Postdoc position in Materials Characterization for Additive/Subtractive Manufacturing and Sustainable Refurbishment

Application Deadline:
12 May 2025

Faculty:
Faculty of Technical Sciences

Institute/Faculty:
Department of Mechanical and Production Engineering

Academic contact person:
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Vacant positions:
1

Hours per week:
37

Number of months:
18

Expected date of accession:
01/07/2025

The Department of Mechanical and Production Engineering (MPE) at Aarhus University invites applications for a 1.5-year Postdoctoral Researcher position in the field of Materials Characterization and Interfaces in Additive/Subtractive Hybrid Manufacturing for Sustainable Refurbishment.

This position is part of the CiP (Circularity in Production), which aims to develop and demonstrate hybrid manufacturing approaches—combining additive (MIG welding-based) and subtractive (CNC machining) processes—for the refurbishment of industrial components. The postdoc will focus on characterizing material interfaces and performance in refurbished metal parts and contribute to assessing their environmental impact, including data input for CO_2e analysis tools.

Expected start date and duration of employment

This is a 1.5–year position from July 1, 2025 or as soon as possible.

Job description

- Design and carry out advanced materials characterization of hybrid additively/subtractive manufactured metallic components.
- Investigate metallurgical properties, microstructures, and mechanical performance across dissimilar metal interfaces (e.g., MIG-welded tool steel to structural steels).
- Develop testing protocols for refurbished metal parts, including wear, hardness, and fatigue evaluations.
- Collaborate with project partners (DAMRC, Dansk AM Hub) and provide input to demonstrator case studies.
- Contribute to sustainability assessments through materials data relevant to CO_2e calculation tools.
- Participate in dissemination of findings through journal papers, conference presentations, and teaching/training activities.
- Support development of technical documentation and teaching modules for industry and engineering students.

Your profile

- A PhD in Materials Science, Mechanical Engineering, Metallurgy, or a related field.
- Proven experience in experimental materials characterization techniques (e.g., SEM, EDS, hardness testing, microstructure analysis).
- Familiarity with welding or additive manufacturing processes (especially MIG-based or hybrid techniques).
- Strong analytical skills and ability to handle cross-disciplinary industrial collaboration.
- Experience in sustainability assessment (e.g., materials life cycle, circular economy) is a plus.
- Excellent communication skills in English, both written and oral.
- Ability to work independently and collaboratively in an applied research environment.

Who we are

Aarhus University is a globally recognized research institution committed to excellence in science and innovation. At the Department of Mechanical and Production Engineering (MPE), we are at the forefront of developing sustainable technologies and advancing digitalization across manufacturing disciplines.

This postdoc will be embedded in the Mechanics of Materials and Surface Engineering (MEMA) section—an active research environment focused on the intersection of materials science, tribology, surface integrity, and durability of engineering components. Our research spans experimental and computational approaches to understand how materials perform under mechanical, thermal, and environmental stresses, with a strong emphasis on real-world industrial applications.

We work closely with Danish and international collaborates in both academia and industry, bridging the gap between fundamental science and applied engineering. MEMA is equipped with state-of-the-art facilities for mechanical testing, surface characterization, and microscopy, and we take pride in mentoring early-career researchers in a collaborative and creative environment.

As a postdoc in our team, you will contribute to shaping the future of hybrid manufacturing and sustainable refurbishment technologies—at the intersection of materials interfaces, advanced characterization, and CO_2-conscious engineering.

Learn more about the department here:
https://ingenioer.au.dk/en/about/organisation/mechanical-and-production-engineering

What we offer

The department offers:

- A dynamic and international research environment at Aarhus University.
- Access to state-of-the-art facilities for additive manufacturing, digital twins, and data analytics.
- Opportunities to collaborate with industry and research institutions on cutting-edge digitalization and sustainability projects.
- Competitive salary and benefits in accordance with Danish employment regulations.

Place of work and area of employment

The main work place is at the Aarhus University
Department of Mechanical and Production Engineering
Katrinebjergvej 89
8200 Aarhus N, Denmark

The position includes regular visits to DAMRC company at Hernning near Aarhus. The attendance at each workplace address is by agreement with your immediate supervisor. At the time of employment, the distribution between the workplace addresses is expected to be days with place of employment in The area of employment is Aarhus University with affiliated institutions.

Contact information

For further information, please contact: Dr., Narguess Nemati, +45 23382445, nnemati@mpe.au.dk

Application procedure

Shortlisting is used. This means that after the deadline for applications – and with the assistance from the assessment committee chairman, and the appointment committee if necessary, – the head of department selects the candidates to be evaluated. All applicants will be notified whether or not their applications have been sent to an expert assessment committee for evaluation. The selected applicants will be informed about the composition of the committee, and each applicant is given the opportunity to comment on the part of the assessment that concerns him/her self. Once the recruitment process is completed a final letter of rejection is sent to the deselected applicants.

Letter of reference

If you want a referee to upload a letter of reference on your behalf, please state the referee's contact information when you submit your application. We strongly

recommend that you make an agreement with the person in question before you enter the referee's contact information, and that you ensure that the referee has enough time to write the letter of reference before the application deadline.
Unfortunately, it is not possible to ensure that letters of reference received after the application deadline will be taken into consideration.

If you wish to add a referee **after** you have submitted your application, you must send this person's details (name, job title, place of work, and email address) as well as the name of the position you have applied for to: HR.Nattech@au.dk

Formalities and salary range

Technical Sciences refers to the Ministerial Order on the Appointment of Academic Staff at Danish Universities under the Danish Ministry of Science, Technology and Innovation.

The application must be in English and include a curriculum vitae, degree certificate, a complete list of publications, a statement of future research plans and information about research activities, teaching portfolio and verified information on previous teaching experience (if any). Guidelines for applicants can be found here.

Appointment shall be in accordance with the collective labour agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations. Further information on qualification requirements and job content may be found in the Memorandum on Job Structure for Academic Staff at Danish Universities.

Salary depends on seniority as agreed between the Danish Ministry of Taxation and the Confederation of Professional Associations.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants.

Research activities will be evaluated in relation to actual research time. Thus, we encourage applicants to specify periods of leave without research activities, in order to be able to subtract these periods from the span of the scientific career during the evaluation of scientific productivity.

Aarhus University offers a broad variety of services for international researchers and accompanying families, including relocation service and career counselling to expat partners. Read more here. Please find more information about entering and working in Denmark here.

Aarhus University also offers a Junior Researcher Development Programme targeted at career development for postdocs at AU. You can read more about it here.

The application must be submitted via Aarhus University's recruitment system, which can be accessed under the job advertisement on Aarhus University's website.

Aarhus University

Aarhus University is an academically diverse and research-intensive university with a strong commitment to high-quality research and education and the development of society nationally and globally. The university offers an inspiring research and teaching environment to its 38,000 students (FTEs) and 8,300 employees, and has an annual revenues of EUR 935 million. Learn more at www.international.au.dk/