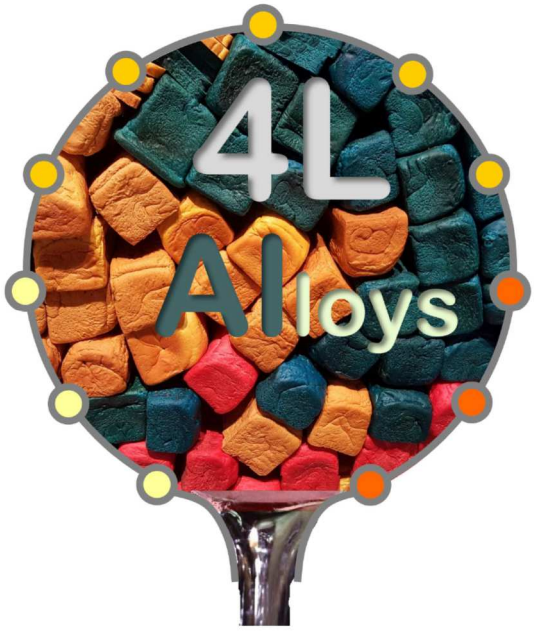

Life Long Learning on Light Alloys:
from Raw Materials to Sustainable Products

In-Field Lab Session #2:
Foundry Lab

- analytical and digital methods for as-cast microstructure analysis -

Aachen – January 26th, 2018

in cooperation with

Presentation

The microstructure is mainly responsible for the mechanical properties of a cast component. Therefore, the quality of the as-cast microstructure has a very important role, especially in recycled secondary alloys with an increased degree of tramp elements. Modern methods for achieving and determining high qualities in the as-cast microstructure include both analytical and digital/numerical methods. The 1-day workshop presents both the simulation of as-cast microstructures with commercially available software as well as analytical methods of microstructure analysis and a new method for measuring the melt purity in aluminum melts. The workshop is supplemented by practical exercises. The workshop is addressed at all professionals in the areas of research, development, and quality assurance from European producers of cast, rolled and extruded Al-based components who want to get an overview of modern methods of material simulation and materials and melt analysis.

Topics Covered

Overview of microstructure simulation of cast light metal alloys
ICME for light metal alloys
Modern methods of microstructure and defect analysis
New ultrasonic detector for the quality assessment of aluminum melts

Lecturers

Dr. Georg J. Schmitz, ACCESS e.V., Aachen
M. Sc. Friederike Feikus, Foundry-Institute, RWTH Aachen University
Dipl.-Ing. Michael Mathes, ACCESS e.V., Aachen
Elke Schaberger-Zimmermann, Foundry-Institute, RWTH Aachen University

Organising Committee

Prof. Dr. Andreas Bührig-Polaczek, Foundry-Institute, RWTH Aachen University
Dr. Georg J. Schmitz, ACCESS e.V., Aachen

Venue:

Foundry Institute
RWTH Aachen University
Intzestr. 5,
D-52072 Aachen
Germany

January 26th, 2018	Foundry Lab - analytical and digital methods for as-cast microstructure analysis -	
8:30 – 9:00	Registration of participants	
9:00 - 9:15	Welcome	A. Bührig-Polczek
9:15 – 10.15	From Massalski to MICRESS- an introduction to microstructure simulation and integrated computational materials engineering (ICME)	G. J. Schmitz
10:15 - 11:00	Thermodynamic modelling of Al-alloys (short demo) • Thermo-Calc Software • Thermodynamic and mobility databases • DICTRA diffusion modeler • TC-PRISMA precipitation modelling • Handling of impurities/recycling	G. J. Schmitz
11:00 - 11:30	ICME for light metal alloys- some examples: • KS1295 • Al-Si (Sr/P) eutectic refinement • 3D dendritic structures in Mg-alloys • Laser Welding of Al-Cu	G. J. Schmitz
11:30 – 11:45	Coffee break	
11:45 – 12:15	Hands-on experience: Analysis of digital microstructures using DP_MICRESS (needs free software to be installed)	G. J. Schmitz
12:15 – 12:45	Hands-on experience: Generation of digital microstructures using Dream3D (needs free software to be installed)	G. J. Schmitz
12:45 - 13:00	open discussion	
13:00 - 14:00	Lunch break	
14:00 – 15:00	Modern methods of microstructure analysis for Al alloys and light metals	M. Mathes E. Schaberger-Zimmermann
15:00 - 15:30	Hands on experience: Examples of microstructure analysis	M. Mathes E. Schaberger-Zimmermann
15:30 – 16:15	New ultrasonic detector for the quality assessment of aluminum melts	F. Feikus
16:15 – 16:45	Conclusions and Coffee break	A. Bührig-Polaczek
	Optional LabTour GI/ACCESS	