3

Rezilne igle
Punch Pins

EXACTA
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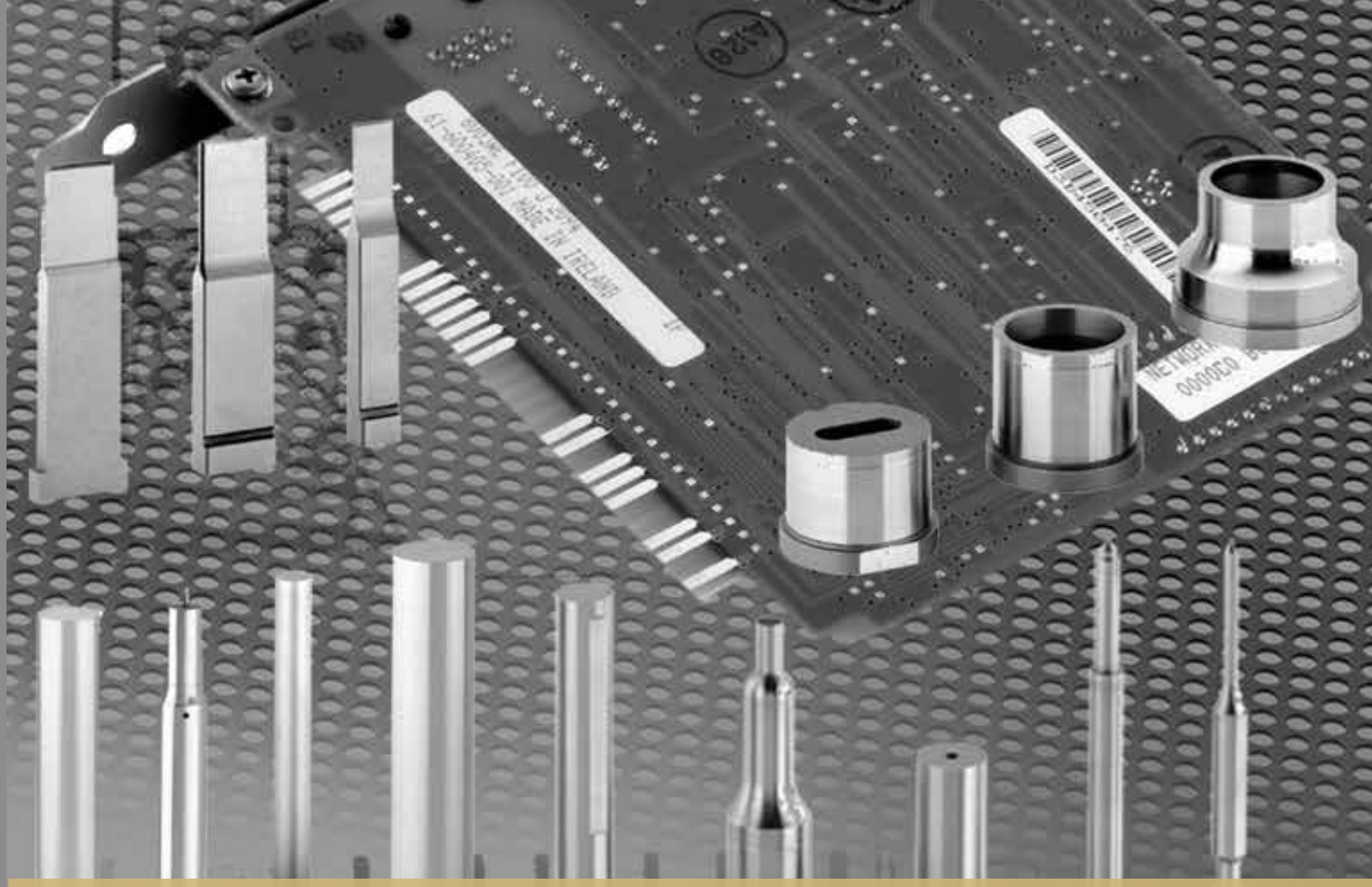
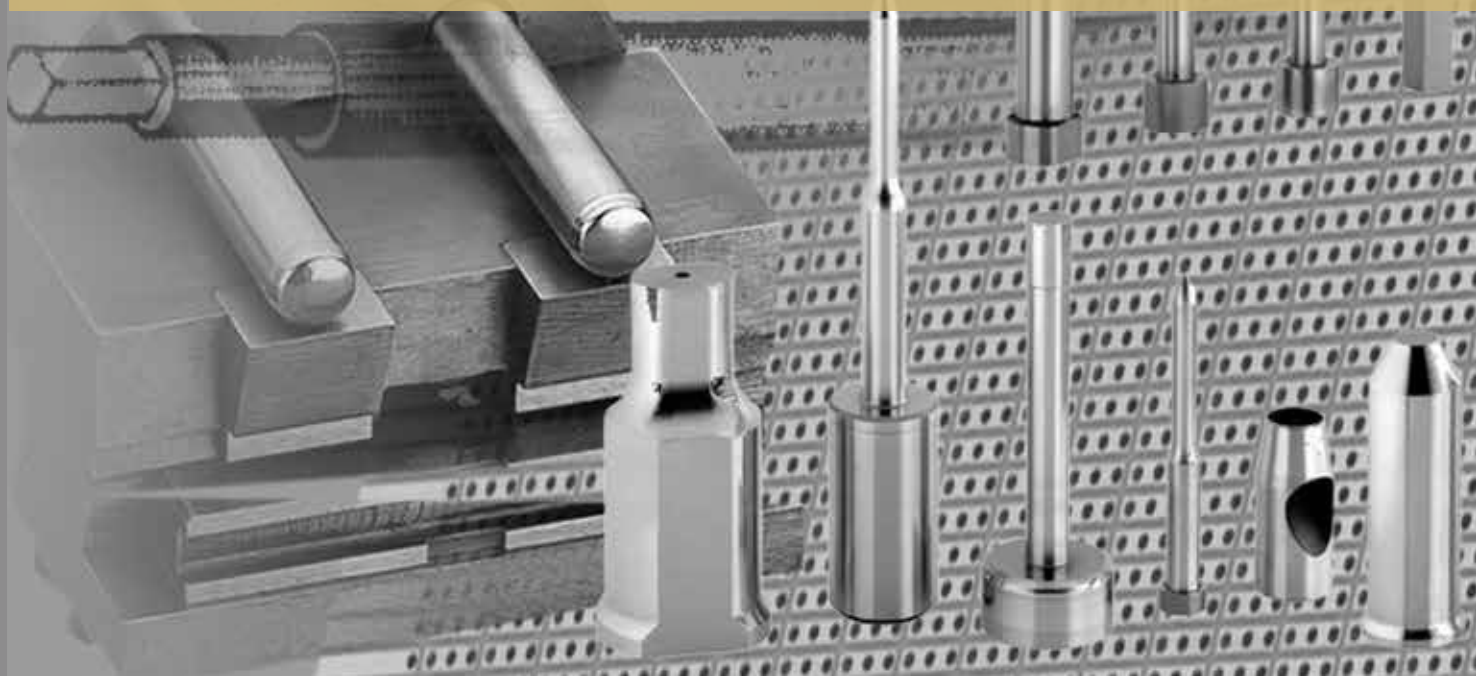


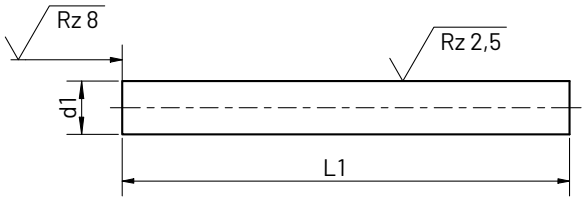
Rezilne igle se uporabljajo v prebijalno-preoblikovalnih orodjih. So sestavni deli v rezilnih orodjih, ki so podvrženi silnemu pritisku. Njihove prednosti so lahko vidne le, če so tudi drugi deli rezilnega orodja precizno narejeni. Rezilne igle so lahko izdelane glede na različne standarde in tudi po skicah na željo stranke.

Punch pins are precision parts. They are components in cutting tools that are subject to high pressure forces. Their advantages and full performance can be reached only if all other parts of the cutting tool are precision-made as well. Punching pins can be manufactured according to various standards as well as to the customer's drawings.



3 Rezilna igla
Punch Pin

DIN 9861 B



Rezilna igla brez glave.

Punch Pin without head.

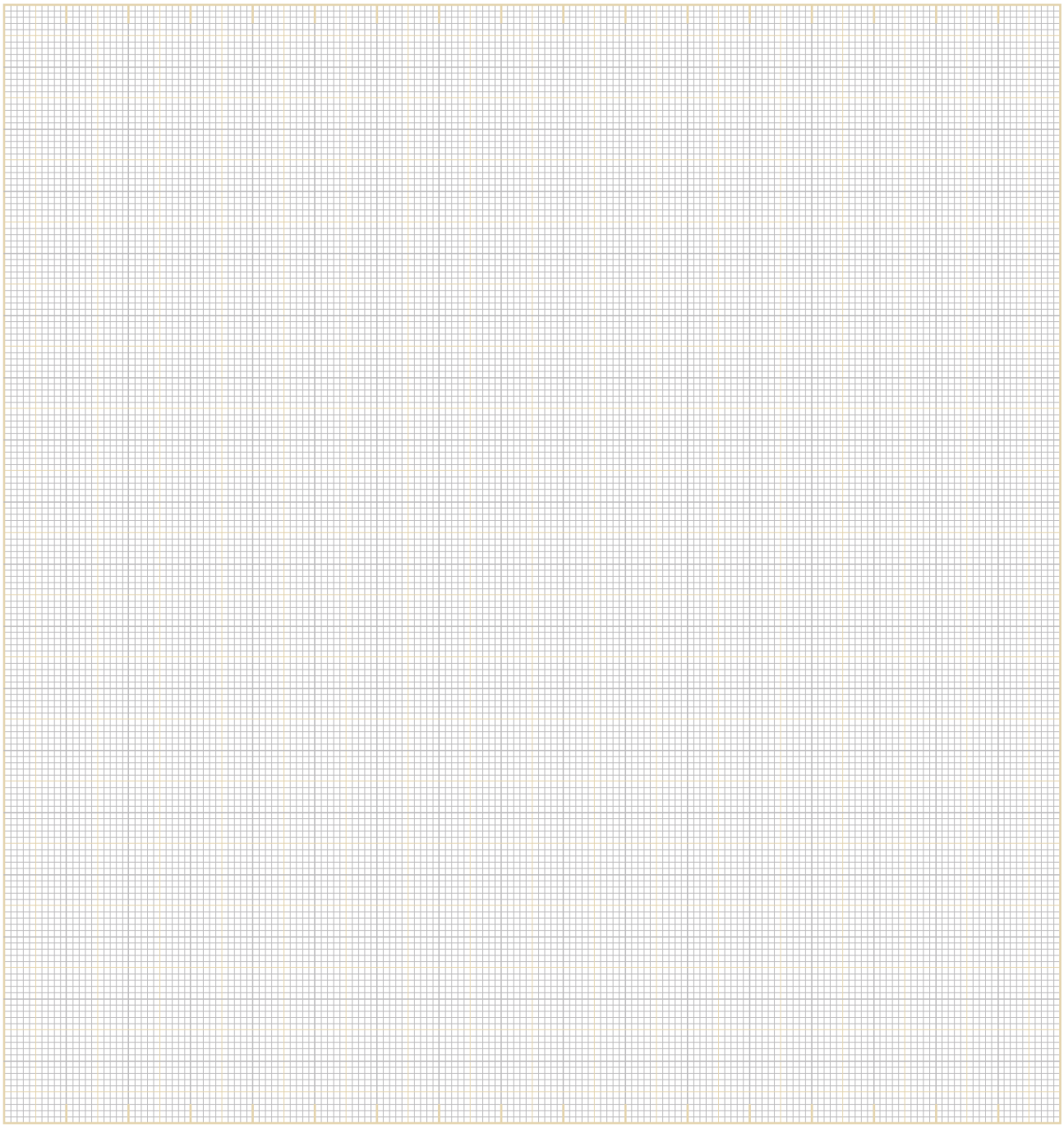
Dimenzije so prikazane v tabeli.

Material:
HSS (hitrorezno jeklo) / **HWS** (visoko legirno jeklo za delo v hladnem - 12% krom) / **WS** (legirano orodno jeklo za delo v hladnem)

The dimensions are shown in the table.

Material:
HSS (High speed Steel) / **HWS** (High alloy cold working steel, approx. 12% Chrome) / **WS** (Alloyed cold-work steel)

d1 h6	Stopnjevanje / Gradation [mm]	L1 + 2,5 0
0,5 - 0,95	0,05	Željena dolžina L1 = 71 Naslednje dolžine so na voljo iz zalog L1 = 60, 80, 90 in 100. Preferred length L1 = 71 The following lengths are also available in limited numbers from stock L1 = 60, 80, 90 and 100.
1,0 - 6,0	0,1	
6,0 - 10,0	,5	



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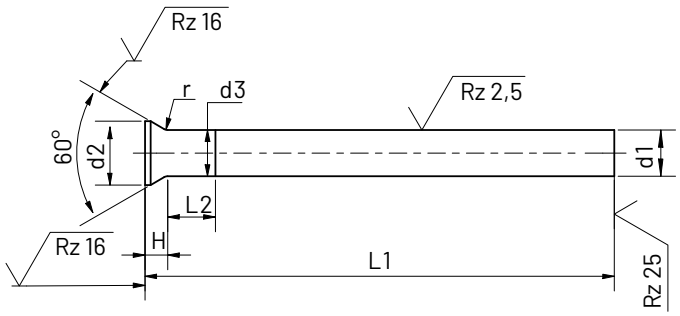
3 Rezilna igla
Punch Pin

DIN 9861 DA



Klasična oblika s 60⁰ - konično glavo in cilindričnim steblom.

Classic design with 60⁰ - conical head and cylindrical shank.

Obseg uporabe:
V rezilnih orodjih za rezanje plošč iz jekla, ne-železne kovine, plastike, papir (in tiskana vezje z gladko površino). Dimenzije so prikazane v tabeli.

Prileganje / tolerance:
Premer stebla d1, dolžina l1+0,5

ø	0,5 - 3	3 - 6	6 - 10	10 - 16
g6	-0,006	-0,008	-0,009	-0,011

Material:
WS (legirno orodno jeklo za delo v hladnem) / **HWS** (visoko legirno orodno jeklo za delo v hladnem; vsebuje 12% kroma) / **HSS** (hitrorezno jeklo)

Lastnosti materiala:
WS: povprečna trpežnost / HWS: visoka trpežnost, dolga življenjska doba / HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti abraziji, visoka natezalna trdnost, visoka odpornost proti vročini.

Trdota
Steblo: WS in HWS 60 - 64, HSS 62 - 66
Glava: WS 40 - 50, HWS in HSS 45 - 55

Obdelava:
Kaljeno, popuščeno, steblo precizno brušeno, 60° stožčasta vroče kovana glava, z dovoljeno nabreklostjo (d3) takoj pod glavo.

Range of application:
Cutting boards, steel, non-ferrous metal, plastic, paper (and printed circuit boards with a smooth surface).
The dimensions are shown in the table.

Tolerance:
Shank diameter d1, length l1+0.5

ø	0,5 - 3	3 - 6	6 - 10	10 - 16
g6	-0,006	-0,008	-0,009	-0,011

Material:
WS (Alloyed cold-work steel) / **HWS** (High alloy cold-work steel; approx. 12% Chrome) / **HSS** (HSS steel)

Material properties:
WS: average durability / HWS: high durability, long life / HSS: extremely high durability for materials which are difficult to work with. Great abrasion resistance, high tear strength, high heat resistance.

Hardness:
Shank: WS and HWS 60 - 64, HSS 62 - 66
Head: WS 40 - 50, HWS in HSS 45 - 55

Finish:
Hardened, tempered, precision steel blade, 60° conical hot-forged head with a permissible head to shank concentric (d3).

Opomba | Note

Za ekstremno visoke zahteve priporočamo rezilne igle narejene iz orodnega jekla s PVD prevlekami in s pozavnastim ali cilindričnim vratom.

HSS igle so lahko na zahtevo prevlečene s posebno prevleko.
Možne so tudi igle iz volfram karbida (hartmetall).

For extremely high demands, we recommend punch pins made of tool steel with Physical Vapor Deposition (PVD) surface layer with trombone or cylindrical neck.

HSS punch pins can be coated with a special coating upon request. Tungsten carbide (hartmetall) possible.

Ø d1 h6	L1 + 0,5 0			d2 ± 0,05	d3	h + 0,20 0	L2 max	r
	71	80	100					
0,50	●	●		0,90	D1+0,02	0,55	5	0,20+ 0,20
0,60	●	●	●	1,10		0,63		
0,70	●	●	●	1,30		0,72		
0,80	●	●	●	1,40		0,92		
0,85	●	●				0,88		
0,90	●	●	●	1,60		1,01		
1,00	●	●	●	1,80	D1+ 0,03	1,19		0,40+ 0,30
1,10	●	●	●			1,11		
1,20	●	●	●	2,00		1,19		
1,30	●	●	●			1,11		
1,40	●	●	●	2,20		1,19		
1,45	●					1,15		
1,50	●	●	●			1,11		
1,60	●	●	●	2,50		1,28		
1,70	●	●	●			1,19		
1,80	●	●	●	2,80		1,37		
1,90	●	●	●			1,28		
2,00	●	●	●	3,00		1,37		
2,10	●	●	●	3,20		1,45		
2,20	●	●	●			1,37		
2,30	●	●	●	3,50		1,54		
2,35	●		●			1,50		
2,40	●	●	●			1,45		
2,50	●	●	●			1,37		
2,60	●	●	●	4,00		1,71		
2,65	●		●			1,67		
2,70	●	●	●			1,63		
2,80	●	●	●			1,54		
2,85	●					1,50		
2,90	●	●	●			1,45		
2,95	●					1,41		
3,00	●	●	●	4,50		1,80		0,60+ 0,40
3,10	●	●	●			1,71		
3,15	●					1,67		
3,20	●	●	●			1,63		
3,30	●	●	●			1,54		
3,40	●	●	●			1,45		
3,45	●					1,41		
3,50	●	●	●	5,00		1,80		
3,55	●	●	●			1,76		
3,60	●	●	●			1,71		
3,65	●					1,67		
3,70	●	●	●			1,63		
3,75	●	●	●			1,58		
3,80	●	●	●			1,54		
3,85	●	●	●			1,50		
3,90	●	●	●			1,45		
4,00	●	●	●	5,50		1,80		
4,10	●	●	●			1,71		
4,15	●	●	●			1,67		
4,20	●	●	●			1,63		
4,25	●					1,58		
4,30	●	●	●			1,54		
4,40	●	●	●			1,45		

Ø d1 h6	L1 + 0,5 0			d2 ± 0,05	d3	h + 0,20 0	L2 max	r
	71	80	100					
4,50	●			6,00	D1+ 0,03	1,80	5	0,60+ 0,40
4,60	●					1,71		
4,70	●	●	●			1,63		
4,80	●	●	●			1,54		
4,90	●	●	●			1,45		
5,00	●	●	●	6,50		1,80	6	
5,10	●	●	●			1,71		
5,20	●	●	●			1,63		
5,30		●	●			1,54		
5,40			●			1,45		
5,50	●	●	●	7,00		1,80		
5,60	●	●	●		D1+ 0,04	1,71		
6,00	●	●	●	8,00		2,23		1,00+0,50
6,10	●		●			2,15		
6,20		●				2,06		
6,30	●					1,97		
6,40	●	●				1,89		
6,50	●	●	●	9,00		3,17		
6,70	●					2,99		
6,90	●					2,82		
7,00	●	●	●			2,73		
7,30	●	●				2,47		
7,40	●	●				2,39		
7,50	●	●	●	10,00		3,17		
7,60	●					3,08		
7,70	●					2,99		
8,00	●	●	●			2,73	8	
8,40	●					2,39		
8,50	●	●	●	11,00		3,17		
8,70	●	●				2,99		
8,75	●	●				2,95		
8,80	●					2,91		
8,90	●					2,82		
9,00	●	●	●			2,73		
9,25		●				2,52		
9,30	●	●				2,47		
9,40	●					2,39		
9,70	●			12,00		2,99		
9,80	●					2,91		
9,90	●					2,82		
10,00	●	●	●			2,73	10	
10,50	●			13,00		3,17		
10,60	●					3,08		
11,00	●	●	●			2,73		
11,60	●			14,00		3,08		
11,80		●				2,91		
12,00	●	●	●			2,73		
12,10	●					2,65		
12,30	●					2,47		
12,50	●			15,00		3,17		
14,00	●	●	●	16,00		3,23	12	1,50 + 0,50
14,90		●		17,00		3,32		
16,00			●	18,00		3,23		

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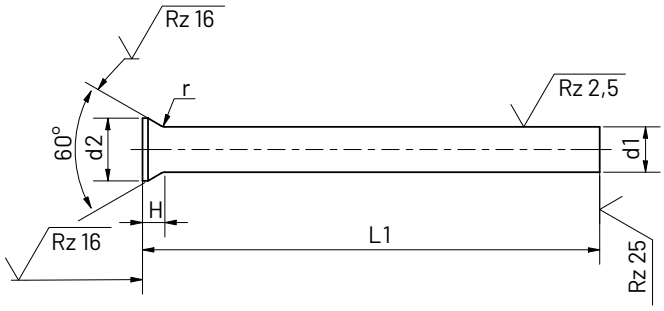
3 Rezilna igla
Punch Pin

DIN 9861 D



Rezilna igla s 60°konično glavo, cilindričnim steblom in brušena / Precizna izvedba.

Punch Pin with the 60 ° conical head, a cylindrical shank and precision ground.

Obseg uporabe:
V rezilnih orodjih za rezanje plošč, jekla, ne-železne kovine, plastiko, papir. Dimenzije so prikazane v tabeli.

Prileganje / Toleranca:
Premer stebla d_1, dolžina $L_{1+0,5}$

ø	0,5 - 3	3 - 6	6 - 10	10 - 16	18-20
g6	-0,006	-0,008	-0,009	-0,011	-0,013

Material:
HWS visoko legirno orodno jeklo za delo v hladnem (vsebuje 12% kroma) / **HSS** (hitrorezno jeklo) / **CPM 10V** (polprašno orodno jeklo) / **HM** (karbidna kovina) /

Lastnosti materiala:
HWS: visoka trpežnost, dolga življenjska doba / **HSS**: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti abraziji. Visoka natezalna trdnost, visoka odpornost proti vročini. / **ASP 23**: občutno večja življenjska doba.

Trdota
Steblo: WS in HWS 60 - 64, HSS 62 - 66
Glava: WS 40 - 50, HWS in HSS 45 - 55

Obdelava:
Kaljeno, popuščeno, 60° stožčasta vroče kovana glava, naknadno brušeno po celotni dolžini, vključno z glavo.

Range of application:
Applications: Cutting boards, steel, non-ferrous metal, plastic, paper. The dimensions are shown in the table.

Fit / Tolerance:
Nominal diameter d_1 stem diameter, length $L_{1+0.5}$

ø	0,5 - 3	3 - 6	6 - 10	10 - 16	18-20
g6	-0,006	-0,008	-0,009	-0,011	-0,013

Material:
HWS: High alloy cold-work steel (approx. 12% Chrome) / **HSS** (High speed steel) / **ASP 23** - non cobalt grade for high performance cutting tools, cold work tools / **CPM 10V** - steel made process / **HM** (hardmetall)

Material properties:
HWS: high durability, long life / **HSS**: extremely high durability for materials which are difficult to work with. High resistance to abrasion. High tear strength, high heat resistance. / **ASP 23**: significantly higher life expectancy.

Hardness:
Shank: WS and HWS 60 - 64, HSS 62 - 66
Head: WS 40 - 50, HWS in HSS 45 - 55

Finish:
Hardened, annealed, 60 ° conical hot-forged head, subsequently ground over the entire length, including the head.

Opomba | Note

Za ekstremno visoke zahteve priporočamo rezilne igle, narejene s pozavnastim ali cilindričnim vratom. HSS igle so lahko na zahtevo prevlečene s posebno prevleko. Možne so tudi igle iz volfram karbida.

For extremely high demands, we would recommend punch pins with trombome or cylindrical neck. HSS punch pins can be coated with a special coating upon request. Tungsten carbide (hartmetall) coating possible.

Ø d1 h6	d2 ± 0,05	H + 0,20	r	L1 +0,5		
				71	80	100
0,30	0,9	0,72	0,2+0,20	●		
0,35		0,68		●		
0,40		0,63		●		
0,45		0,59				●
0,50		0,55		●	●	●
0,55	1,0	0,59		●		●
0,6	1,1	0,63		●	●	●
0,65	1,2	0,68		●		●
0,70	1,3	0,72		●	●	●
0,75		0,68		●	●	●
0,80	1,4	0,92		●	●	●
0,85		0,88		●		●
0,90	1,6	1,01		●	●	●
0,95		0,96		●		●
1,00	1,8	1,19	0,4+0,30	●	●	●
1,05		1,15		●		
1,10		1,11		●	●	●
1,15		1,06		●		
1,20	2,0	1,19		●	●	●
1,25		1,15		●		
1,30		1,11		●	●	●
1,35		1,06		●		
1,40	2,2	1,19		●	●	●
1,45		1,15		●		
1,50		1,11		●	●	●
1,55		1,06		●		
1,60	2,5	1,28		●	●	●
1,65		1,24		●		
1,70		1,19		●	●	●
1,75		1,15		●		
1,80	2,8	1,37		●	●	●
1,85		1,32		●		
1,90		1,28		●	●	●
1,95		1,24		●		
2,00	3,0	1,37	0,4+0,30	●	●	●
2,05		1,32		●		
2,10	3,2	1,45		●	●	●
2,15		1,41		●		
2,20		1,37		●	●	●
2,25		1,32		●		
2,30	3,5	1,54		●	●	●
2,35		1,50		●		
2,40		1,45		●	●	●
2,45		1,41		●		
2,50		1,37		●	●	●
2,55		1,32		●		
2,70	4,0	1,63	0,4+0,30	●	●	●
2,75		1,58		●		
2,80		1,54		●	●	●
2,85		1,50		●		
2,90		1,45		●	●	●
2,95		1,41		●		
3,00	4,5	1,80	0,6+0,40	●	●	●
3,05		1,76		●		

Ø d1 h6	d2 ± 0,05	H + 0,20	r	L1 +0,5		
				71	80	100
3,10		1,71		●	●	●
3,15		1,67		●		
3,20		1,63		●	●	●
3,25		1,58		●		
3,30		1,54		●	●	●
3,35		1,50		●		
3,40		1,45		●	●	●
3,45		1,41		●		
3,50	5,0	1,80		●	●	●
3,55		1,76		●		
3,60		1,71		●	●	●
3,65		1,67		●		
3,70		1,63		●	●	●
3,75		1,58		●		
3,80		1,54		●	●	●
3,85		1,50		●		
3,90		1,45		●	●	●
3,95		1,41		●		
4,00	5,5	1,80		●	●	●
4,05		1,76		●		
4,10		1,71		●	●	●
4,15		1,67		●		
4,20		1,63		●	●	●
4,25		1,58		●		
4,30		1,54		●	●	●
4,35		1,50		●		
4,40		1,45		●	●	●
4,45		1,41		●		
4,50	6,0	1,80		●	●	●
4,55		1,76		●		
4,60		1,71		●	●	●
4,65		1,67		●		
4,70		1,63		●	●	●
4,75		1,58		●		
4,80		1,54		●	●	●
4,85		1,50		●		
4,90		1,45		●	●	●
4,95		1,41		●		
5,00	6,5	1,80	0,6+0,40	●	●	●
5,05		1,76		●		
5,10		1,71		●	●	●
5,15		1,67		●		
5,20		1,63		●	●	●
5,30		1,54		●	●	●
5,40		1,45		●	●	●
5,45		1,41		●		
5,50	7,0	1,80		●	●	●
5,60		1,71		●	●	●
5,70		1,63		●	●	●
5,75		1,58		●		
5,80		1,54		●	●	●
5,90		1,45		●	●	●
6,00	8,0	2,23	1,0+0,50	●	●	●
6,05		2,19		●		

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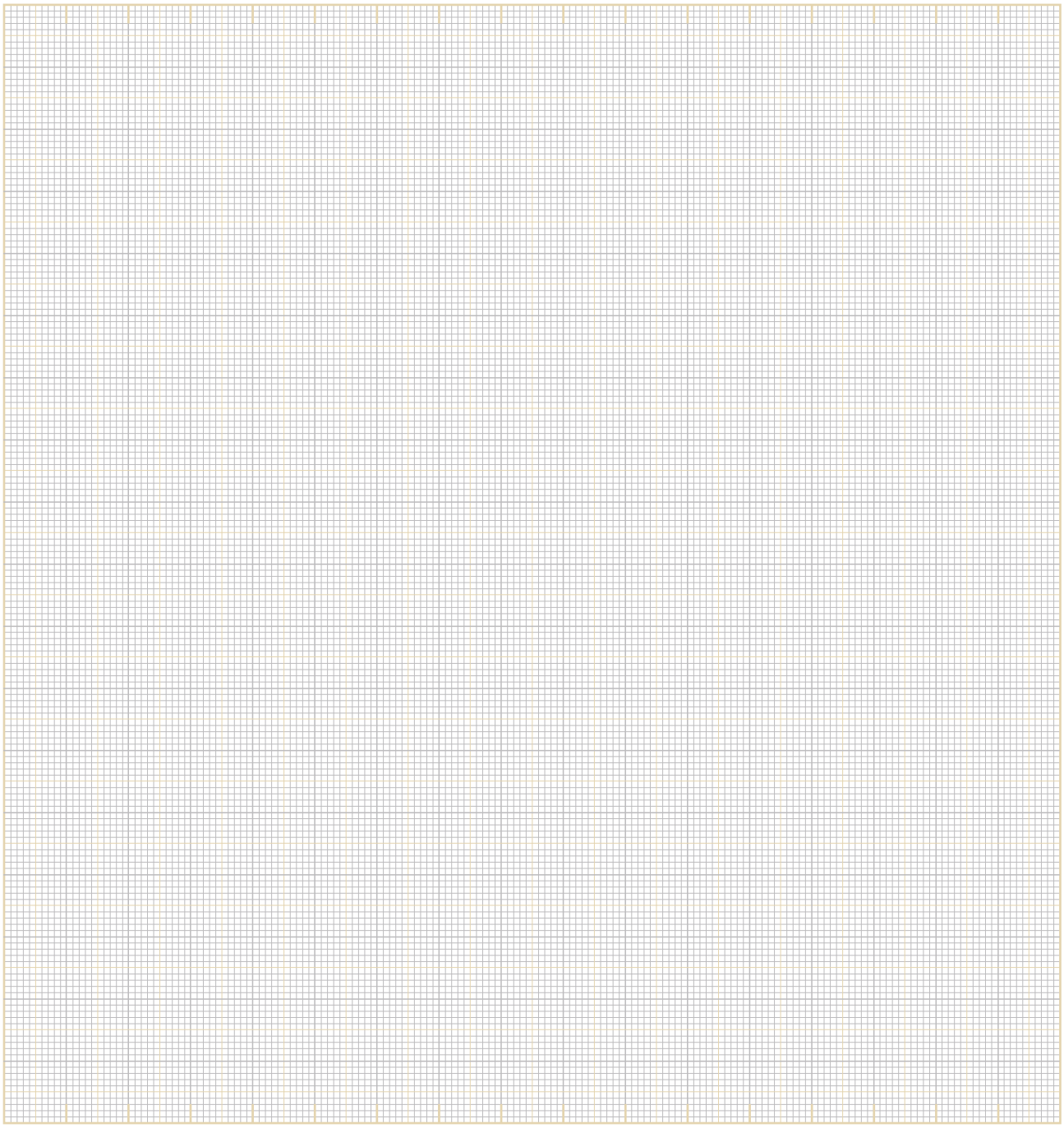
Ø d1 h6	d2 ± 0,05	H + 0,20	r	L1 +0,5		
				71	80	100
6,10		2,15		●	●	●
6,20		2,06		●	●	●
6,30		1,97		●	●	●
6,40		1,89		●	●	●
6,50	9,0	3,17		●	●	●
6,60		3,08		●		
6,70		2,99		●		
6,80		2,91		●		
6,90		2,82		●		
7,00		2,73		●	●	●
7,10		2,65		●		
7,20		2,56		●		
7,25		2,52		●		
7,30		2,47		●		
7,40	10,0	2,39		●		
7,50		3,17		●	●	●
7,60		3,08		●		
7,70		2,99		●		
7,80		2,91		●		
7,90		2,82		●		
8,00		2,73		●	●	●
8,10		2,65		●		
8,20		2,56		●		
8,30		2,47		●		
8,40		2,39		●		
8,50	11,0	3,17		●	●	●
8,60		3,08		●		
8,70		2,99		●		
8,80		2,91		●		
8,90		2,82		●		
9,00		2,73		●	●	●
9,05	11,0	2,69	1,0+0,50	●		
9,10		2,65		●		
9,20		2,56		●		
9,30		2,47		●		
9,40		2,39		●		
9,50	12,0	3,17		●	●	●
9,60		3,08		●		
9,70		2,99		●		
9,80		2,91		●		
9,90		2,82		●		
10,00		2,73		●	●	●
10,10		2,65		●		
10,20		2,56		●		
10,30		2,47		●		
10,40		2,39		●		
10,50	13,0	3,17		●	●	●
10,60		3,08		●		

Ø d1 h6	d2 ± 0,05	H + 0,20	r	L1 +0,5		
				71	80	100
10,70		2,99		●		
10,80		2,91		●		
10,90		2,82		●		
11,00		2,73		●	●	●
11,10		2,65		●		
11,20		2,56		●		
11,30		2,47		●		
11,40		2,39		●		
11,50	14,0	3,17		●	●	●
11,60		3,08		●		
11,70		2,99		●		
11,80		2,91		●		
11,90		2,82		●		
12,00		2,73		●	●	●
12,10		2,65		●		
12,20		2,56		●		
12,30		2,47		●		
12,40		2,39		●		
12,50	15,0	3,17		●	●	●
12,60		3,08		●		
12,70		2,99		●		
12,80		2,91		●		
12,90		2,82		●		
13,00		2,73		●	●	●
13,50	16	2,67	1,5+0,50	●	●	●
14,00		3,23		●	●	●
14,50	17	3,67		●	●	●
15,00		3,23		●	●	●
15,50	18	3,67		●	●	●
16,00		3,23		●	●	●
16,50	19,0	3,67	1,5+0,50	●	●	●
17,00		3,23		●	●	●
17,50	20,0	3,67		●	●	●
18,00		3,23		●	●	●
18,50	21,0	3,67		●	●	●
19,00		3,23		●	●	●
19,50	22,0	3,67		●	●	●
20,00		3,23		●	●	●



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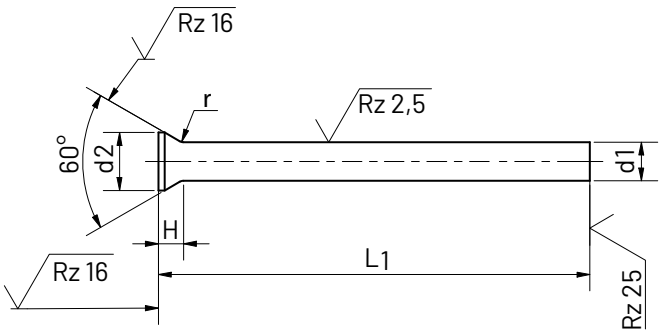
3 Prebijalna igla
Cutting Punch

DIN 9861 D



Rezilna igla z ugrezno glavo.

Cutting Punch with
a Countersunk head.

Dimenzije so prikazane v tabeli.

Material:
Vanadis 23

Na voljo tudi v drugih materialih.
Poglejte tabelo materialov.

Trdota:
Steblo: HRC 64 ± 2
Glava: HRC 50 ± 2

The dimensions are shown in the table.

Material:
Vanadis 23

Other materials available on request,
see table.

Hardnes:
Shank: HRC ca 53
Head: HRC ca 45

Ø d1 h6	d2 ± 0,05	h + 0,20	r	L1 +0,5		
				71	80	100
1,00	1,8	1,19	0,4+0,30	●		●
1,10		1,11		●		●
1,20	2,0	1,19		●		●
1,30		1,11		●		●
1,40	2,2	1,19		●		●
1,50		1,11		●	●	●
1,60	2,5	1,28		●	●	●
1,70		1,19		●	●	●
1,80	2,8	1,37		●	●	●
1,90		1,28		●		●
2,00	3,0	1,37	0,4+0,30	●	●	●
2,10	3,2	1,45		●	●	●
2,20		1,37		●		●
2,30	3,5	1,54		●	●	●
2,40		1,45		●		●
2,50		1,37		●	●	●

Ø d1 h6	d2 ± 0,05	h + 0,20	r	L1 +0,5		
				71	80	100
2,60						●
2,70	4,0	1,63	0,4+0,30	●	●	
2,80		1,54		●	●	●
2,90		1,45		●	●	●
3,00	4,5	1,80	0,6+0,40	●	●	●
3,10		1,71		●	●	●
3,20		1,63		●	●	●
3,30		1,54			●	●
3,40		1,45		●		●
3,50	5,0	1,80		●	●	●
3,60		1,71		●		●
3,70		1,63				●
3,80		1,54				●
3,90		1,45		●		●
4,00	5,5	1,80		●	●	●

Ø d1 h6	d2 ± 0,05	h + 0,20	r	l1 +0,5		
				71	80	100
4,10		1,71		●	●	●
4,20		1,63			●	●
4,30		1,54		●		●
4,50	6,0	1,80		●	●	●
4,60		1,71		●	●	
4,70		1,63				●
5,00	6,5	1,80	0,6+0,40	●	●	●
5,10		1,71		●	●	●
5,20		1,63				●
5,30		1,54				●
5,50	7,0	1,80				●
5,60		1,71				●
6,00	8,0	2,23	1,0+0,50	●	●	●
6,10		2,15				●
6,20		2,06				●
6,50	9,0	3,17		●	●	●
6,60		3,08			●	
6,80		2,91				●
7,00		2,73		●	●	●
7,10		2,65				●
7,50		3,17		●	●	●
8,00		2,73		●	●	●
8,20		2,56				●
8,30		2,47				●
8,50	11,0	3,17				●
9,00		2,73		●	●	●
9,20		2,56				●
9,50	12,0	3,17		●		
10,00		2,73		●	●	●
10,50	13,0	3,17		●		●
11,00		2,73		●		●
12,00		2,73		●	●	●
12,50	15,0	3,17				●
13,00		2,73				●
14,00		3,23				●
16,00		3,23		●		●

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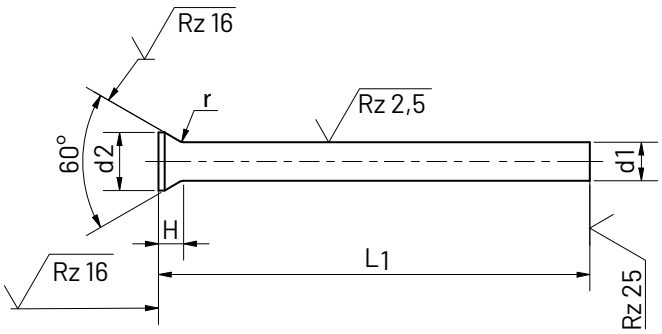
3 Prebijalna igla
Cutting Punch

DIN 9861 D
Kaljen / Hardened



Rezilna igla iz karbidne trdine z ugreznjeno glavo.

Tungsten Carbide punch with countersunk head.

Dimenzije so prikazane v tabeli.

Material:
Volframov karbid / trden karbid
V celoti izdelano iz karbidne trdine.

Na voljo tudi v drugih materialih.
Poglejte tabelo materialov.

Različica:
Izbirate lahko med spajkano ali trdo različico.

The dimensions are shown in the table.

Material:
Tungsten Carbide / Solid Carbide

Other materials available on request, see table.

Version:
It depends on the availability, whether we deliver the brazed or the solid version.

Ø d1 h6 [mm]	L1 +0,05 0 [mm]	d2 ±0,05 [mm]	H +0,02 0 [mm]	R min [mm]
1,0	71	1,8	1,19	0,4 +0,3
1,1			1,11	
1,2		2,0	1,19	
1,3			1,11	
1,4		2,2	1,19	
1,5			1,11	
1,6		2,5	1,28	
1,7			1,19	
1,8		2,8	1,37	
1,9			1,28	
2,0		3,0	1,37	
2,1		3,2	1,45	
2,2			1,37	
2,3		3,5	1,54	
2,4			1,45	
2,5			1,37	
2,6		4,0	1,71	
2,7			1,63	
2,8			1,54	
2,9			1,45	
3,0		4,5	1,80	0,6 +0,4
3,1			1,71	
3,2			1,63	
3,3			1,54	
3,4			1,45	

Ø d1 h6 [mm]	L1 +0,05 0 [mm]	d2 ±0,05 [mm]	H +0,02 0 [mm]	R min [mm]
3,5	71	5,0	1,80	0,6 +0,4
3,6			1,71	
3,7			1,63	
3,8			1,54	
3,9			1,45	
4,0		5,5	1,80	
4,1			1,71	
4,2			1,63	
4,3			1,54	
4,5		6,0	1,80	
4,6			1,71	
4,7			1,63	
4,9			1,45	
5,0		6,5	1,80	
5,5		7,0	1,80	
6,0		8,0	2,23	1,0 +0,5
6,5		9,0	3,17	
7,0			2,23	
7,5		10,0	3,17	
8,0			2,73	
9,0		11,0	2,73	
10,0		12,0	2,73	
15,0		17,0	3,23	1,5 +0,5

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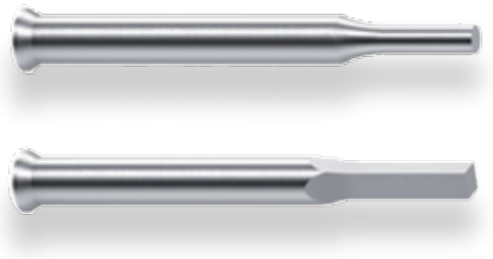
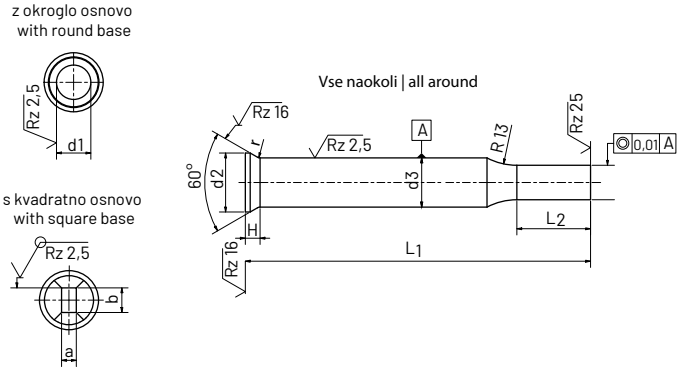
3 Prebijalna igla
Cutting Punch

DIN 9861 C





Rezilna igla z ugreznjeno glavo in različnimi reducirnimi oblikami.

Punch with countersunk head and various reduced points.

Dimenzije so prikazane v tabeli.

Tipi:
Tip CS - reducirni del v obliki kvadrata
Tip CR - reducirni del v obliki pravokotnika
Tip CO - reducirni del v obliki ovala

Material:
HWS (visoko legirno jeklo za delo v hladnem - 12% krom) / **HSS** (hitrorezno jeklo) / **Vanadis 23 / CPM 10V**

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti abraziji, visoka natezalna trdnost, visoka odpornost proti vročini.

Trdota:
Steblo: HWS 60-64, HSS 62-66
Glava: HWS 45-55, HSS 45-55

The dimensions are shown in the table.

Types
Type CS - square stepped shaft
Type CR - rectangular stepped shaft
Type CO - round elongated stepped shaft

Material:
HWS High alloy cold working steel (approx. 12% Chrome) / **HSS** (HSS steel)
Vanadis 23 / **CPM 10V**

Material properties:
HWS: High durability, long life
HSS: Extremely high durability for materials which are difficult to work with. Great abrasion resistance, high tear strength, high heat resistance.

Hardness:
Shank: HWS 60-64, HSS 62-66
Head: HWS 45-55, HSS 45-55

Prednostne dimenzije / Preferred dimensions: 71/80 and 100 mm
Druge dolžine / Other lenght: 60 and 90mm

Ø d1 h6	Stopnje-vanje Gradiation d1	L2 +0,5	Ø d3 h6	L1+0,5			Ø d2	Tol.	r	h+0,2
				71	80	100				
0,5-0,9	0,1	7	2,0	●	●	●	3,0	±0,10	0,4+0,03	1,37
1,0-1,5				●	●	●	3,0			
1,6-2,9			3,0	●	●	●	4,5		0,6+0,04	1,80

D1 h6	a ± 0,01	b ± 0,01	d2	Tol.	d3 h6	H +0,2 +0,1	r +0,5 0	L2 +0,5 0	L1 +0,5 +0			
									71/80	100	60	90
			4,5	± 0,1	3,0	1,80	0,6 +0,4 0		●	●	●	●
			5,5		4,0				●	●	●	●
			6,5	± 0,2	5,0				●	●	●	●
			8,0		6,0	2,23	1,0 +0,5 0	Na željo stranke možne tudi druge dolžine.	●	●	●	●
Na željo stranke G=max d3			9,0		7,0				●	●	●	●
At costumers request G=max d3			10,0		8,0				●	●	●	●
			12,0		10,0			On request other lengths are possible.	●	●	●	●
			14,0		12,0				●	●	●	●
			16,0		14,0	3,23	1,5+0,5 0		●	●	●	●
			18,0		16,0				●	●	●	●
			22,0		20,0				●	●	●	●

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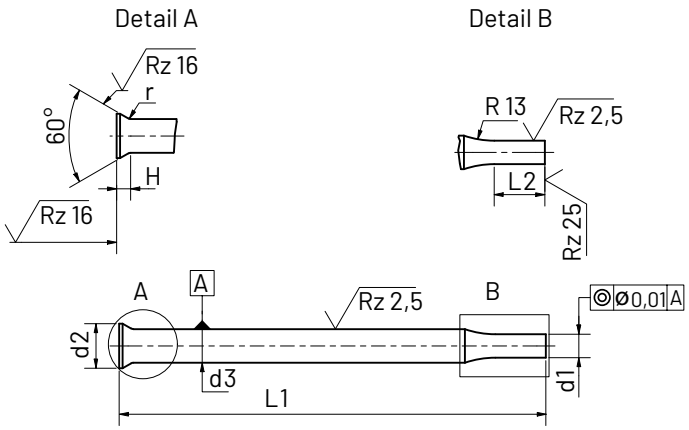
3 Rezilna igla
Punch Pin

DIN 9861 C



Rezilna igla s konično glavo in z reducirnim delom.

Punch Pin with a conical head and reduced point.

Dimenzije so prikazane v tabeli.

Material:
HWS (visoko legirno orodno jeklo za delo v hladnem; vsebuje 12% kroma) / **HSS** (hitrorezno jeklo)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti abraziji, visoka natezalna trdnost, visoka odpornost proti vročini.

Trdota:
Sreblo: HRC 62 ± 2
Glava: HRC 50 ± 5

The dimensions are shown in the table.

Material:
HWS: High alloy cold-work steel (approx. 12% Chrome) / **HSS** (HSS steel)

Other materials available on request, see material table.

Material properties:
HWS: High durability, long life
HSS: Extremely high durability for materials which are difficult to work with. Great abrasion resistance, high tear strength, high heat resistance.

Hardness:
Shaft: HRC 62 ± 2
Head: HRC 50 ± 5

Ø d1 h6	d2 ± 0,1	L2 +0,5 0	Ø d3 h6	H +0,2 0	r	L1+0,5 0	
						71	80
0,5	3	7	2,0	1,37	$0,4^{+0,03}$	●	●
0,6						●	●
0,7						●	●
0,8						●	●
0,9						●	●
1,0						●	●
1,1						●	●
1,2						●	●
1,3						●	●
1,4						●	●
1,5						●	●
1,6						●	●
1,7						●	●
1,8	4,5		3,0	1,8	$0,6^{+0,04}$	●	●
1,9						●	●
2,0						●	●
2,1						●	●
2,2						●	●
2,3						●	●
2,4						●	●
2,5						●	●
2,6						●	●
2,7						●	●
2,8						●	●
2,9						●	●

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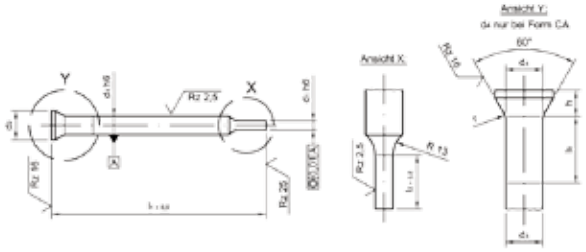
3 Rezilna igla
Punch Pin

DIN 9861 CA



Rezilna igla s konično glavo in z reducirnim delom.

Punch Pin with a conical head and reduced point.

Obseg uporabe:
V rezilnih orodjih za rezanje plošč, jekla, ne-železne kovine, plastiko, papir.

Dimenzije so prikazane v tabeli.

Prileganje / Toleranca:
Premer d1 (reducirni del), dolžina L2+0,5

Ø	0,5 - 3	3 - 6
h6	-0,006	-0,008

Premer stebla d3, celotna dolžina L1+0,5

Ø	1,5 - 3	3 - 6
h6	-0,006	-0,008

Material:
WS (legirno orodno jeklo za delo v hladnem) / **HWS** (visoko legirno orodno jeklo za delo v hladnem; vsebuje 12% kroma) / **HSS** (hitrorezno jeklo)

Lastnosti materiala:
WS: povprečna trpežnost
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti abraziji, visoka natezalna trdnost, visoka odpornost proti vročini.

Range of application:
Cutting tools, cutting boards, steel, non-ferrous metal, plastic, paper.

The dimensions are shown in the table.

Fit / Tolerance:
Nominal diameter d1 (reducing part), length L2 + 0.5

Ø	0,5 - 3	3 - 6
h6	-0,006	-0,008

Stem diameter d3, the total length L1 + 0.5

Ø	1,5 - 3	3 - 6
h6	-0,006	-0,008

Material:
WS: Alloyed cold-work steel / **HWS**: High alloy cold-work steel (approx. 12% Chrome) / **HSS** (HSS steel)

Material properties:
WS: Average durability
HWS: High durability, long life
HSS: Extremely high durability for materials which are difficult to work with. Great abrasion resistance, high tear strength, high heat resistance.

Trdota:
Steblo: WS in HWS 60 - 64, HSS 62 - 66
Glava: WS 40 - 50, HWS in HSS 45 - 55

Hardness:
Shank: WS and HWS 60 - 64, HSS 62 - 66
Head: WS 40 - 50, HWS in HSS 45 - 55

Obdelava:
Kaljeno, popuščano, steblo in reducirni del sta precizno brušena, 60° stožčasta vroče kovana glava, z dovoljeno nabreklostjo d4 takoj pod glavo.

Finish:
Hardened, annealed,precision ground shank and reduced point, 60 ° conical hot-forged head with a permissible shank to head concentric maximum d4.

Ø d1 h6	Stopnjevanje Gradiation d1	L2 +0,5	Ø d3 h6	L1+0,5		Ø d2	Tol.	r	h+0,2	d4	L3 max.
				71	80						
0,5 - 1,4	0,10	7	1,5	●	●	2,2	±0,05	$0,4^{+0,03}$	1,11	$d3^{+0,03}$	5
0,5 - 1,9			2,0	●	●	3,0	±0,10		1,37		
1,6 - 2,9			3,0	●	●	4,5		$0,6^{+0,04}$	1,80		
2,5 - 3,5	0,50	10	4,0	●	●	5,5					
3,5 - 4,5			5,0	●	●	6,5					6
4,5 - 5,5			6,0	●	●	8,0	±0,20	$1,0^{+0,05}$	2,23		

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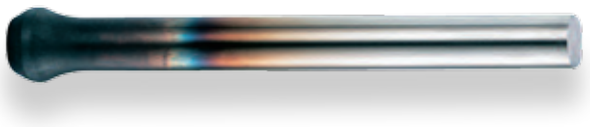
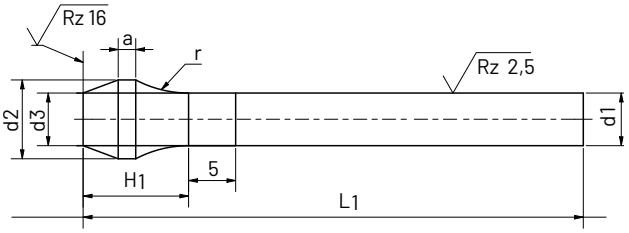
DIN 5118 DA
Kaljen / Hardened





Kovano območje | Forged zone max. d1 +0,04

Rezilna igla s pozavnasto glavo.

Bottle neck puch pins

Material:
HSS (Hitrorezna jekla)
Vanadis 23 (Jekla prašne metalurgije in posebna jekla)

Na voljo tudi v drugih materialih.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
Napustna obstojnost do 200°C / 392°F

Trdota:
Steblo: HRC 60 ± 2
Glava: HRC 50 ± 5

Material:
HSS (High speed steels)
Vanadis 23 (Powdered steels and special steels)

Available in other materials.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
Resistant up to 200 ° C / 392 ° F

Hardness:
Shank: HRC 60 ± 2
Head: HRC 50 ± 5

Ø d1 h6 [mm]	d2 ±0,05 [mm]	H1 +0,02 0 [mm]	a +0,1 [mm]	d3 ≈ [mm]	R 0 -0,2 [mm]	L1 +0,05 0 [mm]		
						71	80	100
3,0	4,5	6,03	1,0	d1±0,1	6,5	●	●	●
3,3						●	●	●
3,4						●	●	●
3,6	5,0				8,0	●	●	●
3,8						●	●	●
3,9						●	●	●
4,0	5,5	7,38				●	●	●
4,1			1,5			●	●	●
4,2						●	●	●
4,3						●	●	●
4,4						●	●	●
4,6	6,0					●	●	●
4,8						●	●	●
5,0	7,0	8,36			10,00	●	●	●
5,2	7,0		1,5	d1±0,1	10,00	●	●	●
5,3						●	●	●
5,4						●	●	●
5,5	8,0					●	●	●
5,6						●	●	●
5,7						●	●	●
5,9						●	●	●
6,0	9,0	9,27				●	●	●
6,5	10,0				12,00	●	●	●
8,0	11,0	9,81		d1±0,2		●	●	●
10,0	14,0	11,48			15,00	●	●	●
11,0	15,0					●	●	●
12,50	16,0					●	●	●

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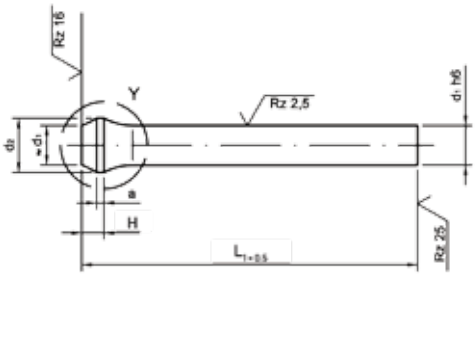
Pozavnasta rezilna igla
Bottle-Neck Punch



Pozavnasta rezilna igla s cilindričnem steblom.

Bootle-neck punch pins with cylindrical shank.

Obseg uporabe:
Za stiskalna orodja z ekstremno visokimi zahtevami.
Dimenzije so prikazane v tabeli.

Prileganje / Toleranca:
Steblo d1

	0,5-3	3-6	6-10	10-16	16-20	20-25
h6	-0,006	-0,008	-0,009	-0,011	-0,013	-0,015

Dolžina L1+0,5

Material:
HWS (visoko legirno jeklo za delo v hladnem - 12% krom) / HSS (hitrorezno jeklo)

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti obrabi, visoka natezalna trdnost, visoka odpornost proti vročini.

Trdota HRC:
Steblo: HWS 60 - 64, HSS 62 - 66
Glava: HWS in HSS 45 - 55

Obdelava:
Kaljeno, napuščeno, steblo precizno brušeno, pozavnasta glava vroče kovana z dovoljeno nabreklino (d3) takoj pod glavo.

Range of application:
For pressing tools with extremely high requirements.
The dimensions are shown in the table.

Fit / Tolerance:
Nominal diameter stem d_1

	0,5-3	3-6	6-10	10-16	16-20	20-25
h6	-0,006	-0,008	-0,009	-0,011	-0,013	-0,015

Length $L_{1+0.5}$

Material:
HWS: High alloy cold working steel (approx. 12% Chrome)/ **HSS** (HSS steel)

Material properties:
HWS: high durability, long life
HSS: extremely high durability for materials which are difficult to work with. High abrasion resistance, high tension strength, high heat resistance.

Hardness: HRC:
Shank: HWS 60 - 64, HSS 62 - 66
Head: HWS in HSS 45 - 55

Finish:
Tempered, hardened, precision-ground shank, trombone head hot forged with the permissible shank to head concentric maximum.

Opomba | Note

HSS rezilne igle so lahko na zahtevo prevlečene s posebno prevleko. Dobavljiva so tudi potrebna grezila za glavo.

HSS punch pins can be treated with a special surface coating upon request. Available is also needed countersink head.

Ø d1 h6	Stopnjevanje Gradiation d1	Ø d2 -0,2	H1 +0,2	a ±0,1	d3	r 0 -0,2	L1+ 0,5				
							71	80	100	110	120
2,0	0,1	3,0	3,0	1,0	d1 ±0,01	3,5	●	●	●	●	●
≥ 2,1		3,2					●	●	●	●	●
2,2								●	●		
≥ 2,3		3,5				5,0	●	●	●	●	●
2,4							●		●		
2,5							●	●	●		
≥ 2,6		4,0				6,5	●	●	●	●	●
2,7							●	●	●		
2,8							●		●		
2,8									●		
≥ 3,0		4,5					●	●	●	●	●
3,1							●	●	●		
3,2							●	●	●		
3,3							●		●		
3,4							●		●		
≥ 3,5		5,0				8,0	●	●	●	●	●
3,6							●		●		
3,7									●		
3,8								●	●		
3,9									●		
≥ 4,0		5,5	4,0	1,5			●	●	●	●	●
4,1							●	●	●		
4,2							●	●	●		
4,3								●	●		
4,4									●		
≥ 4,5		6,0					●	●	●	●	●
4,6									●		
4,7									●		
4,8							●	●	●		
4,9									●		
≥ 5,0		7,0				10,0	●	●	●	●	●
5,1							●		●		
5,2								●	●		
5,3								●	●		
5,4									●		
≥ 5,5		8,0					●	●	●	●	●
5,6							●	●	●		
5,7							●	●	●		
5,8									●		
5,9									●		
6,0	0,5	9,0					●	●	●	●	●
6,1									●		
6,2									●		
6,3									●		
6,4									●		
≥ 6,5		10,0				12,0	●	●	●	●	●
6,6									●		
6,7									●		
6,8									●		
7,0							●	●	●		
≥ 7,5		11,0					●	●	●	●	●
8,0							●	●	●		

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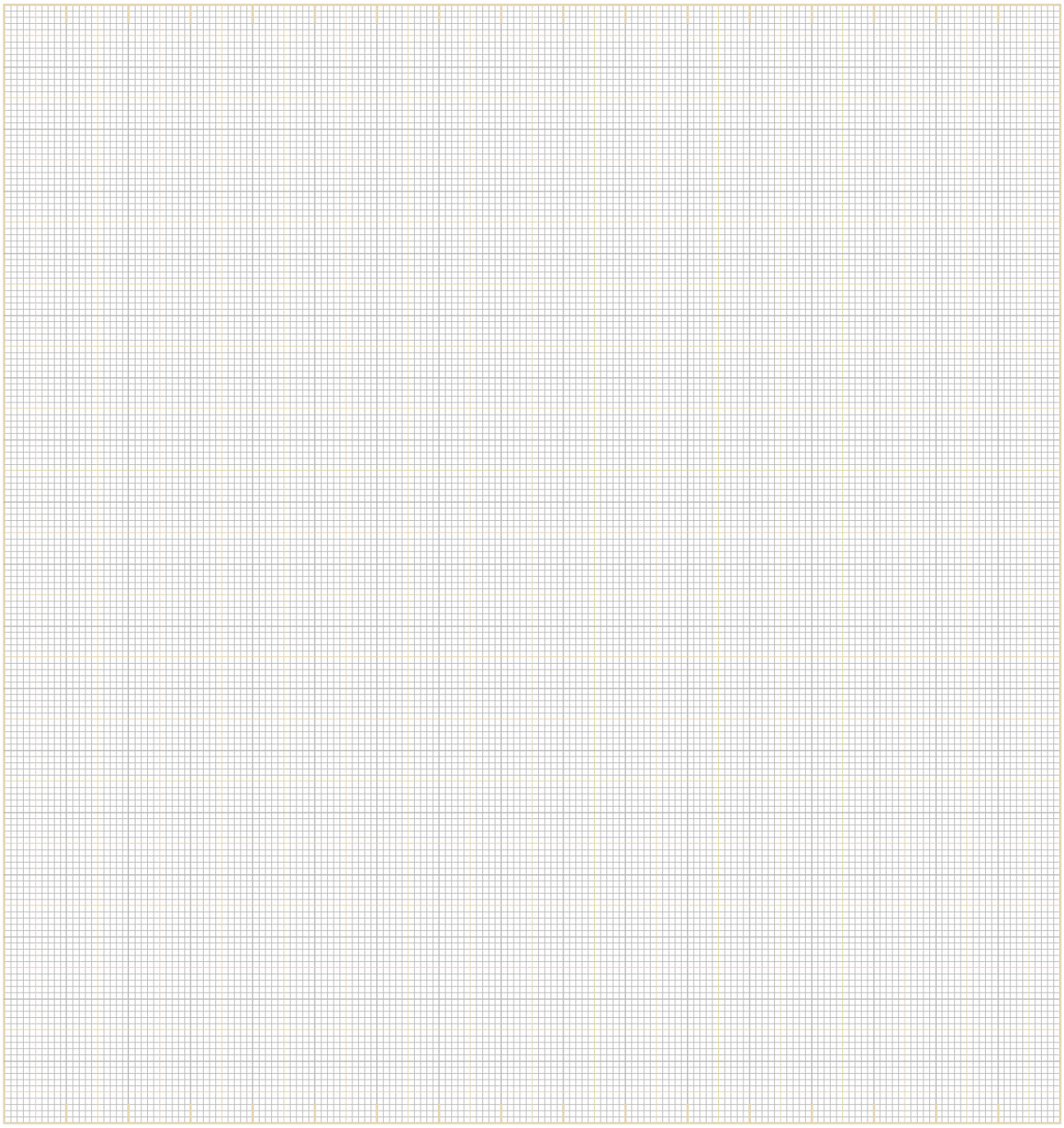
Pozavnasta rezilna igla
Bottle-neck punch

Ø d1 h6	Stopnjevanje Gradiation d1	Ø d2 -0,2	H1 +0,2	a ±0,1	d3	r 0 -0,2	L1+ 0,5				
							71	80	100	110	120
8,1							●		●		
8,2									●		
8,3									●		
8,4									●		
≥ 8,5		13,0			d1 ±0,02	15,0	●	●	●	●	●
9,0							●	●	●		
9,4									●		
9,5		14,0					●	●	●	●	●
10,0							●	●	●	●	●
10,50		15,0					●	●	●	●	●
11,00							●	●	●	●	●
11,50		16,0					●	●	●	●	●
12,00							●	●	●	●	●
12,5		17,0					●	●	●		●
13,00	1,0	17,0					●	●	●	●	●
13,5		18,0					●	●	●		●
14,00		18,0					●	●	●	●	●
14,50		19,0					●	●	●	●	●
15,00							●	●	●	●	●
15,5		20,0					●	●	●		●
16,00		20,0					●	●	●	●	●
16,5		21,0					●	●	●		●
17,00		21,0					●	●	●	●	●
17,5		22,0					●	●	●		●
18,00		22,0					●	●	●	●	●
18,5		23,0					●	●	●		●
19,00		23,0					●	●	●	●	●
19,5		25,0					●	●	●		●
20,00		25,0					●	●	●	●	●
22,00		27,0					●	●	●	●	●
25,00		30,0					●	●	●	●	●



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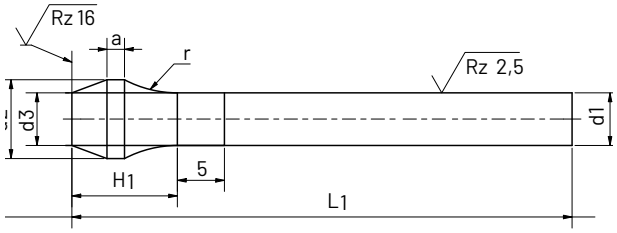
DIN 5118 D
Bottle-Neck Punch



Pozavnasta rezilna igla.

Cutting Punch with botle neck.

Dimenzije so prikazane v tabeli.

Material:
Vanadis 23

Na voljo tudi v drugih materialih.
Poglejte tabelo matererialov.

Trdota:
Steblo: HRC 64 ± 2
Glava: HRC 50 ± 5

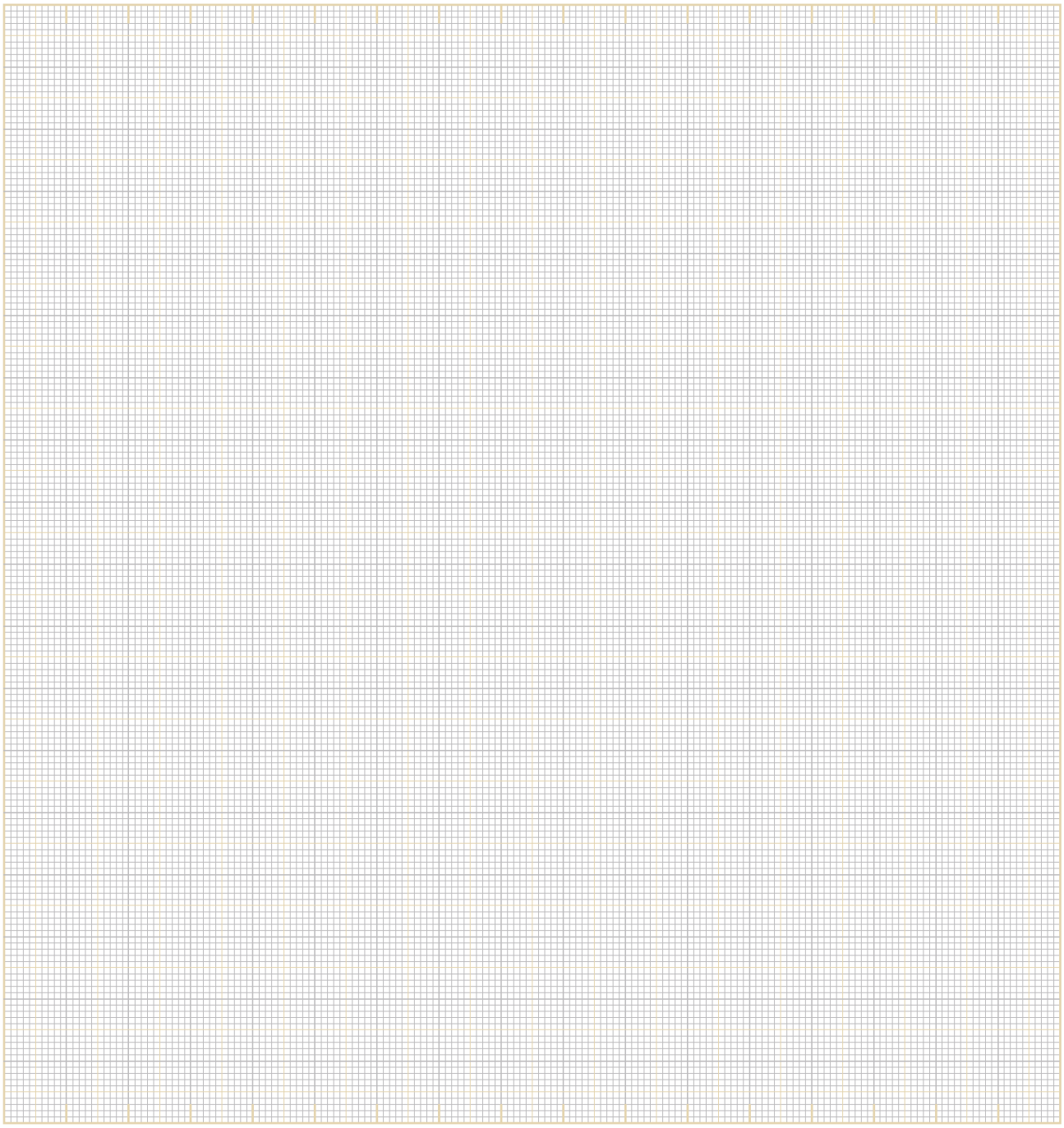
The dimensions are shown in the table.

Material:
Vanadis 23

Other materials available on request, see material table.

Hardnes:
Shank: HRC 64 ± 2
Head: HRC 50 ± 5

Ø d1 h6	d2 ± 0,1	H 1 + 0,2 0	a±0,1	d3=	r 0 -0,2	L1 +0,5
						100
4	5,5	7,38	1,5	4	8	●
5	7	8,36		5	10	●
6	9	9,27		6		●



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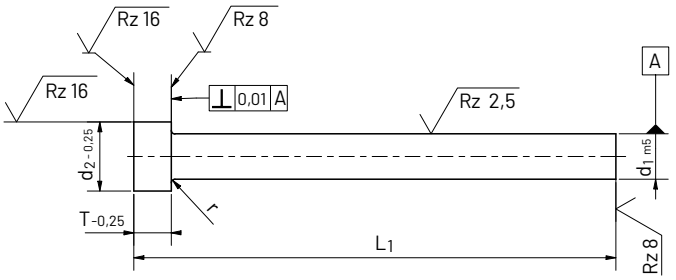
3 Prebijalna igla
Cutting Punch

ISO 8020 A



Precizna izvedba rezilne igle s cilindričnima steblom in glavo, brušeno.

Precision designed Punch Cutting Pin with cylindrical shank and head, plunge cut ground.

Obseg uporabe:
V rezilnih orodjih za rezanje lukenj v plošče (perforacija).

Dimenzije so prikazane v tabeli.

Prileganje / Toleranca:
premer stebla d1, dolžina L+1

Ø	3	4+5+6	8+10	13+16	20+25	32
M5	+0,006	+0,009	+0,012	+0,015	+0,017	+0,020
	+0,002	+0,004	+0,006	+0,007	+0,008	+0,009

Material:
HWS (visoko legirano orodno jeklo za delo v hladnem; vsebuje 12% kroma) / **HSS** (hitrorezno jeklo)HSS (Hitrorezna jekla)

HWS* (Jeklo za hladno preoblikovanje)
** Na voljo samo v omejenem številu iz zaloge.*

Št. materiala:
- 1.2343 X38CrMoV5-1
- 1.3343 (S 6-5-2)

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti obrabi. Visoka natezalna trdnost, visoka odpornost proti vročini.

Range of application:
In cutting tools for cutting holes in the plate (perforation).

The dimensions are shown in the table.

Fit / Tolerance:
Shank nominal diameter d1, length L+1

Ø	3	4+5+6	8+10	13+16	20+25	32
M5	+0,006	+0,009	+0,012	+0,015	+0,017	+0,020
	+0,002	+0,004	+0,006	+0,007	+0,008	+0,009

Material:
HWS (High alloy cold working steel; approx. 12% Chrome) / **HSS** (High speed steels)

HWS* (Cold working tool steel)
** Only available in limited numbers in HWS from stock.*

Material Number:
- 1.2343 X38CrMoV5-1
- 1.3343 (S 6-5-2)

Material properties:
HWS: High durability, long life
HSS: Extremely high durability for materials which are difficult to work with. High abrasion resistance. High tear strength, high heat resistance.

Opomba | Note

HSS igle so lahko na zahtevo prevlečene s posebno prevleko. Možne so tudi igle iz volfram karbida (hartmetall).

HSS punch pins can be coated with a special coating upon request. Tungsten carbide (hartmetall) coating possible.

Trdota:
Steblo **WS** 60 - 64, **HSW** 60 - 64
Glava **WS** 40 - 50, **HSW** 45 - 55

Hardness:
Shank **WS** 60 - 64, **HSW** 60 - 64
Head **WS** 40 - 50, **HSW** 45 - 55

Obdelava:
Kaljeno, popuščeno, 60° stožčasta vroče kovana glava, naknadno brušeno po celotni dolžini, vključno z glavo.

Finish:
A hardened, tempered, 60 ° conical hot forged head, subsequently ground along its entire length, including the head.

Ø d1 m5	Ø d2-0,25	r ±0,1	T+0,25	L+1						
				63	71	80	90	100	120	130
1,5	3	0,2	3					●		
1,5			5					●		
2	4		3					●		
2			5					●		
2,5	5		3					●		
2,5			5					●		
3			3	●	●	●	●	●		
3			5	●	●	●	●	●		
3,5	6		3					●		
3,5			5					●		
4			3	●	●	●	●	●	●	
4			5	●	●	●		●		
4,5	7		3					●		
4,5			5					●		
5	8	0,3		●	●	●	●	●	●	
5,5	6							●		
6	9			●	●	●	●	●	●	
6,5	10							●		
7								●		
7,5	11							●		
8				●	●	●	●	●	●	●
8,5	12							●		
9								●		
10	13			●	●	●	●	●	●	●
11	14	0,4						●		
12	15							●		
13	16			●	●	●	●	●	●	
16	19			●	●	●	●	●	●	
20	23			●	●	●	●	●		
25	28			●	●	●	●	●		
32	35				●	●	●	●		

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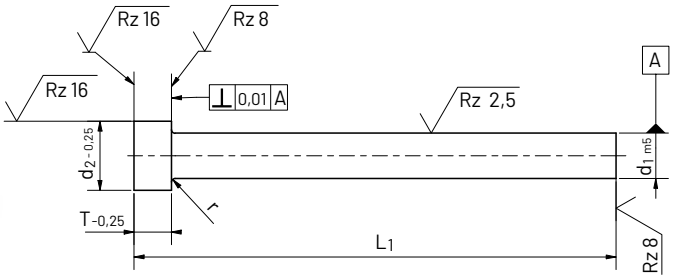
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 A



Prebijalna igla s cilindrično glavo.

Cutting Punch with cylindrical Head.

Dimenzije so prikazane v tabeli.

Material:
HWS* (visoko legirano orodno jeklo za delo v hladnem; vsebuje 12% kroma) / **HSS** (hitrorezno jeklo) / **Vanadis 23** (jekla prašne metalurgije in posebna jekla) / **CPM 10 V** (jekla prašne metalurgije in posebna jekla) / **Karbidna trdina**

Različica:
Brušen iz trdega karbida.

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
- 1.2379 (X155CrVMo12-1)
- 1.3343 (S 6-5-2)

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti obrabi. Visoka natezalna trdnost, visoka odpornost proti vročini.

Trdota:
Steblo: HRC 60 ± 2
Glava: HRC 45 ± 5

The dimensions are shown in the table.

Material:
HWS* (High alloy cold working steel; approx. 12% Chrome) / **HSS** (High speed steels) / **Vanadis 23** (Powdered steels and special steels) / **CPM 10 V** (Powdered steels and special steels) / **Solid Carbide**

Version:
Grinded from solid carbide.

Other materials available on request, see material table.

Material Number:
- 1.2379 (X155CrVMo12-1)
- 1.3343 (S 6-5-2)

Material properties:
HWS: High durability, long life
HSS: Extremely high durability for materials which are difficult to process. High abrasion resistance. High tear strength, high heat resistance.

Hardness:
Shaft: HRC 60 ± 2
Head: HRC 45 ± 5

Opomba | Note

** Na voljo samo v omejenem številu iz zaloge.*

** Only available in limited numbers in HWS from stock.*

HWS, HSS, HWS*

Ø d1 m5	d2 0 ± 0,15	T1 + 0,2 + 0,5	r + 0,1 0	L1 +0,5 +0,2				
				63	71	80	90	100
3	5	3,15	0,3	●	●			●
4	6,5			●	●	●		●
5	8			●	●	●		●
6	9				●			●
8	11	4,2			●	●		●
10	13			●	●	●		●
13	16			●		●	●	
16	19				●	●	●	●
20	23					●		

Vanadis 23

Ø d1 m5	d2 ± 0,15	H 1 + 0,2 + 0,5	r + 0,1 0	L1 +0,5 +0,2				
				83	71	80	90	100
3	5	3	0,2	●	●			
4	6			●	●	●		●
4		5						●
5	8		0,3	●	●	●	●	●
6	9			●	●	●	●	●
8	11			●	●	●	●	●
10	13			●	●	●	●	●
13	16		0,4		●	●	●	●
16	19				●			
20	23							●

CPM 10 V

Ø d1 m5	d2 ± 0,15	H1 + 0,2 + 0,5	r + 0,1 0	L1 +0,5 +0,2
				+0,5
3	5	3	0,2	
4	6			●
5	8	5	0,3	●
6	9			●
8	11			●
10	13			●
13	16		0,4	●
16	19			●

Solid Carbide

Ø d1 m5	d2 ± 0,15	H1 + 0,2 + 0,5	r + 0,1 0	L1 +0,5 +0,2
				100
1	2,0	5	0,3	●
1,1	2,0			●
1,2				●
1,3	2,5			●
1,4				●
1,5	3,0			●
1,6				●
1,7				●
1,8	3,2			●
1,9				●
2				●
2,1	3,7			●
2,2				●
2,3	4,0			●
2,4				●
2,5				●
2,6	4,5			●
2,7				●
2,8				●
2,9				●
3	5,0			●
3,1				●
3,2				●
3,3				●
3,4				●

Ø d1 m5	d2 ± 0,15	H1 + 0,2 + 0,5	r + 0,1 0	L1 +0,5 +0,2
				100
3,5	5,5			●
3,6				●
3,7				●
3,8				●
3,9				●
4	6,0			●
4,1				●
4,2				●
4,3				●
4,4				●
4,5	7,0			●
4,6				●
4,7				●
4,8				●
4,9				●
5	8,0			●
5,5	8,5			●
6	9,0			●
6,5	9,5			●
7	10,00			●
7,5	10,5			●
8	11,00			●
9	12,00			●
10	13,00			●

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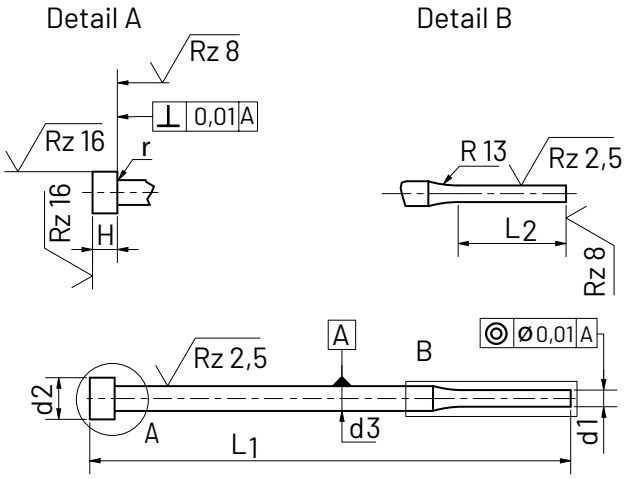
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 B



Prebijalna igla s cilindrično glavo.

Punch with cylindrical head

Precizno zglajena rezilna igla z reducirnim rezilnim delom in cilindrično glavo, brušeno.

Precision smoothed Punch Pin with reduced point and cylindrical head, plunge cut ground.

Obseg uporabe:
V rezilnih orodjih za rezanje lukenj v plošče. Dimenzije so prikazane v tabeli.

Range of application:
Cutting tools for cutting holes in the plates. The dimensions are shown in the table.

Prileganje / Toleranca:
Reducirni del premer d_3, dolžina $L_{1+0,5}$

Fit / Tolerance:
Reduced point diameter d_3, the length $L_{1+0.5}$

Ø	0,8-3	3-6	6-10	10-18	18-30	30-31,9
	+0,004	+0,006	+0,009	+0,008	+0,009	+0,011
J6	-0,002	-0,002	-0,002	-0,003	-0,004	-0,005

Steblo premer d1, dolžina l+1

Stem diameter d1, length L+1

Ø	3	4+5+6	8+10	13+16	20+25	32
	+0,006	+0,009	+0,012	+0,015	+0,017	+0,020
M5	+0,002	+0,004	+0,006	+0,007	+0,008	+0,009

Material:
HSS (Hitrorezna jekla)
HWS (Jeklo za hladno preoblikovanje)

Material:
HSS (High speed steels)
HWS (Cold working tool steel)

Karakteristike:
HWS: visoka trpežnost, dolga življenjska doba
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti obrabi. Visoka natezalna trdnost, visoka odpornost proti vročini.

Material properties:
HWS: high durability, long life
HSS: extremely high durability for materials that are difficult to process. High abrasion resistance. High tear strength, high heat resistance.

Opomba | Note

HSS igle so lahko na zahtevo prevlečene s posebno prevleko. Možne so tudi igle iz volfram karbida (hartmetall).

HSS punch pins can be coated with a special coating upon request. Tungsten carbide (hartmetall) coating possible.

Trdota:
Steblo: WS 60 -64 / HWS 60-64
Glava: WS 40 -50 / HWS 45-55

Hardnes:
Shaft: WS 60 -64 / HWS 60-64
Head: WS 40 -50 / HWS 45-55

Obdelava:
Kaljeno, popuščeno, 60° stožčasta vroče kovana glava, naknadno brušeno po celotni dolžini, vključno z glavo.

Finish:
Hardened, tempered, 60 ° conical hot-forged head, subsequently ground over the entire length, including the head.

Ø d3 j6	Stopnje-vanje Gradiation d3	Ø d2-0,25	Ø d1 m5	T+0,25	r ±0,1	L1 +0,5 0	L+1				
							63	71	80	90	100
0,8 - 2,9	0,10	5	3	3	0,20	10	●	●	●		
1,0 - 3,9		6	4				●	●	●		
1,0 - 4,9		8	5	5	0,30		●	●	●		
1,6 - 5,9		9	6				●	●	●	●	●
2,5 - 7,9		11	8			13	●	●	●	●	●
4,0 - 9,9		13	10			17	●	●	●	●	●
5,0 - 12,9		16	10		0,4		●	●	●	●	●
8,0 - 15,9		19	16				●	●	●	●	●
12,0 - 19,5		24	20					●	●	●	●
16,5 - 24,5	0,50	29	25					●	●	●	●
20,0 - 31,9		36	32					●	●	●	●

L2 10 mm

Ø d1 h6 [mm]	Stopnjevanje Gradation d2	d2 0 - 0,15 [mm]	d3 h6 [mm]	H 0 -0,2 [mm]	R 0 -0,2 [mm]	L2 +0,05 0 [mm]	L1 +0,05 +0,2			
							71	80	90	100
0,8 -1,9		5	3	3	0,2	10	●	●		
2,0 -2,9	0,1	5					●	●		
1,0-1,9		6	4				●	●		
2,0 - 2,9							●	●		
3,0 - 3,9			5				●	●		
1,2 - 1,9		8		5	0,2		●	●		
2,0 - 2,9							●	●		
3,0 - 3,9							●	●		
4,0 - 4,9							●	●		
1,6 - 2,9		9	6				●	●	●	●
3,0 - 3,9							●	●	●	●
4,0 - 4,9							●	●	●	●
5,0 - 5,9							●	●	●	●

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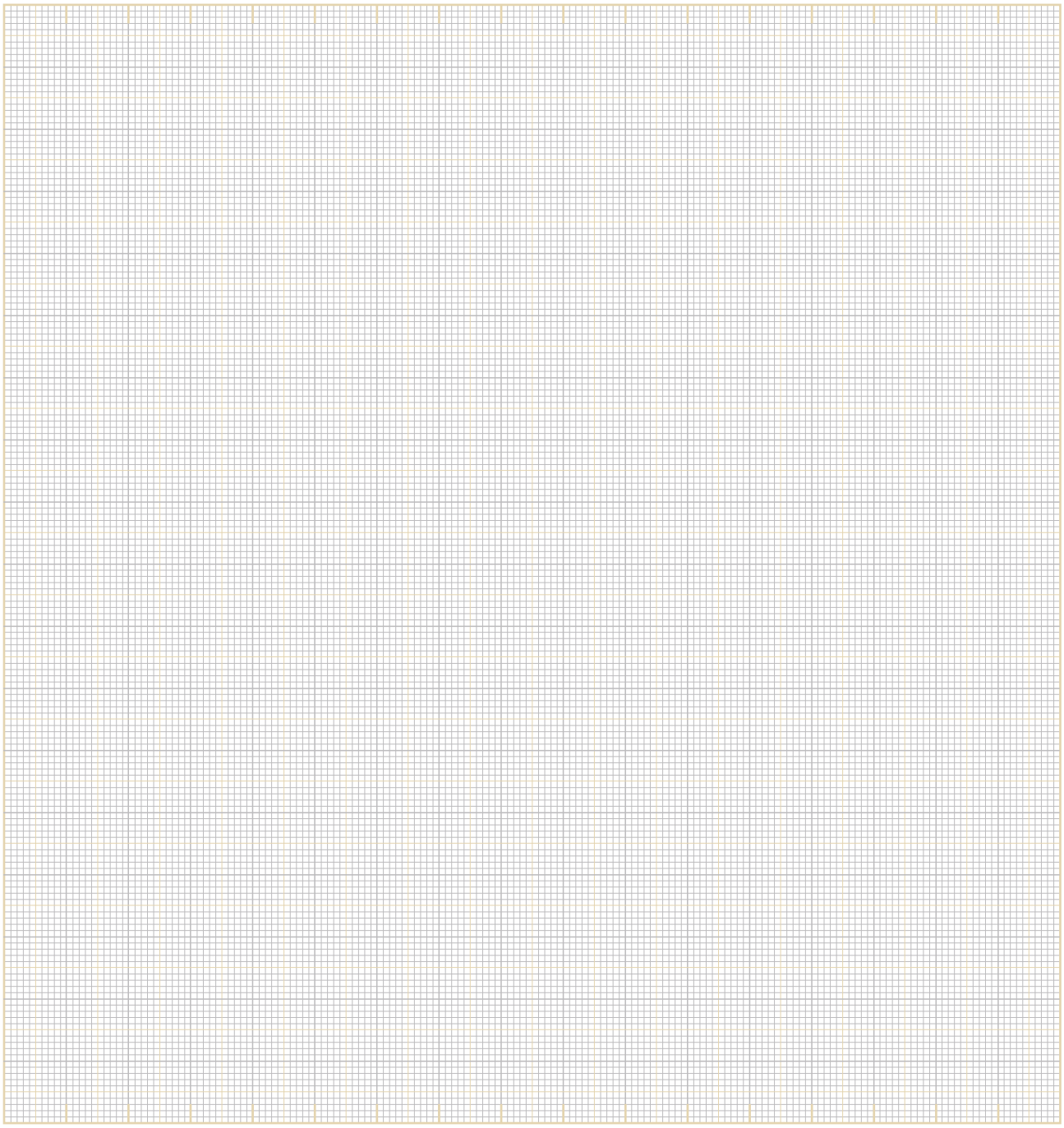
3 Rezilna igla
Punch Pin

L2 13 mm

Ø d1 h6 [mm]	Stopnjevanje Gradation d2	d2 0 - 0,15 [mm]	d3 h6 [mm]	H 0 -0,2 [mm]	R 0 -0,2 [mm]	L2 +0,05 0 [mm]	L1 +0,05 +0,2			
							71	80	90	100
2,5-3,9		11	8	5	0,3	13	●	●	●	●
4,0-4,9	0,1						●	●	●	●
5,0-5,9							●	●	●	●
6,0-6,9							●	●	●	●
7,0-7,9							●	●	●	●

L2 17 mm

Ø d1 h6 [mm]	Stopnjevanje Gradation d2	d2 0 - 0,15 [mm]	d3 h6 [mm]	H 0 -0,2 [mm]	R 0 -0,2 [mm]	L2 +0,05 0 [mm]	L1 +0,05 +0,2			
							71	80	90	100
4,0-4,9		13	10	5	0,3	17	●	●	●	●
5,0-5,9	0,1						●	●	●	●
6,0-6,9							●	●	●	●
7,0-7,9							●	●	●	●
8,0-8,9							●	●	●	●
9,0-9,9							●	●	●	●
5,0-5,9		16	13		0,4		●	●	●	●
6,0-6,9							●	●	●	●
7,0-7,9							●	●	●	●
8,0-8,9							●	●	●	●
9,0-9,9							●	●	●	●
10,0-10,9							●	●	●	●
11,0-11,9							●	●	●	●
12,0-12,9							●	●	●	●
8,0-8,9		19	16				●	●	●	●
10,0-10,9							●	●	●	●
11,0-11,9							●	●	●	●
12,0-12,9		0					●	●	●	●
13,0-13,9							●	●	●	●
14,0-14,9							●	●	●	●
15,0-15,9							●	●	●	●
12,0-13,0		23	20					●	●	●
13,5-14,5								●	●	●
15,0-16,0								●	●	●
16,5-17,5								●	●	●
18,0-19,5								●	●	●
19,5-21,5			28					●	●	●
22,0-23,0								●	●	●



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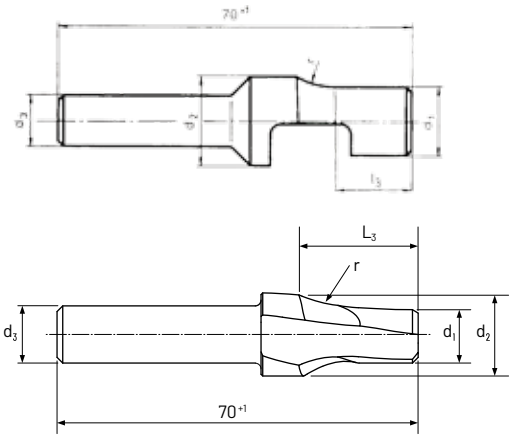
3 Prebijalna igla
Cutting Punch

Povrtalna rezila
Countersink tool



Grezilno orodje s pozavnasto rezilno iglo - eno in tri stranskim prirezovalnikom.

Countersink tool for bottle-neck punch with one or three - side trimmer.

Obseg uporabe:
Grezilno orodje s pozavnasto rezilno iglo - enostranski ali tristranski prirezovalnik.

Dimenzije so prikazane v tabeli.

Material:
HSS (Hitrorezna jekla)

Št. materiala:
- 1.3343 (S 6-5-2)

Karakteristike:
HSS: ekstremno visoka trpežnost, za materiale s katerimi se težko dela. Velika odpornost proti obrabi. Visoka natezalna trdnost, visoka odpornost proti vročini.

Obdelava:
Kaljeno, napuščeno in polirano.

Range of application:
Countersink tool for bottle-neck punch with one - side or three side trimmer.

The dimensions are shown in the table.

Material:
HSS (High speed steels)

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: Extremely high durability for materials which are difficult to process. High abrasion resistance. High tear strength, high heat resistance.

Finish:
Hardened, tempered and grounded.

d1 f7	d2 h8	d3 h11	r + 0,2	L3	70 $_{+1}$
≥ 2,0	3,3	3,3	3,5	5,0	●
≥ 2,1	3,5	3,5			●
≥ 2,3	3,8		5,0		●
≥ 2,5	3,8	3,8	5,0		●
≥ 2,6	4,3		6,5	7,0	●
2,7		4,3			●
≥ 3,0	4,9				●
3,1		4,9			●
3,3					●
≥ 3,5	5,4		8,0		●
3,6		5,4			●
≥ 4,0	5,9	5,9		8,0	●
4,1					●
4,2					●
4,3					●
≥ 4,5	6,4	6,4			●
4,8					●
≥ 5,0	7,4	7,4	10,0	10,0	●
5,2					●
≥ 5,5	8,5				●
5,7		8,5			●
5,8					●
≥ 6,0	9,5				●
≥ 6,5	10,5	10,5	12,0	12,0	●
7,0					●
≥ 7,5	11,5	10			●
8,0					●
≥ 8,5	13,5	10	15,0	12,0	●
9,0					●
≥ 9,5	14,5				●
10,5					●
≥ 10,5	15,5			15,0	●
11,0					●
≥ 11,5	16,5				●
12,0					●
≥ 12,5	17,5				●
13,0					●
≥ 13,5	18,5				●
14,0					●
≥ 14,5	19,5				●
15,0					●
≥ 15,5	20,5				●
16,0					●
≥ 16,5	21,5	16			●
≥ 17,5	22,5				●
≥ 18,5	23,5				●
19,0					●
≥ 19,5 - 20,0	25,5				●

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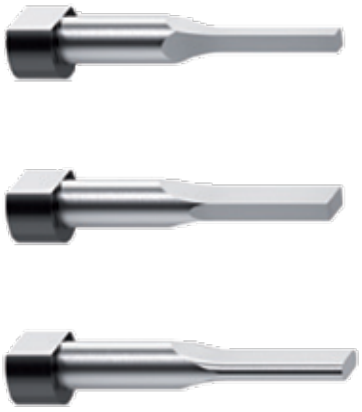
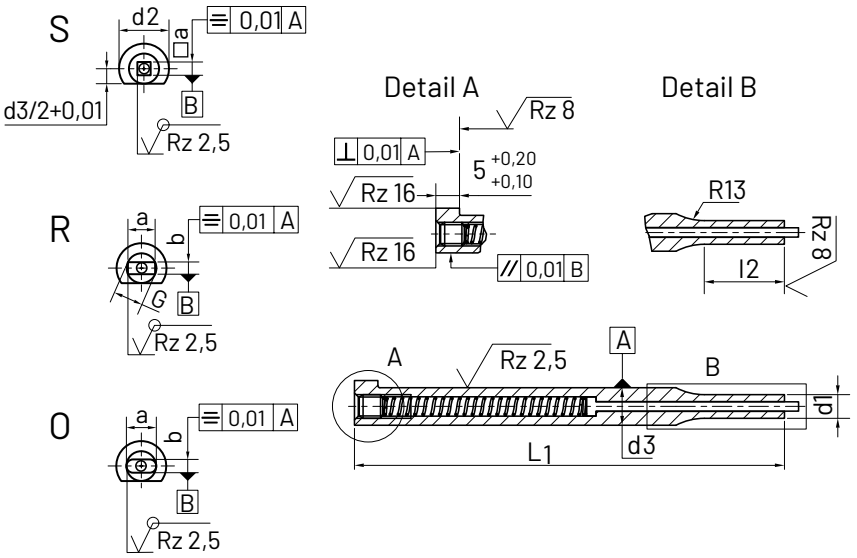
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 C





Prebijalna igla s cilindrično glavo.

Cutting Punch with cylindrical head.

Obseg uporabe:
Rezilna igla s cilindrično glavo in reducirnim delom v obliki pravokotnika ali ovala, podobna standardu DIN ISO 8020 tip C.

Dimenzije so prikazane v tabeli.

Tipi:
Tip CS: reducirni del v obliki kvadrata
Tip CR: reducirni del v obliki pravokotnika
Tip CO: reducirni del v obliki ovala / zaobljenega pravokornika

Material:
HWS (visoko legirno jeklo za delo v hladnem - 12% krom) / **HSS** (hitrorezno jeklo) / **ASP 23** (polprašno orodno jeklo Vanadis 23) / **HM** (karbidna kovina)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Različica in trdota:
Umestitev ravnega dela je vedno na daljši strani glede na smer na glavi. Če želite, vam lahko spremenimo orodje, da je ravna ploskev na krajši strani.

Range of application:
Punch with cylindrical head and with stepped pin, rectangular and round elongated point similar to DIN ISO 8020 standard type C.

The dimensions are shown in the table.

Types:
Type CS: square stepped cutting shaft
Type CR: rectangular stepped cutting shaft
Type CO: oblong stepped cutting shaft

Material:
HWS High alloy cold working steel (approx. 12% Chrome) / **HSS** (High speed steels) / **ASP 23 -** non cobalt grade for high performance cutting tools, cold work tools / **HM** (hardmetall)

Other materials available on request, see material table.

Version and Hardness:
The locating flat can always be found on the longest side. If desired, we can modify the tool so that the locating flat is on the shortest side.

Opomba | Note

Rezilni klini-izbijači niso na zalogi, vendar jih lahko izdelamo v kratkem času. Varnostni zaklop je vedno na dolgi strani. Na zahtevo lahko izdelamo varnostni zaklop proti zasuku tudi na kratki strani. Dostava poteka, odvisno od razpoložljivosti, s križno luknjo.

Cutting punches are not stocked, but can be produced at short notice. The anti-twist lock is always at the longest form side. On request, we can manufacture the anti-twist lock at the short form side. The delivery takes place, depending on availability, with cross hole.

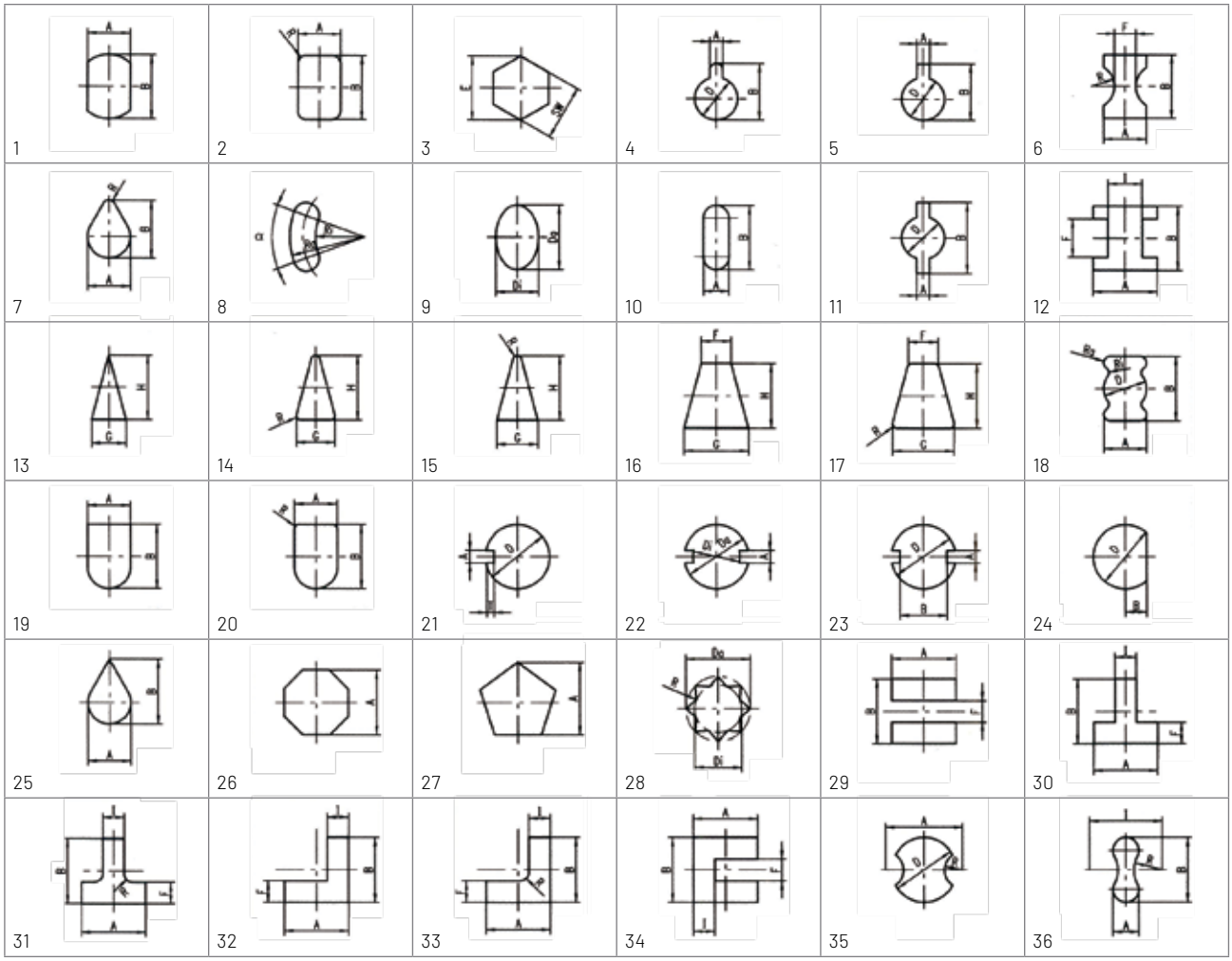
a ± 0,01	b ± 0,01	d_2 0 - 0,15	d_3 m5	H + 0,2 + 0,1	r + 0,5 0	L_2 + 0,5 0	L_1 + 0,5 + 0,2			
							71	80	90	100
Na željo stranke G=max d^3 At the option of the orderer G=max d^3		6	4	3	0,2	Željene velikosti so 10, 13, 17; Možne tudi druge dolžine. Preferred sizes = 10, 13, 17; Other lengths possible	●	●	●	●
		8	5	5	0,3		●	●	●	●
		9	6				●	●	●	●
		11	8				●	●	●	●
		13	10				●	●	●	●
		16	13		0,4		●	●	●	●
		19	16				●	●	●	●
		23	20				●	●	●	●
		28	25							

Tipi profilov
Type variations

| Punches and dies

Naročite lahko tudi druge tipe profilov. Izdelujemo jih po predloženih skicah iz različnih materialov: HWS, HSS in jekla iz prašne metalurgije. Na željo tudi prevleko.

We can supply these tools according to your requirements from a wide range of materials: HWS, HSS and powder metallurgic steels. Also coated if requested.



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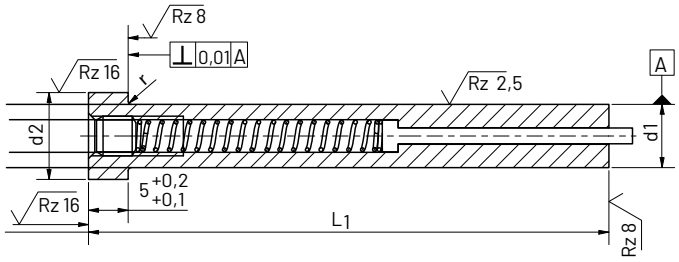
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 E



Precizna izvedba rezilne igle s cilindričnima steblom in glavo ter z odlepnikom.

Precision designed Punch Pins with cylindrical shank and the head with ejector.

Obseg uporabe:
V rezilnih (prebijalnih) orodjih za rezanje lukenj v jeklo (perforacija). Posebej primerne za hiter izmet direktno iz matric.
Dimenzije so prikazane v tabeli.

Prileganje / Toleranca:

Ø	5+6	8+10	13+16	20+25	32
	+0,009	+0,012	+0,015	+0,017	+0,020
M5	+0,004	+0,006	+0,007	+0,008	+0,009

Steblo premer d_1, dolžina L_{+1}

Material:
HSS (hitrorezno jeklo)
CPM 10 V

Karakteristike:
HSS: z ekstremno visoko trpežnostjo ali za materiale, s katerimi se težko dela. Velika odpornost proti obrabi, visoka natezalna trdnost, visoka odpornost proti pregretju.

Trdota:
Steblo: HRC 62 ± 2
Glava: HRC 52± 5

Obdelava:
Kaljeno, popuščano, cilindrična vroče kovana glava, steblo naknadno brušeno po celotni dolžini, vključno pod glavo, z radiusom, brušena površina glave.

Range of application:
In cutting (punching) tools for cutting holes in steel (perforation). Especially suitable for rapid ejection directly from the matrix.
The dimensions are shown in the table.

Fit / Tolerance:

Ø	5+6	8+10	13+16	20+25	32
	+0,009	+0,012	+0,015	+0,017	+0,020
M5	+0,004	+0,006	+0,007	+0,008	+0,009

Shank diameter d_1, the length of L_{+1}

Material:
HSS (High speed steels)
CPM 10 V

Material properties:
HSS: with extremely high durability for materials that are difficult to process. High wear resistance, high tensile strength, high resistance to overheating.

Hardnes:
Shaft: HRC 62 ± 2
Head: HRC 52± 5

Finish:
Hardened, tempered, hot-forged cylinder head, subsequently ground over the entire length, including under the head radius, head surface ground.

Opomba | Note

Te rezilne igle so v celoti dobavljive s posebnimi vzmetmi, vijakom ter izmetačem. Trdota vzmeti se nastavlja z vijakom na glavi.

These punch pins are fully supplied with the special springs, screws and ejectors. The spring tension is adjustable.

HSS

Ø d1 m5	Ø d2 0 -0,15	r ±0,1 0	H +0,25	E	L1 +0,5; +0,2					
					63	71	80	90	100	120
4	6	0,3	5	1,0						
5	8				●	●	●	●	●	
6	9				●	●	●	●	●	●
8	11				●	●	●	●	●	●
10	13			1,4	●	●	●	●	●	●
13	16	0,4			●	●	●	●	●	●
16	19			2,1	●	●	●	●	●	●
20	23				●	●	●	●	●	
25	26				●	●	●	●	●	
32	35				●	●	●	●	●	

CPM 10V

Ø d1 m5	Ø d2 0 -0,15	r ±0,1 0	T+0,25	E	L1 +0,5; +0,2					
					63	71	80	90	100	120
6	9	0,3			●	●	●	●	●	●
8	11				●	●	●	●	●	●
10	13			1,4		●	●	●	●	●
13	16	0,4				●	●	●	●	●
16	19			2,1	●	●	●	●	●	●
20	23				●	●	●	●	●	●

c

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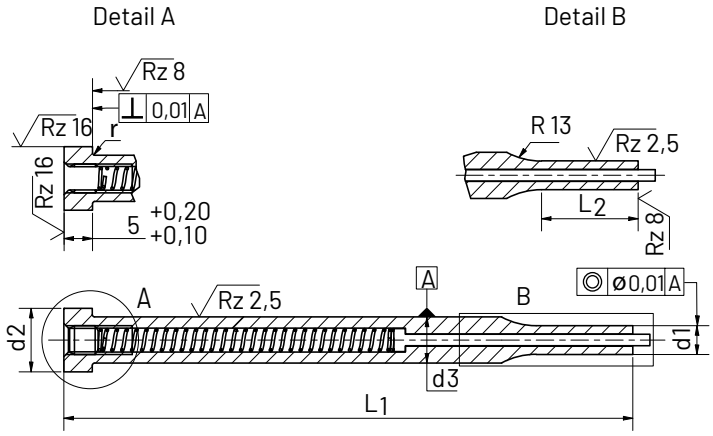
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 F



Precizna obdelava: z reducirnim rezilnim delom, cilindrično glavo, z odlepnikom ter brušeno.

Precision design: reduced cutting point, cylinder head, ejector, plunge cut ground.

Prebijalna igla s cilindrično glavo.

Cutting Punch with Cylindrical Head.

Obseg uporabe:
Za rezilna orodja za rezanje lukenj v jeklo. Posebej primerna za hiter izmet odrezkov iz matrice.
Dimenzije so prikazane v tabeli.

Range of application:
Cutting tools for cutting holes in steel. Especially suitable for fast ejection from the matrix.
The dimensions are shown in the table.

Prileganje / Toleranca:
Premer reducirnega dela d_3

Fit / Tolerance:
Diameter of the reducer part d_3

Ø	1,6-3	3-6	6-10	10-18	18-30	30-31,9
	+0,004	+0,006	+0,007	+0,008	+0,009	+0,011
J6	-0,002	-0,002	-0,002	-0,003	-0,004	-0,005

Premer stebla d_1

Ø	5+6	8+10	13+16	20+25	32
M5	+0,009	+0,012	+0,015	+0,017	+0,020
	+0,004	+0,006	+0,007	+0,008	+0,009

Shank diameter d_1

Ø	5+6	8+10	13+16	20+25	32
M5	+0,009	+0,012	+0,015	+0,017	+0,020
	+0,004	+0,006	+0,007	+0,008	+0,009

Dolžina: celotna L_{+1}
Reducirni del $L_{1+0,5}$

Length: total L_{+1}
Reduced point: $L_{1+0,5}$

Material:
HSS (hitrorezno jeklo)
CPM 10 V

Material:
HSS (High speed steels)
CPM 10 V

Na voljo tudi v drugih materialih.
Poglejte tabelo matererialov.

Other materials available on request, see material table.

Lastnosti materiala:
HSS: z ekstremno močno trpežnostjo, za materiale, s katerimi se težko dela. Velika odpornost proti obrabi, visoka natezalna trdnost, visoka odpornost proti pregretju.

Material properties:
HSS: with extremely strong durability for materials which are difficult to process. High abrasion resistance, high tear strength, high resistance to overheating.

Opomba | Note

V kompletu rezilne igle je posebna vzmet, vijak ter izmetač. Trdota vzmeti se nastavlja z vijakom na glavi.

These punch pins are fully supplied with special springs, screws and ejector. The Hardness: of the spring can be adjusted.

Različica
Brez navzkrižne luknje zatič z vzmetjo

Trdota:
Kaljeno, toplotno obdelano, kompletno sestavljeno

Steblo: HRC 62 - 66
Glava: HRC 45-55

Obdelava:
Kaljeno, popuščeno, cilindrična glava vroče kovana, po celotni dolžini naknadno brušeno steblo, vključno pod glavo - z radiusom, brušena površina glave.

Version
- without cross hole
- with spring loaded pin

Hardnes:
Hardened, tempered, shaft fine grinded, completly assembled

Shaft: HRC 62 - 66
Head: HRC 45- 55

Finish:
Hardened, tempered, cylinder head hot forged, subsequently ground over the entire length, including under the head radius, ground surface of the head.

HSS

Ø d3 j6	Stopnjevanje Gradiation d3	Ø d2 0,25 -0,25	Ø d1 m5	r ±0,1 0,	L1 +0,5 0,	E	H+ 0,25	L+1				
								63	71	80	90	100
1,6 - 5,9	0,1	8	5	0,3	10	1,0	5	●	●	●	●	●
2,5 - 7,9		9	6		13			●	●	●	●	●
3,0 - 7,9		11	8					●	●	●	●	●
4,0 - 9,9		13,	10		17	1,4		●	●	●	●	●
5,0 - 12,9		16	13	0,4				●	●	●	●	●
8,0 - 18,9		19	16			2,1		●	●	●	●	●
12,0 - 19,5		23	20							●	●	●
16,5 - 24,9	0,5	28	25							●	●	●
20,0 - 31,9		35	32							●	●	●

CPM 10V

Ø d1 j6 [mm]	Stopnjevanje Gradation d1	d2 0 - 0,15 [mm]	d3 m5 [mm]	R 0 -0,2 [mm]	L2 +0,05 0 [mm]	L1 +0,05 +0,2			
						71	80	90	100
1,6 - 5,9	0,1	9	6	0,3	10	●	●	●	●
2,5 - 7,9	0,1	11	8		13	●	●	●	●
4,0 - 9,9		13	10		17	●	●	●	●
5,0 - 12,9		16	13	0,4		●	●	●	●
8,0 - 15,9		19	16			●	●	●	●
12,0 - 19,5	0,5	23	20			●	●	●	●
16,5 - 24,5		28	23			●	●	●	●

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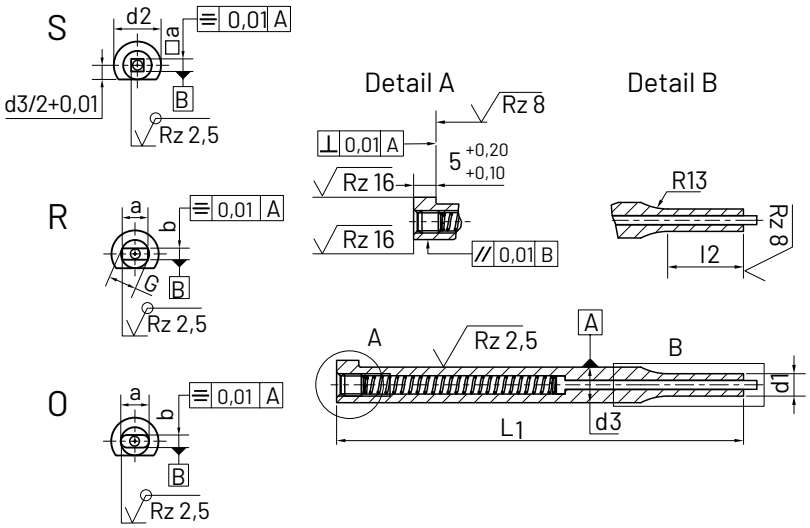
3 Prebijalna igla
Cutting Punch

DIN ISO 8020 G



Prebijalna igla s cilindrično glavo.

Cutting Punch with Cylindrical Head.

Obseg uporabe:
V rezilnih (prebijalnih) orodjih za rezanje lukenj v jeklo (perforacija). Posebej primerne za hiter izmet direktno iz matric.

Dimenzije so prikazane v tabeli.

Tipi:
GS: reducirni del v obliki kvadrata with spring loaded pin
GR: reducirni del v obliki pravokotnika z vzmetnim zatičem
GO: reducirni del v obliki ovala / zaobljenega pravokornika z vzmetnim zatičem

Material:
HWS (visoko legirno jeklo za delo v hladnem - 12% krom) / **HSS** (hitrorezno jeklo) / **ASP 23** (polprašno orodno jeklo Vanadis 23) / **HM** (karbidna kovina)

Različica in trdota:
Umestitev ravnega dela je vedno na daljši strani glede na smer na glavi. Če želite, vam lahko spremenimo orodje, da je ravna ploskev na krajši strani.

Range of application:
Cutting tools for cutting holes in steel. Especially suitable for fast ejection from the matrix.

The dimensions are shown in the table.

Types
GS: square stepped cutting shaft with spring loaded pin
GR: rectangular stepped cutting shaft with spring loaded pin
GO: oblong stepped cutting shaft with spring loaded pin

Material:
HWS High alloy cold working steel (approx. 12% Chrome) / **HSS** (HSS steel) / **ASP 23** - non cobalt grade for high performance cutting tools, cold work tools / **HM** (hardmetall)

Version and Hardness:
Flat part is always on the longer side according to the direction on the head. If you want, we can change the tool for you, that the flat surface is on the shorter side.

Opomba | Note

Rezilni klini-izbijači niso na zalogi, vendar jih lahko izdelamo v kratkem času. Varnostni zaklop je vedno na dolgi strani. Na zahtevo lahko izdelamo varnostni zaklop proti zasuku tudi na kratki strani.

Cutting punches are not stocked, but can be produced at short notice. The anti-twist lock is always at the longest form side. On request, we can manufacture the anti-twist lock at the short form side.

a ± 0,01	b ± 0,01	d_2 0 - 0,15	d_3 m5	r + 0,1 0	L_2 + 0,5 0	L_1 + 0,5 + 0,2		
						71	80	90
Na željo stranke G=max d3 At costumers request G=max d3		9	6	0,3	Željene velikosti so 10, 13, 17; Možne tudi druge dolžine. Preferred sizes = 10, 13, 17; Other lengths possible	●	●	●
		11	8			●	●	●
		13	10			●	●	●
		16	13	0,4		●	●	●
		19	16			●	●	●
		23	20				●	●
		28	25				●	●

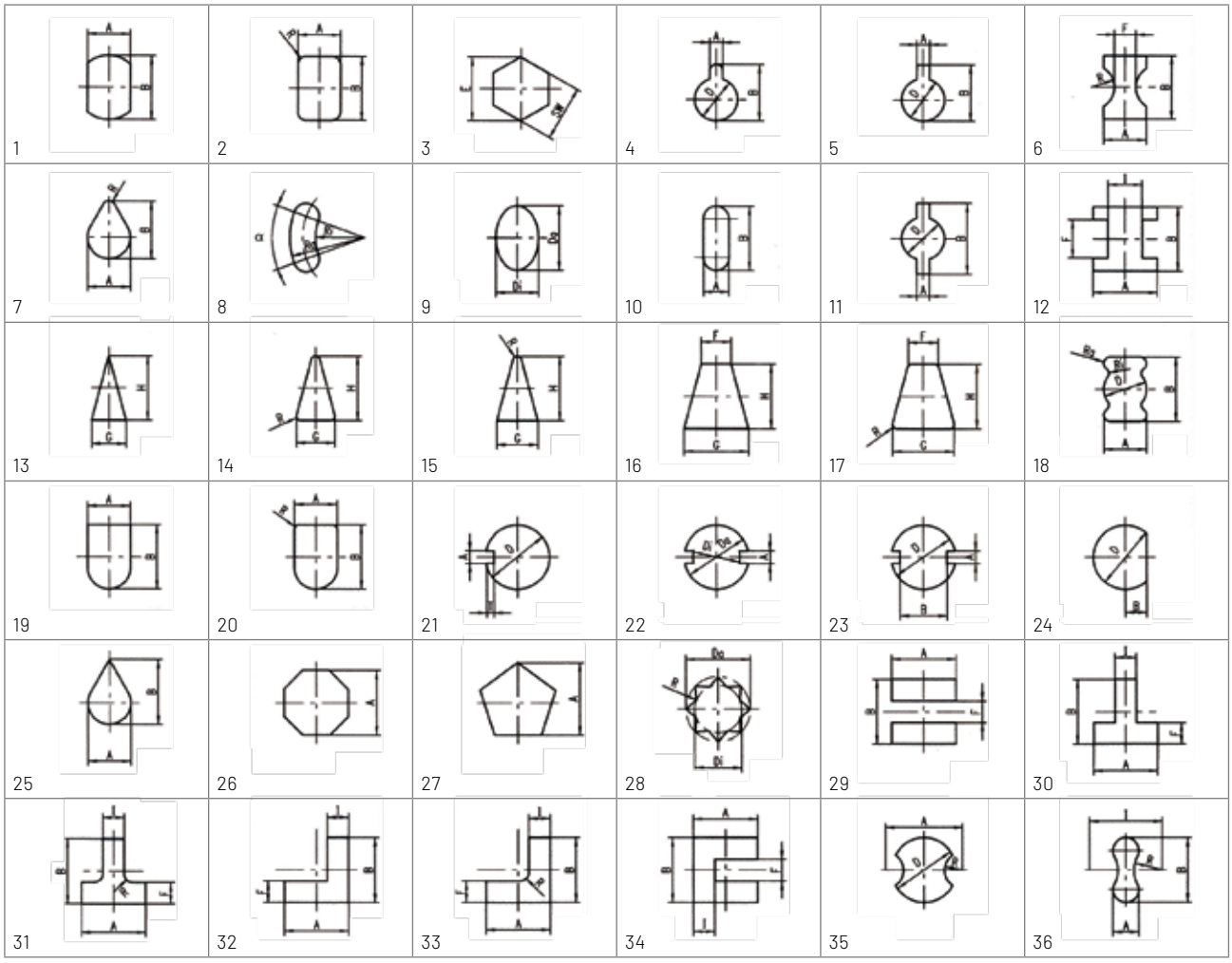
Dostava s križno luknjo je glede na razpoložljivost. / Delivery with cross hole is subject to availability.

Tipi profilov
Type variations

| Punches and dies

Naročite lahko tudi druge tipe profilov. Izdelujemo jih po predloženih skicah iz različnih materialov: HWS, HSS in jekla iz prašne metalurgije. Na željo tudi prevleko.

We can supply these tools according to your requirements from a range of materials: HWS, HSS and powder metallurgic steels. Also coated if requested



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3 Rezilna matrica
Cutting Bush

DIN 9846

Na voljo v različnih izvedbah in oblikah, na primer kvadratne ali pravokotne oblike, z glavo ali brez.

Available in different types and design, for example square or rectangular, with or without head

Opomba | Note

Za najzahtevnejše pogoje uporabe priporočamo rezilne igle iz hitroreznega jekla prašne metalurgije. Rezilne igle HSS se lahko na zahtevo prekrijejo s posebno površinsko prevleko. Na voljo so tudi rezilne igle iz volframovega karbida. Drugi materiali na zahtevo.

For extremely high demands we would recommend punches made from HSS with Physical Vapor Deposition (PVD) surface layer. HSS Piercing punches can be covered with a special surface coating on request. Punches made from tungsten carbide are also available. Other materials on request.

Obseg uporabe:
Za stiskalna orodja za izbijanje/rezanje iz pločevin, jekla, neželeznih kovin, plastike, papirja ali osnovnih materialov za tiskanja vezja.

Dimenzije:
Glede na zahteve stranke.

Velikost glave:
V skladu z DIN 9861 ali glede na zahteve stranke.

Prileganje / Toleranca:
Nazivni premer stebla:
-0,01 ali po specifikacijah stranke.
Nominalni premer reducirnega dela:
-0,01 ali po specifikacijah stranke.
Dolžina: Skupno $L_1^{+0,5}$
Reducirni del $L_2^{+0,5}$ ali po specifikacijah stranke.
Vse druge tolerance:
Glede na zahteve stranke ali nedoločene tolerance v skladu z ISO 2768-m.

Material:
HWS visokolegirano hladno oblikovano jeklo (pribl. 12 % kroma) / **HSS** (jeklo **HSS** – hitrorezno jeklo)

Lastnosti materiala:
HWS: Za obdelovanje trdnejših materialov. Visoka trpežnost – dolga življenjska doba. / **HSS**: Za obdelovanje zelo trdnih ali težavnih

Range of application:
For press tools for piercing/cutting sheet, steel, non ferrous metals, plastics, paper, basic printed circuit board material.

Dimensions:
To customers' specifications.

Head size:
In accordance with DIN 9861 or to customers' specifications.

Fit / Tolerance:
Nominal diameter shaft:
-0.01 or to customers' specifications
Nominal diameter step: -0.01 or to customers' specifications
Length: Total $L_1^{+0,5}$
Step $L_2^{+0,5}$ or to customers' specifications
All other tolerances:
To customers' specifications or non-specified tolerances in accordance with ISO 2768.

Material:
HWS cold working steel (approx. 12 % Chrome) / **HSS** steel (High Speed Steel)

Material properties:
HWS: For processing harder materials. High durability - long service life. / **HSS**: For working

materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost na vročino.

Trdota:
Steblo: HRC: HWS 60 - 64 / HSS 62 - 66
Glava: HRC: HWS 45 - 55 / HSS 45 - 55

Pri tipu D (s ploščato glavo) glava ni žarjena.

Obdelava:
Kaljeno, žarjeno in brušeno. Pri tipu DA je stožčasta glava vroče kovana.

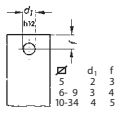
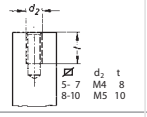
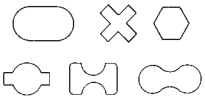
high strength or difficult to work materials. Very abrasion proof, high tension strength and high heat resistance.

Hardness: :
Shank: HRC: HWS 60 - 64 / HSS 62 - 66
Head: HRC: HWS 45 - 55 / HSS 45 - 55

With type D (flat head) the head is not annealed

Finish:
Hardened, annealed and ground.
With type DA the head is hot forged.

Tip in oblika
Type and design

Tip/ Type	Opis (SI)	Description (GB)	Prikaz / View
A	Brez glave. Na zahtevo z enim koncem žarjenim na 45–55 HRC, iz materiala HWS ali HSS.	Without head. On request with one end annealed to 45-55 HRC made from HWS or HSS materials.	
B 	Za rezilne igle od 5 mm brez glave, s prečno luknjo na koncu stebla, na zahtevo s koncem pri prečni luknji žarjenim na 45–55 HRC. Iz materiala HWS ali HSS.	For punches from 5 mm without head, with transverse hole at the end of the shank, on request with the end at the transverse hole annealed to 45-55 HRC. Made from HWS or HSS materials.	
C 	Za rezilne igle od 5 mm brez glave, z navojno skrito luknjo. Iz materiala HWS ali HSS.	For punches from 5 mm without head, with threaded blind hole. Made from HWS or HSS materials.	
DA	Z vroče kovano kvadratno 60° stožčasto glavo. Velikost glave v skladu z DIN 9861. Iz materiala HWS ali HSS.	With hot formed 60° square countersunk head. Head size according to DIN 9861. Made from HWS or HSS materials.	
D	Z vroče kovano kvadratno 60° stožčasto glavo. Velikost glave v skladu z DIN 9861. Iz materiala HWS ali HSS.	With hot formed 60° square countersunk head. Head size according to DIN 9861. Made from HWS or HSS materials.	
E	S precizno brušeno 60° stožčasto glavo. Stožčasta glava ni žarjena. Iz materiala HWS ali HSS.	With precision ground 60° precision countersunk head. The head is not annealed. Made from HWS or HSS materials.	
F	Z okroglim steblom v skladu z DIN 9861, tip D (s 60° stožčasto glavo) in kvadratnim ali pravokotnim reducirnim delom. Iz materiala HWS ali HSS.	With round shank in accordance with DIN 9861, type D (with 60° sountersunk head) and square or rectangular point. Made from HWS or HSS materials.	
G	Z okroglo, vroče kovano 60° stožčasto glavo. Iz materiala HWS ali HSS.	With round, hot formed 60° countersunk head. Made from HWS or HSS materials.	
Oblika / Form **&** **Profil** / Profile punch	Za specifične informacije pošljite povpraševanje. V nadaljevanju je opisanih nekaj različnih tipov.	Please ask for specific information. Below is a small selection of different types.	

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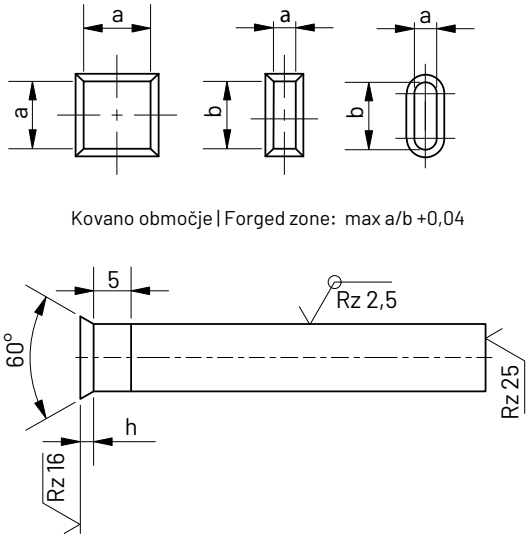
DIN 9846 DA



Rezilna igla s cilindrično glavo.

Forming Punch with Forged Head.

Dimenzije so prikazane v tabeli.

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost.

Trdota:
Steblo: HRC 64 ± 2
Glava: HRC 50 ± 5

Različica:
Z glavo, utrjeno in kaljeno, fino brušeno, glava vroče kovana in ojačano s toplotno obdelavo.

Po meri narejene komponente:
Glava: Rob je lahko je zaradi oblikovanja zaobljen ali ploščat.

The dimensions are shown in the table.

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance.

Hardnes:
Shaft: HRC 64 ± 2
Head: HRC 50 ± 5

Version
With head, hardened and tempered, fine grinded, head hot forged and annealed.

Custom made components
Head: Edge rounded or there will be a fl at due to the forming.

Opomba | Note

Izdelki niso na zalogi. Na željo in naročilo stranke izdelamo v zelo kratkem času. Izdelujemo tudi kvadratne rezilne igle z okroglo glavo.

Forming punches are not stocked, but can be manufactured at short notice. We also manufacture square hole punches with round head.

a ± 0,01	b± 0,01	H +0,2 0	L_1 +0,5
2		1,37	
2,1		1,54	
2,2		1,37	
2,3		1,54	
2,4		1,45	
2,5		1,37	
2,6		1,71	
2,7		1,63	
2,8		1,54	
2,9		1,45	
3		1,80	
3,1		1,71	
3,2		1,63	
3,3		1,54	
3,4		1,45	
3,5		1,80	
3,6		1,71	
3,7		1,63	
3,8		1,54	
3,9		1,45	
4		1,80	
4,1		1,71	
4,2		1,63	
4,3		1,54	

a ± 0,01	b± 0,01	H +0,2 0	L_1 +0,5
4,4		1,45	
4,5		1,80	
4,6		1,71	
4,7		1,63	
4,8		1,54	
4,9		1,45	
5		1,80	
5,1		1,71	
5,2		1,63	
5,3		1,54	
5,4		1,45	
5,5		1,80	
5,6		1,71	
5,7		1,63	
5,8		1,54	
5,9		1,45	
6		2,23	
6,5		3,17	
7		2,73	
7,5		3,17	
8		2,73	
8,5		3,17	
9		2,73	
10		2,73	
11		2,73	
12		2,73	

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Uporaba vedno modernejših strojev in sistemov, nenehno stremljenje k učinkovitejšemu delovanju in potreba po gospodarnejšem poslovanju, pomenijo vedno višje zahteve za proizvajalce rezilnih igel, ki morajo izdelovati boljša in učinkovitejša orodja ter materiale. Za daljšo življenjsko dobo nudimo naslednje rešitve:

Rezilne igle za perforirane kovine
Pri obdelavi perforiranih kovin se pri odmiku igle pojavijo znatne sile, zato priporočamo uporabo rezilnih igel s 40° stožčasto glavo. Rezilne igle z glavo v obliki vratu steklenice ali trobentasto glavo lahko bistveno izboljšajo učinkovitost. Daljšo življenjsko dobo dosežemo s površinsko prevleko.

Rezilne igle za tiskana vezja
V ta namen priporočamo rezilne igle z visokoprecizno brušeno površino (Rz 0,4–0,6 µ). Te rezilne igle imajo izjemno gladko površino, kar nudi dodatno prednost, saj med izbijanjem ne povlečejo obstoječih delcev prahu. Do sedaj je prah vedno povzročal neizogibno, prehitro obrabo rezilnih igel. Z izboljšano površino rezilnih igel smo podaljšali tudi njihovo življenjsko dobo. Rezultat: izjemni prihranki pri stroških orodja in povečana proizvodnja zaradi skrajšanega časa pri motnjah strojne proizvodnje. Površinska prevleka nudi še dodatne prednosti.

Posebni materiali
Razen iz navedenih standardnih materialov WS, HWS in HSS, izdelujemo rezilne igle tudi iz naslednjih materialov za izjemno visoko proizvodnjo:

1. Hitrorezno jeklo, izdelano s prašno metalurgijo
   a) ASP 23 b) ASP 30 c) ASP 60
   d) CPM 10 V e) CPM Rex M4
2. HSS-E kobaltna litina
3. Volframov karbid
4. Nerjaveče jeklo

Površinske prevleke
Z uporabo naslednjih površinskih prevlek, dosežemo daljšo življenjsko dobo za vse rezilne igle, izdelane iz jekla HSS ali jekla HSS, izdelanega s prašno metalurgijo:

1. TIN (postopek PVD) barva: zlato-rumena
Trdoto prevleke 2200–2400 HV 0,05 dosežemo z debelino prevleke 2–4 µ. Relativno nizka temperatura za nanos prevleke omogoča nanašanje prevleke tudi na orodja z najostrejšimi tolerancami.

2. TICN (postopek PVD) barva: modro-siva
Prevleka TICN združuje izjemno trdoto karbidnega sloja (približno 3000 HV 0,05) s prednostmi kemične sestavine in izboljšanih drsnih lastnosti nitratnega sloja. Debelina prevleke je 2–4 µ.

3. Nitrirana površina (postopek Tenifer) barva: sivo-črna
S to obdelavo povečamo trdoto površine na približno 1000 HV 0,3 (približno 70 HRC).

The use of increasingly modern machines and installations, the constant aim for higher performance and the need to be more economical, puts higher demands on the punch manufacturer to produce better and more efficient tools and materials. We can offer the following solutions for a longer life expectancy:

Punches for perforated metals
When processing perforated metals, considerable withdrawal forces will occur. We therefore recommend the use of punches with 40° conical head. Punches with bottle neck or trombone neck head are also very beneficial. A greater life expectancy is of course achieved by using a surface coating.

Punches for printed cicuit boards
For this purpose, we recommend cutting needles with high precision sanded surface (Rz 0.4–0.6 µ). These cutting needles have an outstanding smooth surface, which offers an additional advantage since they do not draw on existing dust particles during the process. So far it is dust that always caused the inevitable, too rapid wear of the cutters needles. We also extended with the improved surface of the cutting needles their lifespan. The result: tremendous savings on tool costs and increased production due to shortened time in the event of machine production disruptions. Surface m coating offers additional benefits.

Special materials
Apart from the already listed standard materials WS - HWS and HSS, we also produce punches from the following materials for extremely high throughput:

1. Physical Vapor Deposition (PVD) surface layer
   a) ASP 23 b) ASP 30 c) ASP 60
   d) CPM 10 V e) CPM Rex M4
2. HSS-E cobalt alloy
3. Tungsten carbide
4. Stainless steel

Surface coatings
By using the following coatings, all punches made from HSS or Physical Vapor Deposition (PVD) surface layer HSS have a greater life expectancy:

1. TIN (PVD procedure) Colour: gold-yellow
The Hardness: of the coating of 2 200 - 2 400 HV 0.05 when a coating strength of 2 - 4 µ is achieved. The relatively low coating temperature permits coating of tools with the closest tolerances.

2. TICN (PVD procedure) Colour: blue-grey
The TICN coating combines the extreme Hardness: of a carbide layer (approx. 3 000 HV 0.05) with the advantageous chemical properties and the favourable gliding behaviour of the nitrate layer. The coating strength is 2 - 4 µ.

3. Nitrided (Tenifer procedure) Colour: grey-black
By using this treatment, an increase in the surface Hardness: to approx. 1 000 HV 0.3 (approx. 70 HRC) has been achieved.

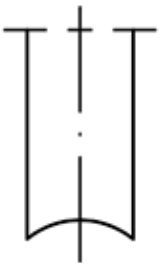
Ostalo
Others

Obdelane konice

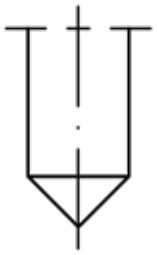
Za posebne namene ponujamo različne dimenzije in tipe brušenih konic in posebnih stožčastih glav. V nadaljevanju je opisanih nekaj vrst obdelave konic, ki jih ponujamo:

Processed ends

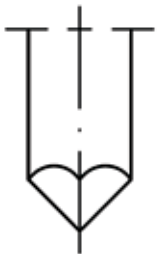
For special applications we can offer different dimensions and types of ground tips and special conical heads. Below are some samples:



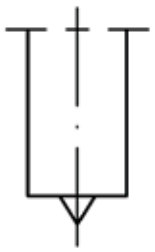
konkavna konica
concave point
(detajl / detail 1)



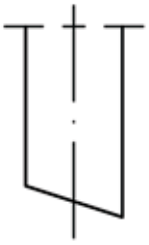
koničasta konica
pointed
(detajl / detail 2)



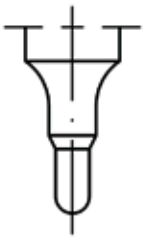
kvadratna konica
square point
(detajl / detail 3)



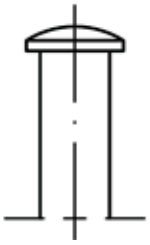
centrirana konica
centre point
(detajl / detail 4)



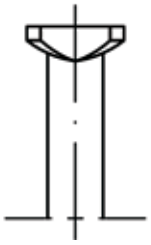
konica pod kotom
angled point
(detajl / detail 5)



reducirna konica s polkrogom
stepped with semi-circle
(detajl / detail 6)



lečasta glava
dome-capped fillister head
(detajl / detail 7)



stožčasta glava z vzporednimi stranmi
countersunk head with parallel sides
(detajl / detail 8)

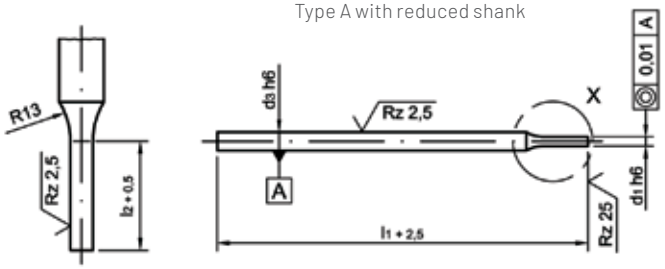
Rezilne igle brez glave

Tovrstne glave izdelujemo le po specifičnih navodilih kot izdelke po naročilu. Igle so daljše za + 2,5 mm, kar zagotavlja dovolj dolžine, da se lahko zahtevana stožčasta glava »izkuje«. Konce je treba obdelati z žarjenjem.

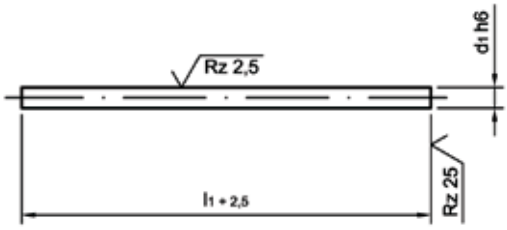
Piercing punches without head

We will only manufacture these punches on specific instruction as a specially made item. We have set the added length to + 2.5 mm. This will give enough length for the required countersunk head to be "hammered". It should be remembered that the ends need to be annealed.

Tip A z reduciranim steblom
Type A with reduced shank



Tip B z nepretrganim steblom
Type B with continous shank



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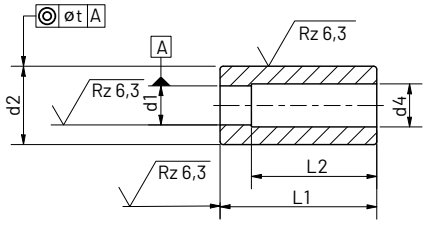
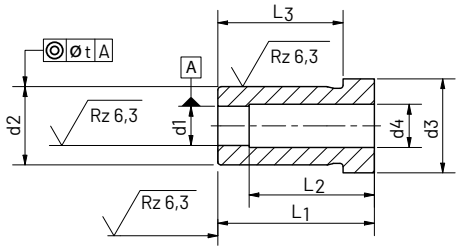
3 Rezilna matrica
Cutting Bush

DIN 9845 A/B

A

B





Rezilne matrice po standardu, tip A - brez glave in tip B - z glavo.

To standard type A – headless and type B – with head.

Dimenzije so prikazane v tabeli.

Tipi:
A - rezilna matrica s cilindričnim premerom, kaljena, napuščena in brušena.
B - matrica z glavo, kaljena, napuščena in brušena.

Izvrtina v premeru d1 je v smeri premera d4 obdelana stožčasto 30'.

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost.

Utrjen in kaljen, znotraj in zunaj brušeno v tolerancah, posneti robovi.

The dimensions are shown in the table.

Types:
A: with cylindrical external diameter, hardened, tempered and ground finished.
B: with head, hardened, tempered and grounded.

Borehole dia. d1 cone 30' to dia. d4.

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance.

Hardened and tempered, inside and outside grinded in tolerance, with insertion chamfer.

Opomba | Note

Upoštevati je potrebno razmik med rezilno iglo in matrico.

Consider the clearance between the piercing punch and the bush.

d1 H8	Stopnjevanje Gradiation	d2 A: n6 B: k6	d3	d4 ± 0,1	Krajša različica Short version			Daljša različica Long version			r	t
					L1 +0,5 0,	L2	L3	L1 +0,5 0,	L2	L3		
1,0	0,1	5	7	d_1 +0,3	20	18	16	28	–	–	0,3	0,01
1,1 - 2,0		6	8		20	17	16		25	24		
1,1 - 2,0		6			28	25	24					
2,1 - 3,0		7	9	d_1 +0,5	20	17	16				0,4	
2,1 - 3,0					28	25	24					
3,1 - 4,0		8	10		28	25	24					
3,1 - 4,0					20	17	16					
4,1 - 5,0		10	12	d_1 +0,7	20	16	16		24			
4,1 - 5,0					26	24	24					
5,1 - 6,0		12	14		20	16	16				0,6	0,02
5,1 - 6,0					28	24	24					
6,1 - 8,0		15	17		28	24	24				0,8	
6,1 - 8,0					20	16	16					
8,1 - 10,0		18	20	d_1 +1	20	16	24					
8,1 - 10,0					28	24	16					
10,1 - 12,0		22	24		20	15	16		25			
10,1 - 12,0					28	23	24					
12,1 - 15,0		26	28		20	15	16					
12,1 - 15,0					28	23	24					
15,5 - 18,0	0,5	30	32		28	23	24				1	

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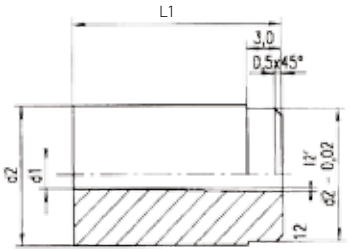
DIN 9845 A - HM



THM podobna standardu DIN 9845 tipu – A.

THM - Tungsten Carbide die similar to DIN 9845 standard type – A.

Dimenzije so prikazane v tabeli.

Tipi:
A - rezilna matrica s cilindričnim premerom, kaljena, napuščena in brušena

Material:
HM - karbidna trdina.

The dimensions are shown in the table.

Types
A - with cylindrical external diameter, grounded.

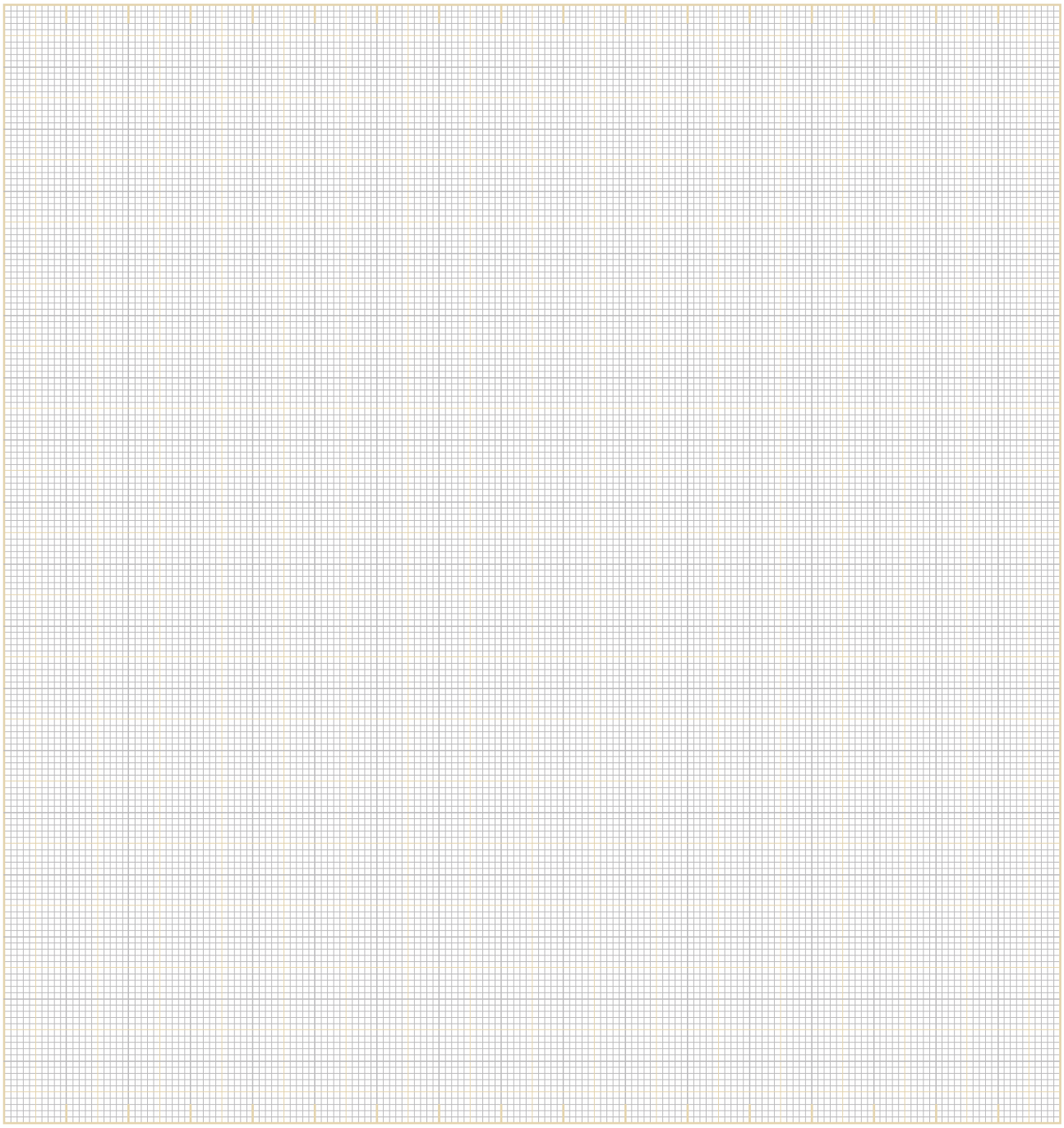
Material:
HM -Tungsten Carbide.

d1 ± 0,005 od / from	Stopnjevanje Gradation	d2 + 0,007 + 0,003	Dolžina / Lenght L1 ± 0,02
0,5	0,01	4	20,05
0,5		5	
0,9		6	
1,7		7	
1,7		8	
1,7		10	
1,7		12	
3,3		15	
3,3		18	

Opomba | Note

Upoštevati je potrebno razmik med rezilno iglo in matrico.

Consider the clearance between the piercing punch and the bush.



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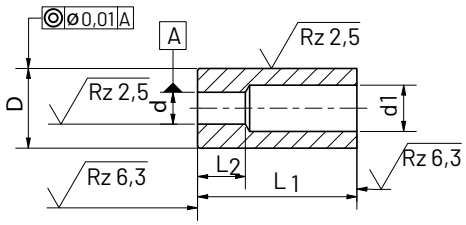
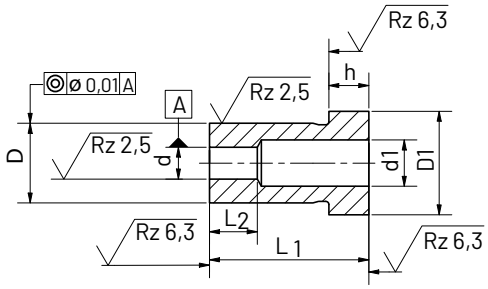
3 Rezilna matrica
Cutting Bush

DIN 8977 A/B

A

B





Rezilne matrice po standardu, tip A - brez glave in tip B - z glavo.

To standard type A – headless and type B – with head.

Dimenzije so prikazane v tabeli.

Tipi:
Tip A - rezilna matrica s cilindričnim premerom, kaljena, napuščena in brušena.
Tip B: matrica z glavo, kaljena, napuščena in brušena.

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost.

The dimensions are shown in the table.

Types:
A: with cylindrical external diameter, hardened, tempered and ground finished
B: with head, hardened, tempered and grounded.

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance.

Opomba | Note

Upoštevati je potrebno razmik med rezilno iglo in matrico.

Consider the clearance between the piercing punch and the bush.

d1 H8	Stopnjevanje Gradiation	D A: n5 B: m5	D1 0 −0,25	d1 max	L2	h + 0,25 0,	L1 +0,5 0,			
							16	20	25	32
1,0 - 2,4	0,1	5	8	2,8	2	5	●	●	●	
1,6 - 3,0		6	9	3,5	3		●	●	●	
2,0 - 3,5		8	11	4,0	4		●	●	●	●
2,5 - 5,0		10	13	5,8	4-8		●	●	●	●
3,0-5,0								●	●	●
4,0 - 7,0		13	16	8,0	5-8			●	●	●
4,0 - 7,2								●	●	●
6,0 - 8,8		16	19	9,5				●	●	●
6,0 - 9,0								●	●	●
7,5 - 11,3		20	23	12,0	8-20			●	●	●
8,0 - 11,0								●	●	●
10,7 - 16,0		25	28	17,3				●	●	●
11,0 - 16,6								●	●	●
15,0 - 20,0	0,5	32	35	20,7				●	●	●
18,0 - 27,0		40						●	●	●
19,0 - 27,0			43	27,7				●	●	●
26,0-36,0		50	53	37,0				●	●	●

Gradacija / Gradation: 16,6 mm and D: 25,0 mm = 0,1 mm
Gradacija / Gradation: 15,0 mm and D: 32,0 mm = 0,5 mm
Upoštevati je potrebno razmik med rezilno iglo in matrico.
Consider cutting clearance for the assignment of cutting punches and die bushes!

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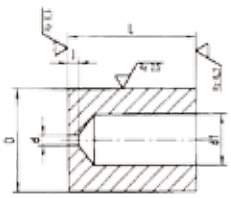
3 Rezilna matrica
Cutting Bush

DIN 8977 A/B

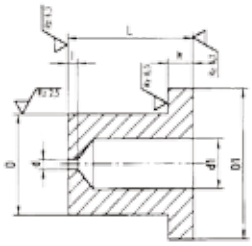
A

B

Tip / Type A



Tip / Type B



Rezilne matrice z začetnimi izvrtinami, tip A - brez glave in tip B - z glavo.

With starter hole, type A – headless and type B – with head.

Dimenzije so prikazane v tabeli.

Tipi:
A - rezilna matrica s cilindričnim premerom, kaljena, napuščena in brušena.
B - matrica z glavo, kaljena, napuščena in brušena.

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost na vročino.

The dimensions are shown in the table.

Types
A - with cylindrical external diameter, hardened, tempered and ground finished
B - with head, hardened, tempered and grounded.

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance.

Opomba | Note

Pri rezilnih matricah za kvadratne in ovalne luknje, diagonala ne sme biti večja od d_1 max.

The diagonal profile should not be larger than max. d_1.

d	D A: n5 B: m5	D1 0 −0,25	d1 max	l2	h + 0,25 0,	L +0,5 0,			
						16	20	25	32
1,0	8	11	4	4	5	●	●	●	●
1,0	10	13	5,8	4-8		●	●	●	●
1,2	13	16	8	5-8			●	●	●
1,2	16	19	9,5				●	●	●
1,5	20	23	12	8-20			●	●	●
1,5	25	28	17,3				●	●	●
1,5	32	35	20,7				●	●	●
1,5	40	43	27,7				●	●	●
1,5	50	53	37				●	●	●

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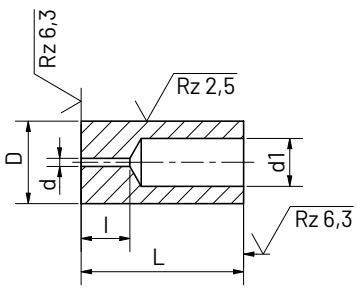
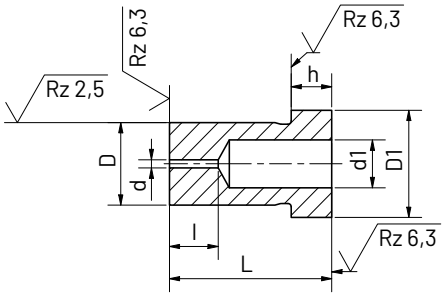
3 Rezilna matrica
Cutting Bush

DIN 8977 C/D

C



D



Rezilne matrice z začetnimi izvrtinami, tip A - brez glave in tip B - z glavo.

With starter hole, type A – headless and type B – with head.

Dimenzije so prikazane v tabeli.

Tipi:
A - rezilna matrica s cilindričnim premerom, kaljena, napuščena in brušena.
B - matrica z glavo, kaljena, napuščena in brušena.

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost na vročino.

Trdota:
HRC 62 ± 2

Obdelava:
Kaljeno, toplotno obdekano, kompletno sestavljeno

The dimensions are shown in the table.

Types
A - with cylindrical external diameter, hardened, tempered and ground finished
B - with head, hardened, tempered and grounded.

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS:For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance on heat.

Hardnes:
HRC 62 ± 2

Finish:
Hardened and tempered, outside grinded in tolerance, with insertion chamfer.

Opomba | Note

Pri rezilnih matricah za kvadratne in ovalne luknje, diagonala ne sme biti večja od d1 max.

The diagonal prole should not be larger than max. d1 on dies for square and rectangular shapes.

d	D A: n5 B: m5	D1 0 −0,25	d1 max	l_2	h + 0,25 0,	L +0,5 0,			
						16	20	25	32
1,0	8	11	4	4	5	●	●	●	●
1,0	10	13	5,8	4-8		●	●	●	●
1,2	13	16	8	5-8			●	●	●
1,2	16	19	9,5				●	●	●
1,5	20	23	12	8-20			●	●	●
1,5	25	28	17,3				●	●	●
1,5	32	35	20,7				●	●	●
1,5	40	43	27,7				●	●	●
1,5	50	53	37				●	●	●

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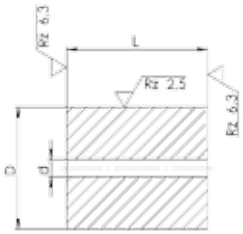
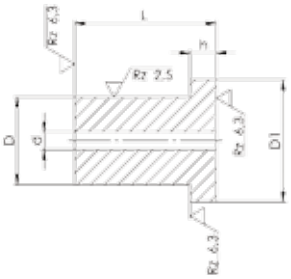
3 Rezilna matrica
Cutting Bush

DIN 8977 E/F

E



F



Rezilna matrica z začetno izvrtino skozi kos.

Dies with continuous starter hole.

Dimenzije so prikazane v tabeli.

Tipi:
E: kaljene in utrjene, zunaj polirane znotraj toleranc s poševnino
F: kaljene in utrjene, zunaj polirane znotraj toleranc s poševnino

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
- 1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost na vročino.

Trdota:
HRC 62 ± 2

The dimensions are shown in the table.

Types:
E: hardened and tempered, outside polished in tolerance, with introduce chamfer
F: hardened and tempered, outside polished in tolerance, with introduce chamfer

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
- 1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance on heat.

Hardness:
HRC 62 ± 2

Opomba | Note

Profil diagonale je max d1 na kvadratnih in pravokotnih matricah.

The diagonal profile should not be larger than max. d1 on dies for square and rectangular forming.

d	D Type E n 5 Type F m 5	D1 0 – 0,25	d1 max	h +0,25 0	L + 0,5 0						
					20	22	25	28	30	32	35
1,0	8	11	4	5,0	●	●	●	●	●	●	●
1,0	10	13	5,8		●	●	●	●	●	●	●
1,2	13	16	8		●	●	●	●	●	●	●
1,2	16	19	9,5		●	●	●	●	●	●	●
1,5	20	23	12		●	●	●	●	●	●	●
1,5	25	28	17,3		●	●	●	●	●	●	●
1,5	32	35	20,7		●	●	●	●	●	●	●
1,5	40	43	27,7				●	●	●	●	●
1,5	50	53	37							●	●

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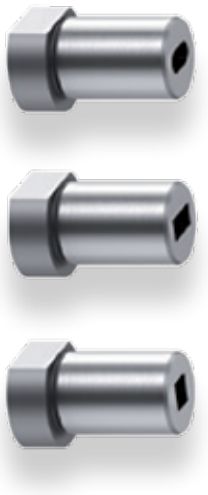
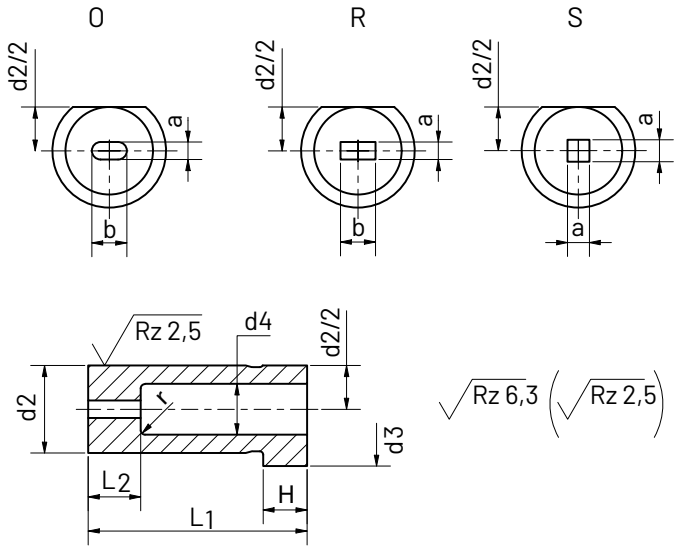
3 Rezilna matrica
Forming Die

ISO 8977





Proti zdrsno oblikovane rezilne matrice s kvadratno – pravokotno in ovalno glavo.

Square – rectangular – round elongated with anti-slip.

Dimenzije so prikazane v tabeli.

Tipi:
S: kvadratni tip
R: pravokotni tip
O: ovalni tip

Material:
HSS (Hitrorezna jekla)

Na voljo tudi v drugih materialih. Poglejte tabelo matererialov.

Št. materiala:
1.3343 (S 6-5-2)

Lastnosti materiala:
HSS: Za obdelovanje zelo trdnih ali težavnih materialov. Izjemna odpornost na drgnjenje, visoka natezna trdnost in visoka odpornost na vročino.

The dimensions are shown in the table.

Types:
S: square cutting form
R: rectangular cutting form
O: oblong cutting form

Material:
HSS (High speed steels)

Other materials available on request, see material table.

Material Number:
1.3343 (S 6-5-2)

Material properties:
HSS: For processing very solid or difficult materials. Exceptional abrasion resistance, high tensile strength and high resistance on heat.

Opomba | Note

Upoštevati je potrebno razmik med rezilno iglo in matrico. Pri rezilnih matricah za kvadratne in ovalne luknje, diagonala ne sme biti večja od d_1 max.

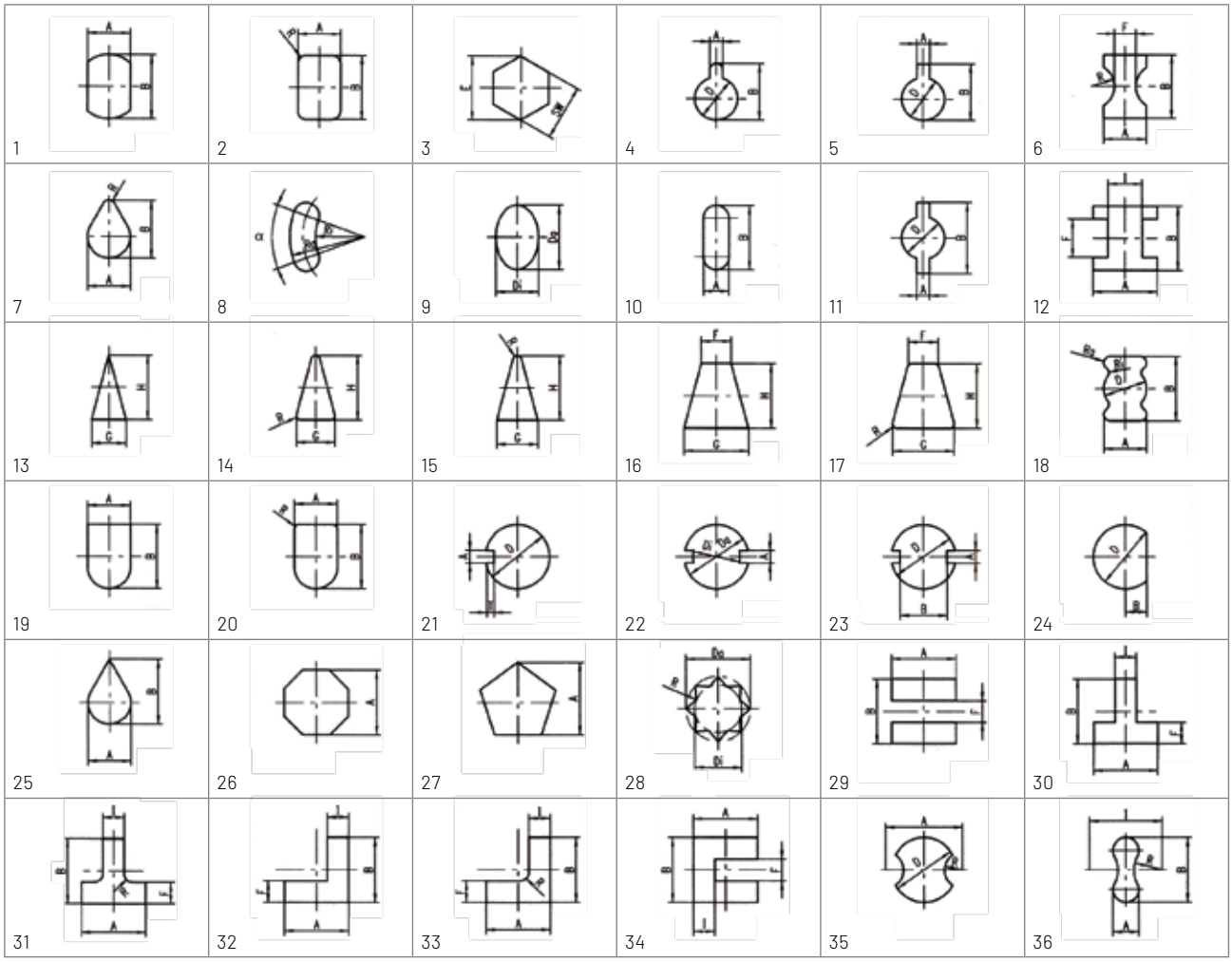
Consider the clearance between the piercing punch and the bush. The diagonal profile should not be larger than max. d_4

a H8	b H8	Stopnjevanje Gradiation	d2 m5	d3	d4 max	H +0,25 0	L1 +0,5 0	L2 min
1,6 - 5,4	2,0 - 5,5	0,1	10	13	5,8	5,0		4
2,0 - 7,4	2,5 - 7,5		13	16	8,0			5
2,0 - 9,9	2,5 - 10,0		16	19	9,5			
2,5 - 12,9	3,2 - 13,0		20	23	12,0		16 / 20 / 25 / 32	8
3,2 - 15,9	4,0 - 16,0		25	28	17,3			
4,0 - 20,9	5,0 - 21,0		32	35	20,7			
5,0 - 26,9	6,3 - 27,0		40	43	27,7			

Tipi profilov
Type variations

Naročite lahko tudi druge tipe profilov. Izdelujemo jih po predloženih skicah iz različnih materialov: HWS, HSS in PVD prevleko.

We can supply these tools according to your requirements from a range of materials: HWS, HSS and Physical Vapor Deposition (PVD) coatings.



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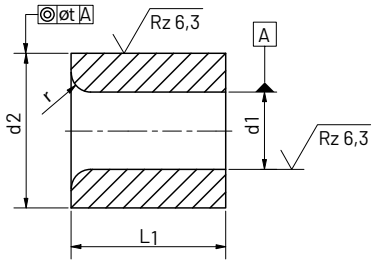
3 Vodilna matrica
Punch Guide Bush

ISO 8978



Vodilna matrica.

Punch guide bush.

Dimenzije so prikazane v tabeli.

Material:
Jeklo, ki ga po presoji določi proizvajalec.

Trdota:
740 ± 40 HV 10
HRC 62 ± 2

Obdelava:
Notranjost in zunaj fino brušeno v tolerancah, posneti robovi.

The dimensions are shown in the table.

Material:
Case-hardened steel as chosen by manufacturer

Hardness:
740 ± 40 HV 10
HRC 62 + 2

Finish:
Inside and outside grinded in tolerance, with insertion chamfer.

Opomba | Note

Bodite pozorni, ker pri rezilni igli standarda ISO 8020 / 8021 ne moremo zagotoviti primernega razmika - skladnosti prileganja. Standard naj bi bil revidiran.

Please consider ISO 8020 / 8021 that no clearance fit can be assured. The standard is going to be revised.

d1 H6	Stopnjevanje Gradiation	d2 n6	L1	r	t
1,0 - 2,3	0,1	5	8,0	1	0,01
1,6 - 3,0		6	12,5		
2,0 - 3,5		8		1,5	
3,0 - 5,0		10	16,0	2,0	
4,0 - 7,2		13			
6,0 - 8,8		16	20,0		
7,5 - 11,3		20		2,5	
11,0 - 16,6		25	25,0		
15,0 - 20,0	0,5	32		4,0	
18,0 - 27,0		40	32,0		
26,00 - 36,00		50	40,0		

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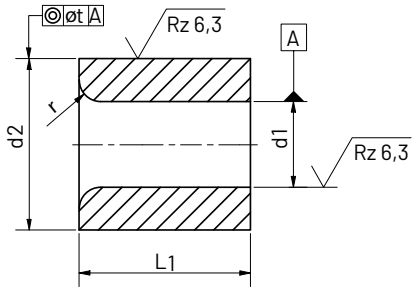
3 Vodilna matrica
Punch Guide Bush

DIN 9845 C



Vodilna matrica tipa C.

Punch guide bush, type C.

Dimenzije so prikazane v tabeli.

Material:
Jeklo, ki ga po presoji določi proizvajalec.

Trdota:
740 ± 40 HV 10
HRC 62 ± 2

Obdelava:
Notranjost in zunaj fino brušeno v tolerancah, posneti robovi.

The dimensions are shown in the table.

Material:
Case-hardened steel as chosen by manufacturer".

Hardness:
740 ± 40 HV 10
HRC 62 + 2

Finish:
Inside and outside grinded in tolerance, with insertion chamfer.

Opomba | Note

Bodite pozorni, ker pri rezilni igli standarda ISO 8020 / 8021 ne moremo zagotoviti primernega razmika - skladnosti prileganja. Standard naj bi bil revidiran.

Please consider ISO 8020 / 8021 that no clearance fit can be assured. The standard is going to be revised.

d1 H7	Stopnjevanje Gradiation	d2 n6	L1	r	t
1,0	0,1	5	9	1	0,01
1,1 - 2,0		6	12		
2,1 - 3,0		7			
3,1 - 4,0		8			
4,1 - 5,0		10	16		
5,1 - 6,0		12		1,5	0,02
6,1 - 8,0		15	20		
8,1 - 10,0		18		2	
10,1 - 12,0		22	28		
12,1 - 15,0		26			
15,5 - 18,0	0,5	30	36		

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