




***NEXT LEVEL
3D-PRINTING***

Workshop Basics and Potentials of Additive Manufacturing in the field of Metal Laser Melting



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»The future – today.«

- Industrial 3D printing offers product developers and engineers creative freedom in dimensions of an unprecedented scale. Design rules specifying conventional manufacturing processes are re-evaluated.
- Functions can be integrated into components and complex geometrics can be prepared which were up to now unthinkable. These can also be produced flexibly in smaller batches.
- The workshop “Basics and Potentials of Additive Manufacturing in the field of Metal Laser Melting” shows participants new ways of overcoming their conventional thinking patterns.
- Innovative approaches are found by freeing your mind from the limits of conventional manufacturing methods.
- The resulting ideas are produced directly and thus implemented in practice. Our SLM systems are available for this purpose.



*»In order to achieve what is right,
you have to address who is right.«*

- The workshop addresses designers and engineers who deal with the conception, design and construction of parts for additive manufacturing as well as persons responsible for processes in manufacturing and quality assurance.
- Basic knowledge of the production process is an advantage in order to use time effectively and for further content.

Added value for participants

- In Module 1, participants will learn to design components in a way that exploits the potential of additive manufacturing. The process of metal laser melting and understanding of the appropriate construction rules are taught using practical examples. Thus, the participants subsequently find themselves in a position to develop components, which can be produced additively and at the same time exploit the peculiarities of the technology in order to gain an advantage over conventional manufacturing processes.
- Within the scope of Module 2, potentials made possible by means of innovation technology in parts range / module environment are developed which are suitable for targeted additive manufacturing. The creativity techniques are not only restricted to additive manufacturing and are therefore a useful tool for development processes.



Special features

- Contents are developed interactively under guidance. Participants are instructed to design and model their own components. Thus, a rethinking of additive manufacturing is achieved and is tested in practice. These new technologies are quickly accessible through direct implementation using the SLM systems.

Scope of services

- Organisational advance information
- Guaranteed implementation of the workshop with a minimum of 4 participants
- On request: hotel reservation
- Including lunch, beverages and snacks
- Production of components using the SLM system within the scope of the workshop

Module 1: Basics of additive manufacturing with the metal laser melting process

The aim of this part of the workshop is to get to know and to understand the basics and processes of additive manufacturing with the metal laser melting process.

Time	Content		
9.00 – 9.30	Welcome and introduction		
9.30 – 10.30	Presentation: MLM in series production M. Timmer, H&H GmbH	- areas of application - quality assurance	- cost situation - visions
10.30 – 11.30	Presentation: Technology and materials n.n.	- state of the art - surfaces	- material properties
11.30 – 12.30	Tour of the production facilities (SLM system)		
12.30 – 13.30	Lunch		

Day 1 / Part 1

Time	Content			
Continuation Module 1				
13.30 – 14.30	Case study: Holder	Case study: Holder	- presentation of component - construction for additive manufacturing - machine start-up	
14.30 – 15.30		Presentation: Topology optimisation S. Kipper, H&H GmbH	- systems - technology - opportunities - costs	
15.30 – 16.30		Presentation: Design guidelines of additive manufacturing M. Timmer, H&H GmbH	- wall thickness - gap dimensions - powder removal - supporting geometry - warping	
16.30 – 17.00		Component analysis	- assessment of the „Holder“ case study	
17.00 – 18.00		Summary of workshop and the results		
			Construction process in SLM system	
				Day 1 / Part 2

Module 2: Potential for additive manufacturing in the target company

The aim of this part of the innovation workshop is to identify existing and possible potential and to evaluate it for use, based on the knowledge gained on the first day on the basics of additive manufacturing with the metal laser melting process.

Time	Content		
8.30 – 9.00	Welcome		Day 2 Part 1
9.00 – 12.30	Creative phase 1: Identification of potential for additive manufacturing in the company Marcus Kühn, Synergy Partner	Task: Joint identification of basic applications of additive manufacturing based on the findings of the first day Methods: Different analysis and creativity techniques such as material, component and process analyses and new brainstorming methods Results: Different areas of application and approaches for the use of additive manufacturing	
12.30 – 13.30	Lunch		

Time	Content		
13.30 – 17.00	Creative phase 2: Review of identified potential for additive manufacturing in the company Marcus Kühn, Synergy Partner	Task: Joint review of identified areas for application and approaches for the use Methods: Different business methods for the evaluation of alternatives with cost-benefit analyses or point rating system, and so on Results: Evaluation of alternatives according to criteria such as implementation duration, benefits, expenses, revenues and costs	Day 2 Part 2
17.00 – 17.30	Summary R. Hoffmann, H&H GmbH	- results - visions - further steps	



Module 3: Development of innovative products by use of additive manufacturing

The aim of this part of the innovation workshop is to build on Modules 1 and 2 and to use the newly acquired knowledge in order to conceptualise new innovative products and concretise these over several phases.

Time	Content	
2 CW	Concept phase	Taking over existing 3D data, design of basic geometry, development of different connection concepts, manufacturing of a component, coordination with fitted parts (circuit boards, connectors, and so on)
2 CW	Revision phase	Introduction of concept solutions in the whole assembly group, FEM - calculations, CFD - calculations, assembly analysis, FMEA, revision of fitted part according to customer requirement
1 CW	Construction of prototype	Preparation of assembly groups or the individual part with additive manufacturing technologies
2 CW	Specification phase	Introduction of optimisation, product-technical itemisation of individual components, DFM

A close-up, high-contrast photograph of a metallic industrial component. The surface is highly textured, showing a fine, granular or crystalline structure. The lighting creates strong highlights and deep shadows, emphasizing the three-dimensional form and the intricate details of the material's surface. The background is a soft, out-of-focus grey, making the metallic part stand out prominently. The overall aesthetic is industrial and technical.

DMRC
DIRECT MANUFACTURING RESEARCH CENTER

FURTHER INFORMATION ON THE WORKSHOP

Duration:	2 days (Module 3 is offered as an option, based on the 2-day Modules 1 and 2)
Training level:	for beginners and intermediates, basic knowledge of additive manufacturing is an advantage
Size of workshop:	maximum of 6 participants
Place and date:	Dates and venues to be agreed
Times of workshop:	08.00 – 18.00
Package price:	Module 1 + Module 2: € 9800 plus VAT. Module 3: by arrangement



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H&H Gesellschaft für Engineering und Prototypenbau mbH
Gewerbestraße 11 · 33818 Leopoldshöhe
Tel. +49 (52 02) 98 76-0 · Fax +49 (52 02) 98 76-510

Große Bleichen 34 · 20354 Hamburg
Tel. +49 (40) 3 49 62 98-10 · Fax +49 (40) 3 49 62 98-15

Munich Office

Mrs Tanja Lohse · Tel. +49 (174) 335 37 21 · t.lohse@huh.de

info@huh.de

www.huh.de