**Electron Beam Melting (EBM) Training for A2M2TECH Early Stage Researchers**

A three-day intensive training program on **Electron Beam Melting (EBM)** was successfully organized at the **Additive Manufacturing Technologies Application and Research Center (EKTAM), Gazi University**, between **18–20 February 2026**. The training was conducted within the framework of the **A2M2TECH (Advanced Materials and Advanced Manufacturing Technologies) H2020-MSCA COFUND project** and aimed to strengthen the practical and theoretical knowledge of Early Stage Researchers (ESRs) in metal additive manufacturing technologies.

The program was delivered by experienced researchers from EKTAM and combined theoretical lectures with hands-on practical sessions using the **Arcam A2X Electron Beam Melting system**. Throughout the training, participants gained direct experience with EBM process fundamentals, machine operation, software workflow, and post-processing procedures.

**Training Content**

The training program was structured over three days and included both theoretical and practical sessions.

**Day 1 – Theoretical Foundations and Software Applications**

The first day focused on the fundamentals of the EBM process and the infrastructure available at EKTAM. Participants were introduced to the working principles of Electron Beam Melting, powder characteristics, powder handling procedures, and general design considerations for EBM manufacturing. In addition, the workflow of the additive manufacturing process using relevant software tools such as **Materialise Magics and EBM system software** was presented.

**Day 2 – Machine Operation and Production Initiation**

The second day consisted of practical sessions using the **Arcam A2X EBM system**. Researchers were introduced to the machine interface, system components, and safety procedures. Participants also performed key machine calibration operations including build plate leveling, vacuum system initiation, and beam alignment procedures. The day concluded with the initiation of a build cycle and real-time monitoring of the manufacturing process.

**Day 3 – Post-Processing and Evaluation**

The final day focused on post-processing operations and evaluation of the produced components. Participants learned how to remove the build plate from the machine

chamber, clean the system, and perform powder sieving and recycling operations. The training concluded with support structure removal from the demonstration part and a comprehensive technical discussion session where participants addressed operational questions and shared feedback.

**Participants**

The training was attended by **Early Stage Researchers (ESRs)** from the A2M2TECH project representing partner universities and research institutions involved in the program. The sessions were conducted by EKTAM researchers who provided both theoretical instruction and practical demonstrations.

**Skills and Competencies Gained**

Through this intensive program, participants developed practical competencies in several key areas of Electron Beam Melting technology, including:

- Understanding of EBM process fundamentals and machine infrastructure
- Preparation of build files and manufacturing workflow using AM software
- Machine calibration procedures and beam alignment
- Operation of the Arcam A2X system and monitoring of the build process
- Post-processing operations including powder recovery and support removal

**Conclusion**

The training successfully provided A2M2TECH Early Stage Researchers with valuable hands-on experience in **Electron Beam Melting technology**, bridging theoretical knowledge with real manufacturing practice. Such training activities are an important component of the A2M2TECH program, enabling researchers to develop advanced technical skills and gain experience with industrial-scale additive manufacturing systems.

This activity also contributes to strengthening the research infrastructure and collaborative training environment within the A2M2TECH network.


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