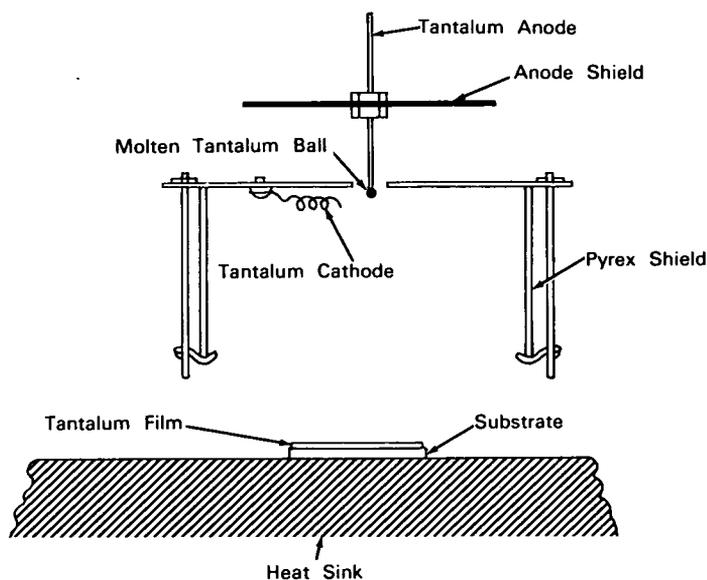


# NASA TECH BRIEF



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## Tantalum Cathode Improves Electron-Beam Evaporation of Tantalum



**The problem:** Providing a constant electron source, free of contaminants, for electron-beam evaporation of tantalum onto a substrate. An elementary or thoriated tungsten filament (cathode) which is commonly used as a source of electrons in this process tends to contaminate the deposited tantalum film with tungsten oxide. In addition, tantalum from the anode is vapor-deposited onto the tungsten cathode and degrades its electron emission properties.

**The solution:** An electron-beam evaporation assembly employing a cathode of tantalum, instead of tungsten, as the electron source.

**How it's done:** The cathode and anode are both made of pure tantalum to prevent contamination of the tantalum film deposited on the substrate. In addition, since the cathode and anode are made of the same material, transfer of tantalum vapor from the

anode to the cathode during the evaporation process does not alter the electron emission properties of the latter.

**Note:** Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, California, 91103  
Reference: B65-10175

**Patent status:** NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: Electro-Optical Systems Inc.,  
under contract to Jet Propulsion  
Laboratory (JPL-WOO-021)

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