

MA/BA/SA

PVD Coatings' Targets Simulation, Manufacturing, and Characterization

Background:

Physical Vapor Deposition (PVD) coatings play a crucial role in high-temperature applications such as aerospace and energy industries, where oxidation resistance, thermal stability, and mechanical durability are essential. At the Chair of Materials Engineering of Additive Manufacturing, we are working on the development of advanced PVD coating targets, particularly MCrAlY-based alloys. This project focuses on investigating different experimental and computational techniques to manufacture PVD targets with tailored properties for specific applications.

Aim:

The objective of this research is to explore and evaluate various material simulation methods and alloy design strategies to optimize PVD target compositions. Through computational modeling and experimental methods, the project aims to identify suitable elemental additions that enhance coating performance while ensuring manufacturability.

Your Tasks:

- Conduct a structured literature review on MCrAlY coatings and their manufacturing processes.
- Evaluate different material simulation techniques to predict the effects of alloying elements.
- Identify potential elemental additions that enhance oxidation resistance, thermal stability, and mechanical properties.
- Summarize findings in reports and presentations to support ongoing research efforts.

Your Profile:

- Enrolled in a Bachelor's or Master's program in Materials Science, Mechanical Engineering, Chemical Engineering, or a related field.
- Strong interest in alloy design, computational materials science, and high-temperature coatings.
- Experience with material simulation tools (e.g., CALPHAD, Thermo-Calc, MatCalc) is a plus.
- Analytical mindset, structured research approach, and strong scientific writing skills.
- English language proficiency is required.

Contact

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