

Division of Mechanical Science and Engineering	Research field	Precision Machining	Lab. ID MS08
Laboratory web site	<a href="http://manufac.w3.kanazawa-u.ac.jp/">http://manufac.w3.kanazawa-u.ac.jp/</a>		
Research subjects			
<p>The focus of the research in our laboratory is on high-efficiency and high-precision machining of various materials such as difficult-to-machine materials. Research themes are as follows:</p> <ul style="list-style-type: none"> <li>● Studies on High-efficiency and High-precision Machining of Difficult-to-machine Materials by PVD Coated Tools. The FAD(Filerd Arc Deposition) coating method is developed for high-efficient machining of difficult-to-machine materials.</li> <li>● Studies on Turning of Difficult-to-machine Materials with Actively Driven Rotary Tool (Spinning Tool) Turning with a spinning insert called actively driven rotary tool (ADRT), where the cutting tool revolves by a powered and programmable spindle, is investigated.</li> <li>● Laser Conditioning of Superabrasive Wheels. Laser truing/dressing is proposed as a new technique in which a laser beam is used as the non-contact thermal conditioning tool of superabrasive wheels.</li> <li>● Effective Coolant Supply in Heavy Cylindrical Grinding This study deals with the reduction of grinding fluid in cylindrical plunge grinding using newly proposed flexible brush nozzle.</li> <li>● High High-efficiency and High-precision Endmilling of CFRP This study deals with the high-efficiency and high-quality milling of the CFRP composite material with DLC-coated end mills having different helix angles.</li> <li>● Micro Wire Electrochemical Machining Using Ultra-short Pulse Voltage This research aims to develop high-efficiency and high-quality wire electrochemical machining method using thin wire electrodes with a diameter of several micrometers to several tens of micrometer.</li> <li>● Influence of Hydrostatic Pressure on Machining Characteristics of Electrical Discharge Machining The external hydrostatic pressure of electrical discharge machining was controlled in order to enhance the machining characteristics, such as material removal rate and surface roughness.</li> </ul>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>Research subjects in our laboratory are joint researches with companies, or funded by government grants and non-profit foundations. Thus all students have to take responsibility for your research theme. Lab meeting is regularly held once a week. Every member reports the progress of research once a month at the meeting. All laboratory members attend the meeting, and the results are discussed. The research results are presented at the academic conference several times a year.</p>			
Daily life in the laboratory, etc.			
<p>Personal working desk is available for every student. All students have to stay at laboratory from 10:00 to 17:00 on weekdays. Many laboratory activities are organized like, welcome party for new comers, excursion, summer workshop, etc.</p>			
Message or comments by the laboratory faculty staffs			
<p>We accept foreign students, and many foreigners took Ph.D in our laboratory. All activities or correspondences in the laboratory can be done in English. We look forward to working with you in our laboratory.</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	High-quality and high-efficiency end milling of CFRP -Detection of generated gas caused by thermal alteration of thermosetting resin during cutting and their influence on tensile strength of milled plate-		
2017.3	Thermal dressing of resin-bonded diamond wire saw with pulsed Nd: YAG laser		
2017.3	Micro electrical discharge machining using high electric resistance electrodes		
2017.3	Studies of Cylindrical Plunge Grinding with Extremely Small Amount of Grinding Fluid -Effect of contact type flexible brush-nozzle on reduction of coolant-		
2016.9	Effects of Cutting Fluid in Turning of Difficult-to-Machine Materials		
2016.3	Studies on the electrical discharge machining in pressurizing and depressurizing atmosphere		
2016.3	Studies on Turning of Difficult-to-machine Materials with Actively Driven Rotary Tool - Cutting Mechanism by Rotating Tools -		
2016.3	Studies on End Milling of Difficult-to-machine Materials with High Smooth Coating Tools		
2016.3	Development of the advance DLC film by FAD method and application to the cutting of aluminum alloys		
2015.3	High-quality Machining of CFRP by Inclination Milling with High Helix End Mill		

2015.3	Study on Reduction of Grinding Fluid in Cylindrical Plunge Grinding Using Flexible Brush Nozzle
2014.3	Minimum Quantity Lubrication with Dual Spray System for Turning of Difficult-to-cut Materials – Effects of Cold Air and Oil Mist with Cold Air–
2014.3	High-efficiency Milling of Difficult-to-cut Materials Using PVD Coated End Mill –Effect of Double Layer Coating of TiAlN/AlCrN–
2014.3	Thermal Dressing of Superabrasive Grinding Wheel by Nd:YAG Laser
2014.3	Study on Minimum Quantity Lubrication Turning with Actively Driven Rotary Tools –Evaluation of Supplying Method of Soluble Oil Mist and Optimum Rotational Speed of Rotary Tool–
2013.3	High-quality Machining of CFRP with DLC Coated End Mill –Development of Inclination Milling with High Helix End Mill–
2013.3	Study on Turning with Actively Driven Rotary Tools –Cutting Force Measurement and Cutting Temperature Simulation–
2013.3	Study on Cutting of Aluminum Alloy with DLC Coated Tools
2013.3	Study on Reduction of Grinding Fluid in Cylindrical Plunge Grinding
2013.3	Thermal Dressing of Metal Bonded Diamond Wheel by Nd:YAG Laser
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Studies on Minimum Quantity Lubrication in Turning Process –Evaluation of lubricating and cooling effects of oil mist by means of Finite Element Method –
2016.3	Studies on Turning Difficult-to-Machine Materials with Super Hard Tools – Cutting characteristics of titanium alloy and sintered carbide –
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