



Additive Manufacturing made by ARBURG

New rules of the game for plastic processing

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ARBURG Technology Days
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ARBURGadditive



2019 InnovatIQ TiQ | LiQ

Filament thermoplastics
Liquid Silicone Rubber (LSR)



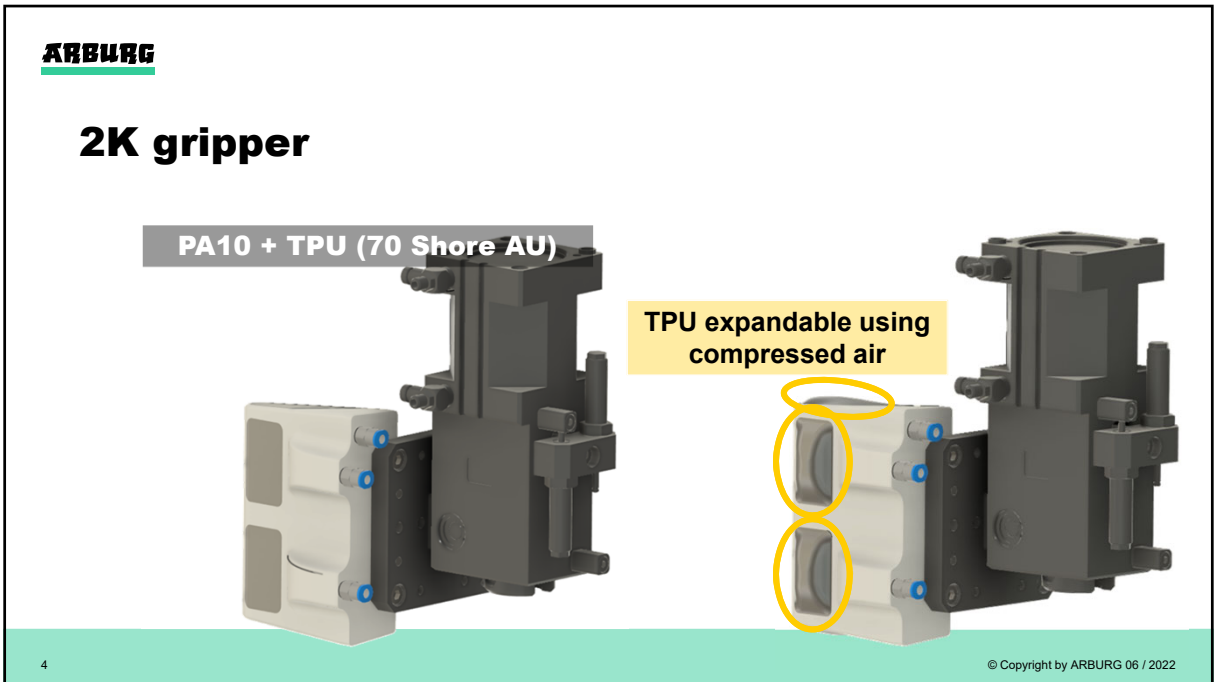
2013 ARBURG freeformer

Industrial granulates
Elastomers
Thermoplastics

ARBURGadditive GmbH Co. KG
Start 12 December 2021, Lossburg

Agenda

- Think Additive – Applications and new areas of application
- Use in medical technology
- ARBURG Plastic Freeforming – adapting component properties
- Sustainable additive manufacturing
- Summary



2K gripper



Spare parts - Just in time

- Conventional production time-consuming and expensive
- Cost-effective additive manufacturing
- freeformer for efficient spare parts production

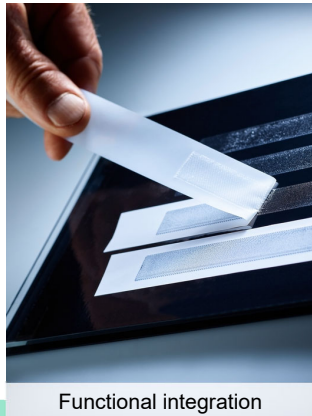


Source: Mosca GmbH

Thinking additive – whatever the application



Personalised products



Functional integration

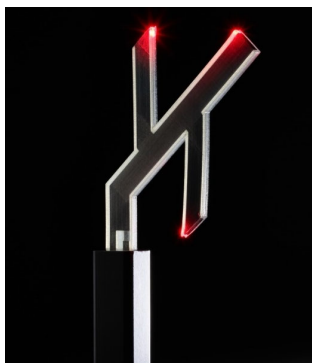


Bionic structures

Thinking additive – whatever the industry



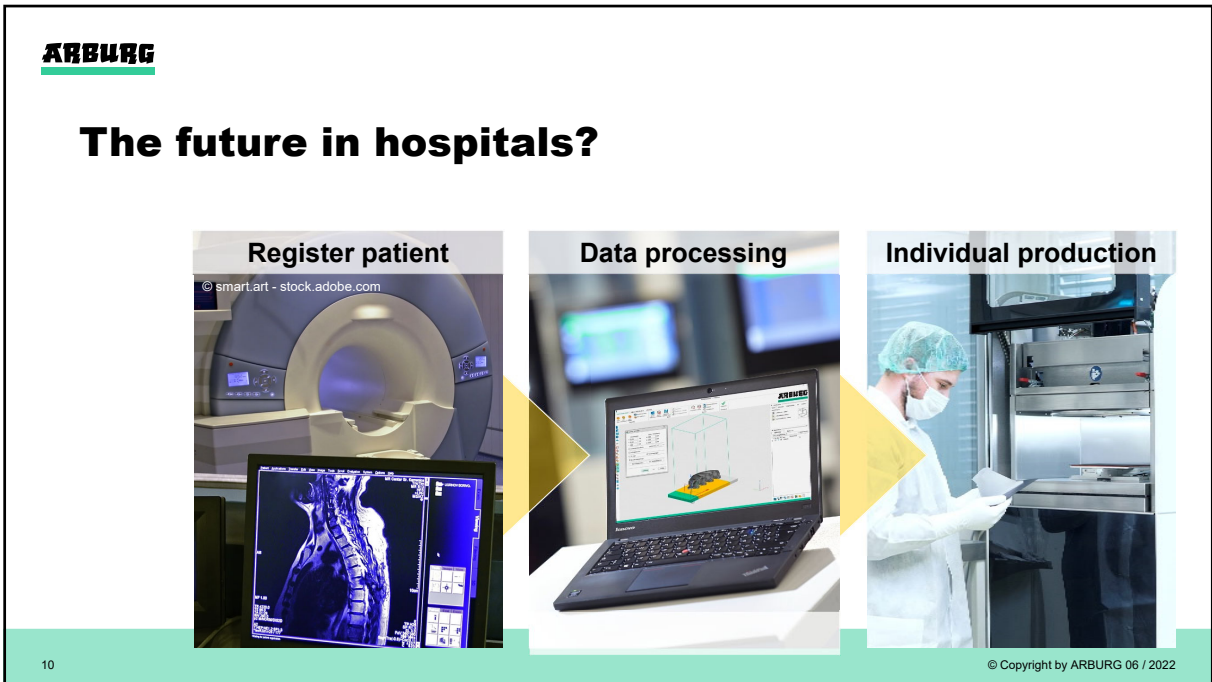
Technical applications



Electronics



Medical



Patient-specific implant

- Patient-specific skull implant made of PEEK Vestakeep® i2 G
- Suitable for implant applications due to outstanding biocompatibility and biostability
- High installation temperature of approx. 200°C required



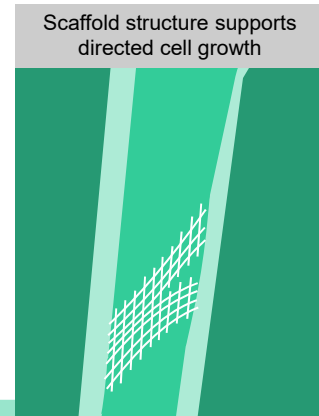
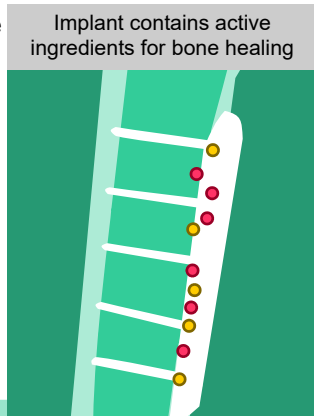
High-performance plastics

- Patient-specific template made of ULTEM HU 1004
- Biocompatible according to ISO 10993
- Resistance to all common sterilisation methods



Resorbable materials

- Resomer PLA Composite LR706 with 30 % β -TCP
- Adapted reduction rate and mechanical properties for optimised bone healing



Thermoplastic elastomers

- Multi-material meniscus made of different implantable polyurethanes
- Accelerating product development through additive manufacturing with original materials



Source: SAMAPLAST AG

Adjust component properties



Ever-expanding range of materials



Technical plastics

- PP
- PA
- PC
- ...



Flexible

- TPE/TPU
- TPV
- SEBS
- ...



Medical

- PLLA
- PMMA
- PCU/PCL
- ...




Special materials

- conductive
- flame-retardant
- biodegradable
- ...



Support materials

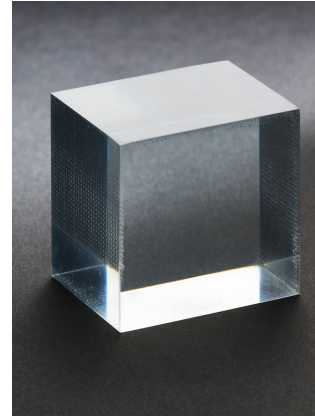
- ARMAT 21
- ARMAT 11
- ARMAT 12
- Compounds



Customer-specific materials

Adjusting component properties in a targeted manner

- Adjustment of the drip ejector
- Variable density in one component
- Mechanical properties adaptable according to requirements



Optimize surface properties

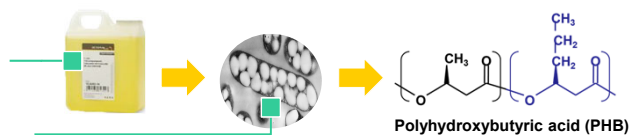
- Part freeformer
 - Ra 19.42
- Wet grinding (ceramic and plastic grinding tools)
 - Ra 0.62
- Polishing
 - Ra 0.46



Sustainable Additive Manufacturing

Additive Manufacturing with biopolymers BioFusion 4.0

- Research project on the substitution of petroleum-based plastics
- Use of **waste fats**
- Fermentation with a **biocatalyst** (bacteria*)
- Manufacture of **PHB**



Source: Fraunhofer IPK



Additive Manufacturing with biopolymers BioFusion 4.0

- Isolation of pure PHB
- Processing into PHB granulate
- Processing on freeformer 300-3X



Additive Manufacturing with biopolymers BioFusion 4.0

- Possible areas of application
 - Spare parts with a short useful life
 - Manufacturing aids and personalized orthoses
- Goals of the project
 - CO₂-neutral additive manufacturing
 - Holistic sustainable process chain
 - Locally optimized material flows
 - Integration in IoT cloud



Project details



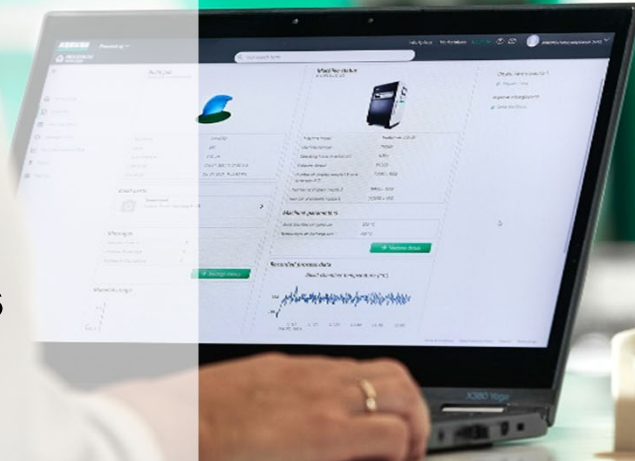
BioFusion 4.0

Forschungsprojekt

01.03.2021 – 29.02.2024

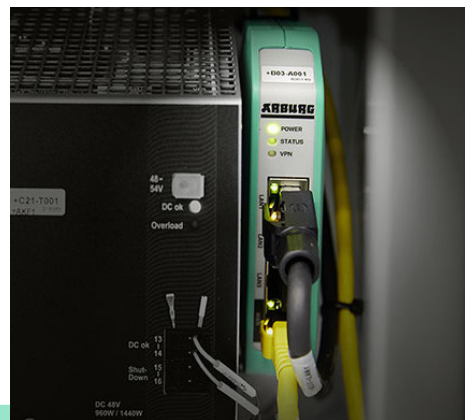


Digital products and services



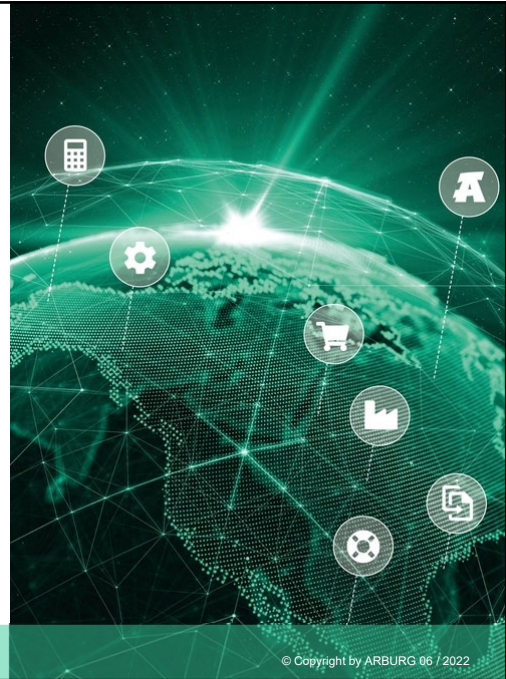
Remote service

- freeformer equipped with IIoT gateway as standard
- Integration into arburgXworld customer portal
- Support from APF experts via protected data connection



arburgXworld

- arburgXworld customer portal: Self-service and spare parts shop
- Access to software updates and data sheets
- Complete documentation and graphic visualisation of process data

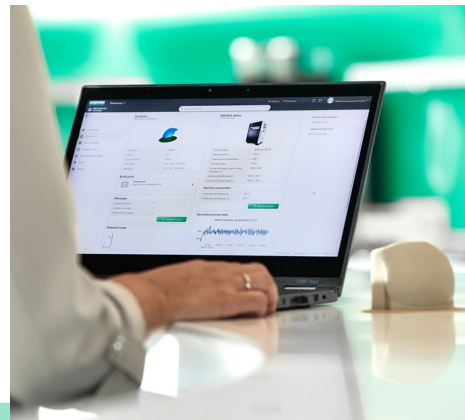


27

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ProcessLog - Process monitoring

- Visualisation of process data
- Documentation of slicing parameters
- Overview of material consumption
- Easy identification and assignment due to component-specific label
- Export of process log as PDF and process data as CSV
- Process optimisation



28

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Summary

Unique System

- **Open system** –
Component properties can be influenced
in a targeted manner
- **Material database** –
diversity is constantly increasing
- **A reliable partner** –
We continuously develop the system further
- **Prerequisite** –
get involved with the technology



