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**TITLE:** Powder Atomization for Development of High Temperature Alloys [Phase 2]

**RELATED ROAD-MAPPING DESIGNATION ID#:** AM53

**SUPPORTIVE INDUSTRY:** ATI, Sumitomo, Boeing

**PROJECT TYPE:** General Project

**PROBLEM STATEMENT (What Are We Trying to Solve?):** This project incorporates the use of the Powder Atomizer toward the continued development of high temperature alloys. These material developments are essential to the evolution of new raw material entrants into Additive Manufacturing (powders or wires). This work is at the forefront of growth in AM and aligns well with the Powder Atomizer and will utilize the HIP furnace currently at OMIC.

**PROJECT DESCRIPTION:** This project carries with it a very specific focus as outlined below:

- As a continuation of AM44, this next phase can focus on atomizing high-temperature alloys, such as refractory alloys, to study the effect of alloying elements on solidification behavior during the AM process.
- Investigation of the formation mechanisms and evolution of second-phase particles in Niobium alloys using a powder metallurgy (PM).
- This research will investigate the feasibility of incorporating these materials in additive manufacturing.
- Spherical powders will be produced using AMAZEMET for both AM and hot isostatic pressing (HIP) processes.

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**Identify Related OMIC R&D Resources:** Proposing researchers should use their best judgment in deciding on the optimal resources for the research. To further aid in this decision, the OMIC staff has taken the initiative to best identify on-site resources (machines, equipment, and staff) that may relate to the scope of this research. Please recognize that researchers are not limited to these resources.

- Machines and equipment at OMIC can be reviewed at:  
<http://omic.us/applied-research/additive/>  
<http://omic.us/applied-research/subtractive/>  
<http://omic.us/applied-research/materials/>  
<http://omic.us/applied-research/robotics/>  
<http://omic.us/applied-research/inspection/>
- OMIC Staff or SMEs  
<http://omic.us/applied-research/>

**PROJECT DELIVERABLES:**

- Final report
- Final presentation
- Final powders developed

**SPECIAL NOTE:** It should be recognized that this Conceptual Abstract is written based on comments collected during OMIC R&D Road-mapping workshop and based on industries need for applied research. However, researchers as SMEs, are encouraged to lend specific technical feedback to further refine the Project Description and/or Project Outcomes. The proposing researcher may do so either directly to OMIC R&D, or in the submitting proposal.

**UTILIZATION OF OMIC RESOURCES:** Researchers are encouraged to utilize the capital and personnel resources available on the OMIC R&D campus in their proposals. Use of OMIC time and machines should be included in the Proposal funding request. If use of OMIC resources are not identified in a proposal and are requested during the project, sponsor will be responsible for requesting a costed project amendment from the Tech Board.

# OMIC R&D TECHNOLOGY BOARD

## CONCEPTUAL ABSTRACT



**PROJECT UPDATE EXPECTATIONS:** Researchers are required to have monthly update discussion with OMIC R&D to provide a summary update on project status. This is done by way of a user-friendly format known as the OMIC 6-Block update. Depending on the scope of the project, OMIC R&D's industry Tech Board representatives are often interested in periodic project updates, and even in project participation. Researchers are required to communicate with supportive industry and facilitate communications as required.

**ADDITIONAL COMMITMENTS TO FACTOR:** Researchers may be asked to present their final project at an OMIC R&D biennial Technology Exchange Symposium. This symposium is an in-person event, held at the OMIC R&D campus in Scappoose, Oregon. The Symposium is held in the spring, and researchers should factor in their availability when bidding on projects.

Researchers may be invited to participate in OMIC R&D's marketing efforts that showcase the working history of the project.

**PROJECT DURATION:** It's OMIC R&D's strong preference that the duration of a General Project aligns with the academic calendar cycle (July 2025 to June 2026). It is preferred that the project be completed by June 2026. Researchers are encouraged to factor in variables such as contracting, student hiring (if needed), procurement, holidays, and travel. It has been OMIC R&D's experience that a project's useful working duration is typically 9 to 10 months. Researchers are also encouraged to give feedback, and to adjust the scope of work to best fit this preferred timeframe. Additionally, it is reasonable to even recommend phasing breakdowns to the project. In some unique circumstances, if the project is to take significantly longer than the duration of the academic year, this reasoning should be explicitly explained in the proposal.

### CONTACTS AT OMIC R&D:

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