

ANNOUNCING

Design For Additive Manufacturing

5 - 7 December 2018, Melbourne, Australia

Delivered by: Wohlers Associates and RMIT Centre for Additive Manufacturing

Location: Advanced Manufacturing Precinct
RMIT University, 58 Cardigan St, Carlton

Cost: \$ 4,000

You are invited to attend a special three-day course on design for additive manufacturing (DfAM). Topics covered in the training include the consolidation of many parts into one and methods to reduce material and weight, such as topology optimization and lattice/mesh structures. It includes best practices and a wealth of DfAM guidelines. Participants will gain valuable hands-on experience by designing real parts and building them on industrial AM equipment.

Benefits of DfAM

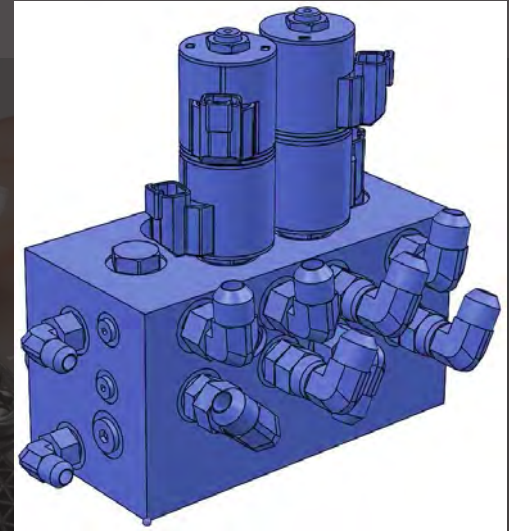
The images show a hydraulic manifold for Atlas Copco mining equipment. The top version is a conventionally machined manifold with 12 nozzles that must be installed. The bottom version was redesigned for and produced by additive manufacturing. The AM version reduced weight by 91% and consolidated 13 parts into one, resulting in lower assembly cost, less weight and scrap, and the elimination of potential leakage points. Learn how to design these and many other types of parts in this special DfAM course.

You will...

- Become familiar with DfAM guidelines and best practices
- Design, redesign, and optimize products
- Use your favorite design software (if you are a CAD user)
- Gain experience with best-in-class DfAM software such as Inspire from solidThinking and the lattice-structure capabilities in Magics from Materialise

Who should attend...

The DfAM course is targeted at designers, engineers, and managers wanting to learn how to design parts that fully benefit from additive manufacturing. It is ideal for those involved in aerospace, medical, motor sports, energy/power, industrial machinery, automotive, and consumer products.



Further information

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Three-Day DfAM Course Outline

Date	Topic	Details
Day 1		
8:30-8:45	Introduction	Introduction to the course and attendees.
8:45-9:30	The state of the AM industry	Recent AM growth trends and developments around the world.
9:30-10:00	Intro to design for AM	Benefits of AM in the context of DfAM, how AM is being applied, and how certain parts can be designed for AM.
10:00-10:15	Break	
10:15-11:00	Intro to design for AM (continued)	Benefits of AM in the context of DfAM, how AM is being applied, and how certain parts can be designed for AM.
11:00-12:00	AM process: from CAD to part	Examining the complete AM process chain, from CAD part creation, to part production. Attendees will gain an understanding of the entire process chain and how it helps them to design better AM parts, file formats, and working with STL manipulation software. Opinions and commentary on the major AM processes, materials, companies, and products.
12:00-12:30	Lunch	
12:30-13:30	AM design optimization exercise	Thought processes behind DfAM. In this exercise, we will design a hydraulic manifold while considering print orientation and support material.
13:30-14:15	Economics of AM	When does it make sense, or not make sense, to use AM for production quantities? What determines AM costs and can we design to minimize cost?
14:15-14:30	Break	
14:30-16:00	Design for mass-customization exercise	Hands-on exercise to design a custom product using a combination of CAD, 3D scanning, and STL editing software. This exercise introduces attendees to the idea of working with multiple software tools and technologies to produce parts optimized for AM.
Day 2		
8:30-9:30	AM process: from CAD to part (continued)	Opinions and commentary on other popular AM processes, materials, companies, and products.
9:30-10:00	Designing for metal AM	Specific issues and guidelines around designing for metal AM, including anisotropy, process constraints, general guidelines related to wall thicknesses, hole sizes, tolerances, angles, etc. Close look at metal AM post-processing and material properties.
10:00-10:15	Break	
10:15-11:00	Designing for metal AM (continued)	Specific issues and guidelines around designing for metal AM, including anisotropy, process constraints, general guidelines related to wall thicknesses, hole sizes, tolerances, angles, etc. Close look at metal AM post-processing and material properties.

11:00-12:00	Lattice structure exercise	A solid part is transformed into a shell filled with a lattice structure.
12:00-12:30	Lunch	
12:30-13:30	Design to reduce residual stress	Redesign of a metal AM part in order to minimize the potential residual stress that would cause distortion
13:30-14:15	Designing for polymer AM processes	Specific issues and design guidelines surrounding polymer AM (material extrusion, LS, SL, etc.), including post-processing.
14:15-14:30	Break	
14:30-16:00	Topology optimization	Designing topology-optimized parts for AM, and creating light-weight parts using software such as Inspire from solidThinking. Workflow of topology optimization, setting up multiple load-cases, and using the generated ideas to produce a final design.
Day 3		
8:30-9:15	Tooling applications of AM	AM beyond direct part production: Tools for injection-molding, sheet-metal forming, cutting and drilling, extrusion, jigs and fixtures, etc. Adding fixtures to parts to ease mounting on CNC machines for more efficient post-processing.
9:15-10:00	Part consolidation exercise	Implications of part consolidation for AM. Hands-on exercises in part consolidation.
10:00-10:15	Break	
10:15-12:00	Putting it all together	Hands-on exercise to design a product that can be printed in metal with minimal support material and post processing. The exercise applies what has been learned over the past three days.
12:00-12:30	Lunch	
12:30-13:30	Expert panel session	DfAM and AM experts offer opinions and answers questions from participants.
13:30-13:45	Break	
13:45-14:30	AM in the future	Looking at where AM and design software tools are headed in the future and the implications they will have on DfAM.
14:30	Conclusion	

