



Because machine tools are expensive devices, it is difficult to renew the machine in the budget of the university. The latest machine tool that is loaned by MTTRF is placed where it touches every student's eyes. Students will aim at work in the field of machining or machine tools after they graduate by touching the interest of this field.

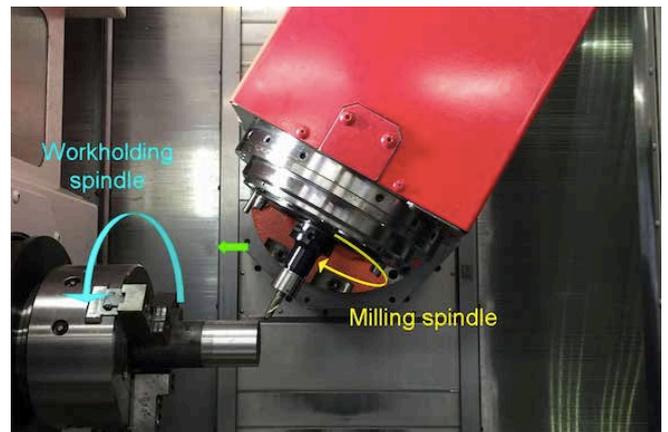
RESEARCH

A Study of Finishing by Turn-Milling Process

The turn-milling process is usually used for roughing because surface roughness grows by interrupted cutting. The processing surface becomes a polygon and it is generally said that a finishing process is necessary by a normal turning. However, the finished surface roughness is not necessary small and the turn-milling process can be used for the finish machining using the surface properties positively.

It is already known theoretically that the typical surface quality can be obtained by turn-milling finishing process. This research starts by first examining the advantage of this unique surface texture created by the turn-milling process. One of the advantages of the turn-milling machining center is the capability of inclination of the cutting tool. The research will also examine that this advantage is still valid in the turn-milling finishing process. The

approach to this research will be 1) selection of cutting tool 2) control of rotational speed of two spindles 3) experiment of axisymmetric workpiece with variable diameter.



Development and Evaluation of Motion Accuracy Test for Multi-Axis Machine Tools

Test standards for multi-axis machine tools have not existed until the end of 2014. Our laboratory have proposed and checked various test methods for five-axis machining

centers using MTTRF equipment. Finally, three parts of ISO standards for five-axis machining centers have completed and published. Among these standards our laboratory has been focusing on the ball bar test simulating cone frustum cutting that is widely known as NAS979.

After completing the new standards, some additional test methods are still proposed. One is the so-called S-shape cutting test. Our laboratory is evaluating the proposed S-shape cutting test and tries to find the problems of executing the test method and analyzing the test results.

EDUCATION

Engineering Practice (Undergraduate course)

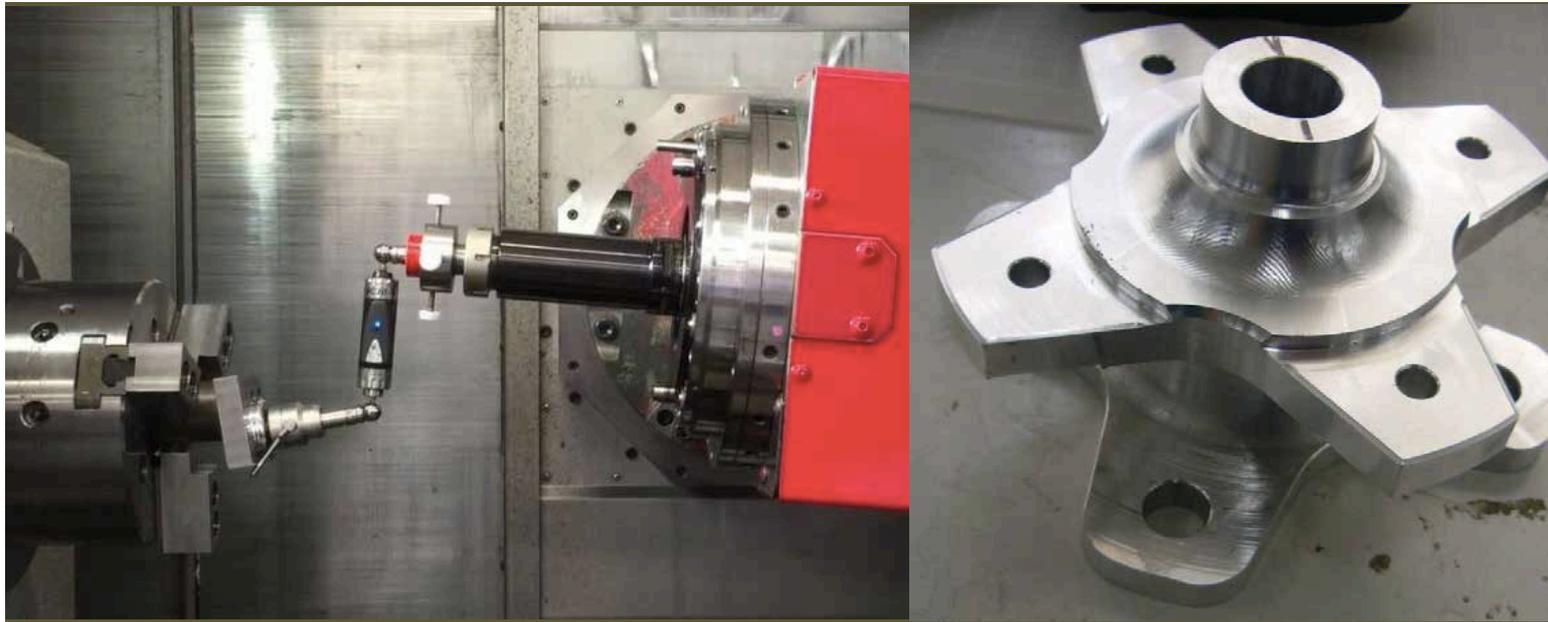
This course is a project-based class with various themes. There are groups for each theme and each group is lead by a Professor. The students discuss the rough design in the

first five weeks. Then the designs become detailed to create engineering drawings. There are engineers from outside the University as consultants who oversee the projects every two weeks.

When the engineering drawings are finished, students start producing parts. The MTTRF equipment is used for producing machine parts that especially have complex structures, such as blades for a wind power generation device or wheel hub. After all the parts are produced, they are assembled, tested and competed.

Advanced Course of CAD/CAM (Graduate course)

Because there is no lecture about the variety and the structure of the machine tools in the undergraduate course, such contents are outlined in this graduate course. Moreover, students have an experience of operating CAM system using ESPRIT.



Yukitoshi Ihara

Professor

Department of Mechanical Engineering
Osaka Institute of Technology (Japan)

Department Website: <http://www.oit.ac.jp/english/education/eng/me/>

MTTRF Awardee since 2009