Production and Further Processing of Flat Products

Programme
March 16\textsuperscript{th}–18\textsuperscript{th}, 2016
in Freiberg
Institute of Metal Forming
Over 60% of rolled products are manufactured from cold and hot rolled sheets. The further development of forming processes in combination with joint technologies enables the production of complex components. During the international conference MEFORM 2016, the production and further processing of sheet products will be demonstrated. The knowledge of research and development about new technologies and materials, as well as the modelling of microstructure formation during manufacturing from solidification to the final products will be shown. Another area of focus will be on the operational challenges of sheet production.

The conference will connect the sheet metal research and development with the manufacturing companies. It will enable the exchange of experiences between specialists and young engineers, technicians and industrial scientists, research and universities.

The articles of the meeting will be published in Material Science Forum (open access, listed in Scopus), to make them available to a broad scientific audience. For this purpose, a scientific committee of experts will review the papers for scientific excellence, relevance and originality.

We would be pleased to arouse your interest and to welcome you to the conference.

With best regards,

Prof. Dr.-Ing. Prof. E.h. mult. Rudolf Kawalla
Conference Chairman
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<td>8.30–9.45 am</td>
<td>Materials characterization</td>
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<td>Reheating furnace — oxidation and descaling</td>
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<td>10.10 am–12.15 pm</td>
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<td>New materials and refinement of semi-finished products and further processes</td>
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<td>6.30 pm: Visit of the Historicum of TU Bergakademie Freiberg (Location: Senatsaal TU Bergakademie Freiberg, Akademiestraße 6)</td>
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<td>10.35–11.50 am</td>
<td>Cold rolling and annealing of flat products</td>
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<td>Closing remarks</td>
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<td>12.00 pm: Light lunch / Take away</td>
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PROGRAMME

Wednesday, March 16th, 2016

11.15 am  Registration

12.15 pm  Opening and Research activities of the IMF in the field of flat products
R. Kawalla, M. Ullmann, F. Hoffmann, G. Korpala
Institute of Metal Forming
TU Bergakademie Freiberg, Germany

12.50 pm  Welcome speech
K.-D. Barbknecht
Rector of TU Bergakademie Freiberg

Rolling technology and thermo-mechanical treatment for hot strip production

1.00 pm  Development of modern steels for strain based design pipe lines and simulation results
C. Heering, K. Tokmakov, I. Schuster
SMS group GmbH, Hilchenbach, Germany

1.25 pm  Effect of parameters in the physical simulated rough rolling stage on microstructure evaluation and tensile properties of a bainitic pipeline steel
M. Soliman, H. Palkowski
Institute of Metallurgy, TU Clausthal, Germany

1.50 pm  On the correlation between microstructure homogeneity and formability in two multi-phase steels treated with different cooling strategies
M. Bechtold¹, M. Witte¹, S. Kluge²
¹Salzgitter Mannesmann Forschung GmbH, Salzgitter, Germany
²Salzgitter Hydroforming GmbH, Crimmitschau, Germany

2.15 pm  New method for producing a steel component with ultrahigh strength properties
G. Korpala¹, R. Kawalla¹, B. Hammer², F. Hisker², T. Heller²
¹Institute of Metal Forming,
TU Bergakademie Freiberg, Germany
²ThyssenKrupp Steel Europe AG,
Duisburg, Germany
2.40 pm  Computer model STAN 2000 and its use in practice of steels hot rolling on mill 2000 of SEVERSTAL
A. A. Ogoltcov¹; D. F. Sokolov²; S. F. Sokolov²; A. A. Vasilyev²
¹ Severstal Russian Steel, Cherepovets, Russia;
² Peter the Great Saint-Petersburg Polytechnic University, St. Petersburg, Russia

3.05 pm  Coffee break

3.30 pm  Production of directly quenched high-strength hot-rolled strip steels - Influence of rolling and cooling conditions on mechanical properties and flatness
J. Schöttler¹, T. Maiwald²; G. Linke²
¹ Salzgitter Mannesmann Forschung GmbH,
² Salzgitter, Germany

3.55 pm  Material aspects of hot rolling and cooling conditions for strips from martensitic steel
M. Dziedzic, S. Turczyn, Z. Kuźmiński
AGH University of Science and Technology, Krakow, Poland

4.20 pm  Development of rolling technology for an iron-based shape-memory-alloy
C. Leinenbach¹, C. Czaderski¹, J. Michels¹ ², M. Graf³, R. Kawalla⁴
¹ Empa – Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland
² re-Fer AG, Wollerau, Switzerland
³ Professorship of Virtual Production Engineering, TU Chemnitz, Germany
⁴ Institute of Metal Forming, TU Bergakademie Freiberg, Germany

4.45 pm  Influence of hot rolling condition on the final microstructure of nonoriented electrical steel Fe-3.2 wt.% Si
A. Stöcker¹, A. Franke², H. Hermann¹, R. Kawalla¹
¹ Institute of Metal Forming, TU Bergakademie Freiberg, Germany
² Stahlzentrum Freiberg e.V., Freiberg, Germany
5.10 pm  **Investigation of texture structure and mechanical properties evolution during hot deformation of 1565 aluminum alloy**  
S.V. Rushchits¹, E. V. Aryshenskiy², R. Kawalla³, V.N. Serebryany⁴  
¹Federal State-Financed Educational Institution of Higher Professional Education „South Ural State University“, Chelyabinsk, Russia  
²Samara State Aerospace University, Samara, Russia  
³Institute of Metal Forming, TU Bergakademie Freiberg, Germany  
⁴Institute of Metallurgy and Materials Science of the Russian Academy of Sciences, Moscow, Russia

5.35 pm  **Developments in the field of nonoriented electrical steels over the last years**  
J. Schneider¹, A. Franke², A. Stöcker¹, R. Kawalla¹  
¹Institute of Metal Forming, TU Bergakademie Freiberg, Freiberg, Germany  
²Stahlzentrum e.V., Freiberg, Germany

7.00 pm  **Welcome reception**  
Institute of Metal Forming, Laboratory field  
TU Bergakademie Freiberg
Thursday, March 17th, 2016

SESSION A

Material characterization

8.30 am  Punch stretch test for TRIP690 and DP780 steel at elevated temperatures
          R. Krupa
          Kirchhoff Poland AG, Mielec, Poland

8.55 am   Cyclic tension test of AZ31 magnesium alloy at elevated temperature realized in a miniaturized uniaxial tensile test setup
          S. Suttner, M. Merklein
          Institute of Manufacturing Technology, FAU Erlangen-Nürnberg, Germany

9.20 am   Bonding strength, mechanical properties and formability of Al/Mg/Al roll-bonded sheets
          H. Saleh, R. Kawalla
          Institute of Metal Forming, TU Bergakademie Freiberg, Germany

9.45 am   Coffee break

Mathematical modeling and simulation for fast and detailed process design

10.10 am  Implementation of a dual mesh method for longitudinal rolling in QForm V8
          D. Gerasimov¹, N. Biba², S. Stebunov¹, M. Kadach³
          ¹QuantorForm Ltd., Moscow, Russia
          ²Micas Simulations Ltd., Oxford, UK
          ³National University of Science and Technology, Moscow, Russia

10.35 am  Material models and their capability for process and material properties design in different forming processes
          K. Schacht, U. Prahl, W. Bleck
          Steel Institute, RWTH Aachen, Aachen, Germany

11.00 am  Advanced modelling of microstructure evolution during hot deformation in finite element simulations
          T. Baron, K. Khlopkov, T. Pretorius
          ThyssenKrupp Steel Europe AG, Duisburg, Germany
11.25 am  A new FE-Model for the investigation of bond formation and failure in roll bonding processes  
M. Pietryga, J. Lohmar, G. Hirt  
Institute of Metal Forming, RWTH Aachen, Germany

11.50 am  Numerical investigation of a process control for the roller levelling process based on a force measurement  
M. Grüber, G. Hirt  
Institute of Metal Forming, RWTH Aachen, Germany

12.15 pm  Lunch break

1.30 pm  Hybrid modelling of materials properties for improved CAE-simulations  
U. Diekmann, A. Miron, A. Trasca  
Metatech GmbH, Kamen, Germany

1.55 pm  Physical and numerical simulation of cold rolling and heating during continuous annealing of DP steel strips  
Ł. Madej 1, N. Kwiaton 2, R. Kuziak 3, M. Sitko 1, M. Pietrzyk 1  
1 AGH University of Science and Technology, Krakau, Poland  
2 Salzgitter Mannesmann Forschung GmbH, Salzgitter, Germany  
3 Stanislaw Staszic Research Institute of Ferrous Metallurgy, Gliwice, Poland

2.20 pm  Comparison of numerical simulation and experiment for the microstructure development of a cold-rolled multiphase steel during annealing  
N. Kwiaton 1, R. Kuziak 2, M. Pietrzyk 3  
1 Salzgitter Mannesmann Forschung GmbH, Salzgitter, Germany  
2 Stanislaw Staszic Research Institute of Ferrous Metallurgy, Gliwice, Poland  
3 AGH University of Science and Technology, Krakow, Poland

2.45 pm  Simulation of microstructure and texture evolution in non-oriented electrical steels during final annealing  
S. Roggenbuck, L.A. Barrales-Mora, S. Korte-Kerzel  
Institute of Physical Metallurgy and Metal Physics, RWTH Aachen, Germany

3.10 pm  Coffee break
SESSION B

Reheating furnace – oxidation and descaling

8.30 am  Potential of energy savings in descaling  
G. Przybylla  
SGGT Hydraulik GmbH, Neunkirchen, Germany

8.55 am  Efficient technical solutions for descaling  
in the hot strip production  
J. Gaydoul¹, W. Hennig²  
¹ Hermetik AB, Täby, Sweden  
² Hermetik Pump Int. GmbH, Witten, Germany

9.20 am  Influencing the product quality of thin slabs  
and hot rolled steel strips by means of rotary descaling  
W. Hennig¹, J. Gaydoul²  
¹ Hermetik Pump Int. GmbH, Witten, Germany  
² Hermetik AB, Täby, Sweden

9.45 am  Coffee break

New materials and refinement of semi-finished  
products and further processes

10.10 am  New high-strength steel grades by combined  
strain and precipitation hardening  
U. Diekmann¹, P. Suchmann²  
¹ Metatech GmbH, Kamen, Germany  
² Comtes FHT a.s., Dobrany, Czech Republic

10.35 am  A new strategy for manufacturing tailored blanks  
by a flexible rolling process  
P. Hildenbrand, M. Lechner, M. Merklein  
Institute of Manufacturing Technology,  
FAU Erlangen-Nürnberg, Germany

11.00 am  Rolling concept for cold and hot deformation  
of new metastable steels in strip production  
K. Pranke, M. Schmidtchen, S. Guk, R. Kawalla  
Institute of Metal Forming  
TU Bergakademie Freiberg, Germany

11.25 am  Substitution of rare earths in magnesium alloys  
R. Hoppe, G. Kurz, D. Letzig  
HZG-Forschungszentrum Geesthacht,  
Geesthacht, Germany
11.50 am  Modelling approach of temperature evolution during hot reversing strip rolling of magnesium alloys
A. Nam¹, U. Prüfert², M. Eiermann², R. Kawalla¹
¹Institute of Metal Forming, TU Bergakademie Freiberg, Germany
²Institute of Numerical Analysis and Optimization, TU Bergakademie Freiberg, Germany

12.15 pm  Lunch break

Thin slab/thin strip cast rolling and twin roll casting

1.30 pm  Arvedi ESP Technology – The hot rolling of HS and AHS thin gauge steel strips
R. Venturini, P. Avancini, N. Barbieri, A. Rizzi, Acciaieria Arvedi, Cremona, Italy

1.55 pm  Effects of process parameter variation on the bonding strength in clad steel strips by twin-roll strip casting
D. Münster, M. Vidoni, G. Hirt
Institute of Metal Forming, RWTH Aachen, Germany

2.20 pm  Continuous casting and rolling technology at MKM Mansfelder Kupfer und Messing GmbH – optimization of the surface quality for Conti-M® strip
K.-D. Palm, H. Busch, A. Dusdorf
MKM Mansfelder Kupfer und Messing GmbH, Hettstedt, Germany

2.45 pm  Microstructure investigations of inverse segregations in twin-roll cast AZ31 strips
C. Krbetschek, F. Berge, M. Oswald, M. Ullmann, R. Kawalla
Institute of Metal Forming, TU Bergakademie Freiberg, Germany

3.10 pm  Coffee Break
Plant layout for productions and processing, control and measuring systems and roll technology

3.35 pm  Digitalization in hot and cold rolling mills
J. Ohlert, A. Sprock, P. Sudau
SMS group GmbH, Hilchenbach, Germany

4.00 pm  The virtual rolling mill – enhancing product development and commissioning
M. Klinkov, R. Feist
Achenbach Buschhütten GmbH & Co. KG, Kreuztal, Germany

4.25 pm  Methodology of low costs and quality efficiency technology improvement for hot rolled steel on the Mill 2000 Severstal
A. Mitrofanow\(^1\), A. A. Ogoltcov\(^1\), E. A. Garber\(^2\), D. L. Shalacosky\(^2\)
\(^1\)Severstal Russian Steel, Cherepovets, Russia
\(^2\)Cherepovets State University, Cherepovets, Russia

4.50 pm  Inline high speed laser cutting of band material
A. Wetzig\(^1\), J. Hauptmann\(^1\), P. Herwig\(^1\), E. Beyer\(^1\), W. Bundschuh\(^2\), S. Volk\(^2\), M. Hemberger\(^2\)
\(^1\)Fraunhofer Institute for Material and Beam technology, Dresden, Germany
\(^2\)Scheuermann + Heilig GmbH, Buchen-Hainstadt, Germany

6.30 pm  Visit of the Historicum of TU Bergakademie Freiberg

7.30 pm  Conference dinner Brauhof Freiberg
Friday, March 18th, 2016

Plant layout for productions and processing, control and measuring systems and roll technology

8.30 am  
**Power Cooling**  
E. Opitz, A. Seilinger, L. Pichler, O. Silbermann, A. Rimnac  
Primetals Technologies Austria GmbH, Linz, Austria

8.55 am  
**Further developments in strip thickness measurement**  
laser-based strip thickness measurement  
E. Roller  
Vollmer GmbH, Hagen, Germany

9.20 am  
**Arvedi ESP for high-quality hot-strip production at Rizhao steel**  
B. Linzer, A. Jungbauer, A. Rimnac  
Primetals Technologies Austria GmbH, Linz, Austria

9.45 am  
**New opportunities for process optimization in the metal industry using laser line sensors for thickness and width gauging**  
A. Sonntag  
Micro-Epsilon Messtechnik GmbH & Co. KG, Ortenburg, Germany

10.10 am  
**Coffee break**
Cold rolling and annealing of flat products

10.35 am
Skin-Pass rolling of high-manganese steels
K. Köhler, N. Kwiaton, M. Bretschneider
Salzgitter Mannesmann Forschung GmbH,
Salzgitter, Germany

11.00 am
Industrialization of new developments in the lubrication system of the coupled tandem mill AMEKO at ArcelorMittal Eisenhüttenstadt with Henkel AG
M. Tille¹, B. Staes², G. Sardo³, A. Müller¹, T. Saffer¹, F. Fabian¹
¹ArcelorMittal Eisenhüttenstadt GmbH,
Eisenhüttenstadt, Germany
²Henkel Belgium N.V., Molenbeek-Saint-Jean,
Belgium
³Henkel AG & Co. KGaA, Düsseldorf, Germany

11.25 am
Rolling of flat aluminum strips
with tailored mechanical properties
O. Grydin¹, S. Bondarenko², M. Stolbchenko¹,
M. Schaper¹
¹Materials Science, University of Paderborn,
Germany
²National metallurgical Academy of Ukraine,
Metal Forming, Dnepropetrovsk, Ukraine

11.50 pm
Closing remarks
R. Kawalla
Institute of Metal Forming,
TU Bergakademie Freiberg, Germany

12.00 pm
Light Lunch/Take away
Lunch at conference venue or packed lunch to take away
Welcome reception

Wednesday, March 16th, 2016, 7.00 pm

Institute of Metal Forming, Freiberg

Please enjoy the rustic buffet and regional beer. A guided tour provides insights into the facilities and the equipment of the Institute of Metal Forming at TU Bergakademie Freiberg.

Visit of the Historicum of TU Bergakademie Freiberg

Thursday, March 17th, 2016, 6.30 pm

Senatssaal TU Bergakademie Freiberg, Akademiestraße 6, Freiberg

The Historicum shows a scientific exhibition of the TU Bergakademie Freiberg.

Conference dinner

Thursday, March 17th, 2016, 7.30 pm

Brauhof Freiberg, Körnerstraße 2, 09599 Freiberg

A conference award committee identifies one paper as the best paper from the conference’s programme. This award will be announced in a short ceremony after the conference dinner.
Contact:

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Kristina Neh
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Kristin Butze
phone: +49 (0) 3731 39-4136

e-mail: meform2016@imf.tu-freiberg.de

www.imf.tu-freiberg.de/meform2016

Location:

Technische Universität Bergakademie Freiberg
Institute of Metal Forming
Bernhard-von-Cotta-Str. 4
09599 Freiberg