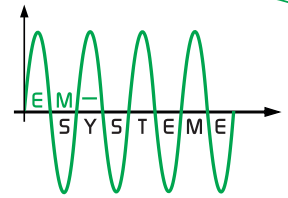


# Overview of services

EM-SYSTEME GmbH



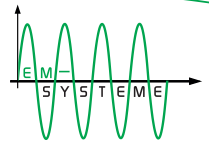
Ultrasonic welding

Carbide blades

Ultrasonic cutting

Services

Vibration cutting



## Ultrasonic technology for welding and cutting

Inside a generator, an electrical voltage in a frequency range of normally 20 – 40 kHz and a power of up to 4000 W are generated.

Piezo elements provided inside a converter unit convert this alternating voltage into mechanical vibration and transmit it to a special tool, which is called sonotrode.

The complete vibratory system, consisting as a minimum of the converter and the welding tool, also referred to as sonotrode, vibrates within its own resonance.

### Here is an extract from our delivery program:

#### Standard and customized ultrasonic presses

- ▶ rotary indexing systems, foil cycle devices
- ▶ soundproof booths
- ▶ indexed quick-change systems
- ▶ remote maintenance

#### Generators

- ▶ installation and desktop designs
- ▶ power from 100 to 4000 W
- ▶ frequencies from 20 to 40 kHz
- ▶ housing also available in IP65 design

#### Handheld devices

- ▶ easy to handle and light-weight
- ▶ cost-effective and sturdy
- ▶ flexibly usable

#### Feed units

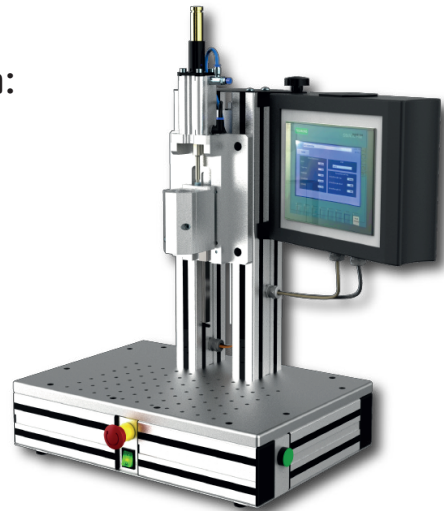
- ▶ pneumatic
- ▶ elektromotive
- ▶ for different areas of use

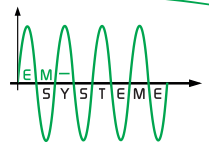
#### Sonotrodes

- ▶ frequencies from 20 to 40 kHz
- ▶ diverse materials and coatings
- ▶ manufacture on modern CNC machines
- ▶ production according to drawing or sample
- ▶ in-house design and FEM analysis

#### Jig construction

- ▶ own application technology
- ▶ welding devices for installation in existing systems
- ▶ design, installation and commissioning
- ▶ control cabinet construction incl. programming
- ▶ machines and devices for tests in application technology





## Ultrasonic welding

In ultrasonic welding, thermoplastic and other materials are welded by mechanical vibration.

- ▶ plastic moulded parts / foils
- ▶ fabrics with a plastic component

The heat required for welding is generated inside the workpiece at the weld.

As there is no need for heating the welding tool (sonotrode), it will not stick to the material.



## Ultrasonic cutting

In ultrasonic cutting, a distinction is made between cutting and sealing (which means cutting while simultaneously sealing the cutting edges), on the one hand, and cutting with a blade integrated into the sonotrode (cutting sonotrode) or screw-in knife tip (knife tip sonotrode), on the other hand.

Our ultrasonic cutting systems are successfully used in the following areas of application:

### Textiles

- ▶ thermoplastic fabrics, knitted fabrics or nonwoven

Cutting and sealing using a sonotrode-and-anvil combination, either as 2 pieces or as a compact assembly.

### Plastic

- ▶ foils/elastomers
- ▶ Plastic components with sprues

The ultrasonic vibration at the blade permits a clean separation of the materials. Deposit plasticisation, stress whitening and optical influences are thus significantly reduced.

### Food

- ▶ pastries/frozen products
- ▶ candy/cereal bars
- ▶ cheese

The ultrasonic vibration at the blade reduces the cutting forces and thus lowers the crushing force.

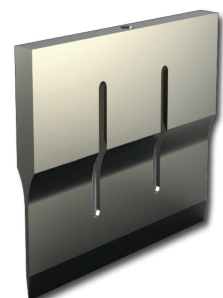
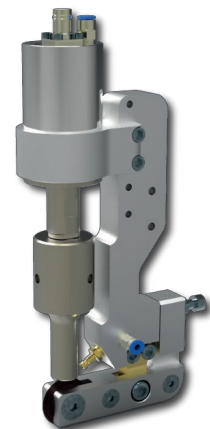
The vibration additionally reduces the adhesion of the material to be cut, resulting in a very low product carry-over.

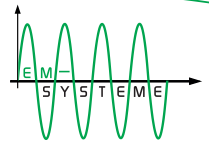
### High-strength fibres and composites

- ▶ glass or carbon fibre, as knitted or nonwoven fabric, non-crimp fabric or Prepreg
- ▶ adhesive materials

The screwed-in knife tip is supported by ultrasound. As a result, the cutting forces are lowered, blade wear is reduced and the cutting speed is increased. Reduced material adhesion offers advantages here as well.

Important: A generator of a high protection rating, such as our ProteUs (IP65 enclosure), is required for carbon fibre materials.





## Vibration cutting

### Vibration cutting head OsCut P150

- ▶ small space requirement, yet extremely powerful
- ▶ high flexibility during installation and handling
- ▶ support Ø 6 mm or 8 mm with weld-on clamping surface
- ▶ customized supports are possible

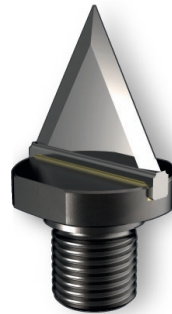
#### Reliably cuts:

- ▶ foams, foils
- ▶ felt
- ▶ cork
- ▶ rubber, elastomers
- ▶ cardboard



## Carbide knives

- ▶ manufacture according ample, drawing or data
- ▶ high quality and long tool life
- ▶ small batch sizes
- ▶ coatings



### The three main groups of our blade program:

#### Ultrasonic knives

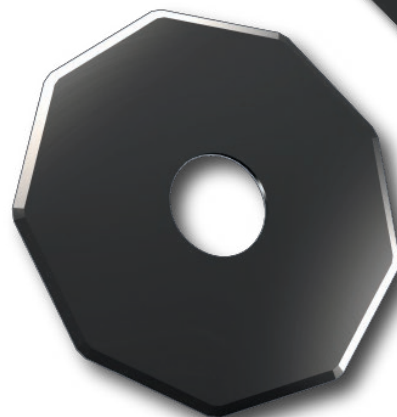
- ▶ connection thread M6x0,5 - M7 - M10x1 - M12x1,25 - 5/16"
- ▶ large stocks of standard blades

#### Rounded shank blade for OsCut

- ▶ long tool life and high bending strength
- ▶ blades up to approx. 145 mm
- ▶ custom blades with special bevel

#### Custom blades

- ▶ Rounded blades made of solid carbide up to Ø200 mm
- ▶ multiple surface blades
- ▶ blades for cutting plotters or cutters



## Services

We develop and design small custom machines and devices:

Applications technology, design, manufacture, control system engineering, programming and installation – everything from one supplier.

Should you be interested in large systems, we will be happy to refer you to machine constructors from our customer base and will gladly offer advice and support.