Chair of Materials Engineering of Additive Manufacturing
TUM School of Engineering and Design
Technical University of Munich

MA/BA/SA

Recycling and Characterization of PVD Targets

Background:
PVD coatings (e.g., MCrAlY alloys) are essential in aerospace and energy applications due to their oxidation resistance and durability. Manufacturing targets is resource-intensive, while used targets still contain valuable elements. Recycling offers both ecological and economic benefits.

Aim:
This thesis focuses on recycling used PVD targets. The workflow includes target acquisition, characterization, remelting (ARC Melter), powder production (AMAZEMET RePowder), powder analysis, and re-manufacturing of targets using SPS or EBM.

Tasks:

- Literature review on PVD target recycling and powder processing.
- Characterization of used targets (SEM, XRD, ICP-OES, etc.).
- Remelting targets into ingots with ARC Melter.
- Plasma atomization into powders using RePowder.
- Powder characterization (size distribution, morphology, chemistry, flowability).
- Preparation and testing of recycled powders for target re-manufacturing.
- Reporting and presentation of results.

Methods & Equipment: ARC Melter, AMAZEMET RePowder, SEM/EDX, XRD, ICP-OES, particle size analysis, SPS/EBM.

Your Profile:

- Mechanical Engineering, Material Science or a similar study.
- Basic knowledge in materials science, metallography, and microscopy.
- Very good English spoken and written.

Contact

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