Characterizing Porous Iron Coatings Produced by Cold Spray Technology

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STUDENT PROFILE

We are looking for a hard-working mechanical engineering student with a proactive attitude. Creative approaches and new ideas are encouraged throughout the project.

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CORE SKILLS

Additive Manufacturing knowledge

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Materials Charactrization

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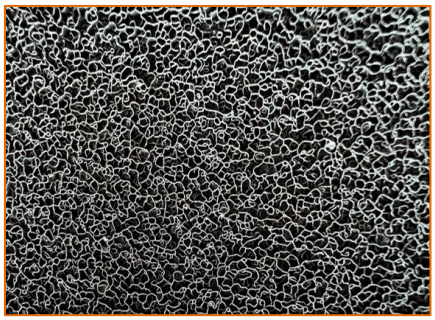
PROBLEM PRESENTATION

Porous deposits produced using Cold Spray (CS) technology can offer many benefits in terms of final performance. Their cellular structure with high porosity imparts unique characteristics such as energy absorption, heat dissipation and surface wettability properties. However, cold spray process conditions and parameter selection is remains a critical issue to obtain and tailor such structures. Understanding these aspects can enable the development of cellular deposits with tailored properties for advanced engineering applications.

THESIS DESCRIPTION

Your research will focus on optimizing the experimental conditions for the deposition of porous iron coatings via cold spray. You will conduct a detailed literature review to uncover existing knowledge gaps and challenges in the field. The study will include a comprehensive characterization of the deposits, assessing their micro and meso-structures, as well as physical and mechanical properties. The project also explores the thermal management and wettability capabilities of porous iron deposits.

APPLICATIONS



Cold sprayed Fe deposits at 450 C, 50 bar, 50 Passes

The development of porous metallic deposits can play a role in enhancing performance in various applications, particularly in thermal management systems. By leveraging the unique properties of cold spray technology, these deposits can be tailored for use in demanding environments, offering benefits such as improved heat transfer efficiency and thermal conductivity.

BASIC INFORMATION

- Duration: 6-9 months
- Immediate start
- Experimental