



Synchronous Tapping Attachments and Taps





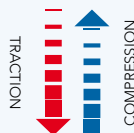
Vergnano Sincro Tapping Attachments

Vergnano Sincro synchronous tapping attachments are specifically designed to enhance the performance of the Vergnano S-Series taps for synchronous tapping processes.

Synchronous Tapping Attachments

In modern CNC machine tools with synchronous spindles, the rotational and axial movements of the spindle are coordinated by the numeric control of the machine. On these modern machine tools standard compensated tapping attachments are not recommended since the large compensation in extension can negatively influence the performance of the tool. Vergnano Sincro synchronous tapping attachments are specifically designed for synchronous tapping: micro-compensation reduces the axial and radial forces generated during the tapping process and enhances tool life. Since machine, tapping attachment and tool are synchronised it is possible to reach high machining speeds. This advantage, together with increased tool life, leads to improved productivity.

CONVENTIONAL TAPPING



SYNCHRONOUS TAPPING



Compensation difference in conventional and synchronous tapping



Requirements for Synchronous Tapping

- CNC machine with synchronised rotational and axial movements of the spindle.
- Spindle with sufficient rotational speed in order to reach the requested cutting speeds also with small diameter taps.
- Synchronous tapping attachment with micro-compensation.
- In order to work at the requested cutting speed during the entire machining process, the spindle must be able to accelerate to the full final speed before the tapping process begins.

Technical Features

The new Vergnano synchronous tapping attachments have an innovative quick-change adaptor system and are characterised by a differential compensation in traction and compression.

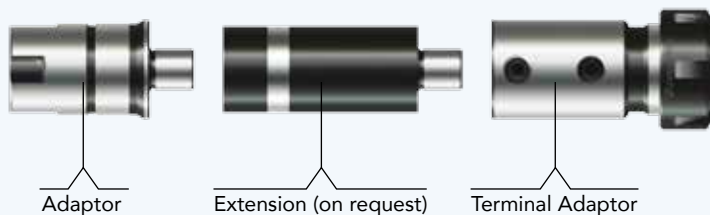
Quick-Change System

Vergnano offers a new system consisting in tapping attachment and quick-change adaptor which allows worn tools to be substituted without changing the entire tapping attachment thereby saving precious machining time.

It is recommended to have a second quick-change adaptor (in addition to that delivered with the tapping attachment) sold separately to exploit this advantage.

Also available are extended quick-change adaptors which permit extension of the tapping attachment in order to reach threads in difficult positions.

This versatile and cost-saving system covers a wide range of applications with just one tapping attachment.



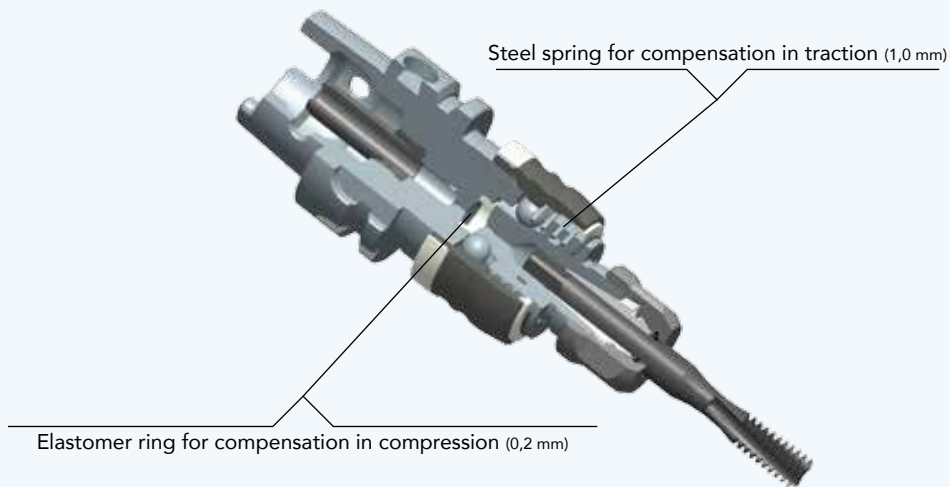
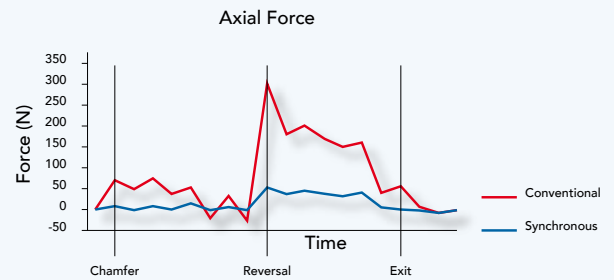
The extended adapter is sold assembled and consists of two parts (adaptor and terminal adaptor). Further extensions are available on request.



Micro-Compensation

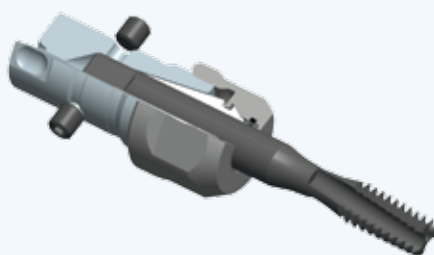
During tap reversal high axial forces are generated on the tap which cause mechanical stresses and micro-wear. This in turn leads to reduced tool life and tool precision. For this reason Vergnano synchronous tapping attachments are designed with differential micro-compensation in traction and compression which compensates the stresses on the tap.

Compensation in traction (1 mm) is obtained by steel springs which guarantee greater reliability while compensation in compression (0,2 mm) is obtained by elastomer rings.



Quick-Change Tap Adaptor with Setting Screws

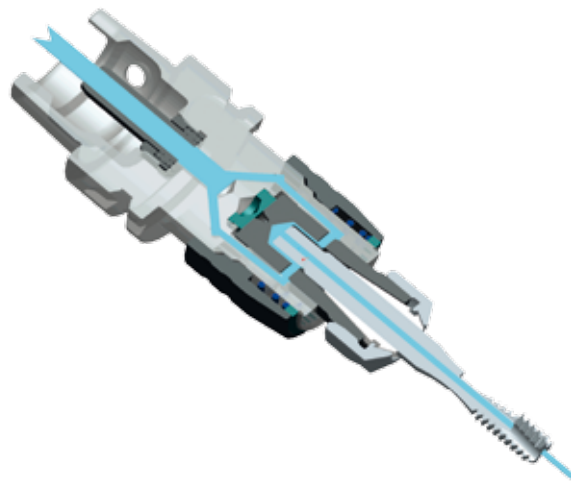
Setting screws on the quick-change adaptors allow the use of standard ER collets without square drives further limiting purchasing costs.





Through Coolant Capability

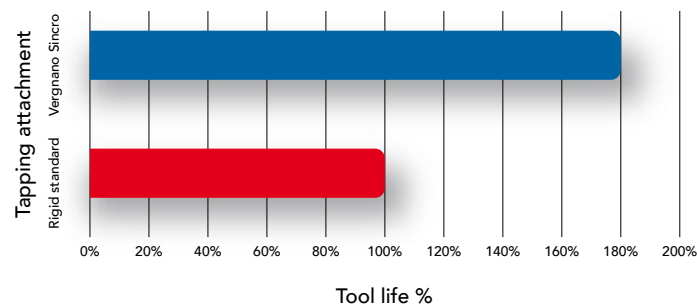
All Vergnano synchronous tapping attachments are designed for use with internal lubrication up to 50 bars. For higher values a special pressure-tight nut screw is available on request. The special attachment design forces the through coolant to enter the tap adaptor from the sides without interfering with the compensation length.



Advantages

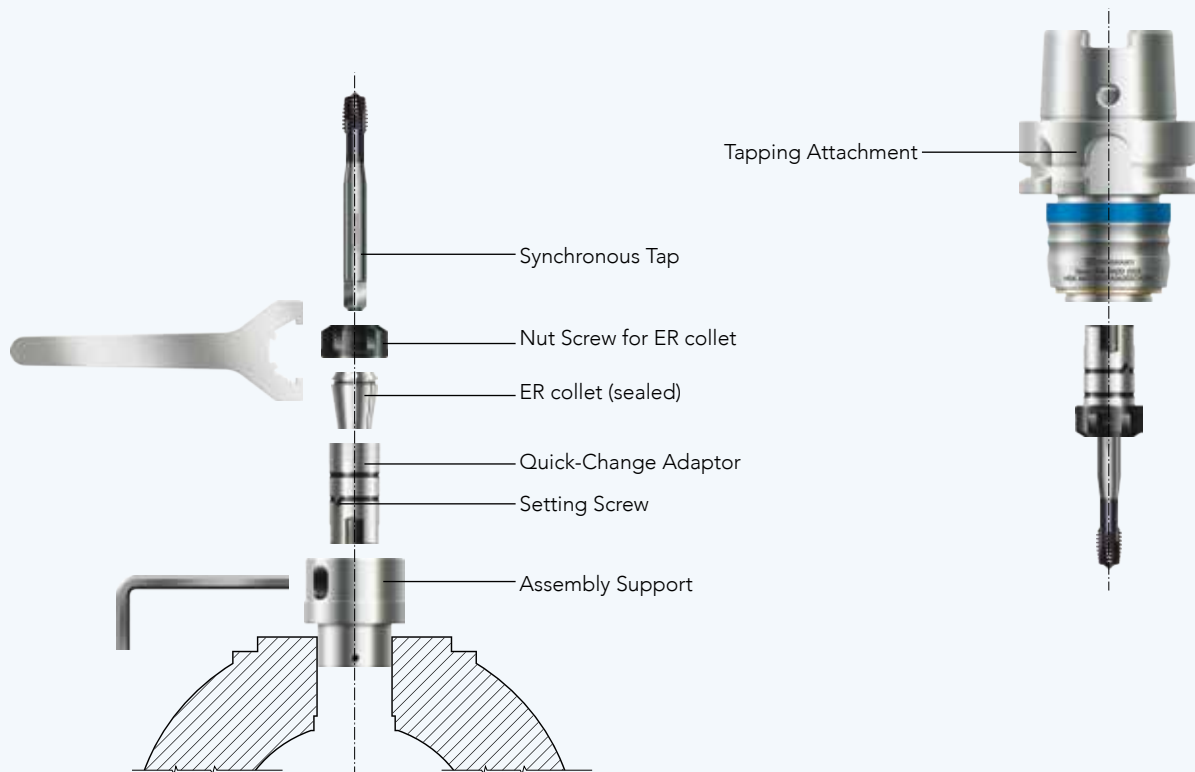
- Reduced machining cycle times, due to higher cutting speeds.
- High tool life.
- High quality threads.
- Cost reduction due to versatile system with one tapping attachment and multiple quick-change adaptors.

Comparative test with tap S17 M12x1,5 TiN			
Workpiece:	Wheel hub	Material:	38MnVS6+P (M.G. P.5)
Hole:	Through	Thread depth [mm]:	14
Lubrication:	Minimal lubrication	Vc [m/min]:	25
Machine:	Stama MC10014	Tapping direction:	Vertical
Tapping attachment:	Rigid standard vs Vergnano Sincro		





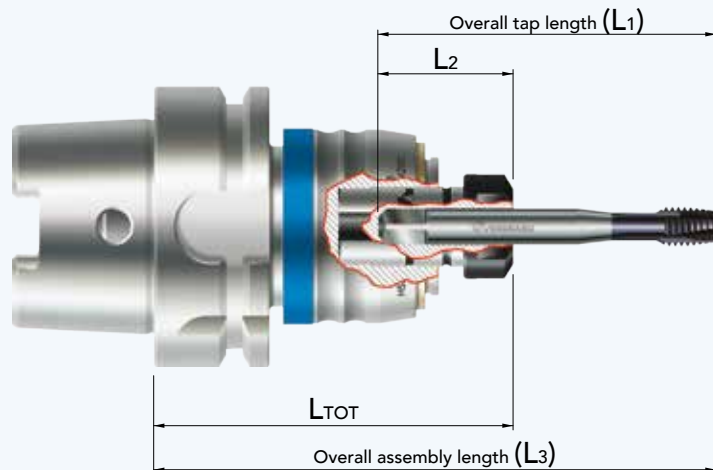
Assembly Instructions



1. Place the quick-change adaptor in the assembly support
2. Insert the ER collet in the nut screw
3. Partially tighten the nut screw on the quick-change adaptor
4. Insert the tap in the quick-change adaptor until it stops
5. Lightly tighten the nut screw to clamp the tap shank
6. Tighten the setting screws on the tap square
7. Securely tighten the nut screw with a wrench
8. Check that setting screws are not too tight
9. Insert the quick-change adaptor into the tapping attachment by pulling back the sleeve



Overall Length of Tapping Attachment Assembly



In the example below, the overall assembly length of the tapping attachment with a mounted tap is shown. This calculation is useful to avoid collisions.


TAPPING ATTACHMENT - DIN 69893 HSK A

Article Code	Attachment ØD ₁ [mm]	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01A06302CH160	HSK-A63	M3 - M12	64	43	20	ER 16	24	88

QUICK-CHANGE ADAPTOR ER 16

Article Code	Tap Size	Shank Ø f [mm]	Ød [mm]	ØD [mm]	L ₁	L ₂
CHADAP160310000	M3 - M12	03 - 10	20	28	24	37

MACHINE TAP M8 S15

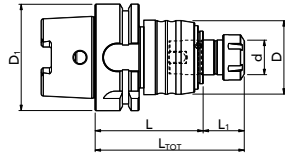
Ød ₁ [mm]	P [mm]	L ₁ js 16 [mm]	L ₂ [mm]	L ₃ [mm]	Ød ₂ h6 [mm]	a h12 [mm]	z [-]	 [mm]
M 8	1,25	90	12,5	35	8	6,2	3	6,8

$$\text{Overall assembly length (L}_3\text{)} = (\text{L}_1 - \text{L}_2) + \text{L}_{\text{TOT}}$$



Order Example

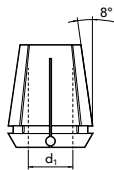
DIN 69893 HSK A



① Choice of tapping attachment

Article Code	Attachment ØD ₁ [mm]	Tap Size	L [mm]	ØD [mm]	Ød [mm]	Collet	L ₁ [mm]	L _{TOT} [mm]
VA01A06302CH160	HSK-A63	M3 - M12	64	43	20	ER 16	24	88

DIN 6499



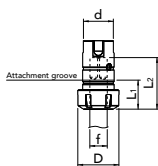
② Article code for tapping attachment and quick-change adaptor

Article Code	Ød ₁ [mm]	Collet
COERWS1604*_000	03 - 10	ER 16

③ Article code for ER Collet (COERWS160406000)

Shaft diameter of tap

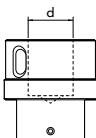
QUICK-CHANGE ADAPTOR



④ Article code for Quick-change adaptor (see "Quick-Change System" page 2)

Article Code	Tap Size	Shank Ø f [mm]	Ød [mm]	ØD [mm]	L ₁	L ₂	Collet
CHADAP160310000	M3 - M12	03 - 10	20	28	24	37	ER 16

ASSEMBLY SUPPORT



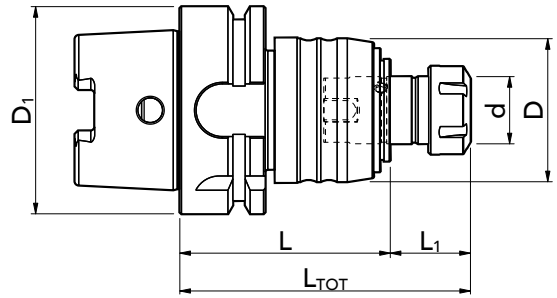
⑤ Article code for Assembly support (see "Assembly Instructions" page 5)

Article Code	Collet	Ød [mm]
ASCHADAP1620000	ER 16	20



SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

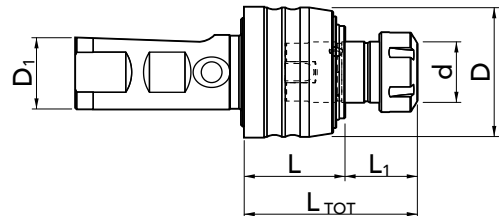
DIN 69893 HSK A



Article Code	Attachment ØD ₁ [mm]	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01A06302CH160	HSK-A63	M3 - M12	64	43	20	ER 16	24	88
VA01A06302CH250	HSK-A63	M6 - M20	97	60	32	ER 25	28	125
VA01A10002CH400	HSK-A100	M14 - M33	115	87	50	ER 40	32	147

SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

DIN 1835 B+E

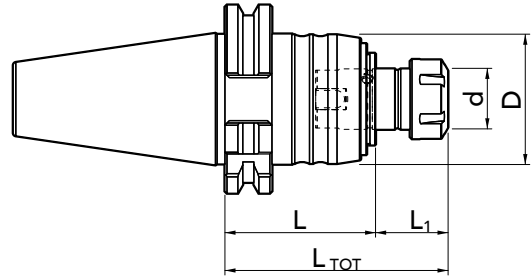


Article Code	Attachment ØD ₁ [mm]	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01C02502CH160	25	M3 - M12	34	43	20	ER 16	24	58
VA01C02502CH250	25	M6 - M20	56	60	32	ER 25	28	84
VA01C04002CH400	40	M14 - M33	80	87	50	ER 40	32	112



SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

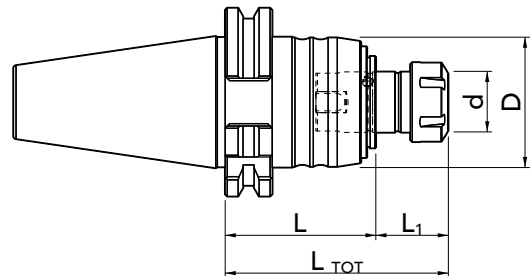
SK DIN 69871 AD



Article Code	Attachment	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01B04002CH160	SK 40 AD	M3 - M12	53	43	20	ER 16	24	77
VA01B05002CH160	SK 50 AD	M3 - M12	53	43	20	ER 16	24	77
VA01B04002CH250	SK 40 AD	M6 - M20	90	60	32	ER 25	28	118
VA01B05002CH250	SK 50 AD	M6 - M20	74	60	32	ER 25	28	102

SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

SK DIN 69871 AD+B



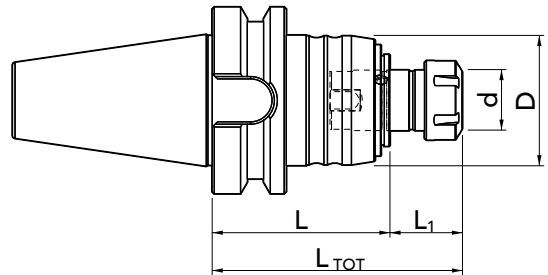
Article Code	Attachment	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01B05002CH400	SK 50 B	M14 - M33	115	87	50	ER 40	32	147

(*) For coolant pressure above 50 bars a special nut screw is available on request



SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

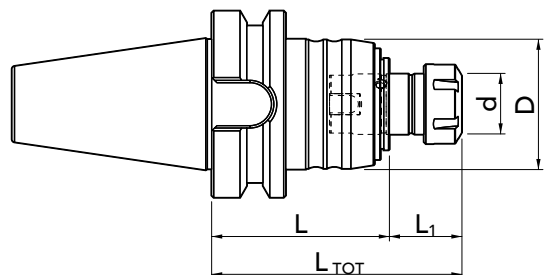
MAS 403 BT



Article Code	Attachment	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01M04002CH160	BT 40	M3 - M12	61	43	20	ER 16	24	85
VA01M05002CH160	BT 50	M3 - M12	72	43	20	ER 16	24	96
VA01M04002CH250	BT 40	M6 - M20	82	60	32	ER 25	28	110
VA01M05002CH250	BT 50	M6 - M20	93	60	32	ER 25	28	121

SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
With internal through coolant capability (*)

MAS 403 BT - B

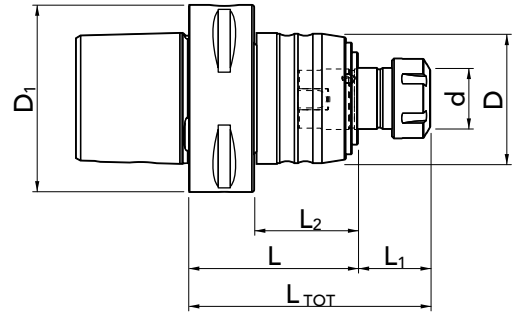


Article Code	Attachment	Tap Size	L [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01M05002CH400	BT 50 B	M14 - M33	124	87	50	ER 40	32	156



SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR
 With internal through coolant capability (*)

POLYGONAL Attachment ISO 26623-1

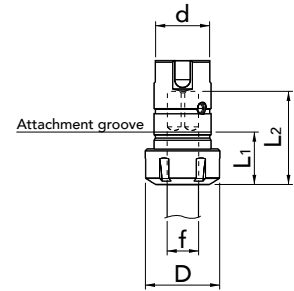


Article Code	Attachment ØD ₁ [mm]	Tap Size	L [mm]	L ₂ [mm]	ØD [mm]	Ød [mm]	ER Collet	L ₁ [mm]	L _{TOT} [mm]
VA01P04002CH160	C40	M3 - M12	55	35	43	20	ER 16	24	79
VA01P05002CH160	C50	M3 - M12	55	35	43	20	ER 16	24	79
VA01P06302CH160	C63	M3 - M12	57	35	43	20	ER 16	24	81
VA01P08002CH160	C80	M3 - M12	66	36	43	20	ER 16	24	90
VA01P04002CH250	C40	M6 - M20	75	55	60	32	ER 25	28	103
VA01P05002CH250	C50	M6 - M20	75	55	60	32	ER 25	28	103
VA01P06302CH250	C63	M6 - M20	77	55	60	32	ER 25	28	105
VA01P08002CH250	C80	M6 - M20	86	56	60	32	ER 25	28	114
VA01P08002CH400	C80	M14 - M33	116	86	87	50	ER 40	32	148

(*) For coolant pressure above 50 bars a special nut screw is available on request

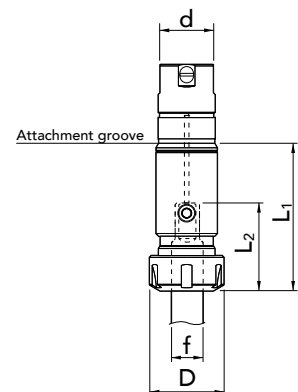


QUICK-CHANGE TAP ADAPTOR



Article Code	Tap Size	ShaftØ f [mm]	Ød [mm]	ØD [mm]	L ₁	L ₂	ER Collet
*CHADAP160310000	M3 - M12	03 - 10	20	28	24	37	ER 16
CHADAP250316000	M6 - M20	03 - 16	32	42	28	52	ER 25
CHADAP400626000	M14 - M33	06 - 26	50	63	32	75	ER 40

EXTENDED QUICK-CHANGE TAP ADAPTOR



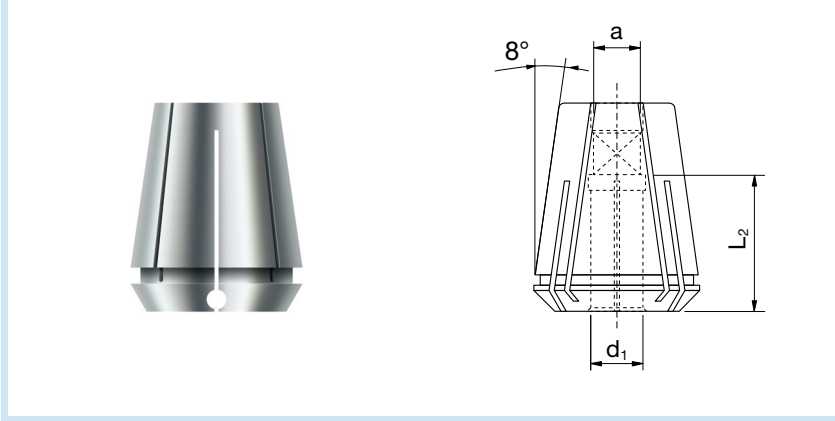
Adaptor + terminal adaptor (see description page 2)

Article Code	Tap Size	ShaftØ f [mm]	Ød [mm]	ØD [mm]	L ₁	L ₂	ER Collet
*CHEXAD160310000	M3 - M12	03 - 10	20	28	55	38	ER 16
CHEXAD250316000	M6 - M20	03 - 16	32	42	86	63	ER 25
CHEXAD400626000	M14 - M33	06 - 26	50	63	95	73	ER 40



ER COLLET (sealed) - with internal square

DIN 6499

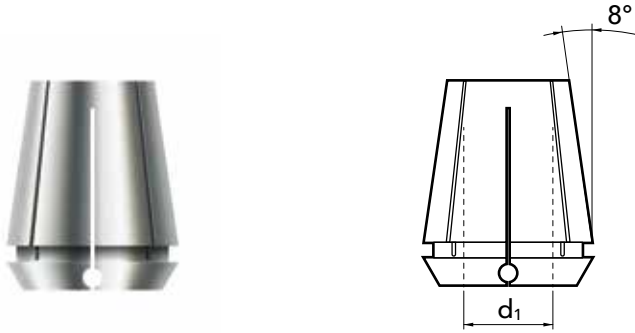


Article Code	ER Collet	Ød ₁ [mm]	a [mm]	L ₂ [mm]
SLERGB160103500	ER 16	3,5	2,7	18
SLERGB160104500	ER 16	4,5	3,4	18
SLERGB160105500	ER 16	5,5	4,3	18
SLERGB160106000	ER 16	6	4,9	18
SLERGB160107000	ER 16	7	5,5	18
SLERGB160108000	ER 16	8	6,2	22
SLERGB160109000	ER 16	9	7	22
SLERGB250103500	ER 25	3,5	2,7	18
SLERGB250104500	ER 25	4,5	3,4	18
SLERGB250105500	ER 25	5,5	4,3	18
SLERGB250106000	ER 25	6	4,9	18
SLERGB250107000	ER 25	7	5,5	18
SLERGB250108000	ER 25	8	6,2	22
SLERGB250109000	ER 25	9	7	22
SLERGB250110000	ER 25	10	8	25
SLERGB250111000	ER 25	11	9	25
SLERGB250112000	ER 25	12	9	25
SLERGB250114000	ER 25	14	11	25
SLERGB250116000	ER 25	16	12	25
SLERGB400106000	ER 40	6	4,9	18
SLERGB400107000	ER 40	7	5,5	18
SLERGB400108000	ER 40	8	6,2	22
SLERGB400109000	ER 40	9	7	22
SLERGB400110000	ER 40	10	8	25
SLERGB400111000	ER 40	11	9	25
SLERGB400112000	ER 40	12	9	25
SLERGB400114000	ER 40	14	11	25
SLERGB400116000	ER 40	16	12	25
SLERGB400118000	ER 40	18	14,5	25
SLERGB400120000	ER 40	20	16	28
SLERGB400122000	ER 40	22	18	28
SLERGB400125000	ER 40	25	20	33



ER COLLET (sealed)

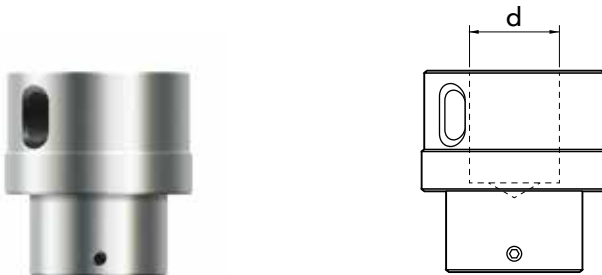
DIN 6499



Article Code	$\varnothing d_1$ [mm]	ER Collet
COERWS1604_*_000	03 - 10	ER 16
COERWS2504_*_000	03 - 16	ER 25
COERWS4004_*_000	06 - 26	ER 40

* 2 digits for indicating shaft diameter of tap (see "Order Example" page 5)

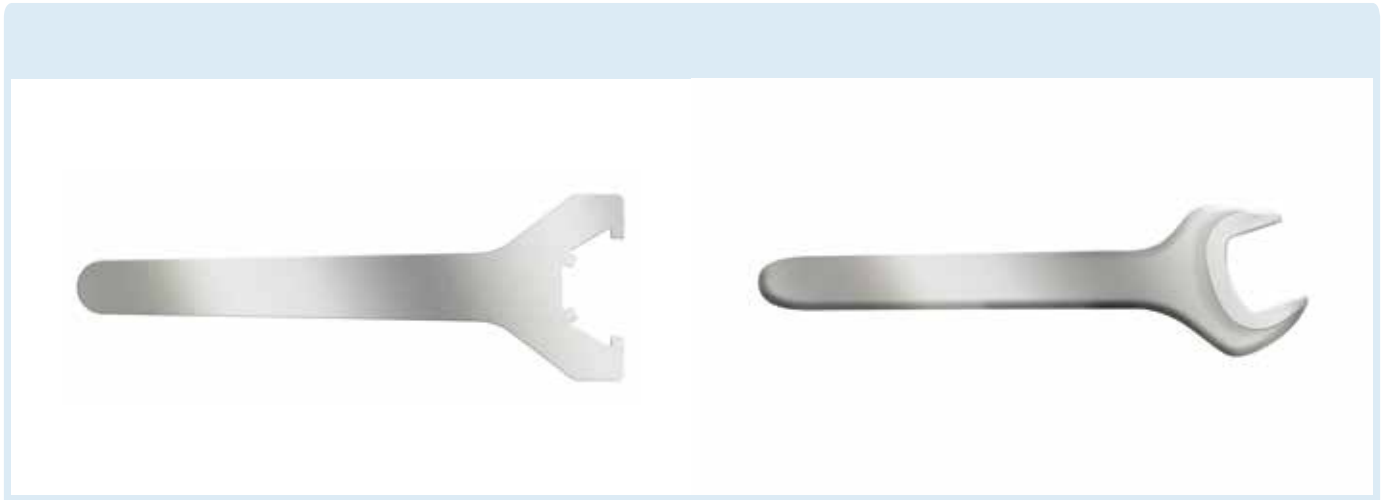
ASSEMBLY SUPPORT



Article Code	ER Collet	$\varnothing d$ [mm]
ASCHADAP1620000	ER 16	20
ASCHADAP2532000	ER 25	32
ASCHADAP4050000	ER 40	50



WRENCH for nut screw



Article Code	Nut Screw	ER Collet
KE02ER160200000	Hexagonal	ER 16
KE04ER250200000	Standard	ER 25
KE04ER400200000	Standard	ER 40

TIGHTENING TORQUE TABLE

It is recommended to tighten the nut screws with the torque values shown in the table below.

ER Collet	Torque [Nm]
ER 16	45
ER 25	70
ER 40	150



S-Series

Synchronous Taps

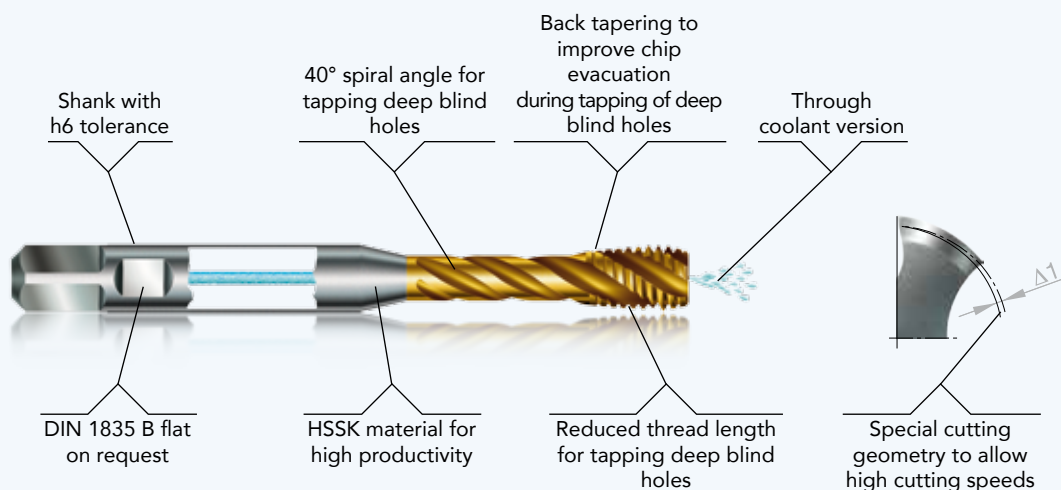
Driven by the trend towards modern CNC machines with synchronous spindles, S-Series taps have been specifically designed for synchronous/rigid tapping and high speed machining. Powder metallurgy high speed steel and advanced PVD coatings convey excellent performance characteristics on a wide range of applications. S-Series taps must be used only in combination with synchronous/rigid tapping attachments.

S-Series Tap Characteristics

S-Series taps are produced in top quality powder metallurgy high speed steel, HSSK. On request, the taps can be delivered with a flat on the shank according to DIN 1835 B to be used with traditional tapping attachments. All S-Series taps have an h6 shank tolerance more precise compared to the h9 tolerance normally used on shanks, necessary for DIN 1835 B flats and also compatible with heat shrinking tapping attachments. The tap geometry and characteristics are specifically designed for synchronous tapping at high cutting speeds. The reduced thread length compared to standard taps permits tapping of deep holes. This reduction is possible since the tap is guided by the machine and not by the tap itself.

Cutting Taps

The Vergnano S-Series cutting tap range includes three geometries (S15, S43, S70) which are also available with internal axial or radial through coolant (BS15, BS43, BS70). Taps with short form E chamfer are also available (S43E and BS43E) for applications where the thread depth is close to the hole depth. In taps for blind holes with high spiral flutes process stability is improved by back-tapering on the thread length which reduces torque during reversal.



Forming taps

In forming, threads are obtained by plastic deformation of the material which results in higher tensile strength of the workpiece thread due to work-hardening.

The absence of chips not only guarantees a more reliable and stable tapping process but also higher surface quality, higher machining speeds and the possibility of tapping very deep blind holes. Forming taps have larger core diameters which confer greater strength and stability to the tap.

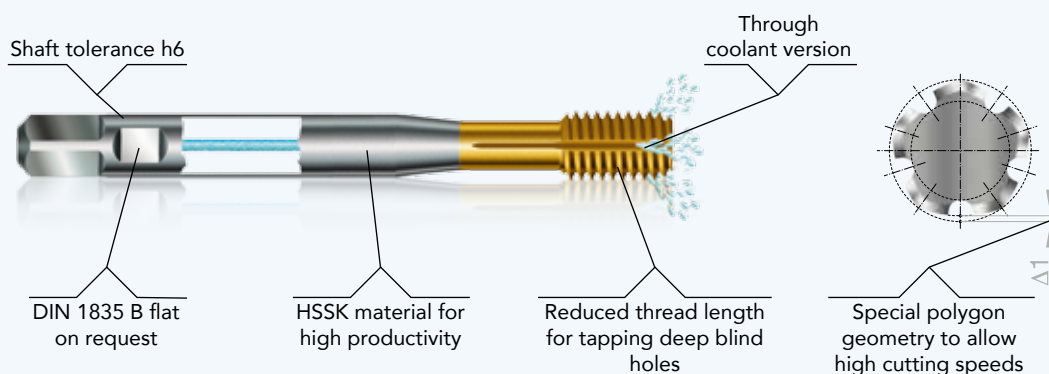
The Vergnano S-Series forming tap range includes taps with oil grooves (S80N), and taps with internal radial coolant (BS80NR). Taps with short form E chamfer are also available (BS80NRE) for applications where the thread depth is close to the hole depth.

Requirements

- Larger and more precise drill hole diameters compared to cutting taps.
- Workpiece material with minimum elongation coefficient A_5 not less than 10% and maximum tensile strength of 1200 N/mm².
- Good lubrication.
- Higher power on machine spindle (30 - 50%) compared to cutting taps.
- 30% reduction of nominal tap diameter which can be used with given tapping attachment (see example below).

TAPPING ATTACHMENT - DIN 69893 HSK A

Article Code	Attachment ØD ₁ [mm]	Tap Size
VA01A06302CH160	HSK-A63	M3 - M12 M10
VA01A06302CH250	HSK-A63	M6 - M20 M18
VA01A10002CH400	HSK-A100	M14 - M33 M29



ARTICLE LEGEND

- S... Synchronous Taps
- B... Taps with internal coolant supply

- ...N Forming taps with oil grooves
- ...R Forming taps with internal coolant supply and radial outlet
- ...E Taps with short chamfer (Form E)

TAP MATERIAL

HSSK Powder metallurgy high speed steel

Attachment DIN 1835 B (WELDON)

☆ On request

COOLANT

- IKZ** Axial hole
- IKZ-R** Radial holes

LUBRICATION

- E** Emulsion
- O** Oil
- MQL** Minimum quantity lubrication

S15 21 Tool code / page

● 40-50 Ideal tap / cutting speed m/min

○ 10-20 Suitable tap / cutting speed m/min

SERIES	S	S	
MATERIAL	HSSK	HSSK	
CHAMFER FORM	B (4-5)	B (4-5)	
TYPE OF HOLE	3xD	3xD	
			
Tool code	M	6H/6HX S15 21	6G/6GX S15 21
	MF	6H/6HX S17 25	
Coolant			
Attachment DIN 1835 B (Weldon)	☆	☆	
Range M	M3 - M16	M3 - M16	
Range MF	M8x1 - M16x1,5		
Coating	TiN	TiH1	

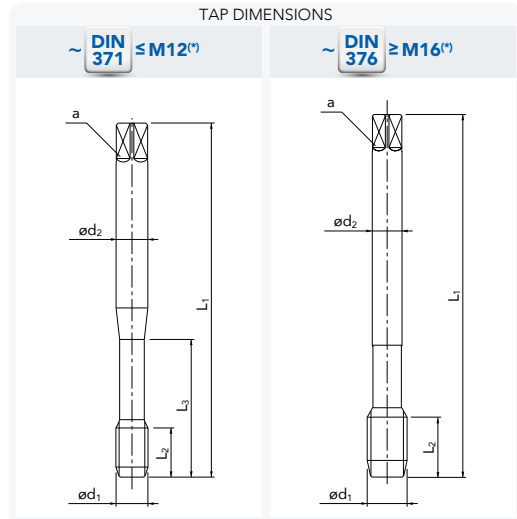
ISO 513	Material	Group	Application	Res.N/mm ²	Lubrication	FOR THROUGH HOLES	
P	Steel	P.1	Mild / magnetic steel	200 - 400	E, O, MQL	● 50-60	● 50-60
		P.2	Construction steel, case hardening steel	350 - 700	E, O, MQL	● 50-60	● 50-60
		P.3	Carbon steel	350 - 850	E, O, MQL	● 45-55	● 45-55
		P.4	Alloyed steel / tempered steel	500 - 850	E, O, MQL	● 40-50	● 40-50
		P.5	Alloyed steel / tempered steel	850 - 1200	O, MQL	● 15-25	● 15-25
		P.6	Alloyed steel / high strength steel	1200 - 1600	O, MQL		
		P.7	Ferritic stainless steel, martensitic stainless steel, precipitation hardening	< 1000	E, O, MQL	● 15-25	● 15-25
M	Stainless steel	M.1	Austenitic stainless steel	< 850	O, MQL	● 15-25	● 15-25
		M.2	Ferritic+austenitic (Duplex)	< 1000	O, MQL	● 10-20	● 10-20
K	Cast iron	K.1	Grey cast iron	< 1000	O, MQL		
		K.2	Nodular cast iron, malleable cast iron, tempered cast iron	< 1000	E, O, MQL	● 45-55	● 45-55
		K.3	Austempered ductile iron (ADI)	< 1400	O, MQL		
N	Aluminium Aluminium alloys	N.1	Pure aluminium	< 300	E, O, MQL	● 50-60	● 50-60
		N.2	Aluminium wrought and die cast alloys with Si < 0,5% (long chipping)	< 500	E, O, MQL	● 45-55	● 45-55
		N.3	Aluminium wrought and die cast alloys with Si < 10% (medium chipping)	< 500	E, O, MQL	● 45-55	● 45-55
		N.4	Aluminium die cast alloys with Si > 10% (short chipping)	< 600	E, O, MQL		
	Copper Copper alloys Brass Bronze	N.5	Pure copper	250 - 350	E, O, MQL	● 40-50	● 40-50
		N.6	Copper alloys (long chipping), soft brass	< 700	E, O, MQL	● 35-45	● 35-45
		N.7	Copper alloys (short chipping), hard brass	< 700	E, O, MQL		
		N.8	High strength bronze	700 - 1500	E, O, MQL		
	Magnesium Magnesium alloys	N.9	Pure magnesium, magnesium alloys	120 - 300	E, O, MQL		
		N.10	High strength magnesium alloy	240 - 400	E, O, MQL		
S	Titanium Titanium alloys	S.1	Pure titanium	400 - 600	E, O, MQL		● 15-25
		S.2	Titanium alloys	600 - 1000	O, MQL		○ 10-20
	Nickel Nickel alloys	S.3	Pure nickel	400 - 600	E, O, MQL	● 15-25	● 15-25
		S.4	Nickel alloys	600 - 1000	O, MQL	○ 10-20	○ 10-20

S		S		S		S		S		S		S		S		S	
HSSK		HSSK		HSSK		HSSK		HSSK		HSSK		HSSK		HSSK		HSSK	
B (4-5)		C (2-3)		C (2-3)		C (2-3)		E(1,5-2)		C (2-3)		E(1,5-2)		C (2-3)		C (2-3)	
3xD		3xD		3xD		3xD		3xD		3xD		3xD		3xD		3xD	
BS15	21	S70	22	S70	22	BS70	22	S43E	20	BS43	20	BS43E	20	S43	20	S80N	23
		S71	26											S45	24	S80N	23
IKZ-R						IKZ				IKZ		IKZ				IKZ-R	
☆		☆		☆		☆		☆		☆		☆		☆		☆	
M5 - M16		M3 - M16		M3 - M16		M5 - M16		M4 - M12		M5 - M16		M5 - M10		M3 - M16		M4 - M12	
		M8x1 - M16x1,5												M8x1 - M16x1,5			
TiH1		TiN		TiH1		TiH1		ACE		ACE		ACE		ACE		TiN	
																TiN	
																TiH1	

FOR THRU HOLES	FOR BLIND HOLES							FOR BLIND AND THRU HOLES	FORMING TAPS		
● 50-60	● 45-55	● 45-55	● 45-55						● 50-60	● 50-60	● 50-60
● 50-60	● 45-55	● 45-55	● 45-55						● 50-60	● 50-60	● 50-60
● 45-55	● 40-50	● 40-50	● 40-50						● 45-55	● 45-55	● 45-55
● 40-50	● 35-45	● 35-45	● 35-45						● 40-50	● 40-50	● 40-50
● 15-25	● 15-20	● 15-20	● 15-20						● 20-30	● 20-30	● 20-30
● 15-25	● 15-20	● 15-20	● 15-20						● 25-35	● 25-35	● 25-35
● 15-25	● 15-20	● 15-20	● 15-20						● 25-35	● 25-35	● 25-35
● 10-20									● 15-25	● 15-25	● 15-25
				● 55-65	● 55-65	● 55-65	● 55-65				
● 45-55	● 40-50	● 40-50	● 40-50								
				○ 20-30	○ 20-30	○ 20-30	○ 20-30				
● 50-60	● 45-55	● 45-55	● 45-55						● 50-60	● 50-60	● 50-60
● 45-55	● 40-50	● 40-50	● 40-50						● 50-60	● 50-60	● 50-60
● 45-55	● 40-50	● 40-50	● 40-50						● 45-55	● 45-55	● 45-55
				● 55-65	● 55-65	● 55-65	● 55-65				
● 40-50	● 35-45	● 35-45	● 35-45						● 50-60	● 50-60	● 50-60
● 35-45	● 30-40	● 30-40	● 30-40						● 50-60	● 50-60	● 50-60
				● 55-65	● 55-65	● 55-65	● 55-65				
				● 55-65	● 55-65	● 55-65	● 55-65				
				● 55-65	● 55-65	● 55-65	● 55-65				
				● 55-65	● 55-65	● 55-65	● 55-65				
● 15-25		● 15-20	● 15-20								● 10-20
○ 10-20		○ 5-15	○ 5-15								○ 5-15
● 15-25	● 15-20	● 15-20	● 15-20						● 10-20	● 10-20	● 10-20
○ 10-20	○ 5-15	○ 5-15	○ 5-15						○ 5-15	○ 5-15	○ 5-15



MACHINE TAPS for Synchronous Tapping - Straight flutes / for cast iron
 For blind and through holes
 ISO Metric coarse thread - DIN 13



(*) DIN 1835-B on request

APPLICATION RANGE - CUTTING SPEED m/min

ISO	MG	S43 ACE	BS43 ACE	S43 E ACE	BS43 E ACE
K	K.1	● 55-65	● 55-65	● 55-65	● 55-65
N	N.4	● 55-65	● 55-65	● 55-65	● 55-65
	N.7	● 55-65	● 55-65	● 55-65	● 55-65
	N.9-10	● 55-65	● 55-65	● 55-65	● 55-65

Tool Code

	S43 ACE	BS43 ACE	S43 E ACE	BS43 E ACE
Tolerance	6HX	6HX	6HX	6HX
Chamfer form	C (2-3)	C (2-3)	E(1,5-2)	E(1,5-2)
Hole type	3xD	3xD	3xD	3xD
Direction of cut	RH	RH	RH	RH
Through coolant				

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	
M 3	0,5	70	5	15	6	4,9	3	2,5	•
4	0,7	70	7	18	6	4,9	3	3,3	•
5	0,8	70	8	23	6	4,9	3	4,2	•
6	1	80	10	29	6	4,9	4	5	•
8	1,25	90	11	33	8	6,2	4	6,8	•
10	1,5	100	13	36	10	8	4	8,5	•
12	1,75	110	16	42	12	9	4	10,2	•
16	2	110	18	-	12	9	4	14	•

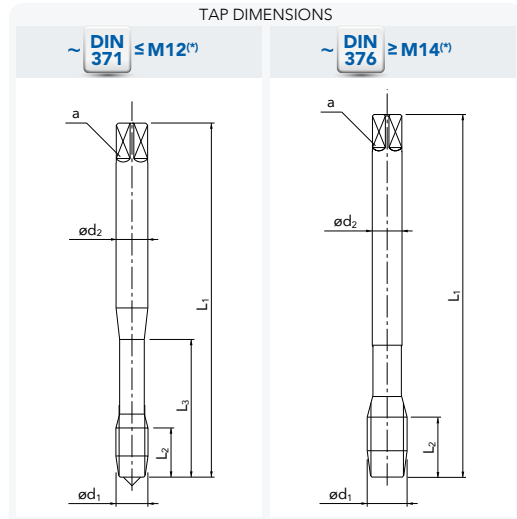
• = standard execution



MACHINE TAPS for Synchronous Tapping - Straight flutes with spiral point

For through holes

ISO Metric coarse thread - DIN 13



(*) DIN 1835-B on request

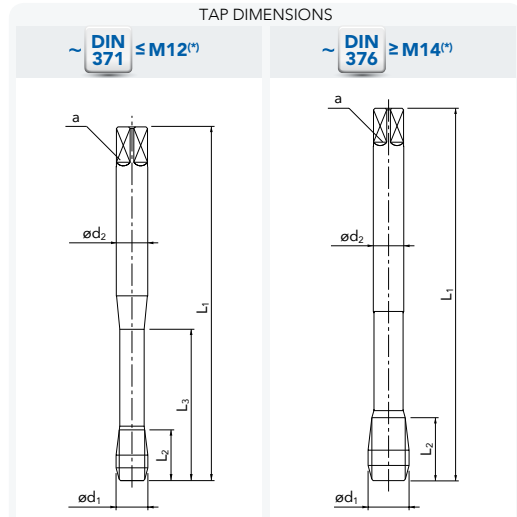
APPLICATION RANGE - CUTTING SPEED m/min					
ISO	MG	S15 TiN	S15 TiH1	BS15 TiH1	
P	P.1-2	● 50-60	● 50-60	● 50-60	
	P.3	● 45-55	● 45-55	● 45-55	
	P.4	● 40-50	● 40-50	● 40-50	
	P.5	● 15-25	● 15-25	● 15-25	
	P.7	● 15-25	● 15-25	● 15-25	
M	M.1	● 15-25	● 15-25	● 15-25	
	M.2	● 10-20	● 10-20	● 10-20	
K	K.2	● 45-55	● 45-55	● 45-55	
N	N.1	● 50-60	● 50-60	● 50-60	
	N.2-3	● 45-55	● 45-55	● 45-55	
	N.5	● 40-50	● 40-50	● 40-50	
	N.6	● 35-45	● 35-45	● 35-45	
S	S.1		● 15-25	● 15-25	
	S.3	● 15-25	● 15-25	● 15-25	

	Tool Code		
	S15 TiN	S15 TiH1	BS15 TiH1
Tolerance	6HX	6HX	6HX
Chamfer form	B (4-5)	B (4-5)	B (4-5)
Hole type	3xD	3xD	3xD
Direction of cut	RH	RH	RH
Through coolant			

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]			
M 3	0,5	70	5	15	6	4,9	3	2,5	•	•	
4	0,7	70	7	18	6	4,9	3	3,3	•	•	
5	0,8	70	8	25	6	4,9	3	4,2	•	•	•
6	1	80	10	30	6	4,9	3	5	•	•	•
8	1,25	90	12,5	35	8	6,2	3	6,8	•	•	•
10	1,5	100	15	39	10	8	3	8,5	•	•	•
12	1,75	110	17,5	42	12	9	3	10,2	•	•	•
14	2	110	20	-	12	9	3	12	•	•	
16	2	110	20	-	12	9	4	14	•	•	•

• = standard execution

MACHINE TAPS for Synchronous Tapping - 40° Spiral flutes / back tapered
 For blind holes
 ISO Metric coarse thread - DIN 13



(*) DIN 1835-B on request

APPLICATION RANGE - CUTTING SPEED m/min

ISO	MG	S70 TiN	S70 TiH1	BS70 TiH1
P	P.1-2	● 45-55	● 45-55	● 45-55
	P.3	● 40-50	● 40-50	● 40-50
	P.4	● 35-45	● 35-45	● 35-45
	P.5	● 15-20	● 15-20	● 15-20
	P.7	● 15-20	● 15-20	● 15-20
M	M.1	● 15-20	● 15-20	● 15-20
K	K.2	● 40-50	● 40-50	● 40-50
N	N.1	● 45-55	● 45-55	● 45-55
	N.2-3	● 40-50	● 40-50	● 40-50
	N.5	● 35-45	● 35-45	● 35-45
	N.6	● 30-40	● 30-40	● 30-40
S	S.1		● 15-20	● 15-20
	S.3	● 15-20	● 15-20	● 15-20

Tool Code

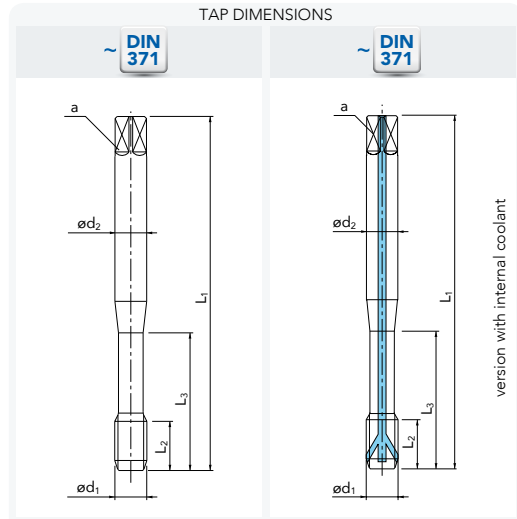
	S70 TiN	S70 TiH1	BS70 TiH1
Tolerance	6HX	6HX	6HX
Chamfer form	C (2-3)	C (2-3)	C (2-3)
Hole type	3xD	3xD	3xD
Direction of cut	RH	RH	RH
Through coolant			

Ød1	P	L1 js 16	L2	L3	Ød2 h6	a h12	z			
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]		
M 3	0,5	70	5,5	14	6	4,9	3	2,5	•	•
4	0,7	70	7,5	18	6	4,9	3	3,3	•	•
5	0,8	70	8,5	25	6	4,9	3	4,2	•	•
6	1	80	10,5	30	6	4,9	3	5	•	•
8	1,25	90	11,5	35	8	6,2	3	6,8	•	•
10	1,5	100	14	40	10	8	3	8,5	•	•
12	1,75	110	16,5	42	12	9	3	10,2	•	•
14	2	110	19	-	12	9	3	12	•	•
16	2	110	19	-	12	9	4	14	•	•

• = standard execution



COLD FORMING TAPS for Synchronous Tapping - Oil grooves
 For blind and through holes
 ISO Metric coarse thread - DIN 13



(*) DIN 1835-B on request

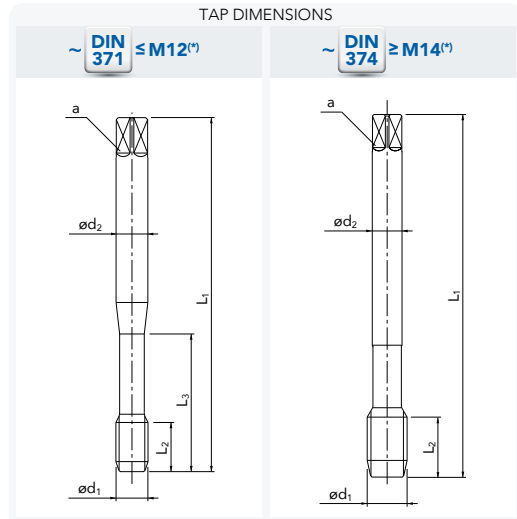
APPLICATION RANGE - CUTTING SPEED m/min					
ISO	MG	S80 N TiN	S80 N 6GX TiN	BS80 NR TiN	BS80 NRE TiH1
P	P.1-2	● 50-60	● 50-60	● 50-60	● 50-60
	P.3	● 45-55	● 45-55	● 45-55	● 45-55
	P.4	● 40-50	● 40-50	● 40-50	● 40-50
	P.5	● 20-30	● 20-30	● 20-30	● 20-30
	P.7	● 25-35	● 25-35	● 25-35	● 25-35
M	M.1	● 25-35	● 25-35	● 25-35	● 25-35
	M.2	● 15-25	● 15-25	● 15-25	● 15-25
N	N.1-2	● 50-60	● 50-60	● 50-60	● 50-60
	N.3	● 45-55	● 45-55	● 45-55	● 45-55
	N.5-6	● 50-60	● 50-60	● 50-60	● 50-60
S	S.1				● 10-20
	S.3	● 10-20	● 10-20	● 10-20	● 10-20

	Tool Code			
	S80 N TiN	S80 N 6GX TiN	BS80 NR TiN	BS80 NRE TiH1
Tolerance	6HX	6GX	6HX	6HX
Chamfer form	C (2-3)	C (2-3)	C (2-3)	E (1,5-2)
Hole type	3xD	3xD	3xD	3xD
Direction of cut	RH	RH	RH	RH
Through coolant				

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z				
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]			
M 4	0,7	70	7	18	6	4,9	5	3,7	•	•	•
5	0,8	70	8	23	6	4,9	5	4,65	•	•	•
6	1	80	10	29	6	4,9	5	5,55	•	•	•
8	1,25	90	11	33	8	6,2	5	7,4	•	•	•
10	1,5	100	13	36	10	8	5	9,3	•	•	•
12	1,75	110	16	42	12	9	5	11,2	•	•	•



MACHINE TAPS for Synchronous Tapping - Straight flutes / for cast iron
 For blind and through holes
 ISO Metric fine thread - DIN 13



APPLICATION RANGE - CUTTING SPEED m/min

ISO	MG	S45 ACE			
K	K.1	● 55-65			
N	N.4	● 55-65			
	N.7	● 55-65			
	N.9-10	● 55-65			

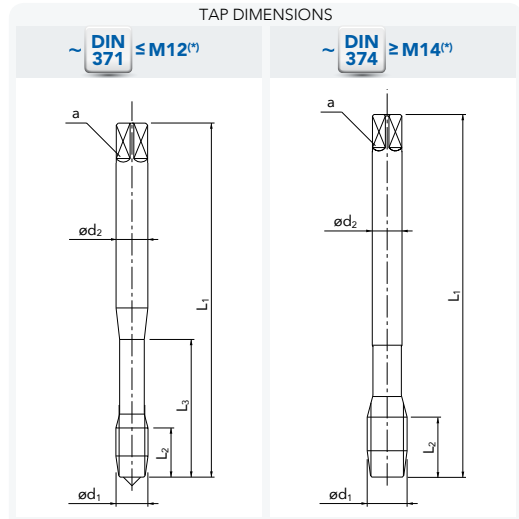
		Article Code		
	S45 ACE			
Tolerance	6HX			
Chamfer form	C (2-3)			
Hole type	3 x D			
Direction of cut	RH			
Through coolant				

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	
M 8	1	90	10	33	8	6,2	4	7	•
10	1	90	10	33	10	8	4	9	•
10	1,25	100	12,5	33	10	8	4	8,8	•
12	1,25	100	12,5	33	12	9	4	10,8	•
12	1,5	100	15	37	12	9	4	10,5	•
14	1,5	100	15	-	12	9	4	12,5	•
16	1,5	100	15	-	12	9	4	14,5	•

• = standard execution



MACHINE TAPS for Synchronous Tapping - Straight flutes with spiral point
 For through holes
 ISO Metric fine thread - DIN 13



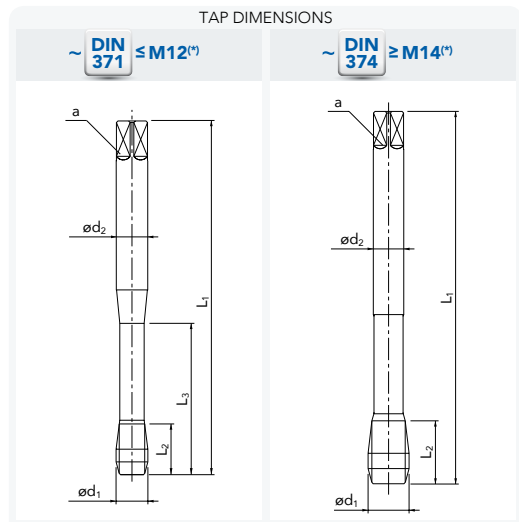
APPLICATION RANGE - CUTTING SPEED m/min		
ISO	MG	S17 TiN
P	P.1-2	● 50-60
	P.3	● 45-55
	P.4	● 40-50
	P.5	● 15-25
	P.7	● 15-25
M	M.1	● 15-25
	M.2	● 10-20
K	K.2	● 45-55
N	N.1	● 50-60
	N.2-3	● 45-55
	N.5	● 40-50
	N.6	● 35-45
S	S.3	● 15-25

Article Code			
S17 TiN			
Tolerance	6HX		
Chamfer form	B (4-5)		
Hole type	3 x D		
Direction of cut	RH		
Through coolant			

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	
M 8	1	90	10	35	8	6,2	3	7	•
10	1	90	10	39	10	8	3	9	•
10	1,25	100	12,5	39	10	8	3	8,8	•
12	1,25	100	12,5	42	12	9	3	10,8	•
12	1,5	100	15	42	12	9	3	10,5	•
14	1,5	100	15	-	12	9	3	12,5	•
16	1,5	100	15	-	12	9	4	14,5	•

• = standard execution

MACHINE TAPS for Synchronous Tapping - 40° Spiral flutes / back tapered
 For blind holes
 ISO Metric fine thread - DIN 13



(*) DIN 1835-B on request

APPLICATION RANGE - CUTTING SPEED m/min

ISO	MG	S71 TiN			
P	P.1-2	● 45-55			
	P.3	● 40-50			
	P.4	● 35-45			
	P.5	● 15-20			
	P.7	● 15-20			
M	M.1	● 15-20			
K	K.2	● 40-50			
N	N.1	● 45-55			
	N.2-3	● 40-50			
	N.5	● 35-45			
	N.6	● 30-40			
S	S.3	● 15-20			

Tool Code

	S71 TiN		
Tolerance	6HX		
Chamfer form	C (2-3)		
Hole type	3 x D		
Direction of cut	RH		
Through coolant			

Ød ₁	P	L ₁ js 16	L ₂	L ₃	Ød ₂ h6	a h12	z		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	
M 8	1	90	10	35	8	6,2	3	7	●
10	1	90	10	40	10	8	3	9	●
10	1,25	100	11,5	40	10	8	3	8,8	●
12	1,25	100	11,5	40	12	9	3	10,8	●
12	1,5	100	14	42	12	9	3	10,5	●
14	1,5	100	14	-	12	9	4	12,5	●
16	1,5	100	14	-	12	9	4	14,5	●

● = standard execution

DRILL SIZES CUTTING TAPS

ISO Metric coarse thread DIN 13				ISO Metric fine thread DIN 13				ISO Metric fine thread DIN 13			
M	Pitch [mm]	Maximum core diam. (toill. 6H) [mm]	Drill size* [mm]	MF	Pitch [mm]	Maximum core diam. (toill. 6H) [mm]	Drill size* [mm]	MF	Pitch [mm]	Maximum core diam. (toill. 6H) [mm]	Drill size* [mm]
M1	0,25	0,785 ⁽¹⁾	0,75	M2 ⁽³⁾	0,25	1,774 ⁽²⁾	1,75	M25	1	24,153	24
1,1	0,25	0,885 ⁽¹⁾	0,85	2,3 ⁽³⁾	0,25	2,085	2,05	25	1,5	23,676	23,5
1,2	0,25	0,985 ⁽¹⁾	0,95	2,5	0,35	2,221	2,15	25	2	23,210	23
1,4	0,3	1,142 ⁽¹⁾	1,1	3	0,35	2,721	2,65	26	1,5	24,676	24,5
1,6	0,35	1,321	1,25	3,5	0,35	3,221	3,15	27	1	26,153	26
1,7 ⁽³⁾	0,35	1,421	1,35	4	0,5	3,599	3,5	27	1,5	25,676	25,5
1,8	0,35	1,521	1,45	4,5	0,5	4,099	4	27	2	25,210	25
2	0,4	1,679	1,6	5	0,5	4,599	4,5	28	1	27,153	27
2,2	0,45	1,838	1,75	5,5	0,5	5,099	5	28	1,5	26,676	26,5
2,3 ⁽³⁾	0,4	1,938	1,9	6	0,75	5,378	5,2	28	2	26,210	26
2,5	0,45	2,138	2,05	7	0,75	6,378	6,2	30	1	29,153	29
2,6 ⁽³⁾	0,45	2,238	2,1	8	0,75	7,378	7,2	30	1,5	28,676	28,5
3	0,5	2,599	2,5	8	1	7,153	7	30	2	28,210	28
3,5	0,6	3,010	2,9	9	0,75	8,378	8,2	30	3	27,252	27
4	0,7	3,422	3,3	9	1	8,153	8	32	1,5	30,675	30,5
4,5	0,75	3,878	3,7	10	0,75	9,378	9,2	32	2	30,210	30
5	0,8	4,334	4,2	10	1	9,153	9	33	1,5	31,676	31,5
6	1	5,153	5	10	1,25	8,912	8,8	33	2	31,210	31
7	1	6,153	6	11	0,75	10,378	10,2	33	3	30,252	30
8	1,25	6,912	6,8	11	1	10,153	10	35	1,5	33,676	33,5
9	1,25	7,912	7,8	12 ⁽³⁾	0,75	11,378	11,2	36	1,5	34,676	34,5
10	1,5	8,676	8,5	12	1	11,153	11	36	2	34,210	34
11	1,5	9,676	9,5	12	1,25	10,912	10,8	36	3	33,252	33
12	1,75	10,441	10,2	12	1,5	10,676	10,5	38	1,5	36,676	36,5
14	2	12,210	12	14	1	13,153	13	39	1,5	37,676	37,5
16	2	14,210	14	14	1,25	12,912	12,8	39	2	37,210	37
18	2,5	15,744	15,5	14	1,5	12,676	12,5	39	3	36,252	36
20	2,5	17,744	17,5	15	1	14,153	14	40	1,5	38,676	38,5
22	2,5	19,744	19,5	15	1,5	13,676	13,5	40	2	38,210	38
24	3	21,252	21	16	1	15,153	15	40	3	37,252	37
27	3	24,252	24	16	1,5	14,676	14,5	42	1,5	40,676	40,5
30	3,5	26,771	26,5	17	1	16,153	16	42	2	40,210	40
33	3,5	29,771	29,5	17	1,5	15,676	15,5	42	3	39,252	39
36	4	32,270	32	18	1	17,153	17	45	1,5	43,676	43,5
39	4	35,270	35	18	1,5	16,676	16,5	45	2	43,210	43
42	4,5	37,799	37,5	18	2	16,210	16	45	3	42,252	42
45	4,5	40,799	40,5	20	1	19,153	19	48	1,5	46,676	46,5
48	5	43,297	43	20	1,5	18,676	18,5	48	2	46,210	46
52	5	47,297	47	20	2	18,210	18	48	3	45,252	45
56	5,5	50,796	50,5	22	1	21,153	21	50	1,5	48,676	48,5
60 ⁽³⁾	5,5	54,796	54,5	22	1,5	20,676	20,5	50	2	48,210	48
64 ⁽³⁾	6	58,305	58	22	2	20,210	20	50	3	47,252	47
68 ⁽³⁾	6	62,305	62	24	1	23,153	23	52	1,5	50,676	50,5
				24	1,5	22,676	22,5	52	2	50,210	50
				24	2	22,210	22	52	3	49,252	49

(*) Drill size according to DIN 336

(1) Tolerance 5H

(2) Tolerance 4H

(3) Size not included in DIN 336

DRILL SIZES FORMING TAPS

ISO Metric coarse thread DIN 13		
M	pitch [mm]	Drill size [mm]
M2	0,4	1,85 ± 0,03
2,5	0,45	2,30 ± 0,03
3	0,5	2,80 ± 0,03
3,5	0,6	3,25 ± 0,03
4	0,7	3,70 ± 0,03
5	0,8	4,65 ± 0,03
6	1	5,55 ± 0,05
8	1,25	7,40 ± 0,05
10	1,5	9,30 ± 0,05
12	1,75	11,20 ± 0,05
14	2	13,10 ± 0,05
16	2	15,10 ± 0,05
18	2,5	16,90 ± 0,05
20	2,5	18,90 ± 0,05
24	3	22,70 ± 0,05
27	3	25,70 ± 0,05
30	3,5	28,45 ± 0,05

ISO Metric coarse thread DIN 13		
MF	Pitch [mm]	Drill size [mm]
M3	0,35	2,85 ± 0,03
4	0,5	3,80 ± 0,03
5	0,5	4,80 ± 0,03
6	0,75	5,65 ± 0,03
8	1	7,55 ± 0,05
10	1	9,55 ± 0,05
10	1,25	9,40 ± 0,05
12	1	11,55 ± 0,05
12	1,25	11,40 ± 0,05
12	1,5	11,30 ± 0,05
14	1,25	13,40 ± 0,05
14	1,5	13,30 ± 0,05
16	1,5	15,30 ± 0,05
18	1,5	17,30 ± 0,05
20	1,5	19,30 ± 0,05

Other drill sizes = theoretical flank diameter + pitch/5

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.

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.

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