

Division of Mechanical Science and Engineering	Research field	Material Engineering	Lab. ID MS09
Laboratory web site			
Research subjects			
<p>Research of the Monzen-Watanabe group covers wide range of materials science, in particular, metals and alloys. Main focus of research in the laboratory concerns relationship between the mechanical- and functional-properties of various advanced materials, and their microstructure. The evaluation of various characteristics of materials is conducted theretically and experimentally in this laboratory to fabricate new metallic materials with more excellent propteties. That of Sasaki group does non-destructive materials evaluation of industrial materials with quantum beam such as X-rays, synchrotron radiation and neutron beams.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>At the beginning of the master's program, students decide their practical subjects for master's thesis after consultation with staffs. All the students must take part in the two regular laboratory meetings. At the first meeting that is held once a week, each student makes a presentation on the topics related to his/her research subject, and all attendees including staffs discuss the presentation. Also, the students report the current progress of research subjects at the monthly meeting. Through the regular meetings, the students improve their skills of presentation, communication and discussion. All the students are encouraged to participate in the workshops/meetings of academic association and international conference. Financial supports are usually available and determined by the laboratory meeting.</p>			
Daily life in the laboratory, etc.			
<p>Personal office desks are available for every students. All relevant students of undergraduate, master and doctor share the laboratory rooms and experimental facilities. Everyday free discussion of research subjects are strongly encouraged. Good communication with others is only a method to increase social skills. Present global society calls for communication skills. Thus, learning social skills is one of the important objects of our laboratory.</p>			
Message or comments by the laboratory faculty staffs			
<p>What one likes, one will do well! Our experience shows that students that study and play with enthusiasm could spend laboratory lives filled and eventually get great results.</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	Effect of external stress on nucleation of bar-like $\alpha$ precipitates in a Ti-20wt%Mo alloy		
2017.3	Influence of mechanical heat treatment on conductivity and strength of a dilute Cu-0.2at% Zr alloy		
2017.3	Fatigue behavior of low carbon steels with different carbon states under variable stress loading		
2017.3	Strain-rate and temperature dependent deformation behavior of Al-Mg system alloy fabricated by Multi-Directional Forging		
2017.3	Microstructure and mechanical property of heavily cold-rolled SUS316LN austenitic stainless steel		
2016.3	Fundamental Study on X-ray Residual Stress Measurement Based on Generalized Cos $\alpha$ Method		
2016.3	Tensile properties of an age-hardening Cu-Ni-Si alloy processed by high-pressure torsion(HPT)		
2016.3	Coarsening of $\omega$ -precipitates in $\beta$ -Ti alloys under tensile stress		
2016.3	Strain rate and temperature dependent deformation behavior of commercial purity titanium with different grain-sizes		
2016.3	Influence of tensile stress on growth process of rod-shaped $\alpha$ precipitates in a Ti-20wt%Mo alloy		
2016.3	Fatigue behavior of low carbon steels under variable stress loading		
2016.3	Effects of Natural Aging on Age-Hardenable Cu Alloys Processed by High-Pressure Torsion		
2015.3	X-ray tri-axial stress analysis of railway rails by means of two-dimensional X-ray detector		
2015.3	X-ray stress measurement of ferritic and austenitic materials with X-ray cos-alpha method		
2015.3	Strain-rate sensitivity of an AZ80Mg alloy fabricated by multi-directional forging at room temperature		
2015.3	Effects of external stress on discontinuous precipitation of a Mg-Al system alloy with strong [0001] texture		
2015.3	Microstructure and high-temperature mechanical properties of cast Al-Mg-Sc system alloys		
2015.3	Effect of applied external stress on nucleation and growth of $\omega$ precipitates in a Ti-20wt%Mo alloy		
2015.3	Fabrication of Cu-Ni-Sn alloys bearing high strength, stress relaxation resistance and electrical conductivity		
2014.9	A fundamental syudy on bearing steel suffered with rolling contact fatigue with two-dimensional X-ray stress measurement with tow-dimensional detector		
2014.3	Strain-rate dependence of an AZ80Mg alloy bearing ultra-fine-grain structure fabricated by multi-directional forging under decreasing temperature condition		
2014.3	Discontinuous precipitation behavior of Mg-Al system alloys		

2014.3	Change in low-cycle fatigue behavior of a pure Al single crystal associated with temperature change
2014.3	Improvement of strength of Cu-Ni-P system alloys
2014.3	Influence of plastic deformation on growth of $\omega$ and $\alpha$ precipitates in a Ti-20wt%Mo alloy
2013.9	Application of X-ray stress measurement with two-dimensional X-ray detector to weldment
2013.3	A fundamental study on X-ray stress measurement with two-dimensional X-ray detector
2013.3	Age-hardening behavior of age-hardenable Cu alloys processed by high-pressure torsion
2013.3	Strain-rate dependent deformation of an AZ61Mg alloy processed by multi-directional forging
2013.3	Mechanical property of a Cu-21wt%Ni-5.5wt%Sn alloy
2013.3	Nucleation and growth of $\omega$ precipitates in a Ti-Mo alloy under tensile stress
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2016.3	Studies on mechanism of rolling contact fatigue under low lambda condition and life data analysis in rolling contact fatigue testing
2015.9	Exposure-readout integrate-type X-ray stress measurement using an image plate
2014.3	Evaluation of chilled structure by means of eddy current method
2013.3	Study on traction fluid for optimum condition of a wheel/rail lubricant and metal surface analysis
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