

About VibroCut

VibroCut GmbH distributes systems for vibration-assisted cutting with which both new and existing machine tools can be equipped. We see ourselves as a provider of complete solutions for vibration-assisted machining and offer the following products and services:

- System solutions for vibration-assisted machining
- Machine integration and commissioning
- Customized technology development
- Employee training and support for series start-up

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Federal Ministry
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EXIST



ESF
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for Germany



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by the German Bundestag



With ultrasonic to high performance

VIBROdrill *ultrasonic*

Solutions for
ultrasonic-assisted drilling
and deep hole drilling

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 **VIBROCUT**

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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.



Innovative systems for ultrasonic-assisted drilling

The **VIBROdrill ultrasonic** toolholders set the drilling tool into high-frequency vibration, 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 enable sufficiently high vibration parameters even at process forces.

Performance parameter **VIBROdrill ultrasonic**

Vibration frequency: $f_{\text{vib}} = 16 \text{ to } 50 \text{ kHz}$
 Vibration amplitude: $\hat{A} = 0.1 \text{ to } 80 \text{ }\mu\text{m}$
 Power: $P_{\text{Wmax}} = 1,000 \text{ W}$

Enhancing value for customers

Using **VIBROdrill ultrasonic** for ultrasonic assistance effectively reduces friction and process forces. This results in extended tool life due to reduced tool wear and an improvement in burr formation. 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 of productivity



Increase of tool life time

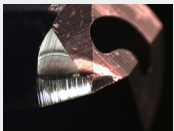


Increase of process reliability

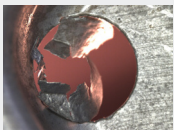


Equipment of new and stock machines

Issues for drilling processes



Tool wear on drills



Burr formation at the bore exit



Ribbon chips and spiral chips

Increase of productivity with **VIBROdrill ultrasonic**

The calculation shows, as an example for a drilling process in machining centers with a cycle time share of 35 percent, the savings potential by increasing the cutting parameters in a single machine.

Machine hour rate: 130 €/h
 Planned occupancy time: 6,000 h/year \approx 750 shifts/year
 Increase of cutting parameters: 20 to 100 percent

Cutting parameter increase	Increase in productivity	Savings/machine
20%	7.1 %	45,500 €/year
40%	10.0 %	78,000 €/year
60%	17.5 %	136,500 €/year