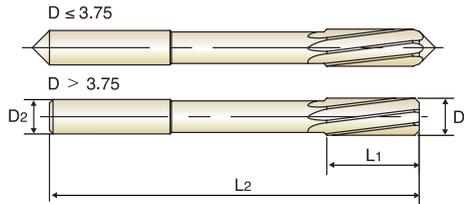


**HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø**

- HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø
- ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
- ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

- ▶ O.D. Tolerances  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ Shank Diameter Tolerances : h6
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ Ø Toleranzen:  
ganzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ Schaft-Durchmesser Toleranzen : h6
- ▶ linksspiralig/ rechtsscheidend
- ▶ Anschnittwinkel - bis Ø3,75 : 15°  
- über Ø3,75 : 45°


**Hole type**


HSS-E

H7

LH7°

15°

45°

Bright

p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter		Shank Diameter		Flute Length		Overall Length	
	D1	D2	D2	D1	L1	L2	L2	L2
K21B100200	2.0	2	2	2	11	49		
K21B100201	2.01	2	2	2	11	49		
K21B100202	2.02	2	2	2	11	49		
K21B100203	2.03	2	2	2	11	49		
K21B100210	2.1	2	2	2	11	49		
K21B100220	2.2	3	3	2	12	53		
K21B100230	2.3	3	3	2	12	53		
K21B100240	2.4	3	3	2	14	57		
K21B100248	2.48	3	3	2	14	57		
K21B100249	2.49	3	3	2	14	57		
K21B100250	2.5	3	3	2	14	57		
K21B100251	2.51	3	3	2	14	57		
K21B100252	2.52	3	3	2	14	57		
K21B100253	2.53	3	3	2	14	57		
K21B100260	2.6	3	3	2	14	57		
K21B100270	2.7	3	3	2	15	61		
K21B100280	2.8	3	3	2	15	61		
K21B100290	2.9	3	3	2	15	61		
K21B100297	2.97	3	3	2	15	61		
K21B100298	2.98	3	3	2	15	61		
K21B100299	2.99	3	3	2	15	61		
K21B100300	3.0	3	3	2	15	61		
K21B100301	3.01	4	4	2	16	65		

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M					K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel			Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC	13	25	28	32	30	29	32	38	35	35	35	23	23	10	10	26	3	25	21	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		

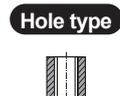
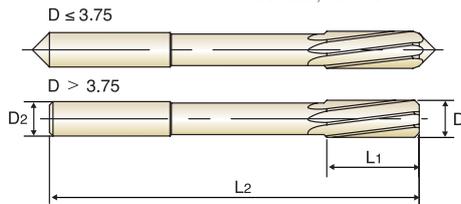
ISO	N					S										H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○

**HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø**

🇩🇪 **HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø**  
🇫🇷 **ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE**  
🇮🇹 **ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI**

- ▶ O.D. Tolerances  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ Shank Diameter Tolerances : h6
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ Ø Toleranzen:  
ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ Schaft-Durchmesser Toleranzen : h6
- ▶ linksspiralig/ rechtsscheidend
- ▶ Anschnittwinkel - bis Ø3,75 : 15°  
- über Ø3,75 : 45°



HSS-E H7 LH7° 15° 45° Bright p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter		Shank Diameter		Flute Length		Overall Length	
	D1		D2		L1		L2	
K21B100302	3.02		4		16		65	
K21B100303	3.03		4		16		65	
K21B100310	3.1		4		16		65	
K21B100320	3.2		4		16		65	
K21B100330	3.3		4		16		65	
K21B100340	3.4		4		18		70	
K21B100350	3.5		4		18		70	
K21B100360	3.6		4		18		70	
K21B100370	3.7		4		18		70	
K21B100380	3.8		4		19		75	
K21B100390	3.9		4		19		75	
K21B100397	3.97		4		19		75	
K21B100398	3.98		4		19		75	
K21B100399	3.99		4		19		75	
K21B100400	4.0		4		19		75	
K21B100401	4.01		4		19		75	
K21B100402	4.02		4		19		75	
K21B100403	4.03		4		19		75	
K21B100410	4.1		4		19		75	
K21B100420	4.2		4		19		75	
K21B100430	4.3		5		21		80	
K21B100440	4.4		5		21		80	
K21B100450	4.5		5		21		80	
K21B100460	4.6		5		21		80	

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P									M					K					
	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○

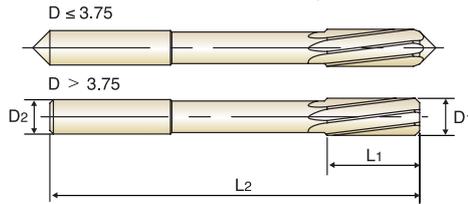
ISO Material Description	N									S							H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

### HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

- HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø
- ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
- ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

- ▶ O.D. Tolerances  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ Shank Diameter Tolerances : h6
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ Ø Toleranzen:  
ganzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ Schaft-Durchmesser Toleranzen : h6
- ▶ linksspiralig/ rechtsscheidend
- ▶ Anschnittwinkel - bis Ø3,75 : 15°  
- über Ø3,75 : 45°



Hole type



HSS-E
H7
LH7°
15°
45°
Bright
p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter		Shank Diameter		Flute Length		Overall Length	
	D1	D2	D1	D2	L1	L2	L1	L2
K21B100480	4.8	5	5	5	23	86		
K21B100490	4.9	5	5	5	23	86		
K21B100497	4.97	5	5	5	23	86		
K21B100498	4.98	5	5	5	23	86		
K21B100499	4.99	5	5	5	23	86		
K21B100500	5.0	5	5	5	23	86		
K21B100501	5.01	5	5	5	23	86		
K21B100502	5.02	5	5	5	23	86		
K21B100503	5.03	5	5	5	23	86		
K21B100510	5.1	5	5	5	23	86		
K21B100520	5.2	5	5	5	23	86		
K21B100550	5.5	6	6	6	26	93		
K21B100560	5.6	6	6	6	26	93		
K21B100570	5.7	6	6	6	26	93		
K21B100580	5.8	6	6	6	26	93		
K21B100590	5.9	6	6	6	26	93		
K21B100597	5.97	6	6	6	26	93		
K21B100598	5.98	6	6	6	26	93		
K21B100599	5.99	6	6	6	26	93		
K21B100600	6.0	6	6	6	26	93		
K21B100601	6.01	6	6	6	28	101		
K21B100602	6.02	6	6	6	28	101		
K21B100603	6.03	6	6	6	28	101		
K21B100610	6.1	6	6	6	28	101		

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M					K								
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel					Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRC	13	25	28	32	30	29	32	38	35	35	35	23	23	10	10	26	3	25	21	21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○				

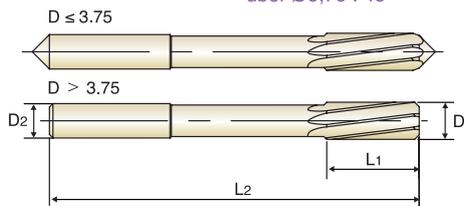
ISO	N					S										H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○

### HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

**HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø**  
**ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE**  
**ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI**

- ▶ O.D. Tolerances  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ Shank Diameter Tolerances : h6
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ Ø Toleranzen:  
ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ Schaft-Durchmesser Toleranzen : h6
- ▶ linksspiralig/ rechtsscheidend
- ▶ Anschnittwinkel - bis Ø3,75 : 15°  
- über Ø3,75 : 45°



Hole type



HSS-E
H7
LH7°
15°
45°
Bright
p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter		Shank Diameter		Flute Length		Overall Length	
	D1		D2		L1		L2	
K21B100620	6.2		6		28		101	
K21B100630	6.3		6		28		101	
K21B100640	6.4		6		28		101	
K21B100660	6.6		6		28		101	
K21B100670	6.7		6		28		101	
K21B100680	6.8		8		31		109	
K21B100700	7.0		8		31		109	
K21B100710	7.1		8		31		109	
K21B100720	7.2		8		31		109	
K21B100730	7.3		8		31		109	
K21B100740	7.4		8		31		109	
K21B100750	7.5		8		31		109	
K21B100770	7.7		8		33		117	
K21B100780	7.8		8		33		117	
K21B100790	7.9		8		33		117	
K21B100797	7.97		8		33		117	
K21B100798	7.98		8		33		117	
K21B100799	7.99		8		33		117	
K21B100800	8.0		8		33		117	
K21B100801	8.01		8		33		117	
K21B100802	8.02		8		33		117	
K21B100803	8.03		8		33		117	
K21B100810	8.1		8		33		117	
K21B100820	8.2		8		33		117	

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P					M					K											
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	3	25	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	230	
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

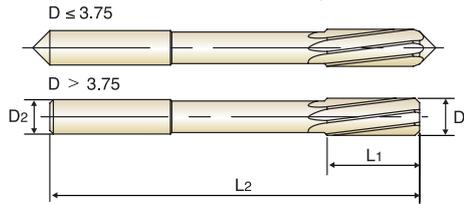
ISO Material Description	N					S					H												
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
HRc	60	100	75	90	130	110	90	100			15	30	25	38	34	400Rm	1050Rm	550	630	400	550	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550	42	55
Recommended	○	○	○	○	○	○	○	○															

**HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø**

- HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø
- ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
- ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

- ▶ O.D. Tolerances  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ Shank Diameter Tolerances : h6
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ Ø Toleranzen:  
ganzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ Schaft-Durchmesser Toleranzen : h6
- ▶ linksspiralig/ rechtsscheidend
- ▶ Ansnittwinkel - bis Ø3,75 : 15°  
- über Ø3,75 : 45°


**Hole type**


HSS-E
H7
LH7°
15°
45°
Bright
p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter	Shank Diameter	Flute Length	Overall Length
	D1	D2	L1	L2
K21B100830	8.3	8	33	117
K21B100840	8.4	8	33	117
K21B100850	8.5	8	33	117
K21B100860	8.6	10	36	125
K21B100870	8.7	10	36	125
K21B100880	8.8	10	36	125
K21B100900	9.0	10	36	125
K21B100902	9.02	10	36	125
K21B100910	9.1	10	36	125
K21B100920	9.2	10	36	125
K21B100950	9.5	10	36	125
K21B100960	9.6	10	38	133
K21B100970	9.7	10	38	133
K21B100990	9.9	10	38	133
K21B100997	9.97	10	38	133
K21B100998	9.98	10	38	133
K21B100999	9.99	10	38	133
K21B101000	10.0	10	38	133
K21B101001	10.01	10	38	133
K21B101002	10.02	10	38	133
K21B101003	10.03	10	38	133
K21B101100	11.0	10	41	142
K21B101198	11.98	10	41	151
K21B101199	11.99	10	41	151

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M					K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	29	32	38	35	35	35	23	10	10	26	3	25	21	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

ISO	N					S										H					
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○

i-ONE DRILLS

i-DREAM DRILLS

DREAM DRILLS -PRO

DREAM DRILLS X

DREAM DRILLS -GENERAL

DREAM DRILLS -HIGH FEED

DREAM DRILLS -FLAT BOTTOM

DREAM DRILLS -INOX

DREAM DRILLS -ALU

DREAM DRILLS -MQL

DREAM DRILLS for HIGH HARDENED STEELS

GENERAL CARBIDE DRILLS

MULTI-1 DRILLS

HPD DRILLS

GOLD-P DRILLS

SUPER-GP DRILLS

STRAIGHT SHANK DRILLS

TAPER SHANK DRILLS

NC-SPOTTING DRILLS

CENTER DRILLS

SPADE DRILLS

**REAMERS**

COUNTER SINKS

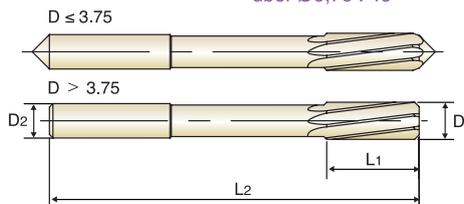
COUNTER BORES

### HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

- 🇩🇪 **HSS-E, NC-MASCHINENREIBAHLEN mit GERADZÄHLIGEN SCHAFT Ø**
- 🇫🇷 **ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE**
- 🇮🇹 **ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI**

- ▶ **O.D. Tolerances**  
Whole-number Ø and 1/10 size : DIN 1420 for H7  
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm  
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- ▶ **Shank Diameter Tolerances : h6**
- ▶ **LH Spiral Flutes / Right Hand Cut**
- ▶ **Chamfer Angle** - Up to Ø3.75 : 15°  
- Over Ø3.75 : 45°

- ▶ **Ø Toleranzen:**  
ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7  
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm  
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- ▶ **Schaft-Durchmesser Toleranzen : h6**
- ▶ **linksspiralig/ rechtsscheidend**
- ▶ **Anschnittwinkel** - bis Ø3,75 : 15°  
- über Ø3,75 : 45°



Hole type

HSS-E
H7
LH7°
15°
45°
Bright
p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter		Shank Diameter		Flute Length		Overall Length	
	D1		D2		L1		L2	
K21B101200	12.0		10		44		151	
K21B101201	12.01		10		44		151	
K21B101202	12.02		10		44		151	
K21B101203	12.03		10		44		151	
K21B101300	13.0		10		44		151	
K21B101400	14.0		14		47		160	
K21B101500	15.0		14		50		162	
K21B101600	16.0		14		52		170	
K21B101700	17.0		14		54		175	
K21B101800	18.0		14		56		182	
K21B101900	19.0		16		58		189	
K21B102000	20.0		16		60		195	

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	13	25	28	32	10	29	32	38	10	15	35	15	23	10	10	26	3	25	130	21
HRC	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO	N										S						H				
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													