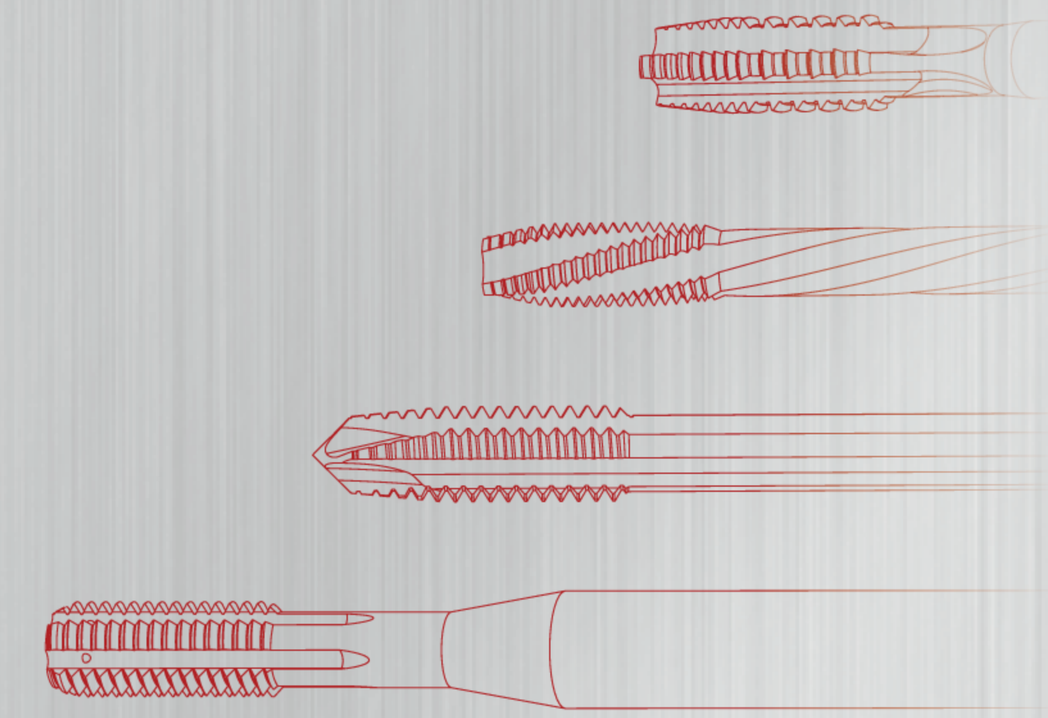

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BELZ INC.

BELZ

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2025

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BELZ

Company profile

Originally founded in 1918 by Louis Maningley in Sutz, Switzerland under Maningley SA, which has been guided by three generations of the Manigley family, Belz has become a leading powerhouse of manufacturing first-class tapping and drilling tools.

In 2014, the company was integrated into the TDC group and relocated to Dalian, China. With TDC's continuous investment in R&D and equipments, Belz entered a new stage of development. It now offers increasingly optimized round tool solutions with enhanced product and service capabilities for global users.

Global Layout


TDC
GE5315B
TOOL GRINDER


Drake
Drake MFG
CAUTION


SMS
GBA 203


HARDCOAT

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ILLUSTRATION

DIN

R Line	DR-G-SFT	General Purpose & Stable Working Conditions SFT -HSSE
	DR-G-POT	General Purpose & Stable Working Conditions POT -HSSE
	DR-G-STT	General Purpose & Stable Working Conditions STT -HSSE
E Line	DE-G-SFT	High Efficiency & Stable Working Conditions SFT -HSSE
	DE-G-POT	High Efficiency & Stable Working Conditions POT -HSSE
	DE-G-STT	High Efficiency & Stable Working Conditions STT -HSSE
P Line	DP-G-SFT	High Performance & General Purpose SFT - HSS PM
	DP-G-POT	High Performance & General Purpose POT - HSS PM
	DP-G-STT	High Performance & General Purpose STT - HSS PM
	DP-G-NRT	High Performance & General Purpose NRT - HSS PM

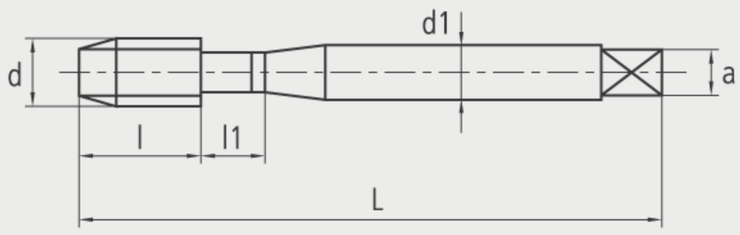
JIS

	JR-GX-SFT	General Purpose & Unstable Working Conditions SFT - HSSE
	JR-GX-POT	General Purpose & Unstable Working Conditions POT - HSSE
R Line	JR-GZ--SFT	General Purpose & Stable/ Unstable Working Conditions SFT - HSSE
	JR-GZ-POT	General Purpose & Stable / Unstable Working Conditions POT - HSSE
	JR-GZ-STT	General Purpose & Stable / Unstable Working Conditions STT - HSSE
E Line	JE-G-SFT	High Efficiency & Stable Working Conditions SFT -HSSE
	JE-G-POT	High Efficiency & Stable Working Conditions POT - HSSE
P Line	JP-G-SFT	High Performance & General Purpose SFT -HSS PM
	JP-G-POT	High Performance & General Purpose POT - HSS PM
	JP-G-STT	High Performance for cast iron STT - HSS PM
	JP-P-NRT	High Performance for steel NRT - HSS PM
	JP-M-NRT	High Performance for stainless steel NRT - HSS PM
	JP-N-NRT	High Performance for non ferrous alloysteel NRT - HSSPM

S Line	DS...	Special & Carbide
	JS...	

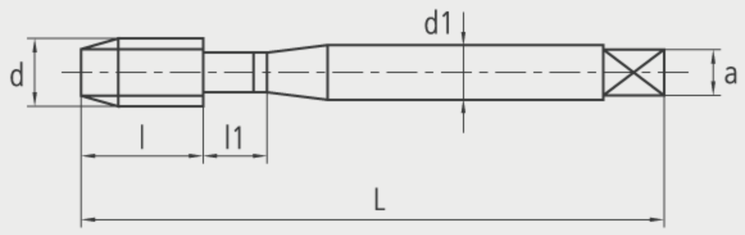
Stock	• Available ○ Production to order	**Performance**	◎ Excellent ○ Good

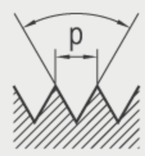
DIN R Line SFT | General Purpose & Stable Working Conditions



													HSS-E	HSS-E	HSS-E
											Norm		DIN 371	DIN 374	DIN 376
											Coating		Nitriding	Nitriding	Nitriding
													C/2.5	C/2.5	C/2.5
			DIN371		DIN374		DIN376								
L	l	l1	d1	a	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
45	8		2.8	2.1					**M2**	**0.4**	6H	1.6	825690 ●		
50	9		2.8	2.1					**M2.5**	**0.45**	6H	2.05	825828 ●		
56	6	11	3.5	2.7					**M3**	**0.5**	6H	2.5	825925 ●		
63	7.5	13	4.5	3.4					**M4**	**0.5**	6H	3.5	884875 ●		
63	7.5	13	4.5	3.4					**M4**	**0.7**	6H	3.3	826034 ●		
70	7.5	16	6	4.9					**M5**	**0.5**	6H	4.5	884883 ●		
70	9	16	6	4.9					**M5**	**0.8**	6H	4.2	826085 ●		
80	8	18	6	4.9					**M6**	**0.75**	6H	5.25	884891 ●		
80	11	18	6	4.9					**M6**	**1**	6H	5	826123 ●		
80	10	21	8	6.2					**M8**	**0.75**	6H	7.25	884905 ●		
90	10	21	8	6.2					**M8**	**1**	6H	7	884913 ●		
90	13	21	8	6.2					**M8**	**1.25**	6H	6.8	826212 ●		
90	12	22	10	8					**M10**	**0.75**	6H	9.25	884921 ●		
90	12	22	10	8					**M10**	**1**	6H	9	884948 ●		
100	14		10	8					**M10**	**1.25**	6H	8.8	812352 ●		
100	16	22	10	8					**M10**	**1.5**	6H	8.5	826247 ●		
100	14				9	7			**M12**	**1**	6H	11		884956 ●	
100	14				9	7			**M12**	**1.25**	6H	10.8		884964 ●	
100	14				9	7			**M12**	**1.5**	6H	10.5		884972 ●	
110	18						9	7	**M12**	**1.75**	6H	10.2			826298 ●
100	16				11	9			**M14**	**1**	6H	13		884980 ○	
100	20				11	9			**M14**	**1.5**	6H	12.5		884999 ●	
110	20						11	9	**M14**	**2**	6H	12			854852 ●
100	16				12	9			**M16**	**1**	6H	15		885006 ●	
100	20				12	9			**M16**	**1.5**	6H	14.5		885014 ●	
110	20						12	9	**M16**	**2**	6H	14			854860 ●
110	25				14	11			**M18**	**1.5**	6H	16.5		885030 ●	
110	25				14	11			**M18**	**2**	6H	16		884888 ●	
125	22						14	11	**M18**	**2.5**	6H	15.5			854879 ●

DIN R Line SFT | General Purpose & Stable Working Conditions



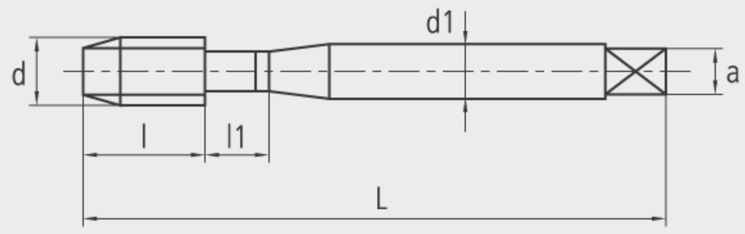


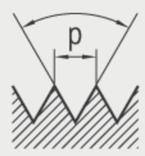
													HSS-E	HSS-E	HSS-E
												Norm	DIN 371	DIN 374	DIN 376
												Coating	Nitriding	Nitriding	Nitriding
													C/2.5	C/2.5	C/2.5
			DIN371		DIN374		DIN376								
L	l	l1	d1	a	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
125	25				16	12			M20	1.5	6H	18.5		884786 ●	
140	25						16	12	M20	2.5	6H	17.5			854887 ●
125	17				18	14.5			M22	1.5	6H	20.5		884787 ●	
140	25						18	14.5	M22	2.5	6H	19.5			854895 ●
140	20				18	14.5			M24	1.5	6H	22.5		884788 ○	
140	20				18	14.5			M24	2	6H	22		884789 ●	
160	28						18	14.5	M24	3	6H	21			854909 ●

★ For Carbon Steel, Alloy Steel, Stainless Steel, and Non-ferrous Alloys with a hardness of HRC 20-32.

P	M	K	N	S	H
◎	◎	-	○	-	-

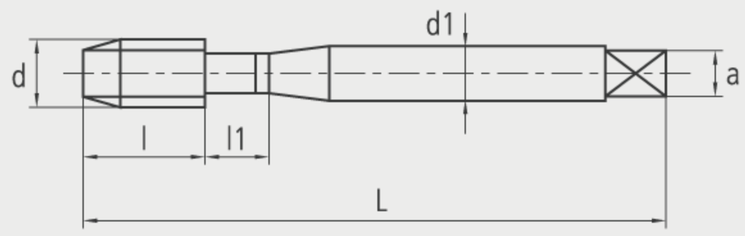
DIN R Line POT | General Purpose & Stable Working Conditions

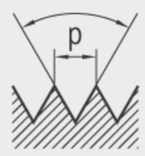




													HSS-E	HSS-E	HSS-E
											Norm		DIN 371	DIN 374	DIN 376
											Coating		Nitriding	Nitriding	Nitriding
													C/4	C/4	C/4
			DIN371		DIN374		DIN376								
L	l	l1	d1	a	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
45	8		2.8	2.1					**M2**	**0.4**	6H	1.6	893564 ●		
50	9		2.8	2.1					**M2.5**	**0.45**	6H	2.05	893556 ●		
56	11	7	3.5	2.7					**M3**	**0.5**	6H	2.5	893572 ●		
63	10	8	4.5	3.4					**M4**	**0.5**	6H	3.5	811870 ●		
63	13	8	4.5	3.4					**M4**	**0.7**	6H	3.3	893580 ●		
70	12	11	6	4.9					**M5**	**0.5**	6H	4.5	811871 ●		
70	16	9	6	4.9					**M5**	**0.8**	6H	4.2	893599 ●		
80	14	11	6	4.9					**M6**	**0.75**	6H	5.25	811872 ●		
80	19	11	6	4.9					**M6**	**1**	6H	5	893602 ●		
80	18	13	8	6.2					**M8**	**0.75**	6H	7.25	811873 ●		
90	22	13	8	6.2					**M8**	**1**	6H	7	811874 ●		
90	22	13	8	6.2					**M8**	**1.25**	6H	6.8	893610 ●		
90	20	15	10	8					**M10**	**0.75**	6H	9.25	811875 ●		
90	20	15	10	8					**M10**	**1**	6H	9	811876 ●		
100	24	15	10	8					**M10**	**1.25**	6H	8.8	812350 ●		
100	24	15	10	8					**M10**	**1.5**	6H	8.5	893629 ●		
100	22				9	7			**M12**	**1**	6H	11		811877 ●	
100	22				9	7			**M12**	**1.25**	6H	10.8		811879 ●	
100	22				9	7			**M12**	**1.5**	6H	10.5		811880 ●	
110	29						9	7	**M12**	**1.75**	6H	10.2			893637 ●
100	22				11	9			**M14**	**1**	6H	13		811881 ○	
100	22				11	9			**M14**	**1.5**	6H	12.5		811882 ●	
110	30						11	9	**M14**	**2**	6H	12			893645 ●
100	22				12	9			**M16**	**1**	6H	15		811883 ●	
100	22				12	9			**M16**	**1.5**	6H	14.5		811884 ●	
110	32						12	9	**M16**	**2**	6H	14			893653 ●
110	25				14	11			**M18**	**1.5**	6H	16.5		811887 ●	
110	25				14	11			**M18**	**2**	6H	16		811900 ●	
125	34						14	11	**M18**	**2.5**	6H	15.5			893661 ●

DIN R Line POT | General Purpose & Stable Working Conditions



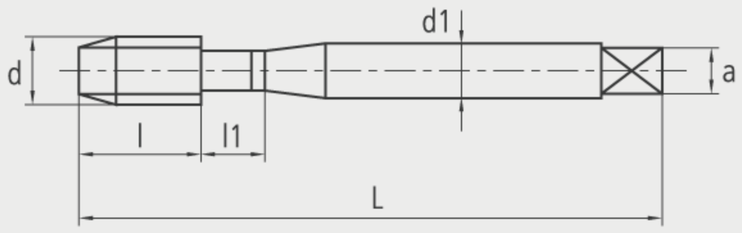


													HSS-E	HSS-E	HSS-E
												Norm	DIN 371	DIN 374	DIN 376
												Coating	Nitriding	Nitriding	Nitriding
													C/4	C/4	C/4
			DIN371		DIN374		DIN376								
L	l	l1	d1	a	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
125	25				16	12			**M20**	**1.5**	6H	18.5		811889 ●	
140	34						16	12	**M20**	**2.5**	6H	17.5			893688 ●
125	25				18	14.5			**M22**	**1.5**	6H	20.5		811901 ●	
140	34						18	14.5	**M22**	**2.5**	6H	19.5			893696 ●
140	28				18	14.5			**M24**	**1.5**	6H	22.5		811903 ○	
140	28				18	14.5			**M24**	**2**	6H	22		811902 ●	
160	38						18	14.5	**M24**	**3**	6H	21			893718 ●

★ For Carbon Steel, Alloy Steel, Stainless Steel, and Non-ferrous Alloys with a hardness of HRC 20-32.

P	M	K	N	S	H
◎	◎	-	○	-	-

DIN R Line STT | General Purpose & Stable Working Conditions

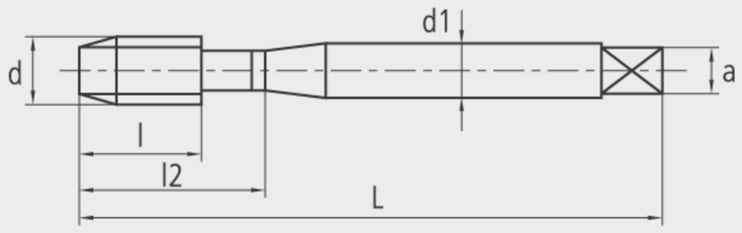


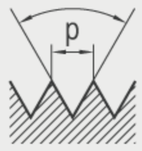
													HSS-E	HSS-E	HSS-E
											Norm		DIN 371	DIN 374	DIN 376
											Coating		AlTiN	AlTiN	AlTiN
													C/2.5	C/2.5	C/2.5
			DIN371		DIN374		DIN376								
L	l	l1	d1	a	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
45	8		2.8	2.1					**M2**	**0.4**	6H	1.6	871374 ●		
50	9		2.8	2.1					**M2.5**	**0.45**	6H	2.05	871382 ●		
56	11	7	3.5	2.7					**M3**	**0.5**	6H	2.5	837257 ●		
63	13	8	4.5	3.4					**M4**	**0.7**	6H	3.3	837273 ●		
70	16	9	6	4.9					**M5**	**0.8**	6H	4.2	837281 ●		
80	19	11	6	4.9					**M6**	**1**	6H	5	856715 ●		
90	22	13	8	6.2					**M8**	**1.25**	6H	6.8	837303 ●		
100	24	15	10	8					**M10**	**1.5**	6H	8.5	837311 ●		
110	29						9	7	**M12**	**1.75**	6H	10.2			856723 ●
110	32						12	9	**M16**	**2**	6H	14			852159 ●
140	34						16	12	**M20**	**2.5**	6H	17.5			852175 ●
90	22				6	4.9			**M8**	**1**	6H	7		866704 ●	
90	20				7	5.5			**M10**	**1**	6H	9		866705 ●	
100	24				7	5.5			**M10**	**1.25**	6H	9.75		884484 ●	
100	22				9	7			**M12**	**1**	6H	11		866706 ○	
100	22				9	7			**M12**	**1.25**	6H	10.75		861212 ●	
100	22				9	7			**M12**	**1.5**	6H	10.5		866707 ●	
100	22				11	9			**M14**	**1.5**	6H	12.5		866708 ●	
100	22				12	9			**M16**	**1.5**	6H	14.5		866709 ●	
110	25				14	11			**M18**	**1.5**	6H	16.5		866710 ○	
125	25				16	12			**M20**	**1.5**	6H	18.5		866711 ●	
125	25				16	12			**M22**	**1.5**	6H	20.5		866812 ●	
140	28				16	12			**M24**	**1.5**	6H	22.5		866814 ●	
140	28				16	12			**M24**	**2**	6H	22		866813 ●	

★ Steel, Alloy Steel and Cast Iron HRC 20 to 32 ; High hard material HRC 28-38, blind hole

P	M	K	N	S	H
○	-	◎	-	-	-

DIN E Line SFT | High Efficiency & Stable Working Conditions



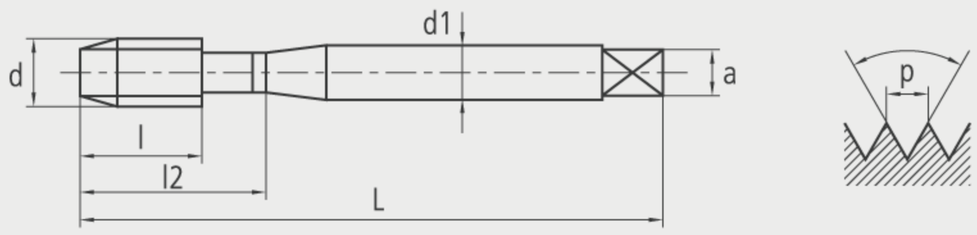


											HSS-E	HSS-E
												
										Norm	DIN371	DIN376
										Coating	AlCrN	AlCrN
											C/2.5P	C/2.5P
			DIN371		DIN376						Art.Stock	Art.Stock
L	l	l2	d1	a	d1	a	d	p	Limit			
56	10	18	3.5	2.7			M3	0.5	6H	2.5	245811 ●	
63	8.4	21	4.5	3.4			M4	0.7	6H	3.3	245812 ●	
70	9.6	25	6	4.9			M5	0.8	6H	4.2	245813 ●	
80	12	30	6	4.9			M6	1	6H	5	245814 ●	
90	15	35	8	6.2			M8	1	6HX	7	245815 ●	
90	15	35	8	6.2			M8	1.25	6H	6.8	245816 ●	
100	18	39	10	8			M10	1	6HX	9	245817 ●	
100	18	39	10	8			M10	1.25	6HX	8.8	245818 ●	
100	18	39	10	8			M10	1.5	6H	8.5	245819 ●	
110	18	-			9	7	M12	1.25	6HX	10.8		245820 ●
110	18	-			9	7	M12	1.5	6HX	10.5		245821 ●
110	18	-			9	7	M12	1.75	6H	10.3		245822 ●
110	20	-			11	9	M14	1.5	6HX	12.5		245823 ●
110	20	-			11	9	M14	2	6HX	12		245824 ●
110	20	-			12	9	M16	1.5	6HX	14.5		245825 ●
110	20	-			12	9	M16	2	6HX	14		245826 ●
125	25	-			14	11	M18	1.5	6HX	16.5		245827 ●
125	25	-			14	11	M18	2.5	6HX	15.5		245828 ●
140	25	-			16	12	M20	1.5	6HX	18.5		245829 ●
140	25	-			16	12	M20	2.5	6HX	17.5		245830 ●

★ Vc: 10 -15m/min
★ Steel, Alloy Steel and Cast Iron ; HRC 20 to 32

P	M	K	N	S	H
◎	-	○	-	-	-

DIN E Line POT | High Efficiency & Stable Working Conditions

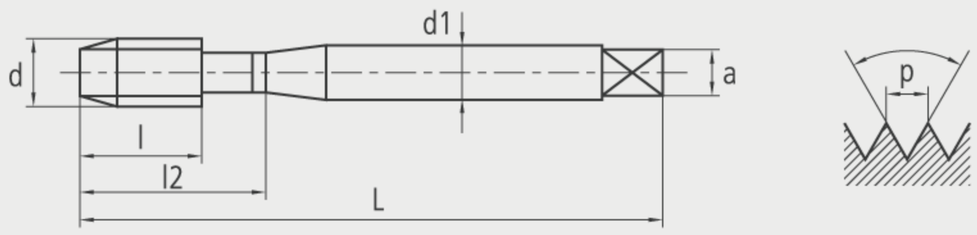


											HSS-E	HSS-E
										Norm	DIN371	DIN376
										Coating	AlCrN	AlCrN
											C/5P	C/5P
			DIN371		DIN376							
L	l	l2	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock
56	10	18	3.5	2.7			**M3**	**0.5**	6HX	2.5	255811 ●	
63	13	21	4.5	3.4			**M4**	**0.7**	6HX	3.3	255812 ●	
70	16	25	6	4.9			**M5**	**0.8**	6HX	4.2	255813 ●	
80	18	30	6	4.9			**M6**	**1**	6HX	5	255814 ●	
90	20	35	8	6.2			**M8**	**1**	6HX	7	255815 ●	
90	20	35	8	6.2			**M8**	**1.25**	6HX	6.8	255816 ●	
100	20	39	10	8			**M10**	**1**	6HX	9	255817 ●	
100	20	39	10	8			**M10**	**1.25**	6HX	8.8	255818 ●	
100	20	39	10	8			**M10**	**1.5**	6HX	8.5	255819 ●	
110	25	-			9	7	**M12**	**1.25**	6HX	10.8		255820 ●
110	25	-			9	7	**M12**	**1.5**	6HX	10.5		255821 ●
110	25	-			9	7	**M12**	**1.75**	6HX	10.3		255822 ●
110	25	-			11	9	**M14**	**1.5**	6HX	12.5		255823 ●
110	25	-			11	9	**M14**	**2**	6HX	12		255824 ●
110	25	-			12	9	**M16**	**1.5**	6HX	14.5		255825 ●
110	25	-			12	9	**M16**	**2**	6HX	14		255826 ●
125	25	-			14	11	**M18**	**1.5**	6HX	16.5		255827 ●
125	25	-			14	11	**M18**	**2.5**	6HX	15.5		255828 ●
140	28	-			16	12	**M20**	**1.5**	6HX	18.5		255829 ●
140	28	-			16	12	**M20**	**2.5**	6HX	17.5		255830 ●

★ Vc: 10 -20m/min
★ Steel, Alloy Steel and Cast Iron ; HRC 20 to 32

P	M	K	N	S	H
◎	-	○	-	-	-

DIN E Line STT | High Efficiency & Stable Working Conditions

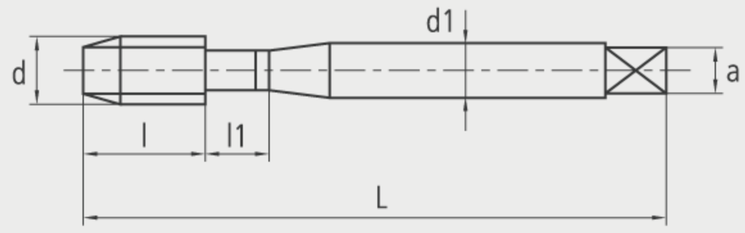


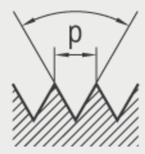
											HSS-E	HSS-E
										Norm	DIN371	DIN376
										Coating	AlCrN	AlCrN
											C/2.5P	C/2.5P
			DIN371		DIN376							
L	l	l2	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock
56	10	18	3.5	2.7			M3	0.5	6HX	2.5	265811 ○	
63	13	21	4.5	3.4			M4	0.7	6HX	3.3	265812 ○	
70	16	25	6	4.9			M5	0.8	6HX	4.2	265813 ○	
80	18	30	6	4.9			M6	1	6HX	5	265814 ●	
90	20	35	8	6.2			M8	1	6HX	7	265815 ○	
90	20	35	8	6.2			M8	1.25	6HX	6.8	265816 ●	
100	20	39	10	8			M10	1	6HX	9	265817 ○	
100	20	39	10	8			M10	1.25	6HX	8.8	265818 ○	
100	20	39	10	8			M10	1.5	6HX	8.5	265819 ●	
110	25	-			9	7	M12	1.25	6HX	10.8		265820 ○
110	25	-			9	7	M12	1.5	6HX	10.5		265821 ○
110	25	-			9	7	M12	1.75	6HX	10.3		265822 ●
110	25	-			11	9	M14	1.5	6HX	12.5		265823 ○
110	25	-			11	9	M14	2	6HX	12		265824 ●
110	25	-			12	9	M16	1.5	6HX	14.5		265825 ○
110	25	-			12	9	M16	2	6HX	14		265826 ●
125	25	-			14	11	M18	1.5	6HX	16.5		265827 ○
125	25	-			14	11	M18	2.5	6HX	15.5		265828 ●
140	28	-			16	12	M20	1.5	6HX	18.5		265829 ○
140	28	-			16	12	M20	2.5	6HX	17.5		265830 ●

★ Cast Iron Vc: 20 -30m/min ; Steel Vc: 10-15m/min
★ Steel, Alloy Steel and Cast Iron HRC 20 to 32 ; High hard material HRC 28-38, blind hole

P	M	K	N	S	H
○	-	◎	-	-	-

DIN P Line SFT | High Performance & General Purpose



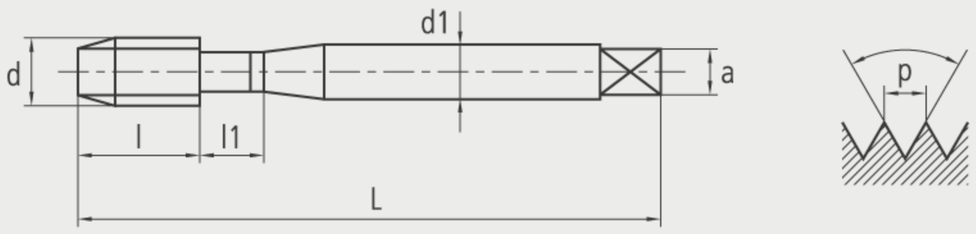


											HSS-PM	HSS-PM	HSS-E
													
										Norm	DIN371	DIN371	DIN376
										Coating	TiCN+DLC	TiCN+DLC	TiCN+DLC
											C/2.5	C/2.5T	C/2.5
L	l	l1	DIN371 d1	DIN371 a	DIN376 d1	DIN376 a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
56	7	11	3.5	3.4			**M3**	**0.5**	6HX	2.5	275832 ●		
63	9	12	4.5	3.4			**M4**	**0.7**	6HX	3.3	275811 ●		
70	10	15	6	4.9			**M5**	**0.8**	6HX	4.2	275812 ●		
80	10	20	6	4.9			**M6**	**1**	6HX	5	275813 ●		
80	10	20	7	5.5			**M7**	**1**	6HX	6	275814 ○		
90	13	22	8	6.2			**M8**	**1**	6HX	7		275815 ●	
90	13	22	8	6.2			**M8**	**1,25**	6HX	6.8		275816 ●	
100	15	24	10	8			**M10**	**1**	6HX	9		275817 ●	
100	15	24	10	8			**M10**	**1.25**	6HX	8.8		275818 ●	
100	15	24	10	8			**M10**	**1.5**	6HX	8.5		275819 ●	
110	17	32			9	7	**M12**	**1**	6HX	11			275820 ●
110	17	32			9	7	**M12**	**1.25**	6HX	10.8			275821 ●
110	17	32			9	7	**M12**	**1.5**	6HX	10.5			275822 ●
110	17	32			9	7	**M12**	**1.75**	6HX	10.3			275823 ●
110	20	33			11	9	**M14**	**1**	6HX	13			275824 ○
110	20	33			11	9	**M14**	**1.25**	6HX	12.75			275825 ●
110	20	33			11	9	**M14**	**1.5**	6HX	12.5			275826 ●
110	20	33			11	9	**M14**	**2**	6HX	12			275827 ●
110	20	34			12	9	**M16**	**1**	6HX	15			275828 ○
110	20	34			12	9	**M16**	**1.25**	6HX	14.75			275829 ●
110	20	34			12	9	**M16**	**1.5**	6HX	14.5			275830 ●
110	20	34			12	9	**M16**	**2**	6HX	14			275831 ●

★ Multi-layered coating provide excellent wear resistance.
★ For Carbon Steel, Alloy Steel with a hardness of 35 HRC or lower, Stainless Steel, and Non-ferrous Alloys.

P	M	K	N	S	H
◎	○	-	○	-	-

DIN P Line POT | High Performance & General Purpose

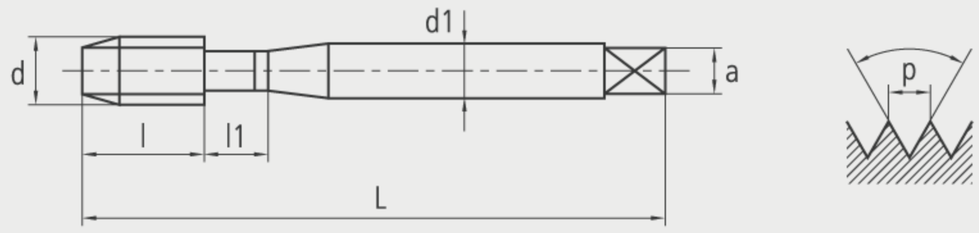


											HSS-PM	HSS-PM	HSS-PM
													
									Norm		DIN371	DIN371	DIN376
									Coating		TiCN+DLC	TiCN+DLC	TiCN+DLC
											C/5	C/5	C/5
			DIN371		DIN376								
L	l	l1	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
56	7	11	3.5	3.4			**M3**	**0.5**	6HX	2.5	285832 ●		
63	9	12	4.5	3.4			**M4**	**0.7**	6HX	3.3	285811 ●		
70	10	15	6	4.9			**M5**	**0.8**	6HX	4.2	285812 ●		
80	10	20	6	4.9			**M6**	**1**	6HX	5	285813 ●		
80	10	20	7	5.5			**M7**	**1**	6HX	6	285814 ○		
90	13	22	8	6.2			**M8**	**1**	6HX	7		285815 ●	
90	13	22	8	6.2			**M8**	**1,25**	6HX	6.8		285816 ●	
100	15	24	10	8			**M10**	**1**	6HX	9		285817 ○	
100	15	24	10	8			**M10**	**1.25**	6HX	8.8		285818 ●	
100	15	24	10	8			**M10**	**1.5**	6HX	8.5		285819 ●	
110	17	32			9	7	**M12**	**1**	6HX	11			285820 ○
110	17	32			9	7	**M12**	**1.25**	6HX	10.8			285821 ●
110	17	32			9	7	**M12**	**1.5**	6HX	10.5			285822 ●
110	17	32			9	7	**M12**	**1.75**	6HX	10.3			285823 ●
110	20	33			11	9	**M14**	**1**	6HX	13			285824 ○
110	20	33			11	9	**M14**	**1.25**	6HX	12.75			285825 ○
110	20	33			11	9	**M14**	**1.5**	6HX	12.5			285826 ●
110	20	33			11	9	**M14**	**2**	6HX	12			285827 ●
110	20	34			12	9	**M16**	**1**	6HX	15			285828 ○
110	20	34			12	9	**M16**	**1.25**	6HX	14.75			285829 ○
110	20	34			12	9	**M16**	**1.5**	6HX	14.5			285830 ●
110	20	34			12	9	**M16**	**2**	6HX	14			285831 ●

★ Multi-layered coating provide excellent wear resistance.
★ For Carbon Steel, Alloy Steel with a hardness of 35 HRC or lower, Stainless Steel, and Non-ferrous Alloys.

P	M	K	N	S	H
◎	○	-	○	-	-

DIN P Line STT | High Performance & General Purpose

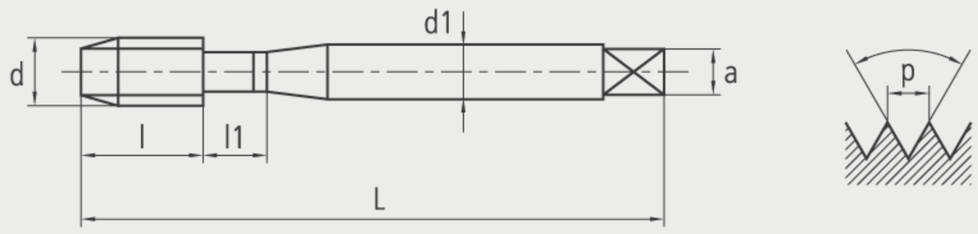


										HSS-PM	HSS-PM	HSS-PM
									Norm	DIN371	DIN371	DIN376
									Coating	TiCN+DLC	TiCN+DLC	TiCN+DLC
										C/3	C/3	C/3
			DIN371		DIN376							
L	l	l1	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
56	7	11	3.5	3.4			M3	0.5	6HX	2.5	295831 ●		
63	9	12	4.5	3.4			M4	0.7	6HX	3.3	295832 ●		
70	10	15	6	4.9			M5	0.8	6HX	4.2	295811 ●		
80	10	20	6	4.9			M6	1	6HX	5	295812 ●		
80	10	20	7	5.5			M7	1	6HX	6	295813 ○		
90	13	22	8	6.2			M8	1	6HX	7		295814 ●	
90	13	22	8	6.2			M8	1,25	6HX	6.8		295815 ●	
100	15	24	10	8	9	7	M10	1	6HX	9		295816 ○	
100	15	24	10	8	9	7	M10	1.25	6HX	8.8		295817 ●	
100	15	24	10	8	9	7	M10	1.5	6HX	8.5		295818 ●	
110	17	32			9	7	M12	1	6HX	11			295819 ○
110	17	32			9	7	M12	1.25	6HX	10.8			295820 ●
110	17	32			11	9	M12	1.5	6HX	10.5			295821 ●
110	17	32			11	9	M12	1.75	6HX	10.3			295822 ●
110	20	33			11	9	M14	1	6HX	13			295823 ○
110	20	33			11	9	M14	1.25	6HX	12.75			295824 ○
110	20	33			12	9	M14	1.5	6HX	12.5			295825 ●
110	20	33			12	9	M14	2	6HX	12			295826 ●
110	20	34			12	9	M16	1	6HX	15			295827 ○
110	20	34			12	9	M16	1.25	6HX	14.75			295828 ○
110	20	34					M16	1.5	6HX	14.5			295829 ●
110	20	34					M16	2	6HX	14			295830 ●

★ Multi-layered coating provide excellent wear resistance.
★ For Gray Cast Iron and Ductile Iron, with high processing accuracy, ideal for large-scale continuous production.

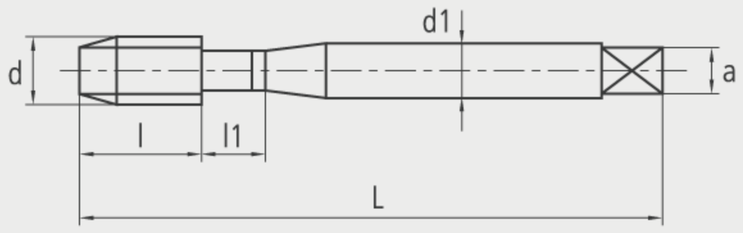
P	M	K	N	S	H
-	-	◎	-	-	-

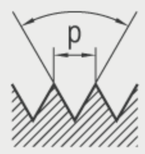
DIN P Line NRT | High Performance & General Purpose



											HSS-PM	HSS-PM	HSS-PM
										Norm	DIN371	DIN371	DIN376
										Coating	TiCN+DLC	TiCN+DLC	TiCN+DLC
											C/2.5	C/2.5	C/2.5
			DIN371		DIN376								
L	l	l1	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
45	6	7	2.8	2.1			**M2**	**0.4**	6HX	1.78-1.82	305811 ○		
50	7	8	2.8	2.1			**M2.5**	**0.45**	6HX	2.25-2.29	305812 ○		
56	7	11	3.5	2.7			**M3**	**0.5**	6HX	2.76-2.81	305813 ○		
63	9	12	4.5	3.4			**M4**	**0.7**	6HX	3.65-3.7	305814 ●		
70	10	15	6	4.9			**M5**	**0.8**	6HX	4.59-4.66	305815 ●		
80	10	20	6	4.9			**M6**	**1**	6HX	5.48-5.57	305816 ●		
80	10	20	7	5.5			**M7**	**1**	6HX	6.48-6.57	305817 ○		
90	13	22	8	6.2			**M8**	**1**	6HX	7.45-7.51		305818 ●	
90	13	22	8	6.2			**M8**	**1.25**	6HX	7.34-7.41		305819 ●	
100	15	24	10	8			**M10**	**1**	6HX	9.45-9.52		305820 ●	
100	15	24	10	8			**M10**	**1.25**	6HX	9.31-9.38		305821 ●	
100	15	24	10	8			**M10**	**1.5**	6HX	9.18-9.28		305822 ●	
110	17	32	9	7			**M12**	**1**	6HX	11.46-11.52		305823 ●	
110	17	32			9	7	**M12**	**1.25**	6HX	11.31-11.38			305824 ●
110	17	32			9	7	**M12**	**1.5**	6HX	11.16-11.22			305825 ●
110	17	32			9	7	**M12**	**1.75**	6HX	11.05-11.15			305826 ●
110	20	33			11	9	**M14**	**1**	6HX	13.5-13.55			305827 ●
110	20	33			11	9	**M14**	**1.25**	6HX	13.38-13.4			305828 ●
110	20	33			11	9	**M14**	**1.5**	6HX	13.16-13.22			305829 ●
110	20	33			11	9	**M14**	**2**	6HX	12.92-13.04			305830 ●
110	20	34			12	9	**M16**	**1**	6HX	15.5-15.58			305831 ●
110	20	34			12	9	**M16**	**1.25**	6HX	15.37-15.45			305832 ●

DIN P Line NRT | High Performance & General Purpose



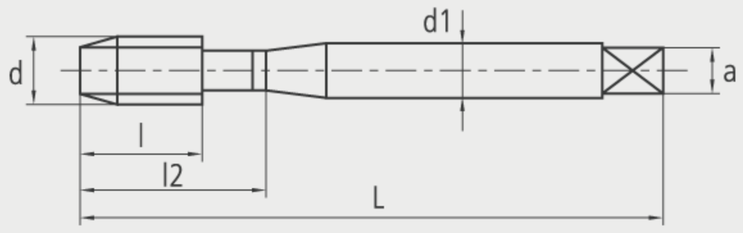


											HSS-PM	HSS-PM	HSS-PM
										Norm	DIN371	DIN371	DIN376
										Coating	TiCN+DLC	TiCN+DLC	TiCN+DLC
											C/2.5	C/2.5	C/2.5
			DIN371		DIN376								
L	l	l1	d1	a	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
110	20	34			12	9	**M16**	**1.5**	6HX	15.16-15.22			305833 ●
110	20	34			12	9	**M16**	**2**	6HX	14.92-15.04			305834 ●
125	25	36			14	11	**M18**	**1.5**	6HX	17.17-17.23			305835 ○
125	25	36			14	11	**M18**	**2**	6HX	17-17.15			305836 ○
125	25	36			14	11	**M18**	**2.5**	6HX	16.63-16.78			305837 ○
140	25	44			16	12	**M20**	**1.5**	6HX	19.17-19.23			305838 ○
140	25	44			16	12	**M20**	**2**	6HX	19-19.5			305839 ○
140	25	44			16	12	**M20**	**2.5**	6HX	18.63-18.78			305840 ○
140	25	44			18	14.5	**M22**	**1.5**	6HX	21.22-21.33			305841 ○
140	25	44			18	14.5	**M22**	**2**	6HX	21-21.5			305842 ○
140	25	44			18	14.5	**M22**	**2.5**	6HX	20.63-20.78			305843 ○
160	30	48			18	14.5	**M24**	**2**	6HX	23-23.5			305844 ○
160	30	48			18	14.5	**M24**	**2.5**	6HX	22.75-22.8			305845 ○
160	30	48			18	14.5	**M24**	**3**	6HX	22.36-22.53			305846 ○
160	30	48			20	16	**M27**	**2**	6HX	26-26.5			305847 ○
160	30	48			20	16	**M27**	**2.5**	6HX	25.75-25.8			305848 ○
160	30	48			20	16	**M27**	**3**	6HX	23.75-24.25			305849 ○
180	35	53			22	18	**M30**	**2**	6HX	29-29.5			305850 ○
180	35	53			22	18	**M30**	**2.5**	6HX	28.75-28.9			305851 ○
180	35	53			22	18	**M30**	**3**	6HX	28.5-28.6			305852 ○
180	35	53			22	18	**M30**	**3.5**	6HX	28.07-28.25			305853 ○

⋆ Multi-layered coating provide excellent wear resistance.
⋆ For Carbon Steel, Alloy Steel with a hardness of 35 HRC or lower, Stainless Steel, and Non-ferrous Alloys.

P	M	K	N	S	H
◎	○	-	○	-	-

JIS R Line SFT | General Purpose & Unstable Working Conditions



HSS-E

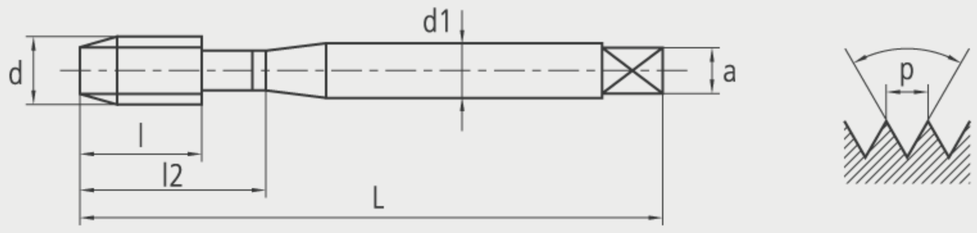
Norm	**JIS**
Coating	**CrN+X**
	**C/2.5P**

L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	515811 ●
52	8.4	20	5	4	**M4**	**0.7**	6H	3.3	515812 ●
60	9.6	24	5.5	4.5	**M5**	**0.8**	6H	4.2	515813 ●
62	12	29	6	4.5	**M6**	**1**	6H	5	515814 ●
70	15	37	6.2	5	**M8**	**1**	6HX	7	515815 ●
70	15	37	6.2	5	**M8**	**1.25**	6H	6.8	515816 ●
75	18	41	7	5.5	**M10**	**1**	6HX	9	515817 ●
75	18	41	7	5.5	**M10**	**1.25**	6HX	8.8	515818 ●
75	18	41	7	5.5	**M10**	**1.5**	6H	8.5	515819 ●
82	18	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	515820 ●
82	18	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	515821 ●
82	18	48	8.5	6.5	**M12**	**1.75**	6H	10.3	515822 ●

⋆ Vc: 3-10m/min
⋆ For Carbon Steel, Alloy Steel, Cast Iron, Stainless Steel, and Non-ferrous Alloys with a hardness of HRC 20-25.

P	M	K	N	S	H
◎	○	○	○	-	-

JIS R Line POT | General Purpose & Unstable Working Conditions



HSS-E

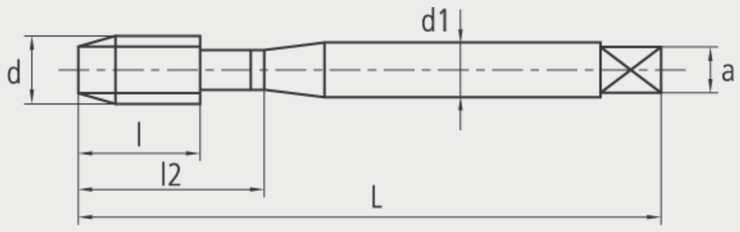
Norm	**JIS**
Coating	**CrN+X**
	C/5P

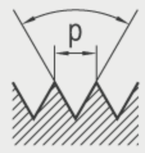
L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	525811 ●
52	12	20	5	4	**M4**	**0.7**	6H	3.3	525812 ●
60	14	24	5.5	4.5	**M5**	**0.8**	6H	4.2	525813 ●
62	16	29	6	4.5	**M6**	**1**	6H	5	525814 ●
70	21	37	6.2	5	**M8**	**1**	6HX	7	525815 ●
70	21	37	6.2	5	**M8**	**1.25**	6H	6.8	525816 ●
75	23	41	7	5.5	**M10**	**1**	6HX	9	525817 ●
75	23	41	7	5.5	**M10**	**1.25**	6HX	8.8	525818 ●
75	23	41	7	5.5	**M10**	**1.5**	6H	8.5	525819 ●
82	24	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	525820 ●
82	24	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	525821 ●
82	24	48	8.5	6.5	**M12**	**1.75**	6H	10.3	525822 ●

★ Vc: 3-10m/min
★ For Carbon Steel, Alloy Steel, Cast Iron, Stainless Steel, and Non-ferrous Alloys with a hardness of HRC 20-25.

P	M	K	N	S	H
◎	○	○	○	-	-

JIS R Line SFT | General Purpose & Stable/ Unstable Working Conditions





HSS-E

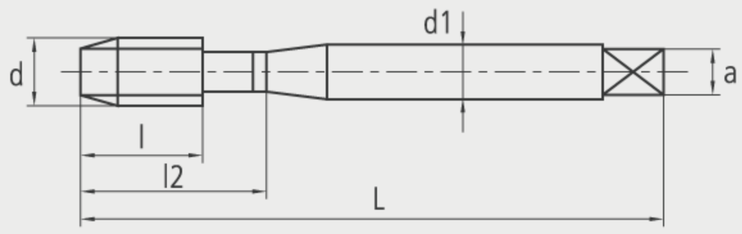
Norm	**JIS**
Coating	**ZrN**
	**C/2.5P**

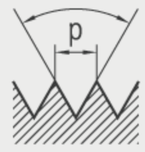
L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	535811 ●
52	8.4	20	5	4	**M4**	**0.7**	6H	3.3	535812 ●
60	9.6	24	5.5	4.5	**M5**	**0.8**	6H	4.2	535813 ●
62	12	29	6	4.5	**M6**	**1**	6H	5	535814 ●
70	15	37	6.2	5	**M8**	**1**	6HX	7	535815 ●
70	15	37	6.2	5	**M8**	**1.25**	6H	6.8	535816 ●
75	18	41	7	5.5	**M10**	**1**	6HX	9	535817 ●
75	18	41	7	5.5	**M10**	**1.25**	6HX	8.8	535818 ●
75	18	41	7	5.5	**M10**	**1.5**	6H	8.5	535819 ●
82	18	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	535820 ●
82	18	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	535821 ●
82	18	48	8.5	6.5	**M12**	**1.75**	6H	10.3	535822 ●
88	20	48	10.5	8	**M14**	**1.5**	6HX	12.5	535823 ○
88	20	48	10.5	8	**M14**	**2**	6HX	12	535824 ○
95	20	52	12.5	10	**M16**	**1.5**	6HX	14.5	535825 ○
95	20	52	12.5	10	**M16**	**2**	6HX	14	535826 ○
100	25	55	14	11	**M18**	**1.5**	6HX	16.6	535827 ○
100	25	55	14	11	**M18**	**2.5**	6HX	15.5	535828 ○
105	25	58	15	12	**M20**	**1.5**	6HX	18.5	535829 ○
105	25	58	15	12	**M20**	**2.5**	6HX	17.5	535830 ○

★ Vc: 5 - 10m/min
★ For Carbon Steel, Alloy Steel, Stainless Steel, and Cast Iron with a hardness of HRC 20-32.

P	M	K	N	S	H
◎	○	○	-	-	-

JIS R Line POT | General Purpose & Stable/ Unstable Working Conditions





HSS-E

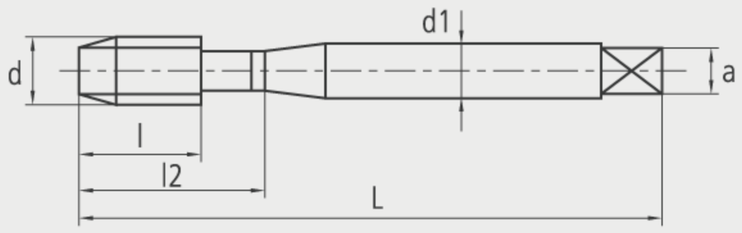
Norm	**JIS**
Coating	**ZrN**
	**C/5P**

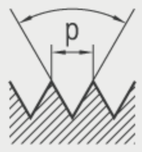
L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	545811 ●
52	12	20	5	4	**M4**	**0.7**	6H	3.3	545812 ●
60	14	24	5.5	4.5	**M5**	**0.8**	6H	4.2	545813 ●
62	16	29	6	4.5	**M6**	**1**	6H	5	545814 ●
70	21	37	6.2	5	**M8**	**1**	6HX	7	545815 ●
70	21	37	6.2	5	**M8**	**1.25**	6H	6.8	545816 ●
75	23	41	7	5.5	**M10**	**1**	6HX	9	545817 ●
75	23	41	7	5.5	**M10**	**1.25**	6HX	8.8	545818 ●
75	23	41	7	5.5	**M10**	**1.5**	6H	8.5	545819 ●
82	24	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	545820 ●
82	24	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	545821 ●
82	24	48	8.5	6.5	**M12**	**1.75**	6H	10.3	545822 ●
88	24	48	10.5	8	**M14**	**1.5**	6HX	12.5	545823 ○
88	24	48	10.5	8	**M14**	**2**	6HX	12	545824 ○
95	24	52	12.5	10	**M16**	**1.5**	6HX	14.5	545825 ○
95	24	52	12.5	10	**M16**	**2**	6HX	14	545826 ○
100	24	55	14	11	**M18**	**1.5**	6HX	16.6	545827 ○
100	24	55	14	11	**M18**	**2.5**	6HX	15.5	545828 ○
105	26	58	15	12	**M20**	**1.5**	6HX	18.5	545829 ○
105	26	58	15	12	**M20**	**2.5**	6HX	17.5	545830 ○

⋆ Vc: 5 - 15m/min
⋆ For Carbon Steel, Alloy Steel, Stainless Steel, and Cast Iron with a hardness of HRC 20-32.

P	M	K	N	S	H
◎	○	○	-	-	-

JIS R Line STT | General Purpose & Stable/ Unstable Working Conditions





HSS-E

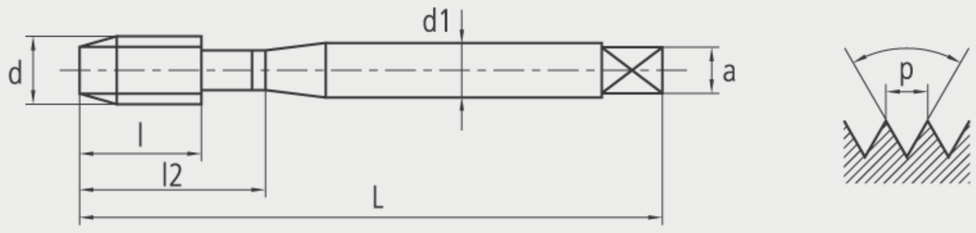
Norm	**JIS**
Coating	**ZrN**
	**C/1.5P**

L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6HX	2.5	555811 ●
52	12	20	5	4	**M4**	**0.7**	6HX	3.3	555812 ●
60	14	24	5.5	4.5	**M5**	**0.8**	6HX	4.2	555813 ●
62	16	29	6	4.5	**M6**	**1**	6HX	5	555814 ●
70	21	37	6.2	5	**M8**	**1**	6HX	7	555815 ●
70	21	37	6.2	5	**M8**	**1.25**	6HX	6.8	555816 ●
75	23	41	7	5.5	**M10**	**1**	6HX	9	555817 ●
75	23	41	7	5.5	**M10**	**1.25**	6HX	8.8	555818 ●
75	23	41	7	5.5	**M10**	**1.5**	6HX	8.5	555819 ●
82	24	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	555820 ●
82	24	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	555821 ●
82	24	48	8.5	6.5	**M12**	**1.75**	6HX	10.3	555822 ●
88	24	48	10.5	8	**M14**	**1.5**	6HX	12.5	555823 ●
88	24	48	10.5	8	**M14**	**2**	6HX	12	555824 ●
95	24	52	12.5	10	**M16**	**1.5**	6HX	14.5	555825 ●
95	24	52	12.5	10	**M16**	**2**	6HX	14	555826 ●
100	24	55	14	11	**M18**	**1.5**	6HX	16.6	555827 ●
100	24	55	14	11	**M18**	**2.5**	6HX	15.5	555828 ●
105	26	58	15	12	**M20**	**1.5**	6HX	18.5	555829 ●
105	26	58	15	12	**M20**	**2.5**	6HX	17.5	555830 ●

★ Cast Iron Vc: 15-25m/min ; Steel Vc: 5-8m/min
★ Steel, Alloy Steel and Cast Iron HRC 20 to 32 ; High hard material HRC 28-38, blind hole

P	M	K	N	S	H
○	-	◎	-	-	-

JIS E Line SFT | High Efficiency & Stable Working Conditions



HSS-E

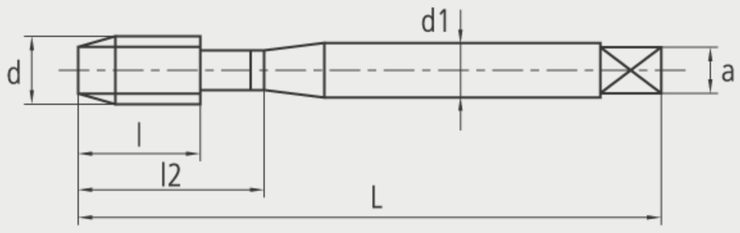
Norm	**JIS**
Coating	**AlCrN**
	C/2.5P

L	l	l2	d1	a	**d**	**p**	Limit		**Art.Stock**
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	565811 ●
52	8.4	20	5	4	**M4**	**0.7**	6H	3.3	565812 ●
60	9.6	24	5.5	4.5	**M5**	**0.8**	6H	4.2	565813 ●
62	12	29	6	4.5	**M6**	**1**	6H	5	565814 ●
70	15	37	6.2	5	**M8**	**1**	6HX	7	565815 ●
70	15	37	6.2	5	**M8**	**1.25**	6H	6.8	565816 ●
75	18	41	7	5.5	**M10**	**1**	6HX	9	565817 ●
75	18	41	7	5.5	**M10**	**1.25**	6HX	8.8	565818 ●
75	18	41	7	5.5	**M10**	**1.5**	6H	8.5	565819 ●
82	18	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	565820 ●
82	18	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	565821 ●
82	18	48	8.5	6.5	**M12**	**1.75**	6H	10.3	565822 ●
88	20	48	10.5	8	**M14**	**1.5**	6HX	12.5	565823 ●
88	20	48	10.5	8	**M14**	**2**	6HX	12	565824 ●
95	20	52	12.5	10	**M16**	**1.5**	6HX	14.5	565825 ●
95	20	52	12.5	10	**M16**	**2**	6HX	14	565826 ●
100	25	55	14	11	**M18**	**1.5**	6HX	16.6	565827 ●
100	25	55	14	11	**M18**	**2.5**	6HX	15.5	565828 ●
105	25	58	15	12	**M20**	**1.5**	6HX	18.5	565829 ●
105	25	58	15	12	**M20**	**2.5**	6HX	17.5	565830 ●

★ Vc: 10 -15m/min
★ Steel, Alloy Steel and Cast Iron , HRC 20 to 32

P	M	K	N	S	H
◎	-	○	-	-	-

JIS E Line POT | High Efficiency & Stable Working Conditions



HSS-E

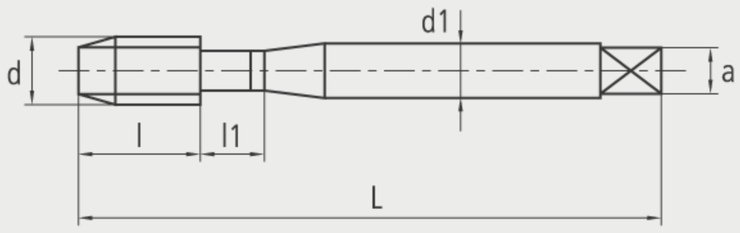
Norm	**JIS**
Coating	**AlCrN**
	**C/5P**

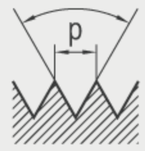
L	l	l2	d1	a	d	p	Limit		Art.Stock
46	10	19	4	3.2	**M3**	**0.5**	6H	2.5	575811 ●
52	12	20	5	4	**M4**	**0.7**	6H	3.3	575812 ●
60	14	24	5.5	4.5	**M5**	**0.8**	6H	4.2	575813 ●
62	16	29	6	4.5	**M6**	**1**	6H	5	575814 ●
70	21	37	6.2	5	**M8**	**1**	6HX	7	575815 ●
70	21	37	6.2	5	**M8**	**1.25**	6H	6.8	575816 ●
75	23	41	7	5.5	**M10**	**1**	6HX	9	575817 ●
75	23	41	7	5.5	**M10**	**1.25**	6HX	8.8	575818 ●
75	23	41	7	5.5	**M10**	**1.5**	6H	8.5	575819 ●
82	24	48	8.5	6.5	**M12**	**1.25**	6HX	10.8	575820 ●
82	24	48	8.5	6.5	**M12**	**1.5**	6HX	10.5	575821 ●
82	24	48	8.5	6.5	**M12**	**1.75**	6H	10.3	575822 ●
88	24	48	10.5	8	**M14**	**1.5**	6HX	12.5	575823 ●
88	24	48	10.5	8	**M14**	**2**	6HX	12	575824 ●
95	24	52	12.5	10	**M16**	**1.5**	6HX	14.5	575825 ●
95	24	52	12.5	10	**M16**	**2**	6HX	14	575826 ●
100	24	55	14	11	**M18**	**1.5**	6HX	16.6	575827 ●
100	24	55	14	11	**M18**	**2.5**	6HX	15.5	575828 ●
105	26	58	15	12	**M20**	**1.5**	6HX	18.5	575829 ●
105	26	58	15	12	**M20**	**2.5**	6HX	17.5	575830 ●

★ Vc: 10 -20m/min
★ Steel, Alloy Steel and Cast Iron , HRC 20 to 32

P	M	K	N	S	H
◎	-	○	-	-	-

JIS P Line SFT | High Performance & General Purpose



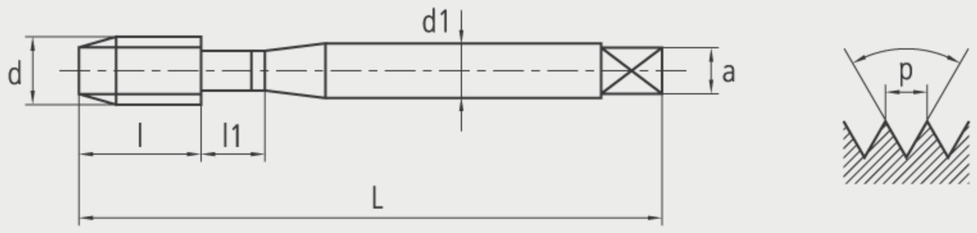


									HSS-PM	HSS-PM	HSS-PM	HSS-PM
												
								Norm	JIS	JIS	JIS	JIS
								Coating	TiCN	TiCN	TiCN	TiCN
									C/1.5	C/2.5	C/2.5	C/2.5
L	l	l1	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock	Art.Stock
37	4.5	-	3	2.5	**M1**	**0.25**	OH1	0.75	585811 ●			
37	4.5	-	3	2.5	**M1.2**	**0.25**	OH1	0.95	585812 ●			
37	6.5	-	3	2.5	**M1.4**	**0.3**	OH1	1.1	585813 ●			
37	8	-	3	2.5	**M1.6**	**0.35**	OH2	1.25	585814 ●			
45	11	-	3	2.5	**M2**	**0.4**	OH2	1.6		585815 ●		
45	12	-	3	2.5	**M2.5**	**0.45**	OH2	2.1		585816 ●		
50	5	13	4	3.2	**M3**	**0.5**	OH2	2.5			585817 ●	
50	6	13	4	3.2	**M3.5**	**0.6**	OH2	2.9			585818 ●	
57	9	11	5	4	**M4**	**0.7**	OH2	3.3			585819 ●	
66	8	17	5.5	4.5	**M5**	**0.8**	OH2	4.2			585820 ●	
69	12	12	6	4.5	**M6**	**1**	OH2	5			585821 ●	
78	13	10	6.2	5	**M7**	**1**	OH3	6			585822 ●	
70	13	23	6.2	5	**M8**	**1**	OH3	7				585823 ●
70	13	23	6.2	5	**M8**	**1,25**	OH3	6.8				585824 ●
75	13	30	7	5.5	**M10**	**1**	OH3	9				585825 ●
75	13	30	7	5.5	**M10**	**1.25**	OH3	8.8				585826 ●
75	15	28	7	5.5	**M10**	**1.5**	OH4	8.5				585827 ●
82	13	29	8.5	6.5	**M12**	**1**	OH3	11				585828 ○
82	13	29	8.5	6.5	**M12**	**1.25**	OH4	10.8				585829 ●
82	17	25	8.5	6.5	**M12**	**1.5**	OH4	10.5				585830 ●
82	17	25	8.5	6.5	**M12**	**1.75**	OH4	10.3				585831 ●
88	20	31	10.5	8	**M14**	**1**	OH3	13				585832 ○
88	20	31	10.5	8	**M14**	**1.25**	OH4	12.75				585833 ●
88	20	31	10.5	8	**M14**	**1.5**	OH4	12.5				585834 ●
88	20	31	10.5	8	**M14**	**2**	OH5	12				585835 ●
95	20	32	12.5	10	**M16**	**1**	OH3	15				585836 ○
95	20	32	12.5	10	**M16**	**1.25**	OH4	14.75				585837 ●
95	20	32	12.5	10	**M16**	**1.5**	OH4	14.5				585838 ●
95	20	32	12.5	10	**M16**	**2**	OH5	14				585839 ●

★ TiCN coating provides excellent wear resistance and smooth chip removal
★ For Carbon Steel, Alloy Steel with a hardness of below 30 HRC, Stainless Steel, Cast Iron, and Non-ferrous Alloys.

P	M	K	N	S	H
◎	○	○	○	-	-

JIS P Line POT | High Performance & General Purpose

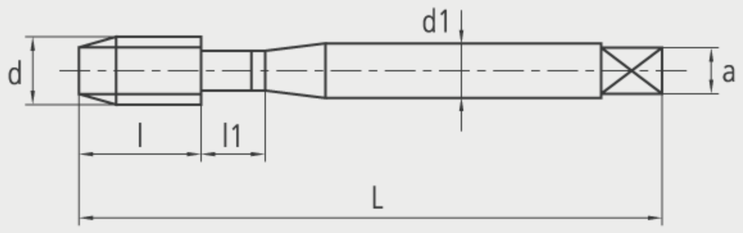


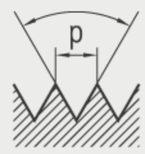
									HSS-PM	HSS-PM	HSS-PM
								Norm	JIS	JIS	JIS
								Coating	TiCN	TiCN	TiCN
									C/5	C/5	C/5
L	l	l1	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
37	4.5	-	3	2.5	**M1**	**0.25**	OH1	0.75	595811 ●		
37	5.5	-	3	2.5	**M1.2**	**0.25**	OH1	0.95	595812 ●		
37	9	-	3	2.5	**M1.4**	**0.3**	OH1	1.1	595813 ●		
37	8	-	3	2.5	**M1.6**	**0.35**	OH2	1.25	595814 ●		
45	11	-	3	2.5	**M2**	**0.4**	OH2	1.6	595815 ●		
45	12	-	3	2.5	**M2.5**	**0.45**	OH2	2.1	595816 ●		
50	12	7	4	3.2	**M3**	**0.5**	OH2	2.5		595817 ●	
50	13	7	4	3.2	**M3.5**	**0.6**	OH2	2.9		595818 ●	
57	14	7	5	4	**M4**	**0.7**	OH2	3.3		595819 ●	
66	16	9	5.5	4.5	**M5**	**0.8**	OH2	4.2		595820 ●	
69	19.5	9.5	6	4.5	**M6**	**1**	OH2	5		595821 ●	
78	13	10	6.2	5	**M7**	**1**	OH3	6		595822 ○	
70	22	15	6.2	5	**M8**	**1**	OH3	7			595823 ●
70	22	15	6.2	5	**M8**	**1,25**	OH3	6.8			595824 ●
75	24	19	7	5	**M10**	**1**	OH3	9			595825 ○
75	24	19	7	5	**M10**	**1.25**	OH3	8.8			595826 ●
75	24	19	7	5	**M10**	**1.5**	OH4	8.5			595827 ●
82	29	17	8.5	6.5	**M12**	**1**	OH3	11			595828 ○
82	29	17	8.5	6.5	**M12**	**1.25**	OH4	10.8			595829 ●
82	29	17	8.5	6.5	**M12**	**1.5**	OH4	10.5			595830 ●
82	29	17	8.5	6.5	**M12**	**1.75**	OH4	10.3			595831 ●
88	20	31	10.5	8	**M14**	**1**	OH3	13			595832 ○
88	20	31	10.5	8	**M14**	**1.25**	OH4	12.75			595833 ●
88	20	31	10.5	8	**M14**	**1.5**	OH4	12.5			595834 ●
88	20	31	10.5	8	**M14**	**2**	OH5	12			595835 ●
95	20	32	12.5	10	**M16**	**1**	OH3	15			595836 ○
95	20	32	12.5	10	**M16**	**1.25**	OH4	14.75			595837 ●
95	20	32	12.5	10	**M16**	**1.5**	OH4	14.5			595838 ●
95	20	32	12.5	10	**M16**	**2**	OH5	14			595839 ●

⋆ TiCN coating provides excellent wear resistance and smooth chip removal
⋆ For Carbon Steel, Alloy Steel with a hardness of below 30 HRC, Stainless Steel, Cast Iron, and Non-ferrous Alloys.

P	M	K	N	S	H
◎	○	○	○	-	-

JIS P Line STT | High Performance for cast iron



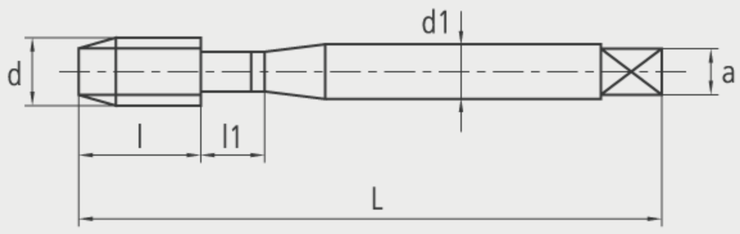


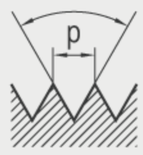
									HSS-PM	HSS-PM
								Norm	**JIS**	**JIS**
								Coating	**AlTiN(Si)**	**AlTiN(Si)**
									C/3	**C/3**
L	l	l1	d1	a	**d**	**p**	Limit		**Art.Stock**	**Art.Stock**
66	16	9	5.5	3.2	**M3**	**0.5**	OH3	2.5	605831 ○	
66	16	9	5.5	4	**M4**	**0.7**	OH3	3.3	605832 ○	
66	16	9	5.5	4.5	**M5**	**0.8**	OH3	4.2	605811 ○	
69	19.5	9.5	6	4.5	**M6**	**1**	OH3	5	605812 ○	
78	13	10	6.2	5	**M7**	**1**	OH3	6	605813 ○	
70	22	15	6.2	5	**M8**	**1**	OH4	7		605814 ○
70	22	15	6.2	5	**M8**	**1,25**	OH4	6.8		605815 ○
75	24	19	7	5.5	**M10**	**1**	OH5	9		605816 ○
75	24	19	7	5.5	**M10**	**1.25**	OH4	8.8		605817 ○
75	24	19	7	5.5	**M10**	**1.5**	OH4	8.5		605818 ○
82	29	17	8.5	6.5	**M12**	**1**	OH5	11		605819 ○
82	29	17	8.5	6.5	**M12**	**1.25**	OH5	10.8		605820 ○
82	29	17	8.5	6.5	**M12**	**1.5**	OH5	10.5		605821 ○
82	29	17	8.5	6.5	**M12**	**1.75**	OH4	10.3		605822 ○
88	20	31	10.5	8	**M14**	**1**	OH6	13		605823 ○
88	20	31	10.5	8	**M14**	**1.25**	OH5	12.75		605824 ○
88	20	31	10.5	8	**M14**	**1.5**	OH5	12.5		605825 ○
88	20	31	10.5	8	**M14**	**2**	OH4	12		605826 ○
90	20	32	12.5	10	**M16**	**1**	OH6	15		605827 ○
90	20	32	12.5	10	**M16**	**1.25**	OH5	14.75		605828 ○
90	20	32	12.5	10	**M16**	**1.5**	OH5	14.5		605829 ○
90	20	32	12.5	10	**M16**	**2**	OH4	14		605830 ○

★ AlTiN(Si) coating provides excellent wear resistance
★ For Gray Cast Iron and Ductile Iron, with high processing accuracy, ideal for large-scale continuous production.

P	M	K	N	S	H
-	-	◎	-	-	-

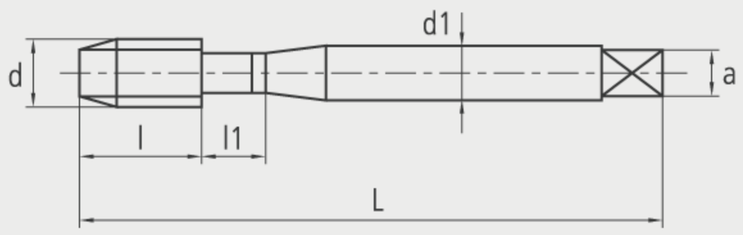
JIS P Line NRT | High Performance for steel





									HSS-PM	HSS-PM	HSS-PM
								Norm	**JIS**	**JIS**	**JIS**
								Coating	**TICN-AL**	**TICN-AL**	**TICN-AL**
									C/2	**C/2**	**C/2**
L	l	l1	d1	a	**d**	**p**	Limit		**Art.Stock**	**Art.Stock**	**Art.Stock**
31	3	-	3	2.5	**M1**	**0.2**	RH4	0.9-0.92	615811 ○		
31	3.5	-	3	2.5	**M1**	**0.25**	RH4	0.9-0.92	615812 ●		
31	3	-	3	2.5	**M1.2**	**0.2**	RH4	1.1-1.15	615813 ○		
31	3.5	-	3	2.5	**M1.2**	**0.25**	RH4	1.1-1.12	615814 ●		
36	3	-	3	2.5	**M1.4**	**0.2**	RH4	1.3-1.32	615815 ○		
36	6.5	-	3	2.5	**M1.4**	**0.3**	RH4	1.27-1.29	615816 ●		
36	3	-	3	2.5	**M1.6**	**0.2**	RH4	1.5-1.52	615817 ○		
35.5	8	-	3	2.5	**M1.6**	**0.35**	RH4	1.44-1.48	615818 ●		
35.5	8	-	3	2.5	**M1.7**	**0.35**	RH4	1.54-1.58	615819 ●		
43.5	4	-	3	2.5	**M2**	**0.25**	RH4	1.87-1.9	615820 ○		
43.5	10	-	3	2.5	**M2**	**0.4**	RH5	1.81-1.85	615821 ●		
43.5	10	-	3	2.5	**M2.3**	**0.3**	RH5	2.11-2.15	615822 ●		
43.5	13	-	3	2.5	**M2.5**	**0.45**	RH5	2.28-2.33	615823 ●		
43.5	13	-	3	2.5	**M2.6**	**0.45**	RH5	2.38-2.43	615824 ●		
48	6	8	4	3.2	**M3**	**0.35**	RH4	2.82-2.87		615825 ○	
48	16	-	4	3.2	**M3**	**0.5**	RH7	2.76-2.81	615826 ●		
48	16	-	4	3.2	**M3.5**	**0.6**	RH7	3.2-3.26	615827 ●		
55	8	8	5	4	**M4**	**0.5**	RH7	3.75-3.78		615828 ○	
55	18	-	5	4	**M4**	**0.7**	RH7	3.65-3.7	615829 ●		
64	8	8	5.5	4.5	**M5**	**0.5**	RH7	4.75-4.8		615830 ○	
63.5	20	-	5.5	4.5	**M5**	**0.8**	RH7	4.59-4.66	615831 ●		
66	12	12	6	4.5	**M6**	**0.5**	RH7	5.75-5.8		615832 ○	

JIS P Line NRT | High Performance for steel

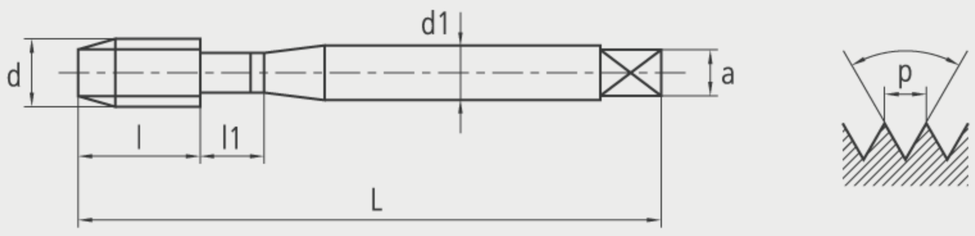


									HSS-PM	HSS-PM	HSS-PM
								Norm	JIS	JIS	JIS
								Coating	TICN-AL	TICN-AL	TICN-AL
									C/2	C/2	C/2
L	l	l1	d1	a	**d**	**p**	Limit		**Art.Stock**	**Art.Stock**	**Art.Stock**
66	12	12	6	4.5	**M6**	**0.75**	RH7	5.62-5.70		615833 ○	
66.5	27	-	6	4.5	**M6**	**1**	RH7	5.48-5.57	615834 ●		
70	13	10	6.2	5	**M7**	**1**	RH7	6.48-5.57			615835 ●
70	13	23	6.2	5	**M8**	**0.75**	RH7	7.62-7.71			615836 ○
70	13	23	6.2	5	**M8**	**1**	RH7	7.48-7.57			615837 ●
70	13	23	6.2	5	**M8**	**1.25**	RH7	7.34-7.41			615838 ●
75	13	30	7	5.5	**M10**	**0.75**	RH7	9.62-9.71			615839 ○
75	13	30	7	5.5	**M10**	**1**	RH7	9.48-9.57			615840 ●
75	13	30	7	5.5	**M10**	**1.25**	RH7	9.34-9.41			615841 ●
75	15	28	7	5.5	**M10**	**1.5**	RH8	9.18-8.28			615842 ●
82	13	29	8.5	6.5	**M12**	**1**	RH7	11.48-11.57			615843 ●
82	13	29	8.5	6.5	**M12**	**1.25**	RH7	11.34-11.41			615844 ●
82	17	25	8.5	6.5	**M12**	**1.5**	RH8	11.18-11.28			615845 ●
82	17	25	8.5	6.5	**M12**	**1.75**	RH9	11.05-11.15			615846 ●
88	20	31	10.5	8	**M14**	**1**	RH7	13.5-13.55			615847 ●
88	20	31	10.5	8	**M14**	**1.25**	RH7	13.37-13.42			615848 ●
88	20	31	10.5	8	**M14**	**1.5**	RH8	13.21-13.3			615849 ●
88	20	31	10.5	8	**M14**	**2**	RH10	12.92-13.04			615850 ●
95	20	32	12.5	10	**M16**	**1**	RH7	15.5-15.58			615851 ●
95	20	32	12.5	10	**M16**	**1.25**	RH7	15.37-15.45			615852 ●
95	20	32	12.5	10	**M16**	**1.5**	RH8	15.21-15.35			615853 ●
95	20	32	12.5	10	**M16**	**2**	RH10	14.92-15.04			615854 ●

★ TICN-AL provides excellent wear resistance
★ For Carbon Steel and Alloy Steel with a hardness of below 30 HRC.

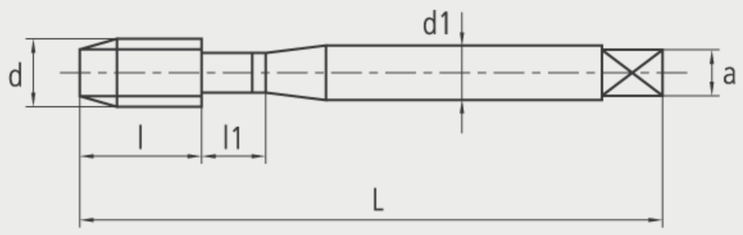
P	M	K	N	S	H
◎	-	-	-	-	-

JIS P Line NRT | High Performance for stainless steel



									HSS-PM	HSS-PM	HSS-PM
								Norm	JIS	JIS	JIS
								Coating	TiN(Si)	TiN(Si)	TiN(Si)
									C/2	C/2	C/2
L	l	l1	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
31	3	-	3	2.5	**M1**	**0.2**	RH4	0.9-0.92	625811 ○		
31	3.5	-	3	2.5	**M1**	**0.25**	RH4	0.9-0.92	625812 ●		
31	3	-	3	2.5	**M1.2**	**0.2**	RH4	1.1-1.15	625813 ○		
31	3.5	-	3	2.5	**M1.2**	**0.25**	RH4	1.1-1.12	625814 ●		
36	3	-	3	2.5	**M1.4**	**0.2**	RH4	1.3-1.32	625815 ○		
36	6.5	-	3	2.5	**M1.4**	**0.3**	RH4	1.27-1.29	625816 ●		
36	3	-	3	2.5	**M1.6**	**0.2**	RH4	1.5-1.52	625817 ○		
35.5	8	-	3	2.5	**M1.6**	**0.35**	RH4	1.44-1.48	625818 ●		
35.5	8	-	3	2.5	**M1.7**	**0.35**	RH4	1.54-1.58	625819 ●		
43.5	4	-	3	2.5	**M2**	**0.25**	RH4	1.87-1.9	625820 ○		
43.5	10	-	3	2.5	**M2**	**0.4**	RH5	1.81-1.85	625821 ●		
43.5	10	-	3	2.5	**M2.3**	**0.3**	RH5	2.11-2.15	625822 ○		
43.5	13	-	3	2.5	**M2.5**	**0.45**	RH5	2.28-2.33	625823 ●		
43.5	13	-	3	2.5	**M2.6**	**0.45**	RH5	2.38-2.43	625824 ●		
48	6	8	4	3.2	**M3**	**0.35**	RH4	2.82-2.87		625825 ○	
48	16	-	4	3.2	**M3**	**0.5**	RH7	2.76-2.81	625826 ●		
48	16	-	4	3.2	**M3.5**	**0.6**	RH7	3.2-3.26	625827 ●		
55	8	8	5	4	**M4**	**0.5**	RH7	3.75-3.78		625828 ○	
55	18	-	5	4	**M4**	**0.7**	RH7	3.65-3.7	625829 ●		
64	8	8	5.5	4.5	**M5**	**0.5**	RH7	4.75-4.8		625830 ○	
63.5	20	-	5.5	4.5	**M5**	**0.8**	RH7	4.59-4.66	625831 ●		
66	12	12	6	4.5	**M6**	**0.5**	RH7	5.75-5.8		625832 ○	

JIS P Line NRT | High Performance for stainless steel

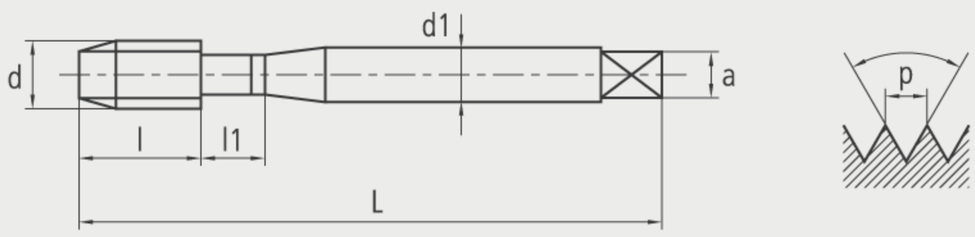


									HSS-PM	HSS-PM	HSS-PM
								Norm	JIS	JIS	JIS
								Coating	TiN(Si)	TiN(Si)	TiN(Si)
									C/2	C/2	C/2
L	l	l1	d1	a	d	p	Limit		Art.Stock	Art.Stock	Art.Stock
66	12	12	6	4.5	**M6**	**0.75**	RH7	5.62-5.70		625833 ○	
66.5	27	-	6	4.5	**M6**	**1**	RH7	5.48-5.57	625834 ●		
70	13	10	6.2	5	**M7**	**1**	RH7	6.48-5.57			625835 ●
70	13	23	6.2	5	**M8**	**0.75**	RH7	7.62-7.71			625836 ○
70	13	23	6.2	5	**M8**	**1**	RH7	7.48-7.57			625837 ●
70	13	23	6.2	5	**M8**	**1.25**	RH7	7.34-7.41			625838 ●
75	13	30	7	5.5	**M10**	**0.75**	RH7	9.62-9.71			625839 ○
75	13	30	7	5.5	**M10**	**1**	RH7	9.48-9.57			625840 ●
75	13	30	7	5.5	**M10**	**1.25**	RH7	9.34-9.41			625841 ●
75	15	28	7	5.5	**M10**	**1.5**	RH8	9.18-8.28			625842 ●
82	13	29	8.5	6.5	**M12**	**1**	RH7	11.48-11.57			625843 ●
82	13	29	8.5	6.5	**M12**	**1.25**	RH7	11.34-11.41			625844 ●
82	17	25	8.5	6.5	**M12**	**1.5**	RH8	11.18-11.28			625845 ●
82	17	25	8.5	6.5	**M12**	**1.75**	RH9	11.05-11.15			625846 ●
88	20	31	10.5	8	**M14**	**1**	RH7	13.5-13.55			625847 ●
88	20	31	10.5	8	**M14**	**1.25**	RH7	13.37-13.42			625848 ●
88	20	31	10.5	8	**M14**	**1.5**	RH8	13.21-13.3			625849 ●
88	20	31	10.5	8	**M14**	**2**	RH10	12.92-13.04			625850 ●
95	20	32	12.5	10	**M16**	**1**	RH7	15.5-15.58			625851 ●
95	20	32	12.5	10	**M16**	**1.25**	RH7	15.37-15.45			625852 ●
95	20	32	12.5	10	**M16**	**1.5**	RH8	15.21-15.35			625853 ●
95	20	32	12.5	10	**M16**	**2**	RH10	14.92-15.04			625854 ●

★ TiN(Si) coating is designed for challenging machining of stainless steel, offering excellent machining characteristics and outstanding wear resistance.
★ For Stainless Steel, including the 200 series and 300 series.

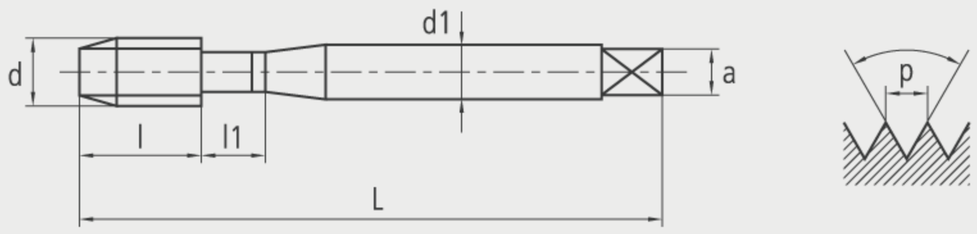
P	M	K	N	S	H
-	◎	-	-	-	-

JIS P Line NRT | High Performance for non ferrous alloysteel



									HSS-PM	HSS-PM	HSS-PM
								Norm	JIS	JIS	JIS
								Coating	DLC	DLC	DLC
									C/2	C/2	C/2
L	l	l1	d1	a	**d**	**p**	Limit		Art.Stock	Art.Stock	Art.Stock
31	3	-	3	2.5	**M1**	**0.2**	RH4	0.9-0.92	635811 ○		
31	3.5	-	3	2.5	**M1**	**0.25**	RH4	0.9-0.92	635812 ●		
31	3	-	3	2.5	**M1.2**	**0.2**	RH4	1.1-1.15	635813 ○		
31	3.5	-	3	2.5	**M1.2**	**0.25**	RH4	1.1-1.12	635814 ●		
36	3	-	3	2.5	**M1.4**	**0.2**	RH4	1.3-1.32	635815 ○		
36	6.5	-	3	2.5	**M1.4**	**0.3**	RH4	1.27-1.29	635816 ●		
36	3	-	3	2.5	**M1.6**	**0.2**	RH4	1.5-1.52	635817 ○		
35.5	8	-	3	2.5	**M1.6**	**0.35**	RH4	1.44-1.48	635818 ●		
35.5	8	-	3	2.5	**M1.7**	**0.35**	RH4	1.54-1.58	635819 ●		
43.5	4	-	3	2.5	**M2**	**0.25**	RH4	1.87-1.9	635820 ○		
43.5	10	-	3	2.5	**M2**	**0.4**	RH5	1.81-1.85	635821 ●		
43.5	10	-	3	2.5	**M2.3**	**0.3**	RH5	2.11-2.15	635822 ○		
43.5	13	-	3	2.5	**M2.5**	**0.45**	RH5	2.28-2.33	635823 ●		
43.5	13	-	3	2.5	**M2.6**	**0.45**	RH5	2.38-2.43	635824 ○		
48	6	8	4	3.2	**M3**	**0.35**	RH4	2.82-2.87		635825 ○	
48	16	-	4	3.2	**M3**	**0.5**	RH7	2.76-2.81	635826 ●		
48	16	-	4	3.2	**M3.5**	**0.6**	RH7	3.2-3.26	635827 ●		
55	8	8	5	4	**M4**	**0.5**	RH7	3.75-3.78		635828 ○	
55	18	-	5	4	**M4**	**0.7**	RH7	3.65-3.7	635829 ●		
64	8	8	5.5	4.5	**M5**	**0.5**	RH7	4.75-4.8		635830 ○	
63.5	20	-	5.5	4.5	**M5**	**0.8**	RH7	4.59-4.66	635831 ●		
66	12	12	6	4.5	**M6**	**0.5**	RH7	5.75-5.8		635832 ○	

JIS P Line NRT | High Performance for non ferrous alloysteel



								Norm	JIS	JIS	JIS
								Coating	DLC	DLC	DLC
									C/2	C/2	C/2
L	l	l1	d1	a	**d**	**p**	Limit		**Art.Stock**	**Art.Stock**	**Art.Stock**
66	12	12	6	4.5	**M6**	**0.75**	RH7	5.62-5.70		635833 ○	
66.5	27	-	6	4.5	**M6**	**1**	RH7	5.48-5.57	635834 ●		
70	13	10	6.2	5	**M7**	**1**	RH7	6.48-5.57			635835 ○
70	13	23	6.2	5	**M8**	**0.75**	RH7	7.62-7.71			635836 ○
70	13	23	6.2	5	**M8**	**1**	RH7	7.48-7.57			635837 ●
70	13	23	6.2	5	**M8**	**1.25**	RH7	7.34-7.41			635838 ●
75	13	30	7	5.5	**M10**	**0.75**	RH7	9.62-9.71			635839 ○
75	13	30	7	5.5	**M10**	**1**	RH7	9.48-9.57			635840 ●
75	13	30	7	5.5	**M10**	**1.25**	RH7	9.34-9.41			635841 ●
75	15	28	7	5.5	**M10**	**1.5**	RH8	9.18-8.28			635842 ●
82	13	29	8.5	6.5	**M12**	**1**	RH7	11.48-11.57			635843 ●
82	13	29	8.5	6.5	**M12**	**1.25**	RH7	11.34-11.41			635844 ●
82	17	25	8.5	6.5	**M12**	**1.5**	RH8	11.18-11.28			635845 ●
82	17	25	8.5	6.5	**M12**	**1.75**	RH9	11.05-11.15			635846 ●
88	20	31	10.5	8	**M14**	**1**	RH7	13.5-13.55			635847 ●
88	20	31	10.5	8	**M14**	**1.25**	RH7	13.37-13.42			635848 ●
88	20	31	10.5	8	**M14**	**1.5**	RH8	13.21-13.3			635849 ●
88	20	31	10.5	8	**M14**	**2**	RH10	12.92-13.04			635850 ●
95	20	32	12.5	10	**M16**	**1**	RH7	15.5-15.58			635851 ●
95	20	32	12.5	10	**M16**	**1.25**	RH7	15.37-15.45			635852 ●
95	20	32	12.5	10	**M16**	**1.5**	RH8	15.21-15.35			635853 ●
95	20	32	12.5	10	**M16**	**2**	RH10	14.92-15.04			635854 ●

★ DLC coating offers excellent wear resistance and minimizes chip adhesion.
★ For processing non-ferrous metals, including ADC, AC, ZDC, MC, Cu, BSC and others.

P	M	K	N	S	H
-	-	-	◎	-	-

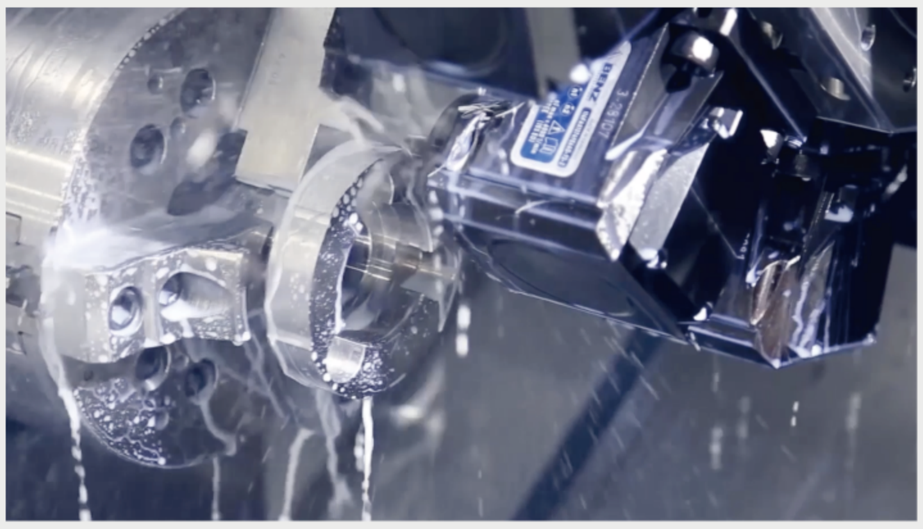
S Line

DS ...
JS ...

Non Standard Ordering Process

1 Requirements Communication

2 Solution Confirmation



3 Samples Test

4 On-site Technical Service

5 Solution Improving

6 Meet Requirements

7 Constant Optimization

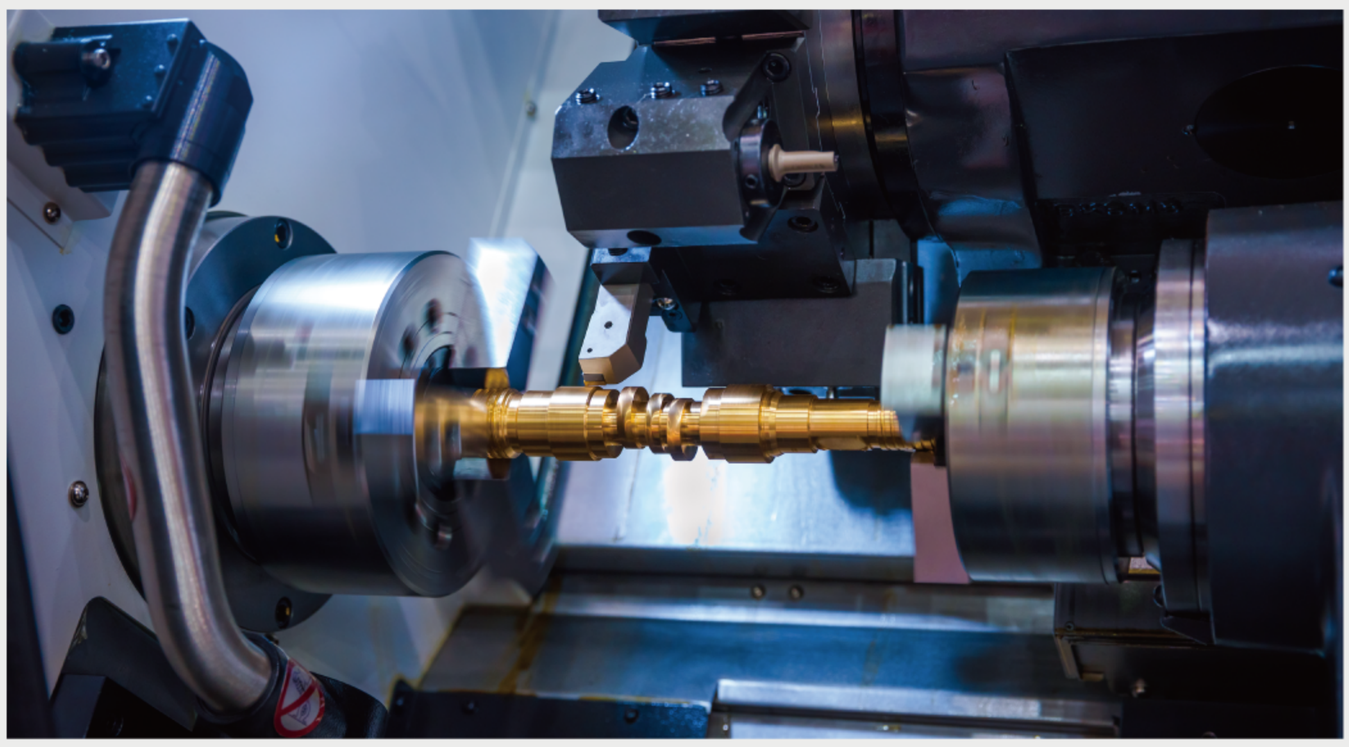
S Line

DS ...
JS ...

Advantages of customized Special Tool Service

1.Available for all kinds of metal cutting tools

Our customized special tool service covers all ranges of metal cutting tools such as drilling, milling, turning. Therefore in this service, customers come up with machining requirements and we are responsible for the ideal results.



2.Provide total machining solutions

Based on customer's machining conditions, workpiece materals and specific needs, we solve machining problems by one-stop service from providing total machining solutions made to achieve excellent machining effect to designing and manufacturing whole set of cutting tools.

3.Constant optimization and improvement

We do our best to constantly help customers improving and optimizing machining process,reducing costs, raising productivity and competitiveness.

In order to provide customized solution, we require some more detailed information as follows:

Drawing of the workpiece

Material of the Workpiece

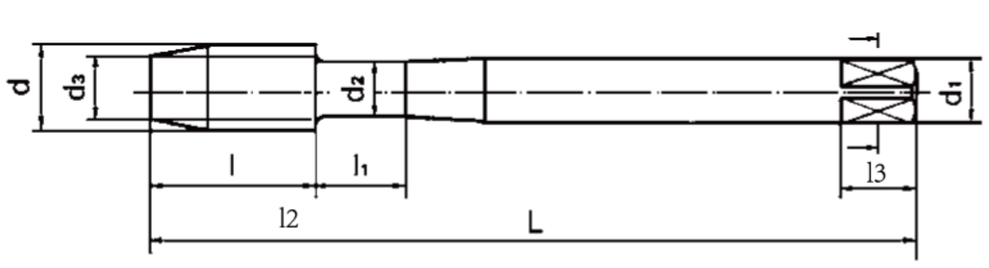
Clamping Situation

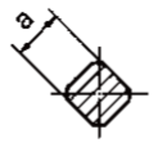
Machine Data

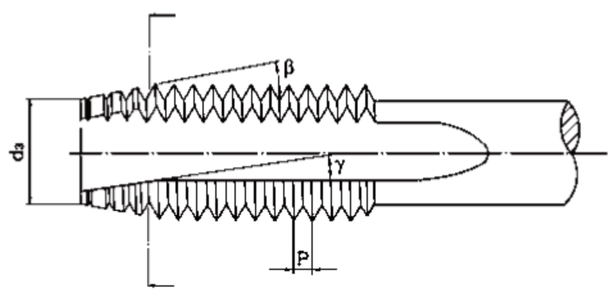
Purchasing Requirement

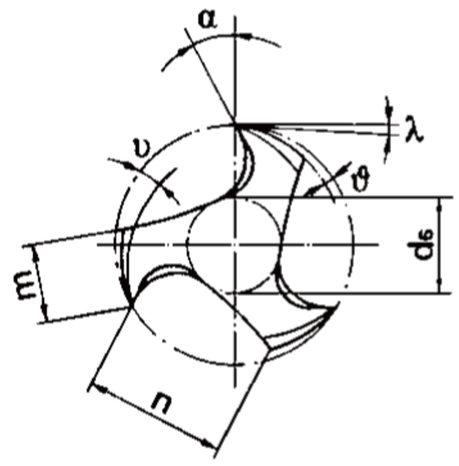
Technical information

Symboles









Taps

Structural dimensions:

L = total length
l = thread length
l1 = neck length
l2 = length of thread & neck
l3 = square length
a = square

d1 = shank diameter
d2 = neck diameter
m = web thickness
n = pitch of thread

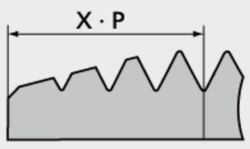
Thread:

d = nominal diameter
d3 = chamfer diameter
d6 = épaisseur de l'âme
P = pas

Geometry:

a = chip angle
b = angel of chamfer
g = angle of spiral point
J = radial relief of thread
l = radial relief angle of thread
u = relief angle of chamfer

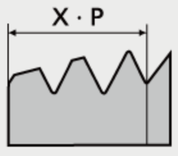
Chamfer form



X 3.5 – 5

Form(e) B

Chamfer form for taps as per DIN. The length of the chamfer is between 3,5 and 5 threads.



X 2 – 3

Form(e) C

Chamfer form for taps as per DIN. The length of the chamfer is between 2 and 3 threads.

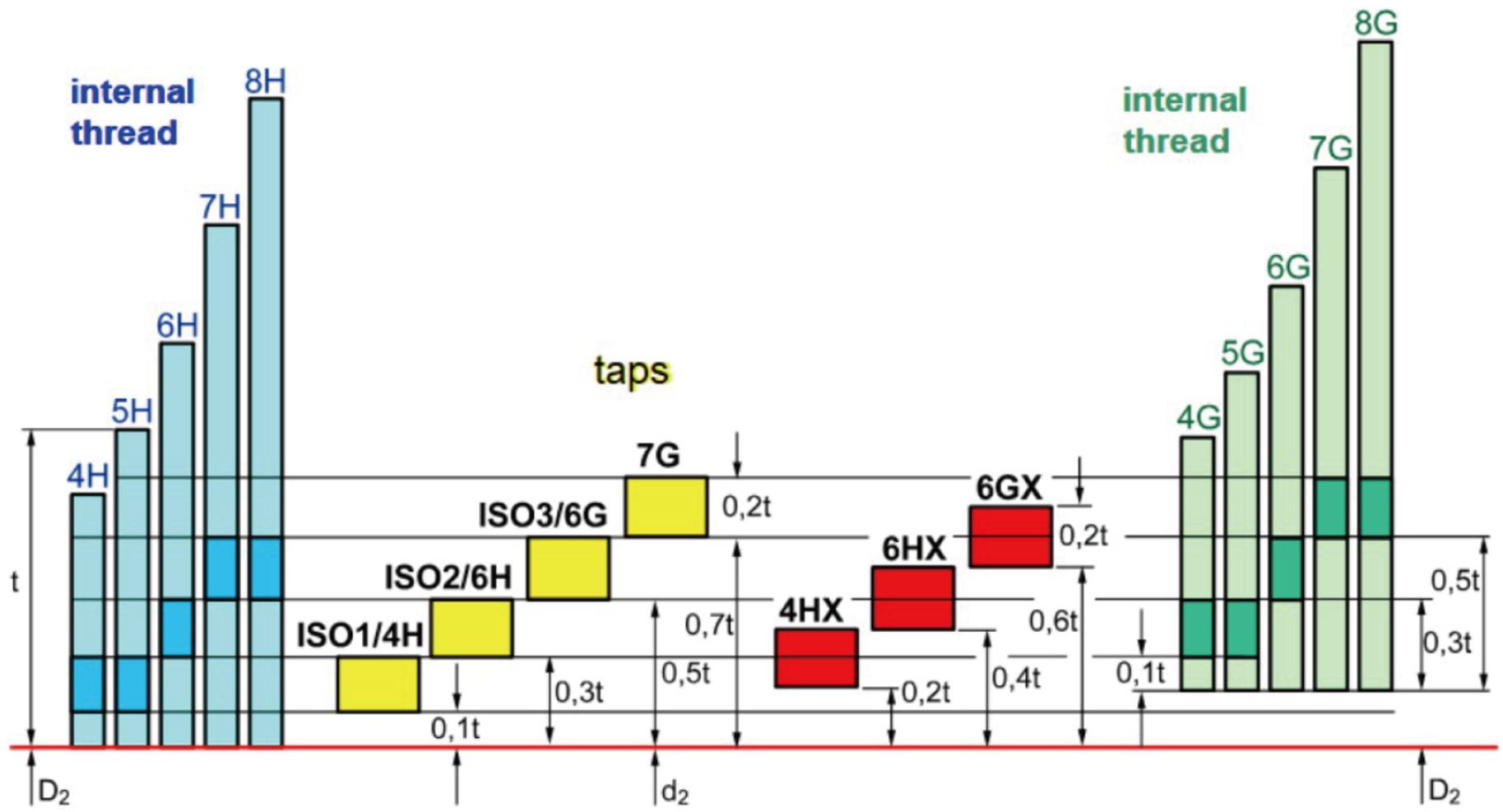
X 1.5 – 2

Form(e) E

Chamfer form for taps as per DIN. The length of the chamfer is between 1,5 and 2 threads.

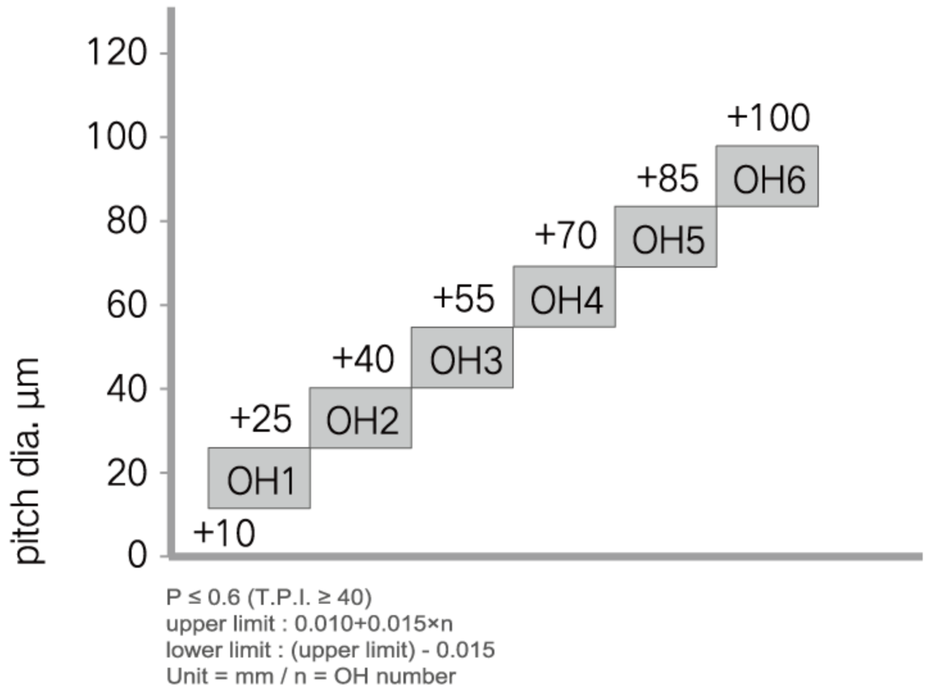
Tolerance of Cutting Tap Thread

ISO limit



Pitch ⩽ 0.6

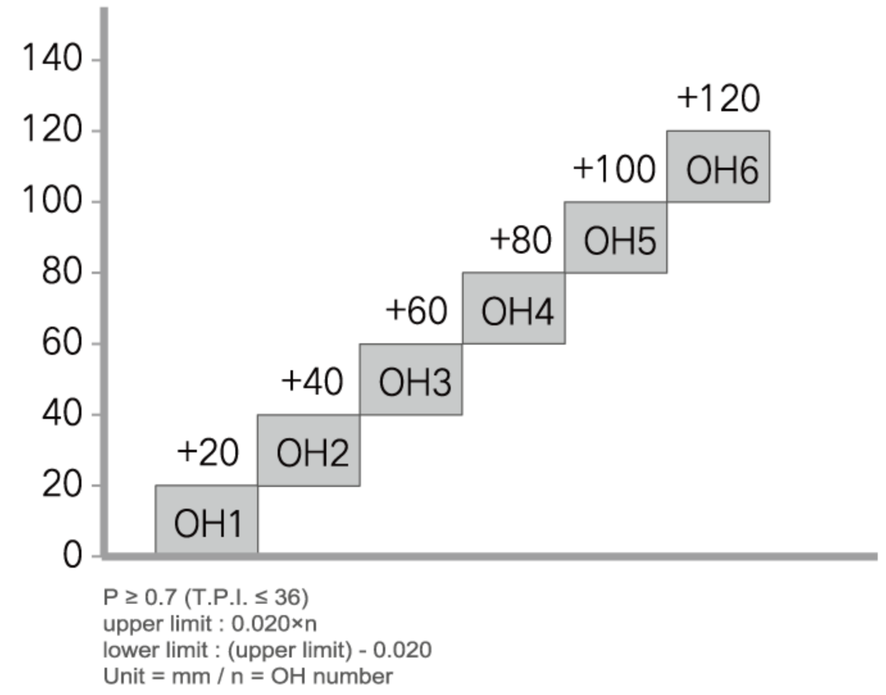
OH limits



P ≤ 0.6 (T.P.I. ≥ 40)
upper limit : 0.010+0.015×n
lower limit : (upper limit) - 0.015
Unit = mm / n = OH number

Pitch ⩽ 0.7

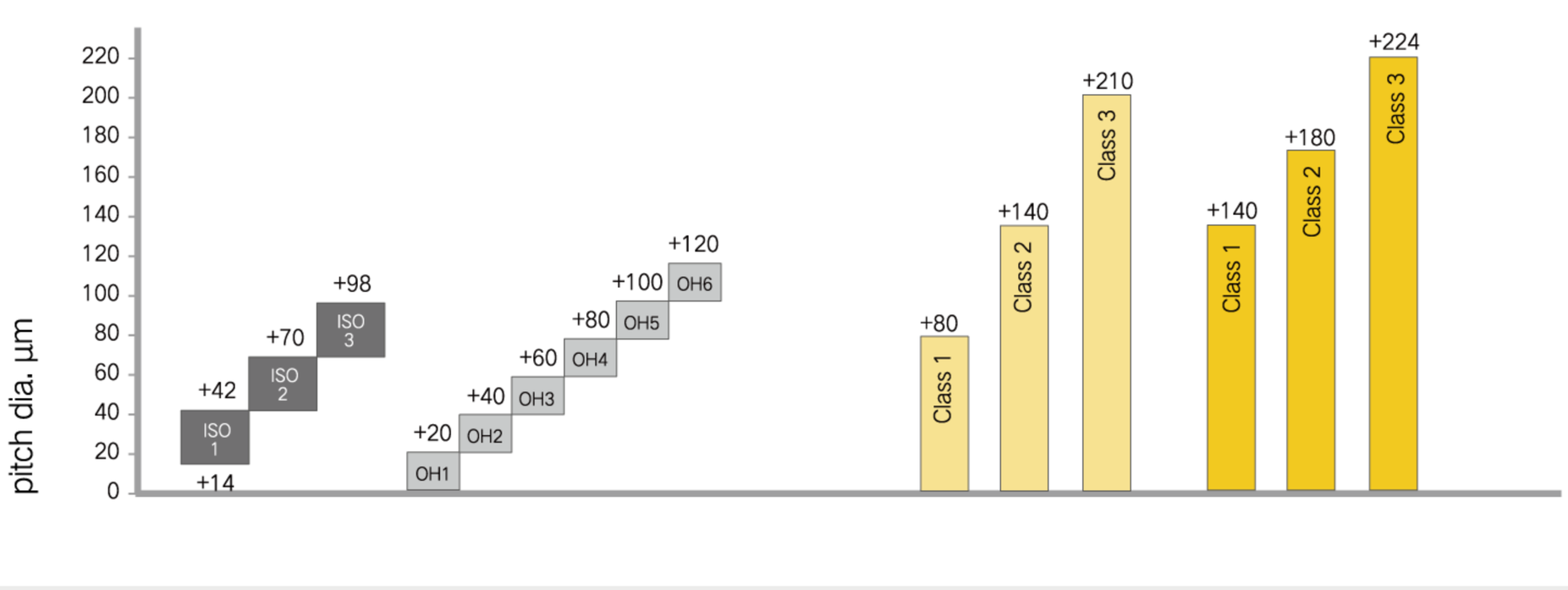
OH limits



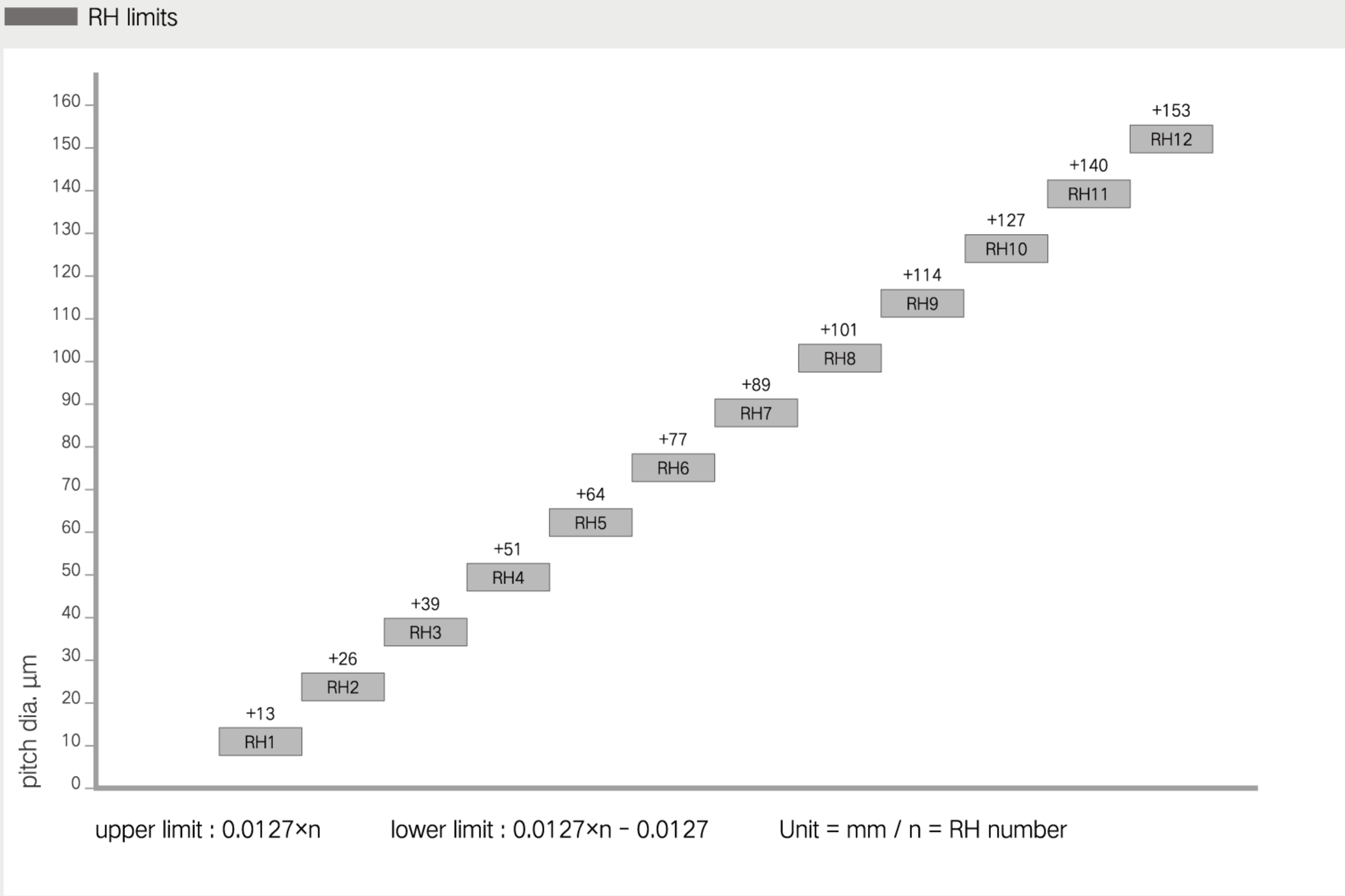
P ≥ 0.7 (T.P.I. ≤ 36)
upper limit : 0.020×n
lower limit : (upper limit) - 0.020
Unit = mm / n = OH number

Example M10 (x 1.5)

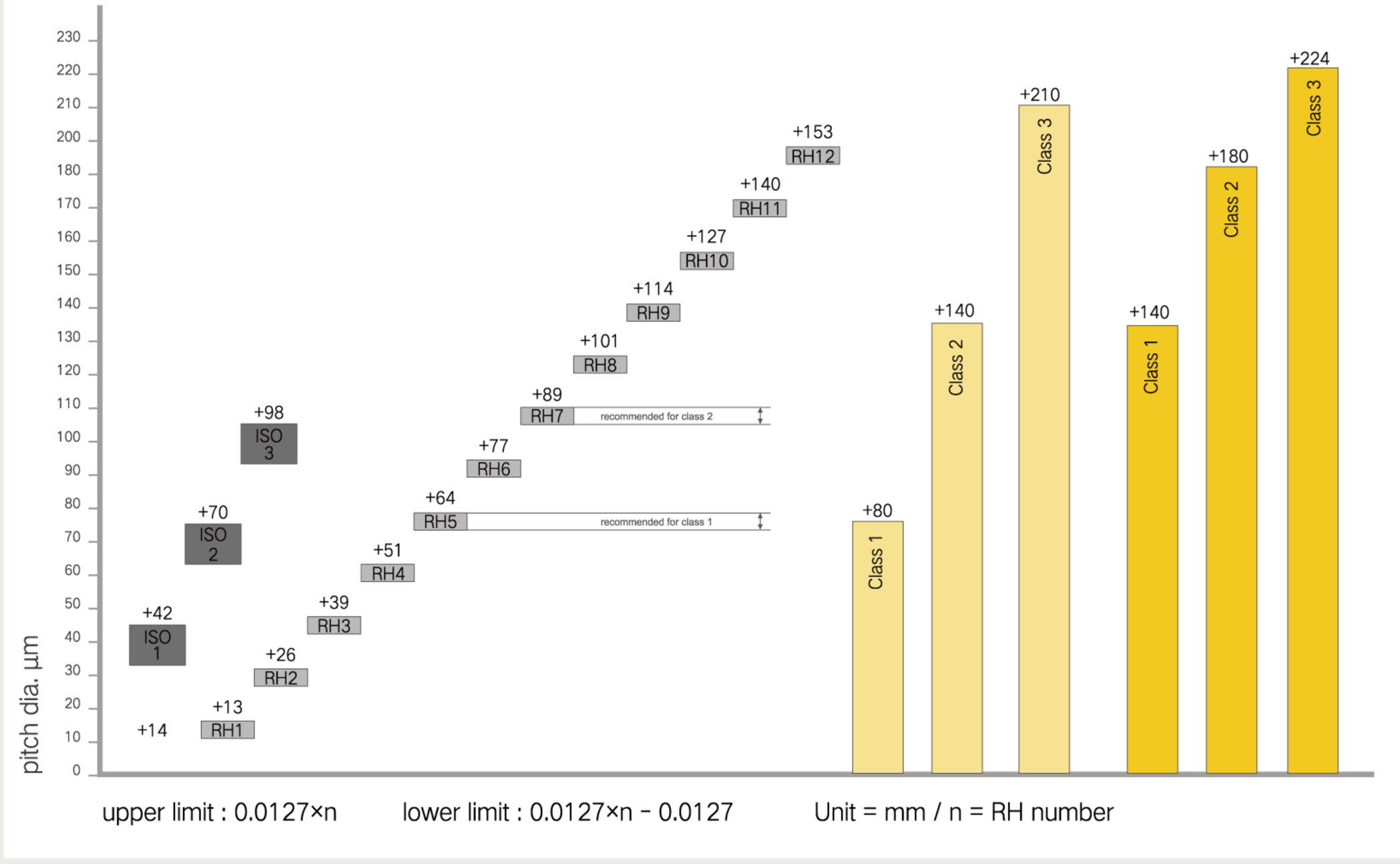
ISO limits
OH limits
JIS internal thread
ISO internal thread



RH limits for forming taps



Example M10 (x 1.5)



Process optimization

Problem	Causes	Solutions
Oversize thread	Improper selection of tap	Select a suitable tap as per application chart
	Angle or position error	Correct alignment of tap and drilled hole
	Countersink is missing	Provide the core hole, before cutting the thread, with a countersink 90°
	Core hole drill too small	Choose the core hole as per chart, for hard materials aim for the upper tolerance limit
	Tap is damaged or has cold welding	Use a new tap, evaluate coolant being used, possibly use a tap with surface treatment
	Cutting speed too high or too low	Choose the correct speed as per chart, according to the working material
	Machine spindle or compensation chuck do not function axially	Check the function of the spindle and the compensation chuck, if possible use a smaller machine
	Chip packing in tap flutes	Avoid chip packing in the flutes or under the work piece
	Tap has the wrong tolerance class	Use a gauge and a tap with the same tolerance class
	Tap has been reground	Tap has the wrong geometry or a burred edge. Regrind the tool , possibly choose a new tap
Undersize thread	Working piece thin walled and/or material with high expansion	Use a tap with a higher tolerance class respectively with oversize
	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Tap has the wrong tolerance class	Use a gauge and a tap with the same tolerance class
	Axial pitch error	See under «axial pitch error»
Axial pitch error	Wrong choice of tap (geometry not adapted)	Use a tap with a higher tolerance class respectively with oversize
	The countersink is missing	Provide the core hole, before cutting the thread, with a countersink 90°
	The cutting force is too high (feed)	With a manual feed reduce the pressure, use a compensation chuck/tap holder. Verify the adjusted feed on the machine, possibly reduce the feed (only possible with a compensation chuck)
	The cutting force is too low (feed)	Verify the adjusted feed on the machine. With manual feed increase the pressure
	Spindle and feed are not synchronised	The adjustment of the machine is not correct. Use a compensation chuck. Verify the machine settings
Widening in a curve	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Angle or position error	Correct alignment of tap and drilled hole
	Countersink is missing	Provide the core hole, before cutting the thread, with a countersink 90°
	The cutting force is too high (feed)	With a manual feed reduce the pressure, use a compensation chuck/tap holder. Verify the adjusted feed on the machine, possibly reduce the feed (only possible with a compensation chuck)
	The cutting force is too low (feed)	Verify the adjusted feed on the machine. With manual feed increase the pressure
	Tap has been reground	Tap has the wrong geometry or a burred edge. Regrind the tool again, eventually choose a new tap
	Machine spindle and compensation chuck do not function axially	Check the function of the spindle and the compensation chuck, if possible use a smaller machine

Problem	Causes	Solutions
Rough thread surface	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Dull tap	Use a new tap
	Tap is damaged or has cold welding	Use a new tap, evaluate coolant being used, possibly use a tap with surface treatment
	Insufficient lubrication	Improve the lubrication, if possible use cutting oil
	Chip packing in tap flutes	Avoid chip packing in the flutes or under the work piece
	Cutting speed too high or too low	Choose the correct speed as per chart, please also consider the working material
	Core drill too small	Choose the core hole as per chart, for hard materials aim for the upper tolerance limit
	Tap has been reground	Tap has the wrong geometry or a burred edge. Regrind the tool again, possibly choose a new tap.
Tool life too short	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Cutting speed too high or too low	Choose the correct speed as per chart, please also consider the working material
	The working material is abrasive (grey cast iron, aluminium/cast alloy with Si, plastic with glass fibres reinforced etc.)	Use a tap with surface treatment
	Insufficient lubrication	Improve the lubrication, if possible use cutting oil
	Work-hardened surface of the core hole, due to blunt or not unsuitable drills	Use sharp and suitable drills. For hard materials avoid the use of carbide drills
Tap breakage	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Taps bottoming in the hole	Verify the adjustment of the thread length, consider the chamfer length and possibly the centre point. Avoid the use of a safety clutch on a machine with forced feed
	Angle or position error	Correct alignment of tap and drilled hole
	Countersink is missing	Provide the core hole, before cutting the thread, with a countersink 90°
	Core hole drill too small	Choose the core hole as per chart, for hard materials aim for the upper tolerance limit
	Dull tap	Use a new tap
	Working piece thin walled and/or material with high expansion	During the return the tap is gripped by the work piece. Use a tap with a higher relief. If possible use a special execution
	Chip packing in tap flutes	Avoid chip packing in the flutes or under the working piece
	Tap has been reground	Use a new tap
Breakage of chamfer and/or guiding teeth	Wrong choice of tap (geometry not adapted)	Select a suitable tap as per application chart
	Chip packing in tap flutes	Avoid chip packing in the flutes or under the working piece. Blind holes being tapped in a recessed hole can cause the breakage of individual teeth on the upper part of the tap
	Core hole drill too small	Choose the core hole as per chart, for hard materials aim for the upper tolerance limit
	Dull tap	Use a new tap
	Taps bottoming in the hole	Verify the adjustment of the thread length, consider the chamfer length and possibly the centre point. Avoid the use of a safety clutch on a machine with forced feed
	Angle or positional error	Choose the core hole as per chart, for hard materials aim for the upper tolerance limit
	Material too hard	Use a tap with more flutes, or use a set of taps