X-ACADEMY ICMMPM2020 WEBINAR

2020 3rd International Conference on Metal Material Processes and Manufacturing (ICMMPM2020)

Singapore (Webinar)

June 23, 2020

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Simple Version of the Schedule

Programme Detail June 23, 2020 (Tuesday)	
ICMMPM2020 Webinar (All Day Will Show E-poster On The Website)	
Singapore & China Time (Standard Time)	June 23, 2020 13:00
Japan & South Korea Time	June 23, 2020 14:00
Thailand Time	June 23, 2020 12:00
Russia Time	June 23, 2020 08:00

13:00-14:00 (Standard Time)	Keynote Session	
	13:00-13:30	**Keynote speech 1: Prof. Takahiro OHASHi** ***Topic:*** *Techniques for Structural Interlock between Dissimilar Materials by Friction Stir Forming*
	13:30-14:00	**Keynote speech 2: Prof. Dong-Won Jung** ***Topic:*** *Longitudinal bow estimation of U-shape Profile in cold roll formed commercial aluminum alloys*
14:00-14:10	Break time	
14:10-17:00	Session Speech	

Committees

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Prof. Dong-Won Jung, Jeju National University, South Korea

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Prof.Ji Shijun,Jilin University,China

Dr.Brahim Safi,University M'hamed Bougara of Boumerdes,Algeria

Prof.Arnulfo Luévanos-Rojas,Autonomous University of Coahuila,México

Dr.Yanjun Li,Florida Atlantic University,USA

Assoc.Prof.Dr.Soumya Mukherjee,Amity University,India

Dr.Beddiaf ZAIDI,University of Batna 1,Algeria

Prof.Vineet Jain,Amity University Haryana,Gurgaon

Associate Prof. Jin-Young Kim, Ulsan National Institute of Science and Technology, South Korea

Assistant Prof. Ankit Gupta, School of Engineering, Shiv Nadar University, Gr. Noida, India

Ph.D. Grzegorz Woroniak, Bialystok University of Technology, Poland

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Associate professor. Kazem reza kashy zadeh, Peoples' Friendship University of Russia, Russia

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Prof. Pavlo Maruschak, Head of Industrial Automation Department, Ternopil Ivan Pul'uj National Technical University, Ukraine

Prof. M. De Cesare, Italian Aerospace Research Centre, Italy

PhD. MA QUANJIN, Universiti Malaysia Pahang, Malaysia

Dr. sarfraj ahmed, NTPC-SAIL Corporation Ltd, India

Note:

1. All the participants are strongly advised to attend 10 minutes before the Webinar is start.
2. Zoom ID and instructions will also be sent 5 days before the conference.
3. The standard time for all programs is Singapore & China Time
4. If you want to deliver oral presentation but your paper is not in the session list, please contact us by Email: cfp@icmmpm.org (for ICMMPM2020)

Instruction about Oral Presentation

Materials Provided by the Presenters:

PowerPoint or PDF files

Duration of each Presentation:

Regular Oral Session: about 10-12 Minutes of Presentation and 5 Minutes of Q&A

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Keynote Speech (13:00-13:30)

Keynote Speech-1 13:00-13:30

Prof. Takahiro OHASHi
Kokushikan University, Japan

Title: "Techniques for Structural Interlock between Dissimilar Materials by Friction Stir Forming"

Prof. Takahiro Ohashi is the head of Mechanical Engineering Department, Graduate School of Science and Engineering, Kokushikan University.Formerly, He directed 3 research teams, including the Metal Forming Research Team, of National Institute of Advanced Industrial Science and Technology (AIST), Trading and Industry (METI) of Japan. He is one of representative delegates of Japan Society for Technology of Plasticity, and the board of trustees of Aluminum Forging Association in Japan. He has been engaged in the research and development of new metalforming processes utilizing die and mold.

Keynote Speech 2- 13:30-14:00

Prof. Dong-Won Jung
Jeju National University, South Korea

Title: "Longitudinal bow estimation of U-shape Profile in cold roll formed commercial aluminum alloys"

Prof. Dong-Won Jung works in School of Mechancial Engineering. He has rich experience in metal forming field. He is a professional reviewer of plenty Journals, such as KSME (Korean Society of Mechanical Engineers), KSPE (Korean Society for Precision Engineering), KSTP(Korean Society for Technology of Plasticity), KSAE(Korean Society for Automobile Engineers), Journal of Ocean Engineering and Technology, Journal of Korea Society for Power System Engineering, the Korean Journal of CAE, etc. He also has lot of publications and academic conference experiences.

14:00-14:10	Break Time

Session Speech (14:10-17:00)

1-Paper ID: PM318

Title: Formability Analysis on Ultra-High Strength Steel for Automotive Parts Using Finite Element Simulation

Authors: Aeksuwat Nakwattanaset, Surasak Suranuntchai

Department: King Mongkut's University of Technology Thonburi, Thailand

Abstract: Finite Element Method (FEM) is one of the most popular methods in the automotive industry to reduce problems, time and wastes in production processes. This method can predict the metal forming processes with computer modeling before making forming tools. In sheet metal forming analysis, Forming Limit Diagram (FLD) is one of the most important indicators in FEM, it can tell each forming regions such as cracks, wrinkles and safe zone. However, the FLD that has automatically created in finite element program isn't enough accurate. Then, the main objective of this research work was to generate FLD of the ultra-high strength steel: NSC980D that usually has been used in auto body frame by using Nakajima's tests. Then, the generated FLD was used to simulate the forming of the automotive parts for solving the cracks caused during the forming along with the Hill's 1948 material model. The Keeler's FLD, which is generated automatically by the commercial software applied, was plotted for comparison during simulation, as well. Drawing process of the panel front was investigated by applying FEM simulating tool: PAMSTAMP to analyze the formability and to determine the optimal forming parameters under suitable service conditions. The main parameters of interest were the part and blank configuration. A number of corrections were successively made

to successfully form the part. From the analysis of 2 case studies, it was found that tearing was occurred in the first case results. When the forming force was reduced from 15 tons to 9 tons in the second case, the complete forming without tearing and similar like actual forming at the same conditions had been taken place in the second results.

2-Paper ID: 11

Title: Determination of Strong Factor in Bird Strike Analysis using Taguchi`s method for Aircraft Manufacturing

Authors: Vijayakumar Mathaiyan, Sivaranjani Sivalingam, R. Vijayanandh, Dong Won Jung

Department: Jeju National University, South Korea

Abstract: Bird strike analysis is of great importance because of the loss it can create. Since there are many factors which influences the level of damage, the computational cost for determining the strong factor is high. Usage of the optimization techniques will give the significant reduction of computational cost. Taguchi method is used to find out the strong factors for a detailed study of bird strike effects on the Aircrafts. This can help the engineers to manufacture the structure free from or have relatively less damage because of the bird strike.

3-Paper ID: 15

Title: Study on the magnetic abrasive finishing process using an alternating magnetic field - Discussion on the application of full-wave rectifier current -

Authors: Huijun Xie, Yanhua Zou

Department: Utsunomiya University, Japan

Abstract: To further improve the finishing efficiency, it has been proposed to apply full-wave rectified current to the coil. In this paper, the effect of full-wave rectified current on the magnetic field and finishing force is studied. The effects of full-wave rectified current and alternating current on finishing characteristics were compared through experiments. The experimental results show that, with different magnetic particle sizes, the finishing efficiency shows different results. In the case of full-wave rectified current, when the average diameter of the magnetic particles is 30 μm, 75 μm and 149 μm, the finishing efficiency is higher than the alternating current, and when the average diameter of the magnetic particles is 330 μm, the finishing efficiency is lower than the alternating current.

4-Paper ID: 16

Title: Investigation on the improvement of surface quality by the magnetic plate-assisted magnetic abrasive finishing process

Authors: Yanhua Zou, Huijun Xie

Department: Utsunomiya University, Japan

Abstract: The traditional magnetic abrasive finishing (MAF) process, the magnetic flux density at the bottom of the magnetic pole is unevenly distributed, resulting in poor uniformity of the finished surface. Therefore, it is proposed to improve the surface quality by attaching a magnetic plate at the bottom of the workpiece to improve the magnetic field distribution. It is confirmed by simulation that the magnetic field distribution at the bottom of the magnetic pole is effectively improved after the magnetic plate is attached. It is proved through experiments that the magnetic plate-assisted MAF process can obtain a smoother surface. The experimental results show that the surface roughness of the glass lens improves from 246 nm Ra to 3 nm Ra through the magnetic plate-assisted MAF process within 45min.

5-Paper ID: PM327

Title: Using Field-Effect Gas Sensors for Monitoring H2 in Transformer Oil

Authors: Arthur Litvinova, Nikolay Samotaev, Maya Etrekova, Anastasia Ivanova, Dmitriy Filipchuck, Yuri Klishin

Department: National Research Nuclear University MEPhI, Russia

Abstract: Hydrogen can be released during the thermal decomposition of organic materials, therefore, monitoring its level in the working industrial high-voltage transformer oil allows you to identify the development of degenerative processes in advance, because these processes can lead to an accident in the future. In experiments has shown that highly sensitive and small-sized field effect gas sensor based on the metal-insulator-semiconductor structure can be used for measuring of Hydrogen in oil with direct contact of its structure with transformer oil. Given the harsh environmental conditions of hydrogen measurement the field effect capacity type gas sensor were fabricated by using laser micromilling technique for fabrication compact ceramic surface mounting device package and microheater for sustentation working temperature of metal-insulator-semiconductor structure.

6-Paper ID: 17

Title: Discussion on Roundness of Non-Ferromagnetic Tube by Interior Magnetic Abrasive Finishing Using a Magnetic Machining Jig

Authors: Jiangnan LIU , Yanhua ZOU

Department: Utsunomiya University, Japan

Abstract: In this study, mainly researching the improvement of roundness of thick SUS304 stainless steel tube by interior magnetic abrasive finishing using a magnetic machining jig. The influence of reciprocating velocity of magnetic pole unit on the improvement of roundness of interior surface was studied by establishing the dynamic equation of magnetic machining jig. Experimental results showed that low reciprocating velocity of magnetic pole unit is conducive to the improvement of interior roundness of the thick SUS304 stainless steel tube. The reason is that the low reciprocating velocity of magnetic pole unit reduces the pitch of the helical motion and can produce greater finishing force of the magnetic machining jig.

7-Paper ID: PM319

Title: Study on Plan Magnetic Abrasive Finishing- Discussion on processing methods for improving flatness-

Authors: Yulong Zhang, Yanhua Zou , Huijun Xie

Department: Utsunomiya University, Japan

Abstract: Magnetic abrasive finishing (MAF) is a precision surface polishing method. At present, most studies on planar MAF are focused on improving the surface roughness accuracy and the uniformity of roughness. In practical applications, the initial surface of the work piece is not only a rough surface, but also a flat surface without a uniform height. While the traditional processing method improves the surface roughness accuracy, the original surface is basically unchanged. In this paper, a processing method is studied. According to the uneven distribution of magnetic brushes, the reasonable distribution of processing speed and processing time can finally achieve the purpose of improving the surface flatness. At the same time, this paper analyzes the non-uniform characteristics of the magnetic pole and the magnetic brush itself, and verifies the effectiveness of the processing method through experiments.

8-Paper ID: PM322

Title: The effect of the sheet metal postures on the forming thickness based on the finite element analysis

Authors: Hu Zhu , Yang Wang , Dong W. Jung

Department: Shenyang Aerospace University, China, Jeju National University, South Korea

Abstract: In order to analysis the effect of the sheet metal postures on the forming thickness, the horizontal sheet posture, the multidirectional sheet postures with the inclined angle of , and the multidirectional sheet postures obtained after optimization were respectively used for comparative analysis through the numerical simulation against the same model. The result shows that the optimized multidirectional sheet metal postures can reduce the overall thickness difference of the formed part and realize the thickness uniformity.

E-poster Session

1-Paper ID: PM320

Title: Segment Matrix Design and Drilling Test of Diamond bit for Sapphire

Authors: Liang Xu, Yibo Liu, Qiang Xu

Department: Beijing Gang Yan Diamond Products Company, China

Abstract: This paper introduces the characteristics of sapphire and sapphire digging bits in LED field. The segment matrix design principle of bit and the rule of diamond selection are put forward. In addition, this paper analyzes the function of different metal powders and diamond parameters in the segment matrix. The results show that the finer grained (for example 80/100 mesh) diamond should be used with the concentrations of 30-60%. In the segment matrix, tin element can make the matrix more brittle and then the bit is sharper. Copper, silver and nickel element can enhance the matrix toughness and strength, cobalt and tungsten element can increase abrasive resistance. All of the above designs enable the sapphire bit to high sharpness and long life. A 4-inch sapphire bit was prepared for drilling sapphire crystal, the efficiency is increased by 8% than the Taiwan drill bit with the same specifications, the life is equal to Taiwan's drill bit, and the defect rate of sapphire bar is less than 0.5%, which satisfies the requirement of customers.

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Thank you for all of your contributions!