aerospace electronics.
2. Availability of permanent manpower with requisite qualifications (B. E.: Mechanical, Metallurgy and ECE, Diploma: ECE, ITI: Welder, Fitter, Electronics, Instrument)
3. Financially stable and solvent company (in view of long realization time of technology)

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