5th Int’l Conf. on Heat Treatment and Surface Engineering of Tools and Dies
Initiated by IFHTSE, Organized by CHTA
Co-organized by Harbin Institute of Technology and Hangzhou Jinzhou Technology Co., Inc.

PROGRAMME

Hangzhou, China
24-26 April 2023
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Prof. Nader Asnafi [Sweden] Oerobo University
Prof. Mufu Yan [China] Harbin Institute of Technology
Prof. You Wang [China] Harbin Institute of Technology
Prof. Jiahu Ouyang [China] Harbin Institute of Technology

CONTACT US
Xiangdong SHI, Chao SUN
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Prof. Fei Chen [China] Beijing Institute of Petrochemical Technology
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Prof. Defu Luo [China] Xihua University
Prof. Li Meng [China] Central Iron & Steel Research Institute
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Xiangdong Shi [China] China Heat Treatment Association (CHTA)
Prof. Lei Wang [China] Northeastern University
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Prof. Jiming Wu [China] Zhejiang University
Prof. Jinfu Xu [China] Ningbo University of Technology
Mingdiao Xia [China] General Manager of Yongkang Qujing heat treatment plant
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Dr. Lei Zhu [China] Harbin Institute of Technology
Defu Zhou [China] Chairman of Nanjing Changjiang Industrial Furnace Technology Group Co. Ltd
Xiaojun Zhu [China] General Manager of Jiangsu Fengdong Thermal Technology Co., Ltd
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<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
<th>Venue</th>
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<tbody>
<tr>
<td>24 April</td>
<td>8:00 - 22:00</td>
<td>Registration</td>
<td>InterContinental Hangzhou</td>
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<tr>
<td>25 April</td>
<td>15:00 - 18:00</td>
<td>中国热协九届五次常务理事会</td>
<td>South Meeting Room, Building 4, North District, Dream Town</td>
</tr>
<tr>
<td></td>
<td>18:30 - 20:00</td>
<td>Dinner</td>
<td>InterContinental Hangzhou, Building B1</td>
</tr>
<tr>
<td>26 April</td>
<td>8:30 - 17:00</td>
<td>Visit</td>
<td>InterContinental Hangzhou, Banquet Hall A</td>
</tr>
</tbody>
</table>

**Date**: 4月24日

**Event**: 会议注册

**Venue**: 良渚洲际酒店

**Time**: 8:00 - 22:00

**Event**: 中国热协九届五次常务理事会

**Venue**: 南区会议厅

**Time**: 15:00 - 18:00

**Event**: 晚餐

**Venue**: 良渚洲际酒店B1楼会议区域

**Time**: 18:30 - 20:00

**Date**: 4月25日

**Event**: 我们在8点在酒店门口集合，然后乘巴士去会场。

**Venue**: 梦栖小镇北区8号楼会议室

**Time**: 8:00 - 8:30

**Event**: 开幕式

**Venue**: 梦栖小镇北区8号楼会议室

**Time**: 8:30 - 9:00

**Event**: 大会报告

**Venue**: 梦栖小镇北区8号楼会议室

**Time**: 9:00 - 12:30

**Event**: 午餐

**Venue**: 良玉邻家(良渚店)

**Time**: 12:30 - 13:45

**Event**: 分会场一: 热处理

**Venue**: 梦栖小镇北区4号楼南会议室

**Time**: 13:45 - 18:00

**Event**: 分会场二: 表面改性

**Venue**: 梦栖小镇北区8号楼会议室

**Time**: 13:45 - 18:00

**Event**: 我们在18:10在8号楼会场门口集合，然后乘巴士回酒店。

**Time**: 18:00 - 18:30

**Event**: 优秀论文颁奖

**Venue**: 良渚洲际酒店B1楼会议区域

**Time**: 18:30 - 20:00

**Date**: 4月26日

**Event**: 参观

**Venue**: 绍兴先越工厂，鲁迅故居

**Time**: 8:30 - 17:00

**Event**: 我们在酒店门口集合，然后乘巴士去绍兴先越工厂，鲁迅故居。

**Time**: 8:30 - 17:00
Transportation Guide

Please take the bus shuttle to transfer between the InterContinental Hangzhou Liangzhu hotel and the conference venue at Liangzhu Dream Town.

备注：

为各点位位置，住宿良渚洲际酒店距离大会报告梦栖小镇北区8号楼约4.4公里，梦栖小镇北区8号楼距离午餐饭店良玉邻家约200米。
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<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Institution</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>8:30 — 9:00</td>
<td>Xinya Li</td>
<td>Harbin Institute of Technology</td>
<td>Chair: Prof. Mufu Yan, Harbin Institute of Technology</td>
</tr>
<tr>
<td>9:00 — 9:30</td>
<td>Prof. Zhenye Zhao [China]</td>
<td>Academia of CAE, Jimei University</td>
<td>Focus on Heat Treatment Industrialization and Promote High-end Manufacturing</td>
</tr>
<tr>
<td>9:30 — 10:00</td>
<td>Prof. Dr. Nader Asnafi [Sweden]</td>
<td>Luleå University of Technology</td>
<td>Metal Additive Manufacturing of Production Tools / Dies / Moulds – Benefits and Constraints</td>
</tr>
<tr>
<td>10:00 — 10:30</td>
<td>Dr. Scott MacKenzie [USA]</td>
<td>Quaker Houghton</td>
<td>Metallurgical Aspects of Distortion and Residual Stresses in Heat Treated Parts</td>
</tr>
<tr>
<td>10:30 — 11:00</td>
<td>Xiaohui Tong [China]</td>
<td>Past President of CHTA</td>
<td>The Status and Trends of Heat Treatment in China</td>
</tr>
<tr>
<td>11:00 — 11:30</td>
<td>Prof. Massimo Pellizzari [Italy]</td>
<td>University of Trento</td>
<td>Heat Treatment of Additively Manufactured Tool steels: Microstructure and Properties</td>
</tr>
<tr>
<td>11:30 — 12:00</td>
<td>Prof. Jianfeng Gu [China]</td>
<td>Shanghai Jiao Tong University</td>
<td>Development of an additive manufactured high-strength Co-Fe-Ni alloy with high thermal conductivity for injection and die-casting mold</td>
</tr>
<tr>
<td>12:00 — 12:30</td>
<td>Dr. Shaolou Wei [USA]</td>
<td>Massachusetts Institute of Technology</td>
<td>Overcoming the limits of strain-induced martensitic transformation in metastable face-centered cubic alloys</td>
</tr>
<tr>
<td>Time</td>
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<td>Authors</td>
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<tr>
<td>13:45-14:05</td>
<td>Experimental Study of Heat Treatment Process for GCr15 for High-end Bearings</td>
<td>Xiaohong Dong, a Hanqin Yin, a Zejian Lu, a Xingfu Yu b a Guangdong Strong Metal Technology Co., Ltd., Foshan, Guangdong 528313, China; b School of Mechanical Engineering, Shenyang University of Technology, Shenyang, Liaoning 110870, China</td>
<td></td>
</tr>
<tr>
<td>14:05-14:35</td>
<td>Processes of Vacuum Heat Treatment</td>
<td>Li Shen* Shanghai Advanced Metallurgical Technology Corporation, Shanghai 201612</td>
<td></td>
</tr>
<tr>
<td>14:35-14:55</td>
<td>The low-temperature cooling rate control of polymer quenchants – way to replace quench oil with water</td>
<td>Yu Hansen,* Ding Lin, Zuo Yongping Nanjing KERUN Lubricants Co., Ltd. 1, Jingfeng industrial park, No. 98 Chengxin Avenue, Jiangning, Nanjing, 211100, China</td>
<td></td>
</tr>
<tr>
<td>14:55-15:15</td>
<td>Induction heating for the surface process of stamping die</td>
<td>Jixu Xu* Shanghai Minzhao Industry Trade Co., Ltd. 10F ledu Building No.251 Ledu Road, Songjiang District Shanghai</td>
<td></td>
</tr>
<tr>
<td>15:15-15:35</td>
<td>Cryogenic Treatment of Steel and Its Application</td>
<td>Kaixuan Gu, a Jia Guo, a, b Zeju Weng, a Junjie Wang, a, b a CAS Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Beijing 100190, China; b Beijing Fawip Cryogenic Technology Co., Ltd, Beijing 100190, China</td>
<td></td>
</tr>
<tr>
<td>15:35-15:50</td>
<td>Mechanical and corrosion properties of bulk nanocrystalline 304 stainless steel plate</td>
<td>Shenggang Wang,* Miao Sun Shenyang National Laboratory for Material Sciences, Institute of Metal Research, Chinese Academy of Sciences, 110016, Shenyang, China</td>
<td></td>
</tr>
<tr>
<td>15:50-16:05</td>
<td>The Harm of Corrosion to Molds and the Importance of Surface Integrity Manufacturing</td>
<td>Jingxian Luo* Institute of Heat Treatment, DAXING, TAIZHOU</td>
<td></td>
</tr>
<tr>
<td>16:05-16:20</td>
<td>Carbon emission calculation method for heat treatment industry</td>
<td>Kun Li, a, b Weijiang Yu, a, b Yongwu Zhang, a, b Jiayang Yu, c Jia Yang a a Xi’an Electric Furnace Institute Co., Ltd, Xi’an 710061, China; b MCC Electric Furnace Engineering Technology Center, Xi’an 710061, China; c Xi’an Huijin Science and Technology Co., Ltd, Xi’an 710061, China</td>
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<tr>
<td>Time</td>
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<td>Authors</td>
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<tr>
<td>16:20-16:35</td>
<td>Heat Treatment for the Toughening of Tool and Die Steels</td>
<td>Zhizhong Yuan,<em>a Lu Chen,a Mengfei Wang,a Jiabo Wei,a,b, Haiming Liu,a, Zongran Niu,a, Zhiyuan Wang,a, Yulin Ju,a, Fuyang Cao,a, Rui Luo</em>a and Bocheng Zhang,a,c</td>
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<td></td>
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<td>a School of Materials Science and Engineering, Jiangsu University, Zhenjiang Jiangsu 212013, China; b Bruker Nano Analytics GmbH, Shanghai 200000, China; c Jingkou Heat Treatment Service Station of Zhenjiang, Zhenjiang Jiangsu 212012, China</td>
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<tr>
<td>16:35-16:55</td>
<td>Integrated High Pressure Die Casting’s challenge to Tool Steel and Heat Treatment</td>
<td>Jackson Sun*</td>
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<td></td>
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<td>Schmied werke Gröditz GmbH, Building A -206, Digital Mansion, Flower City, NO.1079 Nahai Ave. Shekou, Nanshan District, Shenzhen, China</td>
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<tr>
<td>16:55-17:10</td>
<td>Surface corrosion behavior of different aged 2A97 Al alloy after mechanical polishing</td>
<td>Yuxiao Qiu,a Junfeng Chen,a,b Rongyi Liu,a, Linchi Zou,b Haitao Chi c</td>
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<td>a School of Materials Science and Engineering, Fuzhou University,, Fujian 350116, China; b School of Materials Science and Engineering, Fujian University of Technology, Fuzhou 350118, China; c Fujian Xiangxin Light alloys manufacture Co., Ltd., Fuzhou 350119, China</td>
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<tr>
<td>17:10-17:30</td>
<td>Heat treatment and surface strengthening of high-speed steel molds</td>
<td>Buqing Zhao*</td>
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<td>Jialong Knives Manufacturing Co., Ltd, Maanshan, An Hui, 243131</td>
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<tr>
<td>17:30-17:45</td>
<td>Status quo and selection of testing instruments and equipment using for heat treatment quality control</td>
<td>Alex Zhang*</td>
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<td></td>
<td></td>
<td>Standard-Trust Testing Technology Co., Ltd. , 11, No.2 Guigu Road, Guigu Science Park, Jiashan County, Zhejiang 314100, China</td>
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<tr>
<td>17:45-18:00</td>
<td>Application of Laser Phase Change Hardening Technology with High Heat Concentration</td>
<td>Luo Hong*</td>
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<td>Beijing Jingye Bearing Co., Ltd.</td>
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### Session II — Surface Engineering

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<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
</tr>
</thead>
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<tr>
<td>13:45-14:00</td>
<td>Metastable structure transformation of diamond-like carbon films for tools and dies</td>
<td>Yefei Zhou, Zhihao Chen, Zhengyu Qian, Xiaolei Xing</td>
<td>a School of Mechanical Engineering, Yanshan University, Qinhuangdao 066004, China; b Star-Arc Coating New Material Technology Co., LTD, Suzhou 215000, China</td>
</tr>
<tr>
<td>14:00-14:15</td>
<td>Research on the application of New-QPQ in hot-working die steel</td>
<td>Defu Luo, Liwei Long, Fangzhou Wang</td>
<td>School of Materials Science and Engineering, Xihua University, Chengdu Sichuan 610039, China</td>
</tr>
<tr>
<td>14:15-14:30</td>
<td>Prediction of quenching crack by numerical simulation with an embedded ductile fracture criterion</td>
<td>Daming Tong, Miao Gong, Jianfeng Gu</td>
<td>Institute of Materials Modification and Modelling, School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, China</td>
</tr>
<tr>
<td>14:30-14:45</td>
<td>Low temperature plasma nitriding with high efficiency and excellent performance enhanced by titanium for 304 austenitic stainless steel</td>
<td>Runtao Li, Jing Hu, Xiaobing Zhao</td>
<td>a Jiangsu Key Laboratory of Materials Surface Science and Technology, Changzhou University, Changzhou 213164, China; b National Experimental Demonstration Center for Materials Science and Engineering, Changzhou University, Changzhou 213164, China</td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>Study on Phase Control and Corrosion Mechanism of Nitridation Post-Oxidation</td>
<td>Jinquan Sun, Yanpeng Xue, Zan Liu, Fujie Li, Chongyang Zhong, Haotian Li, Yucha Gao</td>
<td>a Shandong University of Science and Technology; b University of Science and Technology Beijing</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>Enhancement of Hardness and Sliding Wear Properties of Ti-6Al-4V Alloy by Cold Rolling/Low Temperature Nitriding Composite Process</td>
<td>Yudong Fu</td>
<td>College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China</td>
</tr>
<tr>
<td>15:15-15:30</td>
<td>Catalysis and strengthening mechanism of rare earth in plasma nitriding from first principles</td>
<td>Yuan You, Mufu Yan</td>
<td>a School of Materials Science and Engineering, Heilongjiang Provincial Key Laboratory of Polymeric Composition materials, Qiqihar University, Qiqihar Heilongjiang 161006, China; b School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China</td>
</tr>
<tr>
<td>15:30-15:45</td>
<td>Catalytic nitriding of AISI H13 dies by ABO₃ perovskite oxides</td>
<td>Chengsong Zhang, Shuai Li, Daodong Tang</td>
<td>School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, 610036, P.R. China</td>
</tr>
<tr>
<td>15:45-16:00</td>
<td>Numerical simulation and properties of 42CrMo Steel surface modified layer with plasma nitriding and laser quenching</td>
<td>Yixue Wang</td>
<td>School of Materials Science and Engineering, Shanghai University of Engineering Science, Shanghai 201620</td>
</tr>
<tr>
<td>Time</td>
<td>Title</td>
<td>Authors</td>
<td>Institution(s)</td>
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<tr>
<td>16:00-16:15</td>
<td>A kinetic model for vacuum carburizing</td>
<td>Yanxiang Zhang,†a Mufu Yan,a Leyu Zhou,b Yueming Xu b</td>
<td>a School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China; b Beijing Research Institute of Mechanical &amp; Electrical Technology, Beijing 100083, China</td>
</tr>
<tr>
<td>16:15-16:30</td>
<td>Rare earth accelerated plasma nitriding on CoCrCuFeNi high entropy alloys</td>
<td>Yifan Wang,a Yuan You‡a, Mufu Yan b</td>
<td>a School of Materials Science and Engineering, Heilongjiang Provincial Key Laboratory of Polymeric Composition materials, Qiqihar University, Qiqihar Heilongjiang 161006, China; b School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China</td>
</tr>
<tr>
<td>16:30-16:45</td>
<td>Thermal stability of low-temperature plasma nitrided layer on 17-4PH stainless steel under simulated service environment</td>
<td>Lingze Li, Ruiliang Liu,* Quanli Liu</td>
<td>Key Laboratory of Superlight Material and Surface Technology of Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China</td>
</tr>
<tr>
<td>16:45-17:00</td>
<td>Microstructure evolution of gradient-structured Cu-2Ti alloys produced by surface mechanical attrition treatment</td>
<td>Huan Wei, Lifeng Hou, Huayun Du, Yinghui Wei,*</td>
<td>a College of Aeronautics and Astronautics, Taiyuan University of Technology; b College of Materials Science and Engineering, Taiyuan University of Technology, 030024, Shanxi, China</td>
</tr>
<tr>
<td>17:00-17:15</td>
<td>Microstructure and Hardness Distribution of 20Cr2Ni4 Steel after Carburizing and Quenching: Prediction and Experiment</td>
<td>Bangzhuang Long, Lei Zhu, Ying Yang, Yanxiang Zhang, Mufu Yan*</td>
<td>School of Materials Science and Engineering, Harbin Institute of Technology, Harbin 150001, China</td>
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<tr>
<td>17:15-17:30</td>
<td>Improved high temperature oxidation resistance of AISI304 steel by PVA modified Al sol coating</td>
<td>Hao Wu, Hongtao Chen,* Jichao Lu, Yicheng Feng, Sicong Zhao, Erjun Guo</td>
<td>School of Materials Science and Chemical Engineering, Harbin University of Science and Technology, Harbin 150080, P R China</td>
</tr>
<tr>
<td>17:30-17:45</td>
<td>Effect of Cu on microstructure and wear properties of TiAl/Cu composite coatings</td>
<td>Qin Wang, Bin Han,* Qi Zhang, Meiyian Li, Fuhao Qi, Lihu Gu</td>
<td>School of Materials Science and Engineering, China University of Petroleum (East China), 66 Chang Jiang West Road, Qingdao, 266580, China</td>
</tr>
<tr>
<td>17:45-18:00</td>
<td>Investigation on Microstructure and Properties of CoCrFeNiMo High Entropy Alloy Coating Prepared by High-speed Laser Cladding</td>
<td>Qi Zhang, Bin Han,* Qin Wang, Fuhao Qi, Meiyian Li, Chunyang Hu</td>
<td>School of Materials Science and Engineering, China University of Petroleum (East China), 66 Chang Jiang West Road, Qingdao, 266580, China</td>
</tr>
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