

# 320 (310) Product Overview

## 320 (310) FINE BORING

### Engineered with wear and tear in mind.

320 (310) Wohlhaupter boring heads are made from steel for  $\varnothing$  0.787" - 4.055" (20.00 mm - 103.00 mm) and coated Alu-Line material for  $\varnothing$  3.937" - 8.071" (100.00 mm - 205.00 mm) boring heads to protect against corrosion and wear. The insert holder can be rotated quickly for reverse machining.

- Diameter range: 0.787" - 8.071" (20.00 mm - 205.00 mm)
- Alu-Line diameter range: 3.937" - 8.071" (100.00 mm - 205.00 mm)
  - Special coating on Alu-Line provides hard, durable surface
  - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Coolant through
- Vernier diameter adjustment of 0.0001" (0.002 mm)
- Max cutting speed: 3,281 SFM (1,000 m/min)



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
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# WOHLHAUPTER® 320 BORING HEAD with NOVI<sup>TECH</sup>

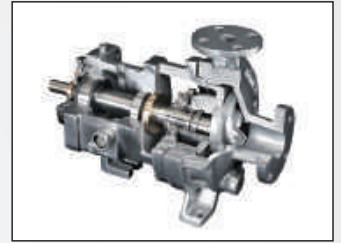
## Time is money, so make it count.

If you want to improve your machining processes, cycle time is a key factor to examine. After all, the longer it takes you to produce a part, the fewer parts you can produce in a given time. Our customer was experiencing lengthy cycle times while machining pumps from grey cast iron. The parts required three bored holes, each with a 12" (304.8 mm) depth and a 22" (558.8 mm) reach.

In order to free up machine time, the customer questioned if their process could be more efficient. The main objectives were to decrease the current cycle time and to maintain a 160 Ra finish, which was required to perform the burnishing process that followed.

The previous tooling ran at a slow 0.47 IPM (11.938 mm/min) and a paint-drying 84-minute cycle time to bore the three holes on each part. With our **Wohlhaupter 320 boring head** utilizing the **NOVI<sup>TECH</sup> vibration dampening module**, the customer increased to a more efficient 3.75 IPM (95.25 mm/min) and slashed the cycle time to 10.5 minutes (an 87% decrease). Along with the increased speed, the Wohlhaupter tooling also achieved a 155 Ra finish, accomplishing everything the customer needed.

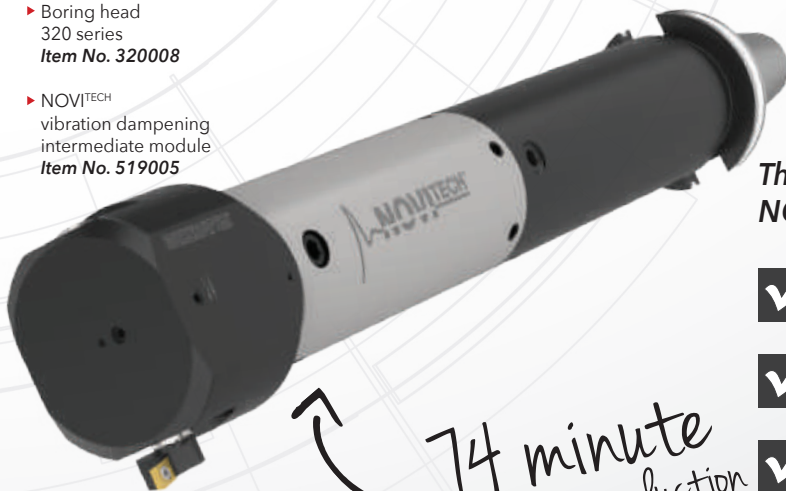
The Wohlhaupter solution reduced the process cycle time by 74 minutes. Improvements in speed and cycle time can free up machine hours, which means more throughput and higher profit for your company. **Are you losing money on applications with substantially long cycle times?**



		Measure	Competitor Boring Head	320 Boring Head w/ NOVI <sup>TECH</sup>
<b>Product:</b>	Wohlhaupter 320 Boring Head with NOVI <sup>TECH</sup>	RPM	39	469
<b>Objectives:</b>	(1) Decrease cycle time (2) Maintain 160 Ra hole finish	Speed Rate	56 SFM (17.069 M/min)	675 SFM (205.74 M/min)
<b>Industry:</b>	Oil & gas/petrochemical	Feed Rate	0.012 IPR (0.305 mm/rev)	0.008 IPR (0.203 mm/rev)
<b>Part:</b>	Pump	Penetration Rate	0.47 IPM (11.938 mm/min)	3.75 IPM (95.25 mm/min)
<b>Material:</b>	Grey cast iron	Cycle Time (per hole)	27 min 54 sec	3 min 32 sec
<b>Hole Ø:</b>	5.500" (139.7 mm)	Hole Finish	160 Ra µin. (4 Ra µm)	155 Ra µin. (3.8 Ra µm)
<b>Hole Depth:</b>	12.000" (304.8 mm)			

▶ Boring head  
320 series  
Item No. 320008

▶ NOVI<sup>TECH</sup>  
vibration dampening  
intermediate module  
Item No. 519005

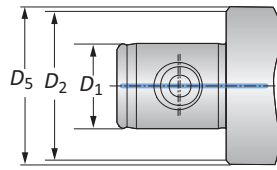


The Wohlhaupter 320 boring head with the NOVI<sup>TECH</sup> vibration dampening module provided:

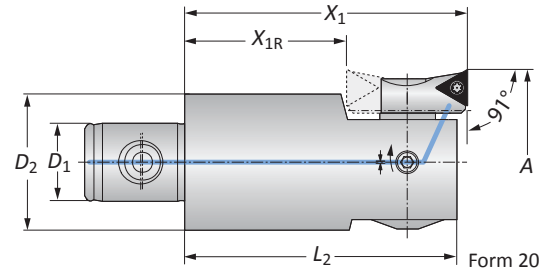
- ✓ Increased penetration rate
- ✓ Decreased cycle time
- ✓ Excellent finish in deep hole application

## Boring Heads

Diameter Range: 0.787" - 4.055" (20.00 mm - 103.00 mm)



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Form 20

### 320 Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
19 - 11	0.787 - 0.965	1.810	-	1.693	-	0.221 (lbs)	20*	364077	320010
22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	20	210059	320020
22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	101	210069	320020
25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	20	210059	320001
25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	101	210069	320001
25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	20	210052	320001
25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	101	210062	320001
32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	20	210052	320003
32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	101	210062	320003
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	20	210020	320004
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	101	210063	320004
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	103	210064	320004
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	20	210020	320005
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	101	210063	320005
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	103	210064	320005
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	20	210020	320006
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	101	210063	320006
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	103	210064	320006

\*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm)

NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

### 310 Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
19 - 11	20.00 - 24.50	46.00	-	43.00	-	0.10 (kg)	20*	364077	310010
22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	20	210059	310020
22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	101	210069	310020
25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	20	210059	310001
25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	101	210069	310001
25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	20	210052	310001
25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	101	210062	310001
32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	20	210052	310003
32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	101	210062	310003
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	20	210020	310004
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	101	210063	310004
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	103	210064	310004
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	20	210020	310005
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	101	210063	310005
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	103	210064	310005
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	20	210020	310006
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	101	210063	310006
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	103	210064	310006

\*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm)

NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

**i** = Imperial (in)

**m** = Metric (mm)

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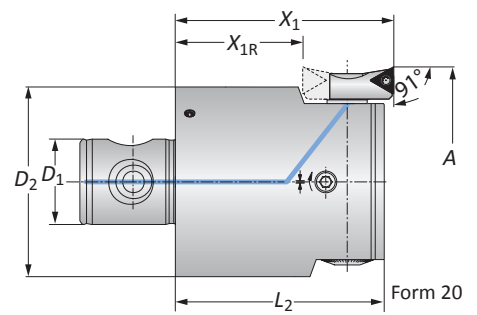
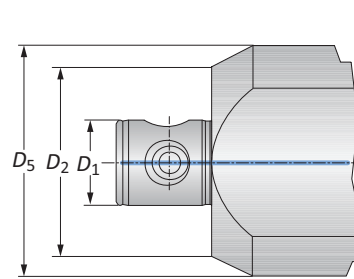
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## Boring Heads

Alu-Line | Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



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Form 20

### Alu-Line 320 Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
			$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
i	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	20	210020	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	101	210063	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	103	210064	320007
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	20	210020	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	101	210063	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	103	210064	320008
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	20	210020	320009
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	101	210063	320009
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	103	210064	320009

NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

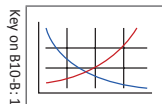
### Alu-Line 310 Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
			$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
m	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	20	210020	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	101	210063	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	103	210064	310007
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	20	210020	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	101	210063	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	103	210064	310008
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	20	210020	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	101	210063	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	103	210064	310009

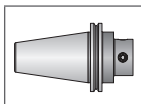
NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

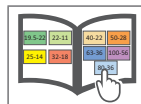
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B10-F



B10: vi-vii



i = Imperial (in)

m = Metric (mm)

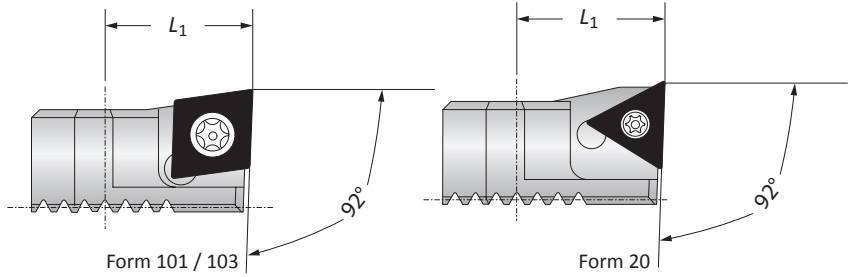
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## Insert Holders for Abrasive Materials | Serrated Shims

Diameter Range: 2.087" - 8.071" (53.00 mm - 205.00 mm)

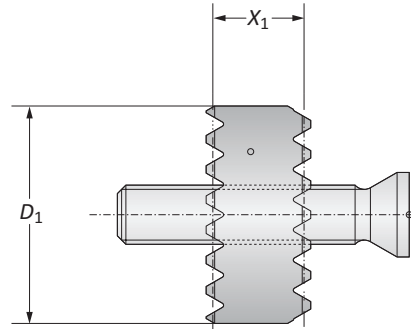


### Insert Holders

Boring Range		Insert Holder	Weight	Insert Form	Part No.
		$L_1$			
i	2.087 - 8.071	0.709	0.066 (lbs)	20	211061
	2.087 - 8.071	0.709	0.066 (lbs)	101	211063
	2.087 - 8.071	0.709	0.066 (lbs)	103	211065
m	53.00 - 205.00	18.00	0.03 (kg)	20	211061
	53.00 - 205.00	18.00	0.03 (kg)	101	211063
	53.00 - 205.00	18.00	0.03 (kg)	103	211065

**NOTE:** Insert holders used for abrasive materials to protect boring head against chip wash

**NOTE:** When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.



### Serrated Shims

	Boring Range	Additional Boring Range	Serrated Shim		Weight	Part No.	
			$X_1$	$D_1$		Serrated Shim & Screw	Replacement Screw
i	1.141 - 2.126	0.315	0.157	0.472	0.022 (lbs)	310070	415360
	1.141 - 2.126	0.472	0.236	0.472	0.022 (lbs)	310071	415342
	2.087 - 8.071	0.394	0.196	0.708	0.022 (lbs)	310074	515595
	2.087 - 8.071	0.590	0.295	0.708	0.022 (lbs)	310075	515596
m	29.00 - 54.00	8.00	4.00	12.00	0.01 (kg)	310070	415360
	29.00 - 54.00	12.00	6.00	12.00	0.01 (kg)	310071	415342
	53.00 - 205.00	10.00	5.00	18.00	0.01 (kg)	310074	515595
	53.00 - 205.00	15.00	7.50	18.00	0.01 (kg)	310075	515596

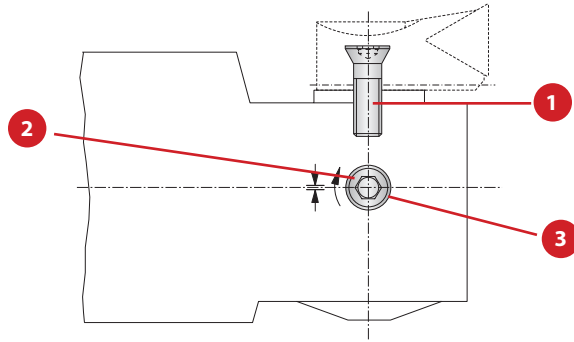
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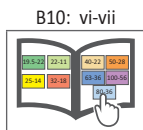
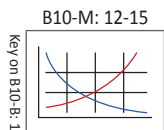
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

## Accessories

### Screws



Boring Head	1 Countersunk Screw		2 Clamping Screw		3 Ball
	Part No.	Service Key	Part No.	Service Key	Part No.
320010 (310010)	215323	T15 / H	364260	s2.0 / A	364270
320020 (310020)	215338	T15 / H	364138	s2.5 / A	364139
320001 (310001)	215338	T15 / H	115136	s2.5 / A	-
320003 (310003)	215338	T15 / H	115180	s2.5 / A	-
320004 (310004)	215462	T20 / H	115249	s4 / B	-
320005 (310005)	215462	T20 / H	115185	s4 / B	-
320006 (310006)	215462	T20 / H	315279	s4 / B	-
320007 (310007)	215462	T20 / H	115186	s4 / B	-
320008 (310008)	215462	T20 / H	115186	s4 / B	-
320009 (310009)	215462	T20 / H	115186	s4 / B	-



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