



+GF+

GF Machining Solutions

# **Digitalization and Intelligent Manufacturing**

Pascal Boillat, President GF Machining Solutions  
Capital Market Day 2019

# Review Technology Day 2016: Since 2016, we have invested in our Laser technologies ...



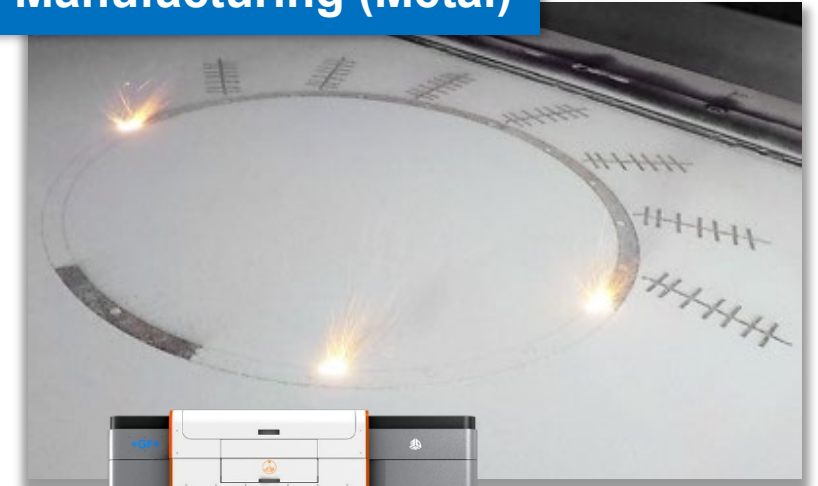
## Laser Texturing



## Laser Micromachining / Drilling



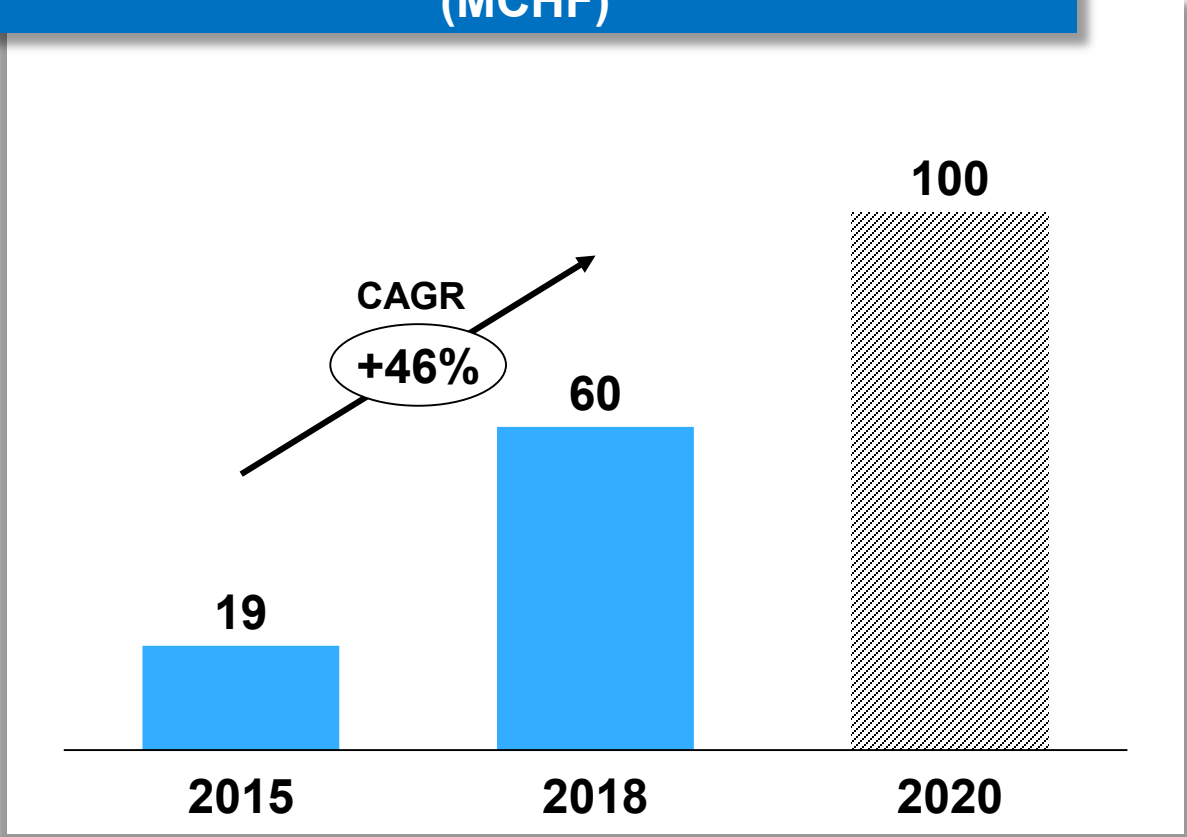
## Laser Additive Manufacturing (Metal)



... and we are well on track to reach our 2020 target



**GFMS Sales of Advanced Laser Technologies  
(MCHF)**



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# Key Market Trends

# Several trends are driving changes in our industry



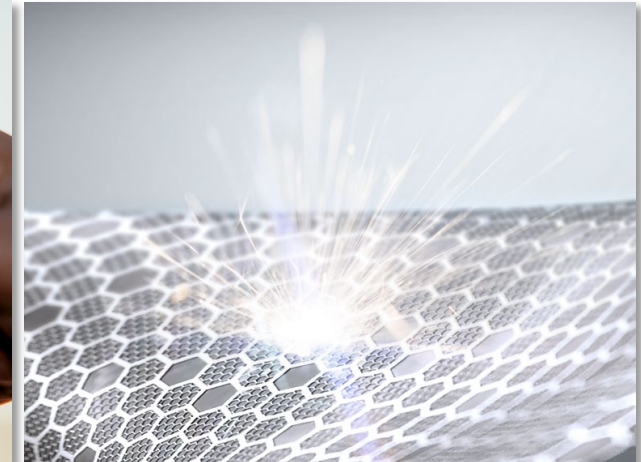
**New Performances**



**Miniaturization**



**Digitalization**



**Cleaner Processes**

# Sustainability is a growing focus for us and the market **+GF+**

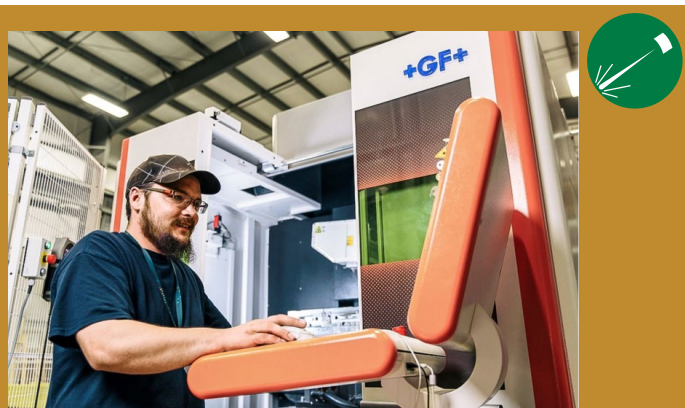


GF Machining Solutions strives to:

**Making high-precision machines highly energy efficient**



Industry, Innovation and Infrastructure



Responsible Consumption and Production



Climate Action

# New technologies are gaining strong momentum



**Additive Manufacturing**



**Intelligent Manufacturing**



**New Materials**



**Ultra Precision**

**Focus Capital Market Day 2019**

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# Focus on Additive and Intelligent Manufacturing



# Additive Manufacturing has been expanding its range of applications and growing fast

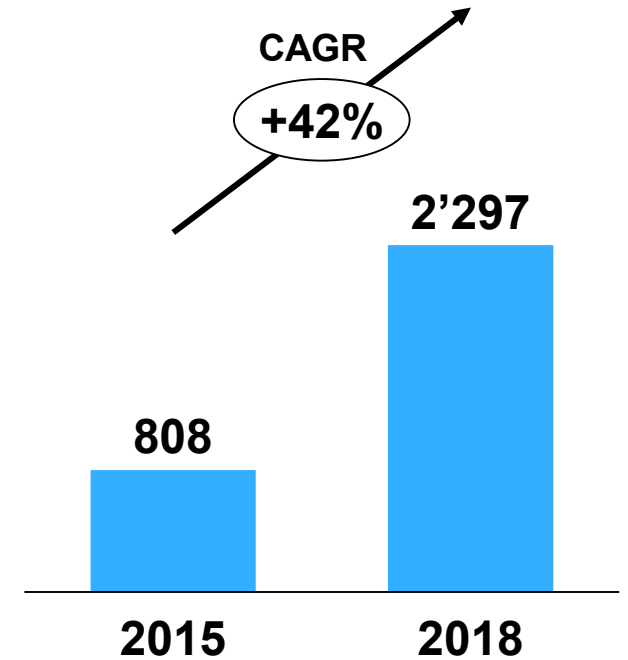


## Aerospace & Automotive



## Medical

## Machines\* sold (units per year)

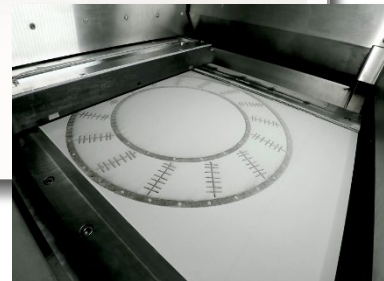


Notes: \*Global Market for Metal Additive Machines  
Source: Wohlers Associates

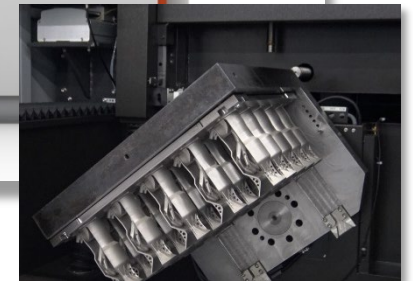
# We developed a modular concept for easier factory automation as well as dedicated post processing solutions



DMP Factory 500



CUT AM 500



# We are uniquely positioned along the value chain



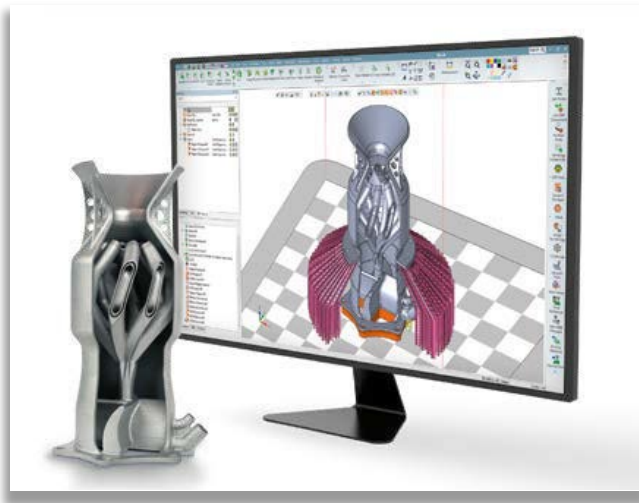
**Design, Prototyping,  
Certification, Production**



**Additive Manufacturing  
Machines**



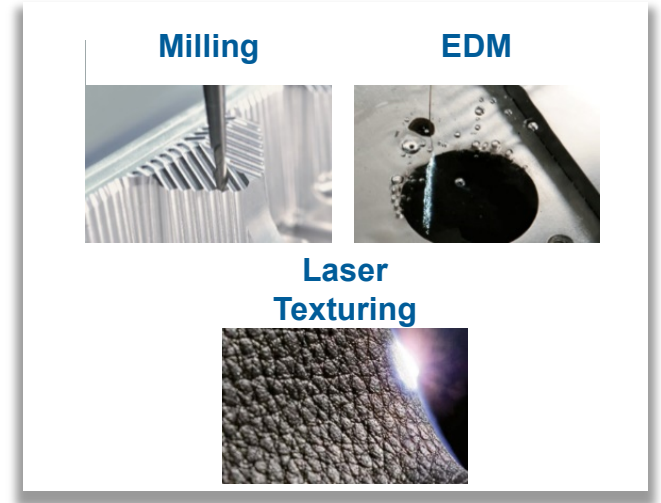
**Post-Processing**



GF Casting Solutions –  
GF Machining Solutions – 3D Systems



GF Machining Solutions – 3D Systems



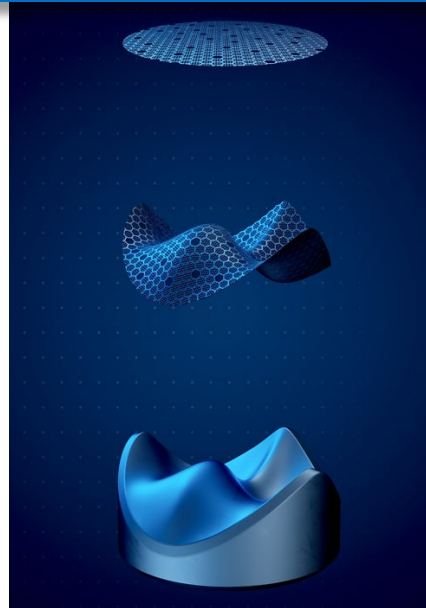
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# Intelligent Manufacturing adds strong value to customers but implementation is complex

Liechti Turbosoft



Smart Patch



Investments

Infrastructure

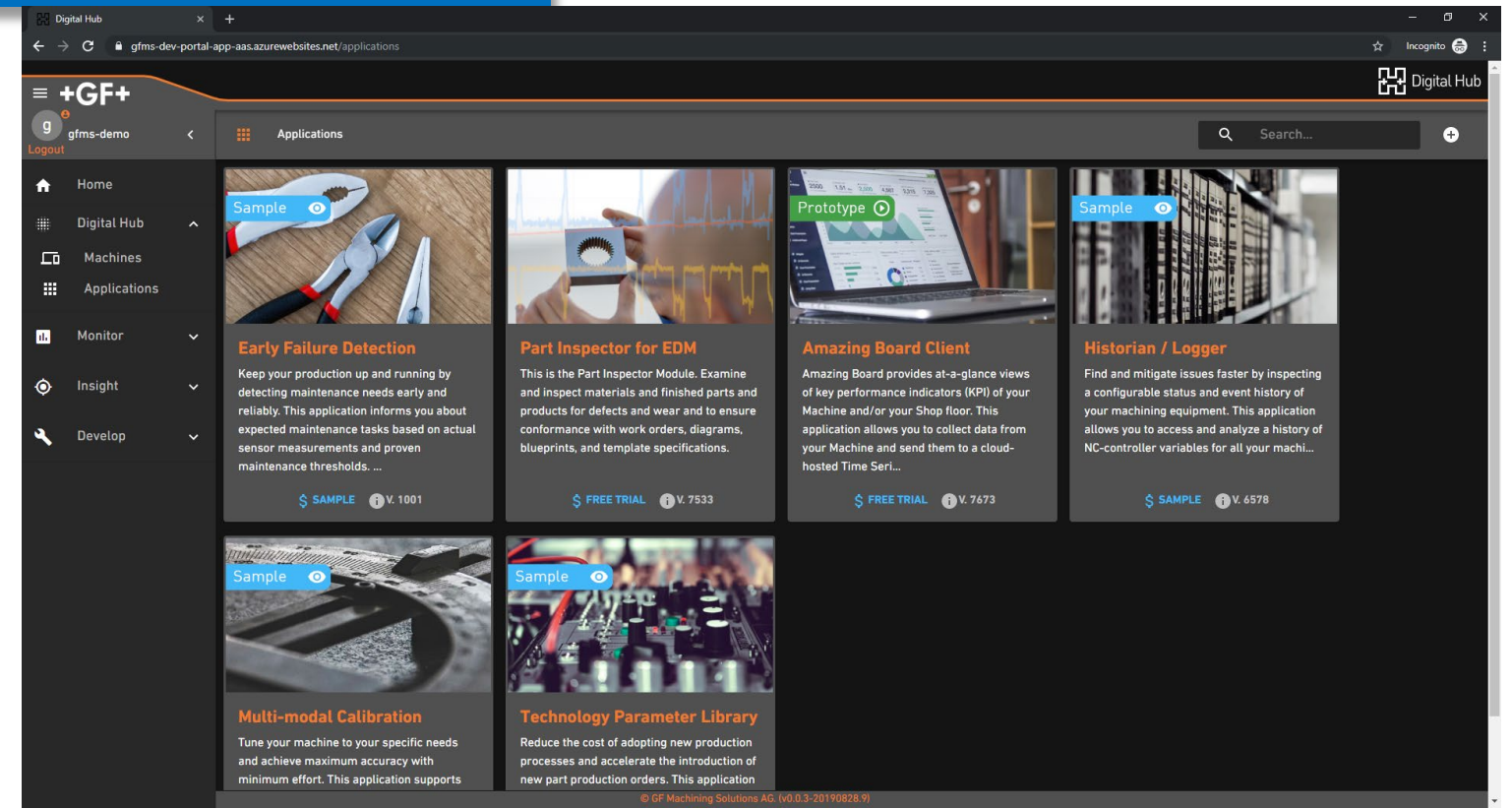
Service

Advanced Solutions

## Edge Computing



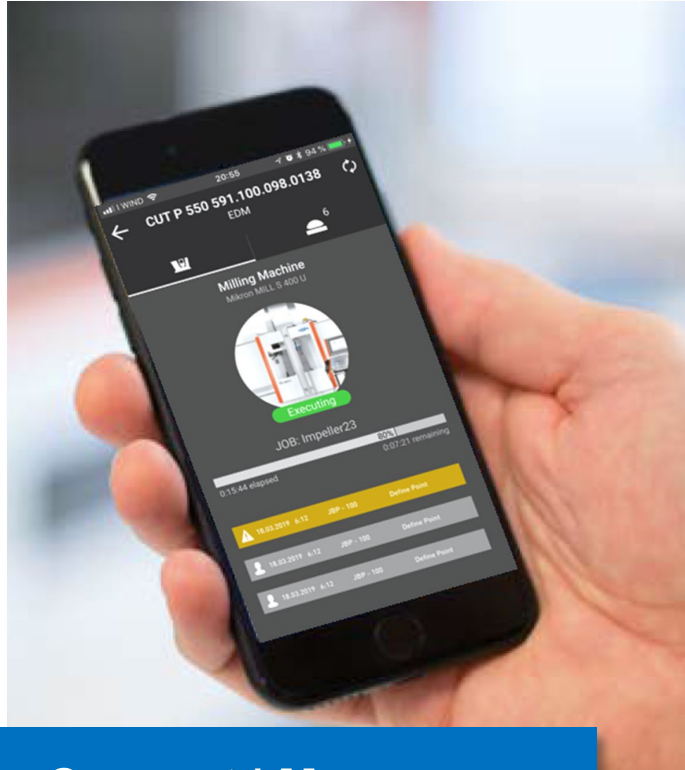
## Digital Hub (Cloud Portal)



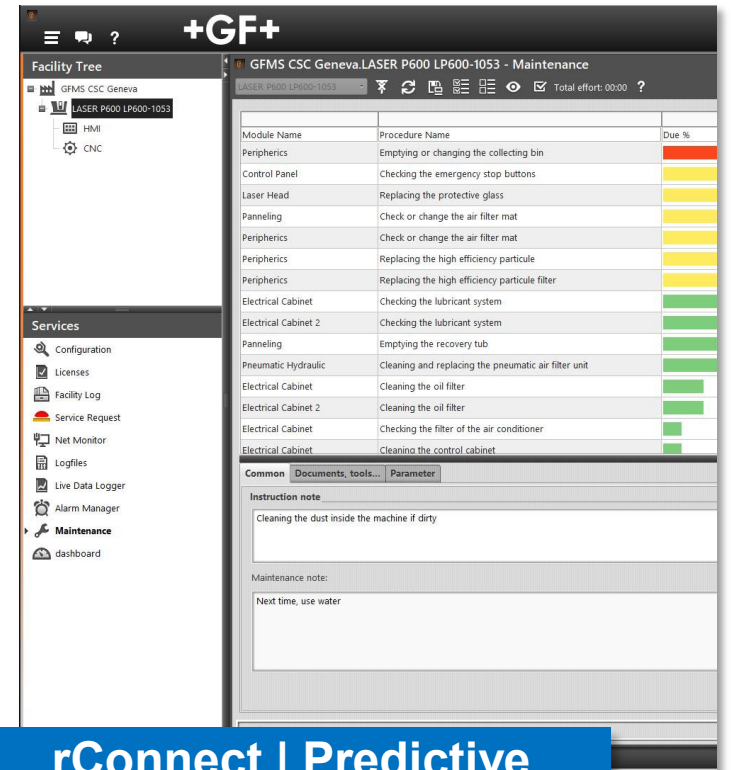
# ... while building up our service platform ...



rConnect | Dashboard



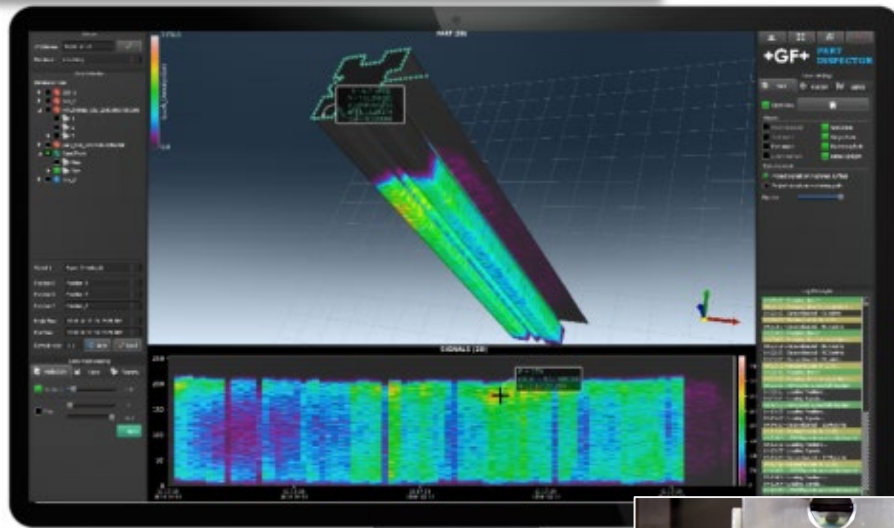
rConnect | Messenger



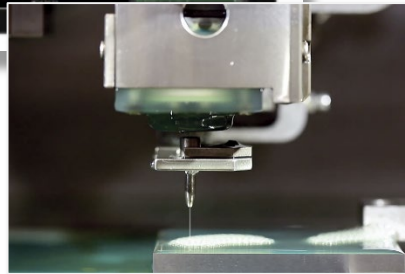
rConnect | Predictive Maintenance

# ... and launching the first steps of advanced solutions based on innovations

## Part Inspector (EDM)



(Spark Track Innovation)



## Real-Time Monitoring (Milling)



(5G Sensing Technology)



# Our solutions contribute to more sustainable production processes



## Additive Manufacturing

- More complex, lighter products
- Reduced scrap

## Intelligent Manufacturing

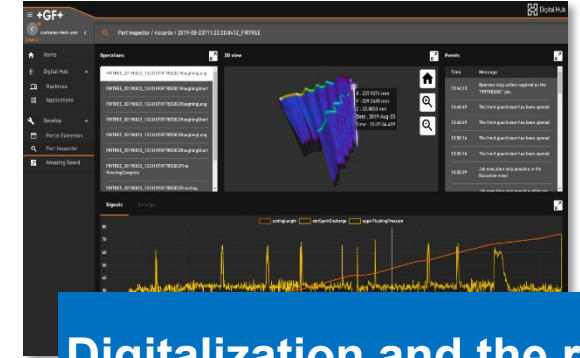
- Full traceability (material and process)
- Better and faster maintenance



# Showcase GF Machining Solutions



**Andreas Rauch**  
Head of Digital Business



**Digitalization and the rise  
of intelligent manufacturing**

**Thank you!**

