

all in

“all in” at ACTech means: having all, mastering all, giving all, maintaining all. That’s why we have always relied on in-house solutions. All casting and CNC machining processes related to rapid prototyping are carried out in-house, right up to the ready-to-install part. Our “all in” concept is the basis for our practice of controlling all production processes ourselves and for our

ability to realize extremely fast cycle times. This makes us more independent, more reliable and faster than others. Ultimately, it is this concept in combination with our experience from more than 25,000 different prototyping projects that convinces our customers to go “all in” with us time and again.



all in

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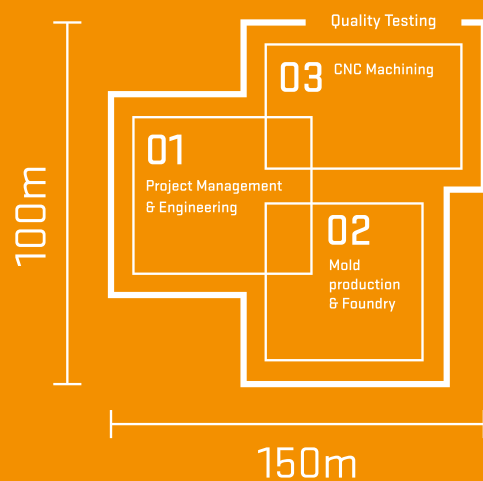


RAPIDEST PROTOTYPING.all in



WELCOME TO THE FRONT-RUNNER.

Since 1995, we have been continually setting new standards for rapid prototype production in terms of both quality and speed. Employing innovative methods and technologies partially developed in-house, in conjunction with complete in-house management of processes and perfectly organized workflows. The results are high-precision, finished ready-to-install casting prototypes, produced in record time. Our customers around the globe, especially in the automotive, engineering and aerospace sectors, place great value on our technological advances and reliability. Speed is one reason our customers keep going “all in” with us.



POSSIBILITIES UNLTD. all in

IT'S IN THE NATURE OF PROTOTYPING.

Every part we manufacture is special. This also means that every part is innovative and presents technological challenges. Our all-in concept enables us to explore all the ways of overcoming these challenges, without the need for experimentation or external supplier involvement. That is why we constantly invest in know-how and technology.

Almost 400 employees work in shifts to provide meticulous and perfectly organised consultancy, preparation, production and quality assurance services.

Our wide variety of techniques means we can manufacture highly complex casting moulds incredibly quickly. We cast in all standard metals and alloys, and have access to 16 different CNC centres for finishing. By continually monitoring all processes we ensure that quality standards are met, just as they would be for batch production.

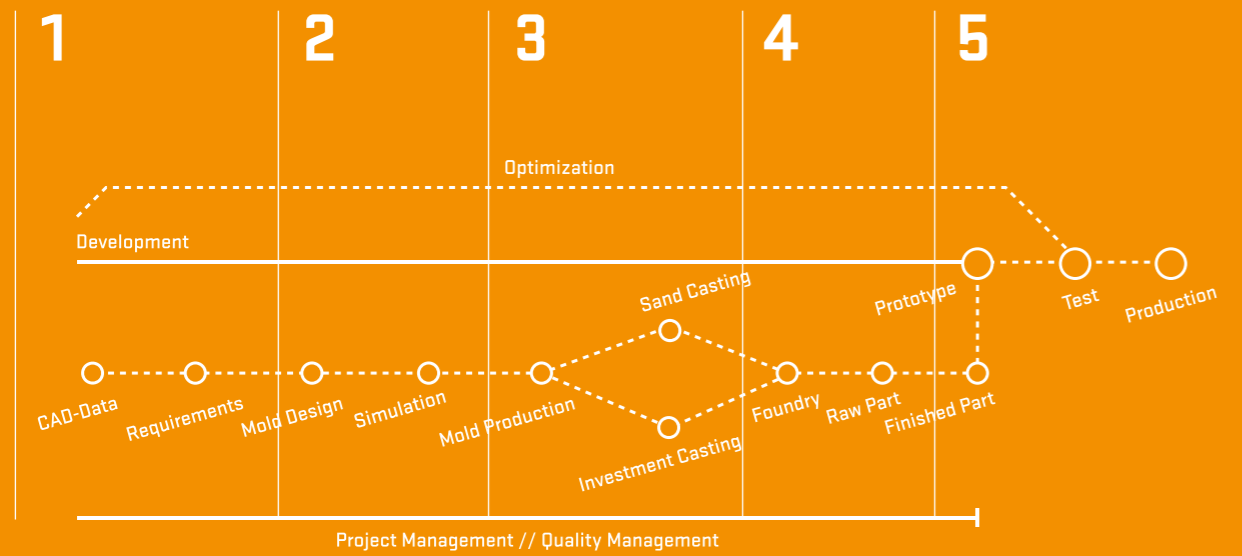
The wide range of projects we have completed in 20 years of prototype production is another reason our customers keep going "all in" with us.



Customer

Development Optimization

ACTECH PROCESS



ACTech

To choose the right casting technology we need the following information:

CAD-Data

Requirements

- Quantity of parts
- Material specification
- Necessary tests
- CNC machining information
- Desired delivery schedule

Project Management Quality Management

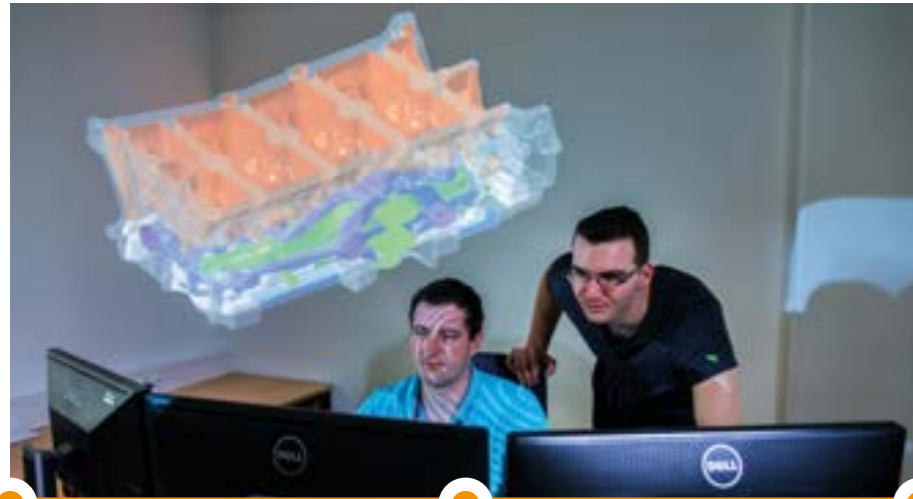
LEAD PROJECT MANAGER

- Responsible for all internal and external communication
- Coordinates work of the foundry project managers and the machining project manager
- Provides technical customer service for key accounts or special projects only

Development Optimization

FILE FORMATS

- CATIA
- ProE
- Siemens NX
- GeoMagic
- 3Dvolution
- Creo
- Magics



Mold Design

- Mold design depending on customers requirements, quantity and used Rapid Prototyping techniques
- Raw part design, adding machining allowance, design of the prepared feeding and gating system
- Define the split lines for mold segmentation and necessary cores, cores fitted with core prints for mold assembly
- Mold segments and cores are fitted with interlocks

Simulation

- Requested by customer
- ANSYS, PROCast
- Mold filling and solidification simulation (PROCast)
- Prediction of possible casting defects and optimization of casting technology

Mold Production

In deciding which is the most appropriate technology to use, ACTech calls on the experience gained from over 25,000 different castings, together with all existing technologies for mold production.

Project Management Quality Management

MACHINING PROJECT MANAGER

- Specialized in applications only, independent of markets or technology
- Responsible for manufacturing details of machining

Mold Production and Sand Casting

- 3D phenolic resin printing
- 3D furan resin printing
- DMM® - Direct mold milling
- Laser-Sintering of sand molds
- CNC milled pattern

3D PHENOLIC RESIN PRINTING

- Build volume: 800 x 500 x 400 mm
- Cold-Hardening Phenol Binder Process (CHP)
- Fragile cores and mold segments with higher strength
- Core structures with a high level of complexity
- Manufacturing of mold parts without any post treatment
- Simple Post Processing

3D FURAN RESIN PRINTING

- Build volume: 1,800 x 1,000 x 700 mm
- Continuous manufacturing process
- Efficient manufacturing of medium sized mold segments and cores

DMM® - DIRECT MOLD MILLING

- Mold segments up to 2,400 x 1,400 x 800 mm
- Larger molds available by segmentation
- Standard sandcasting alloys can be poured
- Very large molds are also available within a few hours



LASER SINTERING OF SAND MOLDS

- Build volume: 720 x 360 x 360 mm
- Complex core packages with the lowest tolerances per piece
- Highest strength for complex and fragile cores

PLASTER MOLD PROCESS

- Efficient manufacturing of aluminium castings
- Smooth surface finish

Mold Production Investment Casting

- Plaster Mold Process
- Ceramic Shell Process

CERAMIC SHELL PROCESS

- Accelerated production of ceramic shell
- Improved mechanical properties in aluminium alloys due to a patented chilling process
- Ceramic shell is also suitable for iron, steel and nickel-base alloys



FOUNDRY PROJECT MANAGER

- Specialized in casting techniques, applications and materials
- Responsible for raw part production details

Development Optimization

.... Test



- Aluminium
- Grey iron
- Ductile iron
- Compacted graphite iron
- Alloyed and high alloyed steel
- Customer alloys



Mold Assembly

- Monitor the mold assembly process with tactile and optical measuring technique for tight tolerances
- Data mining for later non-destructive tests and machining setup

Foundry

- Patented Cooling method for mechanical properties comparable to series part characteristics
- Vacuum supported pouring technology for thin wall thicknesses
- 850 kg melting capacity for aluminum
- 500 kg melting capacity for iron and steel alloys

Raw Part Treatment and Inspection

- Various heat treatment processes
- Optical measurement vs CAD-data set
- Tightness testing, crack detection, Fluoroscopy
- X-ray inspection (160 kV device, radioscapy)
- Visual inspection and endoscopy from 2 mm diameter
- Ultrasonic thickness gauge
- Surface treatment requested by customer

CNC Machining

- CAM programming with Tebis and TopSolid
- VERICUT machining simulation
- Alignment with live optical measurement raw part data vs 3D-CAD-data
- Complete external machining setup with the help of tool presetter with online data transfer and shuttle table systems
- 5-axis simultaneous technology
- Mill/turn and turn/mill- technology up to 1,500 mm table size available

Finished Part Inspection

- In-Process measurement technology
- Quality testing with 3D coordinate measurement
- Quality check with contour and roughness measurement
- Tightness testing and assembly
- Final quality check and report

Ready to install prototype



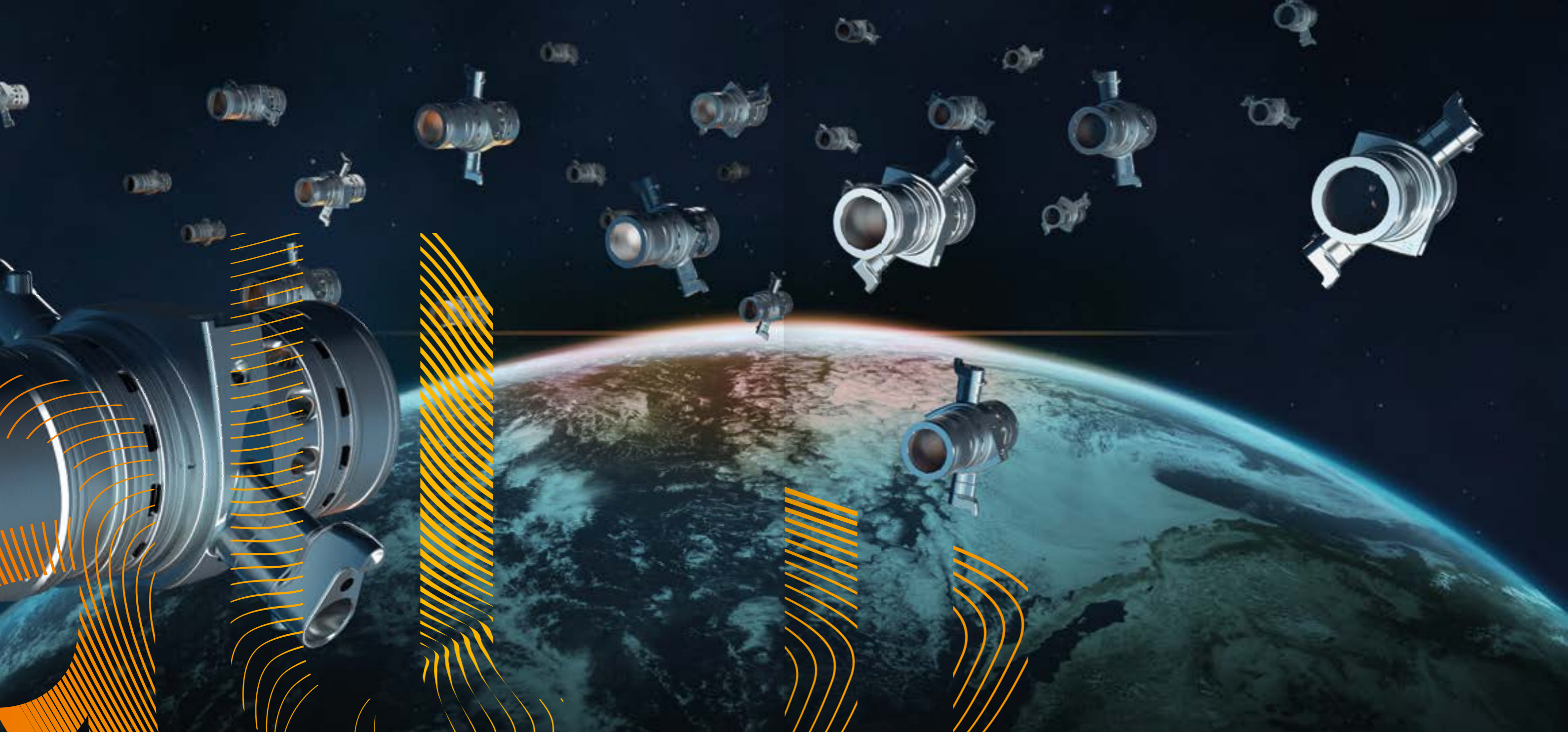


HIGH SPEED WORKFLOW. all in

"I NEED A PERFECT, READY-TO-INSTALL PROTOTYPE, QUICKLY. PREFERABLY YESTERDAY!"

However, because our mission never changes, our factory is changing all the time. We undertake regular inspections of new technologies and equipment. We are constantly optimizing our work flows to achieve the highest quality and the best use of time. How and using what methods can we speed up proto-

type manufacturing? What tools and strategies can we use to further reduce throughput times? How can we best support our customers? We regularly find answers to questions like these and implement the appropriate solutions. Our effectiveness is another reason our customers keep going "all in" with us.



MUCH IS POSSIBLE WITH RAPID PROTOTYPING ...

... but we think that a prototype is only a prototype if it performs so similarly to a batch-produced component that it enables decisions to be made about future batch production. We document all manufacturing processes and measured values and are happy to make these available to our customers. As a result, as well

as a fully installation-ready prototype, you also receive valuable information and advice for planning, optimizing and preparing future batch production. Our quality and service are reasons why our customers keep going "all in" with us.

THE 1ST LIKE THOUSANDS. all in

NO RISK STRATEGY. all in

WE ALSO HAVE SOMETHING ELSE IN COMMON WITH OUR CUSTOMERS:

We can put up with a lot, but we don't tolerate delays or mistakes. Our "all in" concept provides you with:

- Responses to enquiries within 24 hours, including a binding quote and the shortest possible delivery time
- In-house project management, construction, mould production, casting and CNC machining

- Data security audited by our customers
- Certified in-house quality assurance and inspection
- Punctual delivery of ready-to-install prototypes

Security is another reason our customers keep going "all in" with us.

**WORLDWIDE
BUT ALWAYS
PERSONALLY.** all in



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Cylinder block



Rear axle transmission



Wheel carrier



Turbine housing



Compressor housing



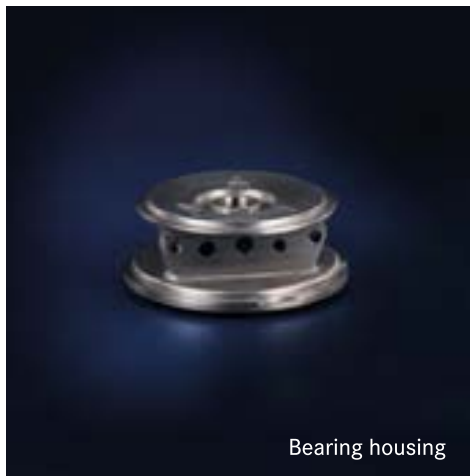
Cylinder head with integrated collector



Compressor wheel



Single cylinder head



Bearing housing



Exhaust manifold with integrated turbine housing