



S I N C R O

Taps for Synchronised Tapping



TAPS FOR SYNCHRONISED TAPPING

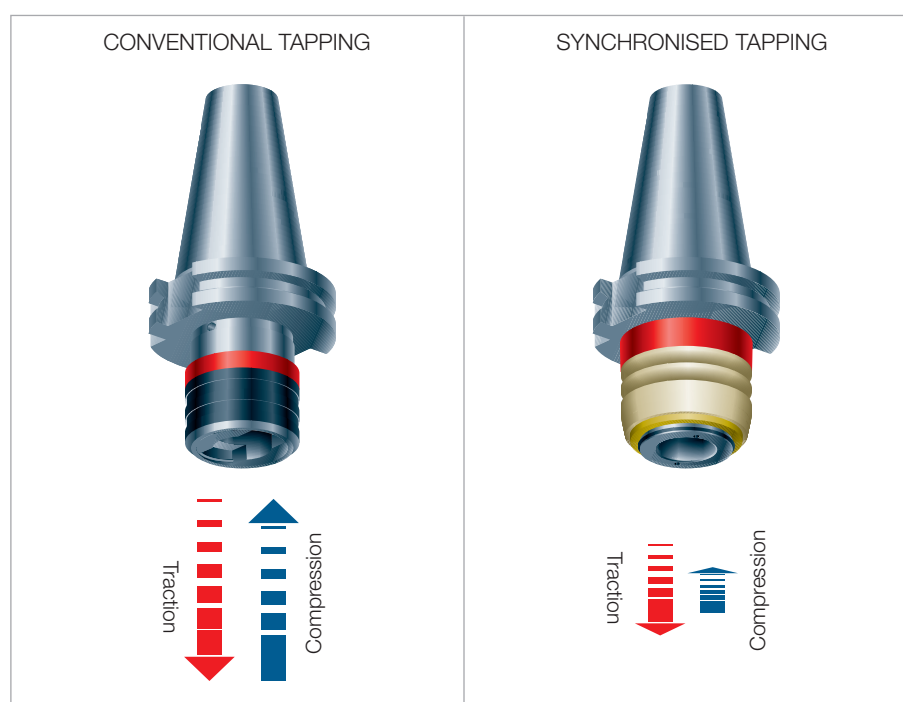
The Vergnano **Sincro** tap series for synchronised tapping S15/BS15 and S70/BS70, introduced in our latest catalogue (issue 42-2007), has now been extended with new types:

- cutting taps with metric fine thread, types S17 and S71
- cutting taps for grey cast iron, types S43, BS43 and S45
- cold forming taps, types S80N and BS80NR.

The new types have been developed in order to fulfill growing industrial demands for higher productivity on a wide range of materials and the increased diffusion of modern CNC machines with synchronised spindles.

Process description

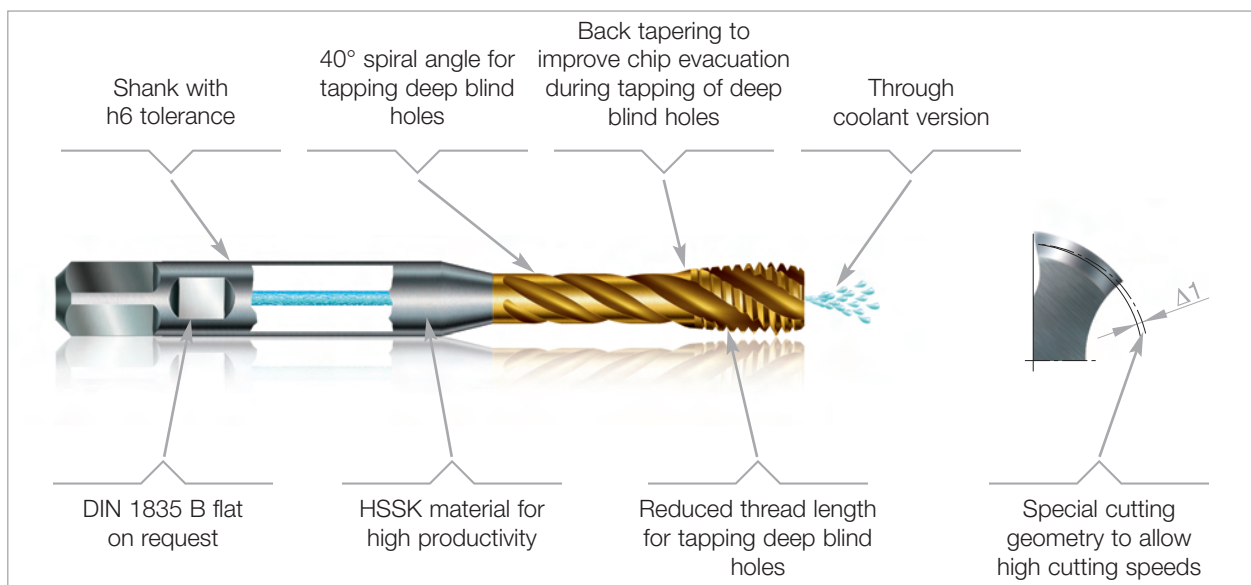
- The rotational and axial movements of the spindle are synchronised through the numeric control of the machine during the entire tapping process.
- Specific tapping attachments for synchronised tapping are equipped with micro-compensation (< 1 mm), differentiated in traction and compression. In contrast to standard compensated tapping attachments, in which the compensation extension is large, synchronised tapping attachments can be defined as “almost rigid”. As a result, synchronised tapping is often referred to as rigid tapping.
- The micro-compensation reduces the axial forces generated on the tap due to small pitch errors and mechanical play.
- The synchronisation between machine, spindle and tap permits high cutting speeds.
- **Sincro** series taps can be used only for rigid tapping. If used with compensated tapping attachments, which allow the tap to free float, the aggressive cutting geometry can generate high axial forces. This may cause the tap to advance more than the requested pitch resulting in oversized threads.
- All Vergnano taps can be used for synchronised tapping but the **Sincro** series is developed specifically for this type of application. This results in higher tool life and higher productivity due to higher cutting speeds.



Compensation difference in conventional and synchronised tapping

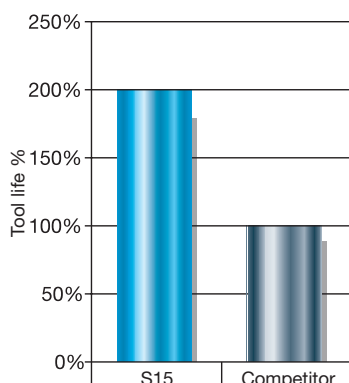
Tap characteristics

- Sincro 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 1835B to be used with traditional tapping attachments. All Sincro series shanks have an h6 tolerance, more precise compared to the h9 tolerance normally used on shanks, necessary for DIN 1835B flats but which also permits use with heat shrinking attachments.
- The specific cutting geometry for synchronised tapping allows 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.
- The 40° spiral flute angle (type S70) is ideal for tapping deep blind holes. In addition, the back tapering on the thread reduces the torque during inversion of the tap.
- The extended series includes three types of cutting taps (S15, S43, S70) and one type of cold forming tap (S80N).
- Versions with internal lubrication, both axial and radial, are available for all types (BS15, BS43, BS70, BS80NR).



Advantages

- Reduced machining cycle times, due to higher cutting speeds.
- Increased productivity.
- High quality threads.


















































Comparative test S15 TiN - competitor			
Size:	M10	Workpiece:	Shaft flange
Material:	38MnVS6 (M.G. 1.4)	Tensile strength [N/mm²]	1100
Hole:	Through	Depth [mm]:	12
Lubrication:	Emulsion 12%	Vc [m/min]	60
Machine:	Machining centre	Threading direction:	Vertical
Spindle:	For synchronised tapping, with micro-compensation		

Requirements

- 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.
- Synchronised tapping attachment with micro-compensation.
- In the case of taps with through-coolant, specific spindle and attachment for this application.
- In order to work at the requested cutting speed during the entire machining process, the spindle must be able to accelerate to full final speed before the tapping process begins.

Range

Tap item	Material	Thread	Hole type and depth	Application	Performance	Spindle	Through coolant	Shank	Chamfer	Cutting speed	Geometry
S43 ACE	HSSK	M	2,5 x D	3.1 4.4 5.3			—	DIN 1835B ON REQUEST	C (2-3)		
BS43 ACE	HSSK	M	2,5 x D	3.1 4.4 5.3				DIN 1835B ON REQUEST	C (2-3)		
S15 TiN	HSSK	M	2,5 x D	1.1-5 2.1-3 4.1-3 5.1-3			—	DIN 1835B	B (4-5)		
BS15 TiN	HSSK	M	2,5 x D	1.1-5 2.1-3 4.1-3 5.1-3				DIN 1835B	B (4-5)		
S70 TiN	HSSK	M	2,5 x D	1.2-5 2.1-3 4.2-3 5.2-3			—	DIN 1835B	C (2-3)		
BS70 TiN	HSSK	M	2,5 x D	1.2-5 2.1-3 4.2-3 5.2-3				DIN 1835B	C (2-3)		
S80N TiN	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2			—	DIN 1835B ON REQUEST	C (2-3)		
BS80NR TiN	HSSK	M	2,5 x D	1.1-4 2.1-2 4.1-3 5.2				DIN 1835B ON REQUEST	C (2-3)		
S45 ACE	HSSK	MF	2,5 x D	3.1 4.4 5.3			—	DIN 1835B ON REQUEST	C (2-3)		
S17 TiN	HSSK	MF	2,5 x D	1.1-5 2.1-3 4.1-3 5.1-3			—	DIN 1835B ON REQUEST	B (4-5)		
S71 TiN	HSSK	MF	2,5 x D	1.2-5 2.1-3 4.2-3 5.2-3			—	DIN 1835B ON REQUEST	C (2-3)		

LEGEND:

TAP MATERIAL

HSSK powder metallurgy high speed steel

DIN 1835 B FLAT (Weldon)

★ standard
☆ on request

INTERNAL COOLANT SUPPLY

IKZ Axial outlet
IKZ-R Radial outlet























LUBRICATION

E Emulsion
O Oil
MQL Minimum quantity lubrication
S Dry

S15 Product code
● 40÷45 Ideal tap / cutting speed m/min
□ 10÷20 Suitable tap / cutting speed m/min

Material	
Types of holes	
<p>Chamfer form DIN 2197</p> <p>Form B 4 - 5 threads Form C 2 - 3 threads</p>	
Chamfer form	
M	6HX
MF	6HX
Internal coolant supply	
DIN 1835 B flat (Weldon)	
Range	
Coatings	

Material	Group	Description	Tensile strength N/mm ²	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
	1.6	Alloyed steel / high strength steel	1200-1600	O, MQL
2. Stainless steel	2.1	Ferritic	< 850	O, MQL
	2.2	Austenitic	< 850	O, MQL
	2.3	Ferritic+austenitic, martensitic, precipitation hardening	< 1000	O, MQL
3. Cast iron	3.1	Grey cast iron	< 1000	O, MQL, S
	3.2	Nodular cast iron, malleable cast iron, tempered cast iron	< 1000	E, 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
	4.4	Aluminium die cast alloys with Si>10% (short chipping)	< 600	E, O, MQL
5. Copper Copper Alloys Brass Bronze	5.1	Pure copper	250-350	E, O, MQL
	5.2	Copper alloys (long chipping), soft brass	< 700	E, O, MQL
	5.3	Copper alloys (short chipping), hard brass	< 700	E, O, MQL
	5.4	High strength bronze	700-1500	E, O, MQL
6. Magnesium Magnesium alloys	6.1	Pure magnesium, magnesium alloys	120-300	E, O, MQL
	6.2	High strength magnesium alloys	240-400	E, O, MQL
7. Titanium Titanium alloys	7.1	Pure titanium	400-600	E, O, MQL
	7.2	Titanium alloys	600-1000	O, MQL
8. Nickel Nickel alloys	8.1	Pure nickel	400-600	E, O, MQL
	8.2	Nickel alloys	600-1000	O, MQL
9. Plastic materials	9.1	Thermoplastic		O, MQL
	9.2	Thermosetting		S

HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK	HSSK
										
										
B	B	B	C	C	C	C	C	C	C	C
S15	BS15		S70	BS70		S43		BS43	S80N	BS80NR
		S17			S71		S45			
-	IKZ-R	-	-	IKZ	-	-	-	IKZ	-	IKZ-R
★	★	☆	★	★	☆	☆	☆	☆	☆	☆
M3 - M16	M5 - M16	M8X1 - M16x1,5	M3 - M16	M5 - M16	M8X1 - M16x1,5	M3 - M16	M8X1 - M16x1,5	M5 - M16	M4 - M12	M6 - M12
TiN	TiN	TiN	TiN	TiN	TiN	ACE	ACE	ACE	TiN	TiN
● 40÷45	● 40÷45	● 40÷45							● 45÷50	● 45÷50
● 40÷45	● 40÷45	● 40÷45	● 35÷40	● 35÷40	● 35÷40				● 45÷50	● 45÷50
● 35÷40	● 35÷40	● 35÷40	● 25÷30	● 25÷30	● 25÷30				● 40÷45	● 40÷45
● 25÷30	● 25÷30	● 25÷30	● 20÷25	● 20÷25	● 20÷25				● 30÷35	● 30÷35
● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15	● 10÷15				□ 15÷20	□ 15÷20
● 16÷18	● 16÷18	● 16÷18	● 12÷15	● 12÷15	● 12÷15				● 15÷20	● 15÷20
● 12÷15	● 12÷15	● 12÷15	● 10÷12	● 10÷12	● 10÷12				● 15÷20	● 15÷20
● 10÷12	● 10÷12	● 10÷12	● 8÷10	● 8÷10	● 8÷10				□ 10÷15	□ 10÷15
						● 60÷65	● 60÷65	● 60÷65		
● 25÷30	● 25÷30	● 25÷30	● 20÷25	● 20÷25	● 20÷25					
● 45÷50	● 45÷50	● 45÷50							● 55÷60	● 55÷60
● 45÷50	● 45÷50	● 45÷50	● 35÷40	● 35÷40	● 35÷40				● 55÷60	● 55÷60
● 45÷50	● 45÷50	● 45÷50	● 35÷40	● 35÷40	● 35÷40	□ 45÷50	□ 45÷50	□ 45÷50	● 55÷60	● 55÷60
						● 35÷40	● 35÷40	● 35÷40		
● 18÷20	● 18÷20	● 18÷20							□ 20÷25	□ 20÷25
● 18÷20	● 18÷20	● 18÷20	● 15÷18	● 15÷18	● 15÷18				● 20÷25	● 20÷25
● 35÷40	● 35÷40	● 35÷40	● 30÷35	● 30÷35	● 30÷35	● 35÷40	● 35÷40	● 35÷40		
● 40÷45	● 40÷45	● 40÷45								
● 30÷35	● 30÷35	● 30÷35	● 25÷30	● 25÷30	● 25÷30					
● 15÷20	● 15÷20	● 15÷20							□ 25÷30	□ 25÷30
□ 10÷15	□ 10÷15	□ 10÷15	□ 8÷12	□ 8÷12	□ 8÷12					
● 18÷20	● 18÷20	● 18÷20								

MACHINE TAPS for cast iron - Straight flutes with or without internal axial coolant

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

[illegible]

- = standard execution

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

● = standard execution

MACHINE TAPS - Back tapered - High spiral flutes with or without internal axial coolant

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

[illegible]

- = standard execution

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

- = standard execution

MACHINE TAPS for cast iron - Straight flutes

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

[illegible]

● = standard execution

MACHINE TAPS - Back tapered - High spiral flutes with or without internal axial coolant

For blind holes - for synchronised tapping
ISO Metric fine thread - DIN 13

[illegible]

● = standard execution



F.lli VERGNANO s.r.l.
Corso Egidio Olia, 2
10023 CHIERI (TO) - Italy
Tel. +39 011 942 35 23
Fax +39 011 942 54 26
www.vergnano.com
info@vergnano.com