



# Fraunhofer USA

FRAUNHOFER CENTER FOR MANUFACTURING INNOVATION

## Gear Design and Manufacturing Simulation

### Focus

Complex interactions and increasing demands on modern high power density gears pose exciting challenges in terms of application-oriented design and suitable manufacturing processes.

We can help you to achieve your design goals by applying comprehensive and validated software solutions to the problem at hand. The calculation possibilities include the gear tooth contact and the simulation of manufacturing processes. This means we can address all the challenges you face along the gear manufacturing chain or afterwards in gear application. If both are intertwined, we can target that issue for you as well. Feel free to contact us in regards to your problem and we will do our best to help you out.

### Our Expertise

- Design of cylindrical, bevel (incl. hypoid) and beveloid gears
- Determination of function-related tolerances
- Simulation of gear manufacturing processes
  - Manufacturing simulations for processes with geometrically defined and undefined cutting edges, covering

bevel, cylindrical, beveloid and worm gears

- Evaluation of the running behavior using FE-based tooth contact analysis
  - Determining characteristic parameters for the load carrying capacity
  - Evaluating noise excitation
  - Local calculation of contact and tooth root fatigue as well a tribological system simulation

### Software Solutions

- Full access to the FVA Workbench ([www.fva-service.de](http://www.fva-service.de))
- FE-based tooth contact analysis ZaKo3D for gear sets with three-dimensional contact behavior
- Geometry generator GearGenerator for generating tooth gap geometries including manufacturing-related deviations
- Process and manufacturing simulation SPARTapro to analyze processes with a defined cutting edge (e.g. gear hobbing, power skiving)
- Process and manufacturing simulation GearGRIND3D (generating gear grinding)
- Process and manufacturing simulation BevelCut (bevel gear cutting)

### Industries Served

- Aerospace
- Automotive
- Industrial drives
- Windturbine industry



### Contact

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