





















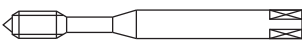
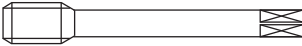
























































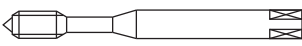
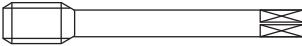

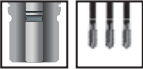


























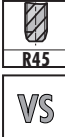
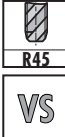

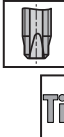
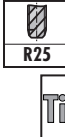

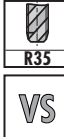














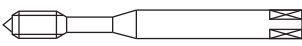
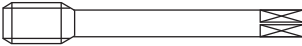


		N						
Merkmale Characteristics				 V	 TiN TiCN	 		 V
								
Lochart Hole type								
		N310-3	N320-3 N320-4	N320V-3 N320V-4	N320TN-3/-4 N320TC-3/-4	N321-3 N321-4	N330-3 N330-4	N330V-3 N330V-4
DIN lang DIN long	DIN 371	60 / 62	62 / 64	60 / 64	64	70	70	70
Extra-lang Extra-long	DC							
ISO kurz ISO short	ISO 529							
DIN kurz DIN short	DIN 352							
Toleranz Tolerance	ISO 2 6H	60 / 62	62 / 64	60 / 64	64	70	70	70
Übermass Oversize	ISO 3 6G		68	68				
Übermass Oversize	7G		68					
Übermass Oversize	+ 0.10 mm + 0.20 mm		68					
Feintoleranz Fine tolerance	ISO 1 4H		66					
LH Linksgewinde LH Left-hand thread	ISO 2 6H	62	66	66				
		N410-3	N420-4	N420V-4	N420TN-4 N420TC-4	N421-4	N430-4	N430V-4
DIN lang DIN long	DIN 376	63	65	65	65	71	71	71
Extra-lang Extra-long	DC							
ISO kurz ISO short	ISO 529							
DIN kurz DIN short	DIN 352							
Toleranz Tolerance	ISO 2 6H	63	65	65	65	71	71	71
Übermass Oversize	ISO 3 6G		69	69				
Übermass Oversize	7G		69					
Übermass Oversize	+ 0.10 mm + 0.20 mm		69 / 71					
Feintoleranz Fine tolerance	ISO 1 4H		67					
LH Linksgewinde LH Left-hand thread	ISO 2 6H	63	67	67				

N								
 R15 	 R40	 R40 	 R40  TiN  TiCN	 R40  V  E 1.5xP	 R40 	 R40  		 
			 	 				
								
N350-3 N350V-3	N360-3	N360V-3	N360TN-3 N360TC-3	N360-5 N360V-5	N361-3	N362V-3	N520-4	N520V-4
72	74	60 / 74	74	80	80	80		
							82	82
72	74	60 / 74	74	80	80	80	82	82
	76	76						
	78	78						
	78	78						
	78							
	76	76						
N450-3 N450V-3	N460-3	N460V-3	N460TN-3 N460TC-3	N460-5 N460V-5	N461-3	N462V-3	N620-4	N620V-4
73	75	75	75	81	81	81		
							83	83
73	75	75	75	81	81	81	83	83
	77	77						
	79	79						
	79	79						
	79							
	77	77						

		N								
Merkmale Characteristics	 TiN		 R40		 V		 TiN			
										
										
Lochart Hole type										
		N520TN-4	N560-3	N560V-3	N560TN-3	N1120-4	N1160-3	N1110 -1 -2 -3 -S		
DIN lang DIN long	DIN 371									
Extra-lang Extra-long	DC	82	84	84	84					
ISO kurz ISO short	ISO 529					118	118	60 / 114		
DIN kurz DIN short	DIN 352									
Toleranz Tolerance	ISO 2 6H	82	84	84	84	118	118	60 / 114		
Übermass Oversize	ISO 3 6G									
Übermass Oversize	7G									
Übermass Oversize	+ 0.10 mm + 0.20 mm									
Feintoleranz Fine tolerance	ISO 1 4H									
LH Linksgewinde LH Left-hand thread	ISO 2 6H									
		N620TN-4	N660-3	N660V-3	N660TN-3	N1220-4	N1260-3	N1210 -1 -2 -3 -S		
DIN lang DIN long	DIN 376									
Extra-lang Extra-long	DC	83	85	85	85					
ISO kurz ISO short	ISO 529					118	118	60 / 115		
DIN kurz DIN short	DIN 352									
Toleranz Tolerance	ISO 2 6H	83	85	85	85	118	118	60 / 115		
Übermass Oversize	ISO 3 6G									
Übermass Oversize	7G									
Übermass Oversize	+ 0.10 mm + 0.20 mm									
Feintoleranz Fine tolerance	ISO 1 4H									
LH Linksgewinde LH Left-hand thread	ISO 2 6H									





























N	W				Z			
 		 DLC	 R40	 R40 DLC	 V	 VS	 R40 V	 R40 VS
 NEW								
								
NP110-S -1 -2 -3 -S	W320-3 W320-4	W320DL-3 W320DL-4	W360-3	W360DL-3	Z320V-3 Z320V-4	Z320VS-4	Z360V-3 Z362V-3	Z360VS-3 Z362VS-3
	86	86	87	87	88	88	89	90
116								
116	86	86	87	87	88	88	89	90
NP210-S -1 -2 -3 -S	W420-4	W420DL-4	W460-3	W460DL-3	Z420V-4	Z420VS-4	Z462V-3	Z462VS-3
	86	86	87	87	88	88	89	91
117								
117	86	86	87	87	88	88	89	91







































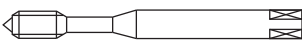
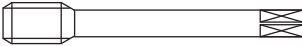
	Z		ZX	H		S		
Merkmale Characteristics	 R45 VS	 R45 VS	 B 4 x P	 TTCN	 R25 TTCN	 VS	 R35 VS	
			 NEW					
Lochart Hole type								
	Z370VS-3	Z373VS-3	ZX320-4	H320-4 H320TC-4	H350-3 H350TC-3	S320VS-4	S360VS-3	
DIN lang DIN long	DIN 371	90	90	93	94	96	98	99
Extra-lang Extra-long	DC							
ISO kurz ISO short	ISO 529							
DIN kurz DIN short	DIN 352							
Toleranz Tolerance	ISO 2 6H	90	90	93	94	96	98	99
Übermass Oversize	ISO 3 6G					96		
Übermass Oversize	7G							
Übermass Oversize	+ 0.10 mm + 0.20 mm							
Feintoleranz Fine tolerance	ISO 1 4H	90					98	
LH Linksgewinde LH Left-hand thread	ISO 2 6H							
	Z470VS-3	Z473VS-3	ZX420-4	H420-4 H420TC-4	H450-3 H450TC-3	S420VS-4	S460VS-3	
DIN lang DIN long	DIN 376	91	91	93	95	97	98	99
Extra-lang Extra-long	DC							
ISO kurz ISO short	ISO 529							
DIN kurz DIN short	DIN 352							
Toleranz Tolerance	ISO 2 6H	91	91	93	95	97	98	99
Übermass Oversize	ISO 3 6G					97		
Übermass Oversize	7G							
Übermass Oversize	+ 0.10 mm + 0.20 mm							
Feintoleranz Fine tolerance	ISO 1 4H							
LH Linksgewinde LH Left-hand thread	ISO 2 6H							



Inhaltsverzeichnis — Maschinengewindebohrer ISO DIN 13

























Directory — Machine taps ISO DIN 13

SA			TL		GG				
									
									
									
SA320-4	SA350-3	SA390-3	TL320VS-4	TL351VS-3	GG350NV-3	GG350TC-3	GG353TC-3	GG550NV-3	
100	100	99	100	100	102	102	102		102
100	100	99	100	100	102	102	102		102
100	100	99	100	100					
SA420-4	SA450-3		TL420VS-4	TL451VS-3	GG450NV-3	GG450TC-3	GG453TC-3	GG650NV-3	
101	101		101	101	103	103	103		103
									103
101	101		101	101	103	103	103		103
101	101		101	101					




















		K			QTAP							
Merkmale Characteristics			TiCN		TiCN		VS		R40		R40	
												
												
					NEW	NEW	NEW	NEW				
Lochart Hole type												
		K313TC-3				Q320VS-4	Q323VS-4	Q360VS-3	Q363VS-3			
DIN lang DIN long	DIN 371	104				61 / 106	106	61 / 107	107			
Extra-lang Extra-long	DC											
ISO kurz ISO short	ISO 529											
DIN kurz DIN short	DIN 352											
Toleranz Tolerance	ISO 2 6H	104				61 / 106	106	61 / 107	107			
Übermass Oversize	ISO 3 6G											
Übermass Oversize	7G											
Übermass Oversize	+ 0.10 mm + 0.20 mm											
Feintoleranz Fine tolerance	ISO 1 4H											
LH Linksgewinde LH Left-hand thread	ISO 2 6H											
		K413TC-3	K613TC-3	K613VS-3		Q420VS-4	Q423VS-4	Q460VS-3	Q463VS-3			
DIN lang DIN long	DIN 376	104				106	106	107	107			
Extra-lang Extra-long	DC		105	105								
ISO kurz ISO short	ISO 529											
DIN kurz DIN short	DIN 352											
Toleranz Tolerance	ISO 2 6H	104	105	105		106	106	107	107			
Übermass Oversize	ISO 3 6G											
Übermass Oversize	7G											
Übermass Oversize	+ 0.10 mm + 0.20 mm											
Feintoleranz Fine tolerance	ISO 1 4H											
LH Linksgewinde LH Left-hand thread	ISO 2 6H											



Inhaltsverzeichnis — Maschinengewindebohrer ISO DIN 13
Directory — Machine taps ISO DIN 13







RTS							
 VS	 VS	 R40 VS	 R40 VS	 R40 E 1.5xP VS	 R40 E 1.5xP VS	 VS	 R40 VS
							
							
RTS320VS-4	RTS323VS-4	RTS360VS-3 RTS362VS-3	RTS365VS-3	RTS362VS-5	RTS365VS-5	RTS523VS-4	RTS565VS-3
108	108	109	109	111	111	112	112
108	108	109	109	111	111	112	112
		110					
		110					
RTS420VS-4	RTS423VS-4	RTS462VS-3	RTS465VS-3			RTS623VS-4	RTS665VS-3
108	108	109	109			112	112
108	108	109	109			112	112
		110					
		110					

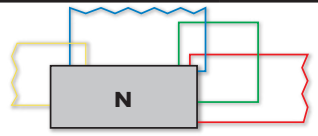



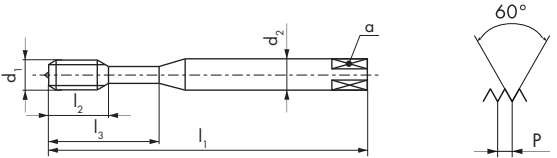












Gewindebohrer-Sortimente
Tap assortments

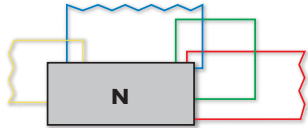
BOXSET		D5855	D5860	D5891
D5855	  N1110-S N1210-S M3, M4, M5, M6, M8, M10, M12			
D5860	  N1110-S N1210-S M3, M4, M5, M6, M8, M10, M12   FO DIN 338 FO DIN 338 D2.5, 3.3, 4.2, 5.0, 6.8, 8.5, 10.2			
D5891	  N310-3 N410-3 M3, M4, M5, M6, M8, M10, M12			
No D5855 / D5860 / D5891		ID	ID	ID
M3 - M12		● 118728	● 118733	● 170922
BOXSET		D5892		
D5892	   N320V-4 M3, M4, M5, M6, M8, M10 			
No D5892		ID		
M3 - M10		● 170921		
BOXSET		D5896		
D5896	   N360V-3 M3, M4, M5, M6, M8, M10 			
No D5896		ID		
M3 - M10		● 167599		

Gewindebohrer-Sortimente — QTAP
Tap assortments — QTAP



BOXSET	D5893
<p>Q320VS-4</p>  <p>M3, M4, M5 M6, M8, M10</p> 	 <p>NEW</p>
<p>No D5893</p>	<p>ID</p>
<p>M3 - M10</p>	<p>● 197104</p>
BOXSET	D5897
<p>Q360VS-3</p>  <p>M3, M4, M5 M6, M8, M10</p> 	 <p>NEW</p>
<p>No D5897</p>	<p>ID</p>
<p>M3 - M10</p>	<p>● 197105</p>

										N310-3	N310-3 LH	N320-3
										<p>N310-3  31 62 73 74 91</p> <p>N310-3 LH  LH 31 62 73 74 91</p> <p>N320-3  62 63 64 72 73 74 81 91</p>		
												
  										  		
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm				ID	ID	ID
1	0.25	40	5.5		2.5	2.1	3			● 150167		
1.1	0.25	40	5.5		2.5	2.1	3			● 174745		
1.2	0.25	40	5.5		2.5	2.1	3			● 150168		
1.4	0.3	40	7		2.5	2.1	3			● 150169		
1.5	0.3	40	7		2.5	2.1	3			● 174752		
1.6	0.35	40	8		2.5	2.1	3			● 174753		
1.7	0.35	40	8		2.5	2.1	3			● 174754		
1.8	0.35	40	8		2.5	2.1	3			● 174755		
2	0.4	45	8		2.8	2.1	3			● 101439	● 111460	
2.2	0.45	45	9		2.8	2.1	3			● 174756		
2.3	0.4	45	9		2.8	2.1	3			● 174757		
2.5	0.45	50	10		2.8	2.1	3			● 101440	● 111461	
2.6	0.45	50	10		2.8	2.1	3			● 101441		
3	0.5	56	12	18	3.5	2.7	3			● 101442	● 111462	
3.5	0.6	56	13	20	4	3	3			● 101443		
4	0.7	63	14	21	4.5	3.4	3			● 101444	● 111464	
5	0.8	70	15	25	6	4.9	* 3			● 101445	● 111465	* 101465
6	1	80	17	30	6	4.9	* 3			● 101446	● 111466	* 101466
8	1.25	90	20	35	8	6.2	3			● 101447		
10	1.5	100	22	39	10	8	3			● 101438		
<p>* N320-3 =  2</p>												



N410-3



31 62 73 74 91

N410-3 LH

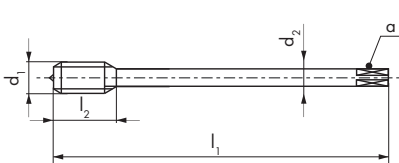


LH

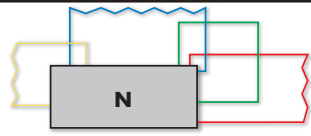





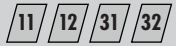







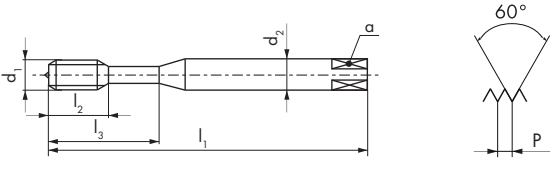






31 62 73 74 91

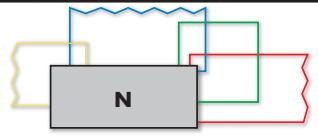







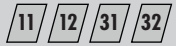
















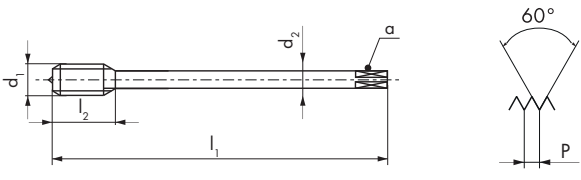






N410-3

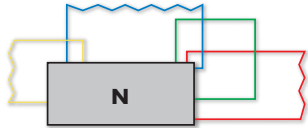
N410-3 LH






$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID
3	0.5	56	12	2.2	1.8	3	2.5	● 101897	
4	0.7	63	14	2.8	2.1	3	3.3	● 101924	
5	0.8	70	15	3.5	2.7	3	4.2	● 101942	
6	1	80	17	4.5	3.4	3	5	● 101953	
7	1	80	17	5.5	4.3	3	6	● 142645	● 111491
8	1.25	90	20	6	4.9	3	6.8	● 101958	● 111492
10	1.5	100	22	7	5.5	3	8.5	● 101866	● 111478
12	1.75	110	24	9	7	3	10.2	● 101870	● 111479
14	2	110	28	11	9	3	12	● 101874	● 111480
16	2	110	30	12	9	3	14	● 101880	● 111481
18	2.5	125	33	14	11	3	15.5	● 101883	● 111482
20	2.5	140	36	16	12	3	17.5	● 101885	● 125530
22	2.5	140	36	18	14.5	3	19.5	★ 101888	
24	3	160	39	18	14.5	4	21	● 101891	● 111485
27	3	160	42	20	16	4	24	● 101895	● 111486
30	3.5	180	45	22	18	4	26.5	● 101901	● 111487
33	3.5	180	48	25	20	4	29.5	★ 101907	
36	4	200	51	28	22	4	32	● 101915	● 111488
39	4	200	55	32	24	4	35	● 101922	
42	4.5	200	55	32	24	4	37.5	● 101932	
48	5	250	63	36	29	4	43	● 111489	
56	5.5	280	71	45	35	5	50.5	● 111447	

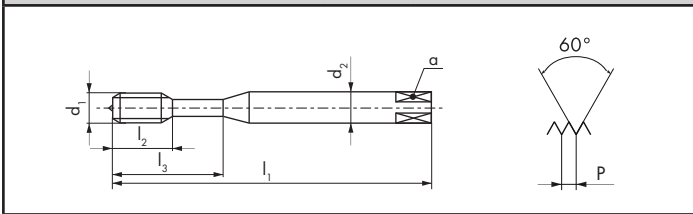
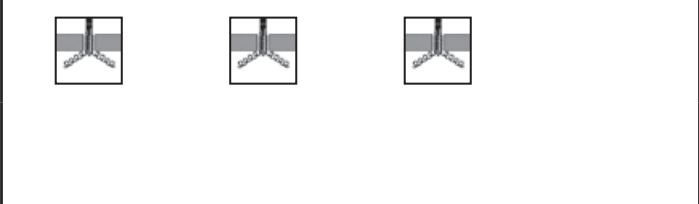
										N320-4	N320V-4	N320TN-4	N320TC-4				
																	
N320-4																	
N320V-4	 V																
N320TN-4	 TiN																
N320TC-4	 TiCN																
																	
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID	ID					
* 1	0.25	40	5.5		2.5	2.1	2	0.75	● 111467								
* 1.1	0.25	40	5.5		2.5	2.1	2	0.85	● 111468								
* 1.2	0.25	40	5.5		2.5	2.1	2	0.95	● 111469								
* 1.4	0.3	40	7		2.5	2.1	2	1.1	● 111470								
* 1.5	0.3	40	7		2.5	2.1	2	1.2	● 111471								
* 1.6	0.35	40	8		2.5	2.1	2	1.25	● 101454								
* 1.7	0.35	40	8		2.5	2.1	2	1.35	● 101455								
* 1.8	0.35	40	8		2.5	2.1	2	1.45	● 101456								
* 2	0.4	45	8		2.8	2.1	2	1.6	● 101458	● 101536	● 101528	● 152900					
* 2.2	0.45	45	9		2.8	2.1	2	1.75	● 101459								
* 2.3	0.4	45	9		2.8	2.1	2	1.9	● 101460								
2.5	0.45	50	10		2.8	2.1	3	2.05	● 101483	● 101545	● 101530	● 101522					
2.6	0.45	50	10		2.8	2.1	3	2.15	● 101484								
3	0.5	56	12	18	3.5	2.7	3	2.5	● 101485	● 101546	● 101531	● 101523					
3.5	0.6	56	13	20	4	3	3	2.9	● 101491	● 101547							
4	0.7	63	14	21	4.5	3.4	3	3.3	● 101495	● 101548	● 101532	● 101524					
5	0.8	70	15	25	6	4.9	3	4.2	● 101499	● 101549	● 101533	● 101525					
6	1	80	17	30	6	4.9	3	5	● 101503	● 101550	● 101534	● 101526					
8	1.25	90	20	35	8	6.2	3	6.8	● 101506	● 101551	● 101535	● 101527					
10	1.5	100	22	39	10	8	3	8.5	● 101481	● 101544	● 101529	● 101521					
* N320-3 / N320V-3 N320TN-3 / N320TC-3 																	




									N420-4	N420V-4	N420TN-4	N420TC-4
N420-4												
N420V-4	 V											
N420TN-4	 TiN											
N420TC-4	 TiCN											
												
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID	
3	0.5	56	12	2.2	1.8	3	2.5	● 102119	● 143418			
4	0.7	63	14	2.8	2.1	3	3.3	● 102146	● 102279			
5	0.8	70	15	3.5	2.7	3	4.2	● 102171	● 102280	● 146297		
6	1	80	17	4.5	3.4	3	5	● 102182	● 102282	● 147439		
7	1	80	17	5.5	4.3	3	6	● 102189	● 144713			
8	1.25	90	20	6	4.9	3	6.8	● 102195	● 102285	● 102251	● 102233	
9	1.25	90	20	7	5.5	3	7.8	● 102202				
10	1.5	100	22	7	5.5	3	8.5	● 102061	● 102263	● 102240	● 102228	
11	1.5	100	19	8	6.2	3	9.5	● 162770				
12	1.75	110	24	9	7	3	10.2	● 102072	● 102265	● 102243	● 102229	
14	2	110	28	11	9	3	12	● 102081	● 102267	● 102245		
16	2	110	30	12	9	3	14	● 102090	● 102269	● 102247	● 102231	
18	2.5	125	33	14	11	3	15.5	● 102097	● 102271			
20	2.5	140	36	16	12	3	17.5	● 102101	● 102273	● 102248	● 102232	
22	2.5	140	36	18	14.5	3	19.5	● 102106	● 102275			
24	3	160	39	18	14.5	4	21	● 102110	● 102278	● 144220	● 163736	
27	3	160	42	20	16	4	24	● 102117	● 143856			
30	3.5	180	45	22	18	4	26.5	● 102124	● 105124			
33	3.5	180	48	25	20	4	29.5	● 102130	● 146968			
36	4	200	51	28	22	4	32	● 102137	● 143430			
39	4	200	55	32	24	4	35	● 102144	● 158724			
42	4.5	200	55	32	24	4	37.5	● 102158	● 143107			
45	4.5	220	59	36	29	4	40.5	● 110225	● 159565			
48	5	250	63	36	29	4	43	● 110226	● 157517			
56	5.5	280	71	45	35	5	50.5	● 110229	● 158178			





N320-4			62 63 64 72 73 74 81 91
N320-4 LH		LH	62 63 64 72 73 74 81 91
N320V-4 LH		V LH	11 12 31 32

N320-4	N320-4 LH	N320V-4 LH	
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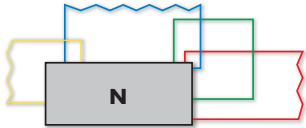
		
ISO 1 4H	ISO 2 6H	ISO 2 6H

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID
* 2	0.4	45	8		2.8	2.1	2	1.6	● 162503	● 111472	● 162771
2.5	0.45	50	10		2.8	2.1	3	2.05	● 159345		
3	0.5	56	12	18	3.5	2.7	3	2.5	● 101487	● 111473	● 162772
4	0.7	63	14	21	4.5	3.4	3	3.3	● 101493	● 111474	● 162773
5	0.8	70	15	25	6	4.9	3	4.2	● 101497	● 111475	● 162774
6	1	80	17	30	6	4.9	3	5	● 101501	● 111476	● 162775
10	1.5	100	22	39	10	8	3	8.5	★ 146484		

* N320-3 / N320V-3



									N420-4	N420-4 LH	N420V-4 LH
N420-4											
N420-4 LH	LH										
N420V-4 LH	V LH										
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	
8	1.25	90	20	6	4.9	3	± 6.8	● 102193	● 102198	● 142621	
10	1.5	100	22	7	5.5	3	8.5	● 102059	● 102064	● 143287	
12	1.75	110	24	9	7	3	10.2	● 102070	● 102040	● 146583	
14	2	110	28	11	9	3	12		● 102084	● 146563	
16	2	110	30	12	9	3	14		● 102093	● 143108	
20	2.5	140	36	16	12	3	17.5		● 102103	● 145579	
24	3	160	39	18	14.5	4	21		● 111493	● 145578	



N320-4



62 63 64 72 73 74
81 91

N320V-4



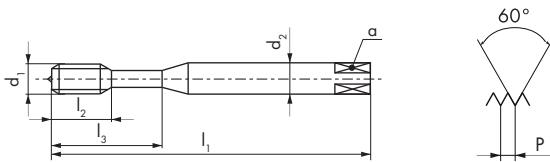
11 12 31 32



N320-4

N320V-4

N320-4

N320-4

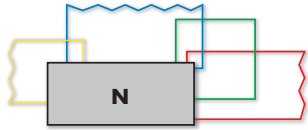























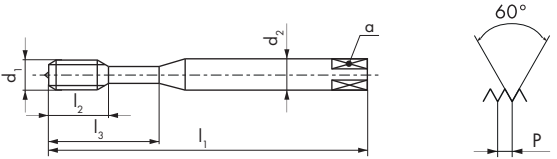








Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
* 2	0.4	45	8		2.8	2.1	2	1.6
2.5	0.45	50	10		2.8	2.1	3	2.05
3	0.5	56	12	18	3.5	2.7	3	2.5
3.5	0.6	56	13	20	4	3	3	2.95
4	0.7	63	14	21	4.5	3.4	3	3.35
5	0.8	70	15	25	6	4.9	3	4.25
6	1	80	17	30	6	4.9	3	5
8	1.25	90	20	35	8	6.2	3	6.8

ID	6H + mm	ID	6H + mm	ID	6H + mm	ID
● 101457	0.019	● 143584	0.019			
● 101482	0.020	● 150522	0.020			
● 101486	0.020	● 143116	0.020	● 101489	0.036	● 101488
● 101490	0.021					
● 101494	0.022	● 143087	0.022	● 101496	0.041	● 111522
● 101498	0.024	● 143088	0.024	● 101500	0.044	● 111523
● 101502	0.026	● 143089	0.026	● 101504	0.050	● 111524
● 101505	0.028	● 143604	0.028			

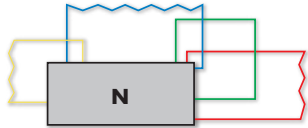
* N320-3 / N320V-3 

								N420-4	N420V-4	N420-4	N420-4			
N420-4		62 63 64 72 73 74 81 91												
N420V-4		11 12 31 32												
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	6H + mm	ID	6H + mm	ID	6H + mm	ID
8	1.25	90	20	6	4.9	3	6.8	● 102194	0.028	● 145246	0.028	● 102199	0.052	● 102196
10	1.5	100	22	7	5.5	3	8.5	● 102060	0.032	● 143726	0.032	● 102065	0.060	● 102062
12	1.75	110	24	9	7	3	10.3	● 102071	0.034	● 145655	0.034	● 102076	0.066	● 102073
16	2	110	30	12	9	3	14	● 135531	0.038	● 162795	0.038	● 102094	0.072	● 102091



									N321-4	N330-4	N330V-4	
<p>N321-4   </p> <p>N330-4  </p> <p>N330V-4   </p>									  			
  									 			
  									 			
									  			
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID	
* 1	0.25	40	5.5		2.5	2.1	2	0.75		● 101558		
* 1.1	0.25	40	5.5		2.5	2.1	2	0.85		★ 101559		
* 1.2	0.25	40	5.5		2.5	2.1	2	0.95		● 101560		
* 1.4	0.3	40	7		2.5	2.1	2	1.1		● 101561		
* 1.6	0.35	40	8		2.5	2.1	2	1.25		● 101562	● 151246	
* 2	0.4	45	8		2.8	2.1	2	1.6	● 101552	● 105125	● 101572	
2.5	0.45	50	10		2.8	2.1	* 3	2.05	● 101553	● 101565	● 101573	
3	0.5	56	12	18	3.5	2.7	* 3	2.5	● 101555	● 101567	● 101574	
3.5	0.6	56	13	20	4	3	2	2.9		● 101568		
4	0.7	63	14	21	4.5	3.4	3	3.3	● 101557	● 101569	● 101576	
5	0.8	70	15	25	6	4.9	3	4.2		● 101570	● 101577	
6	1	80	17	30	6	4.9	3	5		● 101571	● 101578	
<p>* N321-3 / N330-3 / N330V-3 </p> <p>* N330-4 =  2</p> <p>* N330V-4 =  2</p>									<p>ISO 1 4H</p> <p>≤ M1.5</p>			

								N420-4	N421-4	N430-4	N430V-4
N420-4											
N421-4											
N430-4											
N430V-4											
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID
4	0.7	63	14	2.8	2.1	3	3.3		● 102293		
5	0.8	70	15	3.5	2.7	3	4.2		● 102294		
6	1	80	17	4.5	3.4	3	5		● 102295		
8	1.25	90	20	6	4.9	3	6.8	● 102197	● 102296	● 102301	● 102306
10	1.5	100	22	7	5.5	3	8.5	● 102063	● 102286	● 102297	● 102302
12	1.75	110	24	9	7	3	10.2	● 102074	● 102287	● 102298	● 102303
16	2	110	30	12	9	3	14	● 102092	● 102289		



N350-3



62 63 64 72 73 74
81 91

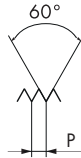
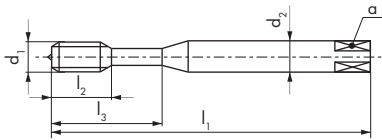
N350V-3





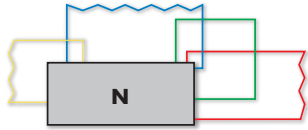
11 12 31 32

N350-3

N350V-3



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID
2	0.4	45	8		2.8	2.1	2	1.6	● 101580	● 101593
2.3	0.4	45	9		2.8	2.1	2	1.9	● 101581	
2.5	0.45	50	10		2.8	2.1	2	2.05	● 101582	● 101594
2.6	0.45	50	10		2.8	2.1	2	2.15	● 101583	
3	0.5	56	12	18	3.5	2.7	2	2.5	● 101584	● 101595
3.5	0.6	56	13	20	4	3	2	2.9	● 101585	
4	0.7	63	14	21	4.5	3.4	2	3.3	● 101587	● 101596
5	0.8	70	15	25	6	4.9	3	4.2	● 101589	● 101597
6	1	80	17	30	6	4.9	3	5	● 101591	● 101598
8	1.25	90	20	35	8	6.2	3	6.8	● 101592	● 146810
10	1.5	100	22	39	10	8	3	8.5	● 101579	● 147217



N450-3

R15

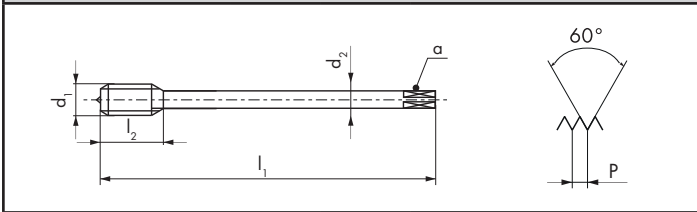
62 63 64 72 73 74
81 91

N450V-3

R15

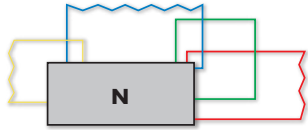
V

11 12 31 32



ISO 2 6H	ISO 2 6H

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID
8	1.25	90	20	6	4.9	3	6.8	● 102327	● 102334
10	1.5	100	22	7	5.5	3	8.5	● 102314	● 102329
12	1.75	110	24	9	7	3	10.2	● 102317	● 102330
14	2	110	28	11	9	3	12	● 102319	● 145487
16	2	110	30	12	9	3	14	● 102321	● 102331
20	2.5	140	36	16	12	4	17.5	● 102324	● 102332
24	3	160	39	18	14.5	4	21	● 102325	● 102333



N360-3 **N360V-3** **N360TN-3** **N360TC-3**



N360-3



63 72 73 74 81 91

N360V-3



11 12 32

N360TN-3

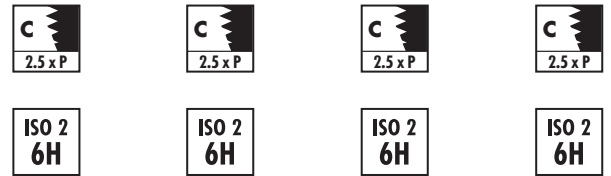
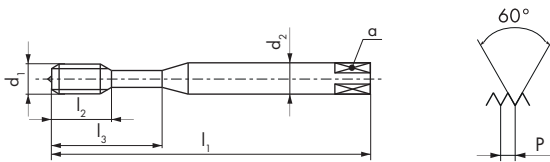


11 12 13 14 32

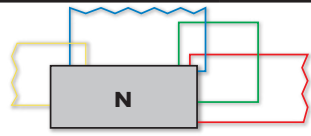
N360TC-3










11 12 13 14 21 31
32 62 64 73 74 82
83







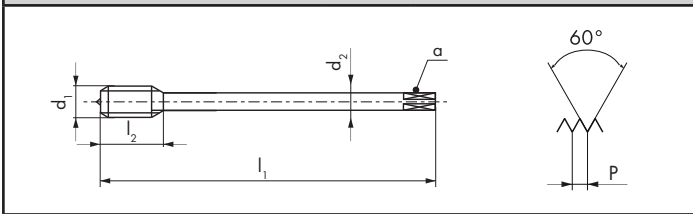
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID	ID
2	0.4	45	7		2.8	2.1	2	1.6	● 101618	● 101708	● 101697	● 146842
2.2	0.45	45	8		2.8	2.1	2	1.75	● 101619			
2.3	0.4	45	8		2.8	2.1	2	1.9	● 101620			
2.5	0.45	50	9		2.8	2.1	2	2.05	● 101622	● 101709	● 101698	● 101689
2.6	0.45	50	9		2.8	2.1	2	2.15	● 101623	● 101710		
3	0.5	56	5.5	18	3.5	2.7	3	2.5	● 101626	● 101711	● 101699	● 101690
3.5	0.6	56	6.5	20	4	3	3	2.9	● 101630	● 142625		
4	0.7	63	7.5	21	4.5	3.4	3	3.3	● 101635	● 101713	● 101700	● 101691
4.5	0.75	70	9	25	6	4.9	3	3.75	● 101639			
5	0.8	70	9	25	6	4.9	3	4.2	● 101644	● 101715	● 101701	● 101692
6	1	80	11	30	6	4.9	3	5	● 101652	● 101717	● 101703	● 101693
7	1	80	11	30	7	5.5	3	6	● 101656	● 101718		
8	1.25	90	12.5	35	8	6.2	3	6.8	● 101663	● 101721	● 101705	● 101694
9	1.25	90	12.5	35	9	7	3	7.8	● 101668			
10	1.5	100	14	39	10	8	3	8.5	● 101612	● 101707	● 101696	● 101688













N460-3		63 72 73 74 81 91
N460V-3	 	11 12 32
N460TN-3	 	11 12 13 14 32
N460TC-3	 	11 12 13 14 21 31 32 62 64 73 74 82 83

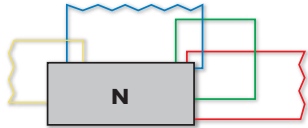









			
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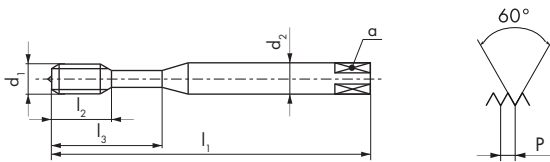
			
			





$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID
5	0.8	70	9	3.5	2.7	3	4.2	● 102410	● 102489	● 160682	
6	1	80	11	4.5	3.4	3	5	● 102411	● 102491	● 152850	
8	1.25	90	12.5	6	4.9	3	6.8	● 102412	● 102492	● 152849	
10	1.5	100	14	7	5.5	3	8.5	● 102351	● 102461	● 150242	● 158687
12	1.75	110	14	9	7	3	10.2	● 102359	● 102465	● 102449	● 102438
14	2	110	14	11	9	3	12	● 102369	● 102468	● 102451	● 111615
16	2	110	18	12	9	3	14	● 102376	● 102471	● 102453	● 102440
18	2.5	125	21	14	11	3	15.5	● 102383	● 102473		
20	2.5	140	24	16	12	4	17.5	● 102389	● 102475	● 102454	● 143280
22	2.5	140	24	18	14.5	4	19.5	● 102394	● 102477		
24	3	160	27	18	14.5	4	21	● 102398	● 102480	● 143119	● 150018
27	3	160	27	20	16	4	24	● 175423	● 102481		
30	3.5	180	30	22	18	4	26.5	● 150246	● 102482		
33	3.5	180	33	25	20	4	29.5	● 167621	● 102483		
36	4	200	36	28	22	5	32	● 143914	● 102484		
39	4	200	40	32	24	5	35	● 175424	● 102485		
42	4.5	200	40	32	24	5	37.5	● 169122	● 102486		
45	4.5	220	44	36	29	5	40.5		● 102487		
48	5	250	48	36	29	5	43		● 102488		
52	5	250	52	40	32	5	47		● 110228		
56	5.5	280	56	45	35	6	50.5		● 102490		
64	6	315	64	50	39	6	58		● 143805		





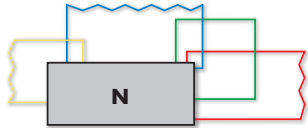
N360-3 LH			63 72 73 74 81 91
N360V-3 LH			LH 11 12 32
N360-3			63 72 73 74 81 91
N360V-3			11 12 32

N360-3 LH N360V-3 LH N360-3 N360V-3



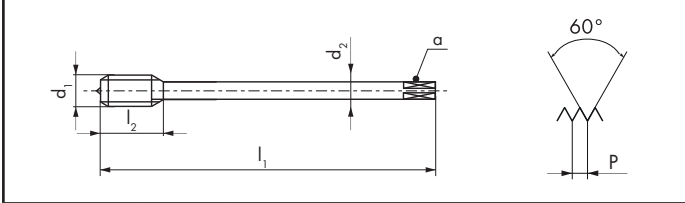
			
ISO 2 6H	ISO 2 6H	ISO 3 6G	ISO 3 6G

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID ^{6H} + mm	ID ^{6H} + mm
2	0.4	45	7		2.8	2.1	2	1.6			● 101617 0.019	● 146000 0.019
2.5	0.45	50	9		2.8	2.1	2	2.05			● 101621 0.020	● 143294 0.020
3	0.5	56	5.5	18	3.5	2.7	3	2.5	● 101627	● 146811	● 101625 0.020	● 104816 0.020
3.5	0.6	56	6.5	20	4	3	3	2.95			● 101629 0.021	● 125829 0.021
4	0.7	63	7.5	21	4.5	3.4	3	3.3	● 101637	● 162540	● 101634 0.022	● 104817 0.022
5	0.8	70	9	25	6	4.9	3	4.2	● 101646	● 144003	● 101643 0.024	● 104818 0.024
6	1	80	11	30	6	4.9	3	5	● 101654	● 144004	● 101669 0.026	● 104819 0.026
8	1.25	90	12.5	35	8	6.2	3	6.8	● 101666	● 143925	● 101662 0.028	● 104820 0.028
10	1.5	100	14	39	10	8	3	8.5	● 101615	● 143587	● 101611 0.032	● 104821 0.032

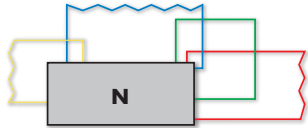


N460-3 LH		LH	63 72 73 74 81 91
N460V-3 LH		V LH	11 12 32
N460-3			63 72 73 74 81 91
N460V-3		V	11 12 32

N460-3 LH	N460V-3 LH	N460-3	N460V-3



$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID $6H$ + mm	ID $6H$ + mm
12	1.75	110	14	9	7	3	10.2	● 102362	● 146354	● 102358 0.034	● 143602 0.034
14	2	110	14	11	9	3	12			● 102368 0.038	● 144712 0.038
16	2	110	18	12	9	3	14	● 102378	● 143439	● 102375 0.038	● 150197 0.038
20	2.5	140	24	16	12	4	17.5	● 102390	● 146564	● 102388 0.042	● 145420 0.042



N360-3



63 72 73 74 81 91

N360V-3

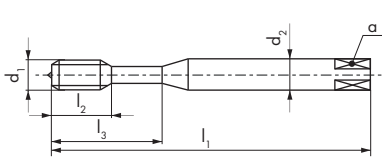




11 12 32

N360-3

N360-3

N360V-3



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		 6H
3	0.5	56	5.5	18	3.5	2.7	3	2.5
4	0.7	63	7.5	21	4.5	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	^Δ 6.8
10	1.5	100	14	39	10	8	3	8.5

ID



ID 6H
+ mm

ID 6H
+ mm

● 101624	● 101628	0.036	● 144311	0.036
● 101633	● 101638	0.041	● 144192	0.041
● 101642	● 101647	0.044	● 143208	0.044
● 101651	● 101655	0.050	● 146709	0.050
● 101661	● 101667	0.052	● 146267	0.052
● 101610	● 101616	0.060	● 142547	0.060

6H
+0.1 mm

6H
+0.1 mm

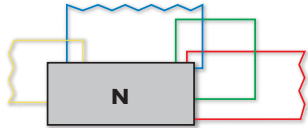
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		 6H +0.1
3	0.5	56	5.5	18	3.5	2.7	3	2.6
4	0.7	63	7.5	21	4.5	3.4	3	3.4
5	0.8	70	9	25	6	4.9	3	4.3
6	1	80	11	30	6	4.9	3	5.1
8	1.25	90	12.5	35	8	6.2	3	6.9
10	1.5	100	14	39	10	8	3	8.6

ID

ID

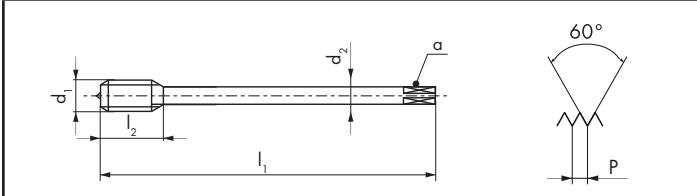
● 160847	
● 101636	● 146513
● 101645	● 146046
● 101653	● 145559
● 101664	● 143415
● 101613	● 124917

^Δ ISO 1 4H = 6.70



N460-3		63 72 73 74 81 91
N460V-3		11 12 32

N460-3	N460-3	N460V-3
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2.5 x P	2.5 x P	2.5 x P
ISO 1 4H	7G	7G

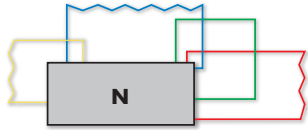
$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm		6H
12	1.75	110	14	9	7	3	10.2
16	2	110	18	12	9	3	14


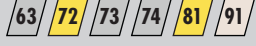












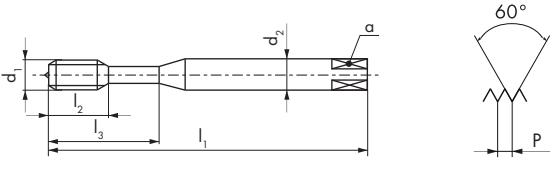




ID	ID 6H + mm	ID 6H + mm
* 124987	● 102363 0.066	● 142532 0.066
	● 102379 0.072	● 144956 0.072

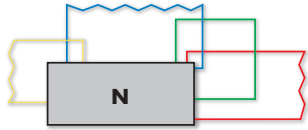
6H +0.1 mm	6H +0.1 mm
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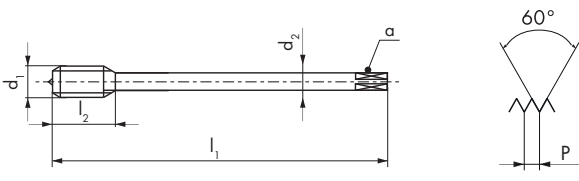






$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm		6H
12	1.75	110	14	9	7	3	10.3
16	2	110	18	12	9	3	14.1

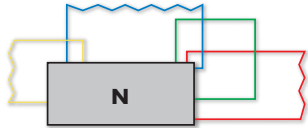
ID	ID
● 102360	● 125044
● 102377	● 145311



										N360-5	N360V-5	N361-3	N362V-3
<p>N360-5  </p> <p>N360V-5   </p> <p>N361-3   </p> <p>N362V-3    </p>													
													
													
													
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID	ID	
2	0.4	45	7		2.8	2.1	2	1.6	● 158079	● 150058			
3	0.5	56	5.5	18	3.5	2.7	3	2.5	● 104809	● 142646	● 101735		
4	0.7	63	7.5	21	4.5	3.4	3	3.3	● 104810	● 142647	● 101736	● 101741	
5	0.8	70	9	25	6	4.9	3	4.2	● 104811	● 142648	● 101737	● 101742	
6	1	80	11	30	6	4.9	3	5	● 104812	● 142649	● 101738	● 101743	
8	1.25	90	12.5	35	8	6.2	3	6.8	● 104813	● 142650	● 101739	● 101744	
10	1.5	100	14	39	10	8	3	8.5	● 104814	● 124899	● 101734	● 101740	

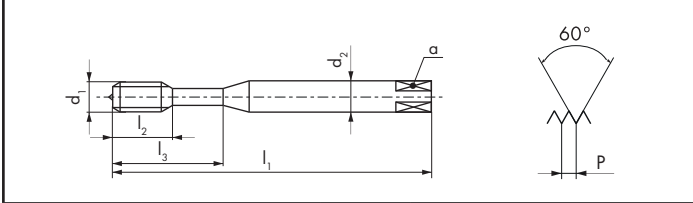


								N460-5	N460V-5	N461-3	N462V-3
<p>N460-5</p>  63 72 73 74 81 91											
<p>N460V-5</p>   11 12 32											
<p>N461-3</p>   61 63 71 72 73 74 81 91											
<p>N462V-3</p>    11 12 32											
								 1.5 x P	 1.5 x P	 2.5 x P	 2.5 x P
								ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID
12	1.75	110	14	9	7	3	10.2	● 104815	● 142651	● 102506	● 102512
14	2	110	14	11	9	3	12				● 102513
16	2	110	18	12	9	3	14				● 102514
18	2.5	125	21	14	11	3	15.5			* 111614	● 102515
20	2.5	140	24	16	12	4	17.5				● 102516
24	3	160	27	18	14.5	4	21				● 102517
27	3	160	27	20	16	4	24				● 159244
30	3.5	180	30	22	18	4	26.5				● 143090



N520-4		62 63 64 72 73 74 81 91
N520V-4	V	11 12 31 32
N520TN-4	TiN	11 12 13 14 32

N520-4	N520V-4	N520TN-4	

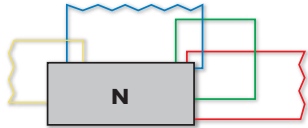









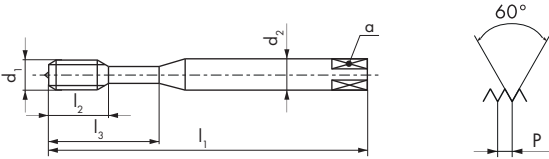




ISO 2 6H	ISO 2 6H	ISO 2 6H

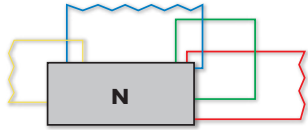
Ø d1 M	P mm	l1 mm	l2 mm	l3 mm	d2 mm	a mm			ID	ID	ID
2.5	0.45	100	10		2.8	2.1	3	2.05	● 102594	● 142623	
3	0.5	112	12	18	3.5	2.7	3	2.5	● 102595	● 143399	● 162790
4	0.7	112	14	21	4.5	3.4	3	3.3	● 102596	● 143400	● 146837
5	0.8	125	15	25	6	4.9	3	4.2	● 102597	● 142654	● 150113
6	1	125	17	30	6	4.9	3	5	● 102598	● 143137	● 148821












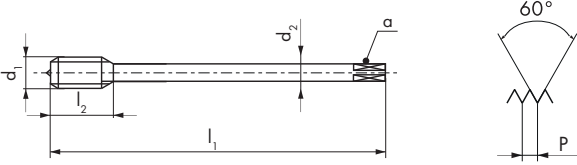










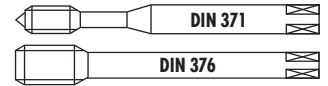
								N620-4	N620V-4	N620TN-4				
								N620-4						
N620V-4														
N620TN-4														
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID				
4	0.7	112	14	2.8	2.1	3	3.3	● 102619	● 142582	● 146442				
5	0.8	125	15	3.5	2.7	3	4.2	● 102620	● 142657	● 146443				
6	1	125	17	4.5	3.4	3	5	● 102621	● 142658	● 144591				
8	1.25	140	20	6	4.9	3	6.8	● 102622	● 143401	● 146262				
10	1.5	160	22	7	5.5	3	8.5	● 102614	● 142660	● 146849				
12	1.75	180	24	9	7	3	10.2	● 102615	● 143127	● 146295				
14	2	180	28	11	9	3	12	● 102616	● 151905					
16	2	200	30	12	9	3	14	● 102617	● 143106	● 143574				
20	2.5	224	36	16	12	3	17.5	● 102618	● 143596	● 174317				



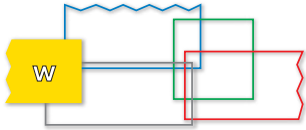
										N560-3	N560V-3	N560TN-3			
<p>N560-3  63 72 73 74 81 91</p> <p>N560V-3   11 12 32</p> <p>N560TN-3   11 12 13 14 32</p>															
															
															
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm				ID	ID	ID			
2.5	0.45	100	9		2.8	2.1	2	2.05		● 102600	● 102607				
3	0.5	112	5.5	18	3.5	2.7	3	2.5		● 102601	● 102608	● 142663			
4	0.7	112	7.5	21	4.5	3.4	3	3.3		● 102602	● 102609	● 142664			
5	0.8	125	9	25	6	4.9	3	4.2		● 102603	● 102610	● 142665			
6	1	125	11	30	6	4.9	3	5		● 102604	● 102611	● 142666			
8	1.25	140	12.5	35	8	6.2	3	6.8		● 102605	● 102612	● 142667			
10	1.5	160	14	39	10	8	3	8.5		● 102599	● 102606	● 142668			



								N660-3	N660V-3	N660TN-3					
<p>N660-3</p>  63 72 73 74 81 91								  							
<p>N660V-3</p>   11 12 32															
<p>N660TN-3</p>   11 12 13 14 32															
								 < 2.5 x D  < 2.5 x D  < 2.5 x D							
								  							
								  							
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID					
6	1	125	11	4.5	3.4	3	5	● 162792	● 115657						
8	1.25	140	12.5	6	4.9	3	6.8	● 162793	● 115544						
10	1.5	160	14	7	5.5	3	8.5	● 162794	● 135539	● 173484					
12	1.75	180	14	9	7	3	10.2	● 102623	● 102626	● 142669					
14	2	180	14	11	9	3	12	● 162253	● 147500						
16	2	200	18	12	9	3	14	● 102624	● 102627	● 142670					
20	2.5	224	24	16	12	4	17.5	● 102625	● 102628	● 178003					



										W320-4	W420-4	W320DL-4	W420DL-4
W320-4													
W420-4													
W320DL-4		DLC											
W420DL-4		DLC											
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm				ID	ID	ID	ID
* 2	0.4	45	8		2.8	2.1	2	1.6	● 104612		● 176688		
2.5	0.45	50	10		2.8	2.1	2	2.05	● 104613		● 176689		
3	0.5	56	12	18	3.5	2.7	2	2.5	● 104615		● 176690		
4	0.7	63	14	21	4.5	3.4	2	3.3	● 104617		● 176691		
5	0.8	70	15	25	6	4.9	2	4.2	● 104618		● 176354		
6	1	80	17	30	6	4.9	2	5	● 104619		● 175590		
8	1.25	90	20		6	4.9	2	6.8		● 104636		● 176692	
10	1.5	100	22		7	5.5	2	8.5		● 104632		● 176693	
12	1.75	110	24		9	7	3	10.2		● 104633		● 176694	
16	2	110	30		12	9	3	14		● 104634		● 176695	
* W320-3													
* W320DL-3													



W360-3



71 72 81

W460-3



71 72 81

W360DL-3



71 72 73

W460DL-3



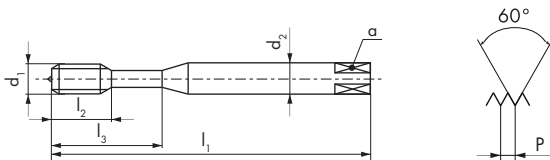
71 72 73

W360-3

W460-3

W360DL-3

W460DL-3



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
2	0.4	45	7		2.8	2.1	2	1.6
2.5	0.45	50	9		2.8	2.1	2	2.05
3	0.5	56	5.5	18	3.5	2.7	2	2.5
4	0.7	63	7.5	21	4.5	3.4	2	3.3
5	0.8	70	9	25	6	4.9	2	4.2
6	1	80	11	30	6	4.9	2	5
8	1.25	90	12.5	35	8	6.2	2	6.8
10	1.5	100	14	39	10	8	2	8.5
12	1.75	110	14		9	7	3	10.2
16	2	110	18		12	9	3	14

ID

ID

ID

ID

● 104625

● 176719

● 104626

● 176720

● 104627

● 176721

● 104628

● 176722

● 104629

● 176723

● 104630

● 176355

● 104631

● 176724

● 104624

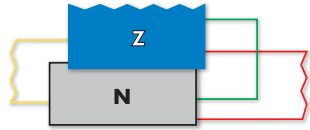
● 176725

● 104640

● 176726

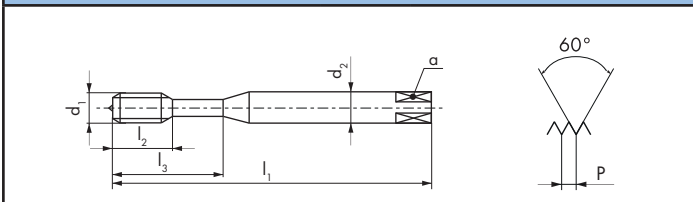
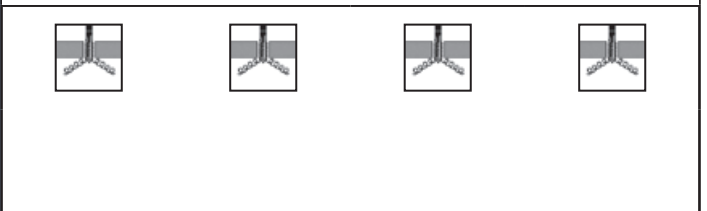
● 104641

● 176727



Z320V-4		V	11 12 13 21 32
Z420V-4		V	11 12 13 21 32
Z320VS-4		VS	11 12 13 14 21 22 23 32 61 63 94
Z420VS-4		VS	11 12 13 14 21 22 23 32 61 63 94

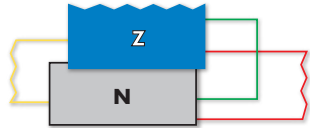
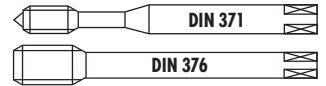
Z320V-4	Z420V-4	Z320VS-4	Z420VS-4
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ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H

Ø d1 M	P mm	l1 mm	l2 mm	l3 mm	d2 mm	a mm			ID	ID	ID	ID
* 1.6	0.35	40	8		2.5	2.1	2	1.25	● 142671			
* 2	0.4	45	8		2.8	2.1	2	1.6	● 111613			
2.5	0.45	50	10		2.8	2.1	3	2.05	● 111455		● 143683	
2.6	0.45	50	10		2.8	2.1	3	2.15	● 142672			
3	0.5	56	12	18	3.5	2.7	3	2.5	● 104669		● 104830	
4	0.7	63	14	21	4.5	3.4	3	3.3	● 104670		● 104831	
5	0.8	70	15	25	6	4.9	3	4.2	● 104671		● 104832	
6	1	80	17	30	6	4.9	3	5	● 104672		● 104833	
8	1.25	90	20	35	8	6.2	3	6.8	● 104673		● 104834	
10	1.5	100	22	39	10	8	3	8.5	● 104668		● 104835	
12	1.75	110	24		9	7	3	10.2		● 104723		● 104836
14	2	110	28		11	9	3	12		● 142673		● 143684
16	2	110	30		12	9	3	14		● 105068		● 111569
18	2.5	125	33		14	11	4	15.5		● 142674		
20	2.5	140	36		16	12	4	17.5		● 105069		● 111570
22	2.5	140	36		18	14.5	4	19.5		● 146003		
24	3	160	39		18	14.5	4	21		● 142675		● 150017
30	3.5	180	45		22	18	4	26.5		● 142676		

* Z320V-3 2.5 x P



Z360V-3



12 21 32

Z362V-3



12 21 32

Z462V-3

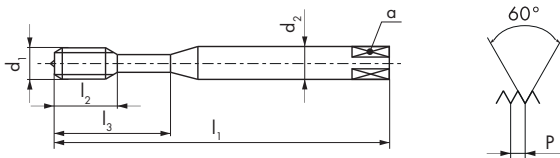


12 21 32

Z360V-3

Z362V-3

Z462V-3



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
2	0.4	45	7		2.8	2.1	2	1.6
2.5	0.45	50	9		2.8	2.1	2	2.05
2.6	0.45	50	9		2.8	2.1	2	2.15
3	0.5	56	5.5	18	3.5	2.7	3	2.5
3.5	0.6	56	6.5	20	4	3	3	2.9
4	0.7	63	7.5	21	4.5	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	6.8
10	1.5	100	14	39	10	8	3	8.5
12	1.75	110	14		9	7	3	10.2
14	2	110	14		11	9	3	12
16	2	110	18		12	9	3	14
18	2.5	125	21		14	11	3	15.5
20	2.5	140	24		16	12	3	17.5
22	2.5	140	24		18	14.5	3	19.5
24	3	160	27		18	14.5	4	21
27	3	160	27		20	16	4	24
30	3.5	180	30		22	18	4	26.5
36	4	200	36		28	22	4	32
42	4.5	200	40		32	24	4	37.5

ID

ID

ID

● 104684

● 104685

● 104686

● 104687

● 104688

● 104689

● 104690

● 104691

● 104692

● 104683

● 104742

● 104743

● 104744

● 104745

● 104746

● 104752

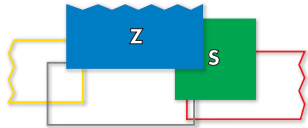
● 104747

● 104748

● 104749

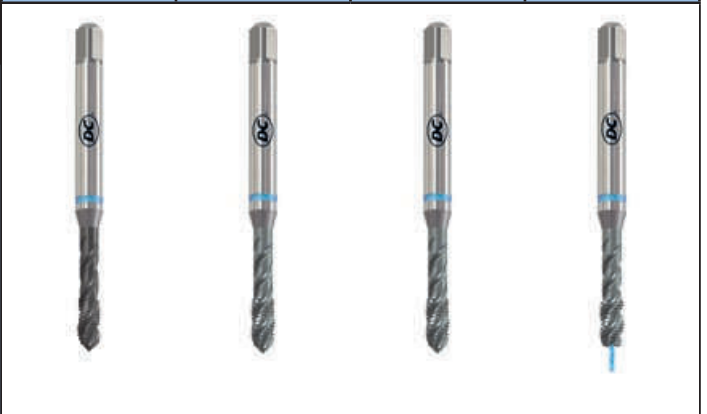
● 104750

● 104751

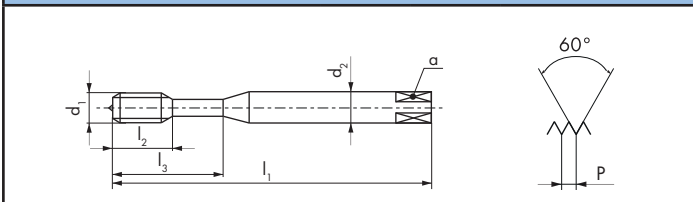


Z362VS-3				12 14 21 22 23 32 61 63
Z370VS-3				14 15 21 22 23 24 51 61
Z373VS-3				94
Z370VS-3				13 14 15 21 22 23 24 51
Z373VS-3				52

Z362VS-3	Z370VS-3	Z370VS-3	Z373VS-3
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< 2.5 x D	< 3 x D	< 3 x D	< 3 x D
	PM	PM	PM



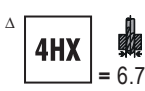
6HX	6HX	4HX	6HX

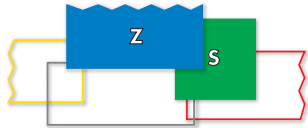
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		
* 3	0.5	56	5.5	18	3.5	2.7	3	2.5
4	0.7	63	7.5	21	4.5	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	6.8
10	1.5	100	14	39	10	8	3	8.5
* Z360VS-3								

ID	ID	ID
● 111504		
● 111505		
● 111506		
● 111507		
● 111508		
● 111509		

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm	a mm		
3	0.5	56	5.5	18	3.5(h9)	2.7	3	2.5
4	0.7	63	7.5	21	4.5(h9)	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	Δ 6.8
10	1.5	100	14	39	10	8	3	8.5

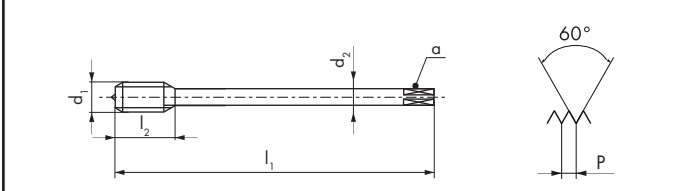
ID	ID	ID
● 162776	● 165324	● 165236
● 162777	● 165325	● 165237
● 162778	● 165326	● 165238
● 162779	● 165327	● 165239
● 162780	● 165328	● 165240
● 162781	● 165438	● 165241





Z462VS-3				12 14 21 22 23 32 61 63
Z470VS-3				14 15 21 22 23 24 51 61
Z473VS-3				94
Z470VS-3				13 14 15 21 22 23 24 51
Z473VS-3				52

Z462VS-3	Z470VS-3	Z473VS-3	
< 2.5 x D	< 3 x D	< 3 x D	
	PM	PM	



6HX	6HX	6HX

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm			ID
12	1.75	110	14	9	7	4	10.2	● 111510
14	2	110	14	11	9	4	12	★ 148169
16	2	110	18	12	9	4	14	● 111511
20	2.5	140	24	16	12	4	17.5	● 111512
24	3	160	27	18	14.5	4	21	★ 111620

ID	ID
● 111510	
★ 148169	
● 111511	
● 111512	
★ 111620	

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ h6 mm	a mm			ID	ID
12	1.75	110	14	* 10	* 8	4	10.2	● 162782	● 165242
14	2	110	14	* 12	* 9	4	12	● 162783	
16	2	110	18	12	9	4	14	● 162784	● 165244
18	2.5	125	21	14	11	4	15.5	● 170643	
20	2.5	140	24	16	12	4	17.5	● 162785	● 165234
22	2.5	140	24	16	12	4	19.5	● 175190	
24	3	160	27	16	12	4	21	● 162786	● 165235

ID	ID
● 162782	● 165242
● 162783	
● 162784	● 165244
● 170643	
● 162785	● 165234
● 175190	
● 162786	● 165235

* Norme DC / * DC Norm/ * Norma DC

ZX AMPCO®

ALU-BRONZE-LEGIERUNGEN

ALU-BRONZE-ALLOYS



ZX - DC-Maschinengewindebohrer mit speziell angepasster Schneidengeometrie

Für Durchgangs- und Sacklöcher < 1.5 x D

Optimal
für AMPCO® 21 / 22
Brinellhärte HB > 280 - < 330

Geeignet
für AMPCO® 18
Brinellhärte HB < 420

Geeignet
für AMPCO® 25 / 26
Brinellhärte HB < 420

Empfehlung
Für AMPCO® 25 / 26: Kernlochdurchmesser + 0.2 mm

Weitere AMPCO® Bearbeitungsoptionen:

Optimal
Für Durchgangslöcher

DC-Maschinengewindebohrer Typ H320-4 / H420-4 für AMPCO® 18
Brinellhärte HB < 200

Optimal
Für Durchgangs- und Sacklöcher < 2 x D
für AMPCO® 25 / 26
Brinellhärte HB > 380 - < 420
Schmierung: Schneidöl / Emulsion

DC-VHM-GewindEFRÄSER Typ GF6165VS
Schnittgeschwindigkeit Vc: 30 - 50 m/min
Fräsvorschub fz: 0.01 - 0.05 mm/Zahn

Optimal
Für Durchgangs- und Sacklöcher < 4 x D
für AMPCO® 25 / 26
Brinellhärte HB > 380 - < 420
Schmierung: Schneidöl / Emulsion

DC-VHM-Gewindewirbler Typ GW301.VS / GWi306.VS
Schnittgeschwindigkeit Vc: 30 - 50 m/min
Fräsvorschub fz: 0.01 - 0.08 mm/Zahn

ZX - DC machine taps with specially adapted cutting geometry

For through and blind holes < 1.5 x D

Optimal
for AMPCO® 21 / 22
Hardness Brinell HB > 280 - < 330

Suitable
for AMPCO® 18
Hardness Brinell HB < 420

Suitable
for AMPCO® 25 / 26
Hardness Brinell HB < 420

Recommendation
For AMPCO® 25 / 26: Core hole diameter + 0.2 mm

Alternative AMPCO® threading solutions:

Optimal
For through holes

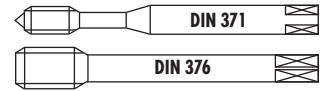
DC machine taps type H320-4 / H420-4 for AMPCO® 18
Hardness Brinell HB < 200

Optimal
For through and blind holes < 2 x D
for AMPCO® 25 / 26
Hardness Brinell HB > 380 - < 420
Lubricant: cutting oil / emulsion

DC solid carbide thread milling cutter type GF6165VS
Cutting speed Vc: 30 - 50 m/min
Feed rate fz: 0.01 - 0.05 mm/tooth

Optimal
For through and blind holes < 4 x D
for AMPCO® 25 / 26
Hardness Brinell HB > 380 - < 420
Lubricant: cutting oil / emulsion

DC solid carbide thread whirl cutter type GW301.VS / GWi306.VS
Cutting speed Vc: 30 - 50 m/min
Feed rate fz: 0.01 - 0.08 mm/tooth



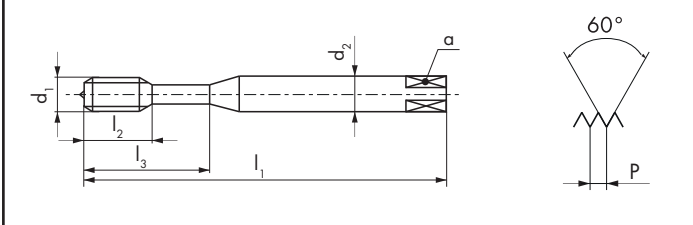
ZX

ZX320-4			AMPCO® 21 22
ZX420-4			AMPCO® 21 22
ZX320-4			AMPCO® 18 25 26
ZX420-4			AMPCO® 18 25 26

ZX320-4	ZX420-4		
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6HX	6HX

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
4	0.7	63	14	21	4.5	3.4	3	* 3.3
5	0.8	70	15	25	6	4.9	3	* 4.2
6	1	80	17	30	6	4.9	3	* 5
8	1.25	90	20	35	8	6.2	3	* 6.8
10	1.5	100	22	39	10	8	3	* 8.5

ID
● 143599
● 145458
● 110232
● 110233
● 124905

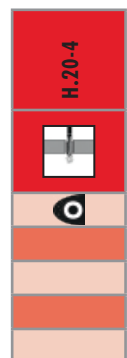
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm		
12	1.75	110	24	9	7	3	* 10.2
16	2	110	30	12	9	3	* 14

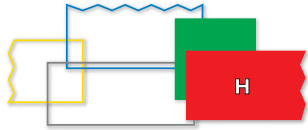
ID
● 110208
● 110207

*Ameco® 25 / Ameco® 26 + 0.2 mm

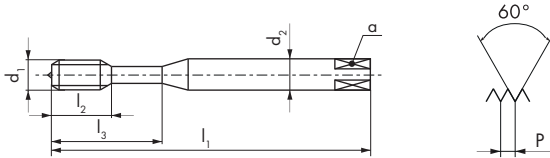
ANWENDUNGSTABELLE FÜR ALU-BRONZE-LEGIERUNGEN APPLICATION CHART FOR ALU-BRONZE-ALLOYS



Werkstoffbezeichnung Material designation	Brinellhärte Hardness Brinell (HB)	Schnittgeschwindigkeit Cutting speed V _c (m/min) Guide Line
AMPCO® 18	< 290	6 - 10
AMPCO® 21	> 280 - < 330	2 - 3
AMPCO® 22	> 280 - < 330	2 - 3
AMPCO® 25	< 420	2 - 3
AMPCO® 26	< 420	2 - 3

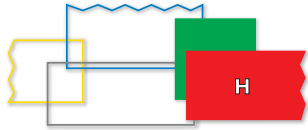



H320-4

15 16 62 64 82
H320TC-4

TiCN
15 16 24 31 82 83
92 93
H320-4
H320TC-4

**ISO 2
6H**
**ISO 2
6H**

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
2	0.4	45	8		2.8	2.1	2	1.6	● 101206	● 151836
2.2	0.45	45	9		2.8	2.1	2	1.75	● 111801	
2.5	0.45	50	10		2.8	2.1	3	2.05	● 101207	● 148603
3	0.5	56	12	18	3.5	2.7	3	2.5	● 101209	● 111836
3.5	0.6	56	13	20	4	3	3	2.9	● 101210	
4	0.7	63	14	21	4.5	3.4	3	3.3	● 101211	● 111502
4.5	0.75	70	15	25	6	4.9	3	3.75	● 101212	
5	0.8	70	15	25	6	4.9	3	4.2	● 101213	● 111458
6	1	80	17	30	6	4.9	3	5	● 101215	● 111456
8	1.25	90	20	35	8	6.2	3	6.8	● 101218	● 111453
10	1.5	100	22	39	10	8	3	8.5	● 101205	● 110911



H420-4



15 16 62 64 82

H420TC-4

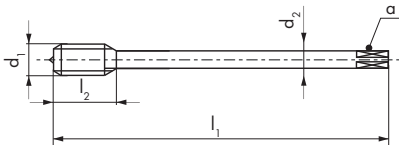




TiCN

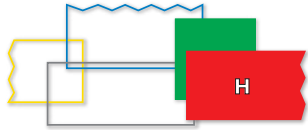
15 16 24 31 82 83
92 93

H420-4

H420TC-4



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm			ID	ID
12	1.75	110	24	9	7	4	10.2	● 101275	● 110912
14	2	110	28	11	9	4	12	● 101277	● 145461
16	2	110	30	12	9	4	14	● 101279	● 111612
18	2.5	125	33	14	11	4	15.5	● 101281	
20	2.5	140	36	16	12	4	17.5	● 101284	● 144606
22	2.5	140	36	18	14.5	4	19.5	● 157752	
24	3	160	39	18	14.5	4	21	● 101286	● 143588
27	3	160	42	20	16	4	24	● 101287	
30	3.5	180	45	22	18	4	26.5	● 101288	
36	4	200	51	28	22	4	32	● 101289	

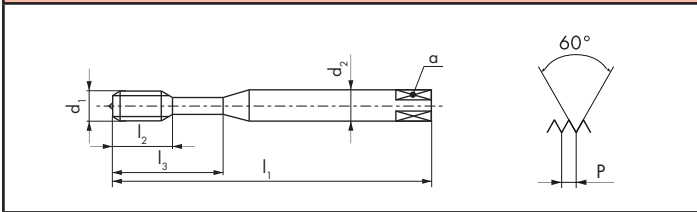


H350-3		15 16 62 64 82
H350TC-3		15 16 24 31 82 83 92 93

H350-3	H350-3	H350TC-3	
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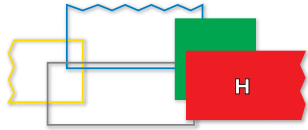



< 1.5 x D	< 1.5 x D	< 1.5 x D
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ISO 2 6H	ISO 3 6G	ISO 2 6H

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		$\pm 6H$ 	ID	ID	$6H$ + mm	ID
2	0.4	45	7		2.8	2.1	2	1.6	● 101238			● 146451
2.5	0.45	50	9		2.8	2.1	3	2.05	● 101239			● 144957
3	0.5	56	5.5	18	3.5	2.7	3	2.5	● 101242	● 101241	0.020	● 111835
3.5	0.6	56	6.5	20	4	3	3	2.9	● 101243			
4	0.7	63	7.5	21	4.5	3.4	3	3.3	● 101245	● 101244	0.022	● 111607
4.5	0.75	70	9	25	6	4.9	3	3.75	● 101246			
5	0.8	70	9	25	6	4.9	3	4.2	● 101248	● 101247	0.024	● 111610
6	1	80	11	30	6	4.9	3	5	● 101251	● 101250	0.026	● 111500
8	1.25	90	12.5	35	8	6.2	3	6.8	● 101255	● 101254	0.028	● 110963
10	1.5	100	14	39	10	8	3	8.5	● 101237	● 101236	0.032	● 111454



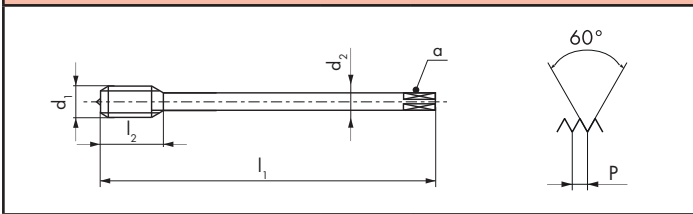
H450-3  15 16 62 64 82




H450TC-3   15 16 24 31 82 83
92 93



H450-3	H450-3	H450TC-3	
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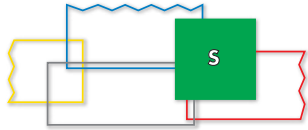
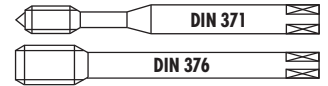


 < 1.5 x D	 < 1.5 x D	 < 1.5 x D	
--	--	--	--



 C 2.5 x P	 C 2.5 x P	 C 2.5 x P	
ISO 2 6H	ISO 3 6G	ISO 2 6H	

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm			ID	ID	6H + mm	ID
12	1.75	110	14	9	7	4	10.2	● 101305	★ 101304	0.034	● 111501
14	2	110	14	11	9	4	12	● 101307			● 146151
16	2	110	18	12	9	4	14	● 101309			● 111605
18	2.5	125	21	14	11	4	15.5	● 101311			
20	2.5	140	24	16	12	4	17.5	● 101313			● 144986
22	2.5	140	24	18	14.5	4	19.5	● 101315			
24	3	160	27	18	14.5	4	21	● 101318			● 144987
27	3	160	27	20	16	4	24	● 101320			
30	3.5	180	30	22	18	4	26.5	● 101323			
36	4	200	36	28	22	4	32	● 101324			
42	4.5	200	40	32	24	4	37.5	● 101325			



S320VS-4



13 15 16 22 23 24
52

S420VS-4

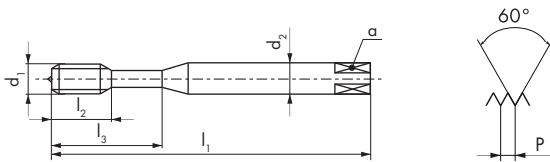


13 15 16 22 23 24
52

S320VS-4

S320VS-4

S420VS-4



6HX

4HX

6HX

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		
3	0.5	56	12	18	3.5	2.7	3	2.5
4	0.7	63	14	21	4.5	3.4	3	3.3
5	0.8	70	15	25	6	4.9	3	4.2
6	1	80	17	30	6	4.9	3	5
8	1.25	90	20	35	8	6.2	3	Δ 6.8
10	1.5	100	22	39	10	8	3	8.5
12	1.75	110	24		9	7	4	10.2
16	2	110	30		12	9	4	14
20	2.5	140	36		16	12	4	17.5

ID

ID

ID

- 111596 * 165318
- 111597 * 165319
- 111598 * 165320
- 111599 * 165321
- 111600 * 165322
- 111601 * 165323

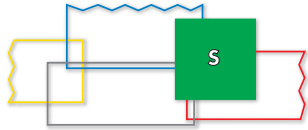
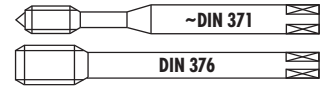
- 111602
- 111603
- 111604

Δ **4HX** = 6.7

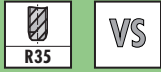
M

ISO DIN 13

PM



S360VS-3



13 15 16 22 23 24
52

S460VS-3



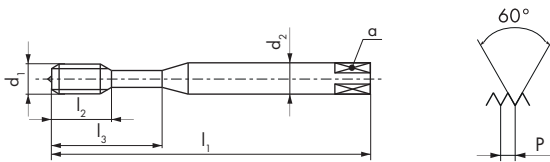
13 15 16 22 23 24
52

aero

SA390-3



16 53



S360VS-3

S460VS-3

SA390-3

SA390-3



6HX

6HX

4HX

6HX

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		
3	0.5	56	5.5	18	3.5	2.7	3	2.5
4	0.7	63	7.5	21	4.5	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	6.8
10	1.5	100	14	39	10	8	3	8.5
12	1.75	110	14		9	7	4	10.2
14	2	110	14		11	9	4	12
16	2	110	18		12	9	4	14
20	2.5	140	24		16	12	4	17.5
24	3	160	27		18	14.5	4	21

ID

ID

- 111513
- 111514
- 111515
- 111516
- 111517
- 111518

- 111519
- * 148171
- 111520
- 111521
- 111606

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm		
4	0.7	63	14	4.5	3.4	3	3.3
5	0.8	70	15	6	4.9	3	4.2
6	1	80	20	6	4.9	3	5
8	1.25	90	25	8	6.2	3	Δ 6.8
10	1.5	100	30	10	8	3	8.5
12	1.75	110	35	12	9	4	10.2
14	2	110	40	16	12	4	12

ID

ID

- | | |
|----------|----------|
| • 149673 | • 149674 |
| • 149693 | • 149694 |
| • 149707 | • 149708 |
| • 149736 | • 149737 |
| * 149754 | • 149755 |
| | • 149775 |
| | * 149792 |

Δ 4HX = 6.7

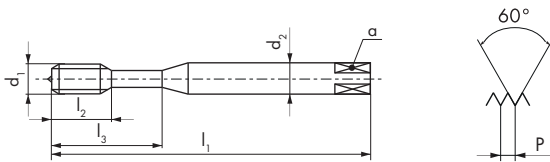
aero

SA320-4

15 16 52 64
SA350-3

15 16 52 64
TL320VS-4

41 42
TL351VS-3

41 42

SA320-4
SA350-3
TL320VS-4
TL351VS-3

4HX
4HX
4HX
4HX

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
3	0.5	56	12		3.5	2.7	3	2.5
4	0.7	63	14		4.5	3.4	3	3.3
5	0.8	70	15		6	4.9	3	4.2
6	1	80	15	23	6	4.9	3	5
8	1.25	90	18	29	8	6.2	3	6.7
10	1.5	100	20	33	10	8	3	8.5

ID
ID
ID
ID

● 147975	● 147987	● 152006	● 152012
● 147976	● 147988	● 152007	● 152013
● 147977	● 147989	● 152008	● 152014
● 147978	● 147990	● 152009	● 152015
● 147979	● 147991	● 152010	● 152016
● 147980	● 147992	● 152011	● 152017



























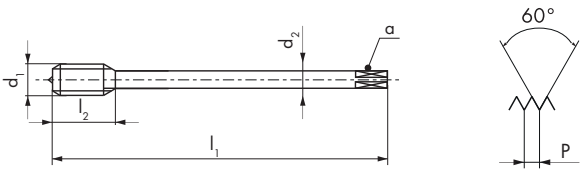








6HX
6HX
6HX
6HX

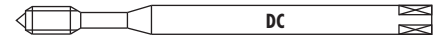
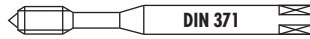
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
3	0.5	56	12		3.5	2.7	3	2.5
4	0.7	63	14		4.5	3.4	3	3.3
5	0.8	70	15		6	4.9	3	4.2
6	1	80	15	23	6	4.9	3	5
8	1.25	90	18	29	8	6.2	3	6.8
10	1.5	100	20	33	10	8	3	8.5

ID
ID
ID
ID

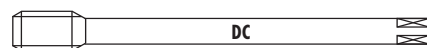
● 147981	● 147993	● 148001	● 148000
● 147982	● 147994	● 148003	● 148002
● 147983	● 147995	● 148007	● 148006
● 147984	● 147996	● 148011	● 148010
● 147985	● 147997	● 148020	● 148018
● 147986	● 147998	● 148027	● 148025

aero

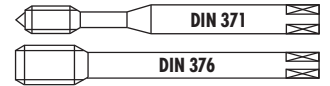
aero									SA420-4	SA450-3	TL420VS-4	TL451VS-3	
SA420-4													
SA450-3													
TL420VS-4													
TL451VS-3													
													
									4HX	4HX	4HX	4HX	
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID		
12	1.75	110	24	9	7	4	10.2	* 148096	* 152189	* 152192	* 152195		
14	2	110	28	11	9	4	12	* 152187					
16	2	110	30	12	9	4	14	* 152188			* 152197		
									6HX	6HX	6HX	6HX	
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID	ID	ID	ID		
12	1.75	110	24	9	7	4	10.2	* 152198	* 152201	* 152204	● 148028		
14	2	110	28	11	9	4	12	* 152199			● 152207		
16	2	110	30	12	9	4	14		* 152203		● 148029		



										GG350NV-3	GG350TC-3	GG353TC-3	GG550NV-3
GG350NV-3													
GG350TC-3													
GG353TC-3													
GG550NV-3													
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm				ID	ID		
3	0.5	56	12	18	3.5	2.7	3	2.5	●	101172	●	101178	
4	0.7	63	14	21	4.5	3.4	3	3.3	●	101173	●	101179	
5	0.8	70	15	25	6	4.9	3	4.2	●	101174	●	101180	
6	1	80	17	30	6	4.9	3	5	●	101175	●	101181	
8	1.25	90	20	35	8	6.2	4	6.8	●	101076	●	101182	
10	1.5	100	22	39	10	8	4	8.5	●	101171	●	101177	
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm	a mm				ID			
5	0.8	70	15	25	6	4.9	3	4.2		●	144947		
6	1	80	17	30	6	4.9	3	5		●	147710		
8	1.25	90	20	35	8	6.2	4	6.8		●	147711		
10	1.5	100	22	39	10	8	4	8.5		●	146708		
$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm				ID			
4	0.7	112	14	21	4.5	3.4	3	3.3		●	101196		
5	0.8	125	15	25	6	4.9	3	4.2		●	101197		
6	1	125	17	30	6	4.9	3	5		●	101198		

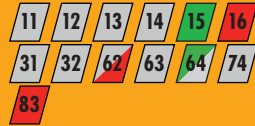
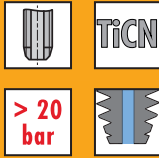


									GG450NV-3	GG450TC-3	GG453TC-3	GG650NV-3
GG450NV-3												
GG450TC-3												
GG453TC-3												
GG650NV-3												
									6HX 6HX 6HX 6HX			
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm			ID	ID	ID	ID	
8	1.25	90	20	6	4.9	4	6.8	● 101189	● 101194			
10	1.5	100	22	7	5.5	4	8.5	● 101183	● 101195			
12	1.75	110	24	9	7	4	10.2	● 101184	● 101190			
14	2	110	28	11	9	4	12	● 101185	● 101191			
16	2	110	30	12	9	4	14	● 101186	● 101192			
20	2.5	140	36	16	12	4	17.5	● 101187	● 101193			
24	3	160	39	18	14.5	4	21	● 101188				
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ h6 mm	a mm			ID				
12	1.75	110	24	* 10	* 8	4	10.2	● 146707				
16	2	110	30	12	9	4	14	● 162796				
* Norme DC / * DC Norm/ * Norma DC												
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	d ₂ mm	a mm			ID				
8	1.25	140	20	6	4.9	4	6.8	● 101203				
10	1.5	160	22	7	5.5	4	8.5	● 101199				
12	1.75	180	24	9	7	4	10.2	● 101200				
16	2	200	30	12	9	4	14	● 101201				
20	2.5	224	36	16	12	4	17.5	● 101202				

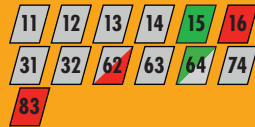
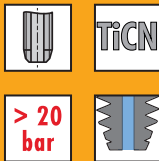


K

K313TC-3

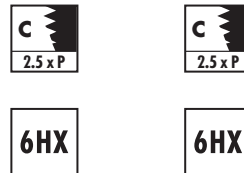
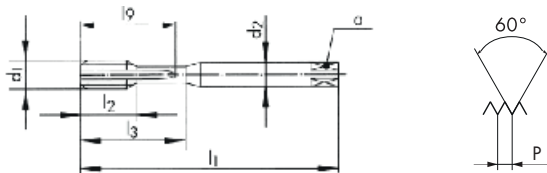


K413TC-3



K313TC-3

K413TC-3

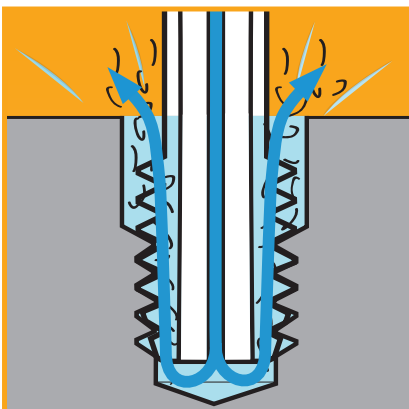


$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	l_0 mm	d_2 mm	a mm		
5	0.8	70	15	25	23	6	4.9	3	4.2
6	1	80	17	30	28	6	4.9	3	5
8	1.25	90	20	35	33	8	6.2	3	6.8
10	1.5	100	22	39	37	10	8	3	8.5
12	1.75	110	24		42	9	7	3	10.2
14	2	110	28		49	11	9	3	12
16	2	110	30		56	12	9	4	14
20	2.5	140	36		70	16	12	5	17.5
24	3	160	39		84	18	14.5	5	21

ID

ID

- 175961
- 170766
- 170769
- 170772
- 165838
- 170778
- 170783
- 170786
- 170775





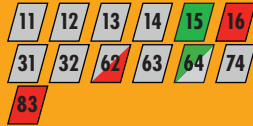
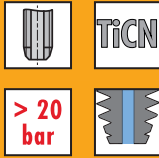
≤ Ø 25.4 > Ø 25.4

PM HSSE

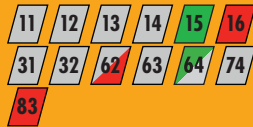
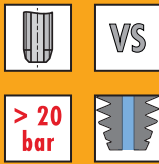


K

K613TC-3

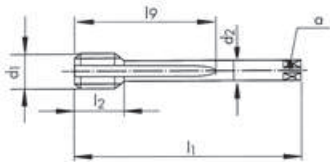


K613VS-3



K613TC-3

K613VS-3



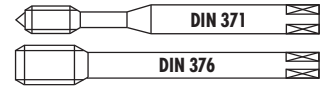
6HX

6HX

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID
6	1	110	17	30	4.5	3.4	3	5	● 170646	● 172699
8	1.25	110	20	40	6	4.9	3	6.8	● 170649	● 172700
10	1.5	125	22	50	7	5.5	3	8.5	● 170652	● 172701
12	1.75	140	24	60	9	7	3	10.2	● 167982	● 172702
14	2	140	28	70	11	9	4	12	● 167983	
16	2	160	30	80	12	9	4	14	● 167984	● 170573
20	2.5	180	36	100	16	12	5	17.5	● 167985	● 170576
24	3	200	39	120	18	14.5	5	21	● 167986	● 172704
27	3	225	42	135	20	16	5	24	● 167987	
30	3.5	250	45	150	22	18	5	26.5	● 165542	
33	3.5	280	48	165	25	20	5	29.5	● 167988	
36	4	300	51	180	28	22	6	32	● 167989	
39	4	300	55	195	32	24	6	35	● 167990	
42	4.5	355	55	210	32	24	6	37.5	● 167999	

Vc (m/min) Guide Line

	M5 - M10	M12 - M16	M20 - M30	M33 - M42
	30 - 40	20 - 30	20 - 30	20 - 30
	30 - 40	30 - 40	30 - 40	30 - 40
	20 - 30	15 - 25	15 - 25	15 - 25
	15 - 20	10 - 15	8 - 12	5 - 8
	8 - 12	5 - 8	5 - 8	5 - 8



QTAP

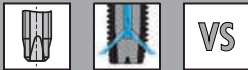
Q320VS-4



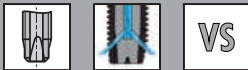
Q420VS-4



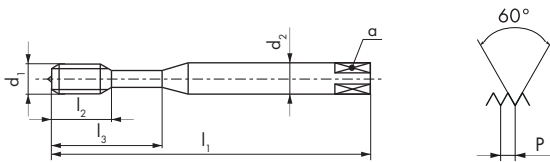
Q323VS-4



Q423VS-4



- 11 12 13 14
- 15 21 22 23
- 24 31 32 51
- 52 61 62 63
- 64 71 72 73
- 74 81 82 83
- 91 92 94



Q320VS-4

Q420VS-4

Q323VS-4

Q423VS-4



NEW



NEW



NEW



NEW



$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		
3	0.5	56	12	18	3.5	2.7	3	2.5
4	0.7	63	14	21	4.5	3.4	3	3.3
5	0.8	70	15	25	6	4.9	3	4.2
6	1	80	17	30	6	4.9	3	5
8	1.25	90	20	35	8	6.2	3	6.8
10	1.5	100	22	39	10	8	3	8.5
12	1.75	110	24		9	7	3	10.2
14	2	110	28		11	9	3	12
16	2	110	30		12	9	3	14
20	2.5	140	36		16	12	4	17.5
24	3	160	39		18	14.5	4	21

ID

ID

ID

ID

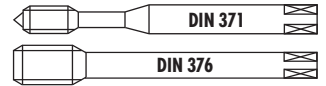
● 195494		● 195505	
● 195495		● 195506	
● 195496		● 195507	
● 195497		● 195508	
● 195498		● 195509	
● 195499		● 195510	
	● 195500		● 195511
	● 195501		● 195512
	● 195502		● 195513
	● 195503		● 195514
	● 195504		● 195515



≤ Ø 16 > Ø 16

PM

HSSE



QTAP

Q360VS-3



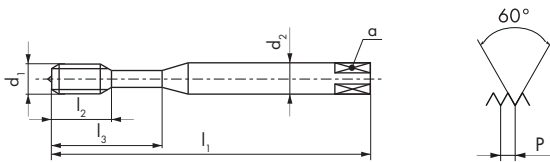
Q460VS-3



Q363VS-3



Q463VS-3



Q360VS-3

Q460VS-3

Q363VS-3

Q463VS-3



NEW



NEW



NEW



NEW



< 2.5 x D



< 2.5 x D



< 2.5 x D



< 2.5 x D



ISO 2 6H





ISO 2 6H



ISO 2 6H



ISO 2 6H

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm		
3	0.5	56	5.5	18	3.5	2.7	3	2.5
4	0.7	63	7.5	21	4.5	3.4	3	3.3
5	0.8	70	9	25	6	4.9	3	4.2
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	6.8
10	1.5	100	14	39	10	8	3	8.5
12	1.75	110	14		9	7	3	10.2
14	2	110	14		11	9	3	12
16	2	110	18		12	9	3	14
20	2.5	140	24		16	12	3	17.5
24	3	160	27		18	14.5	4	21

ID

ID

ID

ID

● 195516

● 195527

● 195517

● 195528

● 195518

● 195529

● 195519

● 195530

● 195520

● 195531

● 195521

● 195532

● 195522 ● 195533

● 195523 ● 195534

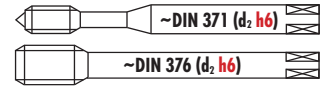
● 195524 ● 195535

● 195525 ● 195536

● 195526 ● 195537



Uniquement pour taraudage synchrone
Nur für Synchrobearbeitung
Only for rigid tapping
Solo per mischilatura sincrona
Solo para roscado sincronizado
Только для rigid tapping

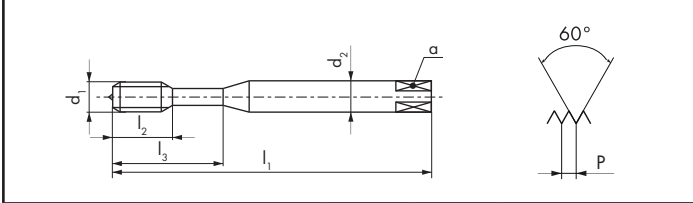
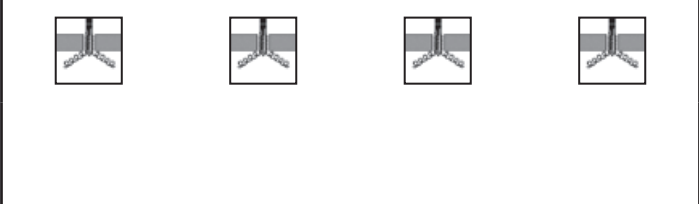


RTS

Rigid Tapping Synchro

RTS320VS-4		VS	11 12 13 14 15 21 31 32 51 61 63 64 72 73 74 81 82 83 91 92 94
RTS420VS-4		VS	11 12 13 14 15 21 31 32 51 61 63 64 72 73 74 81 82 83 91 92 94
RTS323VS-4		VS	11 12 13 14 15 21 31 32 51 61 63 64 72 73 74 81 82 83 91 92 94
RTS423VS-4		VS	11 12 13 14 15 21 31 32 51 61 63 64 72 73 74 81 82 83 91 92 94

RTS320VS-4	RTS420VS-4	RTS323VS-4	RTS423VS-4
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6HX	6HX	6HX	6HX

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	$d_2 h6$ mm	a mm			ID	ID	ID	ID
* 2	0.4	45	8		2.8(h9)	2.1	2	1.6	● 143532			
2.5	0.45	50	10		2.8(h9)	2.1	3	2.05	● 143534			
3	0.5	56	5.5	18	3.5(h9)	2.7	3	2.5	● 150601			
4	0.7	63	7.5	21	4.5(h9)	3.4	3	3.3	● 150603			
5	0.8	70	9	25	6	4.9	3	4.2	● 150605		● 150606	
6	1	80	11	30	6	4.9	3	5	● 150610		● 150611	
8	1.25	90	12.5	35	8	6.2	3	6.8	● 150620		● 150621	
10	1.5	100	14	39	10	8	3	8.5	● 150635		● 150636	
12	1.75	110	14		* 10	* 8	3	10.2		● 151863		● 151864
14	2	110	14		* 12	* 9	3	12		● 162535		
16	2	110	18		12	9	3	14		● 150670		● 150671
20	2.5	140	24		16	12	4	17.5		● 150679		
24	3	160	27		16	12	4	21		● 162787		

* Norme DC / * DC Norm / * Norma DC

* RTS320VS-3

sur demande
auf Anfrage
on request
su richiesta
sobre pedido
no zapyty

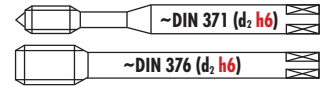
M

ISO DIN 13



Uniquement pour taraudage synchro
Nur für Synchrobearbeitung
Only for rigid tapping
Solo per mescolatura sincrona
Solo para roscado sincronizado
Только для rigid tapping

PM

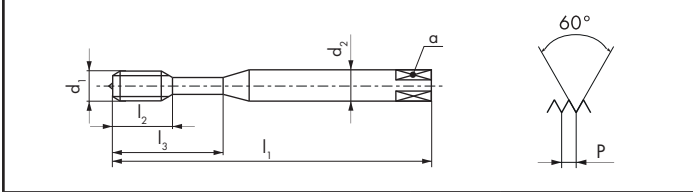
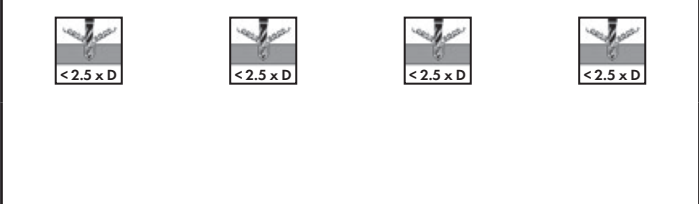
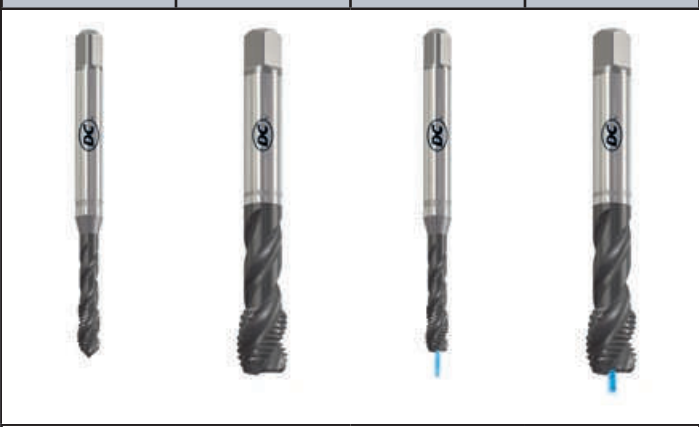


RTS

Rigid Tapping Synchro

RTS362VS-3				<table border="1"> <tr><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>21</td><td>31</td><td>32</td></tr> <tr><td>51</td><td>61</td><td>63</td><td>64</td></tr> <tr><td>72</td><td>73</td><td>74</td><td>81</td></tr> <tr><td>82</td><td>83</td><td>91</td><td>92</td></tr> <tr><td>94</td><td></td><td></td><td></td></tr> </table>	11	12	13	14	15	21	31	32	51	61	63	64	72	73	74	81	82	83	91	92	94			
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72	73	74	81																									
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94																												
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72	73	74	81																									
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94																												
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15	21	31	32																									
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82	83	91	92																									
94																												
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11	12	13	14																									
15	21	31	32																									
51	61	63	64																									
72	73	74	81																									
82	83	91	92																									
94																												

RTS362VS-3	RTS462VS-3	RTS365VS-3	RTS465VS-3
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2.5 x P	2.5 x P	2.5 x P	2.5 x P
6HX	6HX	6HX	6HX

ϕd_1 M	P mm	l_1 mm	l_2 mm	l_3 mm	$d_2 h_6$ mm	a mm			ID	ID	ID	ID
* 2	0.4	45	7		2.8(h9)	2.1	3	1.6	● 143536			
* 2.5	0.45	50	9		2.8(h9)	2.1	3	2.05	● 143538			
3	0.5	56	5.5	18	3.5(h9)	2.7	3	2.5	● 150602		● 160477	
4	0.7	63	7.5	21	4.5(h9)	3.4	3	3.3	● 150604		● 160478	
5	0.8	70	9	25	6	4.9	3	4.2	● 150607		● 150608	
6	1	80	11	30	6	4.9	3	5	● 150612		● 150613	
8	1.25	90	12.5	35	8	6.2	3	6.8	● 150622		● 150623	
10	1.5	100	14	39	10	8	3	8.5	● 150637		● 150638	
12	1.75	110	14		* 10	* 8	3	10.2		● 151865		● 151866
14	2	110	14		* 12	* 9	3	12		● 151870		● 150663
16	2	110	18		12	9	3	14		● 150672		● 150673
20	2.5	140	24		16	12	4	17.5		● 150681		● 150682
24	3	160	27		16	12	4	21		● 151873		● 150690

* Norme DC / * DC Norm / * Norma DC

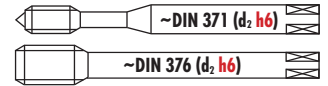
* RTS360VS-3



sur demande
auf Anfrage
on request
su richiesta
sobre pedido
no zampocy



Uniquement pour taraudage synchrone
Nur für Synchronbearbeitung
Only for rigid tapping
Solo per mischilatura sincrona
Solo para roscado sincronizado
Только для rigid tapping



RTS

Rigid Tapping Synchro

RTS362VS-3



RTS462VS-3



RTS362VS-3

RTS462VS-3

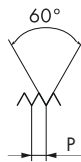
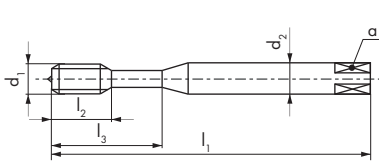
RTS362VS-3

RTS462VS-3



NEW

NEW



$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm	a mm		
3	0.5	56	5.5	18	3.5(h9)	2.7	3	2.5
4	0.7	63	7.5	21	4.5(h9)	3.4	3	3.35
5	0.8	70	9	25	6	4.9	3	4.25
6	1	80	11	30	6	4.9	3	5
8	1.25	90	12.5	35	8	6.2	3	6.8
10	1.5	100	14	39	10	8	3	8.5
12	1.75	110	14		* 10	* 8	3	10.3
16	2	110	18		12	9	3	14

* Norme DC / * DC Norm / * Norma DC

ID	6H + mm	ID	6H + mm	ID	6H + mm	ID	6H + mm
● 162797	0.020			● 184689	0.036		
● 162798	0.022			● 184691	0.041		
● 162799	0.024			● 184693	0.044		
● 162800	0.026			● 184695	0.050		
● 162801	0.028			● 184697	0.052		
● 162802	0.032			● 184699	0.060		
		● 163253	0.034			● 184701	0.066
		● 172037	0.038			● 184703	0.072



sur demande
auf Anfrage
on request
su richiesta
sobre pedido
no zapyty



Uniquement pour taraudage synchrone
 Nur für Synchronbearbeitung
 Only for rigid tapping
 Solo per mescolatura sincrona
 Solo para resacado sincronizado
 Только для rigid tapping



RTS

Rigid Tapping Synchro

RTS362VS-5

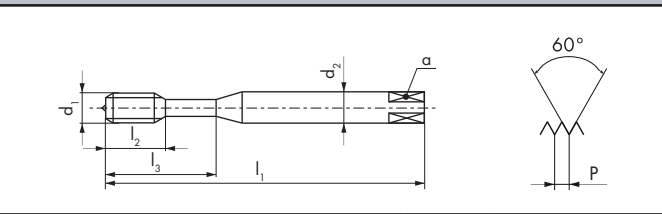
R40 VS

RTS365VS-5

R40 VS

11	12	13	14
15	21	31	32
51	61	63	64
72	73	74	81
82	83	91	92
94			

RTS362VS-5	RTS365VS-5		
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E 1.5 x P	E 1.5 x P
6HX	6HX

$\emptyset d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	$d_2 h6$ mm	a mm			ID	ID
3	0.5	56	5.5	18	3.5(h9)	2.7	3	2.5	● 157648	
4	0.7	63	7.5	21	4.5(h9)	3.4	3	3.3	● 157650	
5	0.8	70	9	25	6	4.9	3	4.2	● 157652	● 162791
6	1	80	11	30	6	4.9	3	5	● 158074	● 151803
8	1.25	90	12.5	35	8	6.2	3	6.8	● 158076	● 157821
10	1.5	100	14	39	10	8	3	8.5	● 153286	● 157823

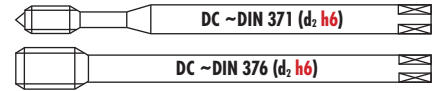
sur demande
 auf Anfrage
 on request
 su richiesta
 sobre pedido
 no zapyty

$\geq \emptyset 6 \text{ mm}$



Uniquement pour taraudage synchro
Nur für Synchrobearbeitung
Only for rigid tapping
Solo per mischilatura sincrona
Solo para roscado sincronizado
Только для rigid tapping

PM

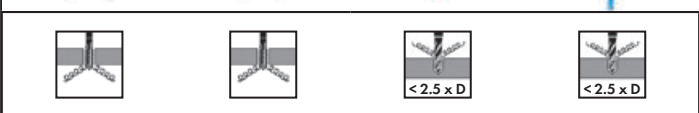


RTS

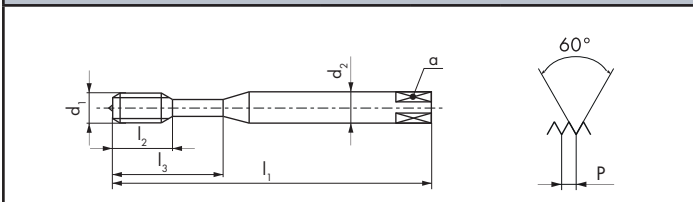
Rigid Tapping Synchro

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72	73	74	81																									
82	83	91	92																									
94																												
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15	21	31	32																									
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11	12	13	14																									
15	21	31	32																									
51	61	63	64																									
72	73	74	81																									
82	83	91	92																									
94																												

RTS523VS-4	RTS623VS-4	RTS565VS-3	RTS665VS-3
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6HX	6HX	6HX	6HX



ϕd_1 M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm	a mm		
5	0.8	125	9	25	6	4.9	3	4.2
6	1	125	11	30	6	4.9	3	5
8	1.25	140	12.5	35	8	6.2	3	6.8
10	1.5	160	14	39	10	8	3	8.5
12	1.75	180	14		* 10	* 8	3	10.2
16	2	200	18		12	9	3	14

ID	ID
● 161038	
● 161041	
● 161044	
● 161047	
	● 161050
	● 161053

* Norme DC / * DC Norm/ * Norma DC

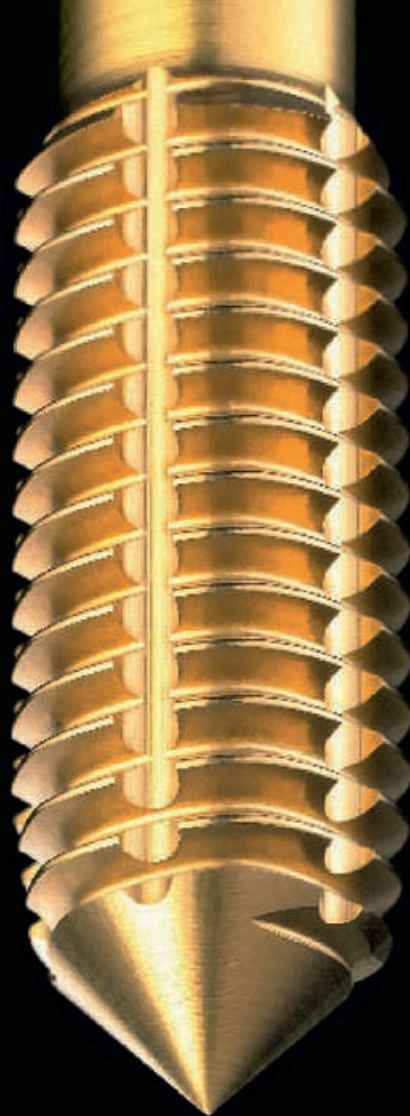
ϕd_1 M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 h6 mm	a mm		
6	1	125	11	30	6	4.9	3	5
8	1.25	140	12.5	35	8	6.2	3	6.8
10	1.5	160	14	39	10	8	3	8.5
12	1.75	180	14		* 10	* 8	3	10.2
16	2	200	18		12	9	3	14

ID	ID	
	● 150614	
	● 150624	
	● 150639	
		● 151867
		● 150674

* Norme DC / * DC Norm/ * Norma DC



sur demande
auf Anfrage
on request
su richiesta
sobre pedido
no zapyty

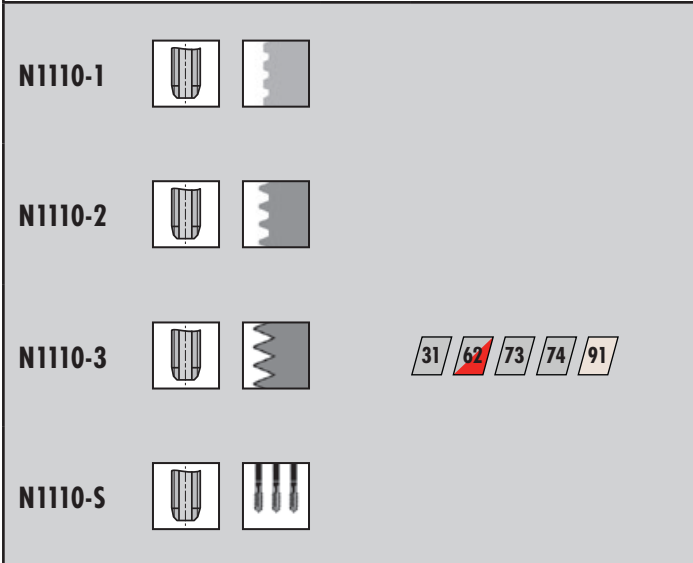
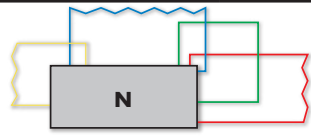


GEWINDEFORMEN

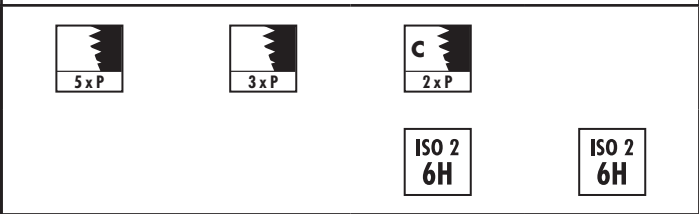
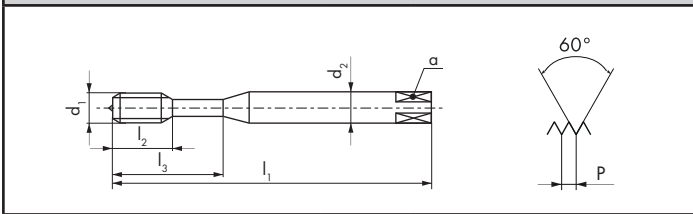
***In diesem Katalog finden Sie das Gewindeformer-
Programm FS - FPS - FAS in einem separaten Kapitel
ab Seite 244.***



THREAD FORMING

**In this catalogue you will find the FS - FPS - FAS thread
former programme in a separate chapter starting on
page 244.**



N1110-1 **N1110-2** **N1110-3** **N1110-S**



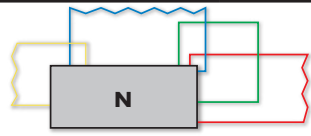
Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID	ID	ID
1	0.25	40	5.5		2.5	2.1	3	0.75	● 102744	● 102844	● 102917	● 111015
1.2	0.25	40	5.5		2.5	2.1	3	0.95	● 102746	● 102846	● 102919	● 111017
1.4	0.3	40	7		2.5	2.1	3	1.1	● 102747	● 102847	● 102920	● 111018
1.6	0.35	40	8		2.5	2.1	3	1.25	● 102749	● 102849	● 102922	● 111020
1.7	0.35	40	8		2.5	2.1	3	1.35	● 102750	● 102850	● 102923	● 111021
1.8	0.35	40	8		2.5	2.1	3	1.45	● 102751	● 102851	● 102924	● 111022
2	0.4	45	8		2.8	2.1	3	1.6	● 102759	● 102854	● 102934	● 111028
2.2	0.45	45	9.5		2.8	2.1	3	1.75	● 102761	● 102856	● 102937	● 111030
2.5	0.45	45	9.5		2.8	2.1	3	2.05	● 102763	● 102858	● 102941	● 111032
2.6	0.45	45	9.5		2.8	2.1	3	2.15	● 102765	● 102860	● 102944	● 111034
3	0.5	48	11	18	3.15	2.5	3	2.5	● 102766	● 102861	● 102947	● 111036
3.5	0.6	50	13	20	3.55	2.8	3	2.9	● 102769	● 102864	● 102950	● 111038
4	0.7	53	13	21	4	3.15	3	3.3	● 102771	● 102866	● 102956	● 111042
4.5	0.75	53	13	21	4.5	3.55	3	3.75	* 102775	* 102869	* 102959	* 111044
5	0.8	58	16	25	5	4	3	4.2	● 102776	● 102870	● 102965	● 111047
6	1	66	19	30	6.3	5	3	5	● 102781	● 102874	● 102973	● 111053
7	1	66	19	30	7.1	5.6	3	6	* 102786	* 102876	* 102978	* 111055
8	1.25	72	22	35	8	6.3	3	6.8	● 102788	● 102878	● 102986	● 111059
9	1.25	72	22	36	9	7.1	3	7.8	* 102792	* 102880	* 102991	* 111061
10	1.5	80	24	39	10	8	3	8.5	● 102752	● 102852	● 102931	● 111026

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									N1210-1	N1210-2	N1210-3	N1210-S
N1210-1												
N1210-2												
N1210-3						31 62 73 74 91						
N1210-S												
$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm				ID	ID	ID	ID
11	1.5	85	22	8	6.3	3	9.5		* 103302	* 103427	• 103489	* 111168
12	1.75	89	24	9	7.1	3	10.2		• 103303	• 103428	• 103499	• 111173
14	2	95	24	11.2	9	3	12		• 103310	• 103430	• 103510	• 111179
16	2	102	32	12.5	10	3	14		• 103319	• 103432	• 103522	• 111185
18	2.5	112	30	14	11.2	3	15.5		• 103324	• 103434	• 103534	• 111191
20	2.5	112	37	14	11.2	3	17.5		• 103330	• 103436	• 103543	• 111196
22	2.5	115	32	16	12.5	3	19.5		* 103337	* 103438	* 103550	* 125567
24	3	130	45	18	14	4	21		• 103341	• 103440	• 103557	• 111204
27	3	135	45	20	16	4	24		* 103347	* 103442	* 103568	* 111211
30	3.5	138	48	20	16	4	26.5		• 103353	• 103444	• 103579	• 111216
33	3.5	151	51	22.4	18	4	29.5		* 103357	* 103446	* 103581	* 111218
36	4	162	57	25	20	4	32		* 103359	* 103448	* 103583	* 111220

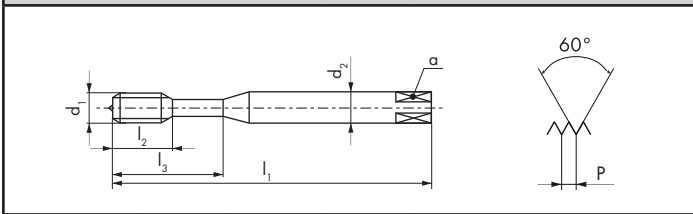
										NP110-1	NP110-2	NP110-3	NP110-S		
NP110-1															
NP110-2															
NP110-3 										NEW	NEW	NEW	NEW		
NP110-S															
$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID	ID	ID			
3	0.5	40	11	18	3.5	2.7	3	2.5	● 174678	● 174687	● 174696	● 173676			
4	0.7	45	13	21	4.5	3.4	3	3.3	● 174679	● 174688	● 174697	● 173644			
5	0.8	50	16	24	6	4.9	3	4.2	● 174680	● 174689	● 174698	● 173677			
6	1	56	19	27	6	4.9	3	5	● 174681	● 174690	● 174699	● 173394			

									NP210-1	NP210-2	NP210-3	NP210-S
NP210-1												
NP210-2									NEW	NEW	NEW	NEW
NP210-3				31	62	73	74	91				
NP210-S												
$\varnothing d_1$ M	P mm	l_1 mm	l_2 mm	d_2 mm	a mm				ID	ID	ID	ID
8	1.25	63	22	6	4.9	3		6.8	● 174682	● 174691	● 174700	● 173645
10	1.5	70	24	7	5.5	3		8.5	● 174683	● 174692	● 174701	● 173646
12	1.75	75	28	9	7	3		10.2	● 174684	● 174693	● 174702	● 173647
14	2	80	30	11	9	3		12	● 174685	● 174694	● 174703	● 173648
16	2	80	32	12	9	3		14	● 180705	● 180706	● 180707	● 174677



N1120-4		62 63 64 72 73 74 81 91
N1220-4		62 63 64 72 73 74 81 91
N1160-3		63 72 73 74 81 91
N1260-3		63 72 73 74 81 91

N1120-4	N1220-4	N1160-3	N1260-3



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Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID
3	0.5	48	11	18	3.15	2.5	3	2.5	• 103068	
4	0.7	53	13	21	4	3.15	3	3.3	• 103075	
5	0.8	58	16	25	5	4	3	4.2	• 103082	
6	1	66	19	30	6.3	5	3	5	• 103090	
8	1.25	72	22	35	8	6.3	3	6.8	• 103102	
10	1.5	80	24	39	10	8	3	8.5	• 103060	
12	1.75	89	24		9	7.1	3	10.2		• 103670
14	2	95	24		11.2	9	3	12		• 103680
16	2	102	32		12.5	10	3	14		• 103690

Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ mm	a mm			ID	ID
3	0.5	48	5.5	18	3.15	2.5	3	2.5		* 103177
4	0.7	53	7.5	21	4	3.15	3	3.3		* 103178
5	0.8	58	9	25	5	4	3	4.2		* 103179
6	1	66	11	30	6.3	5	3	5		* 103180
8	1.25	72	12.5	35	8	6.3	3	6.8		* 103181
10	1.5	80	14	39	10	8	3	8.5		* 103174
12	1.75	89	14		9	7.1	3	10.2		* 103781
16	2	102	18		12.5	10	3	14		* 103782