3D printing prevents expensive production downtime
Filament extrusion line becomes more reliable with 3D-printed spare parts made of PEEK

3D4makers is a leading manufacturer of high-performance filaments for FFF 3D printing (Fused Filament Fabrication). Mainly high-temperature polymers are processed, which have very high melting temperatures and therefore place extreme demands on filament extrusion systems. The systems from 3D4makers are highly specialized and are based on own development. Some components are bought in and contain standard machine elements. If elements fail, the entire system often comes to a standstill and expensive production downtimes occur. In order to increase reliability, components are manufactured in-house as far as possible. 3D printing with high-performance polymers is also used regularly.

An example of this is a gear in the melt pump of the extrusion line. This is subject to permanent temperatures of +/- 200 ° C.

Fig. 1: Gear made of PUR and 3D-printed gear made of LUVOCOM 3F PEEK 9581 NT

The component failed during use (Fig. 2). The gear deformed and the system came to a stop. It would have taken several days to procure spare parts. The loss of production would have been considerable. For a quick repair, a CAD design was created and the gear was manufactured on the in-house FFF printer within two hours. The selected material LUVOCOM 3F PEEK 9581 NT was used because of its high temperature resistance (permanent temperature resistance of 260°C), high strength and toughness, excellent tribological properties and exceptional chemical resistance.

The variant, which was actually only intended as a temporary solution, has proven itself so well that it has been in use for two years.

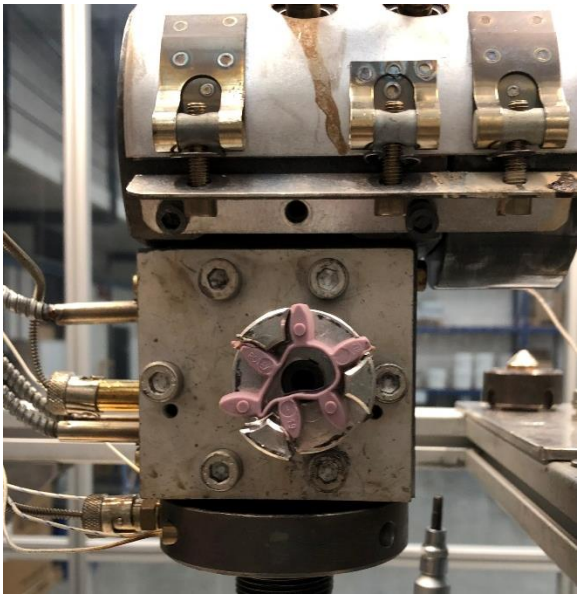

Fig. 2: Deformed gear made of PUR

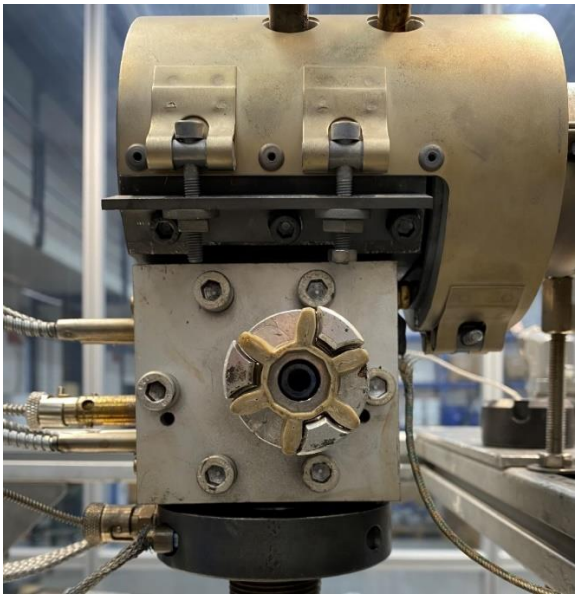

Fig. 3: 3D-printed gear made of LUVOCOM 3F PEEK

Fig. 4: Measurement of the ambient temperature at the gear, 207°C are measured.

Company profiles:

LEHVOSS Group

The LEHVOSS Group under the management of Lehmann&Voss&Co. is a group of companies in the chemicals sector that develops, produces and markets chemical and mineral specialities for various industrial clients. Lehmann&Voss&Co., Hamburg, was founded in 1894 as a trading company. In its success story dating back some 125 years, the owner-run company has developed into a powerful global organization – with long-standing connections to prominent suppliers and with its own production sites in Europe, the USA and Asia. For more information, please visit www.lehvoss.de [lehvoss.de]

With its product lines LUVOSINT® and LUVOCOM® 3F, the LEHVOSS Group is offering innovative and tailor-made plastics for 3D printing. These products have been adapted to the most common production processes, such as powder bed fusion, fused filament fabrication (FFF) and fused granulate fabrication (FGF) processes. The materials are distinguished by their good processing characteristics and excellent material properties. https://www.luvocom.de/de/produkte/3d-druck-materialien/ [luvocom.de]

3D4makers

3D4makers from Haarlem in The Netherlands is specialized in the manufacturing of high-performance filaments for FFF. At the beginning of 2014, father and son Wille started building their own filament extruder. They decided to do this because of the growing interest in 3D printing technology, the knowledge of plastic within the company and the company network. 3D4Makers is the result from a company that primarily dealt with selling plastic raw materials. Now the 3D4Makers team consists of five members, each with their own specialties.

www.3d4makers.com