Fraunhofer
IGD

FRAUNHOFER INSTITUTE FOR
COMPUTER GRAPHICS RESEARCH

FRAUNHOFER IGD: THE INTERNATIONAL LEADING INSTITUTE FOR APPLIED RESEARCH IN VISUAL COMPUTING

CONTACT

Fraunhofer Institute for
Computer Graphics Research IGD
Competence Center "Interactive Engineering Technologies"
Fraunhoferstrasse 5
64283 Darmstadt, Germany

Prof. Dr. André Stork
Head of Competence Center
„Interactive Engineering Technologies "

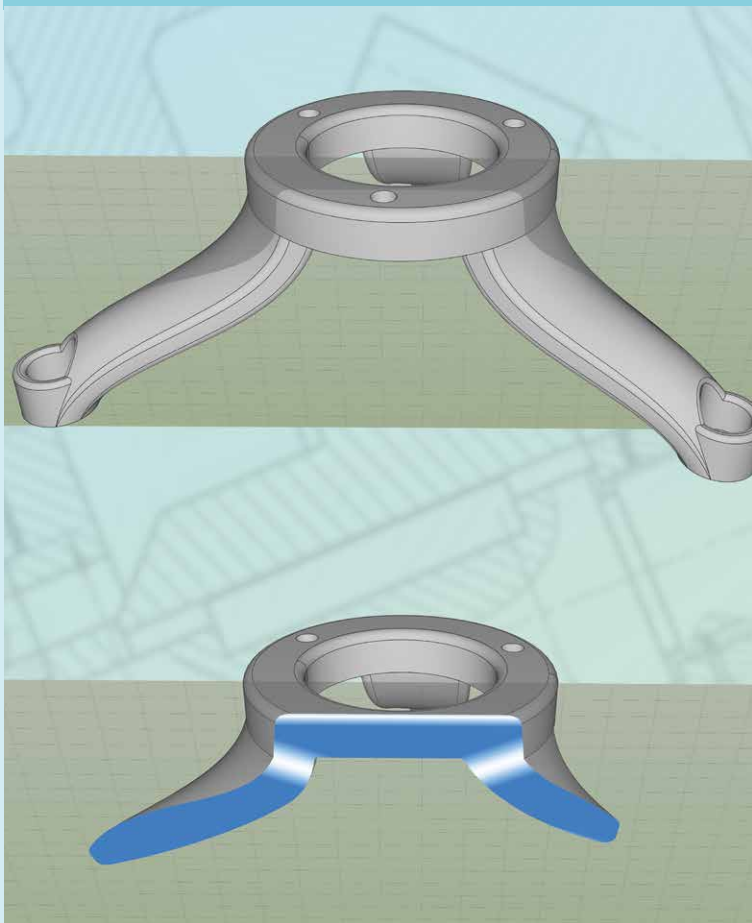
Phone: +49 6151 155-469
Fax: +49 6151 155-139
andre.stork@igd.fraunhofer.de

fh-igd.de/modeling

V04-19-01

GraMMaCAD

GRADED MULTI-MATERIAL CAD



Simply add Functionally Graded Materials (FGM) to CAD models for 3D printing

Today providing CAD models with locally varying properties is difficult and time-consuming for designers, engineers and 3D printing service providers.

Common practice is either to divide the model into partial models, to which different materials are then assigned, or to carry out the material assignment using images (textures) in a preparatory step for 3D printing. The former generally only allows discrete material transitions, while the latter requires grading to be generated as a variation of the texture information.

The challenge is to easily and quickly generate continuous material gradients following the geometry, as they can be produced with modern multi-material printers.

Methods to define material distribution more easily

With our software, we provide the user intuitive and flexible interaction methods to define material distribution on any CAD geometry, by which

- he has various options at his disposal,
- he can use CAD surfaces or auxiliary geometries,
- auxiliary geometries can insert material gradients into the CAD geometry,
- combinations of CAD surfaces and auxiliary geometries will also be possible,
- he can adjust the material transition, i.e., the area over which the material gradient extends can be influenced.

We present a digital technology for the definition of material gradients within virtual products, which allows for interactive setting of grading characteristics to perform functional grading on the CAD model – independently of the CAD system.