



- 1 Cutting disc with adhesively bonded cutting segments.
- 2 Rotor for an electric motor with bonded magnets. (Photo: © SEW Eurodrive GmbH & Co. KG)

**Fraunhofer Institute for  
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## ADHESIVE BONDING – THE JOINING TECHNIQUE FOR TOOLMAKING AND MACHINE ENGINEERING

### Adhesive bonding in toolmaking

In toolmaking it is often necessary to join high-grade cutting or grinding elements with a base body made of a lower grade material. To achieve this, the adhesive bonding technology has, in practice, a number of **key advantages** over traditional methods such as laser-welding and soldering:

- Temperatures below 200 °C for the adhesive bonding process have no negative effects on the metal microstructure.
- This means that there is no need to carry out subsequent processing steps such as straightening and grinding, so saving considerable amount of work and money.
- Adhesive bonding technology can be used to join a wider variety of materials: joining of materials which cannot be soldered such as ceramics.

The experts of Adhesive Bonding Technology at Fraunhofer IFAM develop production processes for assembly, from the adhesive selection stage right through to rapid adhesive curing using, for example, induction.

### Adhesive bonding in machine engineering

A broad range of projects have been undertaken by the scientists of Adhesive Bonding Technology at Fraunhofer IFAM, enabling in-depth experience to be acquired on replacing mechanical joining methods with adhesive bonding technology in the machine engineering industry.



The focus here is not only on structural **applications in mass markets**, such as machines for handicrafts or the bonding of drive units, but also on **individual applications for special purpose machinery manufacture**.

In the area of machine building, Fraunhofer IFAM develops tailored solutions that are closely coordinated with the customer to meet his specific needs.

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#### Portfolio of Fraunhofer IFAM

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The experts of Adhesive Bonding Technology at Fraunhofer IFAM offer companies in the machine engineering and toolmaking sectors an extensive range of services. These services are available either individually or in combination and include:

#### ■ Consultancy

- Identification of the scope for optimizing production processes
- Design of substrates suitable for adhesive bonding

#### ■ Adhesive selection and qualification

- Adhesive selection and qualification in accordance with the requirements laid down in consultation with the customer

#### ■ Implementation in the adhesive bonding production process

- Selection of a method for rapid adhesive curing
- Integration of pre-treatment steps into the production
- Assistance with the selection of suitable technical equipment such as application and mixing devices
- Integration of adhesive bonding into the existing process

#### ■ Quality assurance

- Assistance with and development of solutions to address shortcomings in the production process

#### ■ Replacement of mechanical joining methods