

Zetamix, the First Ceramic and Metal Filaments Accessible to All



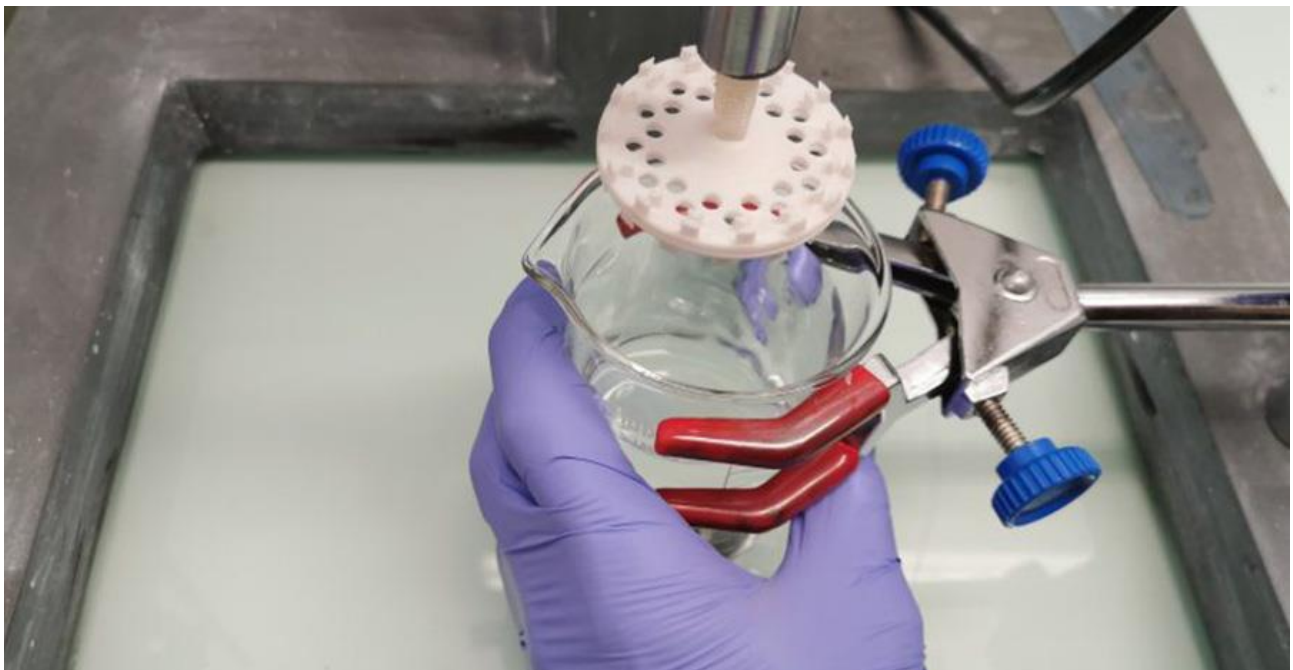
The French company, Nanoe, specializes in high purity ready-to-sinter nanopowders for high tech applications. Originally known for developing products specifically designed for sintering high-performance ceramics, [Nanoe launched a new brand, Zetamix](#)—the first ceramic and metal filaments in 2018.



Standard Inox Blades A Risk of Metallic Pollution on Your Products

Used daily in a variety of industries and research labs, dispersion turbines are used to blend solid/liquid materials into a semi-viscous state. **In Nanoe's lab and production sites, the quality of their products depends directly on the accuracy of the blend.** A majority of the production process consists of stirring or blending ceramic slurries with stainless steel blades.

However, using metallic blades has its disadvantages such as the pollution of slurries by metallic traces, fast oxidation of blades and the standardization of designs that create issues with the specific needs of Nanoe.



Depending on the process, batch size and type of mixer, Nanoe requires a specific blade, and on some occasions a few different blades. In a perfect world, having a various collection of different blades would be the solution but proves to be far too expensive and complex to justify.

Since Nanoe synthesizes and produces high purity ceramic powders for industrial companies, metallic pollution creates issues with their high standards. Due to the abrasiveness of ceramic materials, even stainless steel is not resistant enough. As a result, Nanoe would change its blades often in order to avoid the oxidation of tools and pollution of their ceramic powders, at the cost of maintenance shutdown and resources.

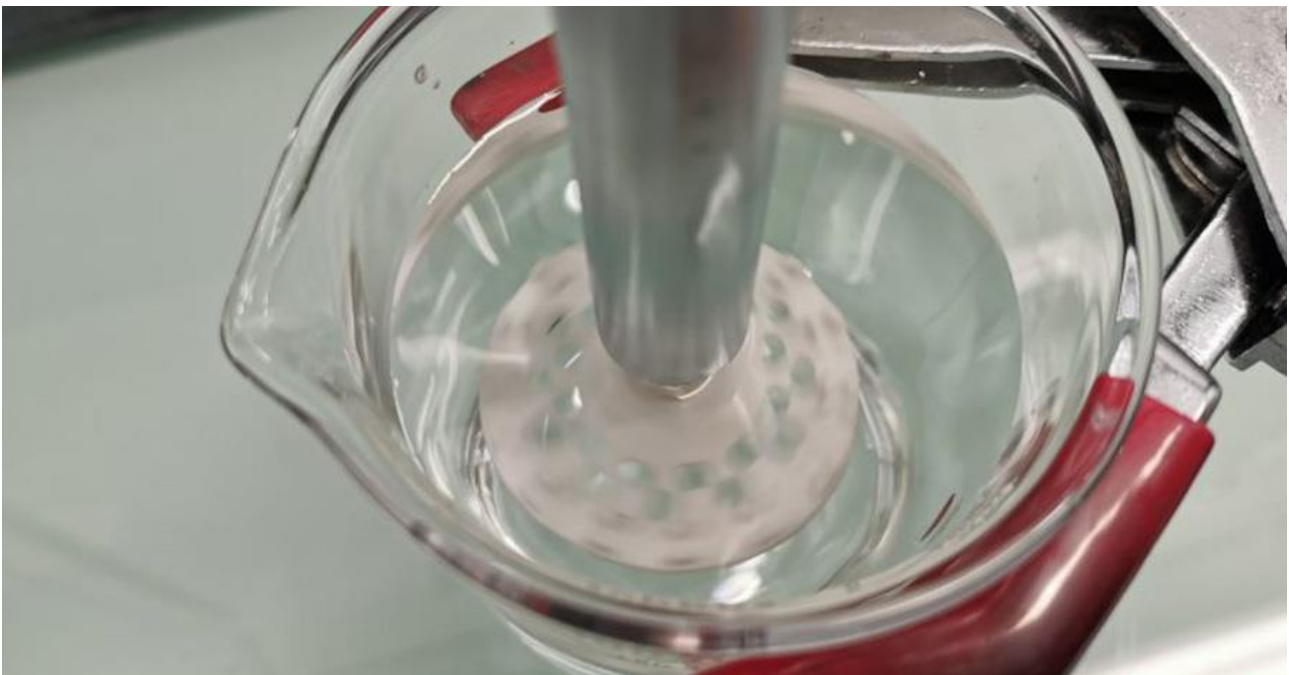
Replacing the traditional steel blade with a ceramic dispersion blade would be the solution, but such a product does not exist in the market today. Purchasing a custom-made ceramic blade would also be very expensive and delivery time would take weeks. **The creation of such a blade would also trigger the launch of a whole new production chain for only a few pieces.**

Moreover, a tailor-made blade currently has an estimated cost of 1000€ and a lead time of 6 weeks.

Raise3D Pro2 and Zetamix Technology A Perfect Mix for Efficient Customized Tools

Thanks to [Raise3D printers](#) and [Zetamix filaments](#), this issue was easily solved. Zetamix is the very first brand producing ceramic filaments compatible with regular 3D printers that makes it possible to obtain ceramic products with a homogeneous microstructure and a density >99%. Inspired by regular injection ceramics processes, parts are obtained in three steps: shaping or in this case printing, de-binding, and sintering.

Dr. Julien Sourice, head of the R&D at Nanoe, designed a blade specifically for his needs and printed using [Raise3D's slicing software, ideaMaker](#). To maximize the efficiency of the tool, he added details and adapted its size to fit the containers precisely. Realizing the importance of wear, resistance and chemical stability, zirconia was chosen as the perfect match. As a result, Dr. Sourice chose **Zetamix White Zirconia filament** to print his custom blade. By adding details such as studs and holes on the blade, he made the dispersion turbine light and efficient, creating an effective part that was impossible to build without additive manufacturing. **Zetamix technology proved to be a cost-efficient alternative in creating complex ceramic designs.**



Moreover, thanks to its direct driving system, the [Raise3D Pro2 printer](#) is the perfect machine for using Zetamix as it enables a better quality of printing by reducing stress on the filaments, which are less flexible than polymers.

Process A Complete Part Obtained in Less Than a Week

The whole process took one week, from the design to the implementation of the new blade, and the material cost was 12€ (25g).

To make sure the detail of the blade is printed properly, Nanoe 3D experts printed it in two steps, disconnecting the top and the bottom of the tool. Applied to both parts, a 0.2 mm nozzle was required and the height of print had to be adjusted to 0.1 mm, in order to improve the surface's quality.

After roughly 2 hours of printing, the blade was soaked in an acetone bath for 12 hours, dried, and was sintered in a ZetaSinter furnace for 3 days.

Nanoe benefits daily on the advantages of Zetamix technology. By customizing its tools for powder production, Nanoe is improving its processes and is no longer dependent on resellers or distributors. This allows important resource savings in terms of negotiating time, money and logistics.

Connect with Raise3D

Do you have a great 3D printing success story and think it would be cool to be featured on www.raise3d.com, we would love to learn more! Write to us at inquiry@raise3d.com

For more information about Raise3D printers and services, browse [our website](#), or [schedule a demo](#) with one of our 3D printing experts.