



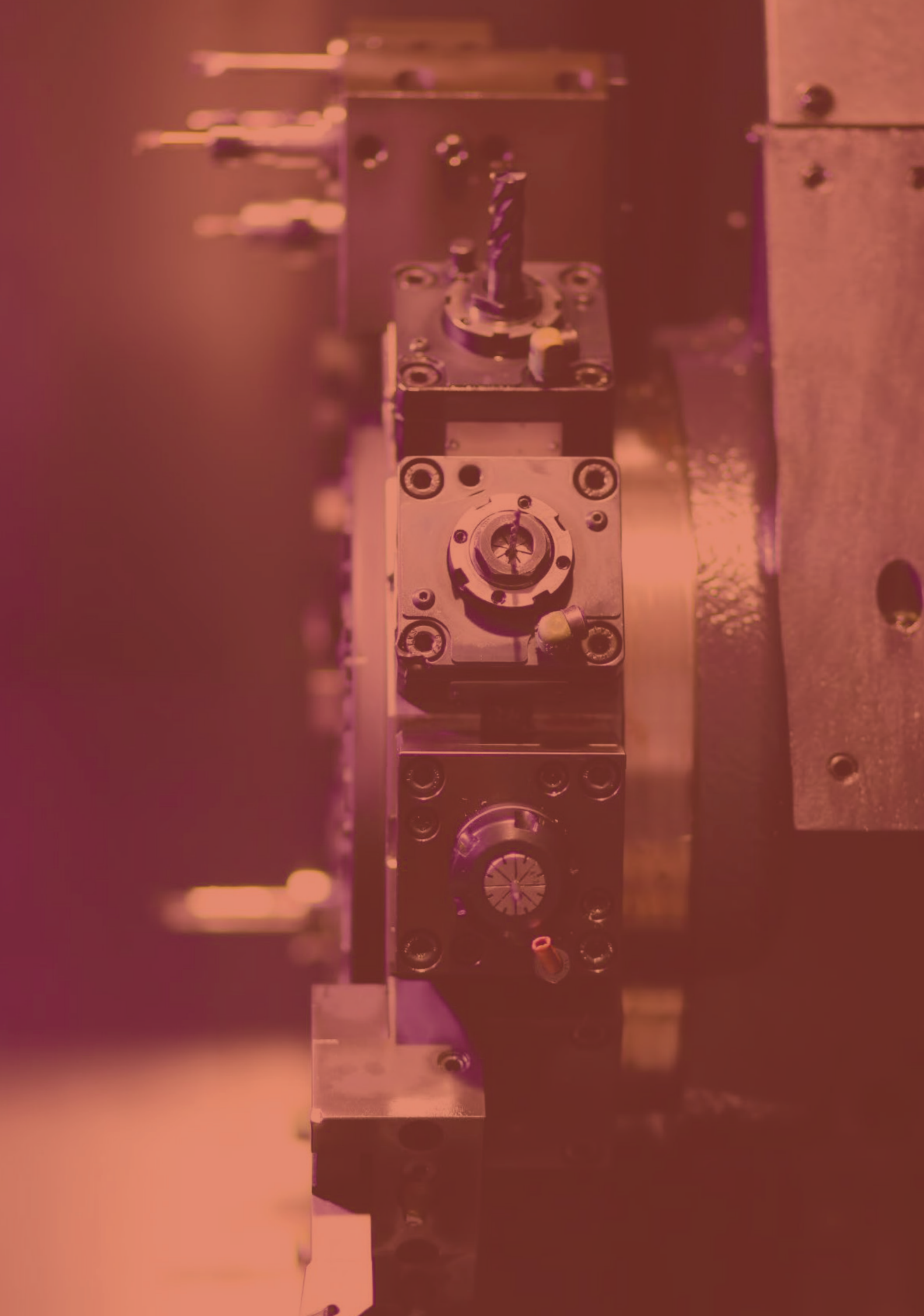
**DEBURRING & MARKING
TECHNOLOGIES**



**High
Tech**
Industrial Representation, Inc.

INDEX

DEBURRING TOOLS	4
DEBURRING ON CNC // FDT SX-0	6
DEBURRING ON CNC // FDT AX F	8
DEBURRING ON CNC // FDT AX B	13
DEBURRING ON ROBOTS // FDT Pn X36	14
MARKING TOOLS	15
Pneumatic Marking // PMT 20 A	16
Pneumatic Marking // PMT 20 A-L	18
Hydraulic Marking // HMT 20	19
Scratch Marking // SMT 20	20
Scratch Marking // SMT 12	22



DEBURRING TOOLS

| on CNC

/ FDT SX-0

/ FDT AX F

/ FDT AX B

| on Robots

/ FDT Pn X36



AKS TEKNIK

FDT

FLEXIBLE DEBURRING TOOL

SX-0

Ø 13mm

Cylindrical Shank



DEBURRING TOOLS

on CNC

FDT SX-0

FDT SX-0 is a flexible deburring tool and an economic solution to remove burrs generated during machining processes. With the help of its flexible mechanism, FDT SX-0 traces the undefined edges on the workpiece. It can compensate 5-10mm edge deviations.

The pressure against the workpiece edge can be adjusted with a built-in mechanism.

FDT SX-0 is driven directly via machine spindle.

FDT SX-0 is designed to automatically deburr workpieces with undefined edges. The differences between programmed and actual workpiece contours are compensated automatically.

6



advantages

Maintenance Free.

No deviations of chamfer widths due to air pressure variations.

High feeds and speeds. (3.000-10.000 rpm – 2–5 m/min.)

Uniform deburring quality on all workpieces. Eliminates tool brakes.

Small compact design suitable for all types of machines. (Suitable for smallest machines)

Long reach simply by changing the cutting tool. Perfect deburring of the hard to reach places.



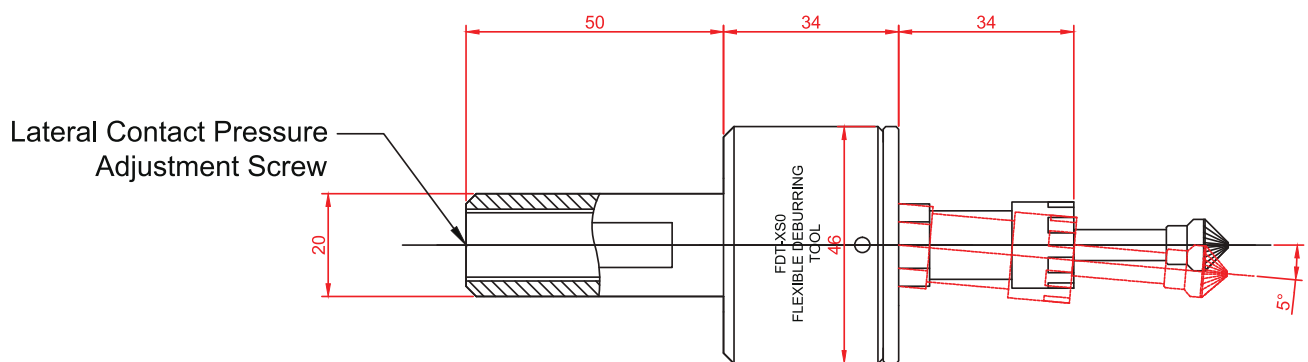
on CNC

FDT SX-0

Spindle Speeds: FDT SX-0 is not completely rigid. We recommend starting spindle speed of 5000 rpm. Observe maximum permitted spindle speed specified by the machine supplier!

Feed Rates: We recommend starting feed rate of $F = 3000 \text{ mm/min}$. The entered speed should be maintained when changing direction, if not, deburring can be uneven. To eliminate extra rounding of the corners, the programed contour should be as close as possible to actual part edge.

Lateral Contact Pressure: For the first deburring process we recommend setting the lateral contact pressure to be set to approximately 5mm. If the milling cutter does not run smoothly, i.e. if it jumps or does not run true, the contact pressure is too low and must be increased. The amount of contact pressure also directly affects the deburring thickness: usually the higher the contact pressure, the wider the deburred edge.



7

working parameters

Activation	Via machine spindle
Speed	3.000 – 8.000 rpm
Feed	2000-4000 mm/min
Max. Deflection	5mm (10mm with 100mm long burr)
Deflection	Lateral – 5 degree
Range	W/ER-11 collet Carbide cutting burrs ranging from $\phi 0.5\text{mm}$ to $\phi 7\text{mm}$ can be used.
Standart Execution	W/20 mm weldon shank. (Special shanks are available upon request)
Materials	All types of materials can be deburred successfully



DEBURRING TOOLS

on CNC

FDT SX-0

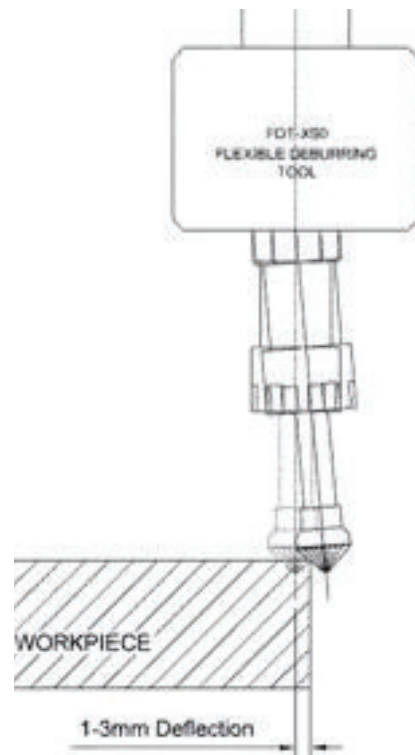
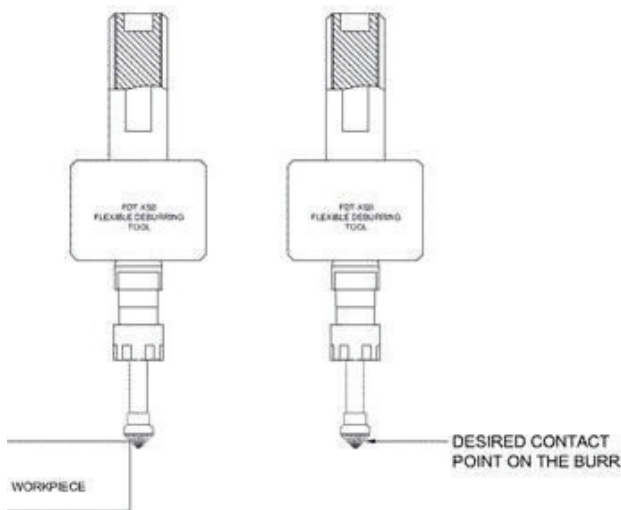
USE OF THE TOOL: FDT SX-0 is a flexible deburring tool. Activated via machine spindle. It can deflect approximately 5mm in radial direction. Using FDT SX-0 is similar to contour programming. It should follow the contour to be deburred and the milling cutter should always be pre-tensioned as 1-3mm.

Contact Point On The Burr: Usually conical deburring cutters are used. Depending on the contour of the deburring edge, the milling cutter can either be used on its tip or further back.

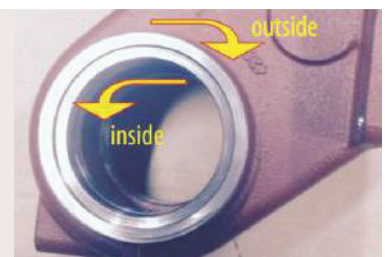
If the shape of the workpiece and the clamping device is suitable, then it is recommended to use burrs at the rear. This allows shorter machining times and better results.

Lateral Deflection Of The Burr: Ensures that the milling cutter is always pre-tensioned. The lateral deflection of approx. 1-3 mm causes it to press against the workpiece.

8



Cutting Direction: FDT deburring tools, the cutter rotation should be clockwise when viewed from above. Climb milling would therefore involve clockwise motion around the part being deburred.





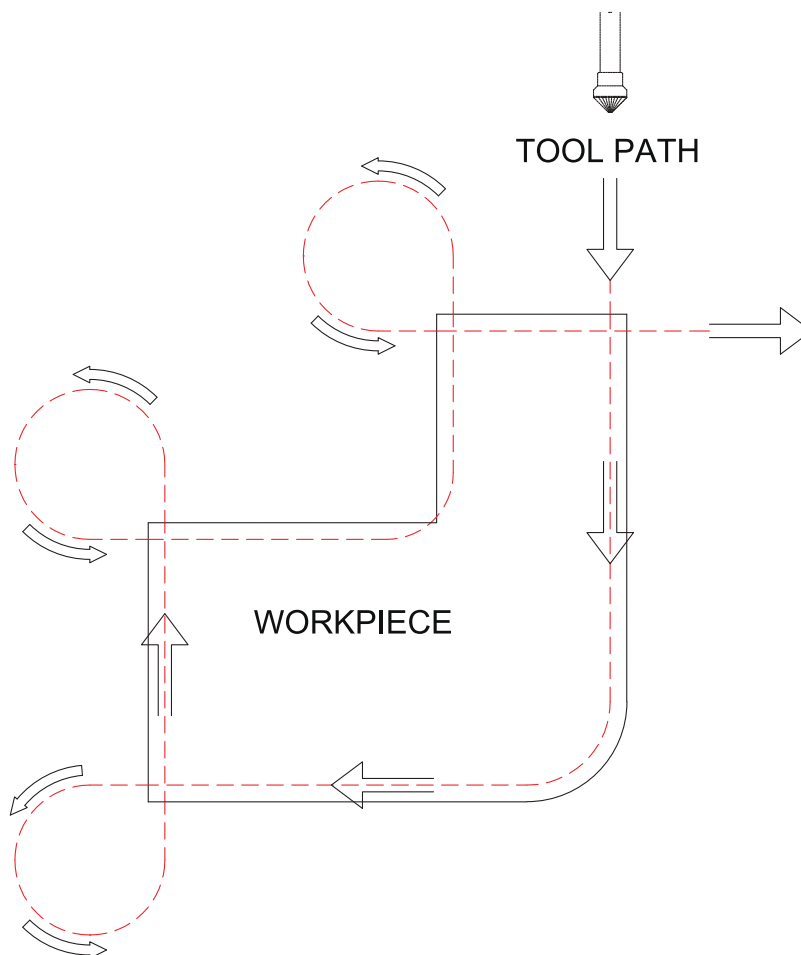
FDT SX-0

Tool Path: Inside corners represents a complex situation for flexible deburring tools. In general, the cutter must not be allowed to simultaneously contact both perpendicular surfaces of an inside corner. The resulting force imbalance in two planes will cause severe tool chatter. We advise to create a tool path, which will prevent the cutter from simultaneously contacting two perpendicular surfaces.

A conical cutter may reach further into such an inside corner if the tool is presented closer to the tip of the tool.

(*Note:* When working near the tip of a tapered cutter, the surface cutting speed is reduced.)

Direction changes inside the workpiece contour (corners); we recommend that you *program a radius instead of a corner*.



CNC Deburring Tool-Path on workpiece contour

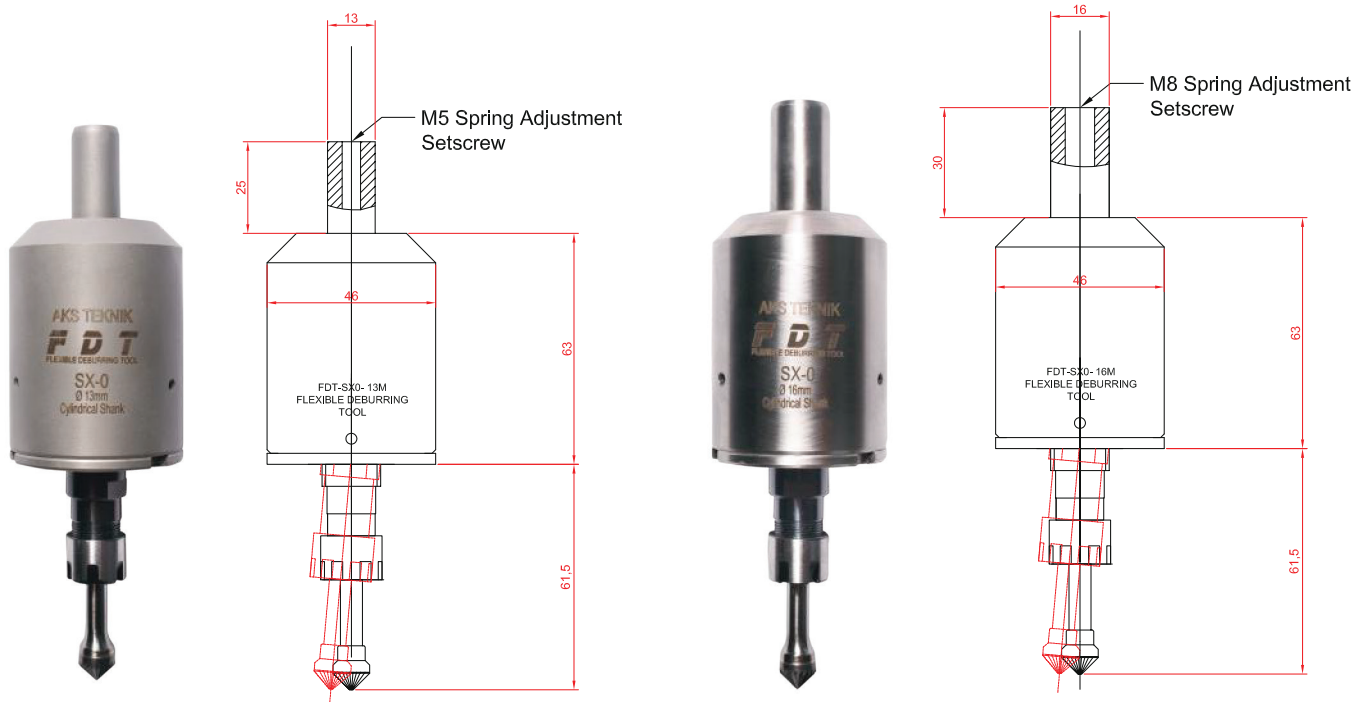


DEBURRING TOOLS

on CNC

FDT SX-0

FDT SX-0 ϕ 13mm & ϕ 16mm



Excessive Deburring:

- Increase feed rate
- Decrease lateral contact pressure on the tool (for too weak lateral pressures cutter may jump / stagger resulting damage to workpiece – tool – machine)

Uneven Deburring:

- Feed speed is not constant due to changes in direction – reduce feed speed
- Feed speed is very slow – increase feed speed
- Tool position is not adjusted correctly check 1-3mm lateral deflection

Deburring Thickness Is Small:

- Decrease feed rate
- Increase lateral contact pressure on the tool
- Reduce spindle speed

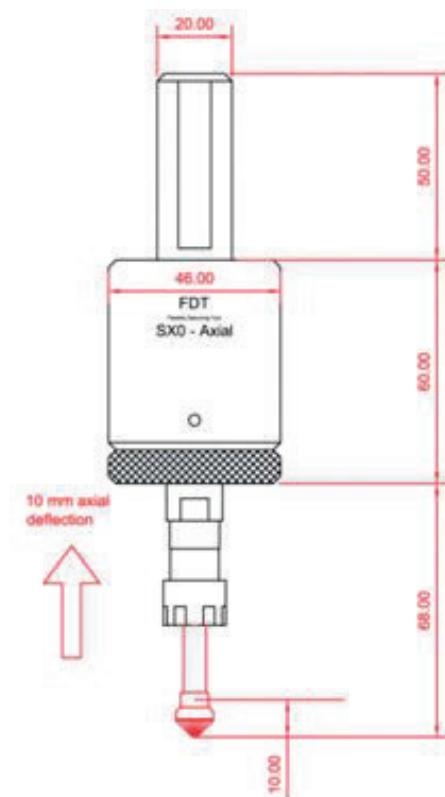
Not Smooth Deburring:

- Increase spindle speed
- Change deburring cutter

FDT Axial F

FDT AXIAL PUSH TYPE – FDT AXIAL (F) is a simple and economical tool that can be used on NC machines, Robots and CNC. The FDT Axial(F) has a push stroke of 10mm in axial direction, is used to deburr of profiles with variable height

or holes on curved surfaces. Adjust the height Z axis by applying a pressure of 1-2mm from the point farthest from the spindle (with the lowest Z coordinate), the FDT will automatically compensate for changes in altitude.



specifications

- With ER-11 collet milling inserts range from $\phi 0.5\text{mm}$ to $\phi 7\text{mm}$ can be used.
- 10mm Axial deflection- pushing against surface contracting.
- Compensation capacity: max stroke 10mm push
- Direction of milling: concordant
- Clockwise rotation: 6-8000 r / min
- Feed Rate : F2000-4000 mm/min



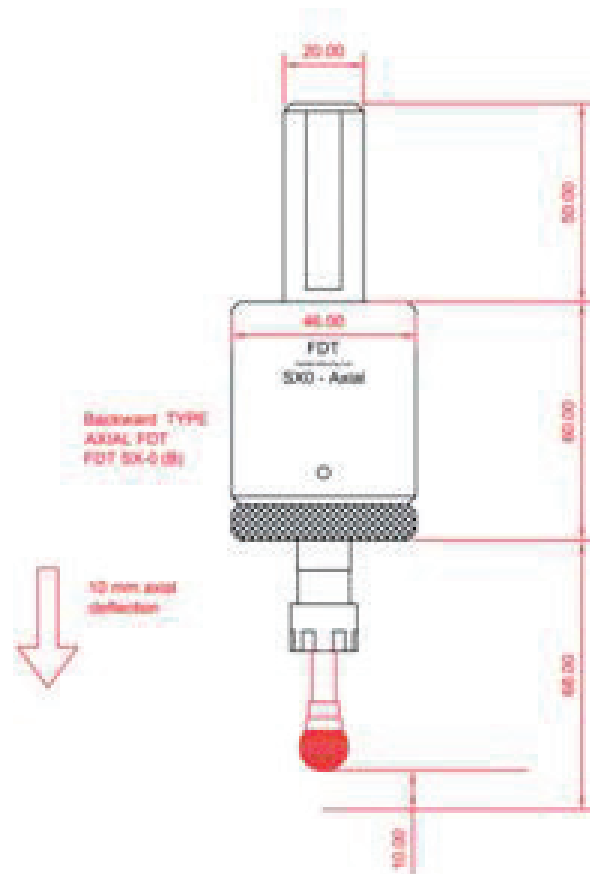
DEBURRING TOOLS *on CNC*

FDT Axial B

FDT AXIAL PULL TYPE – FDT Axial (B) has a expanding stroke of 10mm in axial direction. By constantly pressuring the cutting edge it can deburr profiles with variable height or intersecting holes. Adjust the height of the Z

axis applying pressure of 1-2mm from the point closest to the spindle (with Z value higher) and the FDT will automatically compensate for changes in axial direction.

12



specifications

- With 3 types of springs almost all material types can be deburred.
- With ER-11 collet milling inserts ranging from $\Phi 0.5\text{mm}$ to $\Phi 7\text{mm}$ can be used.
- 10mm Axial deflection- pulling behind surface expanding.
- Compensation capacity: max stroke 10mm in expanding.
- Direction of milling: concordant
- Clockwise rotation: 6-8000 r / min
- Feed Rate: F1500-3000 mm/min

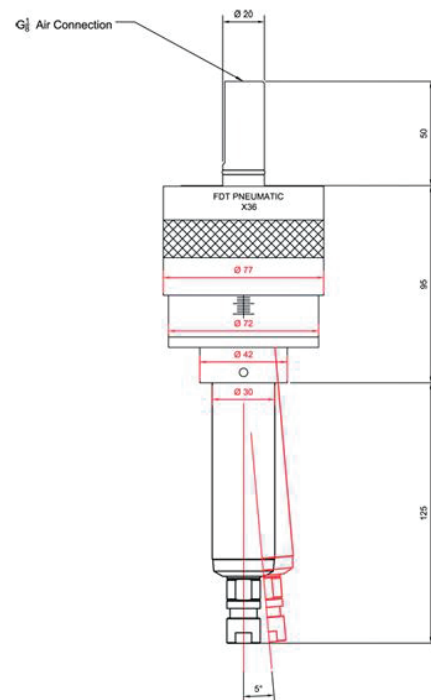


on ROBOTS

FDT Pn X36

FDT is an air driven flexible tool that traces the undefined edges on the workpiece. The lateral pressure against the workpiece edge can be adjusted with a built in mechanism. This allows adjustment of the chamfer width.

FDT Pneumatic is not affected by air pressure deviations, since its lateral flexion force is created with springs. With this feature you can achieve uniform and even deburring results even with air pressure deviations.



13

specifications

- Spindle Speed: 35000rpm
- Power: 300W
- Rotation: clockwise
- With ER-11 collet burrs ranging from $\phi 0.5\text{mm}$ to $\phi 7\text{mm}$ can be used.
- Air consumption: 8.3 l / sec
- Air Supply: hose inside diameter 6mm
- Noise level: 78dB
- Use with lubricated air.
- Air Connection 1/8" Gas – from rear

MARKING TOOLS

| Pneumatic Marking

/ PMT 20 A

/ PMT 20 A-L

| Hydraulic Marking

/ HMT 20

| Scratch Marking

/ SMT 20

/ SMT 12



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Marking Tool



MARKING TOOLS

Pneumatic

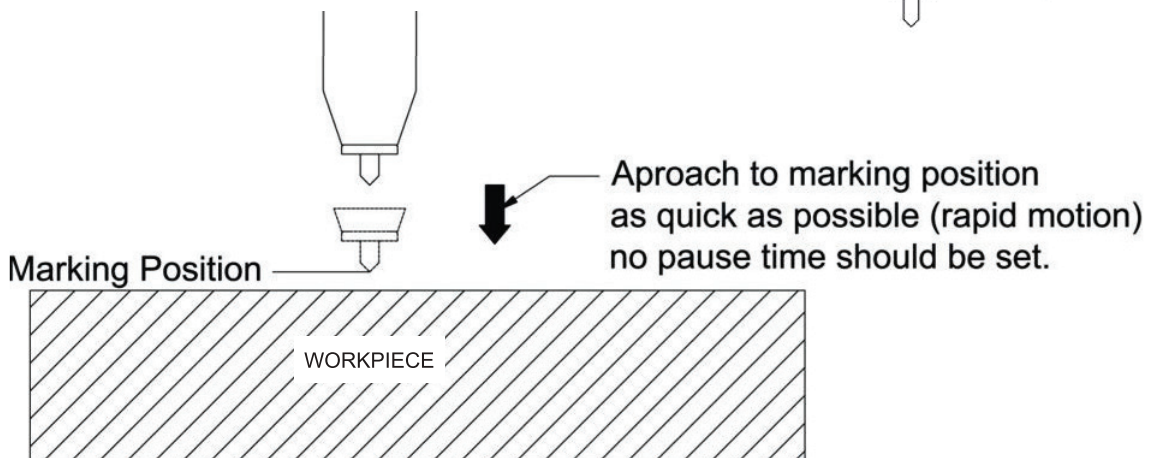
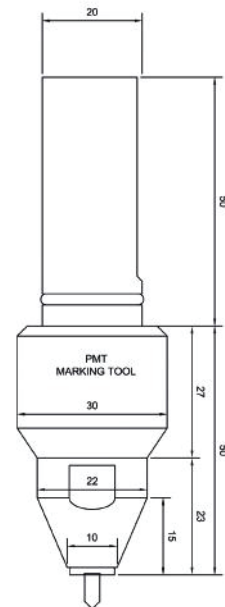
PMT 20 A

PMT20-A is an air pressure driven, dotpeen marking tool suitable for CNC machines and Robotic systems. The tool allows you to do marking operations directly on the machine and it eliminates the marking performed after machining. Marking directly inside the CNC allows you to lower costs by avoiding subsequent re-processing and handling of the pieces and also it avoids possible errors since the marking is set directly into the part-program of the workpiece. PMT automatically compensates for any

differences in height (and/or curved surfaces) within certain limits. This enables marking on every surface (unfinished, raw or milled surfaces) possible. With the carbide marking needle, both soft and hard materials can be marked easily

Adjustable compensation allows the user to adjust oscillation of the marking needle. You can increase the stroke (compensation) by reducing the frequency. Increase the oscillation frequency and get faster feed rates.

16





Pneumatic

PMT 20 A



- 1 - Maximum oscillation frequency
Fastest feed rate - minimum compensation
 -
 -
 -
 -
 -
 - 5 - Minimum oscillation frequency
Slowest feed rate - maximum compensation
- 1 - Smooth Surfaces - High feeds
- 5- Rough Surfaces - Low feeds

operation parameters

Starting Feed Rate	2000 mm/min (Can be adjusted freely)
Spindle Speed	0 rev/min (No spindle rotation)
Air Pressure	5-8 bars
Distance from the surface	6-8mm and decrease of 0.5mm at a time until marking occurs, then descend further 0.5mm in Z axis.

17

PMT 20 A L

With lateral air supply





MARKING TOOLS

Hydraulic

HMT 20

HMT20 Hydraulic marking Tool is a pressured coolant activated marking tool.

It can be used on machining centers or automatic lathes.

Minimum 15 Bar coolant pressure is required.

With pressure adjustment mechanism suitable for 15-80 Bar machines.

Suitable for marking hard workpieces up to 60-62HRc.

Can be used on rough surface marking with the help of distance compensation mechanism. (4mm distance comp.)

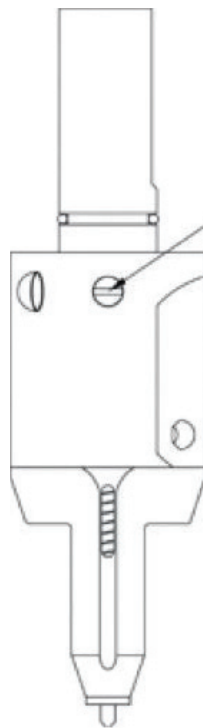
Almost wear free carbide marking needle.

Can be used at low rpm if machine doesn't support non rotating axis movement.

Simple usage and no installation.

20mm standard Weldon shank.

18

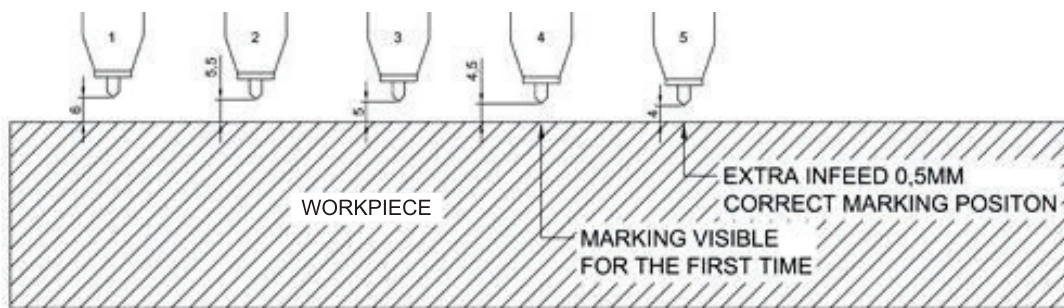


Pressure is reduced by turning in the clockwise direction. The **YELLOW** screw can be turned approx. 7mm to maximum reduction. The tool is delivered in basic setting with the reduction screw completely open.

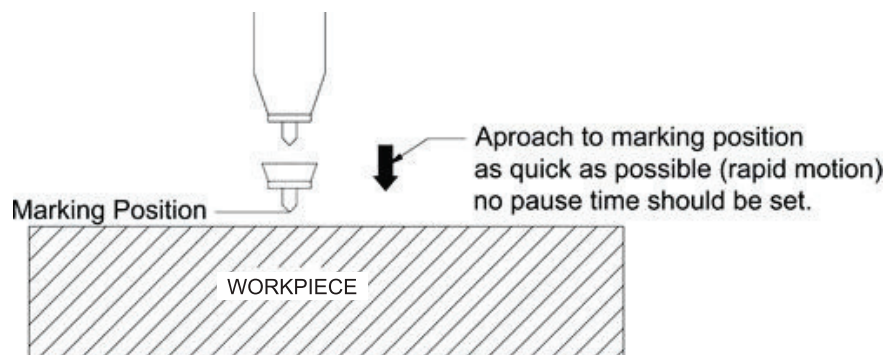
HMT type tools are activated with pressured coolant. For the first trials the marking needle should be positioned 6mm away from the workpiece surface which will be marked. When the interior cooling is activated, let the marking program run in basic setting the first time. no marking should be visible yet!

If the marking is already visible the coolant pressure should be reduced.

After adjusting the cooling pressure advance the marking needle 0.5mm closer towards the workpiece (5,5mm total dist). And run the program second time.
 If no marking is detected advance again 0.5mm towards the workpiece and run the marking cycle.
 Repeat these steps with 0.5mm increments until marking is visible.
 Advance extra 0,5mm to ensure marking is complete and well formed.
 Minimum marking position is 1mm to the workpiece surface. If no marking is seen at 1 mm, stop the application and increase the coolant pressure of the machine or readjust pressure on the tool.



While approaching to the workpiece marking needle hit the first dot multiple times and makes the entrance of the first character deeper. After determining the correct marking position approaching towards the marking position should be as fast as possible to minimize this.



operation parameters	Starting Feed Rate	3000 mm/min (Can be adjusted freely)
	Spindle Speed	0 rev/min (No spindle rotation)



MARKING TOOLS

Scratch Marking

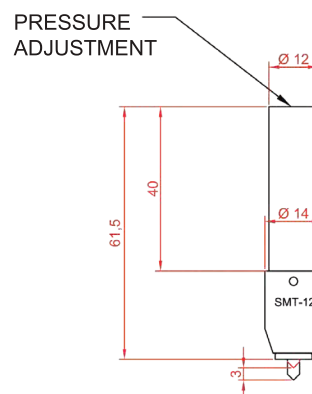
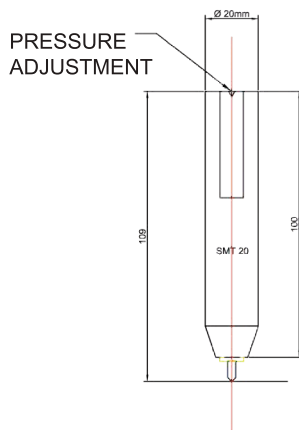
SMT 20

SMT 20 is a small tool for scratch marking workpieces on CNC machining centers. It has an adjustable spring mechanism for different material hardnesses. It is suitable for marking hard workpieces upto 60-62HRc. No spindle, pressure air or coolant activation are required. Almost wear free marking needle. Fast operation speeds. Economical alternative to dot peen marking. Can be used at low rpm if machine doesn't support non rotating axis movement. Can be used on rough surface marking with help of the distance compensation mechanism. (4mm distance comp.)

SMT 12

SMT 12 is a small tool for scratch marking workpieces on CNC machining centers. It has an adjustable spring mechanism for different material hardness. It is suitable for marking hard workpieces upto 60-62HRc. No spindle, pressure air or coolant activation are required. Almost wear free marking needle. Fast operation speeds. Economical alternative to dot peen marking. Can be used at low rpm if machine doesn't support non rotating axis movement. Can be used on rough surface marking with help of the distance compensation mechanism. (3mm distance comp.)

20





AKS TEKNIK DEBURRING & MARKING TECHNOLOGIES



16610 Legacy Lane | New Prague, MN 56071
507.384.7158 C | 952.378.0390 O
todd@htrep.com | www.htrep.com

www.aksteknik.com