

# Patient-specific bone models with integrated metal implants

**Development and demonstration of customized polymer and titanium implants for medical and surgical applications.**

At Fraunhofer IMTE, we develop patient-specific bone models with integrated metal implants to demonstrate end-to-end process chains for point-of-care 3D printing in medical technology and surgery. Applications include implant planning, surgical training, and preoperative preparation.

The development of patient-specific bone models with individualized metal implants serves as a case study for integrating additive manufacturing technologies into clinical process chains. Using polymers and titanium, realistic bone structures and corresponding implants are designed and produced to meet specific clinical requirements in maxillofacial and reconstructive surgery.

This demonstration focuses on the software and process development required for point-of-care (PoC) 3D printing in hospital

environments. By combining imaging data, digital design, and advanced printing technologies, clinical needs can be directly translated into individualized medical products.

These models highlight the potential of additive manufacturing for medical device development, personalized implants, and preoperative planning. The work exemplifies how Fraunhofer IMTE supports the medical technology and healthcare sectors in implementing sustainable, patient-centered innovations at the interface between research and clinical application.

## **Fraunhofer Research Institution for Individualized and Cell-Based Medical Engineering IMTE**

Dr. Thomas Friedrich  
Tel. +49 451 384448-196  
thomas.friedrich@imte.fraunhofer.de  
[www.imte.fraunhofer.de](http://www.imte.fraunhofer.de)

[exhibit overview](#)