

The 2nd International Symposium on Steel Science
(ISSS 2009)

Strength, Plasticity and Fracture in Steels
~Fundamentals and Novel Approaches for New Demands~

October 21-24, 2009
Kansai Seminar House, Kyoto, Japan

www.steelscience.org

Final Program (ver.5)

Oct. 21 (Wed)

- 16:00~18:00 Registration
Japanese Tea Ceremony & Service
18:00~20:00 Welcome Party (Agora Hall)

Oct.22 (Thu)

- 8:00~8:50 Registration
--Main Hall--
8:50~9:00 Opening Remark
9:00~10:15 O01: **Prof. H.Mughrabi** (Universitaet Erlangen-Nuernberg, Germany)
“Cyclic Deformation and Fatigue of Different Steels: Fundamentals and some Examples of Applications” [Plenary]
10:15~10:30 Coffee Break
10:30~11:15 O02: **Prof. K.Higashida** (Kyushu University, Japan)
“Analyzing Dislocation Structures and Its Impacts on Studies for Mechanical Properties in Crystalline Materials” [Invited]
11:15~12:00 O03: **Prof. Y.Tomota** (Ibaraki University, Japan)
“Tensile deformation behavior of steels studied by in-situ neutron scattering and EBSD” [Invited]
12:00~13:00 Lunch
13:00~14:05 Poster Short Presentations I (3 min. per paper; 21 papers)
14:05~14:10 Short Break
14:10~15:15 Poster Short Presentations II (3 min. per paper; 21 papers)
15:15~15:30 Coffee Break
--Agora Hall—
15:30~17:30 Poster Session
--Main Hall--
18:00~20:00 Banquet

Oct. 23 (Fri)

--Main Hall--

- 9:00~10:00 O04: **Dr. K.Ushioda** (Nippon Steel Corporation)
“Challenge for Further Strengthening of Steels” [Keynote]
- 10:00~11:00 O05: **Prof. H.M.Zbib** (Washington State University, U.S.)
“Multiscale Modeling of Plasticity and Deformation Mechanisms in Crystalline Materials: Fundamentals and Applications” [Keynote]
- 11:00~11:15 Coffee Break
- 11:15~12:00 O06: **Dr. A.Uenishi** (Nippon Steel Corporation)
“Work Hardening Behavior and Dislocation Patterning at Large Strains in Sheet Steel” [Invited]
- 12:00~13:00 Lunch
- 13:00~14:00 O07: **Prof. I.Robertson** (University of Illinois, U.S.)
“Understanding How Hydrogen Influences the Mechanical Properties of Iron and Steel” [Keynote]
- 14:00~14:45 O08: **Dr. H.Yaguchi** (Kobelco Research Institute Inc.)
“Mechanical Properties to Be Discussed in Machine Structural Steels in Terms of Dislocations” [Invited]
- 14:45~15:00 Coffee Break
- 15:00~15:45 O09: **Dr. F.G. Caballero** (National Center for Metallurgical Research, Spain)
“Microstructure and Properties of Advanced Bainitic Steels: From Micro to Nano” [Invited]
- 15:45~16:30 O10: **Dr. S.Mitao** (JFE Steel, Co., Ltd.)
“Recent Advances in Microstructural Control Technologies Applied for High Performance Structural Steel Plates” [Invited]
- 16:30~17:15 O11: **Prof. K.Marukawa** (Hokkaido University, Japan)
“Theoretical Evaluation of Solution Hardening in Fe-C Alloy” [Invited]
- 18:00~19:00 Dinner

--Main Hall--

- 19:00~20:30 Evening Session on “New Approaches to Understand Microstructures and Mechanical Properties of Steels”
D01: **Prof. Y.Tomota** (Ibaraki University, Japan)
“*In Situ* Studies on Mechanical Behavior of Steels using Neutron

Diffraction” [Invited]

D02: **Prof. S.Hata** (Kyushu University, Japan)

“Scanning Transmission Electron Microscopy Imaging at Medium Magnifications and Its Combination with Three-Dimensional Imaging Techniques for Steel Research” [Invited]

D03: **Dr. Julia D. Nowak** (Hysitron, Inc., U.S.A.)

“*In Situ* Techniques for Nanomechanical Testing of Nanoscale Structures” [Invited]

Discussions

Oct. 24 (Sat)

--Main Hall--

- 9:00~9:45 O12: **Prof. P.J.Ferreira** (University of Texas, U.S.)
“Nano/Sub-micron Grained Austenitic Stainless Steels” [Invited]
- 9:45~10:30 O13: **Dr. K.Miyata** (Sumitomo Metals Industries, Ltd.)
“Microstructures and Properties of Ultrafine Grained C-Mn Steel Sheets by Super Short Interval Multi-Pass Rolling” [Invited]
- 10:30~10:45 Coffee Break
- 10:45~11:30 O14: **Dr. D.Ponge** (Max-Planck Institute for Iron & Steel Research, Germany)
“Ultra High Strength Steel Design by Using Nanoparticles” [Invited]
- 11:30~11:55 General Discussion
- 11:55~12:00 Closing Remarks

Poster Program (Oct. 21 (Thu) 15:30~17:30 @ Agora Hall)

<i>Poster No.</i>	<i>(Acceptance No.)</i>	<i>Title/Authors/Affiliation</i>
P01	C006	Effect of Microstructure on Cleavage Resistance of High Strength Quenched and Tempered Steels <u>A.Di Schino</u> and C. Guarnaschelli Centro Sviluppo Materiali SpA, Italy
P02	C007	Low Temperature Strengthening Mechanisms in Plate Steels <u>K.O. Findley</u> , K. Partin and C.J. Van Tyne Colorado School of Mines, U.S.
P03	C009	Application of Controlled Cu Nano-Precipitation for Improvement in Fatigue Properties of Steels <u>T.Yokoi</u> , M.Takahashi , N.Maruyama and M.Sugiyama Nippon Steel Corporation, Japan
P04	C010	Finite Element Method and Experimental Approaches in Drawing of Hyper-eutectoid Steel <u>B.I.Jung</u> , C.Y.Lee POSCO, Korea
P05	C011	Mechanical Twinning in a High Strength High Manganese TWIP Steel <u>H. Beladi</u> , I. B. Timokhina, Y. Estrin, J. K. Kim, B. C. De Cooman and S. K. Kim Deakin University, Australia
P06	C012	Bulk Nano-Grained Fe-Ni-Co-Ti Alloy Processed by High Pressure Torsion: Approaching Ideal Strength with Improved Ductility <u>T. Furuta</u> , S. Kuramoto, T. Osuna and Z. Horita Toyota Central R&D Laboratories Inc., Japan

- P07 C013 Effect of V,N precipitation on Sulfur Lean Vanadium Alloyed Steels
C. Capdevila, C. García-Mateo, J. Chao and F.G. Caballero
Centro Nacional de Investigaciones Metalúrgicas (CENIM-CSIC), Spain
- P08 C014 Hydrogen Embrittlement of Submicrocrystalline Ultra-Low Carbon Steel Produced by High-Pressure Torsion Straining
Y.Todaka, K.Morisako, M.Kumagai, Y.Matsumoto and M.Umemoto
Toyohashi University of Technology, Japan
- P09 C015 Effect of Internal Stress on Work Hardening Behavior in Pearlite Steel
N.Nakada, N.Koga, T.Tsuchiyama and S.Takaki
Kyushu Univ., Japan
- P10 C016 Numerical Evaluation of Mechanical Behavior of Ferrite-Pearlite steel
I.Watanabe, D.Setoyama, T.Iwata, N.Iwata and K.Nakanishi
Toyota Central R&D Labs., Inc., Japan
- P11 C017 Metallurgical Design and Development of TS 780 MPa Grade ERW Steel Tube for Automotive Suspension Parts
S. Toyoda, Y. Kawabata, S. Matsuoka, M. Gunji and A. Sato
JFE Steel Corporation, Japan
- P12 C018 Deformation Modes Influencing on Mechanical and Fatigue Properties of JIS SUS304L Stainless Steel in High Pressure Gaseous Hydrogen
H.Fujii and S.Ohmiya
Nippon Steel Corporation, Japan
- P13 C019 Tensile Behavior of Low Carbon Steels with Nano-Sized Alloy Carbides Produced by Interphase Boundary Precipitation
N.Kamikawa, Y.Abe, G.Miyamoto and T.Furuhara
Institute for Materials Research, Tohoku University, Japan

- P14 C020 Characterization of Microstructural Evolution during Deformation in Lath Martensite by Using Micro-Sized Specimen
A.Shibata, Y.Ogawa, M.Sone and Y.Higo
Precision and Intelligence Laboratory, Tokyo Institute of Technology, Japan
- P15 C021 Fatigue Properties and degradation mechanism of stainless and low alloy steels in high pressure gaseous hydrogen environment
J.Nakamura, M.Miyahara, T.Omura, H.Semba, M.Wakita and Y.Otome
Sumitomo metal industries, LTD, Japan
- P16 C022 Elastic and inelastic behavior of high strength steel alloys after prestraining and bake haedening under biaxial loading and
M.Andar, T.Kuwabara , S.Yonemura and A.Uenishi
Tokyo University of Agriculture and Technology, Japan
- P17 C023 ~~Identification of the hydrogen damage in multiphase steels after electrochemical charging~~
D. Pérez Escobar, L. Duprez, K. Verbeken, M. Verhaege
~~Ghent University, Belgium~~ [CANCELLED]
- P18 C024 Effect of grain refinement on strength and toughness in dual-phase steels
M.Calcagnotto, D.Ponge, Y.Adachi and D.Raabe
Max-Planck-Institut für Eisenforschung GmbH, Germany
- P19 C025 Microstructural evolution during hot working of 1.4362 duplex stainless steel
C. Herrera, D. Ponge and D. Raabe
Max-Planck-Institut für Eisenforschung, Germany
- P20 C026 Microscopic analysis of bending deformation in ferrite-martensite dual-phase steel sheets
K.Hayashi, K.Miyata, F.Katsuki, N.Kojima and S.Nomura
Sumitomo Metal Industries Ltd., Japan

- P21 C027 Effect of Deformation and Martensitic Phase Transformation on Yield Strength of AISI 304L Stainless Steel
R. Surki, S. Sabooni, A. Najafizadeh, S. Shirmohamadi
Isfahan University of Technology, Isfahan, Iran
- P22 C028 Effect of solution carbon and retained austenite films on development of deformation structure of lath martensite
S. Morito, T. Araki and T. Ohba
Shimane University, Japan
- P23 C030 Temper Resistance Studies of 1600-1900MPa Flash Bainite Lean Alloy, Low Carbon Steel w/ Total Elongation of 9.5-11.2%
Gary M. Cola, Jr
SFP Works, LLC, U.S.
- P24 C032 Work hardening behavior of single crystal steel under stress reversal test
G. Shigesato, Y. Ikematsu and N. Sugiura
Nippon Steel Corporation, Japan
- P25 C033 Effect of Dispersed Cementite on Stress-Strain Curves in Ultrafine-grained Ferrite-Cementite Steels
N. Tsuchida, S. Torizuka, K. Nagai and R. Ueji
University of Hyogo, Japan
- P26 C034 A dislocation substructural consideration on work hardening and resistance to SCC of Ni-based alloys
Y. Otome, H. Okada M. Igarashi and H. Amaya
Sumitomo Metal Industries, Ltd., Japan
- P27 C035 Impact energy deterioration in the CGHAZ of the Cu added HSLA steel according to post weld heat treatment
S.H.Kim, J.H.Lee, B.C.Hwang, C.G.Lee and C.H.Lee
Hanyang Univ., Korea
- P28 C036 Toughening of 0.05%P containing high strength Cr-Mo steel by microstructure control
M. Jafari, Y. Kimura, Y. Nie, and K. Tsuzaki
University of Tsukuba, Japan

- P29 C037 Deformation and Fracture of Advanced High Strength Multiphase Steels (AHSS)
M.Kapp, T.Hebesberger and O.Kolednik
Material Center Leoben Forschung GmbH and Erich Schmid Institute for Material Science, Austrian Academy of Sciences, Austria
- P30 C038 Work hardening behavior of steel sheets under high strain rate
S.Takagi, T.Shimizu and K.Hashiguchi
JFE Steel Corporation, Japan
- P31 C039 Effect of Si on work hardening behavior in IF steels
Y.Kawasaki, T.Nakagaito, S.Kaneko, S.Takagi, S.Matsuoka
JFE Steel Corporation, Japan
- P32 C040 ~~Effect of Thermomechanical Processing Parameters on Microstructure of Pipeline Steel~~
~~**N.Sanchez-Mouriño**, R.Petrov, J.H.Bae, K.S.Kim and L.Kestens~~
~~Ghent University, Belgium [CANCELLED]~~
- P33 C041 Effect of Retained Austenite on Strain Hardening Behavior of TRIP Steel
S.J.Park, D.W.Suh, C.S.Oh and S.J.Kim
Korea Institute of Materials Science, Korea
- P34 C042 Microstructure and Mechanical Property of Wear-Induced Layer in Fe-Ni Alloys
H.Sato, Y.Kubota, E.Miura-Fujiwara and Y.Watanabe
Nagoya Institute of Technology, Japan
- P35 C044 Mechanical Properties of Ultrafine Grained Multi-Phase Steel Sheets Aiming for Automobile Body Applications
Y.Okitsu and N.Tsuji
Honda R&D Co., Ltd., Japan

- P36 C045 Fracture Mechanism Transition due to Strain Rate Change in Si Steels
T. Mizuguchi, R. Oouchi , R. Ueji , A. Takemura and K. Kunishige
Kagawa University, Japan
- P37 C046 Characterizations of Nanometer-sized Carbides in Steels
Hung-Wei Yen, Ching-Yuan Huang and Jer-Ren Yang
National Taiwan University, Taiwan
- P38 C048 EBSD investigation of inhomogeneous deformation in a ferrite-martensite dual phase steel
S.Ohtani, T.Morikawa, K.Higashida and S.Hashimoto
Kyushu University, Japan
- P39 C050 Microstructure and Mechanical Property of Pure Fe Powder Compact with Nano-Meso Harmonic Structure
S. Takarae H. Fujiwara and K. Ameyama
Ritsumeikan Global Innovation Research Organization, Japan
- P40 C054 Development of 780MPa Grade Steel Plate by Microstructural Control Containing M-A Through the On-Line Heating Process
K.Ueda, S.Suzuki, S.Mitao, and T.Ito
JFE Steel, Co. Ltd., Japan
- P41 C056 Investigation on Brittle Crack Arrest Behavior of T-weld Joint using Thick Plates
E.Tamura, T.Nakagawa, K.Tsutsumi and N.Furukawa
Kobe Steel, Ltd., Japan
- P42 C057 Effect of strain rate on dynamic strain aging for cold forging steels
T.Masuda, T.Tsuchida, and M.Chiba
Kobe Steel, Ltd., Japan
- P43 C029 The role of dislocation sources on the brittle-ductile transition
M.Tanaka, K.Higashida and T.Shimokawa
Kyushu University, Japan

- P44 C003 Processing Pure Iron under Different Modes of Severe Plastic Deformation
K.Edalati and Z.Horita
Kyushu University, Japan
- P45 Effect of Grain Size on the Work-Hardening Behavior and Deformation Twinning of High-Manganese Austenitic Steel
R.Ueji, G.D.Torkamani, N.Tsuchida and K.Kunishige
Kagawa University, Japan
- P46 Recent Developments Enabling the Nanomechanical Testing of Complex Microstructures
David J. Vodnick, Ude Hangen, Julia D. Nowak, and Daniel P. Carlson
Hysitron, Inc., U.S.A.