



DREX[®]-TOOLS

UTENSILI DI PRECISIONE PER L'INDUSTRIA MECCANICA - AERONAUTICA - AEROSPAZIALE
PRECISION TOOLS FOR THE MECHANICAL AVIATION - AEROSPACE MANUFACTURING



FLOATING AXIAL AND RADIAL TOOL HOLDER FOR DEBURRING AND CHAMFERING UNDEFINED EDGES



AND GROUP ITALIA SRL
s. op. Via Polonia, 15 - 20157 Milano

vendite@andgroupitalia.com
sales@andgroupitalia.com
www.andgroupitalia.com

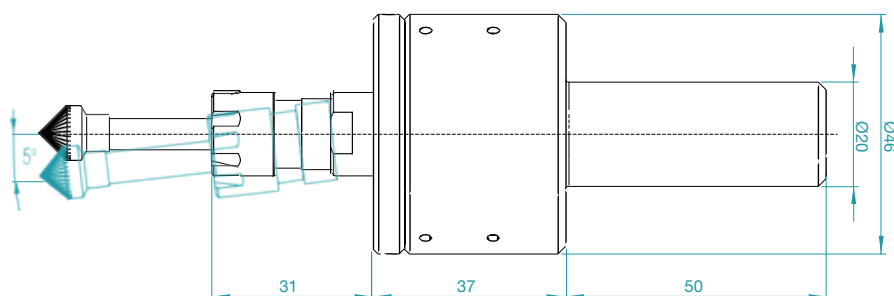
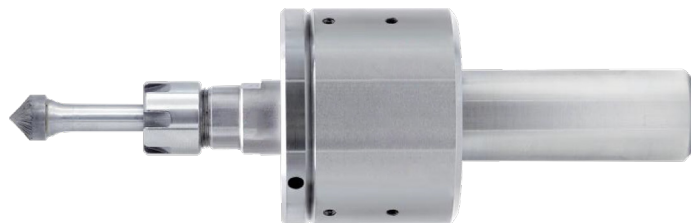


FDH-A0

FLOATING SPINDLE WITH RADIAL DEFLECTION FOR DEBURRING AND CHAMFERING UNDEFINED EDGES

FDH-A0 is a floating tool used to remove uneven contour burrs generated during machining it can automatically compensate the difference between the actual contour of the work piece and the program. Through the floating mechanism of the tool holder, FDH-A0 can move and process along the uneven edge of the workpiece, so that the tool has an edge compensation of 5~10mm.

The pressure at the edge of the workpiece can be adjusted by the adjusting mechanism in the tool holder and the tool can be directly driven by the spindle of the machine tool. The floating deburring tool holder mainly solves the problem that the rigid chamfering tool can not be machined in some places, and the chamfering in some places is very big. At the same time, it can improve the consistency of the chamfer size and optimize the finish through parameter adjustment.



LATERAL PRESSURE

When using the floating deburring tool for the first time, we suggest setting it in the following way: lock the adjusting screw, and then rotate it in the opposite direction for three turns (factory set) If the rotary file cannot be smoothly processed (such as the runout of the rotary file), the contact pressure is too low and must be increased. The press in amount directly affects the thickness of chamfer and deburring. Generally, when the pressing amount increases, the chamfer will also increase.

TECHNICAL INFORMATION

FDM-A0	
Activation	Spindle drive
Speed	3.000÷8.000rpm (recommended start speed: 5.000rpm)
Feed	2.000÷5.000mm/min (recommended start feed: 3.000mm/min)
Max deflection	Radially 5mm (with cutter attachment standard) 10mm with cutter attachment ≤100mm
Deflection	Max spindle deflection is 5° radial
Shank	Cylindrical 20mm
Chuck	ER-11 (the gripping range of the collet is 0,5÷7mm)
Weight	1,3kg

FREQUENTLY ASKED QUESTIONS OR FAQ

Excessive chamfering	1. Increased feed 2. Reduce the lateral press in amount (too small lateral press in amount will cause tool runout and damages the workpiece, tool and machine tool)
Inconsistent chamfer	1. Due to the change of direction, the feed speed is not constant - reduce the feed (applicable to the inconsistent chamfer when changing the processing direction) 2. Feed too low - increases feed speed (applicable to inconsistent chamfers generated by non changing processing direction) 3. The tool position (pressing amount) is not adjusted properly - the lateral pressing amount is 1-3mm
Chamfer too small	1. Decreased feed 2. Increased lateral pressure
Uneven chamfer	1. Increased spindle speed 2. Replace the rotary file

FDH-AB0

FLOATING SPINDLE WITH RADIAL - AXIAL DEFLECTION DEBURRING AND CHAMFERING OF UNDEFINED EDGES

FDH-AB0 is a floating tool used to remove uneven contour (edge) burrs generated during machining, it can automatically compensate the difference between the actual contour of the work piece and the program.

Through the floating mechanism of the tool holder, FDH-AB0 can move and process along the uneven edge of the workpiece, so that the tool has an edge radial compensation of 5~10mm and axial of 8mm.

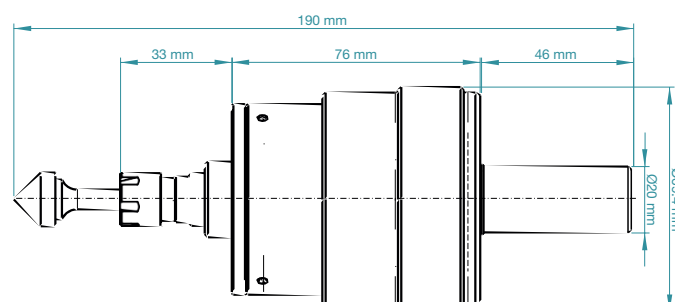
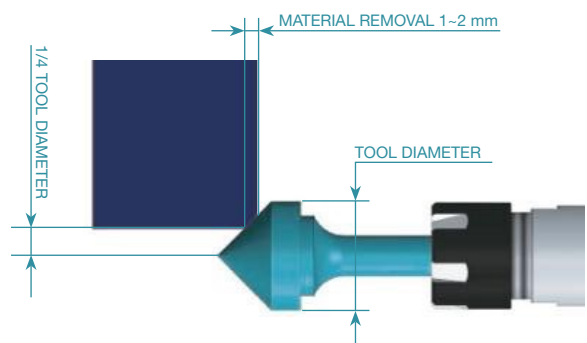
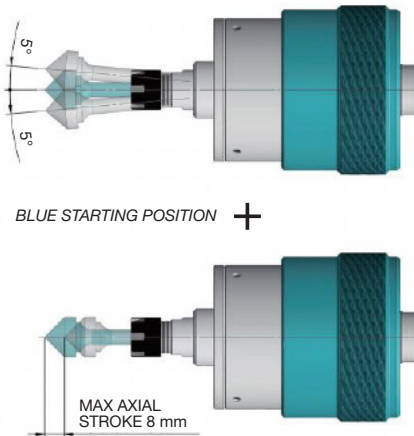
The pressure at the edge of the workpiece can be adjusted by the adjusting mechanism in the tool holder and the tool can be directly driven by the spindle of the machine tool.

The floating deburring tool holder mainly solves the problem that the rigid chamfering tool cannot be machined in some places, and the chamfering in some places is very big. At the same time, it can improve the consistency of the chamfer size and optimize the finish through parameter adjustment.



AXIAL STROKE: 8mm
MAX SPINDLE DEFLECTION: 5°

ONE SPINDLE - TWO FUNCTIONS



WORKING PRESSURE

Ensure that the tool is always preloaded during machining from 1mm to 2mm compared to the piece contour. When the overall part error is not large it is recommended to set a free pre-offset between 0,5mm and 1mm.

The preload value directly affects the thickness of chamfering and deburring. Generally, the higher the preload the higher the chamfer.

TECHNICAL INFORMATION

FDM-AB0	
Activation	Spindle drive
Speed	3.000÷6.000rpm (recommended start speed: 4.000rpm)
Feed	1.800÷4.000mm/min (recommended start feed: 2.000mm/min)
Max axial stroke	8mm
Max deflection	Max spindle deflection is: 5° radial
Shank	Cylindrical 20mm
Chuck	ER-11 (the gripping range of the collet is 0,5÷7mm)
Weight	1,3kg

FDH-B0 FDH-C0 FDH-C1

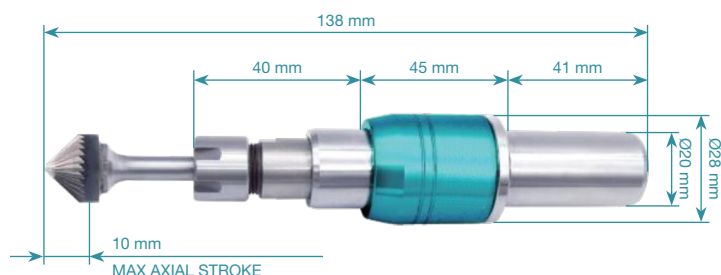
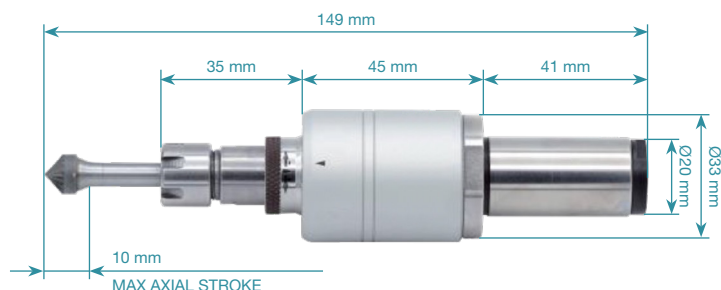
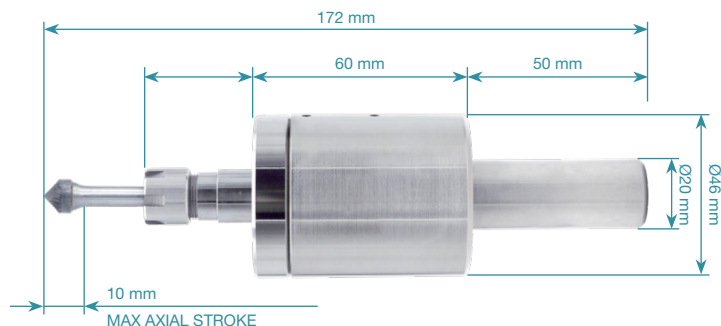
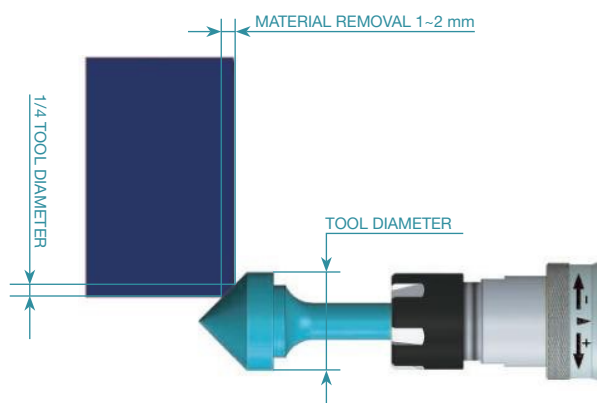
FLOATING SPINDLE AXIAL DEFLECTION

DEBURRING AND CHAMFERING OF UNDEFINED EDGES

The axial upward floating deburring tool holder has compact structure, convenient assembly, high cutting accuracy, better use stability and convenient maintenance. It can adaptively deburr irregular surfaces or contours, improve efficiency and reduce enterprise costs. At the same time, the tool holder can be used on machining centers, automatic lathes, robots and other equipment. Through the floating mechanism inside the tool, the cutting edge of the tool can continuously press the machined edge of the workpiece and stick to the workpiece, so as to achieve the purpose of tool profiling and deburring according to the workpiece shape.

The axial floating deburring tool holder has a floating range of 10mm in the Z axis direction, which is used to deburr the contour of different heights or the orifice surface.

TOOL SETTING MODE

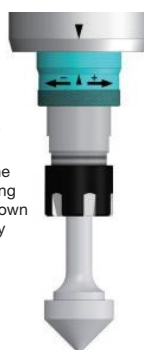


1. The tool holder has been fixed on the machine tool spindle
 2. The blue part shown in the figure is the adjusting holder (the first gear is when it turns 90°)

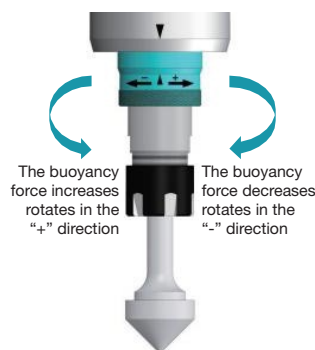
Hold the adjusting holder by hand



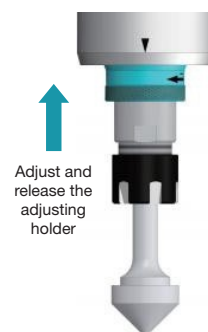
Pull the adjusting holder downward



Rotate the adjusting holder



Release the adjusting holder



Model	Speed	Feed	Adjustment mode	Load kg	Cutting direction
FDH-B0	6.000÷10.000RPM	3.000÷6.000mm/min	internal	0,900	The tool holder (i.e., the machine tool spindle) rotates clockwise, and the machining process revolves around the workpiece
FDH-C0	3.000÷6.000RPM	1.800÷3.000mm/min	external	0,330	
FDH-C1	3.000÷5.000RPM	1.800÷3.000mm/min	internal	0,200	

The tool holder mainly bears axial pressure. If excessive radial load is applied, the tool will be greatly damaged, the tool operation failure will be increased, and the tool life will be greatly reduced.

DO NOT APPLY A RADIAL LOAD, THIS COULD DAMAGE THE TOOL.

TOOL SETTING MODE

When using, adjust the tool position so that the cutting edge of the deburring tool (the offset is initially set at 1/4 of the tool diameter) is close to the workpiece deburring profile and the Z-axis is further downward 1~2mm (pre pressing amount). After that the tool can automatically compensate in the Z-axis direction, so as to remove the burrs from the irregular contour of the workpiece.

ADJUSTMENT MODE

The support force of the head FDH-C0 is adjusted externally according to the direction of the bidirectional arrow on the adjustment ring.

- 1 Hold the adjustment support with your hand
- 2 Pull the green adjustment ring downwards axially.
- 3 Rotate the adjustment ring
To increase in the direction “+”
To decrease in the direction “-”
- 4 Release the adjustment ring
Adjust and release the ring

1. The tool holder has been fixed on the machine tool spindle
2. The blue part shown in the figure is the adjusting holder (the first gear is when it turns 90 °)

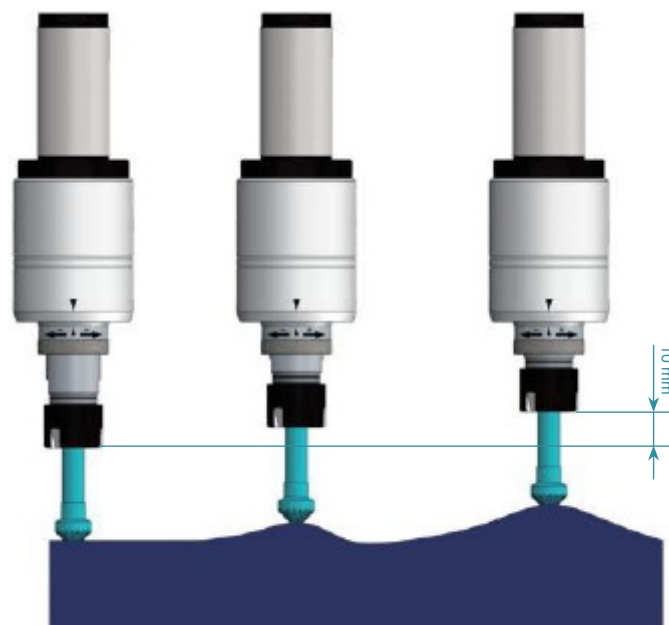
IMPORTANT

Comparison with rigid chamfering tools

Due to the casting or installation error of the workpiece, using a rigid chamfering tool is prone to inconsistent chamfer size or large chamfer in some parts and no chamfer in some parts.

After using the floating deburring tool holder. Through the floating mechanism inside the tool, it enables the cutting edge of the tool to continuously press and cling to the workpiece in the process of processing, so as to achieve the purpose of tool profiling and deburring according to the workpiece shape.

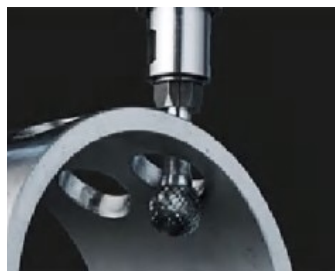
AXIAL UPWARD DISPLACEMENT



PROCESSING EXAMPLES



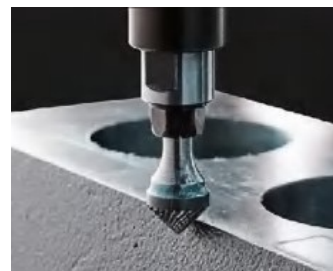
CYLINDER CROSS HOLE OUTSIDE



CYLINDER CROSS HOLE INSIDE



HEIGHT DIFFERENCE SHAPE

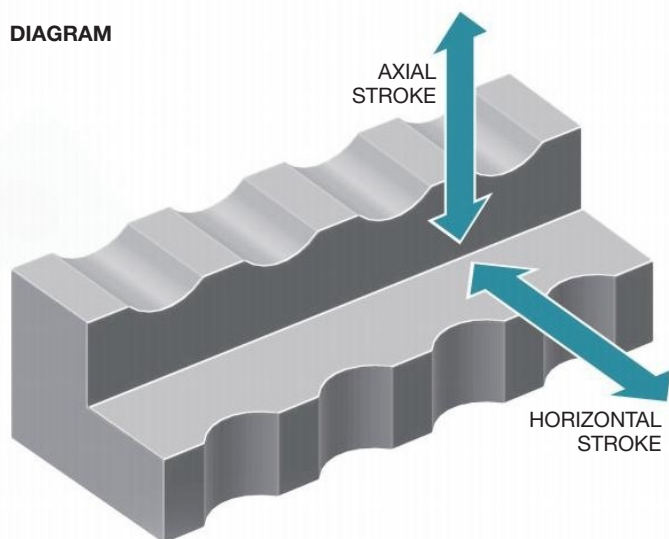


CASTING PROFILE

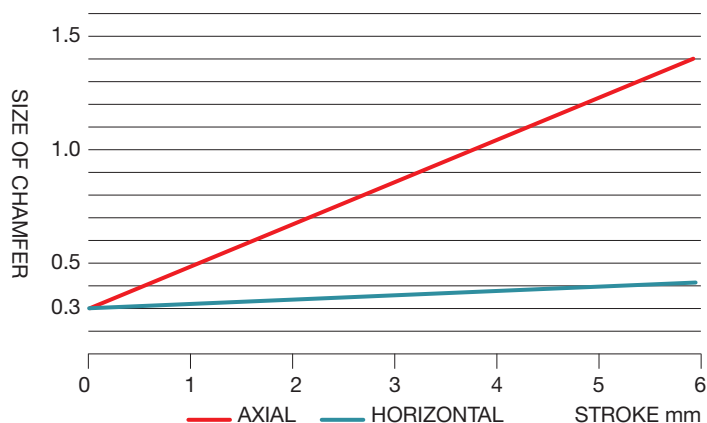
TOOL PROFILING AND DEBURRING ACCORDING TO WORKPIECE SHAPE

- The Cutter Holder freely retracts in the direction (10mm)
- Keep the downforce close to the workpiece

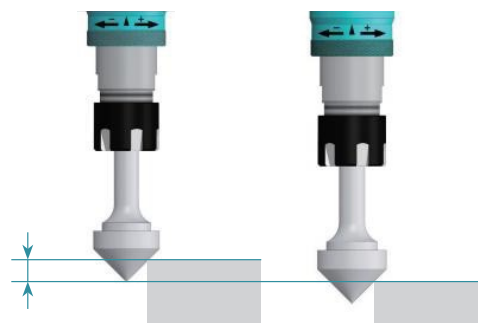
DIAGRAM



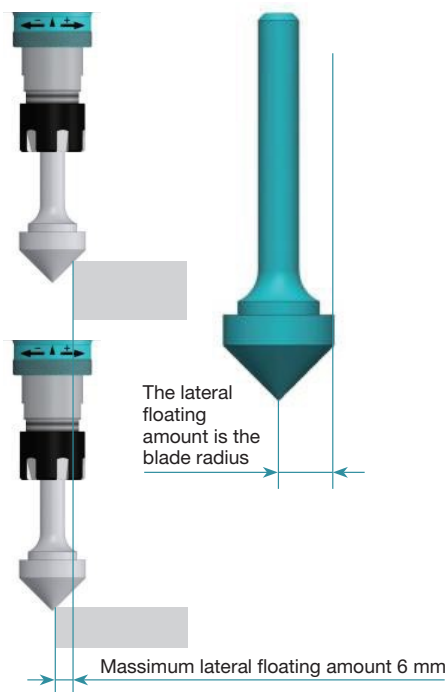
RELATIONSHIP BETWEEN TRACKING SURFACE AND CONTACT SURFACE



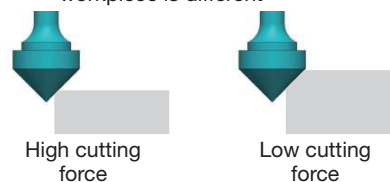
AXIAL STROKE - max 10mm



HORIZONTAL STROKE - blade radius



NOTE: The contact part between the blade and the workpiece is different



FDH-D0

FLOATING SPINDLE AXIAL DEFLECTION

BACK DEBURRING AND CHAMFERING OF UNDEFINED EDGES

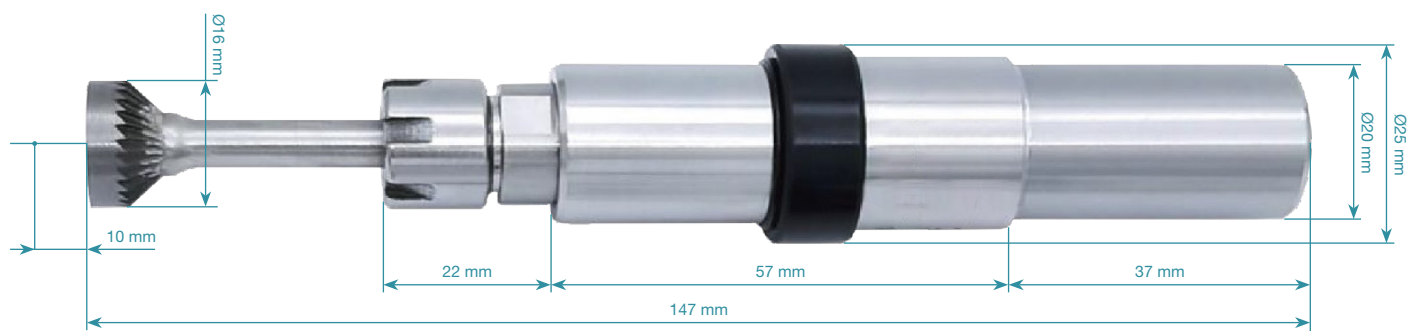
The FDH-D0 axial downward floating deburring tool holder is an economical combination tool and the spindle of the tool holder can move downward in the axial direction.

The tool can quickly and easily deburr the uneven surface profile and holes at the bottom of the workpiece. Through the axial downward movement of the tool holder spindle, a relatively constant pressure can be generated on the workpiece and a relatively uniform chamfer can be processed on the uneven workpiece contour.

The holder is left free; The chamfer quality will not be changed due to the change of air pressure; High feed rate and spindle speed reduce processing time, improve work efficiency, reduce enterprise costs and have a high comprehensive cost performance ratio. At the same time, the holder is small and compact.

It can be used for various machines, including the smallest machine. It can be used on machining centers, automatic lathes, robots and other equipment. Through the floating mechanism inside the tool, the cutting edge of the tool can continuously press the machined edge of the workpiece and stick to the workpiece, so as to achieve the purpose of tool profiling and deburring according to the workpiece shape.

The FDH-D0 axial downward floating deburring tool holder has a downward floating amount of 10mm in the Z-axis direction, which is used to deburr the inner cavity of the shell and the workpiece contour with different positions at the bottom. The floating force can be adjusted through the internal adjusting mechanism of the tool holder.



TECHNICAL INFORMATION

FDM-D0	
Activation	Spindle drive
Speed	5.000-÷8.000rpm (recommended start speed: 4.000rpm)
Feed	1.800-÷3.000mm/min (recommended start feed: 2.000mm/min)
Rotation	Clockwise
Max axial stroke	10mm - axis Z
Shank	Cylindrical 20mm
Chuck	ER-11 (the gripping range of the collet is 0,5÷7mm)
Weight	0,250kg

Reverse rotary file: SK-6M-SCFXR-DZ

FDH-CD0

FLOATING SPINDLE WITH AXIAL DEFLECTION FOR BACK-AND-FORTH DEBURRING AND CHAMFERING OF UNDEFINED PROFILES

The DREX-TOOLS FDH-CD0 floating spindle for bidirectional axial deburring is an economical combination in which the spindle can move on the "Z" axis with a central "0" point in both directions. The spindle can quickly and easily remove burrs due to holes and irregular surface contours on both the upper and lower part of the piece.

Through the axial movement of the spindle downwards or upwards, it is possible to generate a constant pressure on the piece and continuously adjust the support force of the cutter to the piece, generating a uniform bevel on the irregular contour of the piece.

The spindle is maintenance-free.

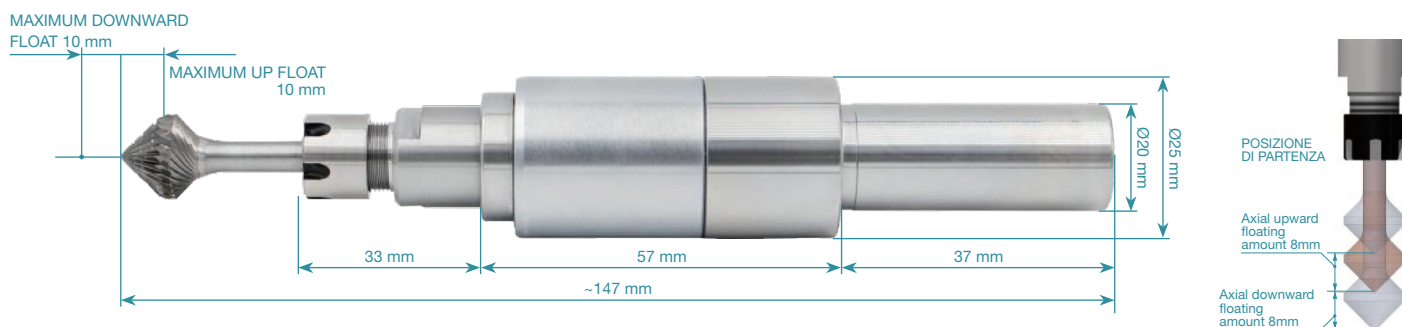
High spindle rotation and feed speed, reduced processing time, improved work efficiency, reduced costs and high overall cost-performance ratio: at the same time the DREX-TOOLS spindle is small and compact.

The DREX-TOOLS spindle for front-back machining of deburring or chamfering can be used on work centers, centers, automatic lathes, robots and other equipment.

Through the internal floating mechanism, the cutting edge of the tool is always pressed evenly against the piece and therefore follows the actual profile of the piece, so as to achieve the desired profiling and deburring.

The DREX-TOOLS floating spindle for front-back axial deburring FDH-CD0 has a bidirectional stroke on the "Z" axis of 10 mm per side, suitable for deburring the internal cavity of the shell and the contour of the piece in the front and rear-lower parts. The floating force can be adjusted through the internal mechanism of the DREX-TOOLS spindle. The initial position is set by the factory and with a minimum pressure and tension preload on both sides.

The floating forces can be adjusted separately using the appropriate screws on the back of the spindle.



TECHNICAL INFORMATION

FDM-CD0	
Activation	Spindle drive
Speed	6.000-÷8.000rpm (recommended start speed: 4.000rpm)
Feed	2.000-÷4.000mm/min (recommended start feed: 2.000mm/min)
Rotation	Clockwise
Max axial stroke	-10mm a +10mm from point 0 on the axis "Z"
Shank	Cylindrical 20mm
Chuck	ER-11 (the gripping range of the collet is 0,5÷7mm)
Weight	0,640kg

Reverse rotary file: KK1615-MR-6-45

FDH-DO/FDH-CD0

OPERATING INSTRUCTIONS OF DEFLECTION SPINDLES FOR FRONT-BACK DEBURRING AND CHAMFERIN OF UNDEFINED PROFILES

To set the tool when using a reverse cutting bur, bring the cutting edge of the bur (recommended "off-set" 6.5 mm) closer to the contour to be deburred on the workpiece, then move the Z axis upwards from 1 mm to 2 mm ("pressure offset"). The tool is automatically compensated in the Z axis direction to remove burrs from the uneven contours of the workpiece. See Figure 1.

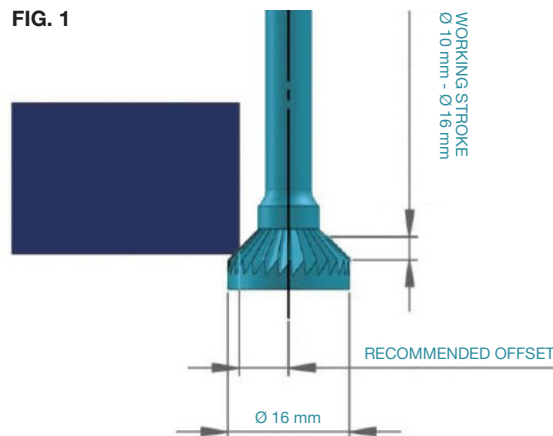
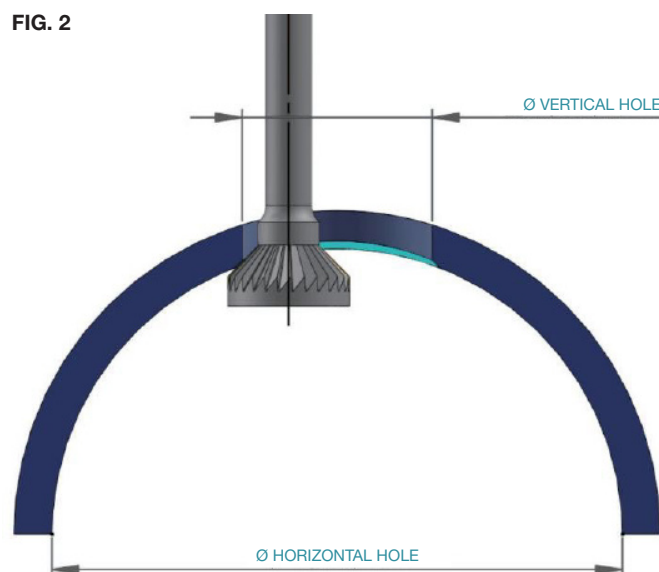
Note: if the offset is too small, the workpiece and the cutter stem will interfere. When the offset is too large, the outer diameter of 16mm cutter will interfere with the workpiece. If the curvature of the machined part of the workpiece is less than the cutter head (45°) shape, the cutter head will come into contact with the inner diameter of the tube and interfere with the outer circumference.

Transverse holes can be machined if the vertical hole size of the horizontal hole diameter OD is $Od \leq 1/3$, otherwise interference will occur. For details, see Figure 2.

When deburring a hole that intersects with another hole, if the ratio between the diameter of the intersection hole and the main hole is too small, interference and tool breakage may occur.

Recommended ratio 3:1.

If during machining the contour of the workpiece abruptly changes geometry in the direction of advancement, the burrs of the contour cannot be effectively removed.

FIG. 1**FIG. 2**

OPERATING INSTRUCTIONS OF DEFLECTION SPINDLES FOR DEBURRING AND CHAMFERING UNDEFINED PROFILES

When machining external corners, it is necessary that the tool let the workpiece to change the machining direction (as shown in the figure)

INNER CORNER MACHINING

For the floating deburring tool, the processing of internal use (at the internal boundary) is slightly more complicated. Generally, the rotary file cannot contact two surfaces with vertical internal angles at the same time because of the unbalanced force generated when two surfaces are processed at the same time, it is likely to cause tool vibration. We recommend adding a tool path so that the rotary file (rotary file or chamfer milling cutter) cannot contact two vertical surfaces at the same time. When approaching such an internal angle, the tool shall be properly lifted up to make the top of the taper rotary file contact the workpiece, so that the rotary file can approach such an internal angle more easily.

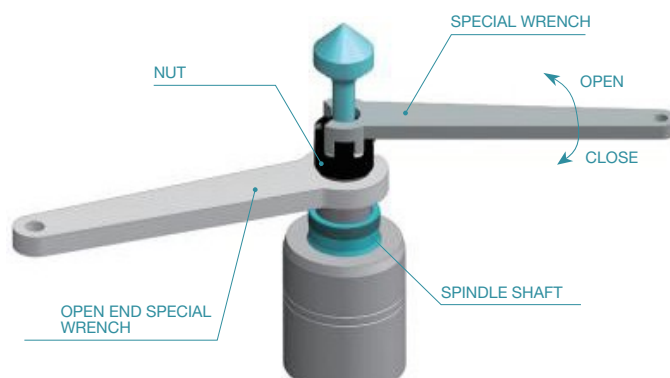
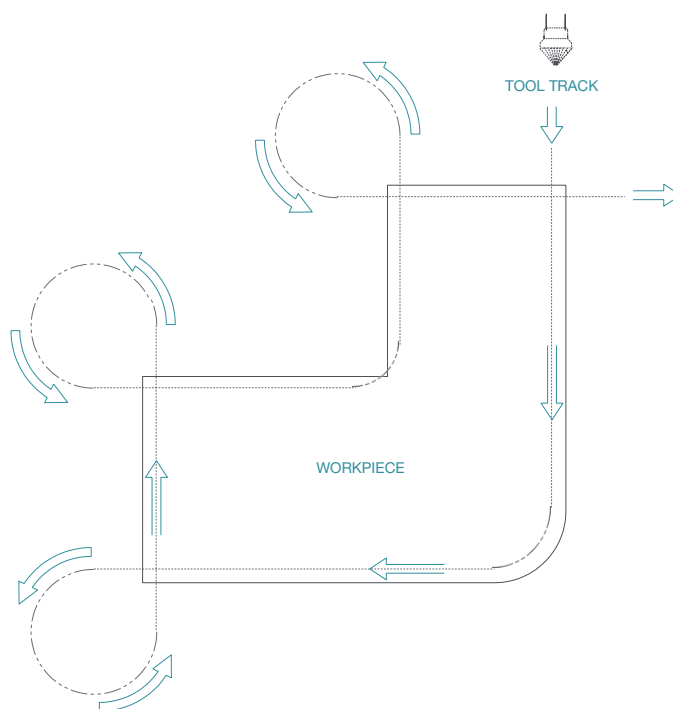
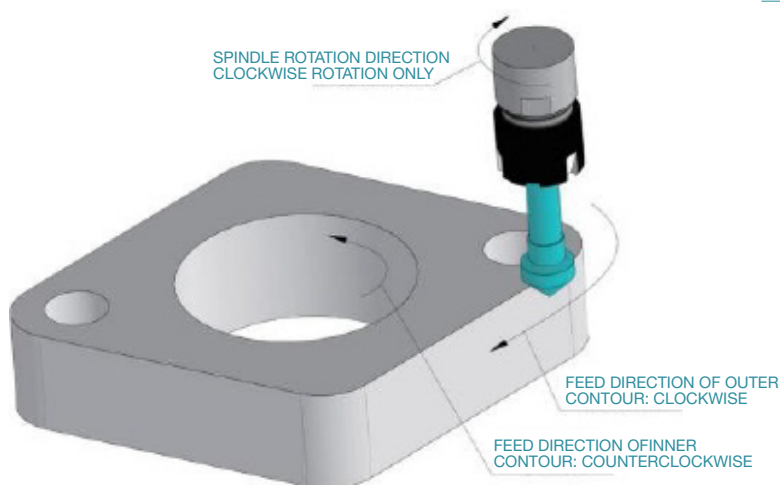
(Note: When the top of the rotary file is used for processing, the processing speed should be reduced.)

When processing the vertical internal angle of the workpiece, the internal angle needs to be processed through the arc program.

ROTARY FILE REPLACEMENT

When installing the rotary file, first use a special open-ended wrench to fix the flat position of the retainers shrink shaft and then use a special ER11 wrench to tighten it.

SCHEMATIC DIAGRAM OF FORWARD AND REVERSE MILLING



GENERAL NOTES FOR USE

The change of spindle speed is proportional to the chamfer size (The tool setting point, downforce and feed rate remain unchanged).

The higher the spindle speed, the greater the chamfer.
The feed speed and floating force remain unchanged.

The change of downforce is proportional to chamfer size (The spindle speed, feed rate and tool setting point remain unchanged).

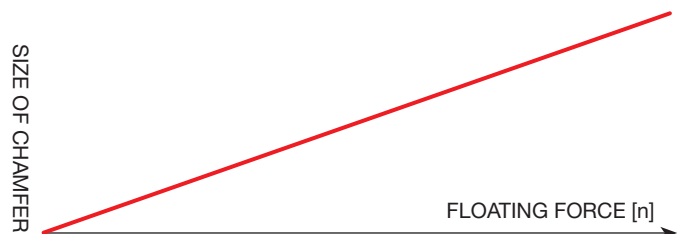


The change of tool setting point is proportional to the amount of burr removal (Under the premise that the spindle speed, feed rate and downforce remain unchanged).

Low tool setting point means to approach the tool tip, while high tool setting point means to approach the tool tip in the opposite direction.

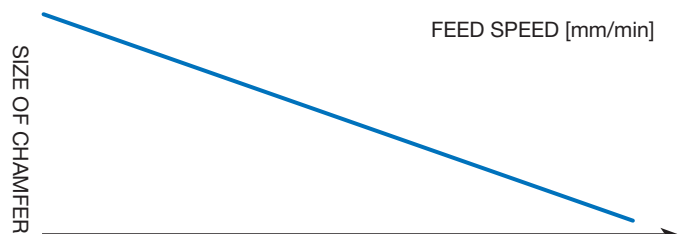
The greater the floating force, the greater the chamfer.
The feed speed and spindle speed remain unchanged.

The change of feed rate is inversely proportional to the amount of burr removal (The spindle speed, tool setting point and downforce remain unchanged).



The downforce can be adjusted through the external adjusting holder of the tool holder.

The higher the feed speed, the smaller the chamfer.
The floating force and spindle speed remain unchanged.



Change of relation ship between various processing parameters and burr removal amount (hereinafter referred to as chamfer)

SPINDLE SPEED	SETTING POINT	DOWN FORCE	FEET RATE	SIZE CHAMFER
LIP	COSTANT	COSTANT	COSTANTE	LARGER
DOWN	COSTANT	COSTANT	COSTANTE	SMALLER
COSTANT	COSTANT	COSTANT	SMALLER	LARGER
COSTANT	COSTANT	COSTANT	LARGER	SMALLER
COSTANT	COSTANT	LARGER	COSTANT	LARGER
COSTANT	COSTANT	SMALLER	COSTANT	SMALLER
COSTANT	HIGT	COSTANT	COSTANT	LARGER
COSTANT	LOW	COSTANT	COSTANT	SMALLER