
RELEVANCE OF POST PROCESSING IN ADDITIVE MANUFACTURING AND RECENT DEVELOPMENTS OF IAPT

Dr.-Ing. Philipp Imgrund

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Post processing in additive manufacturing



Current Situation

- ❖ Post processing accounts for up to 30% of the total cost of an AM-component¹
- ❖ Most of the AM-parts are (still) manually post processed nowadays
- ❖ Manual removal of the supports lead to



High processing times



Low reproducibility



High dependency of qualified technicians

Joseph Crabtree, CEO, Additive Manufacturing Technologies Ltd

*"For AM production applications, post-processing is a considerable element of the overall cost-per-part, and can be anything **up to 60%** of total cost depending on application."*

Jeff Mize, CEO, Post Process Technologies Ltd

*"When people think about a 3D part, they think about the smooth, polished part shown on a trade show floor or shipped to a customer. But the reality is that **the part doesn't come off the 3D printer looking that way.**"*

3D Printing Media Network

*"One of the biggest hurdles to greater adoption of AM in production was always a tendency to **underestimate the impact of cost-effectively post-process large series of prints**"*



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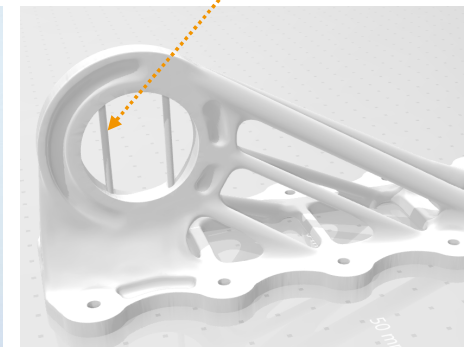
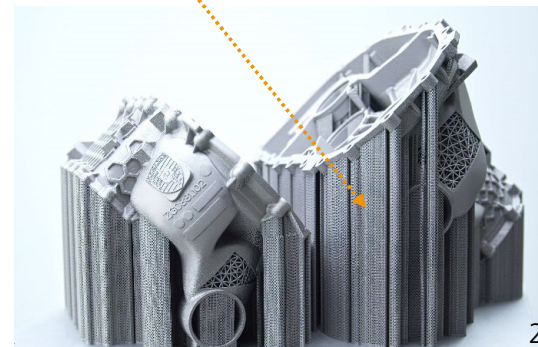
High dependency of qualified technicians



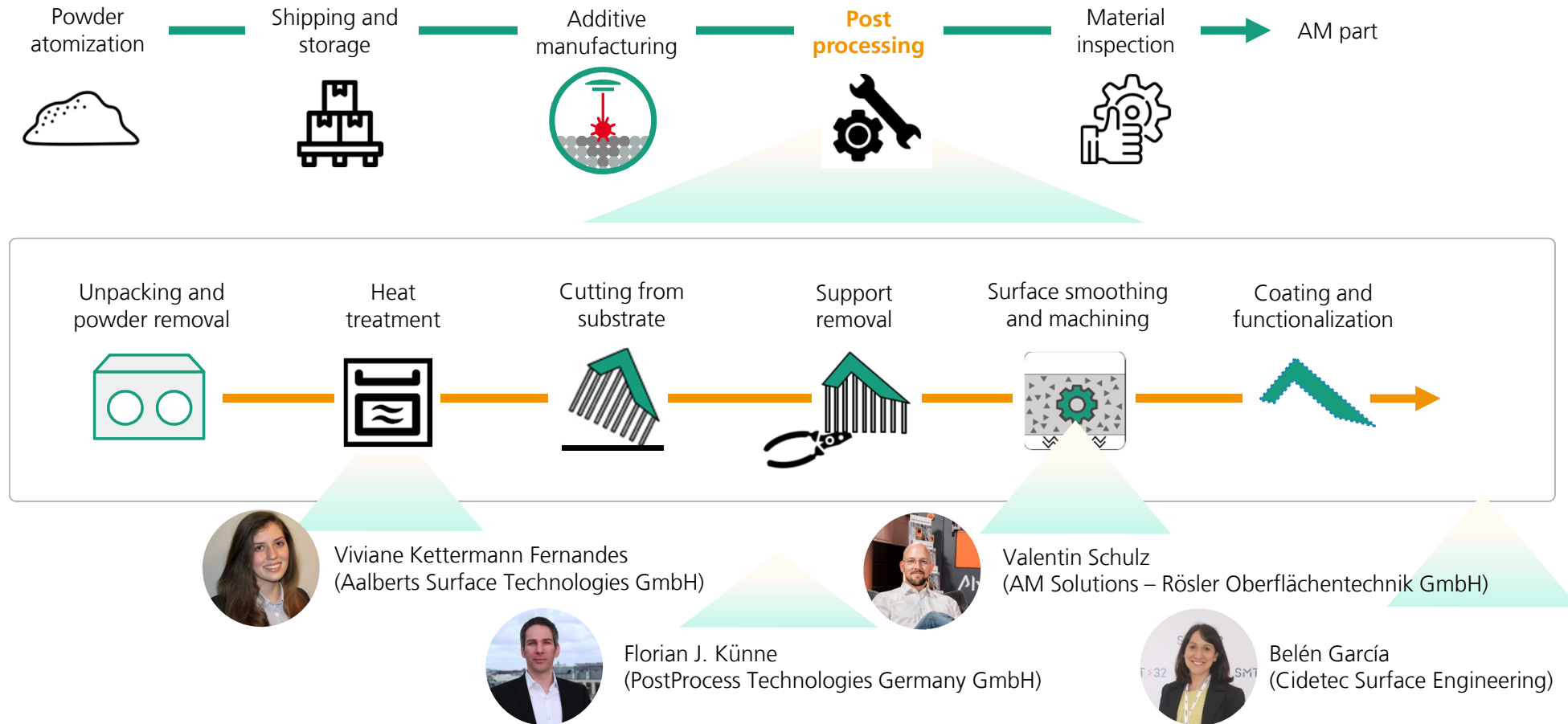
Ductile and hard to remove

Massive amount of supports

Solid support structures



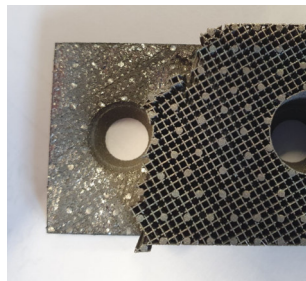
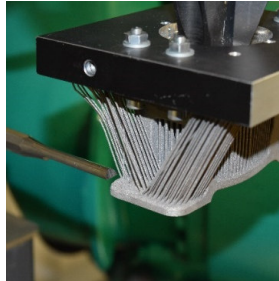
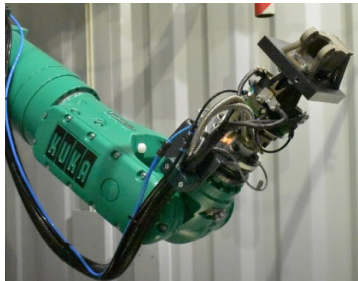
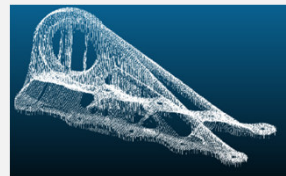
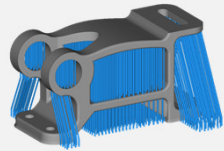
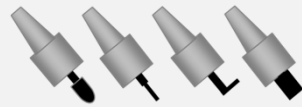
AM process chain



Optimizing Post Processing at IAPT

Robot-guided support removal

- ❖ Developing and optimizing tools and process parameters
- ❖ Abstracting suitable supports structures, strategies and clamping methods
- ❖ Development of corresponding sensor system for quality assurance, safety and process monitoring



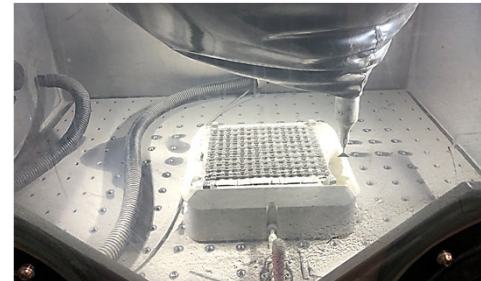
Automated Depowdering for BJT

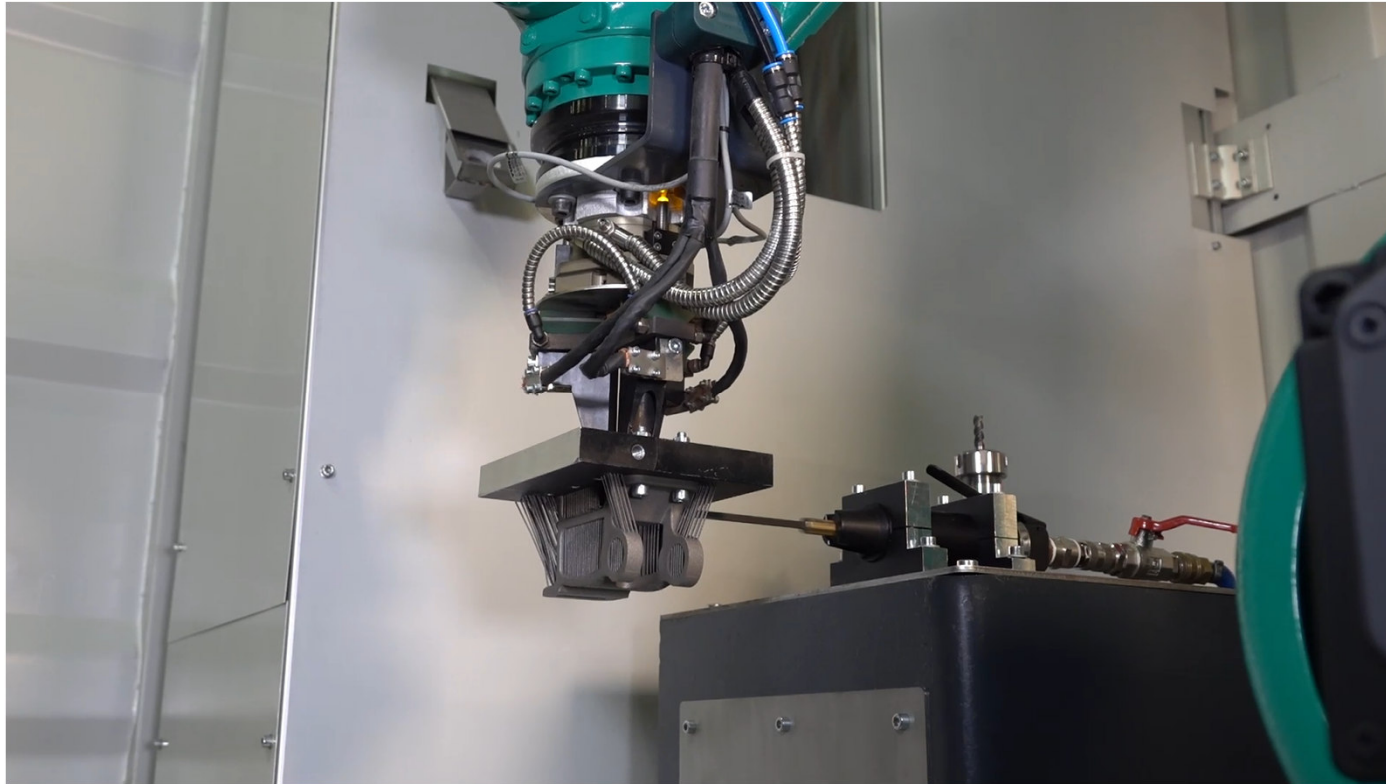
- ❖ Currently, components are unpacked or depowdered manually
- ❖ Components are blown free by compressed air and then transported by hand
- ✗ Components can be easily destroyed by handling
- ✗ Difficult reproducibility
- ✗ Time consuming (one to several hours for a build job)



Developing and testing new concepts for depowdering of parts*

**Patent pending*





IAPT Surface Studies



Surface Benchmark Study

An independent comparison of metal AM post processing methods



Decision aid to choose the right post-processing method for your specific application



Ti-6Al-4V, AlSi10Mg, 1.4404



Surface Roughness, Hardness, Erosion Rate, Edge Rounding, Penetrations Depth, Readability, Costs



8 surface finishing processes investigated



Additive Fatigue Study

A technical study about the influence of different surface finishing methods on mechanical properties for metal AM parts



In-depth data provision and analysis for evaluating effects of post processing on mechanical properties



Ti-6Al-4V, In718



Fatigue Strength, Tensile Strength, Elongation at Break, Dimensional Accuracy, Surface Roughness



6 surface finishing processes + Process Combination + As built and milled parts as reference

Thank you for your attention!

Contact

Dr.-Ing. Philipp Imgrund
philipp.imgrund@iapt.fraunhofer.de
+49 (0)40 / 48 40 10 - 740

