
General Sessions (Oral) | T6 AM Beam Based Technologies

[T6]AM Beam Based Technologies

Oral

Chairpersons: Weiwei Zhou (Tohoku University, Japan), Suyalatu Suyalatu (NTT Data XAM Technologies Corporation, Japan)

Wed. Oct 16, 2024 10:30 AM - 11:30 AM Room B (3F 302, Conference Center)

10:30 AM - 10:50 AM

[16B-T6-32]Tantalum Processing Development for Medical Applications Insights from Relationship of Thermal Processes and Mechanical Properties by LMM-based AM and MIM

Y. Watanabe^{1,2}, *M. Tange^{1,3}, Y. Kanaya^{1,2}, H. Okuyama¹, S. Tanaka¹ (1.Micro MIM Japan Holdings Inc., Japan, 2.Taisei Kogyo Co., Ltd., Japan, 3.Taisei Kogyo (Thailand) Co., Ltd., Thailand)

Keywords:Tantalum, Lithography based Additive Manufacturing, Metal Injection Moulding

The resurgence of interest in tantalum (Ta) within the medical industry is fueled by its refractory nature and exceptional X-ray reflection properties. Despite its commendable malleability, the machining challenges of Ta necessitate the development of powder metallurgy production techniques. While Ta powder metallurgy has found application in condenser production, the deliberate retention of an oxide layer is mandated. In contrast to condenser applications, medical applications demand superior mechanical properties and the impact of oxygen, hydrogen, and nitrogen contamination on Ta is crucial. This research focused on understanding the relationship between the thermal process and mechanical properties, utilising specimens produced through metal injection moulding and lithography-based additive metal manufacturing. The investigation included traditional solvent or thermal debinding, along with an exploration of superheated steam debinding. The findings contribute valuable insights into optimising the thermal processes for Ta in medical applications.