

## Tap holders for synchronized tapping cycles



Modern CNC machines have the capability of synchronizing the spindle rotation to match the feed advance for a specific tap pitch. The «Rigid» or synchronized tapping cycle is very accurate, but it is impossible to avoid small discrepancies between the machine synchronization and the actual pitch of the specific tap being used. Using a rigid tap holder means that any deviation at all increases the thrust forces acting on the tap and this dramatically reduces tap life.

### **SynchroFlex® – The Unique Solution**

At the heart of SynchroFlex® is a precisely machined flexure which provides axial and radial compensation for the unavoidable discrepancy between the machine feed advance and the actual tap pitch. By compensating for this error, the thrust forces acting on the tap are dramatically reduced. The result is the longest possible tap life, 100% improvement or more, and much better quality threads.

### **SynchroFlex® II with increased flow rates for high pressure internal coolant.**

Tapmatic's 80 bar, balanced, internal coolant system is included in all SynchroFlex tap holders and our system does not influence the axial compensation forces. The holders may be used with or without internal coolant.

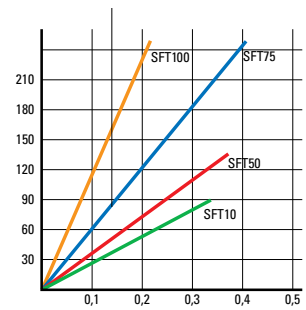


**Design and Development**

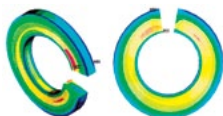
Flexure geometries have been designed using the ANSYS finite element analysis method in order to achieve the optimal force vs. deflection rates for the tap capacity of each holder.

**SynchroFlex® – Force vs. Deflection Rates**

Unlike competitors that employ elastomer rings to provide a small amount of axial compensation ( $\pm 0.5$  mm), the SynchroFlex® flexure has a consistent force vs. deflection rate. This means consistently superior tap life and thread quality.

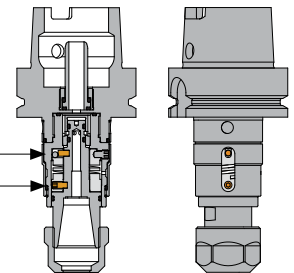


By limiting the axial compensation travel, and torsional forces acting on the flexure, millions of holes can be tapped without causing the SynchroFlex® holder to fatigue, take a set, or wear out. Below is an example of stress analysis at maximum compression

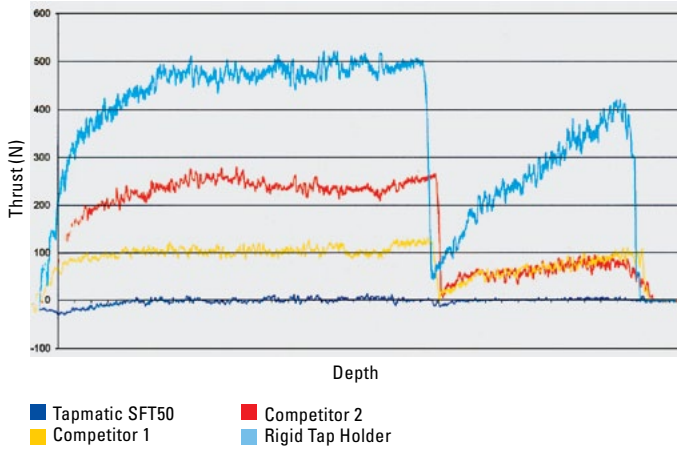


Axial micro compensation is closely limited (mechanically secured)

Torque is transmitted through the drive pins – not through the flexure.



**Comparison tapping with an M6 spiral fluted tap in 6061 Aluminum to depth of 18 mm.**



**Test Results**

SynchroFlex® tap holders have been tested by tap manufacturers all over the world and they have confirmed the dramatic improvement in tap life, and thread quality resulting from the reduction of thrust forces acting on the tap.

The graph to the left is an example of a test conducted by an independent tap manufacturer using a Kistler dynamometer to measure the thrust forces during the tapping process. As you can see from the graph, although the competitive holders do reduce thrust forces compared to a rigid tap holder, they are not as effective as SynchroFlex®.

**Case History**

**Application:** Thread cutting on horizontal machining center rigid tapping during an unmanned shift.

**Material:** 42CrMo4V steel, heat treated to 650 N/mm2

**Tap Size:** M8 x 1

**Lubrication:** Coolant, oil emulsion 6%

**Results:** With the tap held in a rigid holder the life was just 1'000 components per tap.

**Improvement with SynchroFlex®**

Tap life increased to 2'400 to 2'900 components per tap saving the customer not only in tap costs, but the ability to run without interruption through the entire unmanned shift.

**Case History**

**Application:** Thread cutting on machining center rigid tapping.

**Material:** CF8M steel casting

**Tap Size:** #10-32

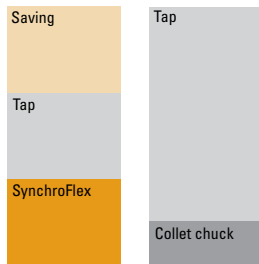
**Lubrication:** Coolant

**Results:** With the tap held in a rigid holder the life was just 72 holes per tap.

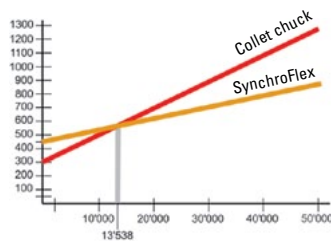
**Improvement with SynchroFlex®**

Tap life increased to more than 216 holes per tap in this difficult material saving the customer not only in tap costs, but by also reducing his down time caused by frequent tap replacement.

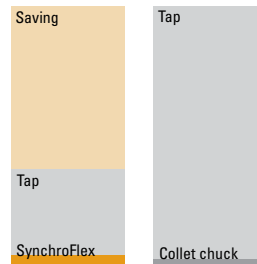
**Total cost/year**



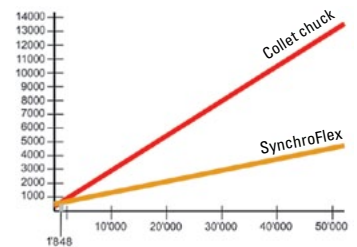
**Break Even Point**



**Total cost/year**



**Break Even Point**



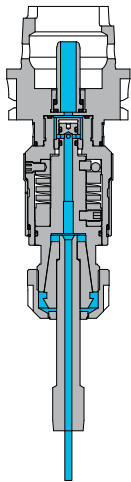
Overview of the SynchroFlex® program



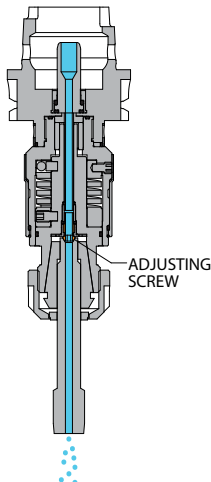
Pictured with ER-collet, spindle and straight shank

Six Sizes to Cover a Wide Range of Taps

- SFT II 5 with capacity M1–M3
- SFT II 10 with capacity M2–M5
- SFT II 50 with capacity M4–M12
- SFT II 75 with capacity M8–M20
- SFT II 100 with capacity M16–M30
- SFT II 150 with capacity M22–M48



SFT II  
High Pressure Internal Coolant  
with increased flow rates



Minimum Quantity Lubrication  
Available for 1 channel or  
Multi channel systems

Internal Coolant and MQL

Tapmatic's high pressure internal coolant system may be used at pressures up to 80 bar without affecting the axial compensation.

Tapmatic also can provide tools ready for Minimum Quantity Lubrication through the spindle. Our system provides direct flow of air and lubricant to the back of the tap. See page 13.

Available with QC spindle

Accepts the standard Quick Change adapters or Tapmatic's ER collet chuck QC adapters for improved tap grip.



Integral shank models

Tapmatic offers standard integral shank HSK and Tapmatic Capto tools. ABS shanks are also available on request.



We can also offer integral Steep Taper shank tools but in most cases we recommend a modular system using a cylindrical shank SynchroFlex® together with our Short Projection SK, BT or CAT shank.

No hole beyond your reach

Four standard extensions are available which increase the tool length by 50, 100, 150, or 200 mm.

Special extensions are also available to fit your specific application. Our extensions keep the flexure in close proximity to the tap ensuring the best performance.



Synchronized Tapping

Synchronous feed tap holders with modular straight shank, with internal coolant system



ER Collet Chuck



Quick-Change

Features and Advantages

- increase tap life by 100% or more
- improves thread quality
- reduces downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm (SFT II 150 +/- 1.5mm)
- wide range of sizes
- available with ER collet or Quick Change chuck
- Tapmatic's 80 bar, balanced, high pressure internal coolant system is included. Coolant pressure does not influence axial compensation.

How to Order

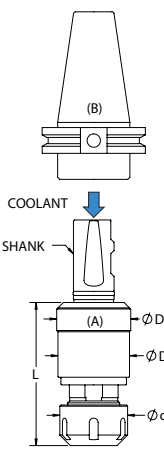
Please select the tap holder (A) and SK or BT shank (B), to fit your machine. For Quick Change models order ER collet adapter (C) shown below or standard adapters shown in accessories section. Please order accessories like collets and sealing gaskets separately as they are not included.

Synchronized Tapping

(A) Tap Holder SFTII Cylindrical Shank, ER Collet Chuck, Internal Coolant System

Model	Capacity (steel)	Collets	Shank	Order code (nut w/o seal)	Order code (with seal nut)	L (nut w/o seal)	L (with seal nut)	Weight kg	D	D1	d
SFT II 5	M1-M3 #00-#5	ER8	12 mm	41051208		28		0.1	12.0	12.0	12
SFT II 10	M2-M5 #2-#10	ER11	25 mm	41102511		52		0.4	23.5	23.5	19
			1"	41101111							
			20 mm	41102011							
			16 mm	41101611							
SFT II 50	M4.5-M12 #8-1/2"	ER20	25 mm	41502520N	41502520	64	69	0.5	34.6	36.3	34
			1"	4150120N	4150120						
			20 mm	41502020N	41502020						
SFT II 75	M8-M20 1/4"-3/4"	ER25	25 mm	41752525N	41752525	83	88	1.0	44.0	45.6	42
			1"	4175125N	4175125						
SFT II 100	M16-M30 5/8"-1"	ER40	25 mm	411002540N	411002540	112	117	2.0	62.0	63.6	63
			1"	41100140N	41100140						
SFT II 150	M22-M48 7/8"-1 7/8"	ER50	40 mm	411504050N	411504050	159	167	5.1	80.0	86.0	78

\*Note: Availability of inch size ER50GB collets is limited. Please consult a Tapmatic sales representative for sizes currently available. These internal coolant tools come standard with sealing nut, but tools with standard nuts are also available. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1".



(A) Tap Holder SFTII Cylindrical Shank, Quick-Change Internal Coolant System

Model	Capacity (steel)	Adapter	Shank	Order code	L	Weight kg	D	D1	d
SFT II 10	M2-M5 #2-#10	Nr. 0	25 mm	411025QC	54.5	0.4	23.5	23.5	25
			1"	41101QC					
			20 mm	411020QC					
			16 mm	411016QC					
SFT II 50	M4-M12 #8-1/2"	Nr. 1	25 mm	415025QC	56	0.5	34.6	36.3	35
			1"	41501QC					
SFT II 75	M8-M16 1/4"-5/8"	Nr. 1	25 mm	417525QC	72	1.0	44.0	45.6	40
			1"	41751QC					
SFT II 100	M22-M48 7/8"-1 7/8"	Nr. 2	25 mm	4110025QC	105	2.0	62.0	63.6	59
			1"	411001QC					

Note: When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1". For best performance we recommend ER collet adapters shown below.

(C) ER collet adapter



Order code with Standard Nut	Adapter	Collets	d1	L1	Order code with Seal Nut	L1 (BCS)
8138211N	Nr. 0	ER11	19	20		
8208216	Nr. 1	ER16	22	24	8208216S	28
8218220	Nr. 1	ER20	28	35	8218220S	40
8288225	Nr. 2	ER25	35	38	8288225S	43
8288232	Nr. 2	ER32	50	48	8288232S	53



## Synchronous feed tap holders with integral HSK shank, with internal coolant system

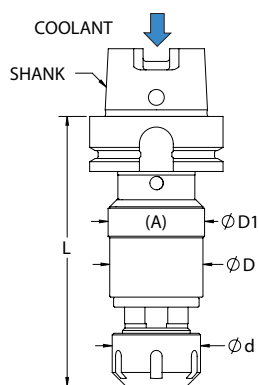


### Features and Advantages

- increase tap life by 100% or more
- improves thread quality
- reduces downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- wide range of sizes
- available with ER collet or Quick Change chuck
- Tapmatic's 80 bar, balanced, high pressure internal coolant system is included. Coolant pressure does not influence axial compensation
- also available for Minimum Quantity Lubrication (MQL) through the spindle. Please see page 13

### How to Order

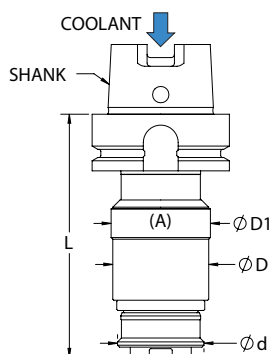
Please select the tap holder (A) including the HSK shank, to fit your machine. For Quick Change models order ER collet adapter (C) shown below or standard adapters shown in Accessories section. Please order accessories like collets and sealing gaskets separately as they are not included.



### (A) Tap Holder SFTII HSK Shank, ER Collet Chuck, Internal Coolant System

Model	Capacity (steel)	Collets	Shank	Order code (with seal nut)	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	ER20	HSK63A	4150H6320	108	1.0	34.6	36.3	34
			HSK80A	4150H8020	113	1.9			
			HSK100A	4150H10020	115	2.7			
SFT II 75	M8-M20 1/4"-3/4"	ER25	HSK63A	4175H6325	128	1.6	44.0	45.6	42
			HSK80A	4175H8025	131	2.4			
			HSK100A	4175H10025	133	3.2			
SFT II 100	M16-M30 5/8"-1"	ER40	HSK63A	41100H6340	160	2.2	62.0	63.6	63
			HSK80A	41100H8040	161	2.9			
			HSK100A	41100H10040	163	3.7			

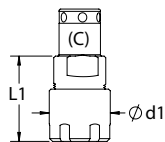
**Note:** These internal coolant tools come standard with sealing nut, but tools with standard nuts are also available. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1".



### (A) Tap Holder SFTII HSK Shank, Quick-Change, Internal Coolant System

Model	Capacity (steel)	Adapter	Shank	Order code	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	Nr. 1	HSK63A	4150H63QC	95	1.0	34.6	36.3	35
			HSK80A	4150H80QC	100	1.9			
			HSK100A	4150H100QC	102	2.7			
SFT II 75	M8-M16 1/4"-5/8"	Nr. 1	HSK63A	4175H63QC	112	1.6	44.0	45.6	40
			HSK80A	4175H80QC	115	2.4			
			HSK100A	4175H100QC	117	3.2			
SFT II 100	M16-M30 1/2"-7/8"	Nr. 2	HSK63A	41100H63QC	148	2.2	62.0	63.6	59
			HSK80A	41100H80QC	149	2.9			
			HSK100A	41100H100QC	151	3.7			

**Note:** When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1". For best performance we recommend ER collet adapters shown below.



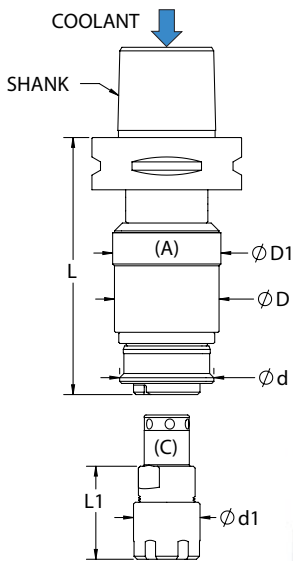
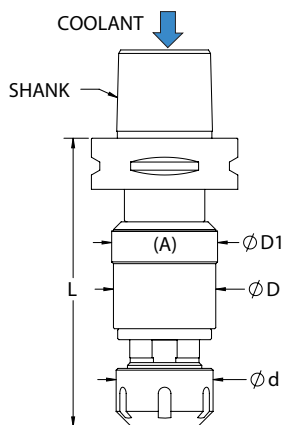
### (C) ER Collet Adapter

Order code with Standard Nut	Adapter	Collets	d1	L1	Order code with Seal Nut	L1
8208216	Nr. 1	ER16	22	24	8208216S	28
8218220	Nr. 1	ER20	28	35	8218220S	40
8288225	Nr. 2	ER25	35	38	8288225S	43
8288232	Nr. 2	ER32	50	48	8288232S	53



Synchronous feed tap holders with Tapmatic Capto shank, with internal coolant system

Synchronized Tapping



Features and Advantages

- increase tap life by 100% or more
- improves thread quality
- reduces downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- wide range of sizes
- available with ER collet or Quick Change chuck
- Tapmatic's 80 bar, balanced, high pressure internal coolant system is included. Coolant pressure does not influence axial compensation.

How to Order

Please select the tap holder (A) including the Tapmatic Capto shank, to fit your machine. For Quick Change models order ER collet adapter (C) shown below or standard adapters shown in Accessories section. Please order accessories like collets and sealing gaskets separately as they are not included.

(A) Tap Holder SFT II Tapmatic Capto Shank, ER Collet Chuck, Internal Coolant System

Model	Capacity (steel)	Collets	Shank	Order code (with seal nut)	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	ER20	C4	4150C420	102	0.7	34.6	36.3	34
			C5	4150C520	103	1.0			
			C6	4150C620	105	1.2			
			C8	4150C820	112	2.1			
SFT II 75	M8-M20 1/4"-3/4"	ER25	C5	4175C525	122	1.2	44.0	45.6	42
			C6	4175C625	124	1.5			
			C8	4175C825	131	2.4			
SFT II 100	M16-M30 5/8"-1"	ER40	C6	41100C640	154	2.9	62.0	63.6	63
			C8	41100C840	161	3.8			

**Note:** These internal coolant tools come standard with sealing nut, but tools with standard nuts are also available. Please add N to part number to specify nut without sealing. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1"

(A) Tap Holder SFT II Tapmatic Capto Shank, Quick-Change, Internal Coolant System

Model	Capacity (steel)	Adapter	Shank	Order code	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	Nr. 1	C4	4150C4QC	89	0.7	34.6	36.3	35
			C5	4150C5QC	90	1.0			
			C6	4150C6QC	92	1.2			
			C8	4150C8QC	99	2.1			
SFT II 75	M8-M16 1/4"-5/8"	Nr. 1	C5	4175C5QC	106	1.2	44.0	45.6	40
			C6	4175C6QC	108	1.5			
			C8	4175C8QC	115	2.4			
SFT II 100	M16-M30 1/2"-7/8"	Nr. 2	C6	41100C6QC	142	2.9	62.0	63.6	59
			C8	41100C8QC	149	3.8			

**Note:** When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1". For best performance we recommend ER collet adapters shown below.

(C) ER Collet Adapter

Order code with Standard Nut	Adapter	Collets	d1	L1	Order code with seal nut	L1
8208216	Nr. 1	ER16	22	24	8208216S	28
8218220	Nr. 1	ER20	28	35	8218220S	40
8288225	Nr. 2	ER25	35	38	8288225S	43
8288232	Nr. 2	ER32	50	48	8288232S	53



Steel Collets



Sealing Gaskets

## Synchronous feed tap holders with VDI shank, with internal coolant system

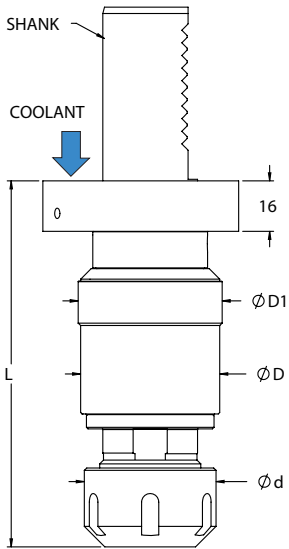


### Features and Advantages

- increase tap life by 100 % or more
- improves thread quality
- reduces downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- wide range of sizes
- Tapmatic's 80 bar, balanced, high pressure internal coolant system is included. Coolant pressure does not influence axial compensation.

### How to Order

Please select the tap holder (A) including the VDI shank, to fit your machine. Please order accessories like collets and sealing gaskets separately as they are not included.



(A) Tap Holder SFT II VDI Shank, ER Collet Chuck, Internal Coolant System

Model	Capacity (steel)	Collets	Shank	Order code (with seal nut)	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	ER20	VDI 30	4150VDI3020	97	1.2	34.6	36.3	34
			VDI 40	4150VDI4020	97	2.1			
SFT II 75	M8-M20 1/4"-3/4"	ER25	VDI 30	4175VDI3025	116	1.5	44	45.6	42
			VDI 40	4175VDI4025	116	2.4			

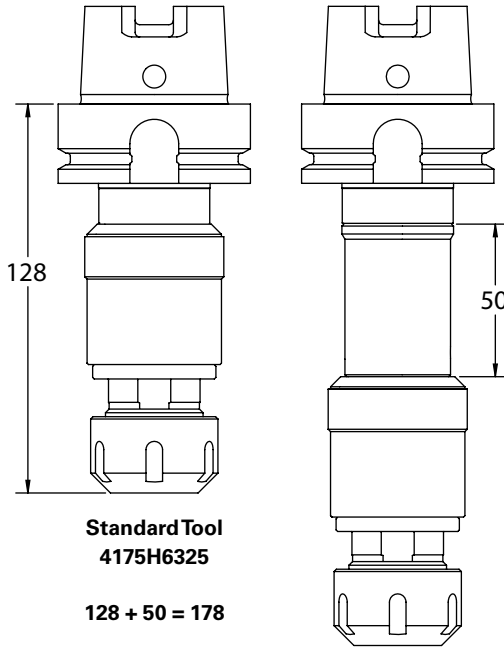
**Note:** These internal coolant tools come standard with sealing nut, but tools with standard nuts are also available. Please add N to part number to specify nut without sealing.  
When using Roll Form Taps the tool's capacity must be reduced 25%.  
All dimensions are shown in mm. 25.4mm = 1"

Synchronized Tapping





**Synchronous feed tap holders with extended length, with internal coolant**



**Features and Advantages**

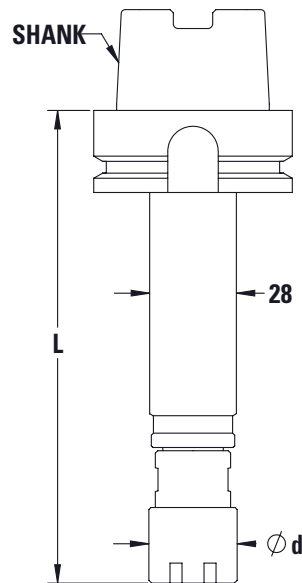
- four standard extensions of 50, 100, 150 and 200 mm
- increased tap life of 100% or more
- improved thread quality
- reduced downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- Tapmatic's 80 bar, balanced, high pressure internal coolant system is included. Coolant pressure does not influence axial compensation

**How to Order**

Please select the standard length SFT50 or SFT75, including the integral shank of your choice. Then choose a standard extension of 50, 100, 150 or 200mm. The order code is given as shown in the example drawing at left. Accessories like steel collets and sealing gaskets are not included. Please order these separately.

Special length extensions are also available upon request.

**Synchronous feed tap holders with reduced diameter and extended length**



**Features and Advantages**

- special reduced diameter extended length tools for difficult to reach holes
- increased tap life of 100% or more
- improved thread quality
- reduced downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- available with internal coolant pressure up to 50 bar
- available with ER16 or ER20 mini nut collet chuck

**How to Order**

Please simply let us know the type of shank, length (L), and your preference of the ER16 or ER20 collet chuck. Please note diameter "d" for ER16 mini nut is 22mm and for ER20 it is 26mm. Accessories like steel collets and sealing gaskets are not included. Please order these separately.



Steel Collets



Sealing Gaskets

Synchronous feed tap holders with integral HSK shank, with MQL, minimum quantity lubrication

Synchronized Tapping



Features and Advantages

- increase tap life by 100% or more
- improves thread quality
- precise lubrication delivery for improved tool life
- reduce coolant and maintenance costs
- environmentally friendly alternative to recirculating coolant
- standard for one channel system, but multi-channel also available

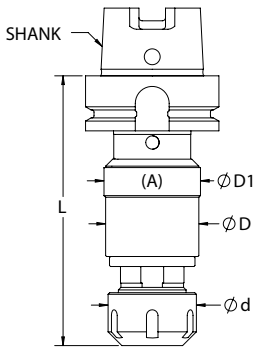
How to Order

Please select the tap holder (A) including the HSK shank, to fit your machine. Please order accessories like collets, adjusting screws and sealing gaskets separately as they are not included.

(A) Tap Holder SFTII HSK Shank, ER Collet Chuck, MQL, minimum quantity lubrication system

Model	Capacity (steel)	Collets	Shank	Order code for MQL version	L	Weight kg	D	D1	d
SFT II 50	M4-M12 #8-1/2"	ER20	HSK63A	4150H6320M	108	1.0	34.6	36.3	34
			HSK80A	4150H8020M	113	1.9			
			HSK100A	4150H10020M	115	2.7			
SFT II 75	M8-M20 1/4"-3/4"	ER25	HSK63A	4175H6325M	128	1.6	44.0	45.6	42
			HSK80A	4175H8025M	131	2.4			
			HSK100A	4175H10025M	133	3.2			

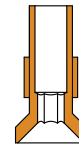
**Note:** These MQL tools come standard with sealing nut. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1". Other shank sizes are also available



Adjusting Screws

Taps with External Center

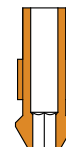
Ø Tap Shank	SFT50II	SFT75II
6mm, 7mm	810836	
8mm, 9mm	810838	811838
10mm	8108310	8108310
11mm to 16mm		8118311



Taps with External Center

Taps with Internal Center

Ø Tap Shank	SFT50II	SFT75II
6mm, 7mm	810836IN	
8mm, 9mm	810838IN	811838IN
10mm	8108310IN	8108310IN
11mm to 16mm		8118311IN



Taps with Internal Center

Additional sizes available on request.

