

镍基高温合金 3D 打印研究

【项目描述】：镍基高温合金因其优异的综合高温性能广泛应用于航空航天、船舶制造等领域。3D 打印所具有的复杂零件成形能力对镍基高温合金的制备具有独特的优势。3D 打印过程中的复杂热机械条件会直接合金微观组织结构, 进而改变其高温性能。为了减少或消除 3D 打印件的微观和宏观缺陷, 并改善其综合性能, 进行后处理是很有必要的。我们项目的研究目标是阐明激光粉末床熔融制造及后处理工艺参数对镍基高温微观组织结构演变的作用机制, 及其对高温性能的影响规律, 为实现结构-组织-性能可调可控的镍基高温合金 3D 打印制造奠定基础。

【职位概述】：我们正在寻求一位基础扎实、自我驱动, 对金属 3D 打印感兴趣, 且愿意开展研究工作的科研助理。理想的候选人应具有材料学、机械设计等方面的相关背景。候选人将在金属 3D 打印过程监测、微观组织分析、高温力学性能测试等方面开展工作, 与团队成员密切合作在知名期刊上发表相关学术论文。通过聚焦性科研延展项目 (FREE), 候选人将有机会获取开展研究工作所需的理论知识和实验技能, 从而增加申请博士或硕士研究生项目获批的可能性以及获得工业界长期工作的机会。

【职位要求】：

- 材料科学与工程、机械工程等相关专业的学士及以上学历, 及金属材料加工等相关背景。
- 金属材料微观组织分析、力学性能测试以及实验方法设计等相关经历。

有关此职位的问题, 请联系巩杉博士, 电子邮件: shan.gong@scu.edu.cn。

3D Printing of Nickel-based High-temperature Alloys

Project Description: Nickel-based high-temperature alloys are widely used in aerospace, shipbuilding, and other fields due to their excellent comprehensive high-temperature properties. The complex part generation capability of 3D printing has unique advantages in the manufacturing of nickel-based high-temperature alloys. The complex thermomechanical conditions during the 3D printing process will directly change the microstructure of the alloy, thereby affecting its high-temperature properties. In order to reduce or eliminate micro and macro defects of 3D printed parts and improve their overall performance, post-processing is often necessary. The goal of our project is to elucidate the effect process parameters of laser powder bed fusion manufacturing and post-processing process on the microstructure evolution of nickel-based high-temperature alloys and associated high-temperature properties, which is a crucial step for achieving quantitative control on structure-structure-property relationship.

Job Description: We are seeking a highly skilled and motivated research fellow specializing in metal 3D printing to contribute to our cutting-edge research initiatives. The ideal candidate will have a strong background in material science, mechanical design. The research fellow will play a key role in 3D printing process monitoring, advanced microstructure characterization, high-temperature mechanical performance testing. Collaborating closely with a diverse team of researchers and engineers, you will actively contribute to the development and submission of research papers in decent reputable journals. Throughout the experience as a Focused Research Extended Experience (FREE) research fellow, you will be able to cultivate the relevant scientific knowledge and experimental skills in a focused and extensive manner such that enhancing opportunities for advancing graduate studies or getting a long term well-paid industrial job.

This position commences in or after early 2024, with individuals anticipated to initiate their responsibilities no later than Spring 2024. The term of employment spans two years, and the contract is structured for annual renewal.

Qualifications:

- Master's or Bachelor's degree in relevant majors such as Material Science and Engineering, Mechanical Engineering, etc., with a focus on metal and alloys processing.
- Experience with advanced microstructure characterization (such as TEM, SEM, EDS, EBSD), mechanical testing, thermal analysis, etc.

For questions regarding this position, please contact Dr. Shan Gong, at shan.gong@scu.edu.cn.