+ CONSULTATION + TRAINING + SIEMENS NX + MACHINERY + PERIPHERAL SYSTEMS + VR PLATFORM VIA +

AMbitious
POWERED BY toolcraft

ADDITIVE MANUFACTURING

Solutions for the complexity of AM

Additive Manufacturing

Robotics

Machining

Injection Moulding & Mould Making

>>> 2019 AMbitious powered by toolcraft

Additive Manufacturing

Additive manufacturing has developed rapidly in recent years and is increasingly being used in regulated industries. Take advantage of the enormous potential of AM – and discover how this technology can sustainably transform your production.

Applications and benefits of AM

Lightweight design

Repairs

Complexity

Hybrid manufacturing

Coating

Material management

Templates and clamping devices

Customization

Porous structures

Functional integration

Joining processes

Spare parts management

AMbitious powered by toolcraft

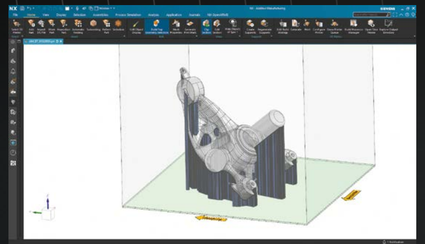
Since 2011, toolcraft AG has been using additive manufacturing processes to produce high-end precision components. The AMbitious business unit brings together this extensive practical expertise. No matter where you are on your journey – we accompany you on your path to becoming an AM expert – worldwide.

Our portfolio

Professional Consultation & Training

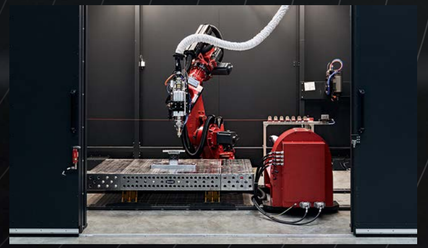
>>> page 6

Siemens NX



>>> page 10

Machinery & Peripheral Systems



>>> page 14

VR Platform VIA

>>> page 26

Consultation & Training

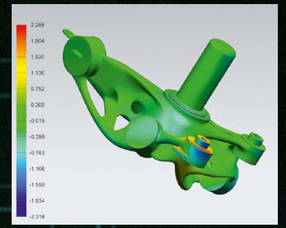
AMbitious provides fast, effective, and cost-efficient knowledge transfer. Wherever you are on your journey – choose your own starting point and pathway to becoming an AM expert.

Machine Park

Safety at work

Parameter development

Design for AM



Simulation

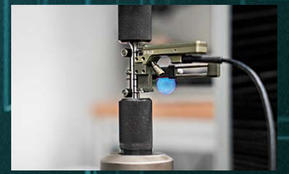
Post-Process

Certification

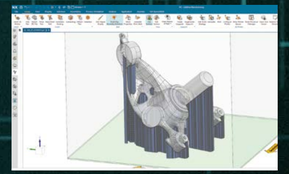
AM-optimized facility planning

Personnel qualification

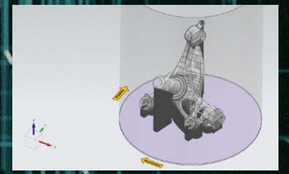
Powder and process qualification



Software



Build job preparation



Machine operation

Quality assurance

References

"The seminar provided a very practical, complete overview of additive manufacturing."

Johannes Pfeiffer, Northrop Grumman LITEF GmbH

"We found the broad overview of the various AM processes and the information on how to design components for AM incredibly useful."

MBDA Deutschland GmbH

"The training course provided us with a good overview of the various AM processes as well as an in-depth look at the process chain"

Toni Zipfel, Faurecia Clean Mobility

"Although I have been printing with metal powders for some time, the course helped me understand the underlying process and improve my skills. I would recommend the course to anyone interested in metal printing, whether they have prior knowledge or not."

Tobias Wühr, Siemens AG

AMbitious

"The course answered our questions about the technology's limitations and which factors influence the process."

Dr. Christian Potzernheim-Zenkel, voestalpine Metal Forming GmbH

"The training was extremely practice-oriented and particularly impressive due to the open exchange with the trainer. It was clear how much know-how and experience went into it."

Florian Rudolph, WITTENSTEIN cyber motor GmbH

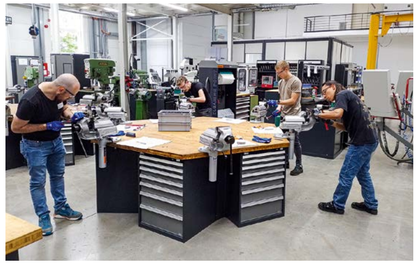
CHAMBER OF COMMERCE AND INDUSTRY (IHK) CERTIFIED TRAINING COURSE

"Industry specialist in additive manufacturing (IHK)"

Industriefachkraft für Additive Fertigung (IHK)

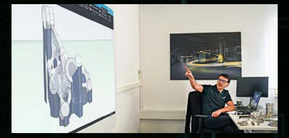
SKZ CERTIFIED TRAINING COURSE

"Industrial Technician in additive manufacturing (IHK)"



Siemens NX

As a Siemens NX Expert Partner, AMbitious has hands-on expertise with the software. Since 2017, toolcraft has been using NX in real-world production – from design and additive manufacturing to fully qualified end products.
The advantage: we know which features truly make a difference, how to streamline workflows, and where efficiency can be increased.



Software Training

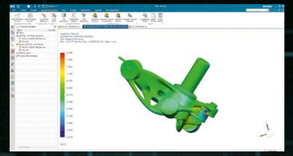
Software Partner
Sell
SILVER EXPERT

SIEMENS

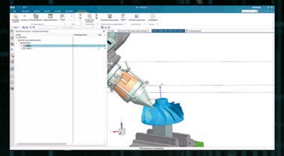
Software Reseller

NX in AM

CAD



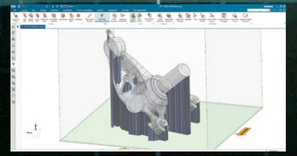
Simulation



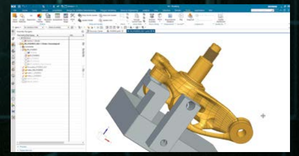
AM: LMD/DED – axis- and robot-guided

Topology optimization

AM: Powder bed



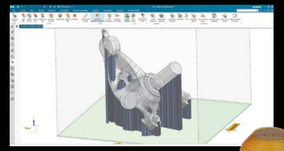
CAM



Powder bed process

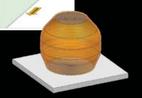
The "Fixed Plane Advanced" module can be used for manufacturing on fixed planes (e.g. powder bed, jetting). It combines fundamental CAD functions with add-ons for additive manufacturing.

+ Orientation in the build space
+ Support structure generation
+ Data slicing for the AM machine
+ Solid modelling
+ 3D nesting
+ Fundamental free-form modelling
+ Assembly modelling
+ Facet processing



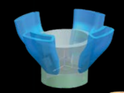
Multi-Axis Deposition

The Multi-Axis basic module covers AM-specific multi-axis CAM operations that can be both axis and robot controlled.

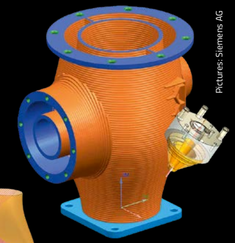


Planar

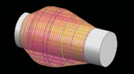
Freeform



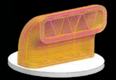
Merging



Pictures: Siemens AG



Rotary



Tubing

Coating

Siemens NX covers the entire process chain (CAD, CAE, and CAM):

Generative Engineering

Design for AM

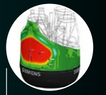
AM Design Validation

Build Preparation

Simulation

Post Processing

Scheduling & Execution



Quality Assurance

Siemens NX also covers the complete process chain for application technologies:

Component Design

Validation

Manufacturing Preparation

Multi-Axis Deposition

Hybrid Manufacturing

Machine Simulation

Process Monitoring

Quality Assurance

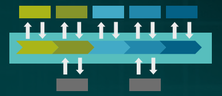
Siemens NX

Siemens NX solves the problem of having multiple interfaces, while making significant time and cost savings. Using this consistent software solution results in savings of up to 25 % or more across the entire manufacturing process. Retrospective changes to the product development process can even reduce the additional time and costs involved by up to 90 %.

Benefits of Siemens NX

DIGITAL TWIN

CONSISTENT PROCESS CHAIN – MODULAR, OPEN & INTEGRATED



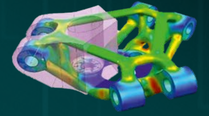
END-TO-END SOLUTION

100 % FEWER INTERFACES

ASSOCIATIVE DESIGN CHANGES

MULTIDISCIPLINARY AND GENERATIVE ENGINEERING

SIMULATION-DRIVEN DESIGN AND MANUFACTURING



> 25 % TIME SAVINGS & INCREASED STAFF EFFICIENCY

References

"We were especially impressed by how the entire workflow was demonstrated in accordance with our needs."

Gregor Stichel, KOBRA Formen GmbH

"The Siemens NX course content was taught expertly and clearly."

Steffen Schlothauer, MTU Aero Engines

"The training on the Siemens NX Multi-Axis Deposition module gave me valuable advice and tips on how to use the various operations for specific tool paths and post-processors."

Daniela Haubold, Reintjes GmbH

"The training courses on Siemens NX were an excellent mix of theory and practice."

Thomas Sedlmaier, OHB System AG

"AMbitious offers us a partnership on equal terms, practical expertise, fast response times, and customized training."

Jörg Willmann, Additive Willmann

Machinery & Peripheral Systems

AM is a complex process. And complex processes require perfectly coordinated solutions. Since 2011, toolcraft has been gaining valuable experience in daily operations and developing products that prove themselves in practice. Our machines and peripherals are successfully used every day – and are also available to you. This way, you can tackle your individual challenges with solutions that make a real difference.

Our portfolio

Build plate transport

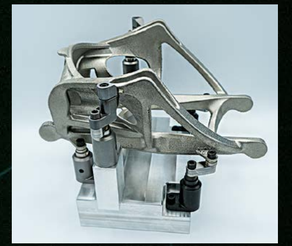
Setup

Powder sampling

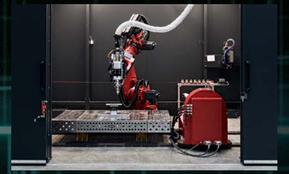
Visual inspection

SUPPORTBLASTER 320-HA >>> page 16

AM-specific clamping concept >>> page 20



Robot cells >>> page 22



SUPPORTBLASTER 320-HA

Our innovative dry ice-based blasting process removes support structures from additively manufactured metal components quickly, reliably, and efficiently. This optimises your processes and sets new standards in terms of the quality and speed of finishing.

+ Consistently precise + Faster + Safer + More ergonomic support removal
+ No bottlenecks + Scalability + Faster processing and delivery times

Setup

Blasting process

Finished component

Technical Data SupportBlaster 320-HA

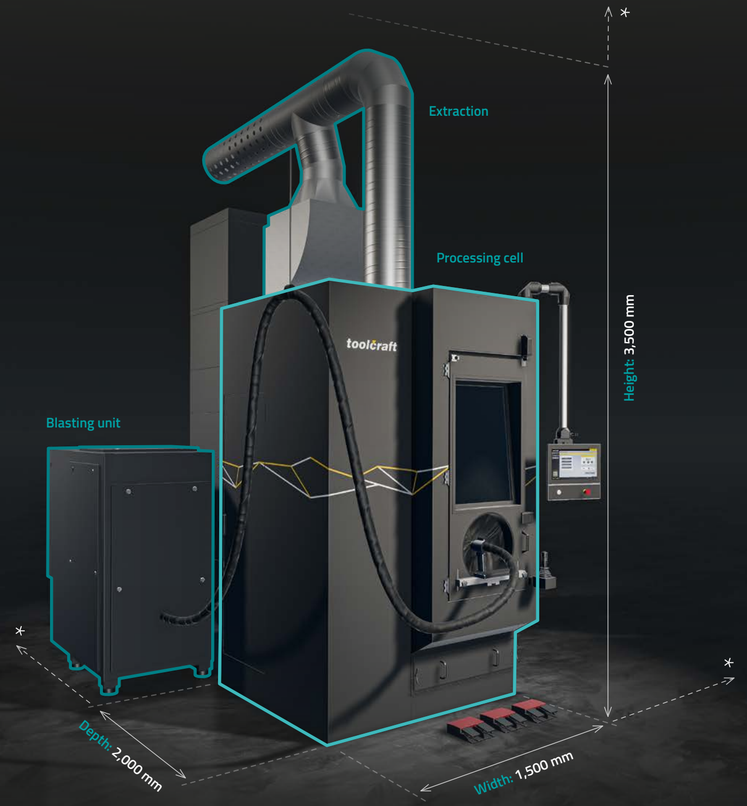
+ Maximum swivel range in Z-axis: 320 mm
+ Clamping surface: 280 mm diameter (variably adjustable)
+ Rotary-tilt table: endlessly rotatable and swivelling, height-adjustable, load capacity: ~20 kg
+ Optional with pelletizer and training

Flexible single-part & series production

+ Intuitive user interface
+ Teach-in function for process automation
+ Full automation is possible through robot integration

Safety at work & ergonomics

+ Ergonomic operation
+ Closed working chamber with extraction
+ Significantly less physical strain compared with conventional methods



* These are standard dimensions and can be customized as required.

SUPPORTBLASTER 320-HA

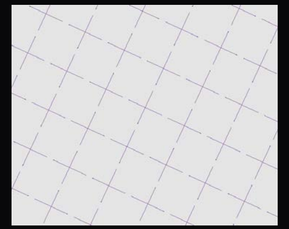
Our unique support removal process uses highly accelerated dry ice in pellet form. The support structures are detached by the impact directly at the connection area.

+ No surface abrasion + No dry ice or powder residues

Factors affecting removability
+ Support-to-part connection
+ Support parameters
+ Material

Processable materials:
+ Aluminum
+ Titanium
+ Stainless steel
+ Nickel-based alloys

Other materials available on request



Raw material:
Dry ice in pellet form.
Available from suppliers or through self-production.

AM CLAMP PRO

Due to delicate and complex geometries, as well as process-related distortions, additively manufactured components generally cannot be clamped using conventional fixtures. Furthermore, in-house manufacturing of tailored fixtures is time- and cost-intensive. With AM CLAMP PRO, you rely on a solution that combines precision, flexibility, and efficiency. Our experts support you during initial setups, evaluate strategies, and assist in optimizing for smooth integration into your production.

Flexible & Modular

With our basic clamping system composed of modular fixtures and a CAD data library, components of various geometries can be optimally clamped.

Precise & Stress-Free

Fixed clamping points combined with flexible compensation elements ensure maximum accuracy without unwanted deformation.

Strategic & Trained

Targeted training for clamping additively manufactured components – including strategies to consider the later clamping setup already during design.

Basic clamping equipment – Part 1 and 2

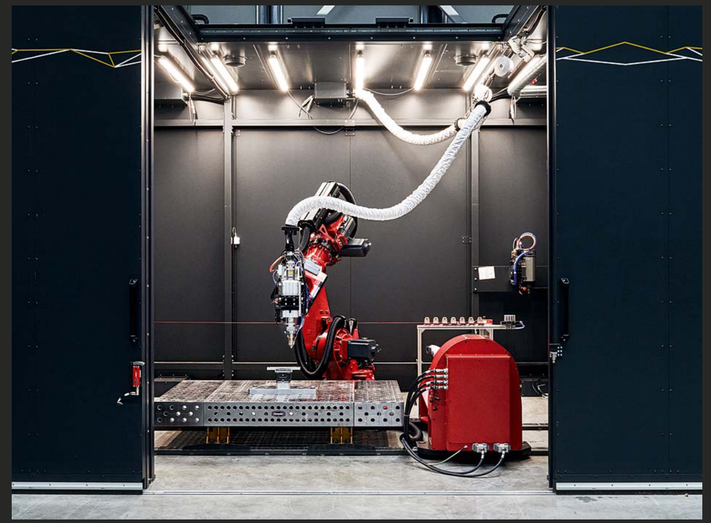
Complex geometry

Tailored clamping concept using modular individual elements

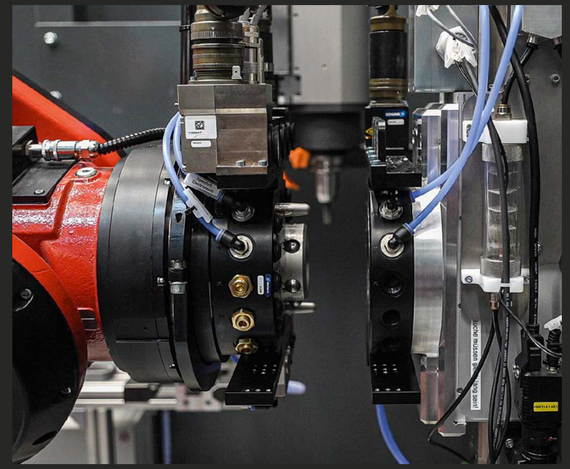
Clamped part ready for CNC machining

Robot cells

No matter what application you have in mind, we develop the right robot cell for you. From powder- and wire-based DED, laser or arc processes, to milling applications – we support you from the initial concept all the way to a CE-compliant, turnkey system.

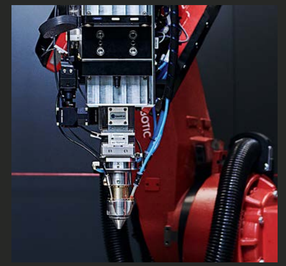


Automation Meets Innovation

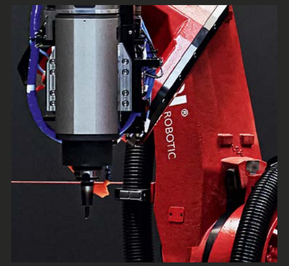


+ Complex applications – additive manufacturing, machining, or automation
+ Comprehensive solutions for both equipment and process – all from a single source
+ Seamlessly integrated and optimally coordinated

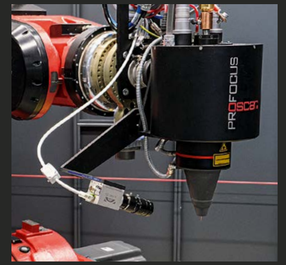
DED-p
(Directed Energy Deposition with powder)



Milling applications
(many other applications possible)



DED-w
(Directed Energy Deposition with wire)



WAAM
(Wire Arc Additive Manufacturing)

Project: Hybrid Robotic Cell DED-w + Milling

Combination of additive and subtractive processes

Robot
+ 6-axis robot with 2.25 m reach
+ 100 kg payload

Adaptive spindle
+ Spindle interface: HSK63
+ Spindle speed: 16,000 rpm
+ Max. torque: 59 Nm

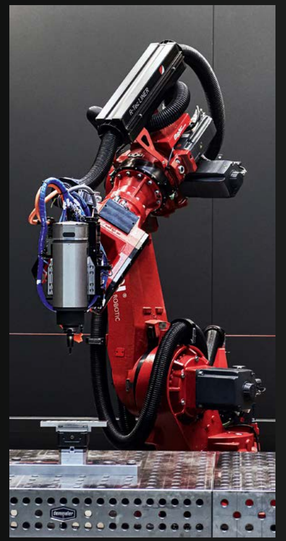
Adaptive laser head
+ 2 kW infrared laser source (direct diode)
+ Metal wire (aluminum, steel, stainless steel, titanium)
+ Expandable to metal powder
+ Deposition rate up to approx. 2 kg/hour

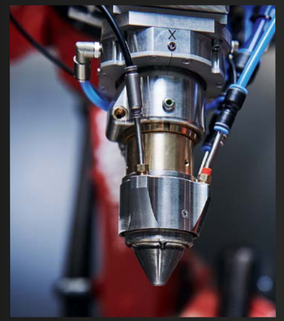
Rotary-tilt table
+ Load capacity: 500 kg
+ Clamping diameter: Ø 600 mm

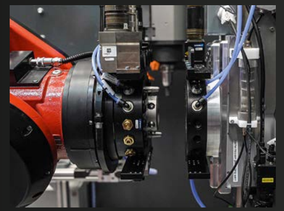
Complete system
+ Automatic quick-change system for spindle and welding head
+ 8 axes in simultaneous operation
+ Laser-safe system enclosure
+ Integrated extraction system for welding fumes
+ Tool changer for milling spindle
+ Working area: 1,000 x 1,000 x 1,000 mm

Further Applications

Hybrid Robot Cell DED-p + Milling







Aluminum roughing operations in milling

Milling of foam materials
+ Automated series production
+ 7-axis simultaneous milling
+ Efficient process with consistent quality

VR Platform VIA

VIA (short for Virtual Innovation Area) is a digital solution that makes the world of Additive Manufacturing and smart industrial processes come to life – digital, interactive, and as an add-on virtual via VR headset.
The app can be used both as a marketing and sales tool (VIA Industry) and for education and training (VIA Academy).

What makes the VIA platform unique?

Modular & Scalable
+ Content can be easily adapted, expanded, and reconfigured

Multilingual & Cloud-based
+ Content, user licenses, and updates are centrally managed

VR Experience
+ Immersive, interactive simulations can be experienced in VR

Desktop Version
+ Content is also available on desktop without VR hardware

Engagement
+ Leave a lasting impression

Infrastructure
+ The app infrastructure and core elements are already in place – your content can be seamlessly integrated

VIA Industry

VIA Academy

Interactive digital twin of the hybrid DED-p + Milling robot cell

VIA Industry

Are your systems too large for exhibitions?
Or is your complex process difficult to explain?
With VIA Industry, the invisible becomes visible. Visualize your products or applications digitally – ideal for sales, marketing, and customer presentations.

Your benefits

+ Impressive presentations of your systems and processes
+ No logistics required for large systems at trade shows
+ Co-marketing in VIA Academy for approved content
+ Can be combined with live demonstrations – as a digital amplifier
+ Optional as VR experience – for maximum fascination

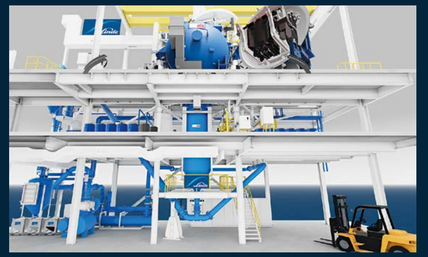
VIA Industry

System visualization

Process simulation & co-marketing

VR experience

References



Linde AMT GmbH

> "Metal powder itself may not look spectacular – but the technology behind its production is truly impressive. VIA allows us to visualize this complex process and bring it to life in virtual reality – a highlight that draws attention and sparks expert dialogue."
>
> *Sandy Sirotic*
> *Linde AMT GmbH*

VIA Academy

Whether at a technical university, university of applied sciences, vocational school, or OEM training center – VIA Academy offers didactically structured learning units covering the entire operational process chain in additive manufacturing.

Your benefits

+ Interactive content for modern learning
+ Easy integration into teaching environments
+ Motivation and engagement through gamification approaches
+ Location- and time-independent learning – also suitable for self-study
+ Always up to date – content can be flexibly expanded
+ Optional: Virtual learning environment for realistic experiences

VIA Academy

Modern learning

Interactive content

Various learning modules

References

TH Rosenheim

"A particular concern of mine is providing our students with practical and future-oriented training. For me, VR is not a gimmick but a forward-looking tool for modern engineering education. VIA is a valuable complement to our hands-on teaching. It allows us to demonstrate complex processes, identify individual errors, provide targeted feedback, and at the same time make resource use in the laboratories more efficient."

Prof. Dr.-Ing. Fabian Riß, Faculty of Engineering, Technical University of Rosenheim, Focus: Lightweight Design and Additive Manufacturing

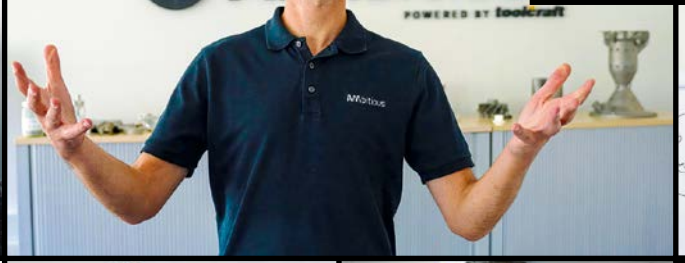
Technische Hochschule Rosenheim

AMbitious
POWERED BY toolcraft

















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