QUALITY CONTROL FOR ADDITIVE MANUFACTURING

Monday January 23rd 2017

08:15-09:00	Registration & Refreshments
09:00-09:15	Welcome Talk: Ken Young, Executive Director, MTC, UK Richard Leach, University of Nottingham, UK
09:15-09:45	Keynote 1: Development of the UK strategy for additive manufacturing by Phill Dickens (Professor of Manufacturing Technology), The University of Nottingham, UK
09:45-10:15	**Session 1 Dimensional metrology & NDT – state-of-the-art review** "Dimensional metrology & NDT for additive manufacturing" by Filippo Zanini, University of Padua, IT
10:15-10:45	**Coffee & networking in exhibition area**
	Session 1 Dimensional metrology & NDT
10:45-11:05	"Non-destructive volumetric control of additive manufactured parts: alternatives methods to X-ray tomography" by Anne-Françoise Obaton, Laboratoire National de Métrologie et d'Essais (LNE), FR
11:05-11:25	"Geometric shape deformation control for additive manufacturing" by Q. Sean Huang, Epstein Department of Industrial and Systems Engineering, University of Southern California, US
11:25-11:45	"A Renishaw solution-approach to AM part quality" by Michael McClelland, Renishaw, UK
11:45-12:05	"A non-contact, information-rich, fast strategy for complex form measurement" by Petros Stavroulakis, Patrick Bointon, Nicholas Southon, Richard Leach, Manufacturing Metrology Team, The University of Nottingham, UK
12:05-12:25	'Simultaneous integrity & dimensional CT inspection' by Nick Brierley, NDT Team, MTC, UK
12:30-13:30	**Lunch**

	Commercial Session 13:30-13:35 Alicona 13:35-13.40 Lambda Photometrics 13:40-13:45 Olympus 13:45-13:50 Added Scientific 13:50-13:55 Zeiss 13:55-14:00 Renishaw 14:00-14:05 HiETA Technologies
14:05-14:35	**Session 2 Surface metrology – state-of-the-art review** "State-of-the-art in surface metrology for additive manufacturing", by Nicola Senin, Manufacturing Metrology Team, The University of Nottingham, UK
	Session 2 Surface Metrology
14:35-14:55	"A fresh approach to surface metrology for additive manufacture", by Adam Thompson, Nicola Senin, Lewis Newton, Carlos Gomez, Richard Leach, Manufacturing Metrology Team, The University of Nottingham, UK
14:55-15:15	"Extracting surface topography data of AM parts from computer tomography systems" by Liam Blunt, University of Huddersfield, UK
15:15-15:30	**Coffee & networking in exhibition area**
15:30-15:50	"Characterization of laser powder-bed fusion processes via in-process and post-process measurements" by John Ziegert, Bin Zhang, Zachary Reese, Angela Davies, Chris Evans, UNCC, US
15:50-16:10	"Effects of build angle and processing on surface measurements", by Bethan Smith, Lewis Newton and Evangelos Chatzivagiannis, NDT and AM teams, MTC and The University of Nottingham, UK
16:10-16:30	"Precision for additive metal manufacturing (PAM^2)" by Ann Witvrouw, KU Leuven, BE
16:30-18:00	**Tour**
18:15-21:00	**Dinner @ MTC**

Tuesday January 24th 2017

08:30-09:00	Keynote 2: From powder to part – why AM needs a TQM system from starting material to built component by Dr Rob Deffley, LPW Technology Ltd
09:00-09:30	**Session 3 In-process metrology & NDT – state-of-the-art review** "Technology landscape for in-process NDT for additive manufacturing" by Ben Dutton, Sarah Everton and Mohd Rosli, NDT team, MTC and The University of Nottingham, UK
	Session 3 In-process metrology & NDT
09:30-09:50	"Approaches for AM in-process inspection using SRAS and OCT", by Adam Clare, Advanced Component Engineering Laboratory, The University of Nottingham, UK
09:50-10:10	"In-situ monitoring and machine learning" by Iain Todd, Department of Materials Science and Engineering, University of Sheffield, UK
10:10-10:40	**Coffee & networking in exhibition area**
10:40-11:00	"Process control for wire-arc additive manufacturing" by Stephen T Newman, University of Bath, UK
11:00-11:20	"High-speed imaging of the powder-bed and shield gas during metal PBF additive manufacture" by Andrew J. Moore, Heriot-Watt University, UK
11:20-11:40	"Spatio-temporal detection of defects is SLM by using in-situ high-speed vision" by Marco Grasso, Bianca M. Colosimo, Politecnico De Milano, IT
11:40-12:00	"The integration of a vision based in-process inspection system within the CassaMobile project" by Xiaoxiao Han, Loughborough University, UK
12:00-13:30 **(12:30-13:30)**	**Lunch & networking** **(MTC tour)**
13:30-14:00	Keynote 3 "Standards for AM" "Standards landscape for additive manufacturing" by Alex Price, BSI, UK
14:00-15:00	**Session 4: Open forum and discussions** **(including coffee break)**

	Session 4 Metrology for process control
15:00-15:20	"Quality control of metal powders used in powder bed additive layer manufacturing" by Steven Hall and Jason Dawes, Powder Management team, MTC, UK
15:20-15:40	"X-ray tomography for additive manufacturing: from metrology to in situ process control" by Peter D. Lee, Alex C.L. Leung, MXIF, University of Manchester, UK
15:40-16:00	"Feedback control and process monitoring of direct laser deposition" by Mark Ward, University of Birmingham, UK
16:00-16:20	"Qualification of wire + arc additive manufacture: measurement requirements" by Stewart Williams, Welding Science and Engineering, School of Aerospace, Transport and Manufacturing, Cranfield University, UK
16:20-16:40	"Current challenges for AM volume production" by Desi Bacheva, HiETA Technologies Ltd, UK
16:40-16:50	**Closing remarks**

Organising Committee: Professor Richard Leach (University of Nottingham), Dr Peter Woolliams (National Physical Laboratory), Dr Ben Dutton (MTC), Mr Marcus Pont (Domin Fluid Power Ltd).

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Information correct at time of print. May become subject to change