



# CS7- Sand 3D printing boosts GRATZ Engineering's production

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# GRATZ Engineering

[GRATZ Engineering](#) boosted its prototype production by integrating sand 3D printing into its technical business units.

The German automotive supplier from the northeast of Baden-Württemberg recognized 3D printing's enormous potential back in the nineties when it was still a very young technology.

Since then, GRATZ has relied on fast metal printing and low-cost 3D printing of sand-casting molds.





# The Case Study

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Metal 3D printing like laser sintering is expensive if speed is not an issue.

If we have two or three weeks for the prototype, we generally prefer to use a combination of classic metal casting with 3D-printed sand molds or investment casting patterns made from PMMA.

This cuts costs enormously, and the increased durability and stability of the components is of course also an advantage. The most practical aspects of this are the large building volumes and fast printing rates.



# The Case Study

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With the Binder Jetting printing systems, we can directly produce several variants of our prototypes, such as turbochargers, in parallel and nested on top of each other in one and the same 3D printing process, and not just in one level, as is the case with DMLS.

We make the best possible use of the volume of the build space, also known as the job box.

This allows us to parallelize the subsequent tests of the casted parts, which saves additional time and reduces the development cycle time.



# The Case Study

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Compared to laser sintering, this still costs a little more time, but we can directly test different variants of the component at the same time in order to define a final design as quickly as possible and release it for production.

In addition, we have a much greater variety of materials for casting.

We can actually work with any alloy. With sintering, on the other hand, we are much more limited.”



# When to use DMLS and when to use rapid casting?

In a direct comparison, the pure metal casting price is around 6.50 to 32 euros per kilogram, and the liter of printed sand material is around nine euros.





With a little more time, we can also economically produce components with complex geometries in batch sizes of one or in small batches of up to one hundred units using rapid casting,”

“The prerequisite is that we can produce the molds and cores quickly and cost-effectively, without expensive specialized tooling.

This is exactly where industrial 3D printing from voxeljet comes into play.” Called rapid casting, the process prints the molds and cores needed for casting completely without the need for tooling. The printed materials are commonly used in foundries. The system enables fast and automated production of the molds using the powerful binder jetting process. The PMMA material set from voxeljet offers another approach. Using this plastic material, patterns can be printed without the need for tools, which can then be processed in the investment casting process in the same way as conventional wax patterns.



# References

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<https://www.3dprintingmedia.network/sand-3d-printing-boosts-gratz-engineerings-production/>

<http://meldmanufacturing.com/>





Thank You!