

OMIC R&D TECHNOLOGY BOARD

Evaluation of Alternate High Efficiency Machining Toolpaths

Request for Proposals

1.0 Project Information

- **Project Title:** An Evaluation of Alternate High Efficiency Machining Toolpaths Methods and Performance Testing for Hard Metals Machining Optimization.
- **Project Type: Joint General Project**
- **Project Description:** The objective of this project is to perform an evaluation of industry leading CAM solutions of high efficiency roughing toolpath algorithms for hard metals machining with measurable performance of physically machined demonstrators. The study will highlight the differences and evaluate the results of the machined demonstrator's performance to better inform industry of optimized solutions for hard metals machining. Today each CAM system utilizes different approaches to optimize each of their toolpath algorithms and some have more capabilities than others. The project proposes to utilize industry leading high efficiency roughing toolpath algorithms for hard metals machining that are commercially available CAM systems such as Catia, HyperMill -Volumill, NX, and MasterCam so that results of study can easily implemented in industry. The project will demonstrate actual results and performance of alternate high efficiency roughing toolpath algorithms and further hard metals machining technologies.
- **Project Outcomes:** The project will develop a common generic design that encompass traditional machined part feature such as open pocket, open pocket w/ islands, closed pocket with island, intermediated levels, 3D surfaces and etc. It will establish common cutting tool and parameters such as type, size, speed and feed to be shared across the different CAM systems. The project will establish a baseline of commanded radial depth of cut and axial depth of cut to each of the CAM systems toolpath algorithms with emphasis on comparing apple to apples in the study.

The project will document performance and results of radial engagement, feedrate, metal removal rate, angle of engagement, actual chip thickness, consumed horsepower, actual machine run time and tool life for each of CAM systems solutions. The project will demonstrate the most optimal solutions for 3-axis and 5-axis high efficiency roughing toolpath algorithms commercially available today. The project will highlight the most optimized approaches and/or combination of approaches with each of the CAM systems.

The project will enhance the hard metals machining capability of OMIC and show case it's contribution to a larger manufacturing community. The new capabilities will directly impact the industry methods and further CAM solutions of high efficiency roughing toolpath algorithms for hard metals machining.

- **Project Duration:** 3-6 months

2.0 General Information for All Proposals

- **Eligibility:** All faculty at OMIC R&D Research institutions and OMIC R&D technical

staff.

- **Performance Period:** The Performance Period of the proposed work must be appropriate for the content given above in the Project Information sections. Requests for excessive or unjustified performance periods can be reason for proposal rejection by the OMIC Technology Board.
- **Award Amounts:** The funding requested must be appropriate for the content given above in the Project Information sections and consistent with any limitations given there. In all cases requested funds must be fully justified. Requests for excessive or unjustified funding can be reason for proposal rejection by the OMIC Technology Board.
- **Proposal Format, Content and Details:** All proposals must strictly follow the template given below and include all required sections
- **Submission Deadlines: Monday June 3, 2019**
- **How to Submit:** Send proposals by email to the OMIC R&D Project Manager, Ally Imbody <alicia.imbody@oit.edu>
- **Proposal Review Process:** Proposals will be reviewed and award decisions made by the OMIC Technical Advisory Board. The Board encourages collaboration between OMIC's university research partners in response to this RFP when collaboration will provide the best value for achieving the desired Project Outcomes. Evaluations will be based on the following criteria:
 - Soundness of the proposed methodology
 - Demonstrated subject-matter expertise of proposed staff
 - Cost/reasonableness of proposed budget
 - Timeline/adherence to proposed schedule
 - Past performance (if applicable)

Technology Board members will evaluate each eligible proposal submitted using a five-point scale where: 1- poor, 2-deficient, 3-acceptable, 4-superior, 5-outstanding.

Evaluators will assign a default score of 3 for Past Performance if no information is available. All scores will be averaged by the Tech Board chair and a decision made based on the highest overall score.

- **Informational Contact:** Questions are to be directed to the OMIC Project Manager, Ally Imbody <alicia.imbody@oit.edu> by **Monday, April 29, 2019**. Consolidated questions will be sent to the Technology Board Chair and responses will be provided to all research partners by **Monday, May 6, 2019**.
- **Performance Requirements:** The PI and institution awarded the project will be expected to progress the work expeditiously to meet all of the progress milestones shown in their proposed schedule (see section two below).
- **Project Termination:** The Tech Board reserves the right to cancel the project at any time.