KONRAD
TOOLS

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BURNISHING TOOLS

ROLLER BURNISHING SYSTEM

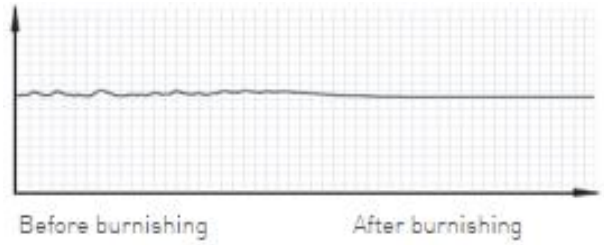
1. ***Introduction of burnishing:***

Burnishing is a machine technique in which a tool is pressed on the surface of a part of lower hardness, crushing the microscopic ridges generated in machining by chip removal and thus reducing its roughness.

This crushing of the ridges displaces the material from the ridges to the valleys and evens out the unevenness. The result of this operation is the generation of a polished surface, with a significantly lower surface roughness.

2. ***Advantages of burnishing:***

- *Versatile and easy to use system.*
- *Obtaining burnished surfaces in a fast and efficient way.*
- *Alternative to grinding. It allows obtaining very low roughness working on the lathe, which in many occasions makes unnecessary the grinding process.*
- *Significant reduction of roughness. In some applications the reduction can be higher than 90%. Ra<0.2 can be obtained.*
- *Slight hardening of the workpiece surface.*
- *Improved corrosion resistance due to reduction of surface pores.*
- *Reduced abrasion resistance due to the lower friction offered by a burnished surface.*
- *Elimination of surface marks.*
- *Economical process with low spare parts consumption.*
- *Fast process with high Vc rates.*
- *No waste.*



To achieve a good burnishing, the following points must be considered:

- *The previous surface must be a good finished (Ra 3.2 - 6.3) and must not have tears, nor striations, nor presence of chips.*
- *The surface must be well dimensioned. When burnishing, the diameter suffers a dimensional variation between 0.01-0.02 mm and this factor must be controlled to obtain the part within the required tolerance.*
- *The thickness of the part to be burnished must be considered, since the part must withstand the compressive force of the burnishing tool.*
- *It is necessary to use coolant to avoid overheating of the tool and to lube the rolling components.*

3. Types of burnishing tools:

We manufacture two types of burnishing tools. Hardened roller tools and diamond tipped tools. Roller tools use a HSS roller hardened to 62-63 HRC and with its surface polished to Ra 0.15-0.4. Roller burnishing tools are usable only on materials with a maximum hardness of 40-45 HRC, so they are not usable on hardened parts. Diamond burnishing tools use a diamond tip of different radius, depending on the material to be burned and the Ra to be obtained. Diamond burnishing tools can be used on parts with hardness up to 63 HRC and they can also be used to obtain better surface finishes, easily reaching values below Ra 0.2

4. Advantages of burnishing tools:

Possibility to regulate the pressure exerted by the tool, to achieve different levels of part roughness.

Possibility of working on parts of different diameters and different materials, both ferrous and non-ferrous.

Simple tools, easy to use and with few elements susceptible to be changed due to wear and/or possible breakage due to collision.

On roller burnishing tools, the rollers are mounted and/or supported on axial or radial bearings, to facilitate turning and smooth the movement.

On diamond burnishing tools, the tips can be mounted in 3 different orientations to increase the tool life.

Both rollers and diamond tips are replaceable elements that can be purchased separately.

5. Preparation of the workpiece for the burnishing:

The workpiece surface must be suitable for burnishing. It is recommended to pre-turning of the best possible quality, since the better the quality of the pre - turning, the better quality will be obtained after burnishing. It should be borne in mind that the burnishing operation, whether by roller or diamond, does not cut the material but crushes it. This crushing results in a reduction of the Ø of the part, which must be considered prior to burnishing. The value of the reduction depends mainly on the type of steel, the pressure exerted and the previous roughness.

Working parameters:

It is recommended to work with a Vc=100-200 m/min and a feed rate of 0.05 - 0.20 mm/turn. If a better finish is required, it is recommended to reduce the feed rate and increase the tool pressure if possible. In the case of soft materials, it is recommended to reduce the tool pressure to the minimum possible.

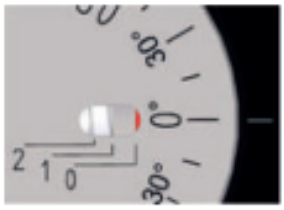
6. Pressure regulation adjustment:

HBU 42, HBE and HBB tools have a simple system for adjusting the pressure exerted by the roller to achieve different burnishing levels. The regulation is made by means of a load adjustment screw placed either on the tool shank (Fig. 1) or on the tool head (Fig. 2)

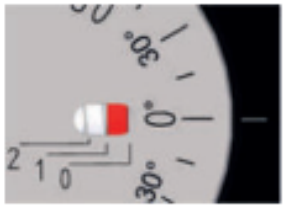
The pressure level is displayed according to the position of the load indicator. There are 3 levels marked with the numbers "0-1-2" where

"0" indicates low load and "2" is the maximum load.

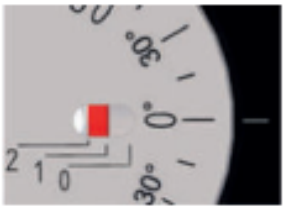
Both the load adjustment screw and the window where the load level is displayed are located on the tool head or on the tool shank, depending on the model. Although it is recommended to always work with the load level in position "2" to achieve the best finish on the part, if the required roughness value is lower than the achieved, then it is better to reduce the load and work with lower pressure to preserve the life of the spring.



Stop in position 0 / Low pressure



Stop in position 1 / Medium pressure



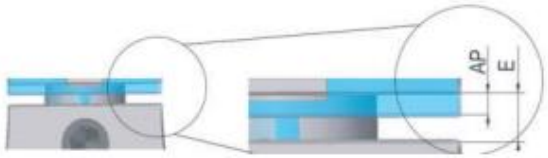
Stop in position 2 / High pressure

The steps to follow are:

1. *Place the roller touching the Ø to be burnished and press against the workpiece until the tool head contracts between 0.1 - 0.2 mm (AP). Do not work with the tool head compressed to the maximum. If the head is compressed until it touches the shank or the tool body, it will stop working and the tool will work as if it were rigid.*

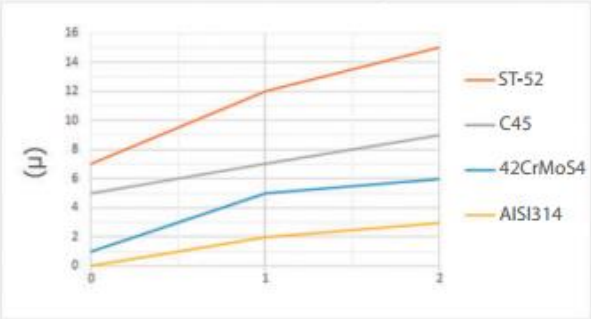
The distance "E" between the tool head and the shank depends on each model.

Model	E
RBUH … -42U	1,5 mm
RBGH … -25E	1,5 mm
RBGH … -30B	1,5 mm
RBUH … -20U	1,7mm
RBOH … -20U	1,7 mm
RBSH … -20U	1,7 mm

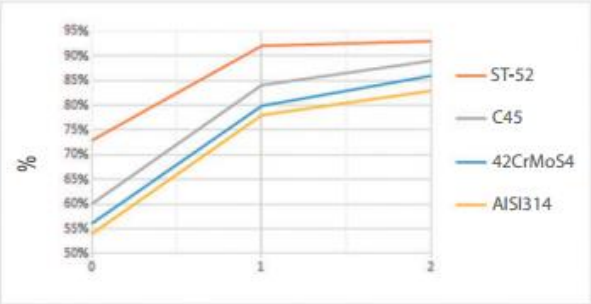


2. *Feed with an f=0.1 - 0.2 mm/turn. Coolant is necessary to achieve a better burnishing finish.*

ROUGHNESS REDUCTION AND SPRING COMPRESSION GRAPHICS:



Reduction of the Ø de la piece



% Reduction of the roughness (Rz)

Reduction of the Ø of the workpiece				
Ra (turning)	Ra1	Ra2	Ra3	Ra4
Steel 60kg/mm2	3-4 µ	7-8 µ	10-12 µ	14-16 µ
Steel 90 kg/mm2	2-3 µ	3-5 µ	5-9 µ	10-12 µ

DIAMOND BURNISHING SYSTEM

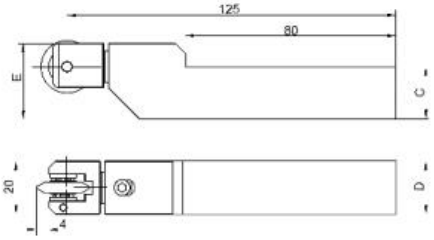
1. *Prior to burnishing, make sure that the turning surface roughness is not higher than Ra 4. Higher roughness can damage the diamond tip. In case it is not possible to achieve the required pre-roughness value, it is recommended to burnish the surface with a roller burnishing tool to Ra<4 before using the diamond burnishing tool.*
2. *Place the diamond tip aligned with the part rotation axis and perpendicular (if possible) to the surface to be burnished.*
3. *The tool head, where the diamond tip is mounted, is supplied preloaded. The spring system allows a maximum compression of 1.0 mm. However, it is recommended that the pressure to be exerted with the diamond on the surface of the part should not exceed 0.1 mm in ferrous materials and 0.005 mm in non-ferrous materials.*
4. *Feed with f=0.05-0.20 mm/turn. always work with coolant to achieve a better burnishing finish and avoid diamond damage.*

RBOH ... -20U

[Fig.1]

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpieces (Fig.1)*
- *The roller is supported between axial bearings*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Carbide pin*
- *Provided with a U type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	C	D	E	Weight (kg)
RBOH 1212R-20U	BR20x4x4	12	12	21	0,3
RBOH 1212L-20U	BR20x4x4	12	12	21	0,3
RBOH 1616R-20U	BR20x4x4	16	16	25	0,4
RBOH 1616L-20U	BR20x4x4	16	16	25	0,4
RBOH 2020RL-20U	BR20x4x4	20	20	29	0,5

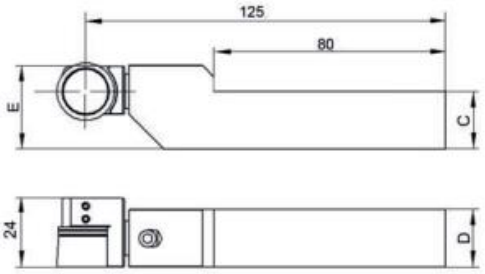
Spare parts	
PH4	
DR4	

RBOH ... -20B

(Fig.1)

Features:

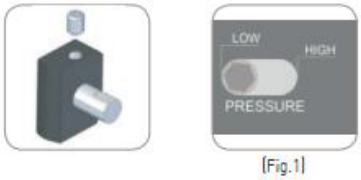
- *Tool designed for burnishing on lathes, on various profiles*
- *Possibility of burnishing up to one face*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpiece (Fig.1)*
- *The roller is supported between axial and radial bearing*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Provided with a B type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	C	D	E	Weight (kg)
RBOH 1212R-20B	BR20x11x16/13	12	12	21	0,3
RBOH 1212L-20B	BR20x11x16/13	12	12	21	0,3
RBOH 1616R-20B	BR20x11x16/13	16	16	25	0,4
RBOH 1616L-20B	BR20x11x16/13	16	16	25	0,4
RBOH 2020R-20B	BR20x11x16/13	20	20	29	0,5
RBOH 2020L-20B	BR20x11x16/13	20	20	29	0,5

Spare parts	
PH13	
DR6	
RR6	

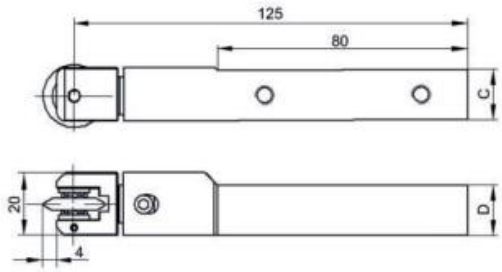
RBSH … -20U



[Fig.1]

Features:

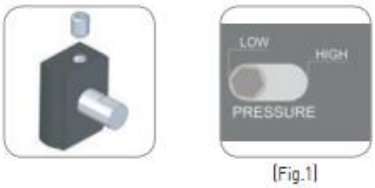
- *Tool designed for burnishing on lathes, on various profiles*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpieces (Fig.1)*
- *The roller is supported between axial bearings*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Carbide pin*
- *Provided with a U type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	C	D	Weight (kg)
RBSH 1212RL-20U	BR20x4x4	12	12	0,3
RBSH 1616RL-20U	BR20x4x4	16	16	0,3

Spare parts	
PH4	
DR4	

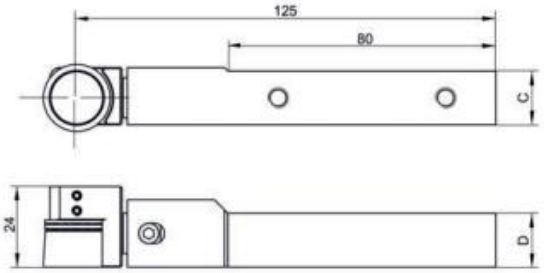
RBSH … -20B



(Fig.1)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Possibility of burnishing up to one face*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpiece (Fig.1)*
- *The roller is supported between axial and radial bearing*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Provided with a B type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	C	D	Weight (kg)
RBSH 1212RL-20B	BR20x11x16/13	12	12	0,3
RBSH 1616RL-20B	BR20x11x16/13	16	16	0,4

Spare parts	
PH13	
DR6	
RR6	

RBUH ... -20U

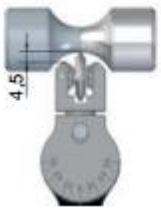

(Fig.1)

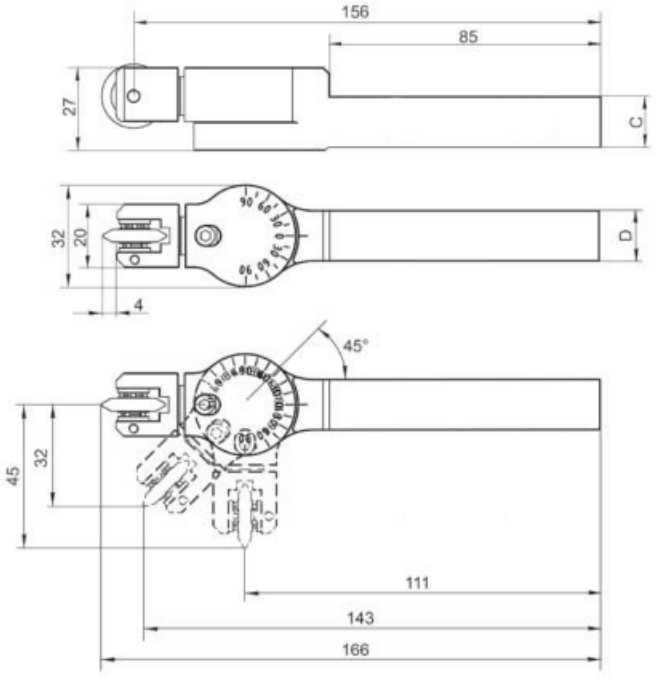

(Fig. 2)

(Fig.3)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Rotating head with graduated scale (Fig.1&2)*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpieces (Fig.1)*
- *The roller is supported between axial bearings*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Carbide pin*
- *Provided with a U type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*

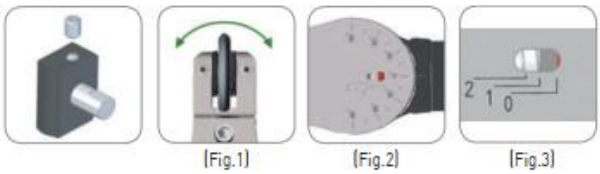




Article	Rolls	C	D	Weight (kg)
RBUH 1016-20U	BR20x4x4	10	16	0,3
RBUH 1216-20U	BR20x4x4	12	16	0,3
RBUH 1616-20U	BR20x4x4	16	16	0,4

Spare parts	
PH4	
DR4	

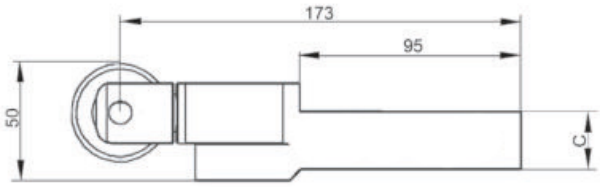
RBUH … -42U

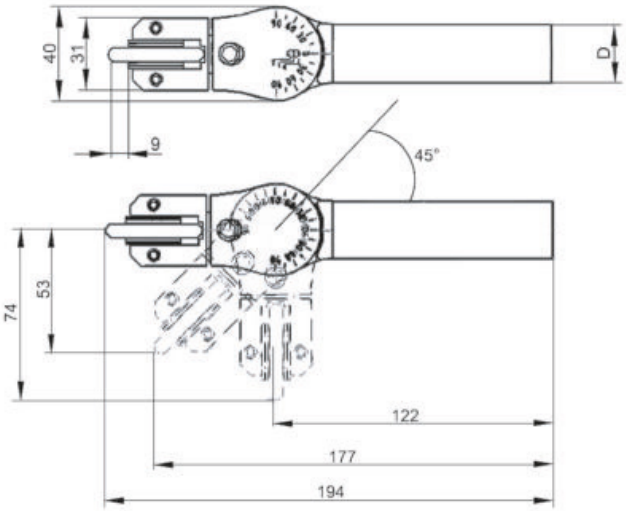


(Fig.1) (Fig.2) (Fig.3)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Rotating head with graduated scale (Fig.1&2)*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpieces (Fig.1)*
- *The roller is supported between axial bearings*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Carbide pin*
- *Provided with a U type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*

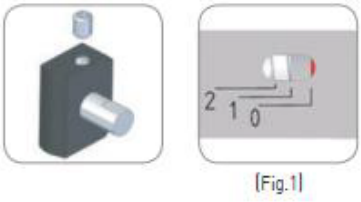




Article	Rolls	C	D	Weight (kg)
RBUH 2025-42U	BR42x6x10	20	25	1,2
RBUH 2525-42U	BR42x6x10	25	25	1,2

Spare parts	
PH10	
DR10	

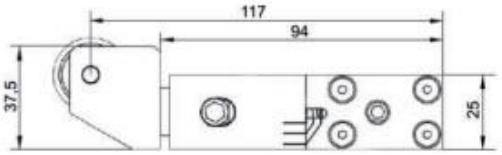
RBGH … -25E



[Fig.1]

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *The roller is supported between axial bearings*
- *The pressure of the head can be adjusted to obtain different levels of burnishing on the workpiece (Fig.1)*
- *Carbide pin*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Provided with a E type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	C	D	Weight (kg)
RBGH 2525RL-25E	BR25x6x6	25	25	0,8

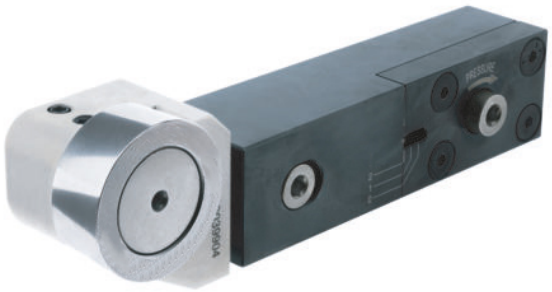
Spare parts	
PH6	
DR6	

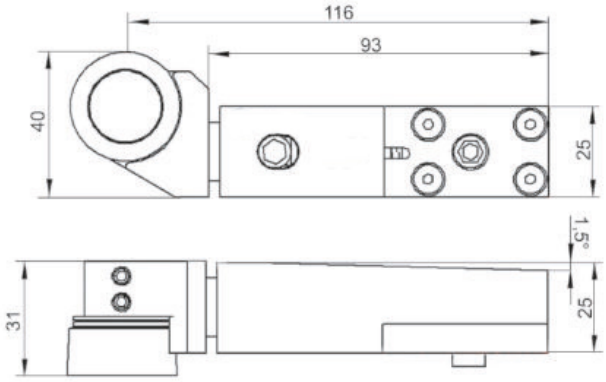
RBGH … -30B

(Fig. 1)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Possibility of burnishing up to one face*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous in all the workpiece (Fig.1)*
- *The roller is supported between axial and radial bearing*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Provided with a B type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*





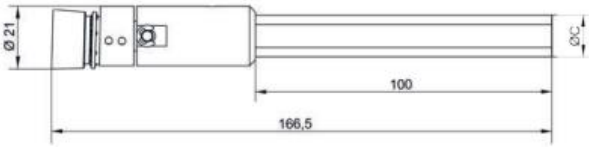
Article	Rolls	C	D	Weight (kg)
RBGH 2525L-30B	BR30x13X20/17	25	25	0,8
RBGH 2525R-30B	BR30x13X20/17	25	25	0,8

Spare parts	
PH17	
DR10	
RR10	

RBAH … -20B

Features:

- *Tool designed for burnishing internal and/or external surfaces*
- *For burnishing holes from Ø22 mm x 70 mm deep*
- *Head provided with an internal spring system that regulates the pressure making it homogeneous on all parts*
- *The roller is supported between axial and radial bearings*
- *Usable on workpieces of different types of materials with hardness up to 45 HRC*
- *Provided with a B type burnishing roller made of HSS and hardened to 62 HRC, with polished surface Ra<0.4*



Article	Rolls	ØC	☒	Weight (kg)
RBAH 12-20B	BR20x11x16/13	12	10	0,2
RBAH 16-20B	BR20x11x16/13	16	14	0,3
RBAH 20-20B	BR20x11x16/13	20	16	0,4

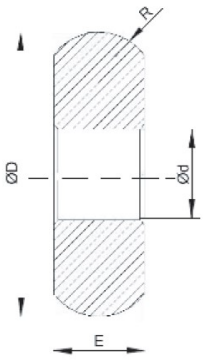
Spare parts	
PH13	
DR6	
RR6	

BURNISHING ROLLERS

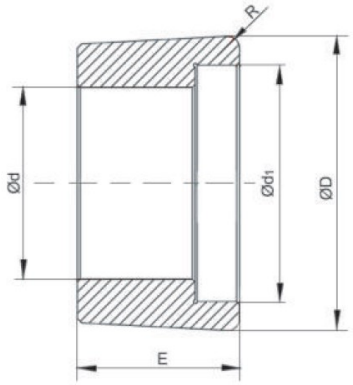
Features:

- *HSS rollers hardened to 62 HRC*
- *Polished surface Ra (0,15-0,40)*

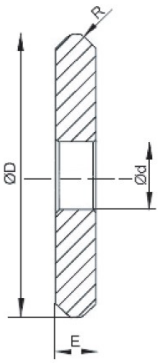
Profile E



Profile B



Profile U



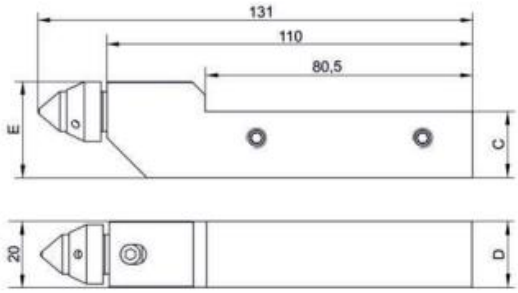
Article	Profile	ØD	E	Ød	Ød1	r	Holder
BR25x6x6	E	25	6	6	*	3,25	RBGH … -25E
BR20x11x16/13	B	20	11	13		0,8	RBOH … -20B, RBSH … -20B,RBAH … -20B
BR30x13x20/17	B	30	13	17	20	0,8	RBGH … -30B
BR20x4x4	U	20	4	4		1,0	RBOH … -20U, RBSH … -20U, RBUH … -20U
BR42x6x10	U	42	6	10	*	2	RBUH … -42U

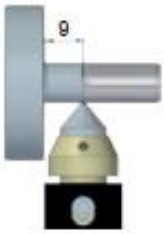
DBOH ...-12

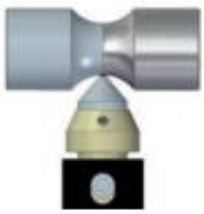
(Fig.1)

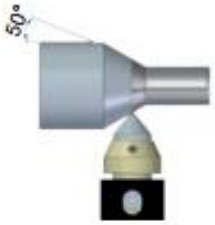
Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Diamond tip aligned with the top face of the shank*
- *The head is equipped with an internal spring system to regulate the pressure of the diamond tip, making it homogeneous on all parts (Fig.1)*
- *Can be used on workpieces made of different types of materials with hardness up to 63 HRC*
- *Possibility of placing the diamond tip in different positions to extend the life of the tool*









Article	Diamond tip	C	D	E	Weight (kg)
DBOH 1212R-12	DT12...	12	12	21	0,3
DBOH 1212L-12	DT12...	12	12	21	0,3
DBOH 1616R-12	DT12...	16	16	25	0,4
DBOH 1616L-12	DT12...	16	16	25	0,4
DBOH 2020RL-12	DT12...	20	20	29	0,5

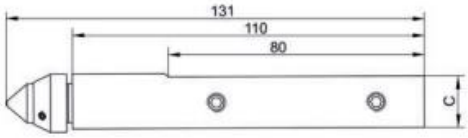
Spare parts	
DT12R0,4	
DT12R0,8	
DT12R1,0	
DT12R2,0	

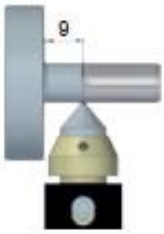
DBSH ...-12

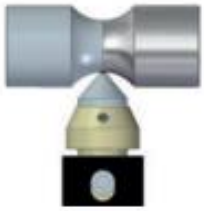
(Fig.1)

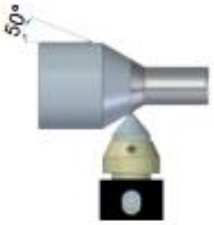
Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Diamond tip aligned with the top face of the shank*
- *The head is equipped with an internal spring system to regulate the pressure of the diamond tip, making it homogeneous on all parts (Fig.1)*
- *Can be used on workpieces made of different types of materials with hardness up to 63 HRC*
- *Possibility of placing the diamond tip in different positions to extend the life of the tool*









Article	Diamond tip	C	D	E	Weight (kg)
DBSH 1212RL-12	DT12...	12	12	21	0,3
DBSH 1616RL-12	DT12...	16	16	21	0,3

Spare parts	
DT12R0,4	
DT12R0,8	
DT12R1,0	
DT12R2,0	

DBUH … -12

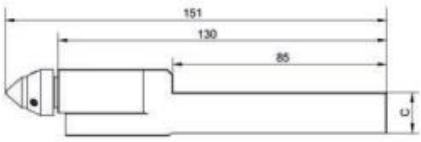

(Fig.1)

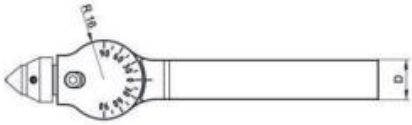

(Fig.2)

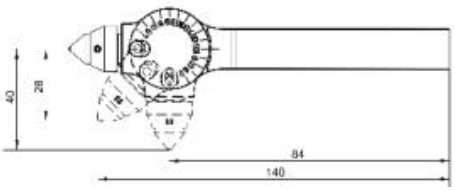
(Fig.3)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Diamond tip aligned with the top face of the shank*
- *Rotating head with graduated scale (Fig.1&2)*
- *The head is equipped with an internal spring system to regulate the pressure of the diamond tip, making it homogeneous on all parts (Fig.3)*
- *Can be used on workpieces made of different types of materials with hardness up to 63 HRC*
- *Possibility of placing the diamond tip in different positions to extend the life of the tool*







Article	Diamond tip	C	D	Weight (kg)
DBUH 1016-12	DT12…	10	16	0,3
DBUH 1216-12	DT12…	12	16	0,3
DBUH 1616-12	DT12…	16	16	0,4

Spare parts	
DT12R0,4	
DT12R0,8	
DT12R1,0	
DT12R2,0	

DBUH … -16

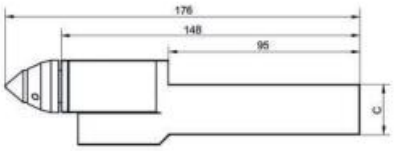

(Fig.1)

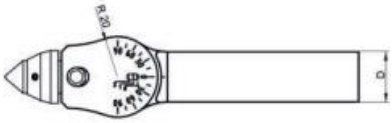

(Fig.2)

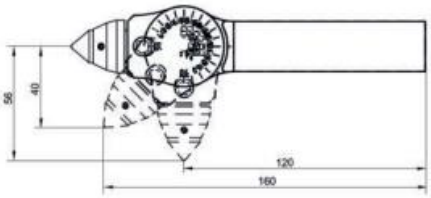
(Fig.3)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Diamond tip aligned with the top face of the shank*
- *Rotating head with graduated scale (Fig.1&2)*
- *The head is equipped with an internal spring system to regulate the pressure of the diamond tip, making it homogeneous on all parts (Fig.3)*
- *Can be used on workpieces made of different types of materials with hardness up to 63 HRC*
- *Possibility of placing the diamond tip in different positions to extend the life of the tool*







Article	Diamond tip	C	D	Weight (kg)
DBUH 2025-16	DT16…	20	25	1,1
DBUH 2525-16	DT16…	25	25	1,1

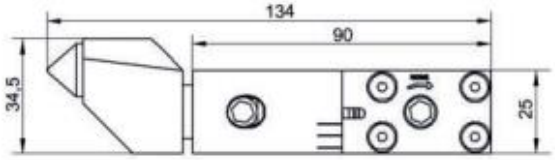
Spare parts	
DT16R0,4	
DT16R0,8	
DT16R1,0	
DT16R2,0	

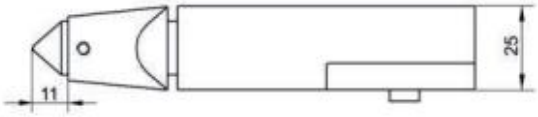
DBGH …-16

(Fig.1)

Features:

- *Tool designed for burnishing on lathes, on various profiles*
- *Diamond tip aligned with the top face of the shank*
- *The pressure of the head can be adjusted to obtain different levels of burnishing on the workpiece (Fig.1)*
- *Can be used on workpieces made of different types of materials with hardness up to 63 HRC*
- *Possibility of placing the diamond tip in different positions to extend the life of the tool*





Article	Diamond tip	C	D	Weight (kg)
DBGH 2525-16	DT16…	25	25	0,4

Spare parts	
DT12R0,4	
DT12R0,8	
DT12R1,0	
DT12R2,0	

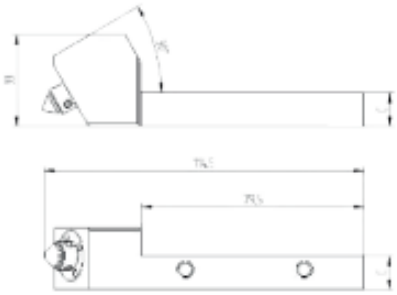
DB30H ...-8
DB45H ...-8
DB60H ...-8

Features:

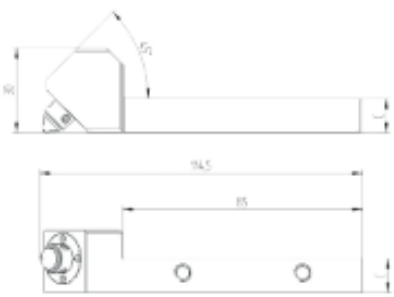
- *Tool designed for burnishing on lathes, external surfaces of various shapes*
- *Compact design*
- *Indexable diamond tip for external tool life*
- *Tool head supported by an internal preload spring system, for constant pressure on all the parts*
- *Can be used on different materials with hardness up to 63HRC*

	Front	Concave	Conical	Convex	Axial
					
DB30H		*	*	*	*
BD45H	*	*	*	*	*
BD60H	*		*		

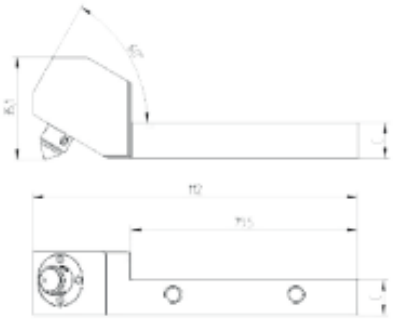
Recommended for axial burnishing



Recommended for front and axial burnishing



Recommended for front burnishing



DIAMOND BURNISHING TOOLS

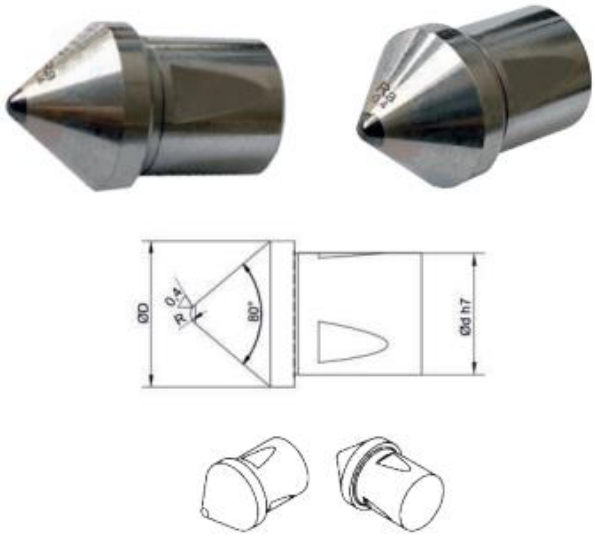
Article	Diamond tip	C	D	Weight (kg)
DB30H 1010R-8	DT8...	10	10	0,2
DB30H 1010L-8	DT8...	10	10	0,2
DB30H 1212R-8	DT8...	12	12	0,3
DB30H 1212L-8	DT8...	12	12	0,3
DB30H 1616R-8	DT8...	16	16	0,3
DB30H 1616L-8	DT8...	16	16	0,3
DB45H 1010R-8	DT8...	10	10	0,2
DB45H 1010L-8	DT8...	10	10	0,2
DB45H 1212R-8	DT8...	12	12	0,3
DB45H 1212L-8	DT8...	12	12	0,3
DB45H 1616R-8	DT8...	16	16	0,3
DB45H 1616L-8	DT8...	16	16	0,3
DB60H 1010R-8	DT8...	10	10	0,3
DB60H 1010L-8	DT8...	10	10	0,3
DB60H 1212R-8	DT8...	12	12	0,4
DB60H 1212L-8	DT8...	12	12	0,4
DB60H 1616R-8	DT8...	16	16	0,4
DB60H 1616L-8	DT8...	16	16	0,4

Spare parts	
DT8R0,4	
DT8R0,8	
DT8R1,0	
DT8R2,0	
HK4P-17 (key)	

BURNISHING DIAMONDS

Features:

- *High performance diamond tip*
- *For burnishing materials up to HRC 63*
- *Polished surface Ra 0.2*
- *Various positions of use by indexing the tip, to increase the tool life*



Article	ØD	Ød	R
DT8R0,4	8	6	0,4
DT8R0,8	8	6	0,8
DT8R1,0	8	6	1,0
DT8R2,0	8	6	2,0
DT12R0,4	12	10	0,4
DT12R0,8	12	10	0,8
DT12R1,0	12	10	1,0
DT12R2,0	12	10	2,0
DT16R0,4	16	12	0,4
DT16R0,8	16	12	0,8
DT16R1,0	16	12	1,0
DT16R2,0	16	12	2,0

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