SMST Oxford 2015

Conference Report

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Introduction
SMST is the largest conference about Shape-Memory Alloys. Since 1994, when the first conference was held in Northern California, it became the most important podium for scientists, engineers, designers and users to discuss about the latest developments in the shape-memory world. To join SMST conferences opens the possibility for new engineers to learn about amazing technologies but it also is a meeting point for the industry working with the materials and getting new ideas for next generation products.

Oxford 2015
Oxford stands in a long tradition of very successful European SMST conferences, Baden-Baden 2004, Stresa 2008, and Prague 2013. It was organized by ASM, the American Society for Materials, with Neil Morgan as the Conference Chair. The conference was held a few miles away from Oxford in the typical English Manor-House-Stile atmosphere of Heythrop Park from 18th to 22nd of May. Dr. Alan Pelton, CTO of G.RAU Inc. gave the Workshop about Nitinol at the first day. This workshop allows new members in the field to get the basics of shape memory alloys before the conference starts. The course was financially supported by NormanNoble, a well-known manufacturer of medical components in Cleveland, Ohio.

Nearly 200 attendees from universities, manufacturers and users came together to hear more than 80 talks and participate in a poster session and an exhibition. The conference members came from over 20 different countries.
For the first time at SMST a fellowship price was granted. Prof. Mohammed Elahina was elected for his work on “Additive Manufacturing of Nitinol Fixation Hardware for Reconstructing Mandibular Segmental Defects”. The price was sponsored by Admedes, Euroflex, FortWayne Metals, G.RAU and NDC.
The Conference
Dr. Keith Melton and Dr. Tom Duerig gave the opening talks. Whereas Dr. Melton gave a historical insight view of the first days of Shape-Memory Alloys, Dr. Duerig described the way, how the material founds its way into the medical industry from very early products, like orthodontic wires and dental reamers to state-of-the-art implants made from binary Nitinol. Without the medical world adapting the amazing properties of superelasticity, kink-resistance and biased-stiffness for products like stents, filters, occlusion devices and heart-valves the community would not be, where it is today. Scientists, engineers and designers all over the world are working on shape-memory alloys, trying to find answers to different material behaviors and raising new questions.

The Technical Program had two main topics, where a lot of talks where about, the influence of pre-strain on fatigue and Nitinol thin films. Nitinol Devices and Components did a lot of work to understand the pre-strain and its effects on fatigue. It could be shown, that under defined circumstances the fatigue life of the RT-binary alloy can be enhanced, if the material has seen certain pre-strain levels. Admedes showed their latest results about fatigue- and corrosion behavior of binary thin films. It was made clear, that the technology to make and test thin films is ready, now the right products are needed to help the technology to become successful.

G.RAU/Euroflex presented their latest results on their next generation Nitinol material HCF, “Influence Of Pre-strain And Thermo-mechanical Treatment Of Next Generation Nitinol Materials in Rotary-Bending Fatigue”. With a new refinement method based on electron-beam remelting it is possible to reduce inclusions to ultrafine sizes. By doing that, it was shown that the fatigue life can be more than doubled. By using this new material approach next generation products will have a bigger safety margins and/or will allow new designs. Whereas originally tube products were in focus, during the conference it became more and more clear that also wire products can take advantage from the extended fatigue properties.

Exhibition
Traditionally SMST wants to be an intermediator between Material Engineering and its use in commercial products, therefore a half-day exhibition is part of the concept. Whereas G.RAU GmbH showed its capabilities in shape-memory actuators, Euroflex demonstrated its wide range of materials and shape memory semi-finished products. G.RAU Inc., the latest member in the G.RAU Group and focusing on consulting and testing of materials and components, was exhibiting the first time and got high interest from the attendees.
It would not have been a conference in England without a visit in a traditional English Pub. On Thursday night all conference members were invited in one of the oldest pubs in Oxford the Turf Tavern. The banquet diner was financially supported by Euroflex.