

6th International Conference on **HOT SHEET METAL FORMING OF HIGH-PERFORMANCE STEEL RECAP**

The Association for Iron & Steel Technology (AIST) was pleased to help organize the 6th International Conference on Hot Sheet Metal Forming of High-Performance Steel (CHS² 2017), held at the Atlanta Marriott Marquis in Atlanta, Ga., USA, on 4–7 June 2017. The biennial conference originated in 2008 as a collaboration between Luleå University of Technology and the University of Kassel, and has grown into the leading platform for scientific exchange related to press hardening and thermomechanical manufacturing. These technologies provide the transportation sector the potential to meet global environmental and passenger safety challenges.

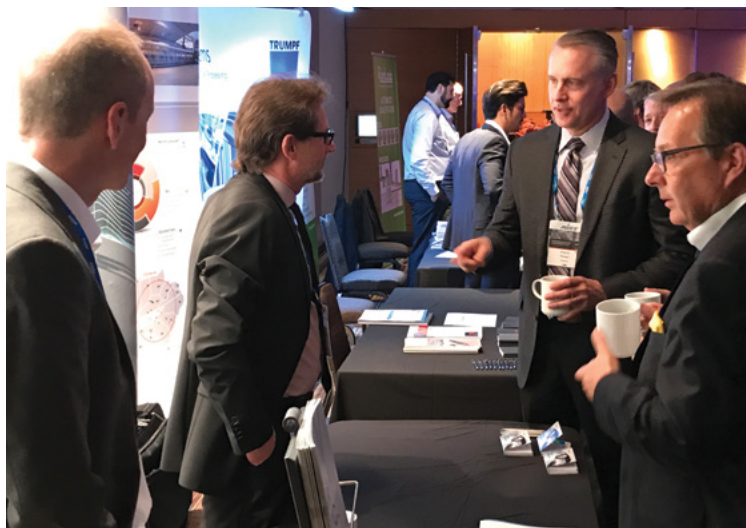




Profs. Mats Oldenburg and Braham Prakash of Luleå University

This year marked the second time AIST had been involved with CHS², and the second time the conference took place in North America, with CHS² being held in Toronto, Ont., Canada, in 2015. Press-hardening technology research and industrial development and implementation are rapidly expanding in North America, and the conference allowed attendees to get a firsthand look at the latest developments.

CHS² 2017 hosted 231 attendees from more than 20 countries. There were 23 sessions with a total of 77 presentations. Prof. Mats Oldenburg and Prof. Braham Prakash of Luleå University of Technology and the CHS² standing organizing committee gave the opening remarks, welcoming everyone to the conference. "CHS² is popular because in the same conference, we can gather research disciplines from very different subjects, including material science, design, simulation [and] material





testing," Prof. Oldenburg said. "CHS² has a broad set of subjects at the conference, yet everyone understands a little bit about each subject."

Following the welcome, Ignacio Martin, research and development general director BIW, Gestamp, provided the opening keynote before the sessions began. The conference proceeded over the next three days with lectures focusing on surface coating advancements, modeling and simulation of processes and final property prediction, process controls for increased robustness of properties, inventive manufacturing and joining processes, and failure mechanism studies.



After the first day of lectures, all attendees were invited to a banquet dinner at the Georgia Aquarium in downtown Atlanta. This dinner offered attendees the chance to view the 800,000-gallon Cold Water Quest beluga whale habitat as well as the Ocean Voyager habitat, containing 6.3 million gallons of water home to thousands of animals representing nearly 50 species, including the giant whale shark, which can reach upwards of 41,000 lbs.



Plenary speakers (left to right): HongGee Kim, Paul J. Belanger, Thomas Kurz and Reiner Kelsch.

The plenary lectures were given by Paul J. Belanger, Gestamp; Reiner Kelsch, voestalpine Automotive Components Schwabisch Gmund GmbH & Co. KG; HongGee Kim, POSCO Research Institute; and Thomas Kurz, voestalpine Stahl GmbH. Belanger's presentation discussed new hot forming steps at Gestamp that can achieve full mechanical properties as well as steps that can more effectively trim and pierce parts. Gestamp believes that hot stamping is the future and they are dedicated to implementing these innovations at their trial line in Barcelona, Spain. Kelsch introduced voestalpine's advances with zinc-coated boron-alloyed press-hardened steels and their processing to eliminate liquid metal embrittlement at the steel and coating interface by means of pre-cooling of the part before the furnace and forming. Kim discussed the reduction of a white line defect seen on the inner

radius of formed parts of Al-Si-coated steels by increasing heating temperature and heating time while decreasing transfer time of the part from furnace to die. Kurz showed the robustness of 20MnB8 with direct hot-forming and pre-cooling technologies in bending crash tests at varying energy levels and discussed the dominant factors in predicting crash damage.

Dr. Andy Roubidoux, research engineer, AK Steel, provided some insight into what attendees learned at CHS². "I came here to see what the industry's current state of the art is for press-hardened steels and press-hardened steel technology. The value of being here is seeing firsthand what all these companies are doing with their press-hardened furnaces and where, exactly, the direction of the steels is going to achieve the properties that the OEMs want," he said.





“The key takeaway, for me, is that the state of the art in hot stamping has progressed a lot in the last couple of years,” said Joseph McDermid, professor, McMaster University. “There are a lot of new alloys, a lot of new technologies coming on board. It’s a field that is advancing very, very quickly.”

CHS² 2017 also featured 12 tabletop exhibitors that attendees were able to interact with. “Networking is always present due to the exchange of ideas and new results, leading to building a new network or promoting an existing one,” said Prof. Dr.-Ing. Marion Merklein, University of Erlangen-Nuremberg.



Exhibitors included Quaker, EBNER Furnaces, Aichelin Holding, Infratec Infrared, Macrodyne Technologies, QuinLogic, Schuler, Schwartz GmbH, Telos Global, TRUMPF and WS Thermal Process Technology.

The organizers of CHS² would also like to thank Shin Sung Yool Yeun IND Co. Ltd. for sponsoring the water bottles and Schwartz GmbH for sponsoring the notebooks.



The 7th conference in the CHS² series will return to Europe in Luleå, Sweden, on 2–5 June 2019. ♦