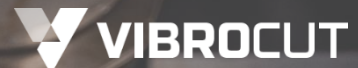
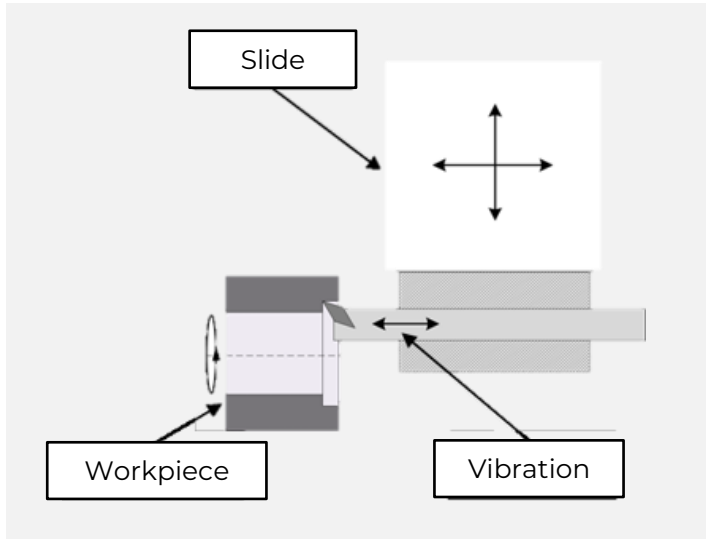


Vibration-assisted turning – VIBROturn



Technology classification



Objective: Realisation of an economic and robust chip breaking behaviour

Manufacturing process:

- Turning (longitudinal/face turning, grooving or parting off, internal or external turning)

Shape of Vibration:

- 1-dimensional (longitudinal)

Frequency of vibration:

- Low frequency 1...100 Hz

Generation of vibration:

- Non-resonant

Orientation to process kinematics:

- Feed direction

Productivity ↑

Process reliability ↑

Vibration-assisted turning – VIBROturn



Product line – VIBROturn

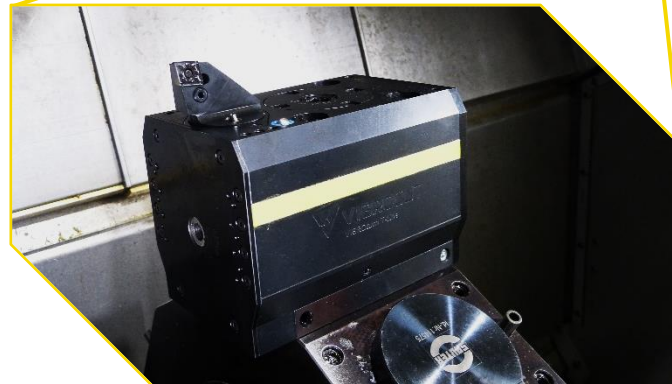
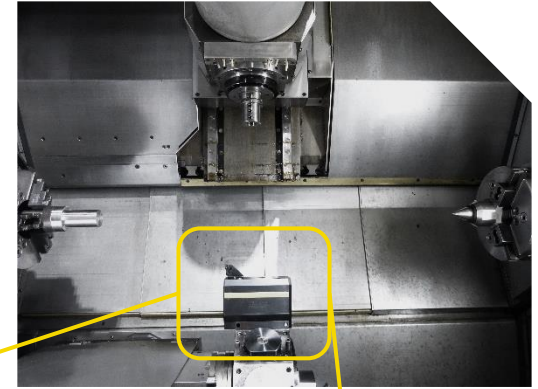
Innovative tool holders

- Self-driven or driven tool
- Rigid bearing of the tool holder
- High performance

Performance:

Frequency:	$f_{\text{vib}} = 1...100 \text{ Hz}$
Stroke (adjustable):	$\hat{A} = 0...0,6 \text{ mm}$
Process forces:	$f_{\text{c, max}} = 9 \text{ kN}$

- Flexible retrofitting independent of the machine manufacturer



VIBROturn for driven tool stations

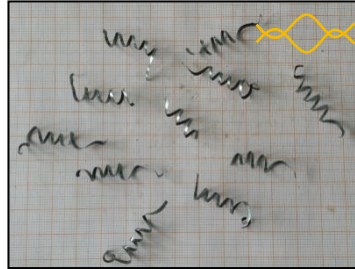


Chip breaking

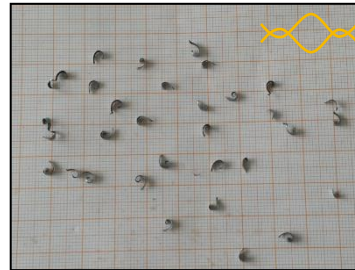


- Material C55
- $v_c = 190$ m/min
- $a_p = 0,5$ mm
- $f = 0,1$ mm

with interrupted cut



$\hat{A} = 0,11$ mm | $f_{vib} = 13$ Hz



$\hat{A} = 0,11$ mm | $f_{vib} = 65$ Hz

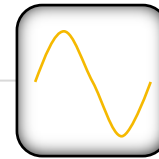
without interrupted cut



$\hat{A} = 0,08$ mm | $f_{vib} = 13$ Hz



$\hat{A} = 0,08$ mm | $f_{vib} = 65$ Hz



Benefits of VIBROturn



Increase of machine availability



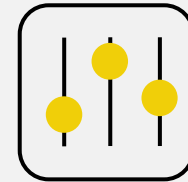
Enhancement of process reliability



Enabling automation and
unmanned production



Improvement of chip handling
and processing



Neutral to cycle time



Savings with VIBROturn



Calculation example internal turning

- Machine hour rate: 85,- € / h
- Planned occupancy time: 6000 h / year (750 shifts / year)
- Machine downtime: 2 - 6 min / h

Downtime due to chip breakage

Usage loss per year

Downtime costs per machine

2 min / h

200 h (3,3 %)

17.000 €

4 min / h

400 h (6,7 %)

34.000 €

6 min / h

600 h (10 %)

51.000 €

