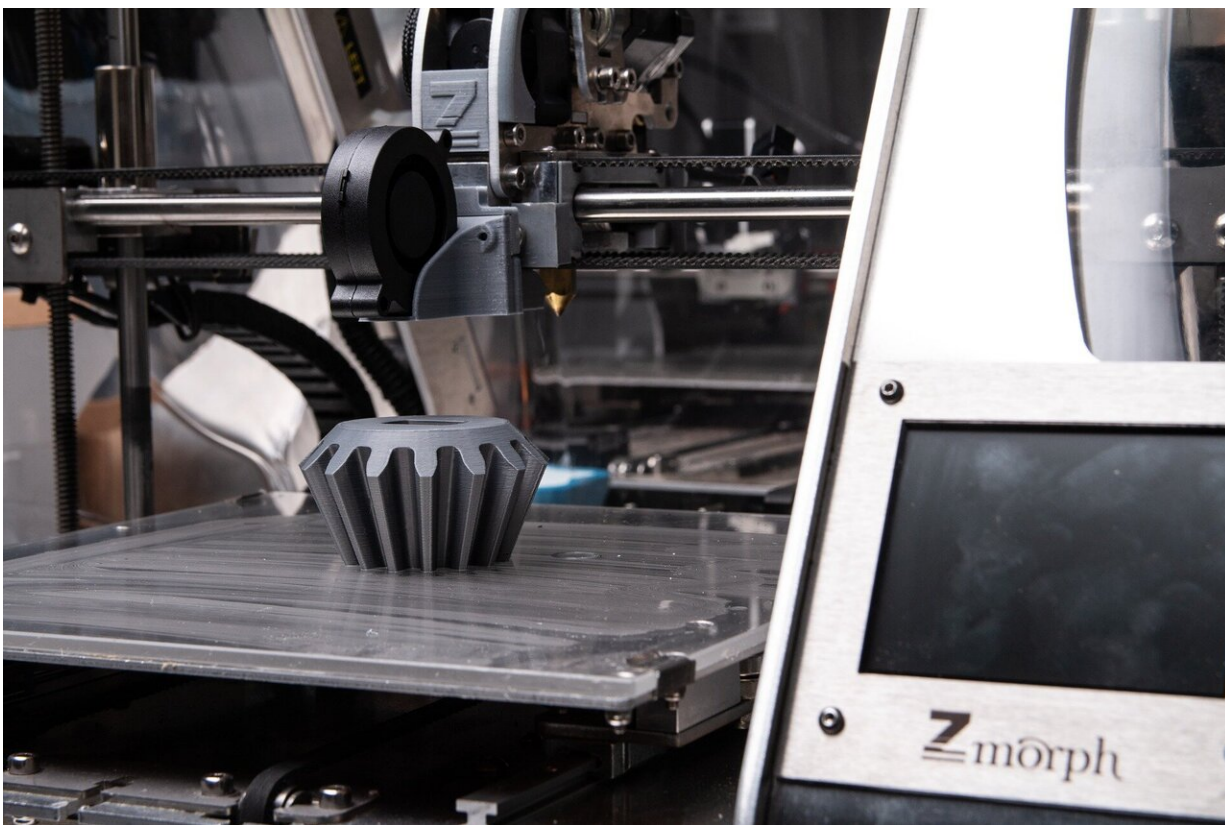


Researchers develop a unique method for creating powder composites

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Scientists from South Ural State University have developed a new method for creating powder metal composites. The method can reduce waste and improve the quality of electrical products and, as a result,

increase the economic efficiency of production by 30%. The study was published in the journal *Metallurgist*.

Mixing is one of the most important stages in the production of metal powders. The scientists introduced a new design for a mixing machine that makes composite powder based on graphiteplastic compositions and coke pitch. The new machine and the associated method produce a high-quality blend and increase the material utilization up to 98%. The new method improves the quality of finished [raw materials](#) for the subsequent pressing process and could reduce waste in the fields of nuclear energy, the aviation and space industries, metallurgy and electric transport. The study was carried out in the International Laboratory of Mechanics, Laser Processes, and Digital Production Technologies of SUSU.

Experts have proposed a number of powder mixing techniques to obtain multicomponent materials. Products made from such materials are of high quality due to the most uniform distribution of properties over the product, such as strength and density.

"The results obtained are unique and can be used in other technological operations and equipment related to the processes of product manufacturing from composite powder materials," says Professor Marina Samodurova at the Department of Metal Forming.

In the present study, the scientists examined the technology of mixing the components of powder blends more thoroughly than in previous studies. The process of making compositions by mixing involves the adsorption, adhesion, and immersion wetting of the surfaces of carbon powders with a liquid binder.

The team of scientists believes that companies involved in the production of mixing machines might be interested in these

developments, as they increase the efficiency of the equipment due to less waste when mixing, improve the quality of the finished [blend](#) and simplify the design of mixing machines.

In the future, scientists plan to create high-entropy powder blends. This is a new direction in science. Components can be completely different in their physical and [mechanical properties](#), having different density indices and particle size distribution.

According to experts, highly entropic blends could be useful in [powder metallurgy](#) and additive manufacturing, where products are made using 3-D printing technology.

More information: M. N. Samodurova et al. Processes and Equipment for the Preparation of Coke Pitch and Graphitoplast Compositions for Pressing of Intermediate Products for Electrical Engineering, *Metallurgist* (2020). [DOI: 10.1007/s11015-020-00956-3](https://doi.org/10.1007/s11015-020-00956-3)

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