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VERGNANO

Forming Taps


VERGNANO

For more than 60 years Vergnano designs and produces finest quality precision tools.

The quality of our products is the result of our long term experience and continuous investiments in both advanced technology and human resources.

The Vergnano
distribution network
now extends all over
the world.

Our objective
is to achieve
complete customer
satisfaction
while manufacturing
tools with due respect

for the environment
and safety at work.

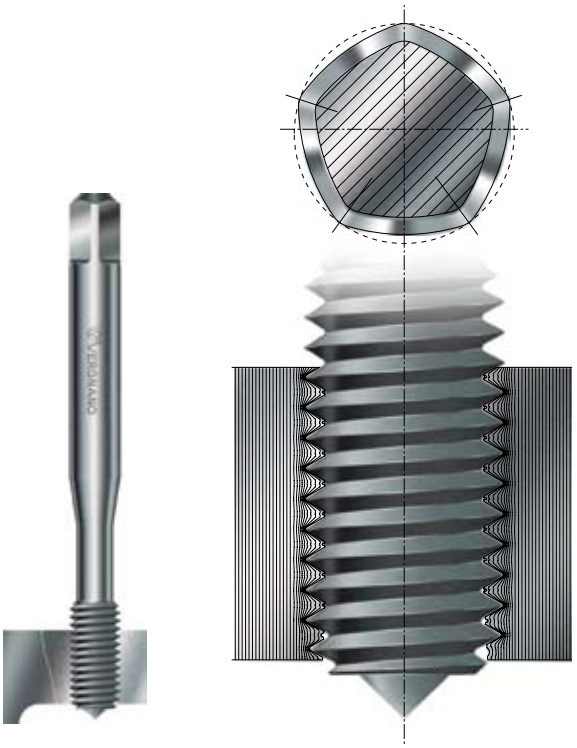
Forming taps and the forming process

Characteristics and advantages of forming taps

- Thread obtained by plastic deformation of material
- No chip formation and therefore high process stability and reliability compared to normal cutting process
- Single tool for both blind and through holes
- Possibility of threading deep blind holes
- Higher tool life
- Higher machining speeds compared to cutting taps
- Better surface finish on formed thread
- Better tensile strength of formed thread due to material work-hardening
- More resistant tap geometry, with lower risk of breakage, due to larger core diameter
- Ecological tool: lower quantity of tools consumed, no costs for chip disposal and possibility of using minimum quantity lubrication

Requirements

- Larger and more precise drilled hole diameter compared to cutting taps
- Workpiece material with a minimum elongation coefficient A_5 of at least 10% and a maximum tensile strength of 1200 N/mm^2
- Good lubrication
- Higher power requirement (100 – 150%) as compared to cutting taps



Thread obtained by plastic deformation of workpiece material

Tolerance fields

Forming taps are constructed with oversize tolerances compared to cutting taps in order to obtain threads which are in tolerance.

For internal thread tolerances 6H and 6G, forming taps with 6HX and 6GX tolerances must be used, respectively.

Forming Taps - Tolerance Ranges			
Internal Thread Tolerance	Tap Tolerance DIN	Tap Tolerance ISO	Forming Tap Tolerance
4H 5H	4H	ISO 1	4HX
4G 5G 6H	6H	ISO 2	6HX
6H 7H 8H	6G	ISO 3	6GX
7G 8G	7G		7GX

Drill hole diameters

In order to obtain the requested tolerance, the formation of a complete internal thread and guarantee the tap tool life, it is important to respect the drill hole diameters and their tight tolerances.

Metric - ISO Threads Coarse Pitch - DIN 13			Metric - ISO Threads Fine Pitch - DIN 13			Whitworth Pipe Threads EN - ISO 228		
M	Pitch [mm]	Drill size [mm]	MF	Pitch [mm]	Drill size [mm]	G	T.P.I.	Drill size [mm]
M 2	0,4	1,80 ± 0,03	M 3	0,35	2,85 ± 0,03	G 1/8"	28	9,25 ± 0,05
M 2,5	0,45	2,30 ± 0,03	M 4	0,5	3,80 ± 0,03	G 1/4"	19	12,50 ± 0,05
M 3	0,5	2,80 ± 0,03	M 5	0,5	4,80 ± 0,03	G 3/8"	19	16,00 ± 0,05
M 3,5	0,6	3,25 ± 0,03	M 6	0,75	5,65 ± 0,03	G 1/2"	14	20,00 ± 0,05
M 4	0,7	3,70 ± 0,03	M 8	1	7,55 ± 0,05	G 3/4"	14	25,50 ± 0,05
M 5	0,8	4,65 ± 0,03	M 10	1	9,55 ± 0,05	G 1"	11	32,00 ± 0,05
M 6	1	5,55 ± 0,05	M 10	1,25	9,45 ± 0,05			
M 8	1,25	7,45 ± 0,05	M 12	1	11,55 ± 0,05			
M 10	1,5	9,30 ± 0,05	M 12	1,25	11,45 ± 0,05			
M 12	1,75	11,20 ± 0,05	M 12	1,5	11,30 ± 0,05			
M 14	2	13,10 ± 0,05	M 14	1,25	13,45 ± 0,05			
M 16	2	15,10 ± 0,05	M 14	1,5	13,30 ± 0,05			
M 18	2,5	16,90 ± 0,05	M 16	1,5	15,30 ± 0,05			
M 20	2,5	18,90 ± 0,05	M 18	1,5	17,30 ± 0,05			
			M 20	1,5	19,30 ± 0,05			

The core diameter of the internal thread obtained by forming is not only a function of the drill hole diameter but also depends on the workpiece material properties. For this reason the tolerance on the core diameter is 7H compared to 6H for cutting taps. For more detailed information see the DIN 13-50 standard.

The range

The Vergnano forming tap range includes four tap types which meet the demanding industrial requirements regarding precision, reliability and productivity.

Standard A-type forming tap

The standard A-type forming taps have a wide application range in both blind and through holes and can be used to machine many different materials. The taps are available in two types of coatings (TiN and TiCN) as well as a vapourised version particularly indicated for tapping soft materials.

High performance P-type forming tap

The **P** range is characterised by high tool life and excellent surface finish on the workpiece thread. The taps represent the state-of-the-art in Vergnano technology: specially-developed polygon geometry and optimised PVD coatings with dedicated process parameters and characteristics.

The **P**-type range also includes two tap versions with internal lubrication: BP80N with axial coolant and BP80NR with radial coolant. These versions, ideal when machining very deep holes, have an increased tool life and can be used together with ecological minimum quantity lubrication (MQL).

Sincro-type forming tap for synchronised tapping

The **S**incro series taps are designed specifically for synchronised tapping and for high speed machining. They are produced in top quality powder metallurgy high speed steel, HSSK. All **S**incro series shanks have an h6 tolerance, more precise compared to the h9 tolerance normally used on shanks, which allows use also with heat shrinking attachments. The reduced thread length compared to standard taps permits tapping of deep holes.
A version with internal coolant and radial outlets is also available (BS80NR) for tapping very deep blind and through holes.

H-type carbide forming taps

The Vergnano H-type carbide forming tap is available in a single version (HB80NR). The tap is equipped with an internal coolant channel with radial outlets and can be used to machine a wide range of materials: from steels (including stainless steel) to aluminium alloys. On steel, the increase in tool life compared to high speed steel forming taps can be up to 20-fold.

It is important to use carbide taps in combination with quality tapping attachments with micro-compensation and no axial or radial play. The best solution is the use of tapping attachments for synchronised tapping, such as the new Vergnano **S**incro attachment series.

Tap item	Material	Thread type	Hole type and depth	Application	Performance	Spindle	Through coolant	Chamfer	Shank	Cutting speed	Geometry
A80	HSSE	M	1,5 x D	1.1-3 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 376		
A80 N	HSSE	M	2,5 x D	1.1-3 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 376		
A81	HSSE	MF	1,5 x D	1.1-3 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 374		
A81 N	HSSE	MF	2,5 x D	1.1-3 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 374		
P80	HSSK	M	1,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 376		
P80 E	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	E (1,5-2)	DIN 371 DIN 376		
P81	HSSK	MF	1,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 374		
P80 N	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 376		
P81 N	HSSK	MF	2,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 371 DIN 374		
P82 N	HSSE	G	2,5 x D	1.1-4 2.1-2 4.1-3 5.2			–	C (2-3)	DIN 2189		
BP80 N	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2				C (2-3)	DIN 371 DIN 376		
BP80 NR	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2				C (2-3)	DIN 371 DIN 376		
S80 N	HSSK	M	3 x D	1.1-4 2.1-2 4.1-3 5.2		S	–	C (2-3)	DIN 1835B ON REQUEST		
BS80 NR	HSSK	M	3 x D	1.1-4 2.1-2 4.1-3 5.2		S		C (2-3)	DIN 1835B ON REQUEST		
HB80 NR	HM	M	3 x D	1.1-5 2.1-2 4.1-3 5.1-2		S		C (2-3)	DIN 371		

See legend on page 24

ARTICLE LEGEND:

INTERNAL COOLANT

IKZ Axial hole
IKZ-R Radial holes

LUBRICATION

E Emulsion
O Oil
MQL Minimum quantity lubrication

TAP MATERIAL

HSSE Conventional high speed steel
HSSK Powder metallurgy high speed steel
HM Solid carbide

8 → Page
A80 M2-M16 → Product code / Range

● 15 ÷ 20 Ideal tap / cutting speed m/min

❑ 15 ÷ 20 Suitable tap / cutting speed m/min

VERGNANO FORMING TAP TYPES

A 80 **A** indicates standard A-type taps
P 80 **P** indicates high performance P-type taps
S 80 **S** indicates S-type taps for sychronised tapping
H 80 **H** indicates H-type taps in carbide

A 80**N** / P80**N** / S80**N** **N** indicates external coolant channels
BP 80 N **B** indicates axial internal coolant
BP 80 N**R** / BS 80 N**R** / HB 80 N**R** **R** indicates internal coolant with radial outlets
P 80 **E** **E** indicates chamfer form E

Material		
Types of hole		
Chamfer form DIN 2197 Form C 2 - 3 threads Form E 1,5 - 2 threads		
Chamfer form		
M	6HX	
	6GX	
	7GX	
MF	6HX	
	6GX	
G	5969X	
Coolant		
Coatings		

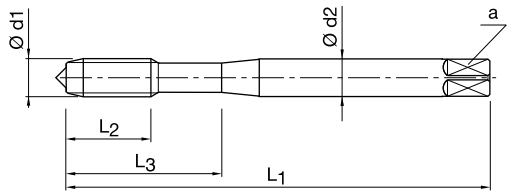
Material	Group	Description	UTS [N/mm²]	Lubrication
1. Steel	**1.1**	Mild / magnetic steel	200-400	E, O, MQL
	1.2	Construction steel, case hardening steel	350-700	E, O, MQL
	1.3	Carbon steel	350-850	E, O, MQL
	1.4	Alloyed steel / tempered steel	500-850	E, O, MQL
	1.5	Alloyed steel / tempered steel	850-1200	O, MQL
2. Stainless steel	**2.1**	Ferritic / automatic	< 850	O, MQL
	2.2	Austenitic	< 850	O, MQL
	2.3	Ferritic + austenitic, martensitic, precipitation hardening	< 1000	O, MQL
4. Aluminium Aluminium alloys	**4.1**	Pure aluminium	< 300	E, O, MQL
	4.2	Aluminium wrought and die cast alloys with Si<0,5% (long chipping)	< 500	E, O, MQL
	4.3	Aluminium wrought and die cast alloys with Si<10% (mean chipping)	< 500	E, O, MQL
5. Copper Copper Alloys	**5.1**	Pure copper	250-350	E, O, MQL
	5.2	Copper alloys (long chipping), soft brass	< 700	E, O, MQL
8. Nickel	**8.1**	Pure nickel	400-600	E, O, MQL

HSSE	HSSE	HSSE	HSSE	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HM
											
											
C	C	C	C	C	E	C	C	C	C	C	C
8 **A80** M2-M16	8 **A80** M2-M16	10 **A80 N** M2-M20	10 **A80 N** M2-M20	12 **P80** M2-M16	12 **P80 E** M3-M10	13 **P80 N** M2-M20	14 **BP80 N** M5-M10	14 **BP80 NR** M5-M20	15 **S80 N** M4-M12	15 **BS80 NR** M6-M12	16 **HB80 NR** M3-M10
9 **A80** M2-M16	9 **A80** M2-M16	11 **A80 N** M2-M16	11 **A80 N** M2-M16	12 **P80** M2-M16		13 **P80 N** M2-M16					
						13 **P80 N** M3-M16					
17 **A81** M3X0,35 - M16X1,5	17 **A81** M3X0,35 - M16X1,5	19 **A81 N** M3X0,35 - M20X1,5	19 **A81 N** M3X0,35 - M20X1,5	21 **P81** M4X0,5 - M16X1,5		21 **P81 N** M4X0,5 - M20X1,5					
18 **A81** M3X0,35 - M16X1,5	18 **A81** M3X0,35 - M16X1,5	20 **A81 N** M3X0,35 - M20X1,5	20 **A81 N** M3X0,35 - M20X1,5	21 **P81** M4X0,5 - M16X1,5		21 **P81 N** M4X0,5 - M20X1,5					
		22 **A82 N** G1/8"-G3/4"	22 **A82 N** G1/8"-G3/4"			22 **P82 N** G1/8"-G3/4"					
-	-	-	-	-	-	-	IKZ	IKZ-R	-	IKZ-R	IKZ-R
VAP	TiN-TiCN	VAP	TiN-TiCN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiCN
	● 35÷40		● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 45÷50	● 45÷50	● 35÷50
● 18÷22	● 35÷40	● 18÷22	● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 35÷40	● 45÷50	● 45÷50	● 35÷50
● 15÷18	● 30÷35	● 15÷18	● 30÷35	● 30÷35	● 30÷35	● 30÷35	● 30÷35	● 30÷35	● 40÷45	● 40÷45	● 30÷45
				● 25÷30	● 25÷30	● 25÷30	● 25÷30	● 25÷30	● 30÷35	● 30÷35	● 25÷40
				❑ 10÷15	❑ 10÷15	❑ 10÷15	❑ 10÷15	❑ 10÷15	❑ 15÷20	❑ 15÷20	● 15÷30
	● 10÷15		● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 15÷20	● 15÷20	● 10÷25
	● 10÷15		● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 15÷20	● 15÷20	● 10÷25
				❑ 8÷10	❑ 8÷10	❑ 8÷10	❑ 8÷10	❑ 8÷10	❑ 10÷15	❑ 10÷15	
	● 40÷45		● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 55÷60	● 55÷60	● 40÷50
	● 40÷45		● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 55÷60	● 55÷60	● 40÷50
	● 40÷45		● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 40÷45	● 55÷60	● 55÷60	● 40÷50
				❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 20÷25	❑ 20÷25	● 15÷40
	● 15÷20		● 15÷20	● 15÷20	● 15÷20	● 15÷20	● 15÷20	● 15÷20	● 20÷25	● 20÷25	● 15÷30
				❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 15÷20	❑ 25÷30	❑ 25÷30	❑ 15÷20

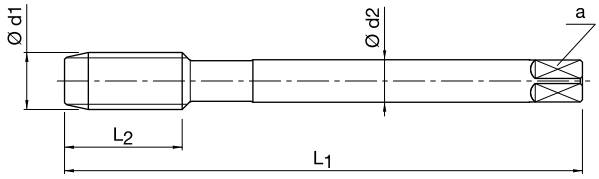
MACHINE COLD FORMING TAPS

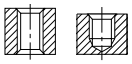
For blind and through holes
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



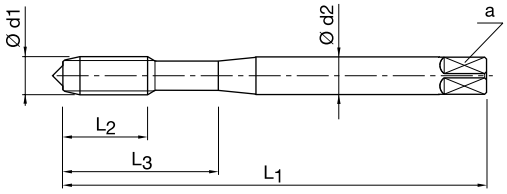
		Tool code			
		A80 VAP	**A80** TiN	**A80** TiCN	
					
Material >	**HSSE**	Tolerance >	**6HX**	**6HX**	**6HX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 2	0,4	45	7	11	2,8	2,1	3	1,8	25,10 €	33,30 €	33,30 €	
2,5	0,45	50	9	15	2,8	2,1	3	2,3	23,30 €	31,50 €	31,50 €	
3	0,5	56	10	18	3,5	2,7	3	2,8	20,00 €	28,20 €	28,20 €	
3,5	0,6	56	11	20	4	3	3	3,25	20,00 €	28,20 €	28,20 €	
4	0,7	63	12	21	4,5	3,4	4	3,7	20,00 €	28,20 €	28,20 €	
5	0,8	70	14	24,5	6	4,9	4	4,65	20,00 €	28,20 €	28,20 €	
6	1	80	16	29	6	4,9	5	5,55	20,00 €	28,20 €	28,20 €	
8	1,25	90	18	33	8	6,2	5	7,45	23,80 €	35,50 €	35,50 €	
10	1,5	100	20	36	10	8	5	9,3	30,40 €	44,90 €	44,90 €	
12	1,75	110	24	-	9	7	5	11,2	36,60 €	53,20 €	53,20 €	
14	2	110	25	-	11	9	6	13,1	47,20 €	69,20 €	69,20 €	
16	2	110	28	-	12	9	6	15,1	61,90 €	85,90 €	85,90 €	

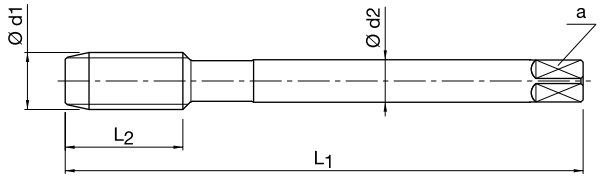
MACHINE COLD FORMING TAPS

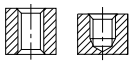
For blind and through holes
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



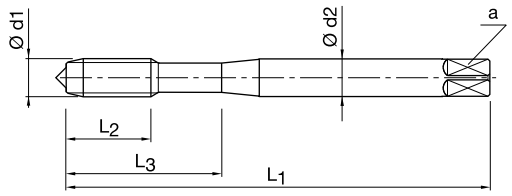
		Tool code			
		A80 6GX VAP	**A80 6GX** TiN	**A80 6GX** TiCN	
					
Material >	**HSSE**	Tolerance >	**6GX**	**6GX**	**6GX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 2	0,4	45	7	11	2,8	2,1	3	1,8	27,60 €	35,80 €	35,80 €
2,5	0,45	50	9	15	2,8	2,1	3	2,3	25,60 €	33,90 €	33,90 €
3	0,5	56	10	18	3,5	2,7	3	2,8	22,00 €	30,30 €	30,30 €
3,5	0,6	56	11	20	4	3	3	3,25	22,00 €	30,30 €	30,30 €
4	0,7	63	12	21	4,5	3,4	4	3,7	22,00 €	30,30 €	30,30 €
5	0,8	70	14	24,5	6	4,9	4	4,65	22,00 €	30,30 €	30,30 €
6	1	80	16	29	6	4,9	5	5,55	22,00 €	30,30 €	30,30 €
8	1,25	90	18	33	8	6,2	5	7,45	26,20 €	37,90 €	37,90 €
10	1,5	100	20	36	10	8	5	9,3	33,40 €	47,90 €	47,90 €
12	1,75	110	24	-	9	7	5	11,2	40,30 €	56,90 €	56,90 €
14	2	110	25	-	11	9	6	13,1	52,00 €	73,90 €	73,90 €
16	2	110	28	-	12	9	6	15,1	68,00 €	92,10 €	92,10 €

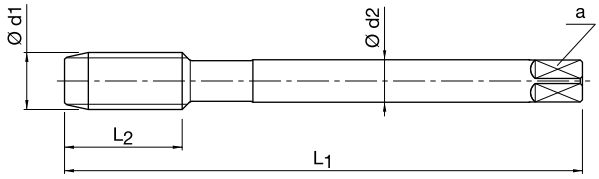
MACHINE COLD FORMING TAPS - With oil grooves

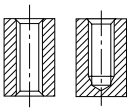
For blind and through holes
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



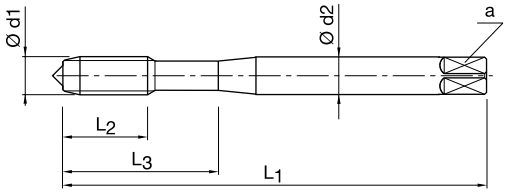
		Tool code			
		A80 N VAP	**A80 N** TiN	**A80 N** TiCN	
					
Material >	**HSSE**	Tolerance >	**6HX**	**6HX**	**6HX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

	$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M	**2**	0,4	45	7	11	2,8	2,1	3	1,8	27,60 €	35,80 €	35,80 €
	2,5	0,45	50	9	15	2,8	2,1	3	2,3	25,70 €	33,90 €	33,90 €
	3	0,5	56	10	18	3,5	2,7	3	2,8	22,00 €	30,30 €	30,30 €
	3,5	0,6	56	11	20	4	3	3	3,25	22,00 €	30,30 €	30,30 €
	4	0,7	63	12	21	4,5	3,4	4	3,7	22,00 €	30,30 €	30,30 €
	5	0,8	70	14	24,5	6	4,9	4	4,65	22,00 €	30,30 €	30,30 €
	6	1	80	16	29	6	4,9	5	5,55	22,00 €	30,30 €	30,30 €
	8	1,25	90	18	33	8	6,2	5	7,45	26,20 €	37,90 €	37,90 €
	10	1,5	100	20	36	10	8	5	9,3	33,40 €	47,90 €	47,90 €
	12	1,75	110	24	-	9	7	5	11,2	40,30 €	56,90 €	56,90 €
	14	2	110	25	-	11	9	6	13,1	52,00 €	73,90 €	73,90 €
	16	2	110	28	-	12	9	6	15,1	68,00 €	92,10 €	92,10 €
	18	2,5	125	28	-	14	11	8	16,9	114,70 €	142,80 €	142,80 €
	20	2,5	140	30	-	16	12	8	18,9	160,50 €	212,10 €	212,10 €

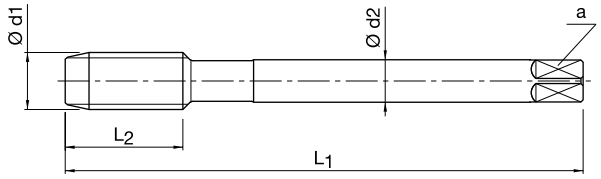
MACHINE COLD FORMING TAPS - With oil grooves

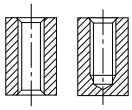
For blind and through holes
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



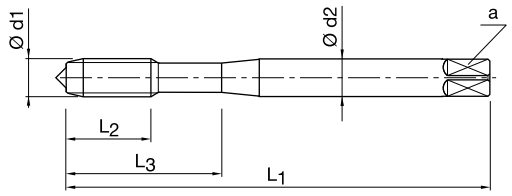
		Tool code			
		A80 N 6GX VAP	**A80 N 6GX** TiN	**A80 N 6GX** TiCN	
					
Material >	**HSSE**	Tolerance >	**6GX**	**6GX**	**6GX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 2	0,4	45	7	11	2,8	2,1	3	1,8	30,40 €	38,60 €	38,60 €
2,5	0,45	50	9	15	2,8	2,1	3	2,3	27,90 €	36,10 €	36,10 €
3	0,5	56	10	18	3,5	2,7	3	2,8	24,30 €	32,50 €	32,50 €
3,5	0,6	56	11	20	4	3	3	3,25	24,30 €	32,50 €	32,50 €
4	0,7	63	12	21	4,5	3,4	4	3,7	24,30 €	32,50 €	32,50 €
5	0,8	70	14	24,5	6	4,9	4	4,65	24,30 €	32,50 €	32,50 €
6	1	80	16	29	6	4,9	5	5,55	24,30 €	32,50 €	32,50 €
8	1,25	90	18	33	8	6,2	5	7,45	28,80 €	40,50 €	40,50 €
10	1,5	100	20	36	10	8	5	9,3	36,80 €	51,30 €	51,30 €
12	1,75	110	24	-	9	7	5	11,2	44,30 €	61,00 €	61,00 €
14	2	110	25	-	11	9	6	13,1	57,10 €	79,10 €	79,10 €
16	2	110	28	-	12	9	6	15,1	74,90 €	99,00 €	99,00 €

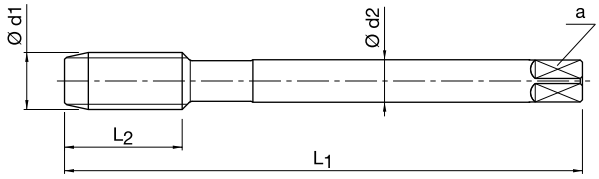
MACHINE COLD FORMING TAPS

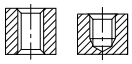
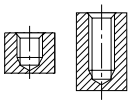
For blind and through holes - High performance taps
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



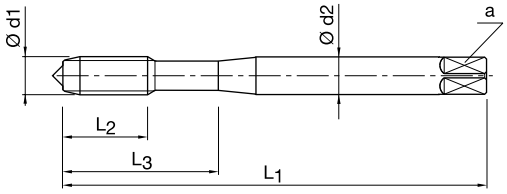
		Tool code			
		P80 TiN	**P80 6GX** TiN	**P80 E** TiN	
					
Material >	**HSSK**	Tolerance >	**6HX**	**6GX**	**6HX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**E / 1,5-2**	
		Application range >		**1.1-4** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

	$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]					
M	**2**	0,4	45	7	11	2,8	2,1	3	1,8	41,60 €	44,80 €	-	
	2,5	0,45	50	9	15	2,8	2,1	3	2,3	39,40 €	42,30 €	-	
	3	0,5	56	10	18	3,5	2,7	3	2,8	35,30 €	37,80 €	41,60 €	
	3,5	0,6	56	11	20	4	3	3	3,25	35,30 €	37,80 €	41,60 €	
	4	0,7	63	12	21	4,5	3,4	4	3,7	35,30 €	37,80 €	41,60 €	
	5	0,8	70	14	24,5	6	4,9	4	4,65	35,30 €	37,80 €	41,60 €	
	6	1	80	16	29	6	4,9	5	5,55	35,30 €	37,80 €	41,60 €	
	8	1,25	90	18	33	8	6,2	5	7,45	44,40 €	47,40 €	52,10 €	
	10	1,5	100	20	36	10	8	5	9,3	56,10 €	59,90 €	65,90 €	
	12	1,75	110	24	-	9	7	5	11,2	66,50 €	71,10 €	-	
	14	2	110	25	-	11	9	6	13,1	86,50 €	92,40 €	-	
	16	2	110	28	-	12	9	6	15,1	107,40 €	115,10 €	-	

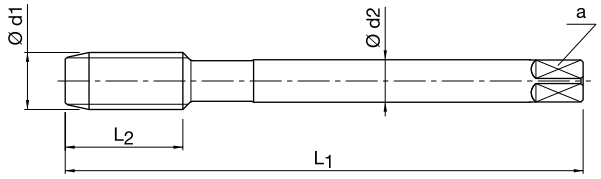
MACHINE COLD FORMING TAPS - With oil grooves

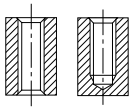
For blind and through holes - High performance taps
ISO Metric coarse thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



		Tool code			
		P80 N TiN	**P80 N 6GX** TiN	**P80 N 7GX** TiN	
					
Material >	**HSSK**	Tolerance >	**6HX**	**6GX**	**7GX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.1-4** **2.1-2** **4.1-3** **5.2**			
		Hole type >				

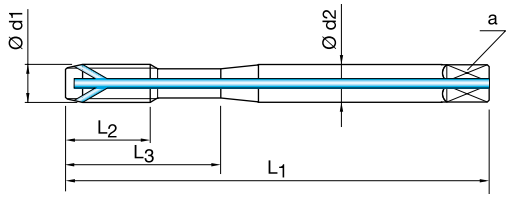
	$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 2		0,4	45	7	11	2,8	2,1	3	1,8	44,80 €	48,30 €	-
2,5		0,45	50	9	15	2,8	2,1	3	2,3	42,30 €	45,10 €	-
3		0,5	56	10	18	3,5	2,7	3	2,8	37,80 €	40,60 €	40,60 €
3,5		0,6	56	11	20	4	3	3	3,25	37,80 €	40,60 €	40,60 €
4		0,7	63	12	21	4,5	3,4	4	3,7	37,80 €	40,60 €	40,60 €
5		0,8	70	14	24,5	6	4,9	4	4,65	37,80 €	40,60 €	40,60 €
6		1	80	16	29	6	4,9	5	5,55	37,80 €	40,60 €	40,60 €
8		1,25	90	18	33	8	6,2	5	7,45	47,40 €	50,60 €	50,60 €
10		1,5	100	20	36	10	8	5	9,3	59,90 €	64,10 €	64,10 €
12		1,75	110	24	-	9	7	5	11,2	71,10 €	76,20 €	76,20 €
14		2	110	25	-	11	9	6	13,1	92,40 €	98,80 €	98,80 €
16		2	110	28	-	12	9	6	15,1	115,10 €	123,70 €	123,70 €
18		2,5	125	28	-	14	11	8	16,9	178,40 €	-	-
20		2,5	140	30	-	16	12	8	18,9	265,20 €	-	-

MACHINE COLD FORMING TAPS - With oil grooves and internal coolant

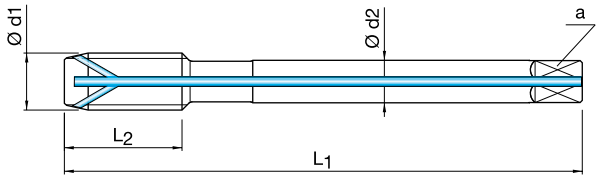
For blind and through holes - High performance taps

ISO Metric coarse thread - DIN 13

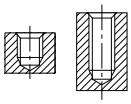
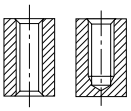
DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 376) from Ø 12



Material >	HSSK

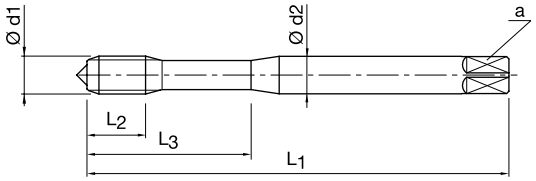
Tool code			
BP80 N TiN	**BP80 NR** TiN		
 Axial hole	 Radial holes		
Tolerance >	**6HX**	**6HX**		
Chamfer form >	**C / 2-3**	**C / 2-3**		
Application range >	**1.1-4** **2.1-2** **4.1-3** **5.2**			
Hole type >				

	$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]					
M	**5**	0,8	70	14	24,5	6	4,9	4	4,65	61,90 €	76,50 €		
	6	1	80	16	29	6	4,9	5	5,55	61,90 €	76,50 €		
	8	1,25	90	18	33	8	6,2	5	7,45	68,60 €	94,50 €		
	10	1,5	100	20	36	10	8	5	9,3	76,50 €	111,40 €		
	12	1,75	110	24	-	9	7	5	11,2	-	125,00 €		
	16	2	110	28	-	12	9	6	15,1	-	175,00 €		
	20	2,5	140	30	-	16	12	8	18,9	-	330,00 €		

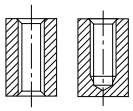
MACHINE COLD FORMING TAPS - With oil grooves - With or without internal radial coolant

For blind and through holes - For synchronised tapping
ISO Metric coarse thread - DIN 13

~ DIN 371 up to Ø 12 (*)



(*) DIN 1835B on request

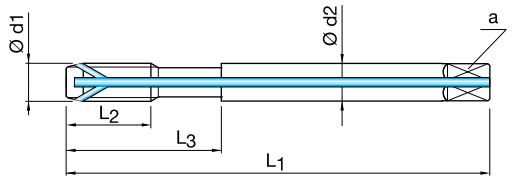
		Tool code			
		S80 N TiN	**BS80 NR** TiN		
			 Radial holes		
Material >	**HSSK**	Tolerance >	**6HX**	**6HX**		
		Chamfer form >	**C / 2-3**	**C / 2-3**		
		Application range >	**1.1-4** **2.1-2** **4.1-3** **5.2**			
		Hole type >				

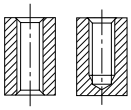
ød1 [mm]	P [mm]	L1 [mm]	L2 [mm]	L3 [mm]	ød2 h6 [mm]	a [mm]	z [-]					
M 4	0,7	70	7	18	6	4,9	4	3,7	43,50 €	-		
5	0,8	70	8	23	6	4,9	5	4,65	43,50 €	-		
6	1	80	10	29	6	4,9	5	5,55	43,50 €	88,00 €		
8	1,25	90	11	33	8	6,2	5	7,45	54,50 €	108,70 €		
10	1,5	100	13	36	10	8	5	9,30	68,90 €	128,10 €		
12	1,75	110	16	42	12	9	5	11,20	81,90 €	148,40 €		

MACHINE COLD FORMING TAPS - With oil grooves and internal coolant

For blind and through holes - Solid carbide
ISO Metric coarse thread - DIN 13

DIN 371



	Tool code			
	HB80 NR TiCN			
	 Radial holes			
Material > **HM**	Tolerance >	**6HX**			
	Chamfer form >	**C / 2-3**			
	Application range >	**1.1-5** **2.1-2** **4.1-3** **5.1-2**			
	Hole type >				

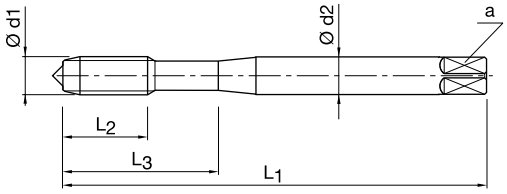
	$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ h6 [mm]	a [mm]	z [-]		
M	**3***	0,5	56	6	18	3,5	2,7	4	2,8	270,00 €
	4*	0,7	63	7,5	21	4,5	3,4	4	3,7	270,00 €
	5	0,8	70	8,5	25	6	4,9	4	4,65	292,80 €
	6	1	80	11	30	6	4,9	4	5,55	328,00 €
	8	1,25	90	14	35	8	6,2	5	7,4	446,80 €
	10	1,5	100	16	39	10	8	5	9,25	512,30 €

* Taps without through coolant

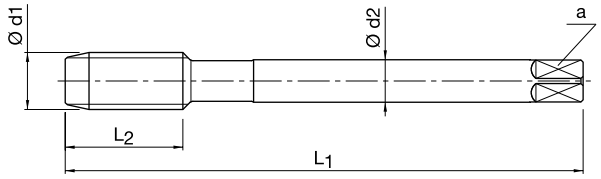
MACHINE COLD FORMING TAPS

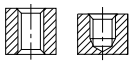
For blind and through holes
ISO Metric fine thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 374) from Ø 12

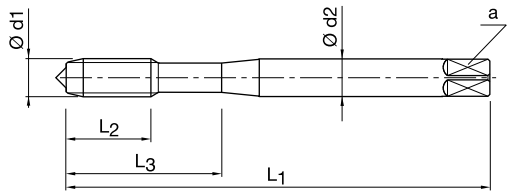


		Tool code			
		A81 VAP	**A81** TiN	**A81** TiCN	
					
Material >	**HSSE**	Tolerance >	**6HX**	**6HX**	**6HX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

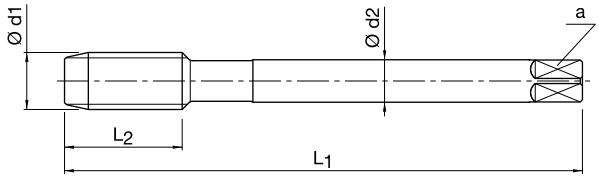
$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 3	0,35	56	10	18	3,5	2,7	3	2,85	29,10 €	37,30 €	37,30 €	
4	0,5	63	12	21	4,5	3,4	4	3,8	29,10 €	37,30 €	37,30 €	
5	0,5	70	14	24,5	6	4,9	4	4,8	29,10 €	37,30 €	37,30 €	
6	0,75	80	16	29	6	4,9	5	5,65	28,30 €	36,60 €	36,60 €	
8	1	90	18	33	8	6,2	5	7,55	31,40 €	43,10 €	43,10 €	
10	1	90	18	34	10	8	6	9,55	35,10 €	49,60 €	49,60 €	
10	1,25	100	20	36	10	8	6	9,45	31,80 €	46,30 €	46,30 €	
12	1	100	22	-	9	7	6	11,55	48,10 €	64,80 €	64,80 €	
12	1,25	100	22	-	9	7	6	11,45	42,50 €	59,20 €	59,20 €	
12	1,5	100	22	-	9	7	6	11,3	42,50 €	59,20 €	59,20 €	
14	1,25	100	22	-	11	9	6	13,45	53,70 €	75,60 €	75,60 €	
14	1,5	100	22	-	11	9	6	13,3	53,70 €	75,60 €	75,60 €	
16	1,5	100	22	-	12	9	6	15,3	67,50 €	92,50 €	92,50 €	

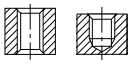
For blind and through holes
ISO Metric fine thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 374) from Ø 12



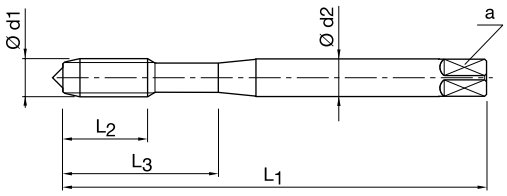
		Tool code			
		A81 6GX VAP	**A81 6GX** TiN	**A81 6GX** TiCN	
					
Material >	**HSSE**	Tolerance >	**6GX**	**6GX**	**6GX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]				
M 3	0,35	56	10	18	3,5	2,7	3	2,85	32,10 €	40,30 €	40,30 €	
4	0,5	63	12	21	4,5	3,4	4	3,8	32,10 €	40,30 €	40,30 €	
5	0,5	70	14	24,5	6	4,9	4	4,8	32,10 €	40,30 €	40,30 €	
6	0,75	80	16	29	6	4,9	5	5,65	31,20 €	39,40 €	39,40 €	
8	1	90	18	33	8	6,2	5	7,55	34,50 €	46,20 €	46,20 €	
10	1	90	18	34	10	8	6	9,55	38,60 €	53,10 €	53,10 €	
10	1,25	100	20	36	10	8	6	9,45	35,00 €	49,50 €	49,50 €	
12	1	100	22	-	9	7	6	11,55	52,30 €	68,90 €	68,90 €	
12	1,25	100	22	-	9	7	6	11,45	46,70 €	63,30 €	63,30 €	
12	1,5	100	22	-	9	7	6	11,3	46,70 €	63,30 €	63,30 €	
14	1,25	100	22	-	11	9	6	13,45	59,00 €	81,00 €	81,00 €	
14	1,5	100	22	-	11	9	6	13,3	59,00 €	81,00 €	81,00 €	
16	1,5	100	22	-	12	9	6	15,3	74,20 €	101,70 €	101,70 €	

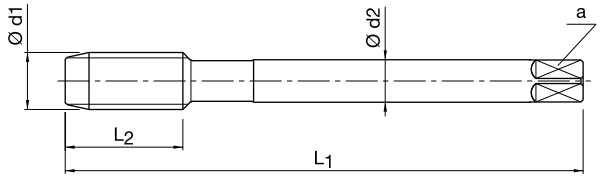
MACHINE COLD FORMING TAPS - With oil grooves

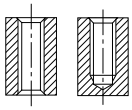
For blind and through holes
ISO Metric fine thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 374) from Ø 12



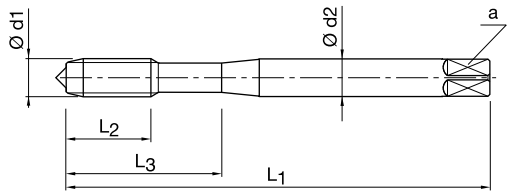
		Tool code			
		A81 N VAP	**A81 N** TiN	**A81 N** TiCN	
					
Material >	**HSSE**	Tolerance >	**6HX**	**6HX**	**6HX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

	ød1 [mm]	P [mm]	L1 [mm]	L2 [mm]	L3 [mm]	ød2 [mm]	a [mm]	z [-]				
M 3	0,35	56	10	18	3,5	2,7	3	2,85	32,10 €	40,30 €	40,30 €	
4	0,5	63	12	21	4,5	3,4	4	3,8	32,10 €	40,30 €	40,30 €	
5	0,5	70	14	24,5	6	4,9	4	4,8	32,10 €	40,30 €	40,30 €	
6	0,75	80	16	29	6	4,9	5	5,65	31,20 €	39,40 €	39,40 €	
8	1	90	18	33	8	6,2	5	7,55	34,50 €	46,20 €	46,20 €	
10	1	90	18	34	10	8	6	9,55	38,60 €	53,10 €	53,10 €	
10	1,25	100	20	36	10	8	6	9,45	35,00 €	49,50 €	49,50 €	
12	1	100	22	-	9	7	6	11,55	52,40 €	69,10 €	69,10 €	
12	1,25	100	22	-	9	7	6	11,45	46,80 €	63,40 €	63,40 €	
12	1,5	100	22	-	9	7	6	11,3	46,80 €	63,40 €	63,40 €	
14	1,25	100	22	-	11	9	6	13,45	59,00 €	81,00 €	81,00 €	
14	1,5	100	22	-	11	9	6	13,3	59,00 €	81,00 €	81,00 €	
16	1,5	100	22	-	12	9	6	15,3	74,20 €	101,70 €	101,70 €	
18	1,5	110	22	-	14	11	8	17,3	103,20 €	130,70 €	130,70 €	
20	1,5	125	25	-	16	12	8	19,3	114,70 €	165,10 €	165,10 €	

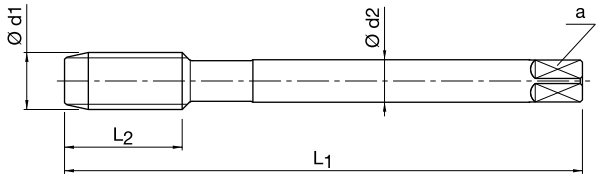
MACHINE COLD FORMING TAPS - With oil grooves

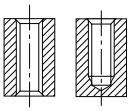
For blind and through holes
ISO Metric fine thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 374) from Ø 12



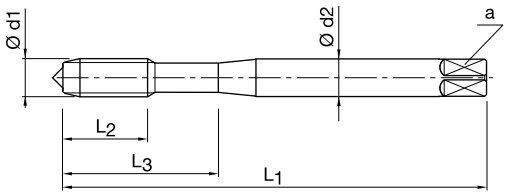
		Tool code			
		A81 N 6GX VAP	**A81 N 6GX** TiN	**A81 N 6GX** TiCN	
					
Material >	**HSSE**	Tolerance >	**6GX**	**6GX**	**6GX**	
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		
		Hole type >				

$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]					
M 3	0,35	56	10	18	3,5	2,7	3	2,85	35,30 €	43,50 €	43,50 €	
4	0,5	63	12	21	4,5	3,4	4	3,8	35,30 €	43,50 €	43,50 €	
5	0,5	70	14	24,5	6	4,9	4	4,8	35,30 €	43,50 €	43,50 €	
6	0,75	80	16	29	6	4,9	5	5,65	34,30 €	42,50 €	42,50 €	
8	1	90	18	33	8	6,2	5	7,55	38,00 €	49,70 €	49,70 €	
10	1	90	18	34	10	8	6	9,55	42,40 €	56,90 €	56,90 €	
10	1,25	100	20	36	10	8	6	9,45	38,50 €	53,00 €	53,00 €	
12	1	100	22	-	9	7	6	11,55	57,00 €	73,70 €	73,70 €	
12	1,25	100	22	-	9	7	6	11,45	51,40 €	68,00 €	68,00 €	
12	1,5	100	22	-	9	7	6	11,3	51,40 €	68,00 €	68,00 €	
14	1,25	100	22	-	11	9	6	13,45	65,00 €	86,90 €	86,90 €	
14	1,5	100	22	-	11	9	6	13,3	65,00 €	86,90 €	86,90 €	
16	1,5	100	22	-	12	9	6	15,3	81,70 €	111,40 €	111,40 €	
18	1,5	110	22	-	14	11	8	17,3	113,50 €	143,30 €	143,30 €	
20	1,5	125	25	-	16	12	8	19,3	126,10 €	181,20 €	181,20 €	

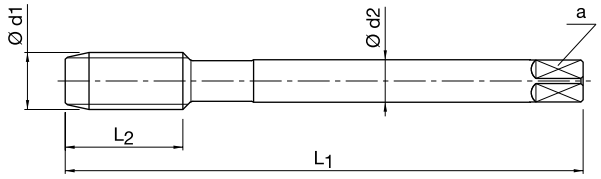
MACHINE COLD FORMING TAPS - With oil grooves

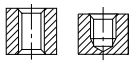
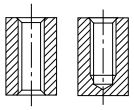
For blind and through holes - High performance taps
ISO Metric fine thread - DIN 13

DIN 2174 (DIN 371) up to Ø 10



DIN 2174 (DIN 374) from Ø 12



		Tool code			
		P81 TiN	**P81 6GX** TiN	**P81 N** TiN	**P81 N 6GX** TiN
					
Material >	**HSSK**	Tolerance >	**6HX**	**6GX**	**6HX**	**6GX**
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	**C / 2-3**
		Application range >	**1.1-4** **2.1-2** **4.1-3** **5.2**			
		Hole type >				

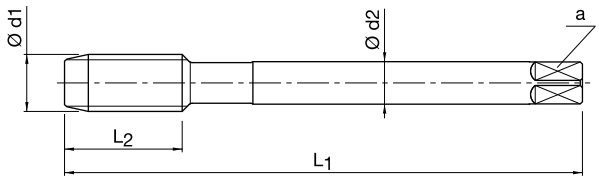
$ød_1$ [mm]	P [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]	$ød_2$ [mm]	a [mm]	z [-]					
M 4	0,5	63	12	21	4,5	3,4	4	3,8	46,70 €	51,30 €	51,30 €	56,50 €
5	0,5	70	14	24,5	6	4,9	4	4,8	46,70 €	51,30 €	51,30 €	56,50 €
6	0,75	80	16	29	6	4,9	5	5,65	45,70 €	50,30 €	50,30 €	55,30 €
8	1	90	18	33	8	6,2	5	7,55	53,90 €	59,20 €	59,20 €	65,20 €
10	1	90	18	34	10	8	6	9,55	62,00 €	68,20 €	68,20 €	75,00 €
10	1,25	100	20	36	10	8	6	9,45	57,90 €	63,70 €	63,70 €	70,10 €
12	1	100	22	-	9	7	6	11,55	79,60 €	87,50 €	87,50 €	96,30 €
12	1,25	100	22	-	9	7	6	11,45	74,00 €	81,30 €	81,30 €	89,50 €
12	1,5	100	22	-	9	7	6	11,3	74,00 €	81,30 €	81,30 €	89,50 €
14	1,25	100	22	-	11	9	6	13,45	94,50 €	103,90 €	103,90 €	114,30 €
14	1,5	100	22	-	11	9	6	13,3	94,50 €	103,90 €	103,90 €	114,30 €
16	1,5	100	22	-	12	9	6	15,3	115,60 €	127,10 €	127,10 €	139,80 €
18	1,5	110	22	-	14	11	8	17,3	-	-	162,80 €	179,10 €
20	1,5	125	25	-	16	12	8	19,3	-	-	206,40 €	227,00 €

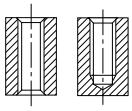
VERGNANO

MACHINE COLD FORMING TAPS - With oil grooves

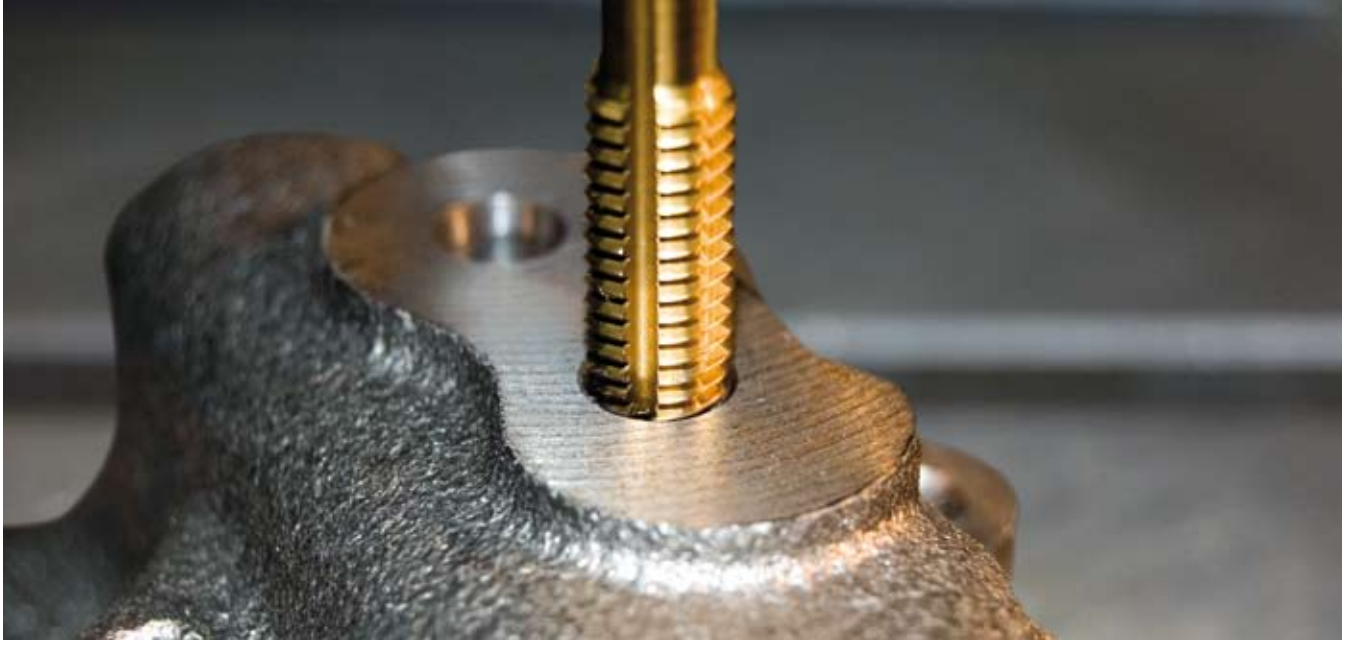
For blind and through holes
Whitworth pipe threads EN ISO 228

DIN 2189



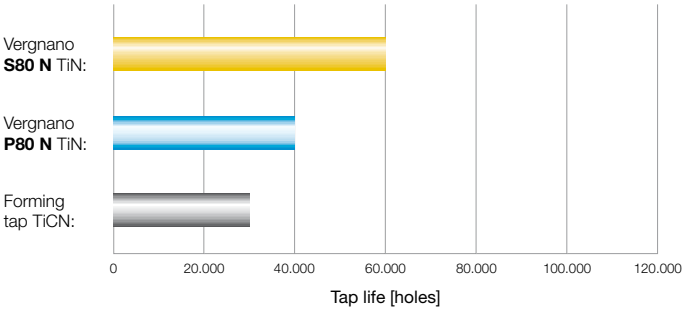
		Tool code			
		A82 N VAP	**A82 N** TiN	**A82 N** TiCN	**P82 N** TiN
					
Material >	**HSSE**	Tolerance >	**ISO 5969X**	**ISO 5969X**	**ISO 5969X**	**ISO 5969X**
		Chamfer form >	**C / 2-3**	**C / 2-3**	**C / 2-3**	**C / 2-3**
		Application range >	**1.2-3**	**1.1-3** **2.1-2** **4.1-3** **5.2**		**1.1-4** **2.1-2** **4.1-3** **5.2**
		Hole type >				

G	T.P.I.	ød$_1$ [mm]	L$_1$ [mm]	L$_2$ [mm]	ød$_2$ [mm]	a [mm]	z [-]					
1/8”	28	9,73	90	18	7	5,5	6	9,25	42,70 €	56,20 €	56,20 €	70,30 €
1/4”	19	13,16	100	22	11	9	6	12,5	48,40 €	65,20 €	65,20 €	81,50 €
3/8”	19	16,66	100	22	12	9	6	16	63,10 €	83,70 €	83,70 €	104,60 €
1/2”	14	20,96	125	25	16	12	6	20	70,10 €	112,20 €	112,20 €	140,20 €
3/4”	14	26,44	140	28	20	16	6	25,5	122,70 €	211,50 €	211,50 €	264,40 €



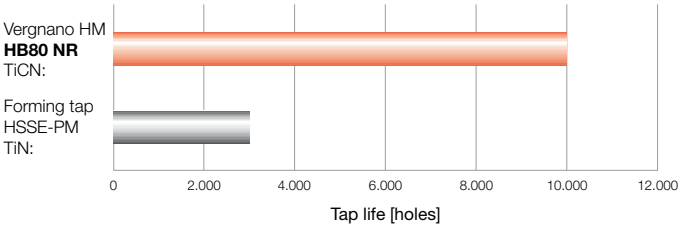
Test 1

Test:	1
Customer:	Italy
Workpiece:	Bushing (Automotive)
Material:	C4C (W Nr 1.0303 EN 10263) - M.G. 1.3
Thread:	M6 6GX
Type of hole:	Through
Thread depth [mm]:	6
Lubrication:	Oil - External
Machine:	Tapping machine
Chuck:	Rigid, with collet
Vc [m/min]:	40
Forming tap TiCN:	30.000
Vergnano **P80 N** TiN:	40.000
Vergnano **S80 N** TiN:	60.000



Test 2

Test:	2
Customer:	Germany
Workpiece:	Connecting Rod
Material:	C70 S6 (M.G. 1.3)
Thread:	M8
Type of hole:	Blind
Thread depth [mm]:	16
Lubrication:	Oil - Internal
Machine:	Machining centre
Chuck:	Synchronous, with collet
Vc [m/min]:	16
Forming tap HSSE-PM TiN:	3.000
Vergnano HM **HB80 NR** TiCN:	10.000



ICON DESCRIPTION

Material: conventional high speed steel

Material: powder metallurgy high speed steel

Material: solid carbide

ISO Metric Coarse Thread

ISO Metric Fine Thread

Gas Whitworth EN ISO 228

Hole type and depth: through up to 1,5 x d_1

Hole type and depth: blind up to 2,5 x d_1

Application range: MG materials groups


Standard tool life


High tool life


Tap for rigid or compensation tapping attachments

Tap only for rigid or synchronised tapping attachments


Through coolant forming tap with internal axial hole


Through coolant forming tap with internal axial and radial holes

Chamfer form C: 2 – 3 threads for blind and through holes

Chamfer form E: 1,5 – 2 threads for blind holes

Shank type: reinforced shank DIN 371 up to M10, reduced shank DIN 376 from M12

Shank type: reinforced shank DIN 371 up to M10, reduced shank DIN 374 from M12

Shank type: DIN 2189

Shank type: with flat DIN 1835 B (“weldon”) on request


High recommended cutting speed


Forming tap without oil grooves


Forming tap with oil grooves

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