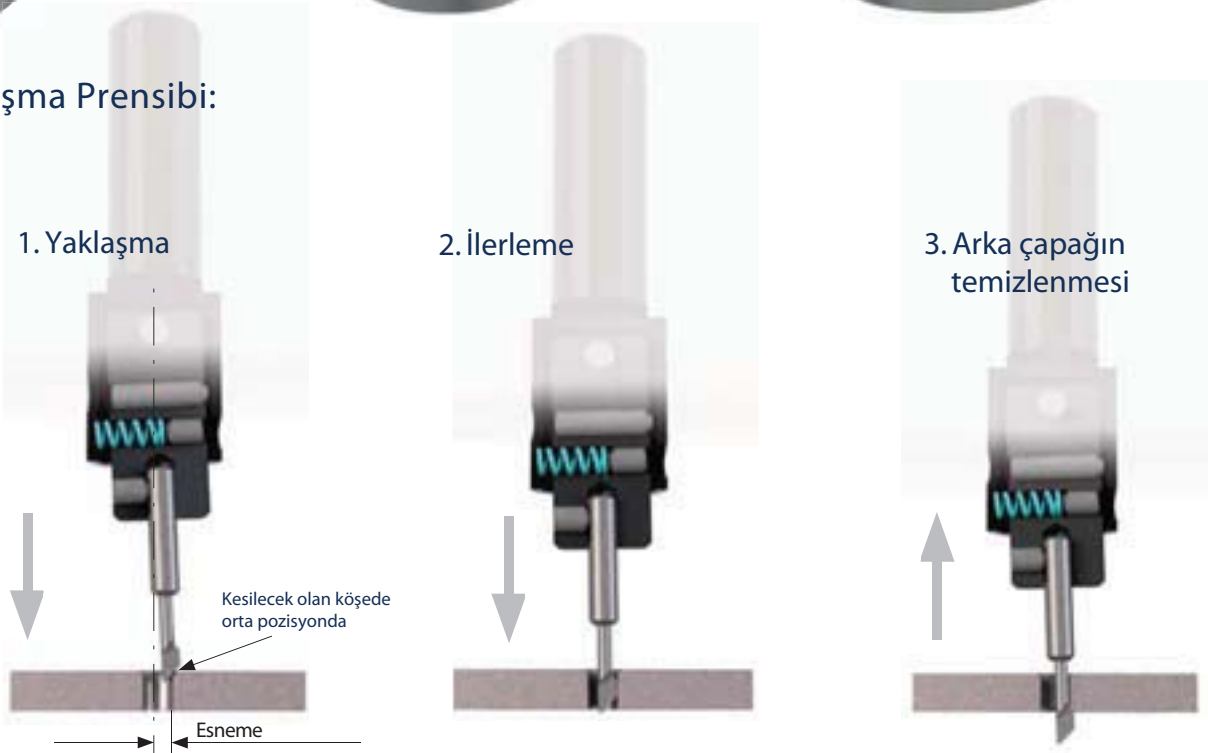




GMO mikro delikler iin apak alma takımıyla matkap deliklerinin apağını kolaylıkla alabilirsiniz. İster i kısmı ister i ve dıř kısmı tek bir adımda temizler. 1,2mm ile 7.5mm arasında her apa ayarlanabilir. Birbirine aılan deliklerde, kemerli paralarda zel kesme ucuyla kolayca apak alabilir. Cnc tezgahlarda kullanımı para bařı maliyeti dıřur. Tanınmıř birok firma tarafından kullanılmakta olan takım 103 57 404 numaralı patent ile korunmaktadır.



### alıřma Prensibi:





# Deburring tool for cnc-machines

This deburring tool was developed in order to deburr inner drill hole edges in a simple manner.

It is protected under the patent number 103 57 404.

The tool can be adjusted to the respective drill hole diameter, starting from 1,2 mm up to 7,5 mm.

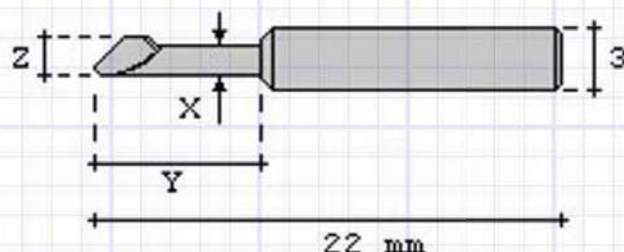
It is possible to deburr either only the inner edge, or both edges in a single step.

The exchangeable blades are of carbid metal and have a long service life, approximate 5000 parts with normal hard steel.

## Measurements:

stock diameter : 10 mm or 7mm  
outer diameter : 14 mm  
total length : 65 mm

blade type	drill hole diameter	X	Y	Z
			[ mm ]	
S12	1,2 - 1,5	0,7	5,7	1,1
S15	1,5 - 2,0	1,0	7,1	1,4
S20	2,0 - 2,5	1,4	8,8	1,9
S23	2,5 - 7,5	1,4	8,8	2,2

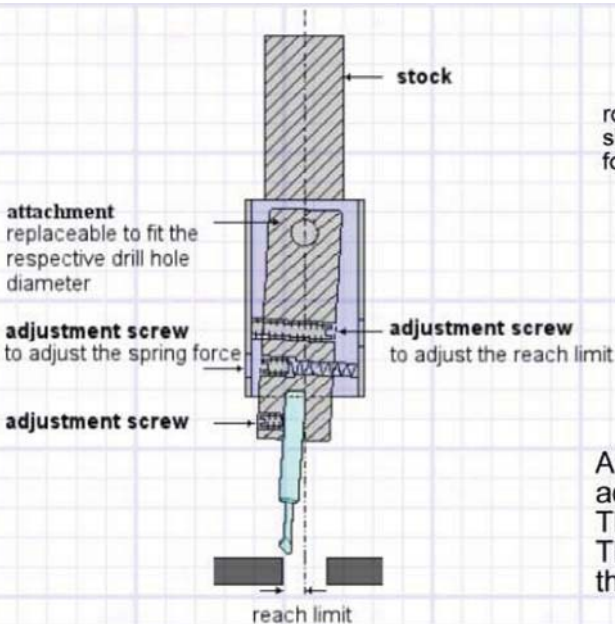


## Advantages:

- deburring of smallest holes, already from diameter 1.20 mm
- ideal to the deburring in series production.
- infinitely variable adjustable on a respective hole diameter
- very fast deburring process
- simple tool change
- in every machine usable (ideal for use into CNC machines)
- solid, slim design
- simple handling
- low costs because of exchangeable consumable parts

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## blades

round edge ( standard )  
sharp edge ( special type B )  
for outer edge deburr

round edge  
to prevent workpiece  
from damage

cutting edge  
angle 45 degrees ( standard )  
angle 25 degrees ( special type 25 )  
for crossholes in very  
vaulted workpieces



## attachments

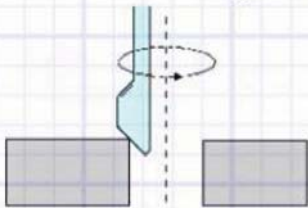
Attachments are used to take up the blades and to adjust the tool to the respective drill hole diameter. They have an alignment into which the cutting blade will be put. The greater the cross hole diameter, the greater is the distance of the alignment to the appliance axis.

## tool configuration

drill hole	attachment	blade
1,2 - 1,5 mm	E00	S12
1,5 - 2,0 mm	E00	S15
2,0 - 2,5 mm	E00	S20
2,5 - 3,5 mm	E05	S23
3,5 - 4,5 mm	E10	S23
4,5 - 5,5 mm	E15	S23
5,5 - 6,5 mm	E20	S23
6,5 - 7,5 mm	E25	S23

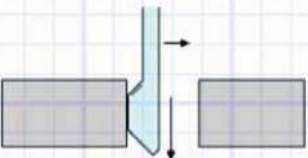
### approaching the drill hole

if you want, you can now  
deburr the outer edge



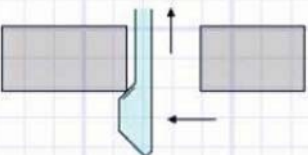
### dive into the drill hole

the blade is pushed towards the axis  
against the spring force



### deburr the inside edge

backward push  
the blade is pulled towards the  
edge by spring force



During the whole process  
the tool always rotates with  
about 500 rpm.

## deburring of inner drill hole edges

Put the position of the tool axis to the drill hole axis.  
Adjust the reach limit, that the drill hole edge meets the  
front slope of the blade about in the middle.  
Drive in the drill hole with rotating tool and with great feed,  
until the blade is through the hole  
and the blade stock lies tight by the drill hole side.  
The front edge of the blade is blunt, to let the blade dive in easy  
and to protect the outer chamfer.  
Drive back with low feed, until the blade edge is free,  
then drive out of the drill hole very fast.  
The deburr intensity depends on the rotation speed,  
the feed speed and the used spring force.

## complete set

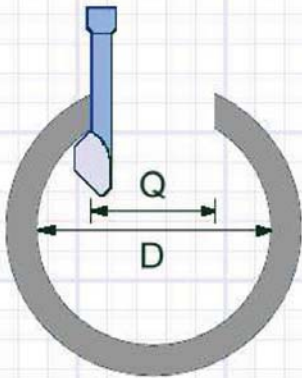
- 1 base body
- 6 attachments E00, E05, E10, E15, E20, E25
- 1 blade S20
- 3 springs with different spring forces
- 2 adjustment keys



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## Choosing the appropriate blade form



There are 4 blade forms available:  
the basic form, and the special forms /B, /25 and /25/B.

If you want to deburr the inside edge and the outside edge of a drill hole, you must use the form /B.

If you have a drill hole in a tube, where the diameter proportions  $Q : D$  is higher than  $1 : 2$ , you must use the form /25.

The form /25/B is a combination of the two above.

With the form /25 you can deburr crossholes with diameter proportions up to  $1 : 1.5$ .

If the proportion is still higher, you should ask us, if this works.

## Choosing the appropriate spring force

The spring force affects the deburr result eminently.

There are 3 types of springs: F40, F50 and F55.

- F40 - soft metal ( aluminium, brass )
- F50 - normal hard steel
- F55 - stainless steel

## Choosing the speed of rotation and of feed

The speed of rotation should be about 500 rpm and the speed of feed, while the blade is working, should be about F100.

If the deburr result doesn't correspond your expectations, you can vary both speeds.

In very vaulted workpiece areas, where you use the form /25, you should decrease the rotational speed ( about 200 - 300 rpm ) and increase the spring force.

## Practical example

workpiece material : 11SMn30

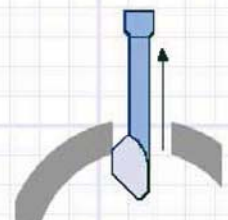
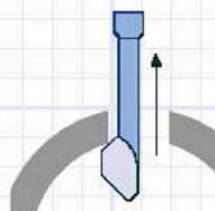
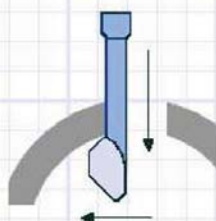
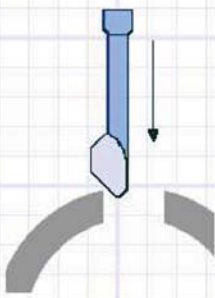
duration of the deburr process : about 3 seconds

Go with fast gear in front of the drill edge.

With feed F500 dive into the hole until the cutting edge of the blade is through.

With feed F100 go back. Possibly you can program a sejour time of about 0.5 sec.

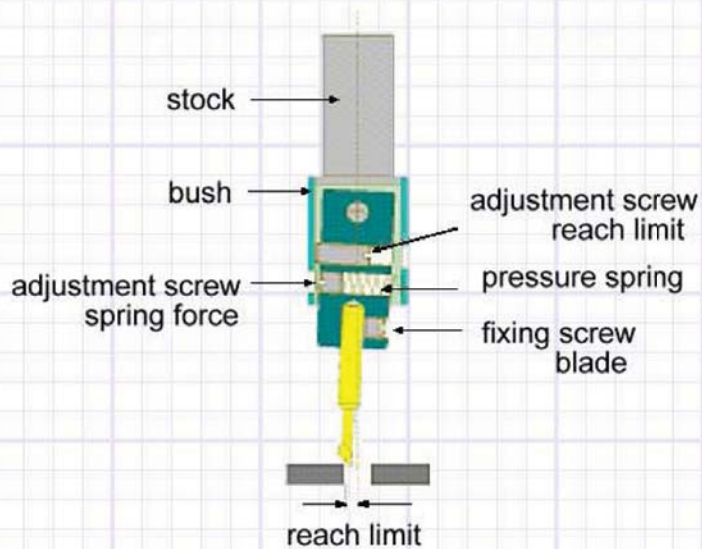
As soon as the cutting edge is free, return the tool with fast gear to the start position.



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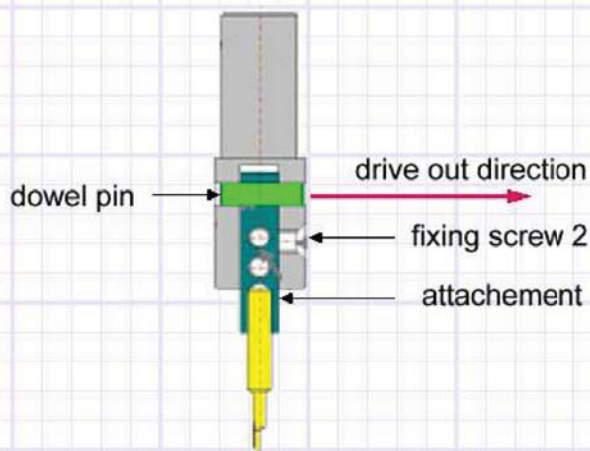


# Assembling instructions



## Changing the pressure spring

1. withdraw the bush  
therefore remove fixing screw 2  
while withdrawing the bush, hold back  
the spring with your thumb
2. push up the bush, until the pressure spring comes free
3. change the spring
4. push back the bush and fix it with the screw.



## Changing the attachment

1. withdraw the bush, remove the spring ( see above )
2. drive out the dowel pin with a drift in the right direction  
and put away the attachment
3. before you insert the new attachment, grease lightly  
the bearing hole in the attachment
4. push the new attachment into the body and drive in the  
dowel pin with a drift. Do not hit too hard.
5. assamble the pressure spring and the bush



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