



1 Printed and sintered gear wheel
 2 Twisted box (stainless steel 316L, green and sintered)

FUSED FILAMENT FABRICATION – A NON-BEAM-BASED APPROACH TO 3D METAL PRINTING

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Fraunhofer IFAM has combined its unique experience in powder metallurgy with polymer-based 3D Printing to develop Fused Filament Fabrication (F³) of metal parts. The process allows free formed metal parts with high materials variety up to multi-materials systems and low investment costs.

In this process, plastic filaments are filled with metal powders up to 60 % volume loading. These filaments are printed in a standard F³ printer, debinded and sintered to near dense structures.

- Multimaterial parts
- Comparably cheap powders (MIM-quality)

Possible Materials

- Steels
- Copper
- Tungsten
- Titanium
- Precious metals
- Ceramics

Advantages

- Low investment costs, i.e. only a fraction of powder bed machines
- Simple process
- High part complexity
- Metal parts with > 98 % density
- High materials variety

R&D Services

- Screening tests
- Materials evaluation & development
- Filament development and production
- Print development
- Component design
- Component development
- Small series production