

PRECISION BORING HEAD

Type 205bh (WOHLHAUPTER-TOGT)

Ø10÷100mm (* Ø6÷100mm)

3/8" ÷ 4" (*Ø 2/5" ÷ 4")

INSTRUCTIONS FOR USE

No. 2621005



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1. Safety recommendations

- 1.1 Before clamping the head on the machine spindle, make sure that the head is not visibly damaged.
- 1.2 Assemble the tools and cartridges in the correct position on the slide. The point of blade should be directed towards the mark on slide.
- 1.3 The head 205bh is balanced neither statically nor dynamically. Therefore we recommend not exceed the maximum allowed speed for individual diameters of the boring range. The maximum allowed speeds are specified in the table of basic technical data in the chapter 4.
- 1.4 Do not start the machine spindle unless you check that slide arresting screw is tight. (Pos.18 on the Fig. 1)

2. Delivery conditions

The fine boring head is delivered in plastic case with foam plastic insert. The head is equipped with the primary accessories.

The exchangeable taper shanks and extension parts are not included in these accessories, it is necessary to order those separately.

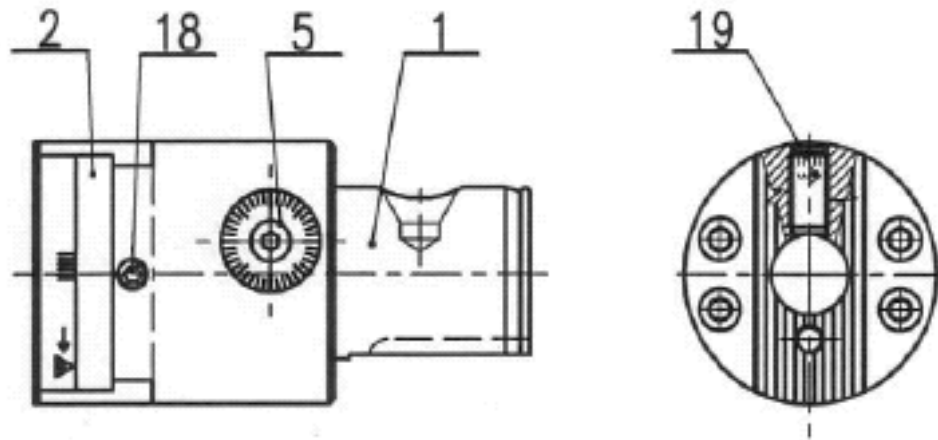
List of the primary accessories

1.	C* – boring tool \varnothing 5,5 x \varnothing 16x 23 0580 0550 K10 \varnothing 6- 14mm, 0,24-0,55 in	1 piece
2.	D – boring tool type 2488 \varnothing 10- 18mm, 0,39-0,70 in	1 piece
3.	E – boring tool type 2490 \varnothing 18- 26mm, 0,70-1,02 in	1 piece
4.	F – holder type 2492 For knives units L a K	1 piece
5.	G – holder type 2493 For knives units L a K	1 piece
6.	L – cartridge type 4896 \varnothing 26- 40mm, 1,02-1,57 in	1 piece
7.	K – cartridge type 4958 \varnothing 40- 60mm, 1,57-2,36 in	1 piece
8.	M– cartridge type 4897 \varnothing 60- 80mm, 2,36-3,15 in	1 piece
9.	N – cartridge type 4898 \varnothing 80-100mm, 3,15-3,93 in	1 piece
10.	Insert type W-20 WHT 12 code 203.850 TOGT- - 02 EL-31	6 pieces
11.	Screw for tool bit M2 x 5 115535	6 pieces
12.	Screw M6 x 16 07150	4 pieces
13.	Washer 6,4 021703.12	4 pieces
14.	Screwdriver T7 x 50	1 piece
15.	Key 3 – model 4986	1 piece
16.	Key 4 - 230710	1 pieces
17.	Rubber ring 10 x 2 029281.1	1 piece
18.	Instruction manual	1 piece

*this item is not delivered in standard accessories, must be ordered separately

3. Description of the head

Fig. 1



Position 1 – BODY

The body is the basic part of the head. It is provided with the cylindrical shank with axial hole for the coolant supply to the cutting point. The slide is fit crosswise on the bottom side of the body.

Position 2 – SLIDE

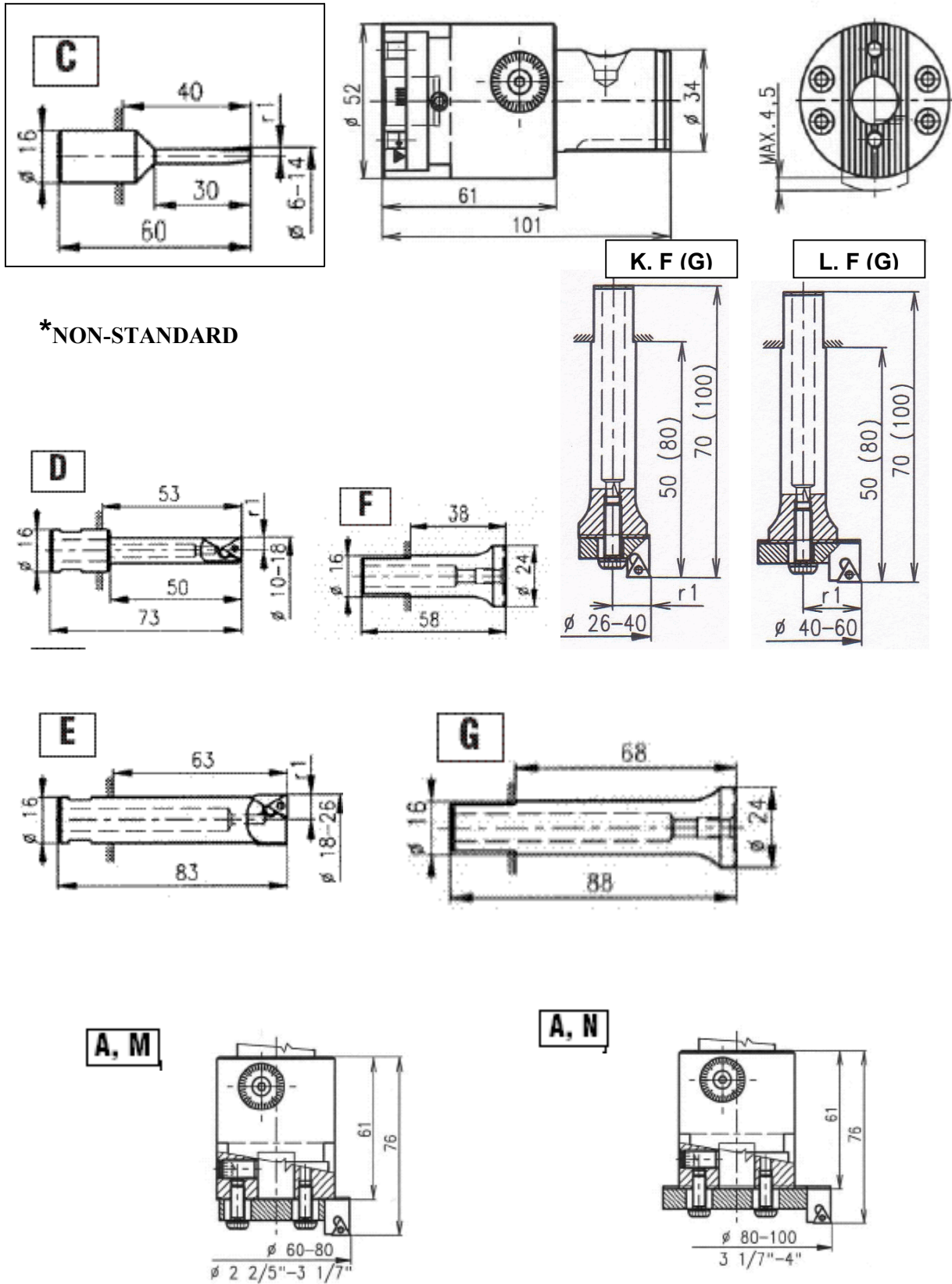
The slide has a bore $\varnothing 16H7$ clamping of boring tools and holders. The slide is equipped with the longitudinal grooving and the threaded hole with M6 for clamping of cartridges M, N. The position of the slide is arrested to the body by means of the arresting screw (Pos. 18).

Position 5 – WORM WITH SCALE

Worm with scale serves to setting the diameter. By turning the slide moves. Turning 1 division on scale results in 0,001 mm slide feed that will change the bore diameter by 0,002 mm.

When turning the scale make sure that the slide arresting screw (pos.18) is loose. Turning the scale by one complete rotation (360°) will feed the slide by 0,05 inch.

Dimensions



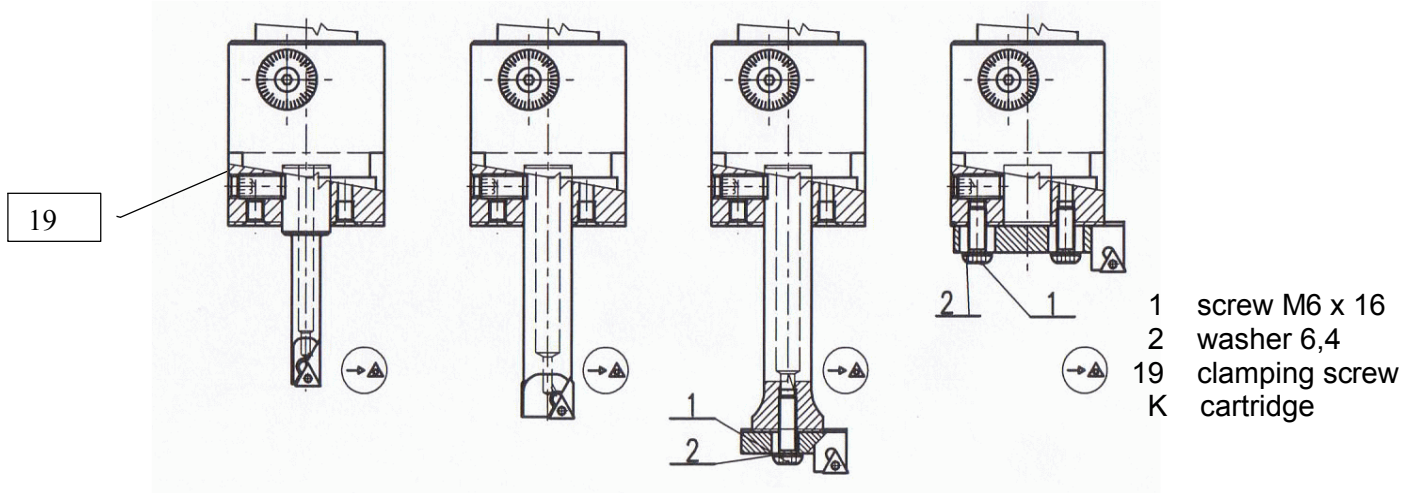
***NON-STANDARD**

Fig. No.2

4. Basic technical data

Parameter [mm] Ø	6- 14	10- 18	18- 26	26- 40	40- 60	60- 80	80-100
Parameter [inch] Ø	0,24-0,55	0,39-0,70	0,70-1,02	1,02-1,57	1,57-2,36	2,36-3,15	3,15-3,93
Used elements	A + C	A + D	A + E	A + F(G) + L	A + F(G) + K	A + M	A + N
Weight of the set [kg]	1,19	1,19	1,25	1,25 (1,29)	1,27 (1,31)	1,24	1,28
Max. revolutions [min ⁻¹]	6000	6000	5000	3.500	2500	1500	1000
Max. depth of boring hole [mm]	29	49	62	49(79)	49(79)		
Accuracy of adjustment	1 scale division = 0.0025 mm / Ø						
Accuracy of boring	IT 6						

5. Clamping of the tools



- Tools C, D, E and holders F and G are clamped into the bore Ø 16H7 of the slide the way the flat on the clamping part faces to the clamping screw (Pos. 23). **and simultaneously the tool tip is directed to the mark on slide.** Clamp bolt poz.19 is tightened key size 4 tightening torque 5Nm.
- Holders F and G are fixed in the slide in the same way as tools. Cartridges K, L are put on the grooved heads of holders and are clamped by means of the screw and washer. Pay attention to the orientation of the point of the insert.
- Cartridges M, N are mounted on the grooved face of the slide with two screws – see the figure. The driving insert with M6 thread is put in the bore Ø 16H7 and it is fixed with the clamping screw (Pos. 23). Pay attention to the orientation of the point of the insert.

6. Clamping of the head on the machine spindle

The precision boring head is clamped by means of the cylindric connection in the exchangeable taper shank, which is the part of the modular clamping system MSK 34. The connection is fixed with the screw (Pos. 1) by tightening torque of 25 Nm. The screw (Pos. 2) is tightened and glued permanently, this screw is not a subject of manipulation. The figure with the table 4 shows the assortment of exchangeable taper shanks and their basic dimensions.

Warning! Insert the sealing ring in the bore of the taper shank before inserting the connection. The sealing rubber ring poz.17 (page No.2) makes possible the coolant flow through the head and it is included in the primary accessories.

Exchangeable taper shanks

Code	Holder MSK AD34 Taper - type - norm	X [mm]	L [mm]
209 227	ISO 40 DIN 69871AD+B	65	133
209 234	ISO 50 DIN 69871AD+B	48	150
209 241	ISO 40 DIN 2080	45	139
209 258	ISO 50 DIN 2080	45	172
209 265	MAS BT 40	55	121
209 272	MAS BT 50	66	168
209 289	CAT 40	65	133
209 269	CAT 50	48	150

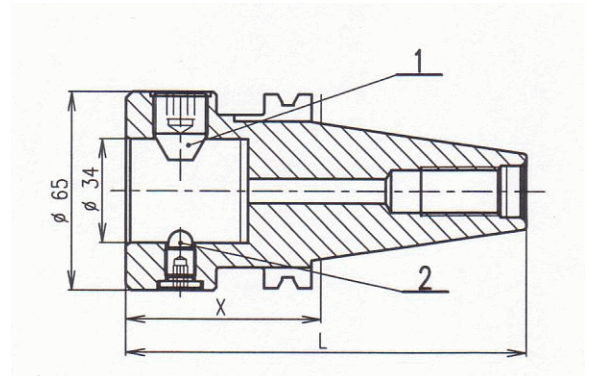


Fig.No.4

Make sure, that the spindle taper is clean before inserting the head in the machine spindle. The dirty surfaces are the most frequent reason of the unaccurate clamping.

7. Using the head

The precision boring head is designed for precise boring through and blind cylindric holes on boring or milling machines or CNC machining centres. We do not recommend to use the precision boring head for roughing. Tooling accessories make possible to bore the in length of tools. depths according to the used tools. It can be extended by using cartridges M and N and the extension element of the required length. (Fig. No.5).

EXTENSION ELEMENT

Kód	L [mm]
210 056	50
210 063	100
210 070	150

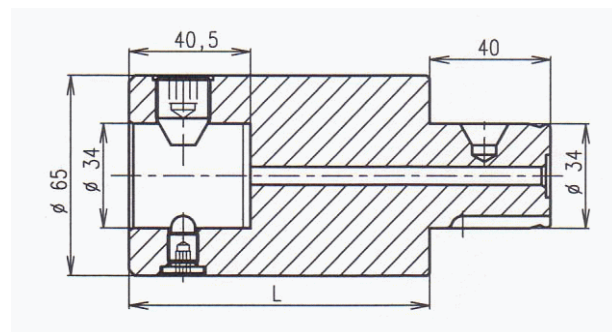


Fig. 5

Recommended cutting conditions:

Table 2

		Cutting conditions		v – cutting speed [m/min]	s – feed [mm/min]
Material		Tool C	Tools D, E	Cartridges K, L, M, N	
Structural steel 400 Mpa	v	60 – 150			
	s	0,03 - 0,06			
Unalloyed steel 600 Mpa	v	80 – 120	125 - 200	100 - 170	
	s	0,03 - 0,06	0,04 - 0,08	0,05 - 0,1	
Alloyed steel 900 Mpa	v	70 – 100	110 - 180	90 - 150	
	s	0,03 - 0,06	0,04 - 0,08	0,05 - 0,1	
Special alloy steel 1200 Mpa	v	60 – 90			
	s	0,02 - 0,05			
Grey iron HB < 200	v	110 – 180	100 - 150	100 - 150	
	s	0,03 - 0,07	0,04 - 0,08	0,05 - 0,1	
Bronze	v	110 – 180	200 - 280	180 - 300	
	s	0,03 - 0,07	0,04 - 0,08	0,05 - 0,1	
Aluminium Al -alloy	v	160 – 200	200 - 280	100 - 300	
	s	0,04 - 0,07	0,04 - 0,08	0,04 - 0,08	

If the tool vibrates we recommend to reduce the cutting speed until vibrations disappear.

Recommended depth of cuts: tool Cmax. 0,3 mm

Other toolsmax 1 mm

8. Adjusting the boring diameter

The scale of dial screw (Pos.5) and guideline on the body(Fig.1) are used for adjustment of the dimension. Maximum slide travel is 4,5 mm.

Keep following rule: the required diameter should be adjusted in the same direction of the scale rotation.

This method eliminates the axial backlash of the dial screw (dead travel).

Method for adjusting the boring diameter

- Loosen the arresting screw (Pos. 18)
- Turn the scale anticlockwise for necessary value - the tool moves out to the greater diameter
- Tighten the arresting screw (Pos. 18) by tightening torque

If you overtravel the required dimension, return the scale by half revolution and readjust the size again.

9. Maintenance and storing

The precision boring head should be kept clean and the dial screw and the slide to be oiled if necessary. The head is turned on the side and a few drops of oil should be put into the lubricator. The contact surfaces are oiled by moving the slide. The excess oil will run out after turning the head back.

The head, protected with oil, should be stored in a dry nonaggressive place.

The repairs are provided by supplier and conducted by manufacturer.

10. Disposal of the packing

The packing consists of the plastic cassette and foam plastic insert. The packing can be liquidated by recycling.

11. Guarantee and guarantee conditions

The manufacturer NAREX MTE provides the guarantee on the head 205bh for 1 year from the day of sale. The guarantee relates hidden defects of material, incorrect construction or manufacturing. It does not apply to the incorrect use inconsistent with recommendations in this instructions for use. The guarantee will not be applied for dismounted heads and for heads modified without approval of the manufacturer.

In case of claim please submit the documents proving your purchase.

Extract from the catalogue of WOHLHAUPTER

Exchangeable inserts – available collection

Form20 form	Cutting tip with 3 edges				Carbid				Carmet		Diamond				
	b ₂	Angle face γ	r ₁	Marking	Order.No	uncoated		coated		uncoated	coated	CBN C60	CBN C40	CBN C20	PKD D30
						WHW01(K10)	WHW10(P10)	WHC10(Tin)	WHC25(Tin/Tic)						
			0,3	TOGW--03FN-11	097 150	•		•							
	1,0	5°	0,1	TOGT--01 FL-31	097 151		•		•						
	1,0	5°	0,3	TOGT--03 FL-31	097 152	•	•		•						
	1,0	13°	0,1	TOGT--01 FL-31	097 153	•									
	1,0	13°	0,3	TOGT--03 FL-31	097 154	•									
	0,4	5°	0,1	TOGT--01 FL-31	097 181	•	•		•						
	0,9	10°	0,2	TOGT--02 EL-31	097 546					•	•				
	0,9	10°	0,1	TOGT--01 FL-31	097 547					•	•				
	0,9	10°	0,4	TOGT--04 EL-31	097 599					•					
			0,2	TOGW--02 FN-71	097 487										•
			0,3	TOGW--03 TN-71	097 407							•	•	•	

Technological usage

	P unlegierter und legierter Stahl und Stahlguss, nichtrost. ferritischer und martensit. Stahl und Stahlguss					M nicht-rostender austenitischer Stahl und Stahlguss					K Grauguss Temperguss, Kugelgraphitguss, NE-Metalle, Kunststoffe				
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30		
HT Cermet unbeschichtet Uncoated cermet	WHT 10					WHT 10					WHT 10				
	WHT 12					WHT 12					WHT 12				
	WHT 20					WHT 20					WHT 20				
	WHT 30					WHT 30					WHT 30				
Schneidstoff Cutting material Matériaux de coupe	Zähigkeit / toughness / Tenacité					Zähigkeit / toughness / Tenacité					Zähigkeit / toughness / Tenacité				
	Verschleißbeständigkeit / wear resistance / Résistance à l'usure					Verschleißbeständigkeit / wear resistance / Résistance à l'usure					Verschleißbeständigkeit / wear resistance / Résistance à l'usure				

WHW 01 (K10)

High-precision turning, finish machining and light roughing at medium cutting speeds and up to 1000 m/min for aluminium. Cast materials, aluminium, non-ferrous metals, highmelting metals (Mo, TZM), plastics, glass-fibre reinforced plastics, laminated paper, carbon, fine ceramics, heat-resistant alloys.

WHW 10 (P10)

Fine and medium machining of steel and cast steel. For high cutting speeds and medium feeds, also for less favourable conditions.

Coated TK (HC)**WHC 10 (P30 / K 10)**

TIN coating for rough and finish machining at elevated cutting speeds within the K05-K20 cutting group and for finish machining at high cutting speeds in K5 – K10 group. Can also be used in P20 – P40 cutting group depending on individual application.

WHC 25 (P25)

Coated hard metal, rough and finish machining at high cutting speeds; steel, steel casting and malleable cast iron. Continuous and fitful cut.

Uncouated cermet (HT)**WHT 12 (P10/M20/K10)**

Very wide field of application for finish machining, cutting speed range from less than 100 to 300 m/min, for aluminium and nonferrous metals up to 1000 m/min. Unalloyed and alloyed steel, tool steel, stainless steel, sintered metals and spheroidal cast iron, aluminium.

WHT 20 (P15/M30)

Finish machining at low cutting speeds and short feed, good wear-resistance properties with high sensitivity to cutting edge breakage. Unalloyed and alloyed steel, tool steel, stainless steel, sintered metal.

CubicchrySTALLine bornitrid (CBN)**CBN C 20**

Finish machining of grey cast iron and nodular cast iron, with cutting speeds of 400 to 1500 m/min.

CBN C 40

Finish machining of hardened steel without interruption in cutting from 48 HRC, cutting speeds 100 to 200 m/min.

CNB C 60

Finish machining of hardened steel without interruption in cutting from 48 HRC, Cutting speeds 100 to 200 m/min.

PolychrySTALLine diamond (PKD)**PKD D 30**

Finish machining of non-ferrous metals for general applications, medium fine-grain grade, of high quality with regards to toughness and wear resistance. Cutting speeds up to 3000 m/min.

Table of recommended cutting speeds and feeds during boring with cutting tip
WOHLHAUPTER – FORM 20

WHW - KARBID UNALLOYED WHC - KARBID ALLOYED WHT - CERMET UNALLOYED	Type of cutting tip	Cutting speed m/min	Cutting edge radius [mm]			
			r ₁ = 0,1	r ₁ = 0,2	r ₁ = 0,3	r ₁ = 0,4
unalloyed steel ≤ 600 Mpa	WHW	150-200	0,02 ÷ 0,05	0,04 ÷ 0,08	0,07 ÷ 0,12	0,10 ÷ 0,16
	WHC	140-250				
	WHT	250-350				
alloyed steel and cast steel > 600 Mpa	WHW	100-180				
	WHC	125-220				
	WHT	200-300				
high alloyed steel ≤ 900 MPa	WHW	100-160				
	WHC	110-180				
	WHT	180-250				
high alloyed steel > 900 MPa	WHW	100-160				
	WHC	110-180				
	WHT	180-250				
heat-resistant stainless steel martensit, ferrit.	WHW	60-90				
	WHC	80-120				
	WHT	160-220				
heat-resistant stainless steel austentic	WHW	40-80				
	WHC	80-120				
	WHT	140-200				
Stellit	WHW	20-60				
	WHC	40-120				
Titanium and titanium alloy	WHW	20-50				
	WHC	40-100				
Malleable cast iron	WHW	125-175				
	WHC	150-200				
GG 10-25 Grey cast iron HB < 200	WHW	100-160				
	WHC	150-250				
GG 25-40 Grey cast iron HB > 200	WHW	100-140				
	WHC	160-220				
GGG Spheroidal graphite cast iron	WHW	110-160				
	WHC	150-200				
Aluminium alloy < 12 % Si	WHW	100-1000				
	WHC	100-800				
	WHT	400-1500				
> 13 % Si	WHT	400-1500				



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