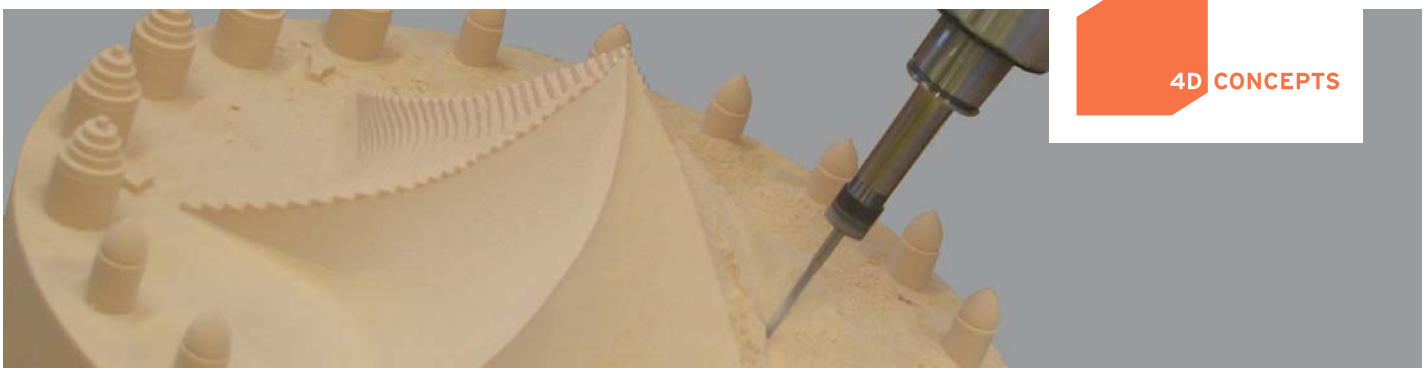


4D CONCEPTS

# Milling

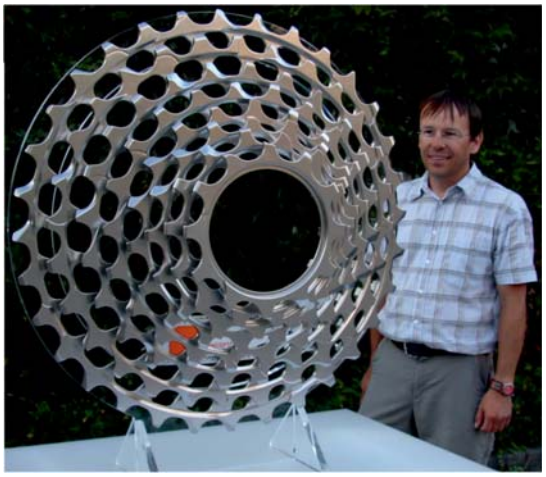
Generative 3D printing methods do not always offer the best solution for the realisation of a model or mould. Especially for components, moulds and fixtures with large dimensions, milling with 3 or 5 axes is often the more efficient solution. Using 3D CAD data as the basis, we process the entire range of hard foam and synthetic materials – from lightweight model-making foam with low density, for example for large trade fair models, all the way to highly filled foam material for rugged moulds or gauges. The range of materials offers many and varied options. Depending on the requirement, the combination of milling and 3D printing is often also the most efficient solution for a project – our project engineers will develop a customised solution completely in line with your requirements.

## Advantages

- Efficient for large component dimensions
- Broad range of materials
- Moulds for RIM, deep-drawing, thermoforming, etc.
- Gauges and fixtures
- Combination with 3D printing

Car underbody for spray water test

## Options



- Dimensions up to 2300 x 1450 x 600 mm
- Milling with STL data possible, STEP, IGES, Parasolid preferred
- Range of plastic and hard foam materials
- Models, moulds, gauges, fixtures
- Finishing options from painting to waterproofing

Trade fair model ring gear 10:1 milled with steel effect paint

**Phone: +49-6152-9231-0 • Fax: +49-6152-9231-11 • mail@4dconcepts.de • www.4dconcepts.de**

## Application example RIM mould

For casting and recasting applications such as RIM low-pressure spraying or also recasting methods like deep-drawing and thermoforming, efficient moulds can be produced for (small) series production. Depending on the requirements, the range of foam materials offers a complete range all the way up to highly filled materials here. Compared to silicone moulds, milled moulds offer a considerably larger output and thus allow larger quantities.

Components with approx. 12 litre shot weight via RIM

Milled mould cover made of 670 block material

## Application example exhibit

Large models for trade fairs, exhibitions and presentations can often be produced more efficiently with milling than with 3D printing. Lower material costs of the foam materials have more of a positive effect in a comparison with 3D printing of larger models Through 5-axis processing, complex geometries can also be realised with machining, naturally always taking into consideration the constraints of milling – e.g. hollows and undercuts. Through post-processing, for example painting or waterproofing, the appearance and function of models can be finished to match the respective application

Exhibit of archaeological findings at a scale of 10:1, milled with true to the original paintwork

## Application example deep-drawing mould

Rigid foam moulds are also perfect for reforming methods like thermoforming or deep-drawing. Fast machining and cost-efficient materials provide a very good price/performance ratio especially for projects with very low quantities. A two-part deep-drawing mould for the “glassy skin” of a Neanderthal was created for an anatomical exhibit. For the starting base, the skeleton was scanned, the external of a Neanderthal statue approximated and the skeleton generated via Freeform. The 3D data of the internal organs were adjusted to the skeleton and from that, the data of the glassy skin of the deep-drawing mould were derived. For the exhibit, the clear outer casing was created through deep-drawing in milled moulds and the internal organs via CJP powder printing. The components of theu internal organs, skeleton and glassy casing were finally put together.

Project exhibit Neanderthal approx. 1800 mm long

**Phone: +49-6152-9231-0 • Fax: +49-6152-9231-11 • mail@4dconcepts.de • www.4dconcepts.de**