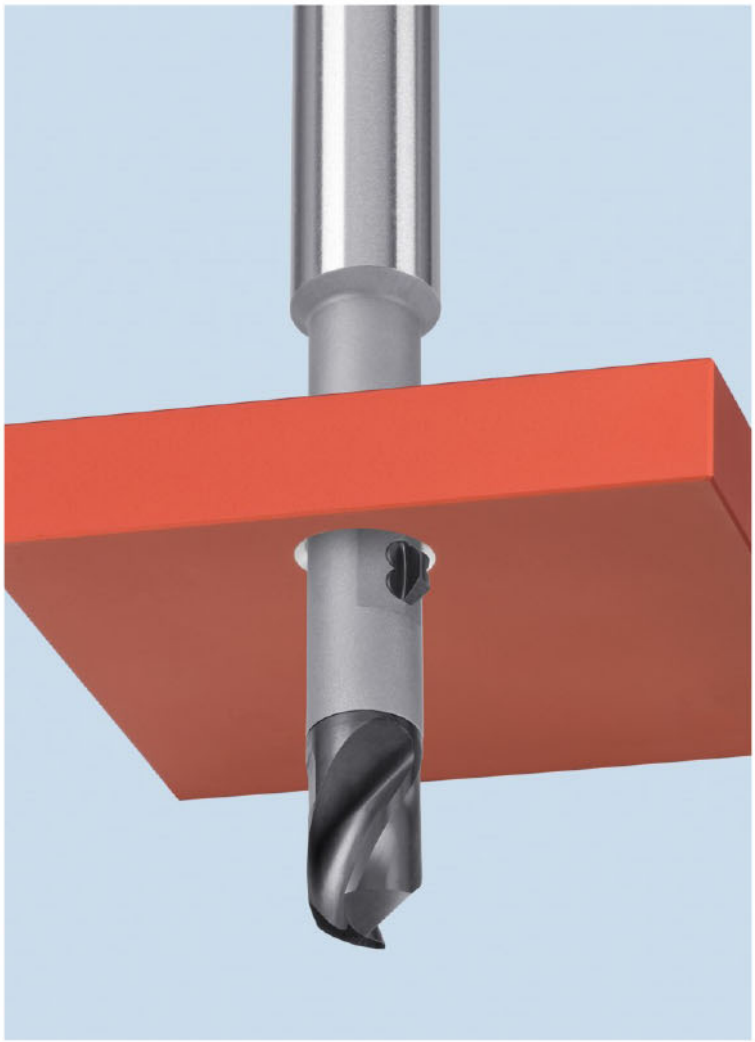
HEULE
PRECISION TOOLS

ONEOPERATION

VEX-S

Instruction Book

Combination drill and front & back chamfering of through holes in a single operation.



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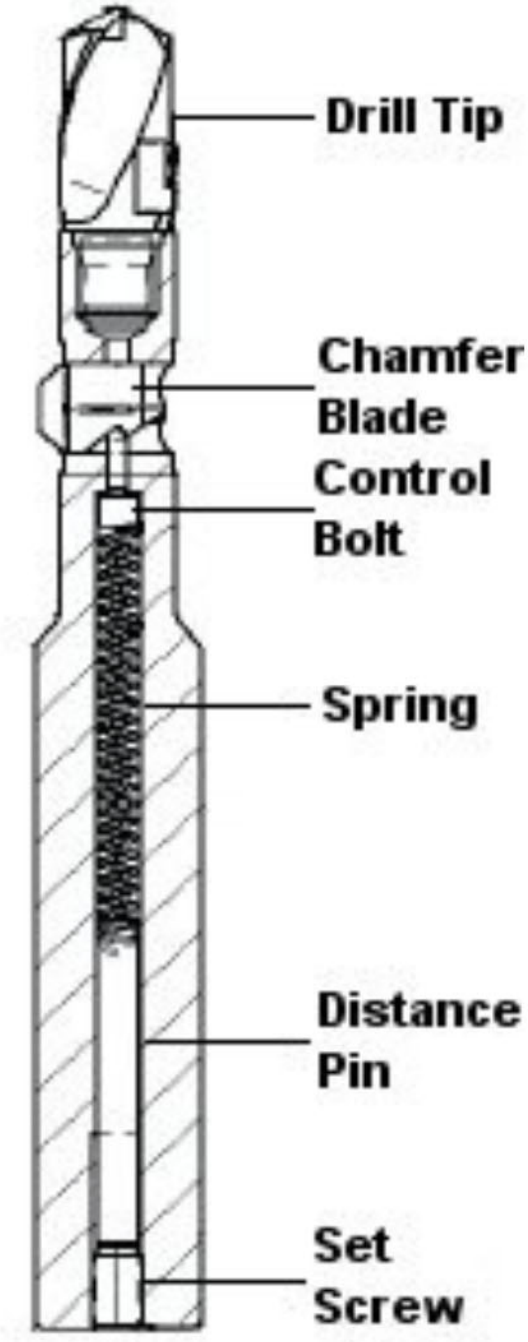
Certified Management System ISO 9001 SQS Reg. Nr. 14757

SWISS MADE

Tool Description



What does the VEX-S tool do?

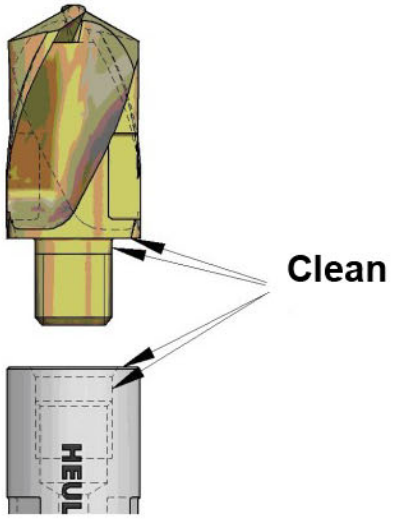
The VEX-S Combi combines a replaceable high performance twist drill with our patented SNAP chamfering system. This system makes drilling and front and back chamfering in a single operation possible and is especially suited for machining smaller diameter holes.

The VEX twist drill is replaceable and incorporates VEX, the new self-centering high performance cutting geometry. It is manufactured from high quality solid carbide and can also be easily re-ground and recoated ensuring optimum cost effectiveness.

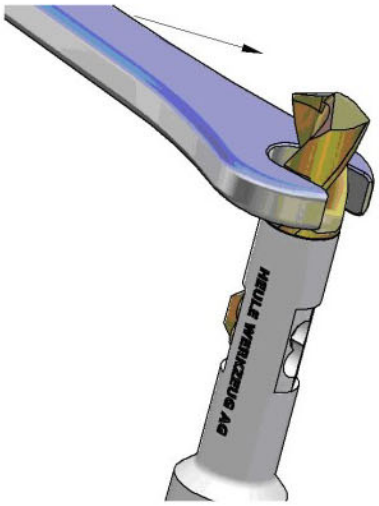
The new VEX cutting geometry guarantees high drilling performance with short chips. Due to the convex cutting edge (1) which merges into a concave chip angle (2) short chips are guaranteed even when machining a long chipping material. A large chip channel also optimizes swarf evacuation.

The specially developed connecting system ensures robust and accurate connection with the tool body and facilitates good transmission of power and also allows quick and easy replacement of the VEX-S twist drill.

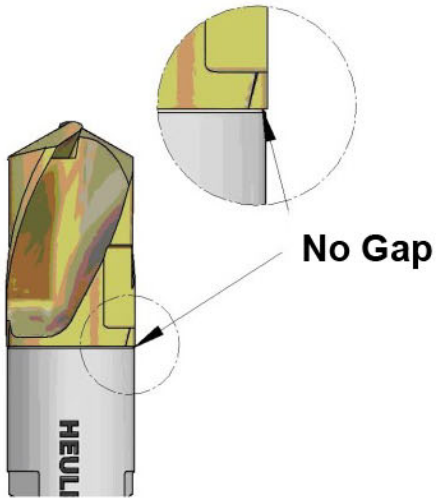
How do I Change the Drill Tip?



Step 1



Step 2



Step 3

Assembly

Step 1
Clean the surfaces between the VEX-S twist drill and the tool body.

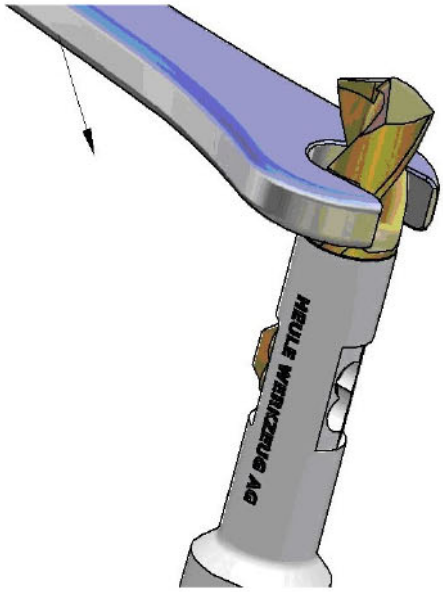
Step 2
Screw the VEX-S drill insert tightly with a flat wrench to the tool body.

Step 3
Check to make sure there is a seamless connection between the drill insert and tool body after tightening the drill insert. There should not be any gaps.

NOTE
There are a few situations that could cause gaps:

- Dirt between drill and tool body.
- VEX-S twist drill is not tight enough.
- Adaption areas are damaged.

How do I Change the Drill Tip?



Step 1

Disassembly

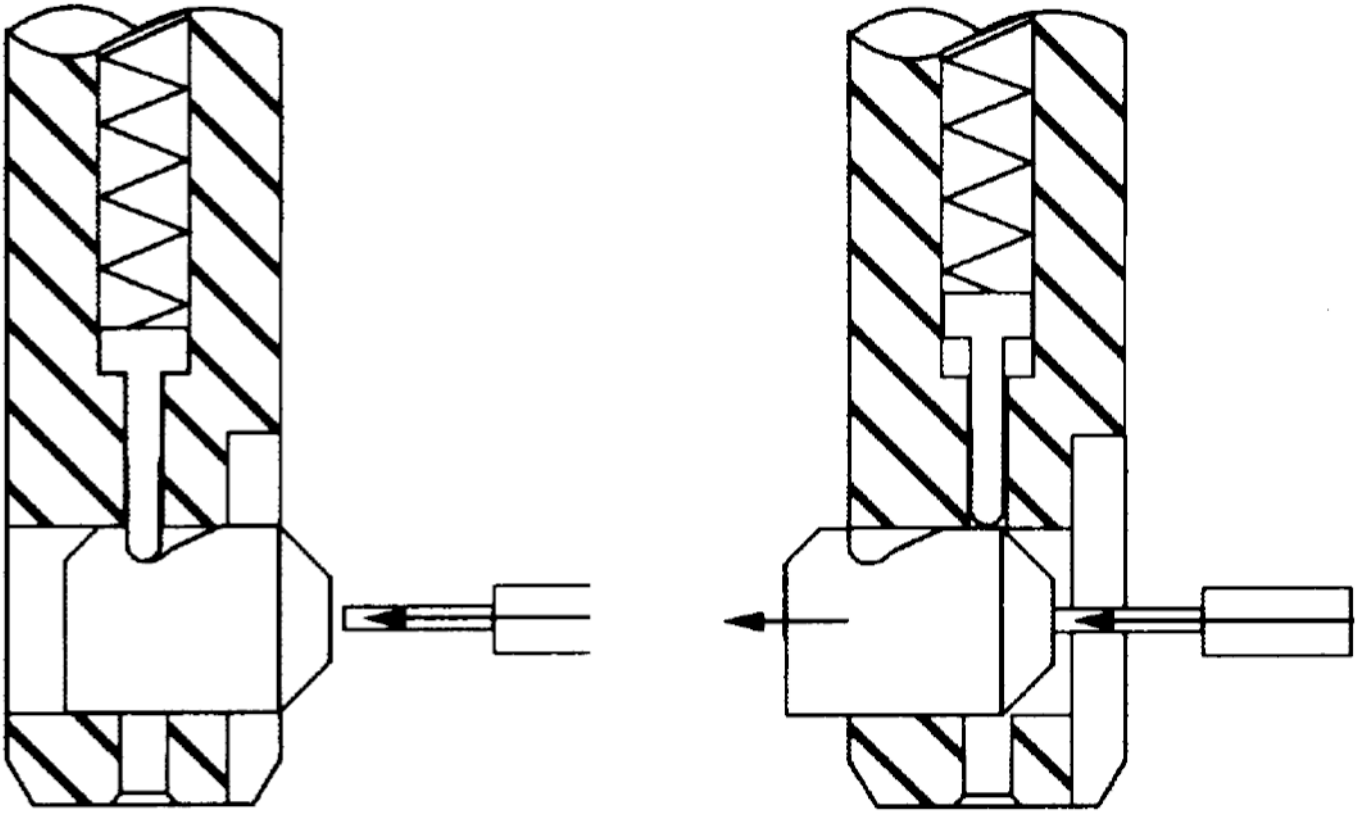
Step 1
Unscrew the VEX-S twist drill with a flat wrench in counter-clockwise direction from the tool body and remove the twist drill.

Wrenches

Be sure to use the wrenches available from Heule to assemble the VEX-S tools. This chart explains which wrench goes with which series.

Wrenches	Description	Distance Across Flats
GH-H-S-2301	Wrench; Series B&C, 5.0-6.49	4 or 5mm
GH-H-S-2302	Wrench; Series C,D&E 6.5-8.99	6 or 7mm
GH-H-S-2303	Wrench; Series E, 9.0-10.0	8 or 9mm

How do I change the chamfer blades?



Step 1

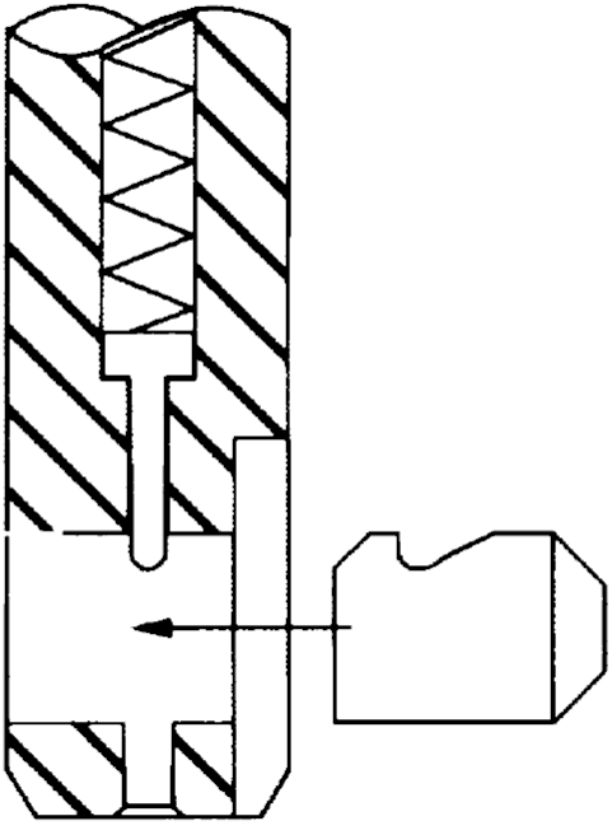
Step 2

Disassembly

Step 1
Push the front of the blade through to the back until it ‘snaps’ and is sticking out of the back side.

Step 2
Push the blade the rest of the way through or grab the back of the blade and pull it the rest of the way out.

How do I change the chamfer blades?



Step 1

Assembly

Step 1
Place the back side of the new blade into the blade window and push the blade into the window until it ‘snaps’ into place.

Check that the blade works by pushing the front of the blade in and make sure it pushes back out on its own.

How do I program?

VEX-S Speeds and Feeds

Recommended programming information for VEX-S Drill for 1xd - bore depth (T) to hole dia. (Ød).

IMPORTANT: Do not exceed 6000 RPM without contacting Heule Tool Corporation; special components required for securing deburr blade.

Material	Hardness HB	SFM	IPR
Unalloyed steel	<150	300-400	.004-.010
Cast steel Free machining steel	150-250	275-350	.004-.010
Low-alloy steel	<250	250-400	.004-.010
Cast steel	250-300	220-350	.004-.010
High-alloy steel	<250	130-220	.004-.008
Stainless steel	130-190	100-160	.003-.004
Grey cast iron	<150	275-500	.006-.013
Nodular cast iron	90-240	275-450	.004-.012
Aluminium-forging alloys		380-600	.008-.013
Aluminium-casting alloys		300-600	.008-.013
Brass		300-500	.008-.013
Bronze – short chipping		200-300	.006-.012
Bronze – long chipping		130-200	.004-.010

How do I program? *(continued)*

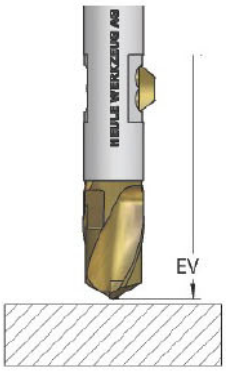
It is not necessary to change the direction of rotation or stop the spindle.

AV: Working feed, forward
EV: Rapid feed, forward
AR: Working feed, backward
ER: Rapid feed, backward

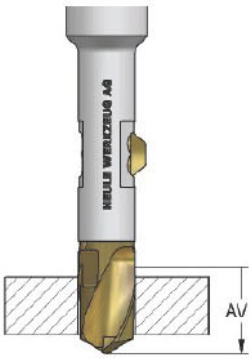
STEP 1: EV
Rapid traverse of the tool to just above the top of the work piece.

NOTE: Clearance distance.

STEP 2: AV
In forward linear feed the hole is produced. Continue working feed until the drill insert is completely clear of the hole.



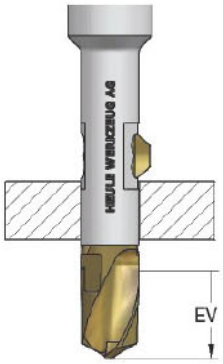
Step 1



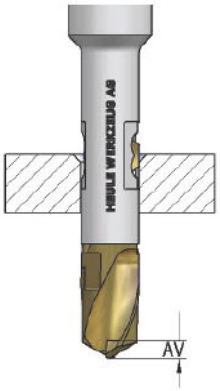
Step 2

STEP 3: EV
Position tool with SNAP blade in rapid feed, forward slightly above the top of the material surface bore or burr.

STEP 4: AV
In linear feed forward the chamfer is generated. Continue in linear feed until the blade is completely retracted into the tool.



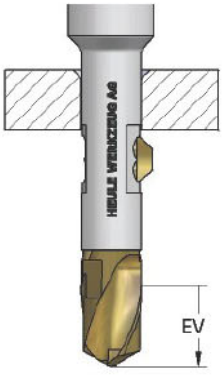
Step 3



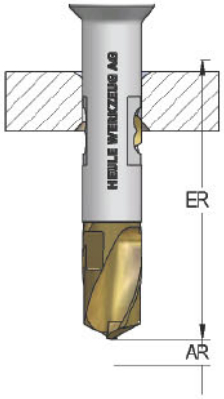
Step 4

STEP 5: EV
The tool can be passed through the hole in rapid feed forward until the SNAP blade clears the hole and is fully extended.

STEP 6: AR / ER
The back chamfer is machined by linear feed backward (no change of spindle rotation). As soon as the SNAP blade is completely retracted into the tool, the tool can travel out of the hole in rapid feed backward.

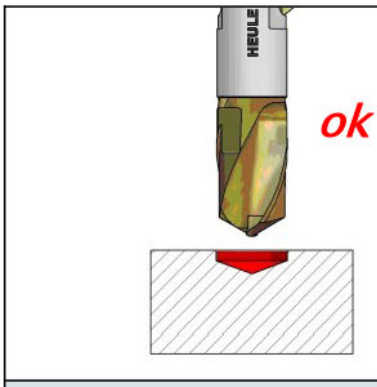
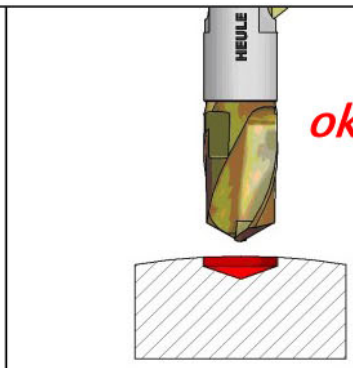
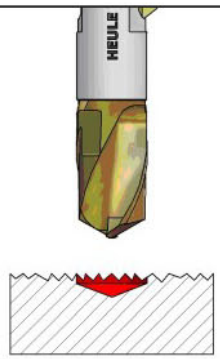
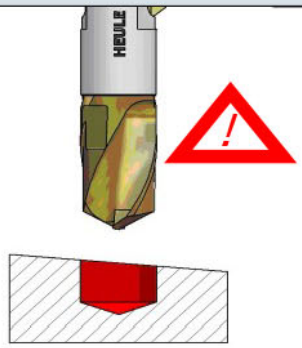
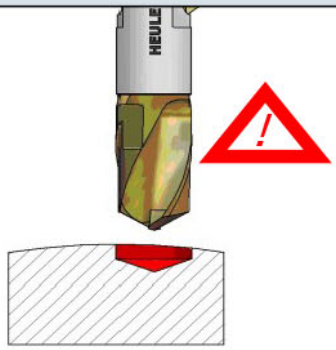
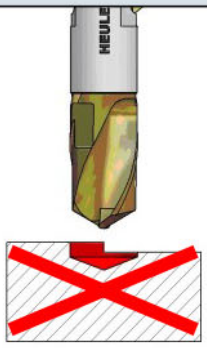
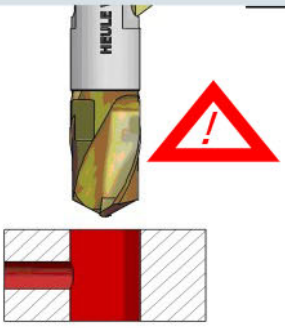
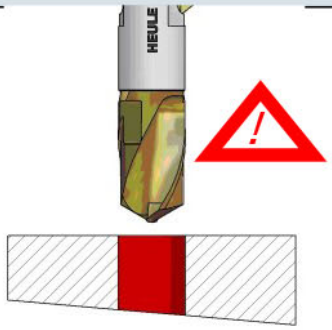
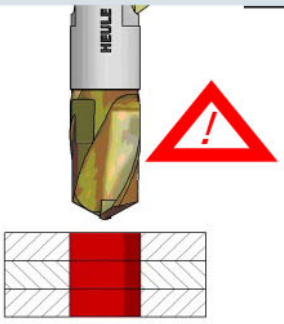


Step 5



Step 6

Troubleshooting *(continued)*

		
Drilling of even machined surfaces.	**Drilling on central or convex surfaces.**	**Drilling on uneven surfaces. If necessary reduce feed-rate.***
		
Drilling on angled surfaces.*	**Drilling on off-center convex or concave surfaces.***	**Drilling on an uneven surface in forged or cast iron: Not possible.**
		
Drilling through a cross-hole. Ø cross-hole max. 0.5x Ø bore. If necessary reduce feed rate.**	**Drilling with angle on back side. Reduce feed rate to about 50-60%.***	**Drilling through several layers. Seamless fitting of the different work pieces is necessary.**

* Chamfer won't be clean

** Tool can break! Blade for chamfering can get stuck in the cross-hole (drive through the bore with no rotation of the tool!)

Troubleshooting

PROBLEM	EXPLANATION	SOLUTION
Built-up Edge	Work piece material is welded to the cutting edge.	Raise cutting speed Raise coolant pressure May need different coating
Chip Jam	Drill chips are not evacuating through chip gullet.	Reduce feed rate Raise coolant pressure Improve drilling cycle
Burr Formation on the Exit of the Bore	Too large of burr will reduce chamfer blade life.	Reduce cutting speed Raise coolant pressure Exchange worn drill head Reduce exit feed 50%
Hole Variation	Hole size is inconsistent or not symmetrical	Reduce feed rate Raise coolant pressure Check rotation Check stability of spindle and setting
Bad Surface Quality	Indicates a chip control issue, reduction of drill life.	Raise coolant pressure Check rotation Exchange worn drill head
Chatter	Must be corrected to avoid tool breakage	Reduce cutting speed Raise feed rate Raise coolant pressure Check rotation
Major Cutting Edge Wear		Raise cutting speed Reduce feed rate Raise coolant pressure
Excessive Margin Wear	Accelerated corner wear or discoloration on margins O.D.	Reduce cutting speed Check runout Raise coolant pressure Check stability of spindle and setting
Clearance Surface Wear	Rapid flank wear indicates too high of surface footage.	Reduce cutting speed Raise coolant pressure
Chipping of Cutting Edge	If starting/exiting on incline, decrease entry/exit feed 50%	Raise cutting speed Reduce feed rate Raise coolant pressure Check stability of spindle and setting
Chipping of the Top of the Drill-bit	Possible deflection or too high feed (IPR)	Reduce feed rate Raise coolant pressure Check stability of spindle and setting

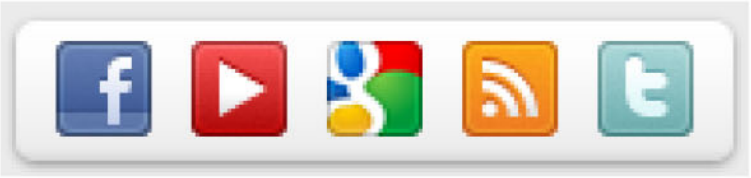
Grinding may produce hazardous dust. To avoid adverse effects, use adequate ventilation and read MSDS. Cutting tools may break during use. To avoid injury, use proper safety precautions and protective equipment.

- Use the machine tool with sufficient rigidity and horsepower
- Use a cover on a machine tool and a protector such as glasses against shattering chips and broken tools due to misuse.
- Do not use insoluble oil, because there is a danger of causing fire.

Visit our website for product brochures and videos

www.HeuleTool.com

We are also available on:

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