Tool 2012 – Developing the World of Tooling

11. – 14. September 2012

Leoben, Austria

Tuesday, September 11, 2012

18:00 - 21:00 **Welcome Reception**

Wednesday, September 12, 2012

Two parallel sessions will be held in the lecture rooms Archduke Johann Auditorium and Kuppelwieser Lecture Hall.

08:30 - 09:00 **Opening Remarks (Room AM)**

09:00 - 09:40 **Plenary Lecture (Room AM)**
Torsten Hallfeldt
Ford Research & Advanced Engineering Europe, Germany

09:40 - 10:10	**Invited Lecture**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
N.N.	**N.N.**
Session Chair: *Werner Theisen* *Ruhr-Universitaet Bochum, Bochum, Germany*	Session Chair: *Christoph Broeckmann* *RWTH Aachen University, Aachen, Germany*

Wednesday, September 12, 2012, continued

10:10 – 10:30	*Coffee Break*

10:30 - 12:30	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Materials development I:	**Properties I**
Session Chair: *Werner Theisen* *Ruhr-Universitaet Bochum, Bochum, Germany*	Session Chair: *Christoph Broeckmann* *RWTH Aachen University, Aachen, Germany*
10:30 Characteristics of the new developed hot work tool steel for aluminium extrusion *José Britti Bacalhau, R&D Center, Villares Metals S.A., Brasil*	10:30 Fatigue properties of tool steels – particular focus on very high cycle fatigue *Jens Bergstroem, Department of Mechanical and Materials Engineering, Karlstad University, Sweden*
10:50 A new high-performance die steel for the die forging industry *Dirk Bockholt, Production Technology and Development, Buderus Edelstahl GmbH, Germany*	10:50 Interaction between aluminizing, oxidation and thermal fatigue in aluminium die casting tool *Mehdi Salem, Université de Toulouse, INSA, UPS, EMAC, ISAE, ICA (Institut Clément Ader), CROMeP, SUMO, Campus Jarlard, France*
11:10 Special hot-work tool steels for die cast structural components of passenger cars *Ingolf Schruff, Kind & Co., Edelstahlwerk KG, Germany*	11:10 Effect of Si on thermal fatigue of SDH3 hot work die steel *Qingchun Zhou, School of Materials Science and Engineering, Shanghai University, China*
11:30 New high performance hot work tool steel with improved physical properties *Siegfried Gelder, Boehler Edelstahl GmbH & Co KG, Austria*	11:30 Thermal fatigue of Nb-bearing alloys for hot rolling mill rolls *Mário Boccalini Jr., Institute for Technological Research, Brazil*
11:50 Production of a novel hot work tool steel by mechanical milling and spark plasma sintering *Massimo Pellizzari, Department of Materials Engineering and Industrial Technologies, University of Trento, Italy*	11:50 Influence of tool temperature and loading conditions on the static and cyclic material behaviour of tool steels used for cold work applications *Gerhard Jesner, Boehler Edelstahl GmbH & Co KG, Austria*

Wednesday, September 12, 2012, continued

10:30 - 12:30		**Concurrent Sessions, continued**	
12:10	Improvement of thermal conductivity of hot-work tool steels by alloy design and heat treatment *Emeline Meurisse, Deutsche Edelstahlwerke GmbH, Germany*	12:10	Effect of cooling rate on microstructure and properties of a non-quenched plastic mould steel *Yi Luo, Research and Development Center of Wuhan Iron and Steel (Group) Company, China*

12:30 – 14:00	*Lunch Break*

14:00 – 14:30	**Invited Lecture**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
14:00 **N.N.**	14:00 **N.N.**
Session Chair: *Hans-Olof Andrén* *Chalmers University of Technology, Gothenburg, Sweden*	Session Chair: *Alberto Molinari* *Universitá degli Studi di Trento, Trento, Italy*

14:30 - 15:50	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Materials development II	**Properties II**
Session Chair: *Hans-Olof Andrén* *Chalmers University of Technology, Gothenburg, Sweden*	Session Chair: *Alberto Molinari* *Universitá degli Studi di Trento, Trento, Italy*
14:30 Pre-hardened tool steel with improved ductility *Ulrika Leimalm, SSAB EMEA, Sweden*	14:30 Tool wear for shear cutting of ultra high strength steels according to different tool materials and tool geometries *Katrin Nothhaft, Institute of Metal Forming and Casting, Technical University Munich, Germany*

Wednesday, September 12, 2012, continued

14:30 - 15:50		**Concurrent Sessions, continued**	
14:50	New tool steel with very high levels of toughness for cutting of press hardened steel and other demanding applications *Anna Ingebrand, Rovalma S.A., Spain*	14:50	Influence of tool steel microstructure on the prevailing wear mechanisms in metal powder compaction *Mikael Olsson, Dalarna University, Sweden*
15:10	Developing cementite-free martensitic steels: A relevant route to obtain high strength-high toughness steels for tools applications *Denis Delagnes, Université de Toulouse, Mines Albi, ICA (Institut Clément Ader), Campus Jarlard, France*	15:10	The characterization of the wear behaviour of different die materials and coatings for forging dies using a rotational tribometer *Bruno Buchmayr, Chair of Metal Forming, University of Leoben, Austria*
15:30	Development of corrosion and wear resistant metal matrix composites for use in polymer processing equipment *Horst Hill, Deutsche Edelstahlwerke GmbH - Abteilung Sonderwerkstoffe, Germany*	15:30	Investigation of the wear behaviour of different tool steels and heat treatment conditions for the cutting of a HCT980C advanced high strength steel *Reinhold Schneider, University of Appl. Sciences Upper Austria – Campus Wels, Austria*

15:50 – 16:20	*Coffee Break*

16:20 - 17:40	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Materials development III	**Properties III**
Session Chair: *Hans-Olof Andrén* *Chalmers University of Technology, Gothenburg, Sweden*	Session Chair: *Alberto Molinari* *Universitá degli Studi di Trento, Trento, Italy*

Wednesday, September 12, 2012, continued

16:20 - 17:40		**Concurrent Sessions, continued**	
16:20	The effect of nickel on precipitation of carbides in a medium-alloyed tool steel *Maria Kvarnstroem, Research and Development, Uddeholms AB, Sweden*	16:20	Investigations on die roughness of hot forming tools *Andreas Klassen, Institute of Forming Technology and Machines, Leibniz Universitaet Hannover, Germany*
16:40	Effect of nickel on hardenablility and tetragonality of martensite lattice in medium-alloyed tool steels *Anna Medvedeva, Research and Development, Uddeholms AB, Sweden*	16:40	Tribology of thread forming: Study of load and wear of thread forming tools according to process conditions *Christian Peuker, AC²T research GmbH, Austria*
17:00	The influence of aluminium on the precipitation and coarsening behaviour of secondary hardening carbides in high speed steels *Gert Kellezi, Boehler Edelstahl GmbH & Co KG, Austria*	17:00	Identification of the velocity accommodation mechanisms in a high temperature contact *Pauline Lepesant, Université de Toulouse, Mines Albi, ICA (Institut Clément Ader), Campus Jarlard, France*
17:20	Coarsening investigations of precipitates in PM tool steel grades – an effect of nitrogen *Greta Lindwall, Swerea KIMAB, Sweden*	17:20	Analysis of crack propagation and crack tip opening displacements by measurements 2-D Digital Image Correlation in a hot working tool steel *Manel Baccar, Toulouse University, INSA; UPS, Mines Albi, ISAE, ICA (Institut Clément Ader), Campus Jarlard, France*

17:45 - approx. 18:30

Exploratory Meeting of IFHTSE (Int. Fed. for Heat Treatm. and Surf. Eng.) on the formation of a working group for "Heat Treatment and Surface Engineering of Tooling Materials"

19:00 - 22:00	Poster Session

Evaluation of selected properties of a tool made of high speed steel Bohler S600 after the application of CVD process

Pavol Beraxa, ŽP Research and Development Centre, Slovakia

Comparison of LCF behaviour and microstructure evolution of a Hadfield and a corrosion resistant austenitic CrMnCN steel

Michael Schymura, Material Science and Engineering, University of Duisburg-Essen, Germany

Costs and environmental benefits of using modified molybdenum addition to electric arc furnace at Uddeholms ab

Mselly Nzotta, Research and Development, Uddeholms AB, Sweden

Carbides in the cryogenically treated high speed tool steels

Chandrashekhar Laxmanrao Gogte, Maharashtra Institute of Technology, India

Development of quenching process for large-sized 1.2738 plastic die block with 1200mm thickness

Zhangzheng, School of Materials Science and Engineering, Shanghai University, China

Evolution of carbides in cold-work tool steels during heat treatment

Jun-Yun Kang, Korea Institute of Materials Science, Korea

Stress corrosion cracking resistance in hot forming tools

Anna Gironès Molera, Fundació CTM Centre Tecnològic, Spain

Effect of cryogenics on surface integrity of tool steels

Sachin Vijay Lomte, Maharashtra Institute of Technology, India

Effect of cooling rate on the mechanical properties of Al-Si alloys using high thermal conductivity tool steel

Silvia Molas, Fundació CTM Centre Tecnològic, Spain

Investigation of high thermal conductivity of hot stamping steel

Yin Xuewei, Department of Material and Science Engineering, Shanghai University, China

Plasma nitriding of stainless steel surfaces

Zdeněk Joska, Department of Mechanical Engineering, University of Defence Brno, Czech Republic

Study on aging dynamics of 10Ni3MnCuAl precipitation hardened plastic mould steel

Yi Luo, Research and Development Center of Wuhan Iron and Steel (Group) Company, China

Development of nickel free diamond cutting tool using electrolytic iron powder

Narendra B. Dhokey, Department of Metallurgical Engineering, College of Engineering Pune, India

Microstructure and properties of non-quenched prehardened steel for plastic mould with 700 mm thickness

Yi Luo, Research and Development Center of Wuhan Iron and Steel (Group) Company, China

Fabrication of hat mold by aluminium plaster mold casting process

Young-Koo Park, Chonbuk National University, South Korea

Thursday, September 13, 2012

08:30 - 09:10

Plenary Lecture (Room AM)
Christian Juricek
Magna Cosma International, Austria

09:10 -09:40	**Invited Lecture**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
09:10 **N.N.**	09:10 **N.N.**
Session Chair: *Jens Bergström* *Karlstad University, Karlstad, Sweden*	Session Chair: *Farhad Rezai-Aria* *Université de Toulouse, Albi, France*

09:40 - 11:00	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Heat treatment I	**Properties IV**
Session Chair: *Jens Bergström* *Karlstad University, Karlstad, Sweden*	Session Chairs *Farhad Rezai-Aria* *Université de Toulouse; Albi, France*
09:40 Detailed investigation on the morphology of phases during Time-Temperature-Transformation on a hot-work tool steel *Sebastian Ejnermark, Department of Material Science, Uddeholms AB, Sweden*	09:40 Influence of size and distribution of hard phases in tool steels on the early stage of galling *Patrik Karlsson, Karlstad University, Sweden*
10:00 The effects of cryogenic and stress relief treatments in the temper carbides precipitation of an AISI D2 tool steel *Paula Fernanda da Silva Farina, Faculdade de Tecnologia Arthur de Azevedo, Villares Metals S.A., Escola Politécnica da Universidade de São Paulo, Brazi*	10:00 Galling resistance for un-coated and coated tool steels sliding against high-strength carbon steel sheet *Anders Gåård, Department of Mechanical and Materials Engineering, Karlstad University, Sweden*

Thursday, September 13, 2012, continued

09:40 - 11:00		**Concurrent Sessions, continued**	
10:20	Influence of lowered austenitization temperature during hardening on the tempering resistance of a modified H13 tool steel (Uddeholm Dievar) *Maria Teresa Coll Ferrari, Department of Material Science, Uddeholms AB, Sweden*	10:20	Experimental characterisation of the behaviour of short fatigue cracks in a PM high speed tool steels *Peter J. Gruber, Material Center Leoben Forschung GmbH, Austria*
10:40	Influence of tempering temperature on the corrosion behaviour of plastic mould steel X38CrMo16 *Silvia Zinner, Boehler Edelstahl GmbH & Co KG, Austria*	10:40	The influence of cooling rate during quenching and preheating temperature on the toughness of a hot-work tool steel *Henrik Jesperson, Department of Material Science, Uddeholms AB, Sweden*

11:00 – 11:20	Coffee Break

11:20 - 12:40		**Concurrent Sessions**	
Archduke Johann Auditorium (Erzherzog Johann Auditorium)		Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)	
Heat treatment II		**Materials characterization I**	
Session Chair:	*Jens Bergström* *Karlstad University, Karlstad, Sweden*	Session Chair:	*Harald Leitner* *University of Leoben, Leoben, Austria*
11:20	Vacuum heat treatment of high speed steel cutting tools *Andre Rousseau, Applied Science (Physics), RMIT University, Australia*	11:20	Characterizing of the complex microstructure in the plastic mould tool steel Nimax by LOM, SEM and EBSD evaluation *Christer Soederstroem, Materials Science, Uddeholms AB, Sweden*
11:40	Abnormal grain growth on high-speed steels *Ingrid Schemmel, Boehler Edelstahl GmbH & Co. KG, Austria*	11:40	Multi-functional K_{ic}-test specimen for assessment of different tool and high-speed steel properties *Vojteh Leskovšek, Institute of Metals and Technology, Slovenia*

Thursday, September 13, 2012, continued

11:20 - 12:40		**Concurrent Sessions, continued**	
12:00	Sub-zero treatment of P/M Vanadis 6 Ledeburitic tool steel *Peter Jurči, Faculty of Material Sciences and Technology in Trnava, Slovakia*	12:00	Characterization of Nb-alloyed high speed steels in the as cast condition *Paula Fernanda da Silva Farina, Faculdade de Technologia Arthur de Azevedo, Brazil*
12:20	Investigation on heat treatment process of Cr8-type tool steel *Chenhui Li, School of Materials Science and Engineering, Shanghai University, Chinal*	12:20	Comparison of different standards for determining cleanliness of tool steels: A status quo of different automated image analysis-systems for the introduction of EN 10247 *Wolfgang Schuetzenhoefer, Boehler Edelstahl GmbH & Co KG, Austria*

12:40 – 14:00	Lunch Break

14:00 -14:30	**Invited Lecture**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
14:00 **N.N.**	14:00 **N.N.**
Session Chair: *Reinhold Schneider* *University of Appl. Sciences Upper Austria – Campus Wels, Wels, Austria*	Session Chair: *Reinhold Ebner* *Material Center Leoben Forschung GmbH, Leoben, Austria*

14:30 - 15:30	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Processing I	**Surface engineering I**
Session Chair: *Reinhold Schneider* *University of Appl. Sciences Upper Austria – Campus Wels, Wels, Austria*	Session Chair: *Reinhold Ebner* *Material Center Leoben Forschung GmbH, Leoben, Austria*

Thursday, September 13, 2012, continued

14:30 - 15:30		**Concurrent Sessions, continued**	
14:30	New opportunities, using the next generation HIP equipment *Stefan Sehlstedt, Avure Technologies AB, Sweden*	14:30	Microstructure and properties of self-mating coatings on cold work tool steel generated by friction surfacing *Stefanie Hanke, Materials Science and Engineering, University of Duisburg-Essen, Germany*
14:50	Performance of PM-steel in punching of stainless steel sheets *Muhammad Waqas Tofique, Department of Mechanical and Materials Engineering, Karlstad University, Sweden*	14:50	Thermal cracking and soldering on PVD coated tool steel with edges and different surface finishing *Daniele Ugues, Department of Applied Science and Technologies, Politecnico di Torino, Italy*
15:10	Influence of hard milling on the surface integrity of hot working steel *Martin Stolorz, Fraunhofer Institute for Production Technology IPT, Germany*	15:10	Use of modern tool steel and surface engineering in sheet cold forming *Per Hansson, SSAB EMEA, Sweden*

15:30 – 16:00	Coffee Break

16:00 - 17:00		**Concurrent Sessions**	
Archduke Johann Auditorium (Erzherzog Johann Auditorium)		Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)	
Processing II		**Surface Engineering II**	
Session Chair:	*Reinhold Schneider* *University of Appl. Sciences Upper Austria – Campus Wels, Wels, Austria*	Session Chair:	*Reinhold Ebner* *Material Center Leoben Forschung GmbH, Leoben, Austria*
16:00	A step-by-step analysis of manual polishing sequences *Sabina Rebeggiani, The Functional Surface Research Group, Halmstad University, Sweden*	16:00	A comparison of plasma and gaseous nitriding for tools in hot massive forming *Stefanie Hoja,*

Thursday, September 13, 2012, continued

16:00 - 17:00		**Concurrent Sessions, continued**	
16:20	Aspects of machining advanced mould and die steels *Johann Mayerhofer, Boehler Edelstahl GmbH & Co KG, Austria*	16:20	Soldering and cracking of thin PVD coatings in molten aluminum alloy *Massimo Lorusso, Department of Applied Science and Technologies, Politecnico di Torino, Italy*
16:40	Study on machinability of pre-hardened plastic mould steel *Yiping Yang, School of Materials Science and Engineering, Shanghai University, China*		

17:00 **Departure to Conference Dinner**

13:30 – 17:00 **Workshop for Toolmakers**

Friday, September 14, 2012

08:30 - 09:10

Plenary Lecture (Room AM)
Reinhold Ebner
Material Center Leoben Forschung GmbH, Leoben, Austria

09:10 - 09:40		**Invited Lecture**	
Archduke Johann Auditorium (Erzherzog Johann Auditorium)		Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)	
14:00	**N.N.**	14:00	**N.N.**
Session Chair:	*Bruno Hribernik* *The Austrian Society for Metallurgy and Materials, Leoben, Austria*	Session Chair:	*Harald Leitner* *Montanuniversitaet Leoben, Leoben, Austria*

Friday, September 14, 2012, continued

09:40 – 11:00	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Simulation	**Tool design**
Session Chair: *Bruno Hribernik* *The Austrian Society for Metallurgy and Materials, Leoben, Austria*	Session Chair: *Harald Leitner* *Montanuniversitaet Leoben, Leoben, Austria*
09:40 Coupling of experimental and computational methods to assist the development of high-nitrogen tool steels *Karin Frisk, Swerea KIMAB, Sweden*	09:40 Wear protection of tools by local geometry and material optimization *Fritz Klocke, Fraunhofer Institute for Production Technology IPT, Germany*
10:00 Tempering of tool steels – a multiscale simulation *Atilim Eser, Institute for Materials Applications in Mechanical Engineering (IWM), RWTH Aachen, Germany*	10:00 Tooling solutions for sheet metal forming and punching of lean duplex stainless steel *Boel Wadman, Swerea IVF AB, Sweden*
10:20 Development of a simulation aided design strategy for casting die frames *Ronald Schoengrundner, Materials Center Leoben Forschung GmbH, Austria*	10:20 Optimisation of a cold roll steel grade for tandem work rolls *Joachim Gnauk, Steinhoff GmbH & Cie. OHG, Germany*
10:40 Prediction of dominant failure modes of tools for machining of bevel gears *Julian Staudt, Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany*	10:40 Iron based tool materials for micro cold forming via rapid solidification *Alwin Schulz, Stiftung Institut fuer Werkstofftechnik, Germany*

11:00 – 11:30	Coffee Break

Friday, September 14, 2012, continued

11:30 - 12:10	**Concurrent Sessions**
Archduke Johann Auditorium (Erzherzog Johann Auditorium)	Kuppelwieser Lecture Hall (Kuppelwieser Hoersaal)
Simulation	**Materials Characterization II**
Session Chair: *Bruno Hribernik* *The Austrian Society for Metallurgy and Materials, Leoben, Austria*	Session Chair: *Harald Leitner* *Montanuniversitaet Leoben, Leoben, Austria*
11:30 Time-efficient and precise tool load determination for a lateral extrusion process by coupled FEM/BEM simulation *Fabian Schongen, Laboratory for Machine Tools and Production Engineering (WZL), RWTH Aachen, Germany*	11:30 On the relationship of heat treatment, microstructure, mechanical properties, and thermal conductivity of tool steels *Jens Wilzer, Lehrstuhl Werkstofftechnik, Ruhr-Universitaet Bochum, Germany*
11:50 Prediction of the void fraction evolution during hot rolling of plastic mould steel *Jens-Sebastian Klung, Deutsche Edelstahlwerke GmbH, Germany*	11:50 A comparative experimental and analytical study on the use of HTCS® hot work tool steel for high pressure die Casting of aluminum alloys *Anwar Hamasaiid, Rovalma S.A., Spain*
	12:10 Failure Investigation of Tools Used in LSAW Pipe Expansion Process *J Raghu Shant, Welspun Corp. Ltd, R&D, Anjar, Gujarat, INDIA*

12:30 **Closing Remarks (Room AM))**

09:00 – 12:30 **Workshop for Toolmakers**