3D printed vane rotors

More design flexibilty due to modern technology

Authors

Jint Nijman, Cornelia Küchenmeister-Lehrheuer, Thermo Scientific Karlsruhe

Keywords

Vane rotors, 3D printing, customized solutions, design flexibility

In the last 30 year 3D printing or additive manufacturing has come a long way. Professional 3D printers for polymers are now widely being used in industry, many hobyist creatively use inexpensive 3D printers at home and additive metal printing has slowly become a manufacturing alternative, for certain applications, in industry in recent years.

Currently additive manufacturing of metal parts does not yet offer the same accuracy and surface quality (in the micrometer range), as classical metal cutting manufacturing does, but is very useful for quickly manufacturing parts in small quantities and/or parts with complex shapes.

3D printed vane rotor

In rheology, the number of requests for special measuring geometries is increasing. Metal 3D printing offers a new way to respond to these requests, especially for the manufacturing of “relative” measuring geometries like vanes in various shapes. Manufacturing a vane with 6 or even 8 blades using classical machining (cutting, welding) is problematic due to the small angles between the blades, this problem does not exist when using additive manufacturing.

Figure 1 shows three FL40 vane rotors with 4, 6 and 8 blades respectively and a 6 mm shaft. These rotors can be mounted to the rheometer using the Connect Assist Adapter U1. The individual geometry parameters can be programmed in the Connect Assist tag of the adapter for the automatic recognition of the rotor by the rheometer

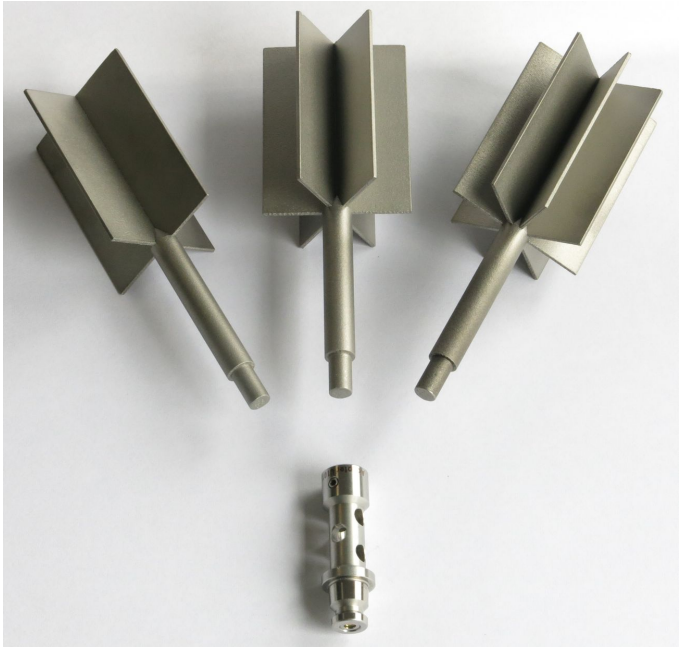

Figure 1. 3D printed vane rotors with Connect Assist adapter U1

The vanes are made of stainless steel 316L - 1.4404 (X2CrNiMo17-12-2).

Ordering information

Part	Order no.
Vane rotor FL40 4B (4 blades, 3D printed)	603-2447
Vane rotor FL40 6B (6 blades, 3D printed)	603-2448
Vane rotor FL40 8B (blades, 3D printed)	603-2449
Connect Assist adapter U1 with 6 mm bore	222-2130