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3D PRINTING WITH GRANULES OR CHOPPER PARTS OF POLYMER MATERIAL

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Today, the main consumable for FDM 3D printing is monofilament, especially considering how popular 3D printers have become in the last few years. Monofilaments are easy to use and store. However, polymer filament is not the only consumable currently used for FDM 3D printing. A separate variety can be consumables in the form of granules or crushed particles of polymer material. In most cases, pellets are the starting material for any plastic product manufactured using molding equipment. In relation to monofilament, granules are also its starting material.

The production of monofilament from granules makes this consumable, and therefore the cost of products created with the help of 3D printing, more expensive compared to the use of granules or crushed plastic particles.

3D printing with pellets has a number of advantages: faster printing speed; lower cost of finished products. It is technologically a little more complicated. No matter how well the granules are compacted, there are always air gaps between them, which fall into the nozzle of the 3D printer with the flow of molten polymer and break the integrity of the layer. Also, the uniformity of the supply of such a consumable depends on the design features of the supply mechanism, the shape of the granules, and their size. All this must be taken into account when designing the specified device. This type of printers is under development and undergoing experimental research [1].

3D printing with polymer granules in the rapidly developing industry in the future will become competitive along with other types of 3D printing and types of consumables.

References

1. Oleh Polishchuk, Petro Zozulia, Andrii Polishchuk. Development and research of equipment for processing of granulated polymeric materials via 3D printing for the needs of light industry. *Fibres and Textiles* (4) 2020, pp.70-80 (in Slovakia).