TIWARI
SCIENTIFIC INSTRUMENTS

Alumini of: esa business incubation centre Hessen & Baden Württemberg

RAPTOR

Additive Manufacturing of Metals and Ceramics

RAPTOR is an Additive Manufacturing (AM) solution for the production of complex geometries made out of metals and ceramics. With the RAPTOR, TIWARI Instruments utilizes the Fused Filament Fabrication (FFF) technique to produce ceramic and metallic parts with a 3D-printer working with special filaments. The 3D- printed parts are then eliminated of any non-metallic or non-ceramic component (binder) with the help of heat treatment at high temperatures, yielding pure and resistant parts suitable for all engineering applications in a matter of days. This cost-effective technique is suitable for a number of metals and ceramics, including metal-ceramic or ceramic-ceramic composites, and is capable of producing parts with over 98% relative density.

RAPTOR Key Features:

- **Max. Part Size:** 15 (W) x 15 (D) x 15 (H) cm
- **Achievable Relative Density:** >98%
- **Surface Finish (Ra):** 2-4 µm (as-printed)
- **Dimensional accuracy:** <150 µm
- **Standard used for part testing:** ASTM
- **Available material properties:**
  - **Tensile strength/Bending strength**
  - **Young's Modulus**
  - **CTE [-130°C, +399°C]**
  - **Thermal Conductivity [-100°C, +100°C]**
  - **Thermal Diffusivity [-100°C, +100°C]**
- **Available Materials:**
  - **Metals:**
    - Titanium (Ti6Al4V)
    - Stainless Steel
    - Copper
  - **Ceramics:**
    - Alumina (Al2O3)
    - Molybdenum Disilicide (MoSi2)
    - Silicon Carbide (SiC)
    - Silicon Nitride (Si3N4)
    - Zirconia (ZrO2)

Want to know more about RAPTOR?
Get in touch with us:

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About TIWARI Scientific Instruments:

We are a hardware-oriented company and specialize in identifying promising technologies developed for space missions for their benefit on Earth (Spin-off) and adopt emerging terrestrial technologies for the space missions of the future (Spin-in). Founded in 2019, we have successfully developed and commercialised a 3D-printing technology for manufacturing of high-density metals and ceramics, and offer manufacturing services and consultancy to companies interested in adopting the technology. In addition to our numerous commercial projects with clients all over the globe, we have also participated and successfully completed several R&D projects both at EU and National-level in Germany