

About VibroCut

VibroCut GmbH is leading in the development and sale of systems for hybrid machining. Our innovative solutions – with a focus on ultrasonic and oscillation technology – enable both the retrofitting of existing and the equipping of new machine tools. The focus is on precision, efficiency and increased productivity for our customers.

As a provider of complete solutions, we offer you:

- System solutions and tool holders for hybrid machining
- Machine integration and commissioning for seamless implementation
- Customized technology development, tailored to your individual requirements
- Employee training and support for series start-up

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Ultrasonics for high performance

VibroCut *ultrasonic*

Solutions for

**ultrasonic-assisted drilling
and deep hole drilling**

Contact

VibroCut GmbH

Annaberger Str. 240

09125 Chemnitz | Germany

Tel. +49 371 335 656 0

info@vibrocut.de

www.vibrocut.de

 **VIBROCUT**

www.vibrocut.de

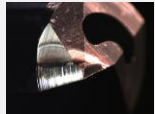
Demands in Drilling and Deep Hole Drilling

Drilling and deep hole drilling play an important role in industrial part production, accounting for 25 to 30 percent of all machining processes. Especially in series processes, conventional optimization methods via cutting parameters or tool geometry are often exhausted. Deep hole drilling, which is characterized by a high ratio of hole depth to diameter, is particularly demanding in terms of process control.

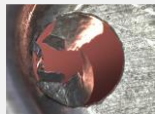
In order to achieve an increase in performance with these processes, the following limitations must be overcome:

1. High process forces limit productivity.
2. Tool wear limits productivity and reduces process reliability.
3. Burr formation at the bore exit causes non-value-adding additional processes.
4. Poor chip removal leads to process uncertainties.

Issues for drilling processes



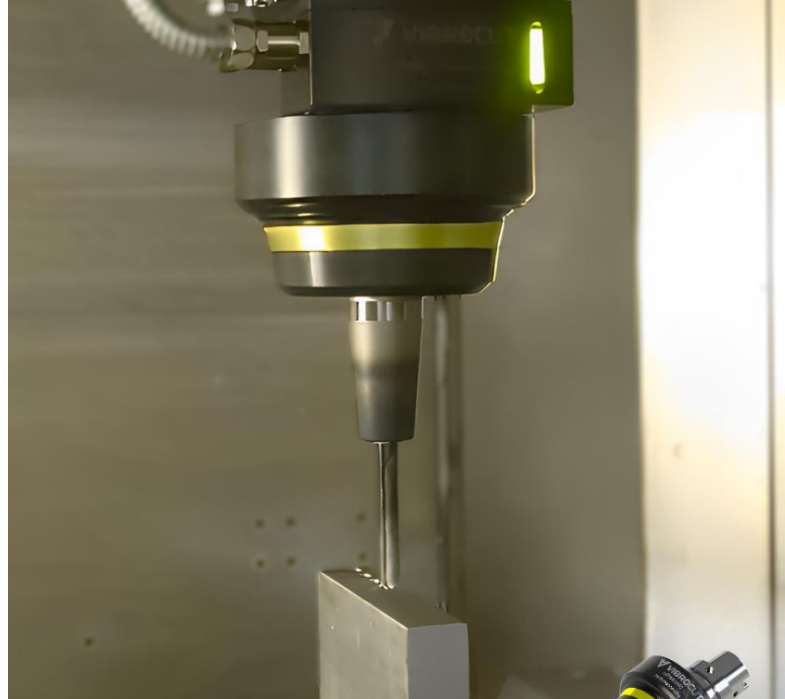
Tool wear on drills



Burr formation at the bore exit



Ribbon chips and spiral chips



Innovative systems for ultrasonic-assisted drilling

The **VibroCut ultrasonic** toolholders set the drilling tool into an ultrasonic motion, which changes both the process kinematics and the mechanisms of action during chip formation. This leads to a modification of the tribological contacts and reduced friction, as well as to material-specific effects and a reduction in process forces. The unique feature is the performance of the systems, which enables sufficiently high-performance parameters even under high loads. An integrated sensor for measuring the ultrasound and a highly dynamic control system ensure maximum precision.

Performance parameters VibroCut ultrasonic

Ultrasonic frequency	$f_{us} = 16...50 \text{ kHz}$
Amplitude	$\hat{A}_{pp} = 0.1...80 \text{ }\mu\text{m}$
Performance	$P_{max} = 1,000 \text{ W}$

Enhancing value for customers

Ultrasonic assistance with **VibroCut ultrasonic** enables a reduction in tool wear, process forces and burr formation and thus an increase in tool life. In addition, tool vibrations can be reduced during deep hole drilling, and chip evacuation and the center course can be improved. This increases the productivity and process reliability of the drilling process. The ultrasonic system can be integrated into new machines via the standardized interfaces but can also be retrofitted to existing machines.



Increase in productivity



Increase of tool life time



Increase in process reliability



Equipment of new and existing machines

Increase of productivity with VibroCut ultrasonic

The calculation shows, as an example for a drilling process in machining centers with a cycle time share of 45 percent, the savings potential by increasing the cutting parameters in a single machine.

Machine hour rate: 75 €/h

Planned occupancy time: 6000 h/year \approx 750 shifts/year

Increase of cutting parameters: 25-100 percent

Cutting parameter increase	Increase in productivity	Savings/machine
25 %	9.0 %	40,500 €/year
50 %	15.0 %	67,500 €/year
100 %	22.5 %	101,250 €/year