

# PowerLine

Made by **GUHRING**

**PERFECT HSS / HSCo TOOLS**



**++High quality ++Attractive prices**

# **Power***Line*

## **HIGH-QUALITY TOOLS AT ATTRACTIVE PRICES**

Discover our high-quality tool range  
for the following applications:

**DRILLING**

**TAPPING**

**MILLING**

**REAMING**

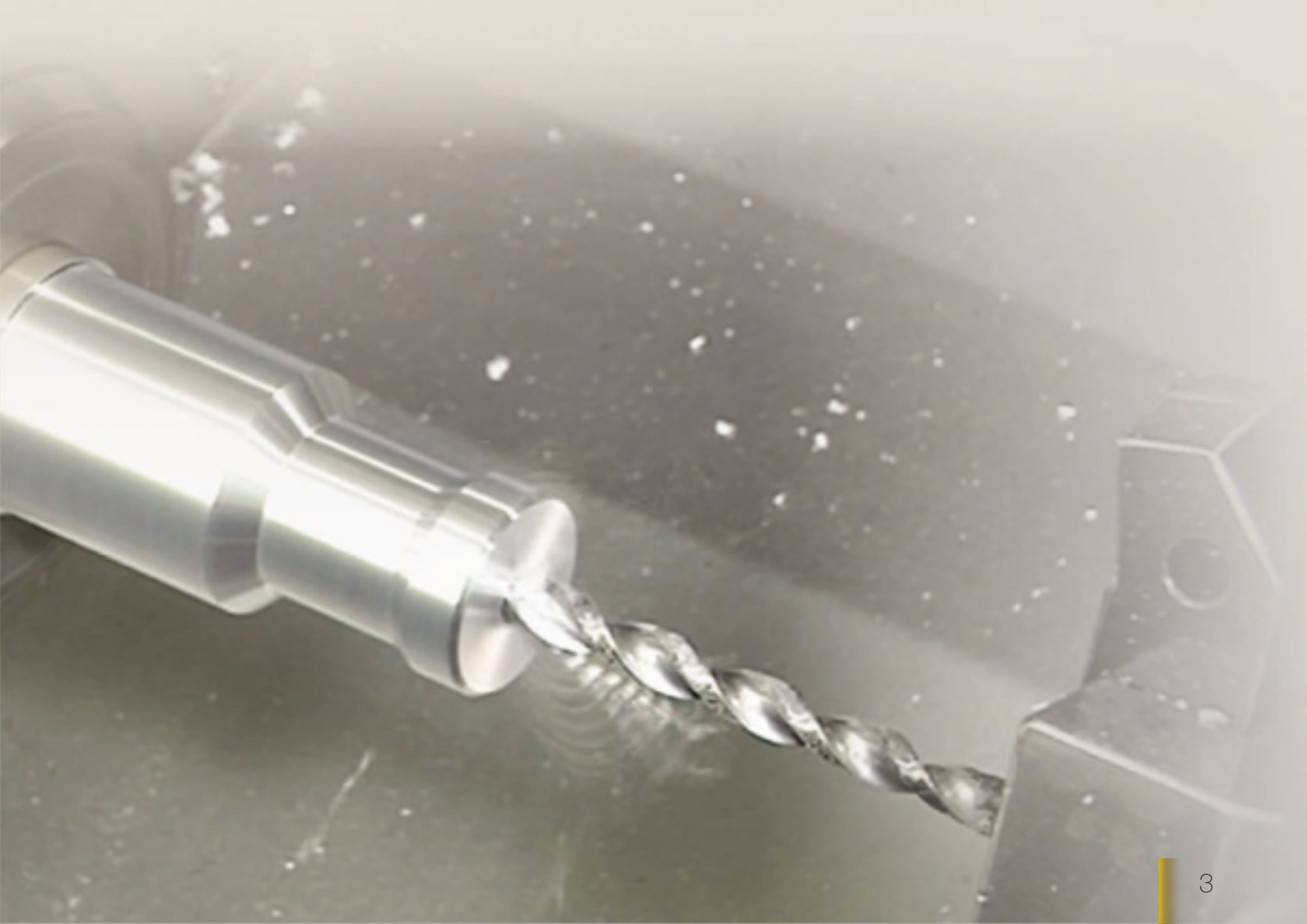
**COUNTERSINKING**



# **PowerLine**

## **YOUR BENEFITS:**

- **High quality**
- **Attractive prices**
- **Customer friendly service**
- **Made in EU**
- **World-wide uniform technical standards**



# PowerLine

## CLOSE TO THE CUSTOMER – WORLD-WIDE

In order for you to benefit from the advantages of our tooling solutions all over the world, Guhring is represented internationally with own production plants, service centers, sales companies and countless sales and marketing partners. World-wide uniform technical standards ensure that you can always and everywhere rely on the same high Guhring quality.



- 61** Production plants and service centers
- 46** Sales companies
- 25** Sales and marketing partners

## Twist drills

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Twist drills

## Threading tools

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Milling cutters

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Reamers

## Countersinks

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Countersinks

**TWIST DRILLS**

Standard	Type	Tool illustration	Cutting direction	Tool material	Surface	Diameter range	PowerLine no.	Discount group	Page
<b>Stub drills</b>									
DIN 1897	N		right-hand	HSS		2.00 -13.00	8900	101	10
DIN 1897	G 500		right-hand	HSCO		2.00 -13.00	8904	101	12
<b>Jobber drills</b>									
DIN 338	N		right-hand	HSS		1.00 -13.00	8902	101	13
DIN 338	N		right-hand	HSS	 head coated	2.00 -13.00	8906	101	17
DIN 338	GT 100		right-hand	HSS		1.00 -13.00	8916	101	18
in-house std.	N		right-hand	HSS		13.00 -25.00	8908	101	20
<b>Jobber drills sets</b>									
DIN 338	N		right-hand	HSS		1.00 -13.00	8901	101	19
Set consists of: jobber drills, PowerLine no. 8902									
<b>Long series twist drills</b>									
DIN 340	GT 100		right-hand	HSS		1.00 -13.00	8918	101	21
<b>Extra length twist drills</b>									
DIN 1869 R1	GT 100		right-hand	HSS		2.00 -13.00	8920	101	24
DIN 1869 R3	GT 100		right-hand	HSS		2.50 -13.00	8922	101	25
<b>Twist drills</b>									
DIN 345	N		right-hand	HSS		9.00 -40.00	8924	101	26
<b>90° NC-spotting drills</b>									
in-house std.	N		right-hand	HSS		6.00 -16.00	8914	101	28
<b>Center drills without flat</b>									
DIN 333	A		right-hand	HSS		0.50 -12.50	8912	101	29
<b>Straight shank drills double-ended</b>									
in-house std.	DK 77		right-hand	HSS		2.00 -10.00	8910	101	30
<b>Spot weld drills</b>									
in-house std.			right-hand	HSCO		6.00 -8.00	8926	101	31

 bright	 steam tempered	 bright/steam tempered	 bright/nitrided lands	 TIN
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## THREADING TOOLS

Standard	Type	Tool illustration	Cutting direction	Tool material	Surface	Diameter range	PowerLine no.	Discount group	Page
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### Taps for ISO metric threads

DIN 2184-1 / DIN 371	N R40		right-hand	HSS-E		3.00 -10.00	8950	203	36
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### Tap set with core drills and countersinks

in-house std.	N R40		Set consists of: - taps, PowerLine no. 8950 - twist drills, PowerLine no. 8906 - 90° countersinks, PowerLine no. 8940	HSS-E		M3 - M10 Ø 2.5 - 8.5 Ø 6.3 / 12.4	8903	112	37
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## MILLING CUTTERS

Standard	Type	Tool illustration	Cutting direction	Tool material	Surface	Diameter range	PowerLine no.	Discount group	Page
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### Slot drills (2-fluted)

DIN 327	N			M42		1.00 -25.00	8970	112	40
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### Slot drills (3-fluted)

DIN 327	N			M42		20.00 -30.00	8972	112	41
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## REAMERS

Standard	Form	Tool illustration	Cutting direction	Tool material	Surface	Diameter range	PowerLine no.	Discount group	Page
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### Machine reamers

DIN 208	B		right-hand	HSS-E		4.00 -40.00	8980	105	44
DIN 208	A		right-hand	HSS-E		6.00 -40.00	8982	105	45
DIN 212	B		right-hand	HSS-E		1.00 -3.00	8984	105	46
DIN 212-2	B		right-hand	HSS-E		4.00 -20.00	8986	105	47
DIN 212	A		right-hand	HSS-E		1.50 -3.00	8988	105	48
DIN 212-2	A		right-hand	HSS-E		4.00 -20.00	8990	105	49

## COUNTERSINKS

Standard	Form	Tool illustration	Cutting direction	Tool material	Surface	Diameter range	PowerLine no.	Discount group	Page
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### 90° countersinks

DIN 335	C			HSS		5.00 -31.00	8940	105	54
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### Counterbores with fixed pilots for fine tolerances

DIN 373				HSS		4.30 -20.00	8942	105	55
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 bright     steam tempered

# **Power***Line*

**SPECIAL DESIGN  
HIGH SPEED STEEL DRILLS  
FOR SPECIAL  
MACHINING TASKS**



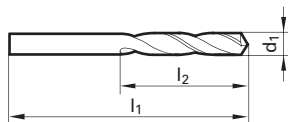


# TWIST DRILLS




<b>PowerLine no.</b>	<b>8900</b>
<b>Standard</b>	<b>DIN 1897</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>N</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>

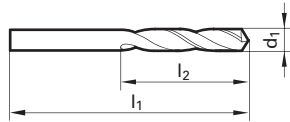
**Ø range:** 2.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 118°  
**Web thinned ≥Ø:** 2.00 mm



d1	l1	l2	Availability
mm	mm	mm	
2.000	38.000	12.000	●
2.100	38.000	12.000	●
2.200	40.000	13.000	●
2.300	40.000	13.000	●
2.400	43.000	14.000	●
2.500	43.000	14.000	●
2.600	43.000	14.000	●
2.700	46.000	16.000	●
2.800	46.000	16.000	●
2.900	46.000	16.000	●
3.000	46.000	16.000	●
3.100	49.000	18.000	●
3.200	49.000	18.000	●
3.300	49.000	18.000	●
3.400	52.000	20.000	●
3.500	52.000	20.000	●
3.600	52.000	20.000	●
3.700	52.000	20.000	●
3.800	55.000	22.000	●
3.900	55.000	22.000	●
4.000	55.000	22.000	●
4.100	55.000	22.000	●
4.200	55.000	22.000	●
4.300	58.000	24.000	●
4.400	58.000	24.000	●
4.500	58.000	24.000	●
4.600	58.000	24.000	●
4.700	58.000	24.000	●
4.800	62.000	26.000	●
4.900	62.000	26.000	●
5.000	62.000	26.000	●
5.100	62.000	26.000	●
5.200	62.000	26.000	●
5.300	62.000	26.000	●
5.400	66.000	28.000	●
5.500	66.000	28.000	●
5.600	66.000	28.000	●
5.700	66.000	28.000	●
5.800	66.000	28.000	●

bright/steam tempered

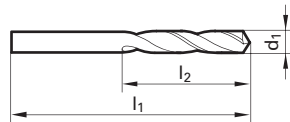
<b>PowerLine no.</b>	<b>8900</b>
<b>Standard</b>	<b>DIN 1897</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>N</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>




d1	l1	l2	Availability
mm	mm	mm	
5.900	66.000	28.000	●
6.000	66.000	28.000	●
6.100	70.000	31.000	●
6.200	70.000	31.000	●
6.300	70.000	31.000	●
6.400	70.000	31.000	●
6.500	70.000	31.000	●
6.600	70.000	31.000	●
6.700	70.000	31.000	●
6.800	74.000	34.000	●
6.900	74.000	34.000	●
7.000	74.000	34.000	●
7.100	74.000	34.000	●
7.200	74.000	34.000	●
7.300	74.000	34.000	●
7.400	74.000	34.000	●
7.500	74.000	34.000	●
7.600	79.000	37.000	●
7.700	79.000	37.000	●
7.800	79.000	37.000	●
7.900	79.000	37.000	●
8.000	79.000	37.000	●
8.500	79.000	37.000	●
9.000	84.000	40.000	●
9.500	84.000	40.000	●
10.000	89.000	43.000	●
10.200	89.000	43.000	●
10.500	89.000	43.000	●
11.000	95.000	47.000	●
11.500	95.000	47.000	●
12.000	102.000	51.000	●
12.500	102.000	51.000	●
13.000	102.000	51.000	●

<b>PowerLine no.</b>	8904
<b>Standard</b>	DIN 1897
<b>Tool material</b>	HSCO
<b>Surface finish</b>	
<b>Type</b>	G 500
<b>Cutting direction</b>	right-hand
<b>Tolerance</b>	h8
<b>Discount group</b>	101

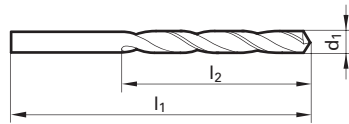
**Ø range:** 2.000 - 13.000  
**Point geometry:** Facet point grind  
**Point angle:** 118°  
**Web thinned ≥Ø:** 2.00 mm




d1	l1	l2	Availability
mm	mm	mm	
2.000	38.000	12.000	●
2.500	43.000	14.000	●
3.000	46.000	16.000	●
3.200	49.000	18.000	●
3.300	49.000	18.000	●
3.500	52.000	20.000	●
4.000	55.000	22.000	●
4.200	55.000	22.000	●
4.500	58.000	24.000	●
5.000	62.000	26.000	●
5.100	62.000	26.000	●
5.200	62.000	26.000	●
5.500	66.000	28.000	●
6.000	66.000	28.000	●
6.500	70.000	31.000	●
6.800	74.000	34.000	●
7.000	74.000	34.000	●
7.500	74.000	34.000	●
8.000	79.000	37.000	●
8.500	79.000	37.000	●
9.000	84.000	40.000	●
9.500	84.000	40.000	●
10.000	89.000	43.000	●
10.200	89.000	43.000	●
10.500	89.000	43.000	●
11.000	95.000	47.000	●
11.500	95.000	47.000	●
12.000	102.000	51.000	●
12.500	102.000	51.000	●
13.000	102.000	51.000	●

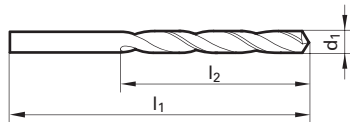
<b>PowerLine no.</b>	<b>8902</b>
<b>Standard</b>	<b>DIN 338</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>N</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>

**Ø range:** 1.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 118°  
**Web thinned ≥Ø:** 1.00 mm



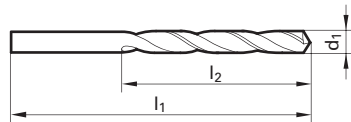
d1	l1	l2	Availability
mm	mm	mm	
1.000	34.000	12.000	●
1.100	36.000	14.000	●
1.200	38.000	16.000	●
1.300	38.000	16.000	●
1.400	40.000	18.000	●
1.500	40.000	18.000	●
1.600	43.000	20.000	●
1.700	43.000	20.000	●
1.800	46.000	22.000	●
1.900	46.000	22.000	●
2.000	49.000	24.000	●
2.100	49.000	24.000	●
2.200	53.000	27.000	●
2.300	53.000	27.000	●
2.400	57.000	30.000	●
2.500	57.000	30.000	●
2.600	57.000	30.000	●
2.700	61.000	33.000	●
2.800	61.000	33.000	●
2.900	61.000	33.000	●
3.000	61.000	33.000	●
3.100	65.000	36.000	●
3.200	65.000	36.000	●
3.300	65.000	36.000	●
3.400	70.000	39.000	●
3.500	70.000	39.000	●
3.600	70.000	39.000	●
3.700	70.000	39.000	●
3.800	75.000	43.000	●
3.900	75.000	43.000	●
4.000	75.000	43.000	●
4.100	75.000	43.000	●
4.200	75.000	43.000	●
4.300	80.000	47.000	●
4.400	80.000	47.000	●
4.500	80.000	47.000	●
4.600	80.000	47.000	●
4.700	80.000	47.000	●
4.800	86.000	52.000	●

<b>PowerLine no.</b>	8902
<b>Standard</b>	DIN 338
<b>Tool material</b>	HSS
<b>Surface finish</b>	
<b>Type</b>	N
<b>Cutting direction</b>	right-hand
<b>Tolerance</b>	h8
<b>Discount group</b>	101



d1	l1	l2	Availability
mm	mm	mm	
4.900	86.000	52.000	●
5.000	86.000	52.000	●
5.100	86.000	52.000	●
5.200	86.000	52.000	●
5.300	86.000	52.000	●
5.400	93.000	57.000	●
5.500	93.000	57.000	●
5.600	93.000	57.000	●
5.700	93.000	57.000	●
5.800	93.000	57.000	●
5.900	93.000	57.000	●
6.000	93.000	57.000	●
6.100	101.000	63.000	●
6.200	101.000	63.000	●
6.300	101.000	63.000	●
6.400	101.000	63.000	●
6.500	101.000	63.000	●
6.600	101.000	63.000	●
6.700	101.000	63.000	●
6.800	109.000	69.000	●
6.900	109.000	69.000	●
7.000	109.000	69.000	●
7.100	109.000	69.000	●
7.200	109.000	69.000	●
7.300	109.000	69.000	●
7.400	109.000	69.000	●
7.500	109.000	69.000	●
7.600	117.000	75.000	●
7.700	117.000	75.000	●
7.800	117.000	75.000	●
7.900	117.000	75.000	●
8.000	117.000	75.000	●
8.100	117.000	75.000	●
8.200	117.000	75.000	●
8.300	117.000	75.000	●
8.400	117.000	75.000	●
8.500	117.000	75.000	●
8.600	125.000	81.000	●
8.700	125.000	81.000	●

<b>PowerLine no.</b>	<b>8902</b>
<b>Standard</b>	<b>DIN 338</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>N</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>



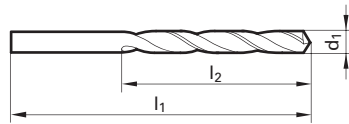
d1	l1	l2	Availability
mm	mm	mm	
8.800	125.000	81.000	●
8.900	125.000	81.000	●
9.000	125.000	81.000	●
9.100	125.000	81.000	●
9.200	125.000	81.000	●
9.300	125.000	81.000	●
9.400	125.000	81.000	●
9.500	125.000	81.000	●
9.600	133.000	87.000	●
9.700	133.000	87.000	●
9.800	133.000	87.000	●
9.900	133.000	87.000	●
10.000	133.000	87.000	●
10.100	133.000	87.000	●
10.200	133.000	87.000	●
10.300	133.000	87.000	●
10.400	133.000	87.000	●
10.500	133.000	87.000	●
10.600	133.000	87.000	●
10.700	142.000	94.000	●
10.800	142.000	94.000	●
10.900	142.000	94.000	●
11.000	142.000	94.000	●
11.100	142.000	94.000	●
11.200	142.000	94.000	●
11.300	142.000	94.000	●
11.400	142.000	94.000	●
11.500	142.000	94.000	●
11.600	142.000	94.000	●
11.700	142.000	94.000	●
11.800	142.000	94.000	●
11.900	151.000	101.000	●
12.000	151.000	101.000	●
12.100	151.000	101.000	●
12.200	151.000	101.000	●
12.300	151.000	101.000	●
12.400	151.000	101.000	●
12.500	151.000	101.000	●
12.600	151.000	101.000	●






<b>PowerLine no.</b>	8906
<b>Standard</b>	DIN 338
<b>Tool material</b>	HSS
<b>Surface finish</b>	(S)
<b>Type</b>	N
<b>Cutting direction</b>	right-hand
<b>Tolerance</b>	h8
<b>Discount group</b>	101

**Ø range:** 2.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 118°  
**Web thinned ≥Ø:** 2.00 mm

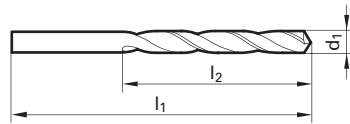


d1	l1	l2	Availability
mm	mm	mm	
2.000	49.000	24.000	●
2.500	57.000	30.000	●
3.000	61.000	33.000	●
3.300	65.000	36.000	●
3.500	70.000	39.000	●
4.000	75.000	43.000	●
4.200	75.000	43.000	●
4.500	80.000	47.000	●
4.900	86.000	52.000	●
5.000	86.000	52.000	●
5.300	86.000	52.000	●
5.500	93.000	57.000	●
5.600	93.000	57.000	●
6.000	93.000	57.000	●
6.500	101.000	63.000	●
6.800	109.000	69.000	●
7.000	109.000	69.000	●
7.500	109.000	69.000	●
8.000	117.000	75.000	●
8.500	117.000	75.000	●
9.000	125.000	81.000	●
9.500	125.000	81.000	●
10.000	133.000	87.000	●
10.200	133.000	87.000	●
10.500	133.000	87.000	●
11.000	142.000	94.000	●
11.500	142.000	94.000	●
12.000	151.000	101.000	●
12.500	151.000	101.000	●
13.000	151.000	101.000	●

(S) TiN head coated

<b>PowerLine no.</b>	<b>8916</b>
<b>Standard</b>	<b>DIN 338</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>GT 100</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>


**Ø range:** 1.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 130°  
**Web thinned ≥Ø:** 1.00 mm



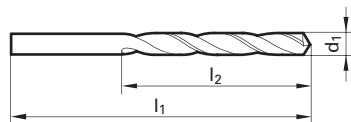
d1	l1	l2	Availability
mm	mm	mm	
1.000	34.000	12.000	●
1.500	40.000	18.000	●
2.000	49.000	24.000	●
2.500	57.000	30.000	●
3.000	61.000	33.000	●
3.300	65.000	36.000	●
3.500	70.000	39.000	●
4.000	75.000	43.000	●
4.200	75.000	43.000	●
4.500	80.000	47.000	●
5.000	86.000	52.000	●
5.500	93.000	57.000	●
6.000	93.000	57.000	●
6.500	101.000	63.000	●
6.800	109.000	69.000	●
7.000	109.000	69.000	●
7.500	109.000	69.000	●
8.000	117.000	75.000	●
8.500	117.000	75.000	●
9.000	125.000	81.000	●
9.500	125.000	81.000	●
10.000	133.000	87.000	●
10.200	133.000	87.000	●
10.500	133.000	87.000	●
11.000	142.000	94.000	●
11.500	142.000	94.000	●
12.000	151.000	101.000	●
12.500	151.000	101.000	●
13.000	151.000	101.000	●






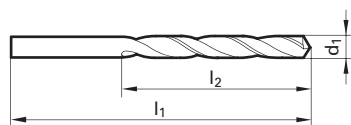
<b>PowerLine no.</b>	8918
<b>Standard</b>	DIN 340
<b>Tool material</b>	HSS
<b>Surface finish</b>	
<b>Type</b>	GT 100
<b>Cutting direction</b>	right-hand
<b>Tolerance</b>	h8
<b>Discount group</b>	101

**Ø range:** 1.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 130°  
**Web thinned ≥Ø:** 1.00 mm




d1	l1	l2	Availability
mm	mm	mm	
1.000	56.000	33.000	●
1.100	60.000	37.000	●
1.200	65.000	41.000	●
1.300	65.000	41.000	●
1.400	70.000	45.000	●
1.500	70.000	45.000	●
1.600	76.000	50.000	●
1.700	76.000	50.000	●
1.800	80.000	53.000	●
1.900	80.000	53.000	●
2.000	85.000	56.000	●
2.100	85.000	56.000	●
2.200	90.000	59.000	●
2.300	90.000	59.000	●
2.400	95.000	62.000	●
2.500	95.000	62.000	●
2.600	95.000	62.000	●
2.700	100.000	66.000	●
2.800	100.000	66.000	●
2.900	100.000	66.000	●
3.000	100.000	66.000	●
3.100	106.000	69.000	●
3.200	106.000	69.000	●
3.300	106.000	69.000	●
3.400	112.000	73.000	●
3.500	112.000	73.000	●
3.600	112.000	73.000	●
3.700	112.000	73.000	●
3.800	119.000	78.000	●
3.900	119.000	78.000	●
4.000	119.000	78.000	●
4.100	119.000	78.000	●
4.200	119.000	78.000	●
4.300	126.000	82.000	●
4.400	126.000	82.000	●
4.500	126.000	82.000	●
4.600	126.000	82.000	●
4.700	126.000	82.000	●
4.800	132.000	87.000	●

<b>PowerLine no.</b>	<b>8918</b>
<b>Standard</b>	<b>DIN 340</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>GT 100</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>

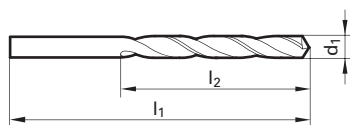


d1	l1	l2	Availability
mm	mm	mm	
4.900	132.000	87.000	●
5.000	132.000	87.000	●
5.100	132.000	87.000	●
5.200	132.000	87.000	●
5.300	132.000	87.000	●
5.400	139.000	91.000	●
5.500	139.000	91.000	●
5.600	139.000	91.000	●
5.700	139.000	91.000	●
5.800	139.000	91.000	●
5.900	139.000	91.000	●
6.000	139.000	91.000	●
6.100	148.000	97.000	●
6.200	148.000	97.000	●
6.300	148.000	97.000	●
6.400	148.000	97.000	●
6.500	148.000	97.000	●
6.600	148.000	97.000	●
6.700	148.000	97.000	●
6.800	156.000	102.000	●
6.900	156.000	102.000	●
7.000	156.000	102.000	●
7.100	156.000	102.000	●
7.200	156.000	102.000	●
7.300	156.000	102.000	●
7.400	156.000	102.000	●
7.500	156.000	102.000	●
7.600	165.000	109.000	●
7.700	165.000	109.000	●
7.800	165.000	109.000	●
7.900	165.000	109.000	●
8.000	165.000	109.000	●
8.100	165.000	109.000	●
8.200	165.000	109.000	●
8.300	165.000	109.000	●
8.400	165.000	109.000	●
8.500	165.000	109.000	●
8.600	175.000	115.000	●
8.700	175.000	115.000	●



<b>PowerLine no.</b>	<b>8920</b>
<b>Standard</b>	<b>DIN 1869 R1</b>
<b>Tool material</b>	<b>HSS</b>
<b>Surface finish</b>	
<b>Type</b>	<b>GT 100</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>h8</b>
<b>Discount group</b>	<b>101</b>


**Ø range:** 2.000 - 13.000  
**Point geometry:** Relieved cone  
**Point angle:** 130°  
**Web thinned ≥Ø:** 2.00 mm



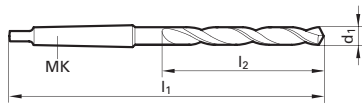
d1	l1	l2	Availability
mm	mm	mm	
2.000	125.000	85.000	●
2.100	125.000	85.000	●
2.200	135.000	90.000	●
2.300	135.000	90.000	●
2.400	140.000	95.000	●
2.500	140.000	95.000	●
2.600	140.000	95.000	●
2.700	150.000	100.000	●
2.800	150.000	100.000	●
3.000	150.000	100.000	●
3.200	155.000	105.000	●
3.300	155.000	105.000	●
3.500	165.000	115.000	●
4.000	175.000	120.000	●
4.200	175.000	120.000	●
4.500	185.000	125.000	●
5.000	195.000	135.000	●
5.200	195.000	135.000	●
5.500	205.000	140.000	●
6.000	205.000	140.000	●
6.500	215.000	150.000	●
6.800	225.000	155.000	●
7.000	225.000	155.000	●
7.500	225.000	155.000	●
8.000	240.000	165.000	●
8.500	240.000	165.000	●
9.000	250.000	175.000	●
9.500	250.000	175.000	●
10.000	265.000	185.000	●
10.200	265.000	185.000	●
10.500	265.000	185.000	●
11.000	280.000	195.000	●
11.500	280.000	195.000	●
12.000	295.000	205.000	●
12.500	295.000	205.000	●
13.000	295.000	205.000	●






PowerLine no.	8924
Standard	DIN 345
Tool material	HSS
Surface finish	
Type	N
Cutting direction	right-hand
Tolerance	h8
Discount group	101

**Ø range:** 9.000 - 40.000  
**Point geometry:** Relieved cone  
**Point angle:** 118°  
**Web thinned ≥Ø:** 14.01 mm



d1	MK	l1	l2	Availability
mm		mm	mm	
9.000	1	162.000	81.000	●
9.500	1	162.000	81.000	●
10.000	1	168.000	87.000	●
10.200	1	168.000	87.000	●
10.500	1	168.000	87.000	●
11.000	1	175.000	94.000	●
11.500	1	175.000	94.000	●
12.000	1	182.000	101.000	●
12.500	1	182.000	101.000	●
13.000	1	182.000	101.000	●
13.500	1	189.000	108.000	●
14.000	1	189.000	108.000	●
14.500	2	212.000	114.000	●
15.000	2	212.000	114.000	●
15.500	2	218.000	120.000	●
16.000	2	218.000	120.000	●
16.500	2	223.000	125.000	●
17.000	2	223.000	125.000	●
17.500	2	228.000	130.000	●
18.000	2	228.000	130.000	●
18.500	2	233.000	135.000	●
19.000	2	233.000	135.000	●
19.500	2	238.000	140.000	●
20.000	2	238.000	140.000	●
20.500	2	243.000	145.000	●
21.000	2	243.000	145.000	●
21.500	2	248.000	150.000	●
22.000	2	248.000	150.000	●
22.500	2	253.000	155.000	●
23.000	2	253.000	155.000	●
23.500	3	276.000	155.000	●
24.000	3	281.000	160.000	●
24.500	3	281.000	160.000	●
25.000	3	281.000	160.000	●
25.500	3	286.000	165.000	●
26.000	3	286.000	165.000	●
26.500	3	286.000	165.000	●
27.000	3	291.000	170.000	●
27.500	3	291.000	170.000	●

 steam tempered











# PowerLineNavigator Twist drills

Tools with bold feed column no. are preferred choice.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the PowerLineNavigator on the internet: [www.guehring.de](http://www.guehring.de).

**PowerLine no.**  
**Standard/DIN**  
**Tool material**  
**Surface finish**  
**Type**  
**Std. range page**

PowerLineNavigator  
 Twist drills

Drill-Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0,50</b>	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
<b>1,00</b>	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
<b>2,00</b>	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
<b>2,50</b>	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
<b>3,15</b>	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
<b>4,00</b>	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
<b>5,00</b>	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
<b>6,30</b>	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
<b>8,00</b>	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
<b>10,00</b>	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
<b>12,50</b>	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
<b>16,00</b>	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
<b>20,00</b>	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
<b>25,00</b>	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
<b>31,50</b>	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
<b>40,00</b>	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
<b>50,00</b>	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
<b>63,00</b>	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
<b>80,00</b>	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Coolant:  
 ○ Air  
 ● Neat oil  
 ● Soluble oil

Material group	Material examples, new description (old description in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm <sup>2</sup> )	Hardness	Coolant
Common structural steels	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		●
Free-cutting steels	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		●
Unalloyed heat-treatable steels	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		●
Alloyed heat-treatable steels	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		●
Unalloyed case hardened steels	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		●
Alloyed case hardened steels	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		●
Nitriding steels	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		●
Tool steels	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		●
High speed steels	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
Spring steels	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
Stainless steels, sulphured	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
austenitic	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
Hardened steels	-		≤48 HRC ≤66 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Cast iron	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	●
Spheroidal graphite iron and malleable cast iron	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	●
Chilled cast iron	-		≤350 HB	●
Ti and Ti-alloys	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminium and Al-alloys	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		●
Al wrought alloys	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		●
Al cast alloys ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		●
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
Magnesium alloys	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
Copper, low-alloyed	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn2Pb	≤500		●
Brass, short-chipping	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		●
long-chipping	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		●
Bronze, short-chipping	<b>2.1090</b> CuSn7Zn2Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		●
Bronze, long-chipping	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
New cast materials GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	●
New cast materials ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		●
Kevlar	GFK/CFK	≤1000		○
Glass, carbon concentrated plastics	GFK/CFK	≤1000		○

○ <sup>>0</sup>/<sub>2,36</sub> bright/steam tempered      ○ steam tempered      ○ <sup>>0</sup>/<sub>2,36</sub> bright/ nitrided lands      ● nitrided lands





# **Power***Line*

**PERFECT THREADS,  
HIGH CUTTING  
PERFORMANCE AND  
MAXIMUM PROCESS  
RELIABILITY**

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# THREADING TOOLS



Threading tools





# **Power***Line*

**MILLING CUTTERS  
WITH NEARLY INFINITE  
TOOL LIFE FOR  
STRONG PERFORMANCE  
AND QUALITY**



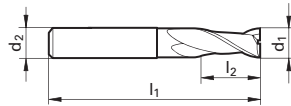
# MILLING CUTTERS



Milling cutters

<b>PowerLine no.</b>	<b>8970</b>
<b>Standard</b>	<b>DIN 327</b>
<b>Tool material</b>	<b>M42</b>
<b>Surface finish</b>	○
<b>Type</b>	<b>N</b>
<b>Shank form</b>	<b>B</b>
<b>Helix</b>	<b>30°</b>
<b>Tolerance</b>	<b>e8/h10</b>
<b>Discount group</b>	<b>112</b>

Ø range: 1.000 - 25.000



Milling cutters

d1	d2	Tolerance	l1	l2	z	Availability
mm	mm		mm	mm		
1.000	6.000	h10	47.000	2.000	2	●
1.500	6.000	h10	47.000	3.000	2	●
2.000	6.000	e8	48.000	4.000	2	●
2.500	6.000	e8	49.000	5.000	2	●
3.000	6.000	e8	49.000	5.000	2	●
4.000	6.000	e8	51.000	7.000	2	●
5.000	6.000	e8	52.000	8.000	2	●
6.000	6.000	e8	52.000	8.000	2	●
6.500	10.000	h10	60.000	10.000	2	●
7.000	10.000	e8	60.000	10.000	2	●
8.000	10.000	e8	61.000	11.000	2	●
9.000	10.000	h10	61.000	11.000	2	●
10.000	10.000	e8	63.000	13.000	2	●
11.000	12.000	h10	70.000	13.000	2	●
12.000	12.000	e8	73.000	16.000	2	●
13.000	12.000	h10	73.000	16.000	2	●
14.000	12.000	e8	73.000	16.000	2	●
15.000	12.000	h10	73.000	16.000	2	●
16.000	16.000	e8	79.000	19.000	2	●
17.000	16.000	h10	79.000	19.000	2	●
18.000	16.000	e8	79.000	19.000	2	●
19.000	16.000	h10	79.000	19.000	2	●
20.000	20.000	e8	88.000	22.000	2	●
22.000	20.000	e8	88.000	22.000	2	●
25.000	25.000	e8	102.000	26.000	2	●

○ bright





fz-corrections:\*  
 ap = 2 x d; fz -30%  
 fz-corrections:\*\*  
 ap = 1-2 x d; fz +25%  
 fz-corrections\*\*\*  
 ap = 1-2 x d; fz +60%

Application	Feed width (ae)	Feed depth (ap)
<b>Slotting*</b>	1 x d	0.5 up to 1.0 x d
<b>Roughing*</b>	0.5 up to 0.9 x d	0.5 up to 1.0 x d
<b>Finishing</b>	0.05 up to 0.1 x d	1.0 up to 2.0 x d
<b>HPC-roughing**</b>	0.25 up to 0.5 x d	1.0 up to 2.0 x d
<b>HSC-roughing***</b>	0.1 up to 0.25 x d	1.0 up to 2.0 x d

Material	Hardness	usable type	Type of application	cut Vc	fz (mm/z)								
					3	6	8	10	12	16	20	25	
<b>Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels</b> 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	up to 850 N/mm <sup>2</sup>	2-fluted	Slotting	125	0.013	0.025	0.032	0.042	0.049	0.063	0.070	0.105	
		2- or 3-fluted	Roughing	140	0.014	0.028	0.039	0.049	0.060	0.070	0.084	0.119	
		4-fluted	Finishing	190	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
<b>Free-cutting steels, unalloyed case hardened steels, nitriding steels</b> 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm <sup>2</sup>	2-fluted	Slotting	110	0.013	0.025	0.032	0.042	0.049	0.063	0.070	0.105	
		2- or 3-fluted	Roughing	130	0.014	0.028	0.039	0.049	0.060	0.070	0.084	0.119	
		4-fluted	Finishing	150	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
<b>Alloyed heat-treatable, tool and high speed steels</b> 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm <sup>2</sup>	2-fluted	Slotting	95	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
		2- or 3-fluted	Roughing	115	0.014	0.028	0.035	0.046	0.056	0.067	0.077	0.112	
		4-fluted	Finishing	140	0.011	0.021	0.028	0.035	0.042	0.049	0.063	0.091	
<b>Hardened steel</b> Tool steel, heat-treatable steel, spring steel, high-speed steel, case hardened steel, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	up to 54 HRC	2-fluted	Slotting	50	0.007	0.015	0.018	0.024	0.027	0.036	0.042	0.060	
		2- or 3-fluted	Roughing	75	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
		4-fluted	Finishing	105	0.009	0.018	0.024	0.030	0.036	0.042	0.054	0.078	
	54-60 HRC	2-fluted	Slotting										
		2- or 3-fluted	Roughing										
		4-fluted	Finishing										
<b>Stainless steel</b> 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	up to 750 N/mm <sup>2</sup>	2-fluted	Slotting	85	0.009	0.018	0.024	0.030	0.036	0.042	0.054	0.078	
		2- or 3-fluted	Roughing	100	0.011	0.021	0.027	0.036	0.042	0.054	0.060	0.090	
		4-fluted	Finishing	125	0.010	0.018	0.024	0.033	0.039	0.048	0.057	0.084	
<b>Stainless steel</b> 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm <sup>2</sup>	2-fluted	Slotting	55	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
		2- or 3-fluted	Roughing	85	0.010	0.018	0.024	0.033	0.039	0.048	0.057	0.084	
		4-fluted	Finishing	100	0.009	0.018	0.024	0.030	0.036	0.042	0.054	0.078	
<b>Stainless steel</b> 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	above 850 N/mm <sup>2</sup>	2-fluted	Slotting	50	0.007	0.015	0.018	0.024	0.027	0.036	0.042	0.060	
		2- or 3-fluted	Roughing	70	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
		4-fluted	Finishing	85	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
<b>Special alloys (nickel based "Ni")</b> Nimonic, Inconel, Monel, Hastelloy	up to 1,300 N/mm <sup>2</sup>	2-fluted	Slotting	20	0.006	0.009	0.012	0.015	0.018	0.024	0.030	0.036	
		2- or 3-fluted	Roughing	25	0.006	0.012	0.018	0.021	0.024	0.033	0.039	0.048	
		4-fluted	Finishing	30	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
<b>Titanium alloys ("Ti")</b> 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	up to 1,300 N/mm <sup>2</sup>	2-fluted	Slotting	40	0.009	0.015	0.021	0.027	0.030	0.039	0.048	0.072	
		2- or 3-fluted	Roughing	60	0.010	0.018	0.024	0.033	0.039	0.048	0.057	0.084	
		4-fluted	Finishing	90	0.010	0.018	0.024	0.033	0.039	0.048	0.057	0.084	
<b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b> 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	2-fluted	Slotting	115	0.012	0.024	0.030	0.039	0.048	0.057	0.066	0.096	
		2- or 3-fluted	Roughing	125	0.012	0.024	0.033	0.042	0.051	0.060	0.072	0.102	
		4-fluted	Finishing	155	0.011	0.021	0.027	0.036	0.042	0.054	0.060	0.090	
<b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b> 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	above 240 HB 30	2-fluted	Slotting	100	0.010	0.018	0.024	0.033	0.039	0.048	0.057	0.084	
		2- or 3-fluted	Roughing	115	0.012	0.024	0.030	0.039	0.048	0.057	0.066	0.096	
		4-fluted	Finishing	140	0.011	0.021	0.027	0.036	0.042	0.054	0.060	0.090	
<b>Aluminium, Al-wrought alloys, Al-alloys</b> 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	up to 3% Si	2-fluted	Slotting	350	0.014	0.028	0.035	0.046	0.056	0.067	0.077	0.112	
		2- or 3-fluted	Roughing	420	0.014	0.028	0.039	0.049	0.060	0.070	0.084	0.119	
		4-fluted	Finishing	700	0.013	0.025	0.032	0.042	0.049	0.063	0.070	0.105	
<b>Aluminium-cast alloys</b> 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9 3.2581 G-AISI12, 3.2583 G-AISI2Cu, - G-AISI2CuNiMg	above 3% Si	2-fluted	Slotting	160	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
		2- or 3-fluted	Roughing	200	0.014	0.028	0.035	0.046	0.056	0.067	0.077	0.112	
		4-fluted	Finishing	245	0.013	0.025	0.032	0.042	0.049	0.063	0.070	0.105	
<b>Magnesium-alloys</b> MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	2-fluted	Slotting	125	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
		2- or 3-fluted	Roughing	150	0.014	0.028	0.035	0.046	0.056	0.067	0.077	0.112	
		4-fluted	Finishing	200	0.013	0.025	0.032	0.042	0.049	0.063	0.070	0.105	
<b>Non-ferrous metals (copper, short- or long-chipping brass or bronze)</b> 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	up to 850 N/mm <sup>2</sup>	2-fluted	Slotting	175	0.011	0.018	0.025	0.032	0.035	0.046	0.056	0.084	
		2- or 3-fluted	Roughing	210	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	
		4-fluted	Finishing	280	0.011	0.021	0.028	0.039	0.046	0.056	0.067	0.098	

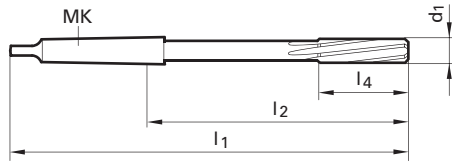
All recommendations are valid for coated tools. For bright milling cutters please vc - 40% and fz -25%!

# REAMERS



<b>PowerLine no.</b>	<b>8980</b>
<b>Standard</b>	<b>DIN 208</b>
<b>Tool material</b>	<b>HSS-E</b>
<b>Surface finish</b>	○
<b>Form</b>	<b>B</b>
<b>Cutting direction</b>	<b>right-hand</b>
<b>Tolerance</b>	<b>H7</b>
<b>Discount group</b>	<b>105</b>

Ø range: 4.000 - 40.000



d1	Morsetaper	l1	l2	l4	z	Availability
mm	MK	mm	mm	mm		
4.000	1	125.000	63.000	19.000	6	●
5.000	1	133.000	71.000	23.000	6	●
6.000	1	138.000	76.000	26.000	6	●
8.000	1	156.000	94.000	33.000	6	●
9.000	1	162.000	100.000	36.000	6	●
10.000	1	168.000	106.000	38.000	6	●
11.000	1	175.000	113.000	41.000	6	●
12.000	1	182.000	120.000	44.000	6	●
13.000	1	182.000	120.000	44.000	6	●
14.000	1	189.000	127.000	47.000	8	●
15.000	2	204.000	129.000	50.000	8	●
16.000	2	210.000	135.000	52.000	8	●
17.000	2	214.000	139.000	54.000	8	●
18.000	2	219.000	144.000	56.000	8	●
19.000	2	223.000	148.000	58.000	8	●
20.000	2	228.000	153.000	60.000	8	●
21.000	2	232.000	157.000	62.000	8	●
22.000	2	237.000	162.000	64.000	8	●
23.000	2	241.000	166.000	66.000	8	●
24.000	3	268.000	174.000	68.000	8	●
25.000	3	268.000	174.000	68.000	8	●
26.000	3	273.000	179.000	70.000	8	●
27.000	3	277.000	183.000	71.000	10	●
28.000	3	277.000	183.000	71.000	10	●
29.000	3	281.000	187.000	73.000	10	●
30.000	3	281.000	187.000	73.000	10	●
32.000	4	317.000	199.500	77.000	10	●
33.000	4	317.000	199.500	77.000	10	●
34.000	4	321.000	203.500	78.000	10	●
35.000	4	321.000	203.500	78.000	10	●
36.000	4	325.000	207.500	79.000	10	●
38.000	4	329.000	211.500	81.000	10	●
40.000	4	329.000	211.500	81.000	10	●

○ bright

Reamers













# PowerLineNavigator Reamers

Tools with bold feed column no. are preferred choice.

For blind holes with close diameter tolerances choose straight-fluted reamers.

For exact definition of tools please refer to the "Standard range and technical data" pages.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the PowerLineNavigator on the internet: [www.guehring.de](http://www.guehring.de).

<b>PowerLine no.</b>
<b>Standard/DIN</b>
<b>Tool material</b>
<b>Surface finish</b>
<b>Form</b>
<b>Std. range page</b>

Reamer Ø mm	Feed column no.						
	71	72	73	74	75	76	77
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
<b>4.00</b>	0.100	0.125	0.160	0.300	0.500	1.000	1.200
<b>5.00</b>	0.100	0.125	0.160	0.400	0.600	1.000	1.400
<b>6.30</b>	0.125	0.160	0.200	0.400	0.700	1.200	1.600
<b>8.00</b>	0.160	0.200	0.250	0.600	1.000	1.800	2.400
<b>10.00</b>	0.200	0.250	0.315	0.600	1.200	1.800	2.400
<b>12.50</b>	0.200	0.250	0.315	0.800	1.200	2.000	2.500
<b>16.00</b>	0.250	0.315	0.400	0.800	1.400	2.200	2.600
<b>20.00</b>	0.315	0.400	0.500	0.800	1.400	2.200	2.600
<b>25.00</b>	0.400	0.500	0.630	1.000	1.600	2.500	3.000
<b>31.50</b>	0.400	0.500	0.630	1.000	2.000	3.000	3.600
<b>40.00</b>	0.500	0.630	0.800	1.200	2.000	3.000	3.600
<b>50.00</b>	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

Coolant:  
 Air  
 Neat oil  
 Soluble oil

Material group	Material examples, new description (old description in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm <sup>2</sup> )	Hardness	Coolant
Common structural steels	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		<input checked="" type="radio"/>
Free-cutting steels	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		<input checked="" type="radio"/>
Unalloyed heat-treatable steels	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		<input checked="" type="radio"/>
Alloyed heat-treatable steels	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		<input checked="" type="radio"/>
Unalloyed case hardened steels	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		<input checked="" type="radio"/>
Alloyed case hardened steels	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		<input checked="" type="radio"/>
Nitriding steels	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		<input checked="" type="radio"/>
Tool steels	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		<input checked="" type="radio"/>
High speed steels	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		<input checked="" type="radio"/>
Spring steels	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Stainless steels, sulphured	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		<input checked="" type="radio"/>
austenitic	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
martensitic	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
Hardened steels	-		≤48 HRC ≤66 HRC	<input checked="" type="radio"/>
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Cast iron	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	<input checked="" type="radio"/>
Spheroidal graphite iron and malleable cast iron	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	<input checked="" type="radio"/>
Chilled cast iron	-		≤350 HB	<input checked="" type="radio"/>
Ti and Ti-alloys	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		<input checked="" type="radio"/>
Aluminium and Al-alloys	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		<input checked="" type="radio"/>
Al wrought alloys	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		<input checked="" type="radio"/>
Al cast alloys ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		<input checked="" type="radio"/>
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="radio"/>
Magnesium alloys	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		<input type="radio"/>
Copper, low-alloyed	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		<input checked="" type="radio"/>
Brass, short-chipping	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		<input checked="" type="radio"/>
long-chipping	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		<input checked="" type="radio"/>
Bronze, short-chipping	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		<input checked="" type="radio"/>
Bronze, long-chipping	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		<input checked="" type="radio"/>
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		<input type="radio"/>
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		<input type="radio"/>
New cast materials GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	<input checked="" type="radio"/>
New cast materials ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		<input checked="" type="radio"/>
Kevlar	Kevlar	≤1000		<input type="radio"/>
Glass, carbon concentrated plastics	GFK/CFK	≤1000		<input type="radio"/>

bright

## Machine reamers

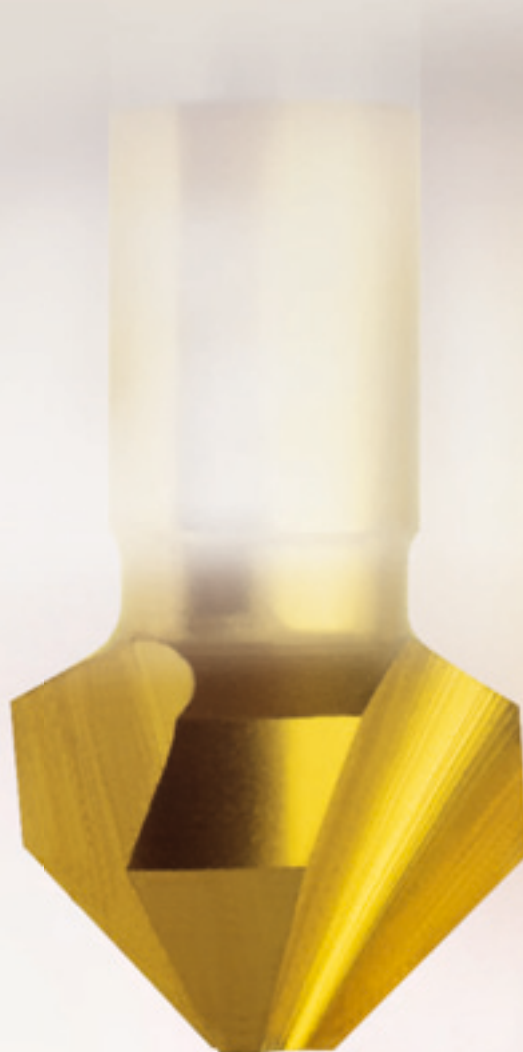
8988	8984	8990	8986	8982	8980
212	212	212-2	212-2	208	208
HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
○	○	○	○	○	○
A	B	A	B	A	B
48	46	49	47	45	44



V <sub>c</sub> m/min	Feed column no.					
16	72	72	72	72	72	72
12	72	72	72	72	72	72
12	72	72	72	72	72	72
10	71	71	71	71	71	71
14	72	72	72	72	72	72
12	71	71	71	71	71	71
10	71	71	71	71	71	71
10	71	71	71	71	71	71
8	71	71	71	71	71	71
16	72	72	72	72	72	72
10	71	71	71	71	71	71
8	71	71	71	71	71	71
10	71	71	71	71	71	71
8	71	71	71	71	71	71
14	72	72	72	72	72	72
10	71	71	71	71	71	71
10	71	71	71	71	71	71
6	72	72	72	72	72	72
6	72	72	72	72	72	72
4	72	72	72	72	72	72
14	71	71	71	71	71	71
12	71	71	71	71	71	71
12	71	71	71	71	71	71
10	71	71	71	71	71	71
6	71	71	71	71	71	71
4	71	71	71	71	71	71
18	73	73	73	73	73	73
18	73	73	73	73	73	73
20	72	72	72	72	72	72
18	72	72	72	72	72	72
20	72	72	72	72	72	72
18	72	72	72	72	72	72
18	72	72	72	72	72	72
16	72	72	72	72	72	72
20	72	72	72	72	72	72
18	72	72	72	72	72	72
18	72	72	72	72	72	72
14	72	72	72	72	72	72
12	73	73	73	73	73	73
14	73	73	73	73	73	73
8	71	71	71	71	71	71
8	71	71	71	71	71	71

# **Power***Line*

## **COUNTERSINKS FOR THE MACHINING OF HOLE ENTRIES**



# COUNTERSINKS







# PowerLineNavigator Countersinks

Tools with bold feed column no. are preferred choice.

For exact definition of tools please refer to the "Standard range and technical data" pages.

For multi-fluted countersinking tools the Ø-range for the respective flute no. is in brackets.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the PowerLineNavigator on the internet: [www.guehring.de](http://www.guehring.de).

<b>PowerLine no.</b>
<b>Standard/DIN</b>
<b>Tool material</b>
<b>Surface finish</b>
<b>Angle of taper</b>
<b>Form</b>
<b>Pilot</b>
<b>Std. range page</b>

Counter-sink Ø mm	Feed column no.					
	81	82	83	84	85	86
	f (mm/rev.)					
<b>2.00</b>	0.03	0.04	0.06	0.08	0.10	0.13
<b>2.50</b>	0.03	0.05	0.07	0.10	0.13	0.16
<b>3.15</b>	0.03	0.05	0.08	0.11	0.15	0.20
<b>4.00</b>	0.04	0.06	0.09	0.13	0.17	0.22
<b>5.00</b>	0.04	0.07	0.10	0.14	0.18	0.23
<b>6.30</b>	0.04	0.07	0.12	0.15	0.19	0.24
<b>8.00</b>	0.05	0.08	0.13	0.16	0.20	0.25
<b>10.00</b>	0.06	0.09	0.14	0.17	0.22	0.26
<b>12.50</b>	0.06	0.10	0.15	0.19	0.23	0.28
<b>16.00</b>	0.07	0.11	0.17	0.21	0.26	0.31
<b>20.00</b>	0.08	0.13	0.18	0.23	0.28	0.33
<b>25.00</b>	0.09	0.15	0.21	0.26	0.30	0.38
<b>31.50</b>	0.12	0.17	0.24	0.30	0.36	0.42
<b>40.00</b>	0.14	0.21	0.28	0.34	0.40	0.46
<b>50.00</b>	0.17	0.24	0.31	0.36	0.42	0.48
<b>63.00</b>	0.20	0.27	0.33	0.38	0.44	0.50
<b>80.00</b>	0.23	0.30	0.35	0.40	0.46	0.52
<b>100.00</b>	0.25	0.30	0.35	0.40	0.46	0.52

Coolant:  
 Air  
 Neat oil  
 Soluble oil

Material group	Material examples, new description (old description in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm <sup>2</sup> )	Hardness	Coolant
Common structural steels	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		<input checked="" type="radio"/>
Free-cutting steels	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		<input checked="" type="radio"/>
Unalloyed heat-treatable steels	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		<input checked="" type="radio"/>
Alloyed heat-treatable steels	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		<input checked="" type="radio"/>
Unalloyed case hardened steels	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		<input checked="" type="radio"/>
Alloyed case hardened steels	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		<input checked="" type="radio"/>
Nitriding steels	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		<input checked="" type="radio"/>
Tool steels	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		<input checked="" type="radio"/>
High speed steels	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		<input checked="" type="radio"/>
Spring steels	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Stainless steels, sulphured	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		<input checked="" type="radio"/>
austenitic	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
martensitic	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
Hardened steels	-		≤48 HRC ≤66 HRC	<input checked="" type="radio"/>
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Cast iron	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	<input checked="" type="radio"/>
Spheroidal graphite iron and malleable cast iron	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	<input checked="" type="radio"/>
Chilled cast iron	-		≤350 HB	<input checked="" type="radio"/>
Ti and Ti-alloys	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		<input checked="" type="radio"/>
Aluminium and Al-alloys	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		<input checked="" type="radio"/>
Al wrought alloys	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		<input checked="" type="radio"/>
Al cast alloys ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		<input checked="" type="radio"/>
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="radio"/>
Magnesium alloys	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		<input checked="" type="radio"/>
Copper, low-alloyed	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		<input checked="" type="radio"/>
Brass, short-chipping	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		<input checked="" type="radio"/>
long-chipping	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		<input checked="" type="radio"/>
Bronze, short-chipping	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		<input checked="" type="radio"/>
Bronze, long-chipping	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		<input checked="" type="radio"/>
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		<input checked="" type="radio"/>
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		<input checked="" type="radio"/>
New cast materials GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	<input checked="" type="radio"/>
New cast materials ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		<input checked="" type="radio"/>
Kevlar	Kevlar	≤1000		<input checked="" type="radio"/>
Glass, carbon concentrated plastics	GFK/CFK	≤1000		<input checked="" type="radio"/>

bright



## Countersinks

8940
335
HSS
○
90°
C
54



## Counterbores

8942
373
HSS
○
C
with fixed pilot
55



V <sub>c</sub> m/min	Feed column no.
32	85
30	85
32	85
30	85
32	85
30	85
20	84
15	84
12	84
25	85
15	84
10	84
15	85
12	84
17	84
15	84
15	84
10	84
16	84
12	84
14	84
8	84
25	85
16	84
22	84
20	84
8	84
15	85
10	85
90	85
70	86
40	85
30	85
100	86
60	84
80	85
50	85
30	86
26	86
24	86
20	86
30	84
40	85
70	84

V <sub>c</sub> m/min	Feed column no.
32	85
30	85
32	85
30	85
32	85
30	85
20	84
15	84
12	84
25	85
15	84
10	84
15	85
12	84
17	84
15	84
15	84
10	84
16	84
12	84
14	84
8	84
25	85
16	84
22	84
20	84
8	84
15	85
10	85
90	85
70	86
40	85
30	85
100	86
60	84
80	85
50	85
30	86
26	86
24	86
20	86
30	84
40	85
70	84



## MINI POWERLINE-BOX

THE MOST DEMANDED TOOLS FROM OUR PRODUCTION PROGRAMME ALWAYS AT HAND IN YOUR FIRM

- ⇒ Tools immediately available
- ⇒ Possibility to choose tools according to your needs



PowerLine no.	Standard range page	Discount group	Standard	Description	Tool material	Type	Form	Shank form
8900	10	101	DIN 1897	Stub drills	HSS	N		
8901	19	101	DIN 338	Jobber drill sets	HSS	N		
8902	13	101	DIN 338	Jobber drills	HSS	N		
8903	37	203	in-house std.	Tap set with core drills and countersinks	HSS-E	N R40	C	
8904	12	101	DIN 1897	Stub drills	HSCO	G 500		
8906	17	101	DIN 338	Jobber drills	HSS	N		
8908	20	101	in-house std.	Jobber drills, shank Ø 12.7 mm	HSS	N		
8910	30	101	in-house std.	Straight shank drills double-ended	HSS	DK 77		
8912	29	101	DIN 333	Center drills without flat	HSS		A	
8914	28	101	in-house std.	90° NC-spotting drills	HSS	N		
8916	18	101	DIN 338	Jobber drills	HSS	GT 100		
8918	21	101	DIN 340	Long series twist drills	HSS	GT 100		
8920	24	101	DIN 1869 R1	Extra length twist drills, series 1	HSS	GT 100		
8922	25	101	DIN 1869 R3	Extra length twist drills, series 3	HSS	GT 100		
8924	26	101	DIN 345	Taper shank twist drills	HSS	N		
8926	31	101	in-house std.	Spot weld drills	HSCO			
8940	54	105	DIN 335	90° countersinks	HSS		C	
8942	55	105	DIN 373	Counterbores with fixed pilots for fine tolerances	HSS			
8950	36	203	DIN 371/2184-1	Taps for ISO metric threads	HSS-E	N R40	C	
8970	40	112	DIN 327	Slot drills (2-fluted)	M42	N		B
8972	41	112	DIN 327	Slot drills (3-fluted)	M42	N		B
8980	44	105	DIN 208	Machine reamers	HSS-E		B	
8982	45	105	DIN 208	Machine reamers	HSS-E		A	
8984	46	105	DIN 212	Machine reamers	HSS-E		B	
8986	47	105	DIN 212-2	Machine reamers	HSS-E		B	
8988	48	105	DIN 212	Machine reamers	HSS-E		A	
8990	49	105	DIN 212-2	Machine reamers	HSS-E		A	

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