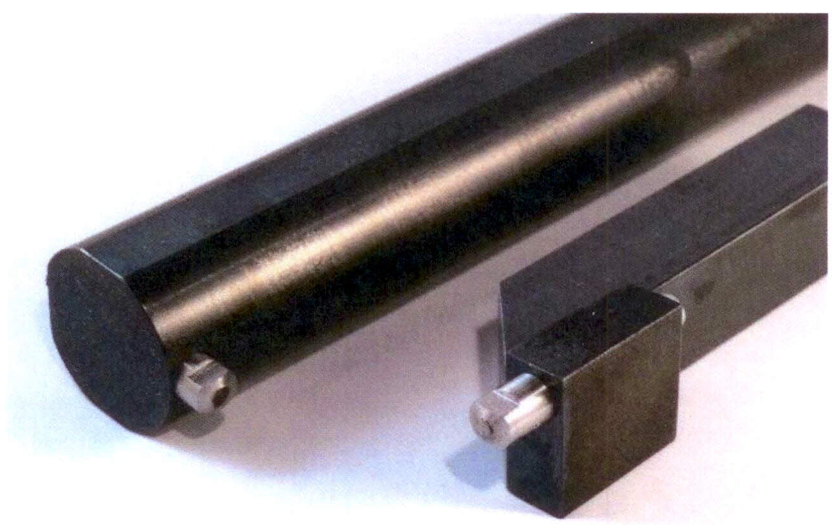
DIAMOND BURNISHING TOOL



Instructions

Polishing data

Select a peripheral speed lower than 250 m/min. A suitable initial setting is the cutting speed used to make a finishing cut (100 - 250 m/min.) Trials have shown that surface finish is not affected by peripheral speed.

Please remember that higher the peripheral speed, the higher the temperature in the polished area. If the temperature rises above 650°C the burnishing tool will begin breaking down into graphite.

Whenchoosing the feed speed remember that the lower feed speed, the better the surface finish will be. The feed speed should be slower than that used for finish machining. A suitable initial setting is half this speed.

You should never use the same feed speed as used for finish machining as the peaks of the machined surface will meet the diamond in exactly the same place all the time and result in rapid wear.

To obtain a good surface finish to Ra = 0,1 - 0,2 microns after burnishing, the initial polishing should be to Ra = 2,0 - 2,5 microns. This is achieved with the feed speed s = 0,15 - 0,20 mm/rev. and a nose radius r = 0,8 or 1,2

For burnishing, set the feed speed to s = 0,08 - 0,10 mm/rev.

Applied pressure

The tool is applied at right angles to the work piece and level with it´s centre line. The spring-loaded spindle is then pushed into the holder and the pressure is built up.

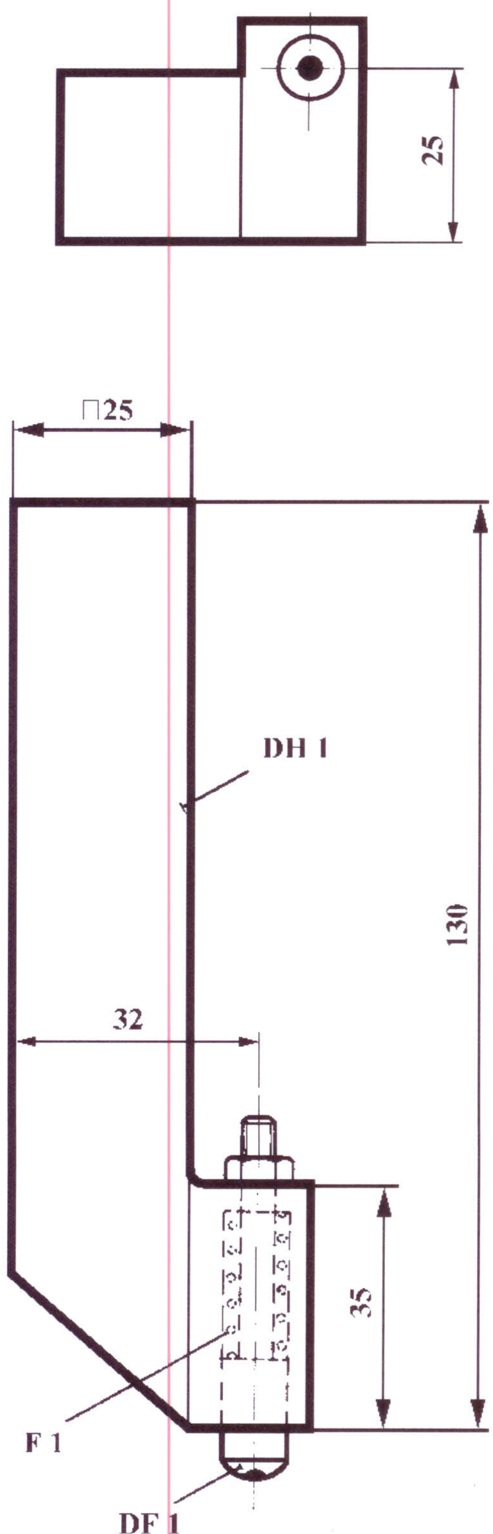
The applied pressure will depend on how far the spindle is pushed in, i.e. the degree to which the spring is compressed and the strength of the spring. The range of movement of the spindle is around 7,5 mm. At least 1 mm of this range should be left free so that the diamond tool always has some freedom of movement in the holder. There is a choice of weak or strong spring providing a constant 50 N/mm or 60 N/mm respectively.

The applied pressure should be kept as low as possible in relation to the desired surface finish, since high pressures lead to high temperatures in the polishing zone.

Coolant

Coolant must be used. It must have good lubrication and cooling characteristics. It is very important that the polishing zone is well supplied with coolant.

NOTE !!!



Diamond burnishing tool DP 1

Complete tool	**DP 1**
Diamond mounting	**DF 1**
Holder	**DH 1**
Spring	**F 1**

Instructions

The tool is supplied with the integral spring relaxed. Maximum compression = 6 mm. Do not press the spring to the bottom, compress it about 4 mm for steel and slightly less for softer materials.

Bring the tool against the stationary work piece to give the desired spring pressure. Turn on the coolant, start the feed and choose a speed equivalent to a maximum of 240 m/min. Set the feed speed s = 0,08 - 0,10 mm/rev.

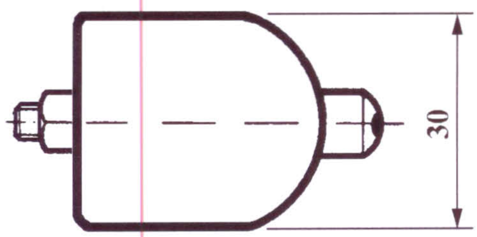
NOTE ! ALWAYS USE COOLING WATER.

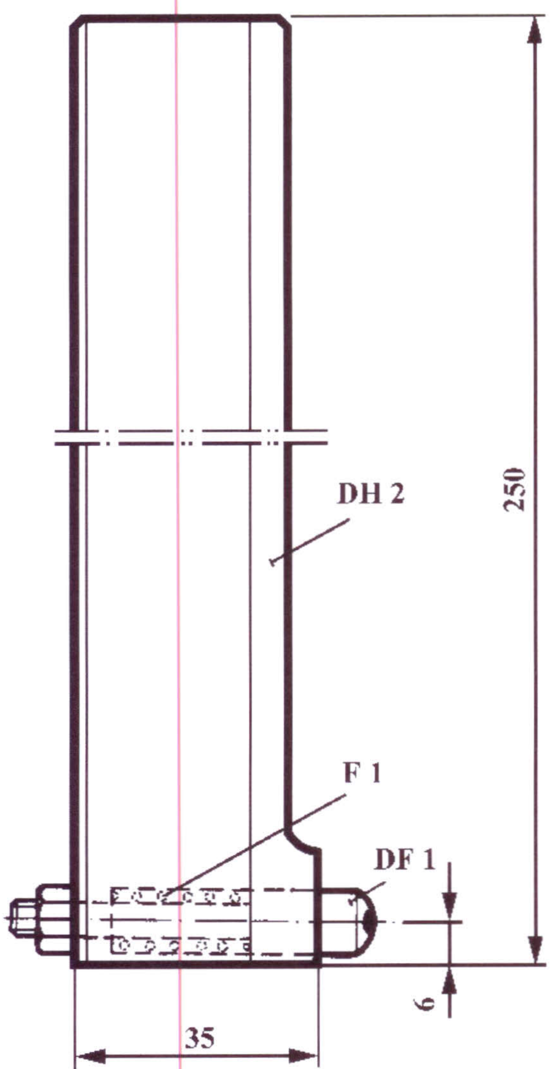
I theory any material that can be machined with cutting tools can also be polished. If the hardness is higher than HRc 40 - 45 the life of the diamond will be greatly reduced. This includes stainless steel.

Machining example:

Preparing turned shaft, lathe plate nose radius 0,8 feed speed s = 0,20 mm/rev.
After polishing, the surface finish is Ra 0,05 - 0,10 microns. Ground surfaces are improved by a factor of about 10. Trials and tests will demonstrate what results can be achieved with your materials. Contact us for more information.

NOTE !





Diamond burnishing tool DP 2

Complete tool	**DP 2**
Diamond mounting	**DF 1**
Holder	**DH 2**
Spring	**F 1**

Instructions

The tool is supplied with the integral spring relaxed. Maximum compression = 6 mm. Do not press the spring to the bottom, compress it about 4 mm for steel and slightly less for softer materials.

Bring the tool against the stationary work piece to give the desired spring pressure. Turn on the coolant, start the feed and choose a speed equivalent to a maximum of 240 m/min. Set the feed speed s = 0,08 - 0,10 mm/rev.

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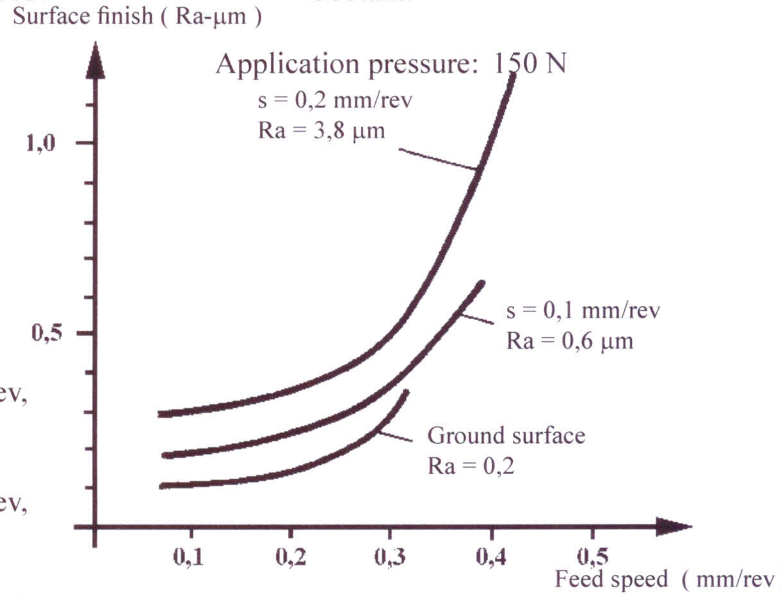
NOTE !

Test results (Bofors)

Conditions **Parameters for burnishing**

Work piece: EN 10 025 Peripheral speed:
v = 15 m/min
Preparation: Turned Feed speed: 0,06 - 0,42
mm/rev
Feed speed: 0,1 - 0,2 mm/rev Coolant:
Trucut SCW 1:30
Nose radius: r = 1,2 mm Application pressure: 150 N
Cutting depth: a = 1,0 mm



Method

Three different surfaces were prepared as follows:

1 Turned surface, feed speed s = 0,2 mm/rev, surface finish Ra = 3,8 microns

2 Turned surface, feed speed s = 0,1 mm/rev, surface finish Ra = 0,6 microns

3 Ground surface, surface finish Ra = 0,2 microns

These surfaces were polished at various feed speeds. The graph shows the surface finish as a function of feed speed.
From the graph it is clear that the surface finish achieved during burnishing improves as the feed speed is reduced. The results are even better if the prepared surface is smoother.

The trial was supplemented by an investigation of how the choice of work piece material affects the surface finish during polishing. Four different materials were turned at a feed speed of 0,1 mm/rev and then pressure polished.

Material	Feed speed	Surface finish
DIN 17210	0,10	0,06
DIN 17200	0,10	0,08
EN 10 088	0,10	0,10
BS 2870-2875	0,10	0,19

The results of this trial show that the surface finish achieved during burnishing is dependent on