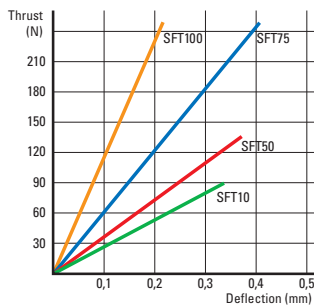


Tap holders for synchronized tapping cycles

Synchronized Tapping



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

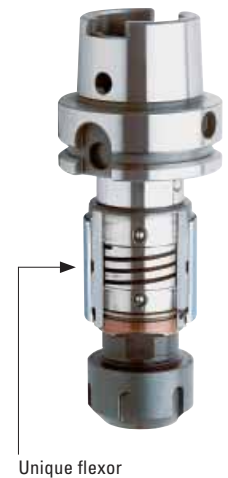


General Information

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.

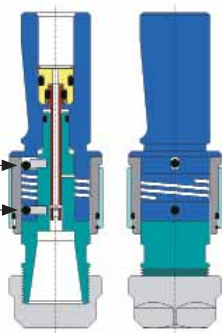
SynchroFlex® – The Unique Solution

Each holder is made with 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.



Axial micro compensation is closely limited (mechanically secured)

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



Design and Development

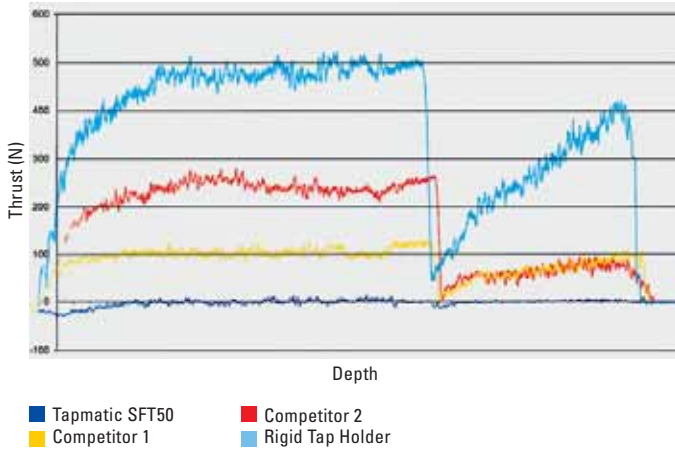
Flexure geometries have been designed using the ANSYS finite element analysis method in order to achieve the optimal force vs. deflection rates for the tap capacity of each holder.

As you can see from the cross section drawing, torque is transmitted through the drive pins not through the flexure.

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.



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.

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.

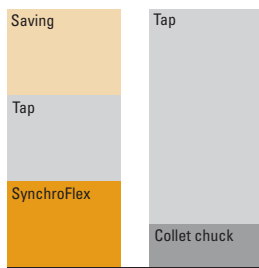
Improvement with SynchroFlex®

Tap life increased to 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.

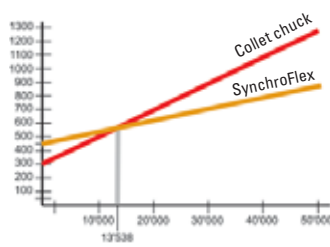
Improvement with SynchroFlex®

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



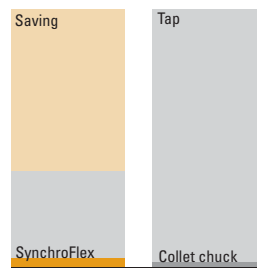
Break Even Point



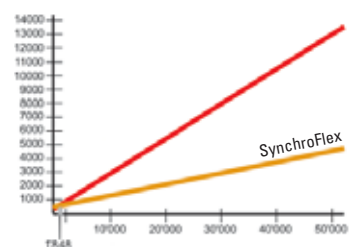
Evaluation of economic efficiency

Costs	SynchroFlex chuck	Collet chuck without compensation
Number of threads/year	50'000	50,000
Number of threads/tap	2'400	1,000
Number of taps/year	21	50
Price/tap in \$	26	26
Tap costs in \$	546	1,300
Chuck costs in \$ (approx.)	600	405
Total costs in \$/year	1,146	1,705
Cost reduction in \$/year	559	

Total cost/year



Break Even Point



Evaluation of economic efficiency

Costs	SynchroFlex chuck	Collet chuck without compensation
Number of threads/year	50,000	50,000
Number of threads/tap	216	72
Number of taps/year	231	695
Price/tap in \$	26	26
Tap costs in \$	6,006	18,070
Chuck costs in \$ (approx.)	600	405
Total costs in \$/year	6,606	18,475
Cost reduction in \$/year	11,869	

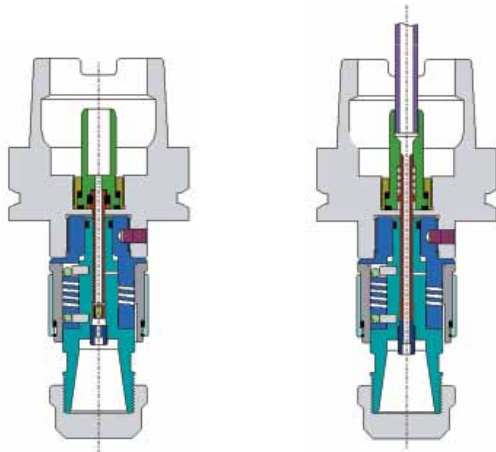
Overview of the SynchroFlex® program



Pictured with ER-collet, spindle and straight shank

Four Sizes to Cover a Wide Range of Taps

- SFT10 with capacity M2–M5 or #2–#10
- SFT50 with capacity M4–M12 or #8–#1/2"
- SFT75 with capacity M8–M20 or 1/4"–3/4"
- SFT100 with capacity M16–M30 or 5/8"–1"



High Pressure Internal Coolant

Minimum Quantity Lubrication

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.

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.



Synchronous feed tap holders with modular straight shank, with or without internal coolant system



ER Collet Chuck



Quick-Change

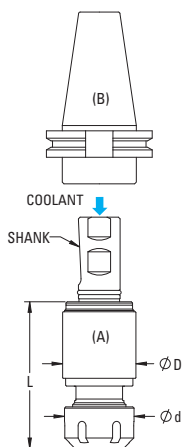
Features and Advantages

- increase tap life by 100% or more
- improves thread quality
- reduces downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- wide range of sizes
- available with ER collet or Quick Change chuck
- available with high pressure internal coolant system up to 80 bar (Balanced Coolant System)

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.

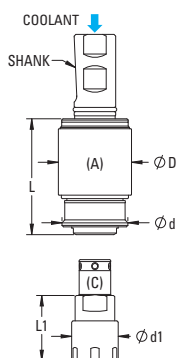
(A) Tap Holder SFT Cylindrical Shank, ER Collet Chuck



Model	Order code no BCS	Capacity (steel)	Shank	Collets	Weight kg	D	d	L	Order code for BCS version	L (BCS)
SFT10	43102511	M2-M5	25 mm	ER11	0.4	24	19	53		
	4310111	#2-#10	1"							
	43102011		20 mm							
	43107511		3/4"							
	43101611		16 mm							
SFT50	43106211		5/8"	ER20	0.5	35	34	63	43502520S	68
	43502520	M4.5-M12	25 mm							
	4350120	#8-1/2"	1"							
SFT75	43502020		20 mm	ER25	1.0	44	42	83	43502020S	88
	43752525	M8-M20	25 mm							
	4375125	1/4"-3/4"	1"							
SFT100	4310002540	M16-M30	25 mm	ER40	1.5	62	63	112	4310002540S	117
	431000140	5/8"-1"	1"							

Note: The SFT high pressure coolant models (BCS) include a sealing disk nut which adds 5 mm to «L» dimension. When using Roll Form Taps the tool's capacity must be reduced 25%.

(A) Tap Holder SFT Cylindrical Shank, Quick-Change



Model	Order code no BCS	Capacity (steel)	Shank	Adapter	Weight kg	D	d	L	Order code for BCS version	L (BCS)
SFT50	435025QC	M4-M12	25 mm	Nr. 1	0.5	35	35	52	435025QCS	52
	43501QC	#8-#1/2"	1"							
	435020QC		20 mm							
SFT75	437525QC	M8-M16	25 mm	Nr. 1	1.0	44	40	70	437525QCS	70
	43751QC	#1/4"-5/8"	1"							
SFT100	4310025QC	M16-M30	25 mm	Nr. 2	1.5	62	59	105	4310025QCS	105
	431001QC	1/2"-7/8"	1"							

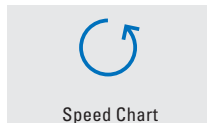
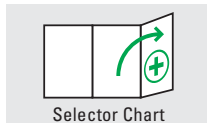
Note: When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1"

(C) ER collet adapter



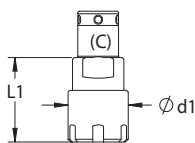
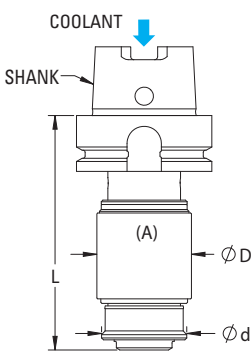
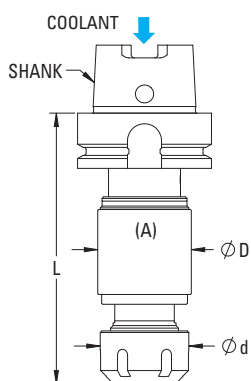
Order code with Standard Nut	Adapter	Collets	d1	L1	Order code with Seal Nut for BCS version	L1 (BCS)
8208216	Nr. 1	ER16	22	24	8208216S	28
8218220	Nr. 1	ER20	28	35	8218220S	40
8288225	Nr. 2	ER25	35	38	8288225S	43

Synchronized Tapping



Synchronous feed tap holders with integral HSK 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
- available with high pressure internal coolant system up to 80 bar. (Balanced Coolant System)
- also available for Minimum Quantity Lubrication (MQL) through the spindle on request

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 SFT HSK Shank, ER Collet Chuck, Internal Coolant System

Model	Order code with internal coolant	Capacity (steel)	Shank	Collets	Weight kg	D	d	L
SFT50	4350H6320S	M4–M12	HSK63A	ER20	1.0	35	34	108
	4350H8020S	#8–1/2"	HSK80A		1.9			
	4350H10020S		HSK100A		2.7			
SFT75	4375H6325S	M8–M20	HSK63A	ER25	1.6	44	42	128
	4375H8025S	1/4"–3/4"	HSK80A		2.4			
	4375H10025S		HSK100A		3.2			
SFT100	43100H6340S	M16–M30	HSK63A	ER40	2.2	62	63	157
	43100H8040S	5/8"–1"	HSK80A		2.9			
	43100H10040S		HSK100A		3.7			

Note: The SFT high pressure coolant models (BCS) include a sealing disk nut. Other shanks and sizes available on request. 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 HSK Shank, Quick-Change, Internal Coolant System

Model	Order code with internal coolant	Capacity (steel)	Shank	Adapter	Weight kg	D	d	L
SFT50	4350H63QCS	M4–M12	HSK63A	Nr. 1	1.0	35	35	92
	4350H80QCS	#8–1/2"	HSK80A		1.9			
	4350H100QCS		HSK100A		2.7			
SFT75	4375H63QCS	M8–M16	HSK63A	Nr. 1	1.6	44	40	110
	4375H80QCS	1/4"–5/8"	HSK80A		2.4			
	4375H100QCS		HSK100A		3.2			
SFT100	43100H63QCS	M16–M30	HSK63A	Nr. 2	2.2	62	59	145
	43100H80QCS	1/2"–7/8"	HSK80A		2.9			
	43100H100QCS		HSK100A		3.7			

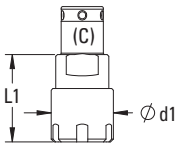
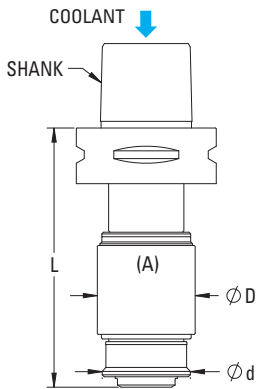
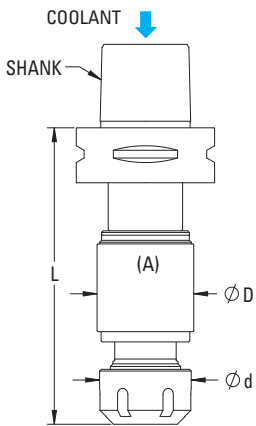
Note: Other shanks and sizes available on request. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1"

(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



Synchronous feed tap holders with Tapmatic Capto 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
- available with high pressure internal coolant system up to 80 bar. (Balanced Coolant System)

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 Tapmatic Capto Shank, ER Collet Chuck, Internal Coolant System

Model	Order code for BCS version	Capacity (steel)	Shank	Collets	Weight kg	D	d	L
SFT50	4350C420S	M4–M12	C4	ER20	0.7	35	34	112
	4350C520S	#8–1/2"	C5		1.0			114
	4350C620S		C6		1.2			118
	4350C820S		C8		2.1			112
SFT75	4375C525S	M8–M20	C5	ER25	1.2	44	42	133
	4375C625S	1/4"–3/4"	C6		1.5			137
	4375C825S		C8		2.4			131
SFT100	43100C640S	M16–M30	C6	ER40	2.9	62	63	166
	43100C840S	5/8"–1"	C8		3.8			160

Note: The SFT high pressure coolant models (BCS) include a sealing disk nut. Other shanks and sizes or tools without internal coolant available on request. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1"

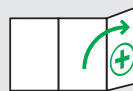
(A) Tap Holder SFT Tapmatic Capto Shank, Quick-Change, Internal Coolant System

Model	Order code for BCS version	Capacity (steel)	Shank	Adapter	Weight kg	D	d	L
SFT50	4350C4QCS	M4–M12	C4	Nr. 1	0.7	35	35	96
	4350C5QCS	#8–1/2"	C5		1.0			98
	4350C6QCS		C6		1.2			102
	4350C8QCS		C8		2.1			96
SFT75	4375C5QCS	M8–M16	C5	Nr. 1	1.2	44	40	115
	4375C6QCS	1/4"–5/8"	C6		1.5			119
	4375C8QCS		C8		2.4			113
SFT100	43100C6QCS	M16–M30	C6	Nr. 2	2.9	62	59	154
	43100C8QCS	1/2"–7/8"	C8		3.8			148

Note: Other shanks and sizes or tools without internal coolant available on request. When using Roll Form Taps the tool's capacity must be reduced 25%. All dimensions are shown in mm. 25.4mm = 1"

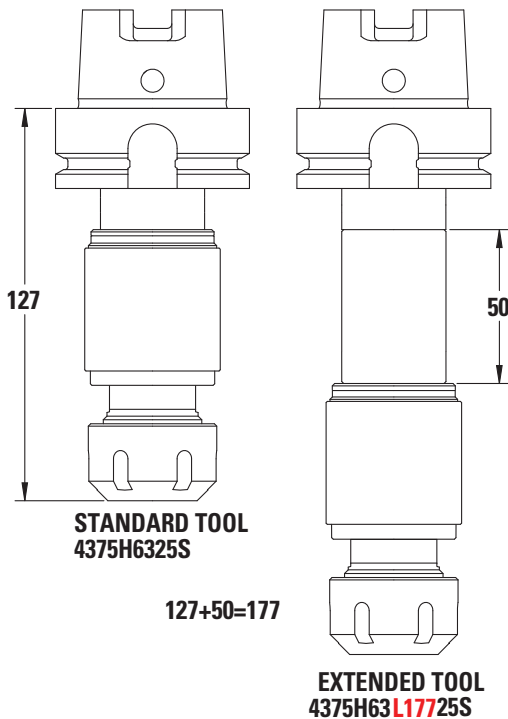
(C) ER Collet Adapter

Order code with Standard Nut	Adapter	Collets	d1	L1	Order code with IC-nut for BCS version	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



Synchronous feed tap holders with extended length, with internal coolant

Synchronized Tapping



Features and Advantages

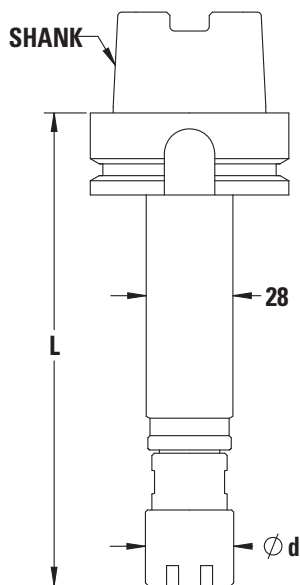
- four standard extensions of 50, 100, 150 and 200 mm
- increased tap life of 100% or more
- improved thread quality
- reduced downtime by lowering frequency of tap replacement
- Axial compensation +/- 0.5mm
- available with internal coolant pressure up to 80 bar

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



Selector Chart

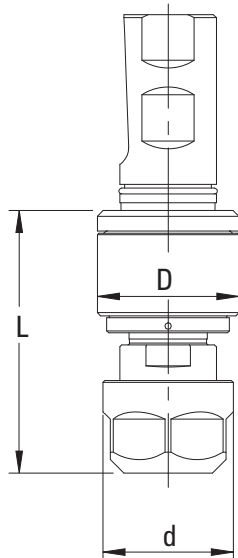


Speed Chart



Programming

Synchronous feed tap holders with micro length compensation and adjustable start force



Features and Advantages

- for backlash compensation in axial and radial direction
- eliminates pressure on the tap, thereby perfect threads and up to double tap life
- adjustable start force for applications requiring higher thrust forces to start the tap.
- steel collets ER-GB, modular shank versions
- internal coolant system up to 30 bar (BCS version for up to 80 bar)

How to Order

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

(A) Tap Holder SelectaFlex® Straight Shank and Weldon Flat, Adjustable Thrust

Model	Order code no BCS	Capacity (steel)	Straight shank Ø mm	Collets	Axial compensation mm	Dimensions			Weight kg	Order code for BCS version	L
						L mm	d mm	D mm			
SX10	44102511	M2–M5	25	ER11	± 0.5	52	19	26	0.4	44102511S	52
SX50	44502520	M4–M12	25	ER20	± 0.5	63	34	37	0.5	44502520S	68
SX75	44752525	M10–M20	25	ER25	± 0.5	83	42	44	1.0	44752525S	88
SX100	441002540	M20–M25	25	ER40	± 0.5	116	63	63	1.8	441002540S	121
SX150	441504050	M22–M48	40	ER50	± 2.0	153	78	75	4.0	441504050S	158

Note: When using internal coolant of more than 30 bar, we recommend using our Balanced Coolant System. The SX high pressure coolant models (BCS) include a sealing disk nut which adds 5 mm to «L» dimension. When using Roll Form Taps, the chuck's tapping capacity must be reduced by 25%. All dimensions are shown in mm. 25.4mm = 1"



(C)



Interchangeable Steep Tapers



Steel Collets



Sealing Gaskets



Selector Chart



Speed Chart



Programming