

SYNCHRO RTS



The Allrounder Solution
Highest Process Security
Great Performance



THREADING
TECHNOLOGY

EN-ID-0617

WHAT MEANS "RIGID TAPPING"?

All modern CNC-machines are now equipped with the option so-called "Rigid Tapping" (a tapping spindle with axial float is no longer needed).

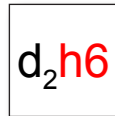
The main objective is to simplify the programming of the tapping operation. The optimal synchronisation between the rotation and the spindle feed permits the correct pitch to be cut, whilst the tap is held rigidly in a toolholder.



The perfect synchronization of the spindle and the programmed feed



The pitch to be cut is determined by the spindle feed

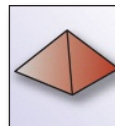


The tool is clamped rigidly

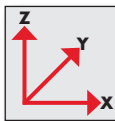
WHICH ARE THE REQUIREMENTS?



CNC machine with "Rigid Tapping" function (Synchro)



Efficient and stable machining centre



Synchronization of the spindle and the Z-axis

WHICH ARE THE ADVANTAGES ?



Wide range of application in over 50 materials



High cutting speeds = Reduced cycle times



Traditional tapping spindle unnecessary



Simplified programming



Process security thanks to NC-controlled feed



Shank tolerance h6, therefore shrinking possible

ONE TAP FOR ALL YOUR APPLICATIONS!

One tap for all materials? Unfortunately we can't keep this promise entirely, yet the application range of the RTS Geometry is impressive: Regardless of whether you work in aluminium, cast iron, stainless steel or highly alloyed materials up to 1'150 N/mm², the RTS gets them all!

11 Free-cutting steels 1.0711 9S20 1.0715 9SMn28 1.0718 9SMnPh28 1.0726 3S20 1.0737 9SMnPh36	12 Structural, cementation steels 1.0037 S137-2 (S235JR) 1.0050 S150-2 (E295) 1.0060 S160-2 (E335) 1.5919 15CrNi6 1.7131 16MnCr5	13 Carbon steels 1.0503 C45 1.0535 C55 1.0601 C60 1.1545 C105W1 1.2067 102Cr6 (100Cr6)	14 Alloy steels < 850 N/mm ² 1.2363 X100CrMoV5-1 1.3551 80MoCrV42-16 1.7218 25CrMo4 1.7220 34CrMo4 1.7225 42CrMo4
15 Alloy steels hard./temp. >850 - <1150 N/mm ² 1.3553 X82WMoCrV6-5-4 1.6580 30CrNiMo8 1.7220 34CrMo4 1.7225 42CrMo4 1.8507 34CrAlMo5	21 Free machining stainless steels 1.4005 X12CrS13 1.4104 X14CrMoS17 1.4305 X10CrNiS18-9	22 Austenitic stainless steels 1.4301 X5CrNi18-10 1.4406 X2CrNiMoN17-12-2 1.4435 X2CrNiMo18-14-3 1.4541 X6CrNiTi18-10 1.4571 X6CrNiMoTi17-12-2	31 Cast iron 0.6015 GG15 0.6020 GG20 0.6025 GG25 0.6030 GG30
32 Spheroidal graphite + malleable cast iron 0.7040 GGG40 0.7043 GGG40.3 0.7050 GGG50 0.7060 GGG60 0.7080 GGG80	61 Pure copper (electrolytic copper) 2.0060 E-Cu57 (E-Cu)	63 Long chip brass 2.0240 CuZn15 (Ms85) 2.0265 CuZn30 (Ms70) 2.0321 CuZn37 (Ms63)	72 Al alloyed Si < 1.5% 3.1255 AlCuSiMn 3.1355 AlCuMg2 3.2315 AlMgSi1 3.3206 AlMgSi0.5 3.4345 AlZnMgCu0.5
73 Al alloyed Si > 1.5% - < 10% 3.2161 G-AlSi8Cu3 3.2162 GD-AlSi8Cu3 3.2341 G-AlSi5Mg 3.2371 G-AlSi7Mg	74 Al alloyed Si > 10% Mg-alloys 3.2381 G-AlSi10Mg 3.2382 GD-AlSi10Mg 3.2581 G-AlSi12 3.2583 G-AlSi12 (Cu)		

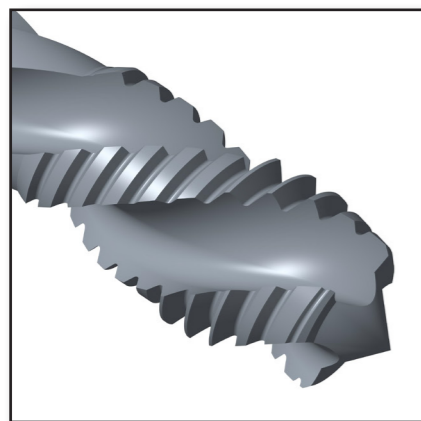
A COMPLETE PROGRAMME

DC has developed "multirange" taps **type RTS**, for through and blind holes, with and without internal coolant. These taps are designed to take advantage of "Rigid Tapping" and are capable of overcoming the negative effects by incorporating the following features:

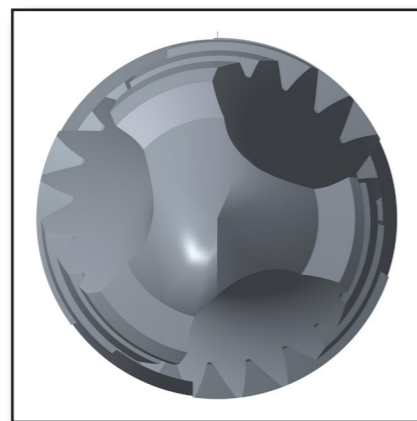
- Cutting geometry suitable for a wide range of current materials up to 1'150 N/mm² tensile strength, contributing to tool rationalisation and consequently to important cost reduction.
- Flute profile and double surface coating, which in spite of variable cutting speed ensure efficient swarf removal.
- Wide standard programme in M, MF, UNC, UNF and G (BSP), from Ø 2 up to 24 mm, as well as in several tolerances.



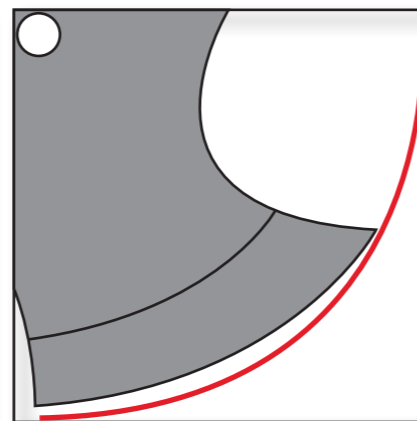
Truncated thread



Efficient swarf forming

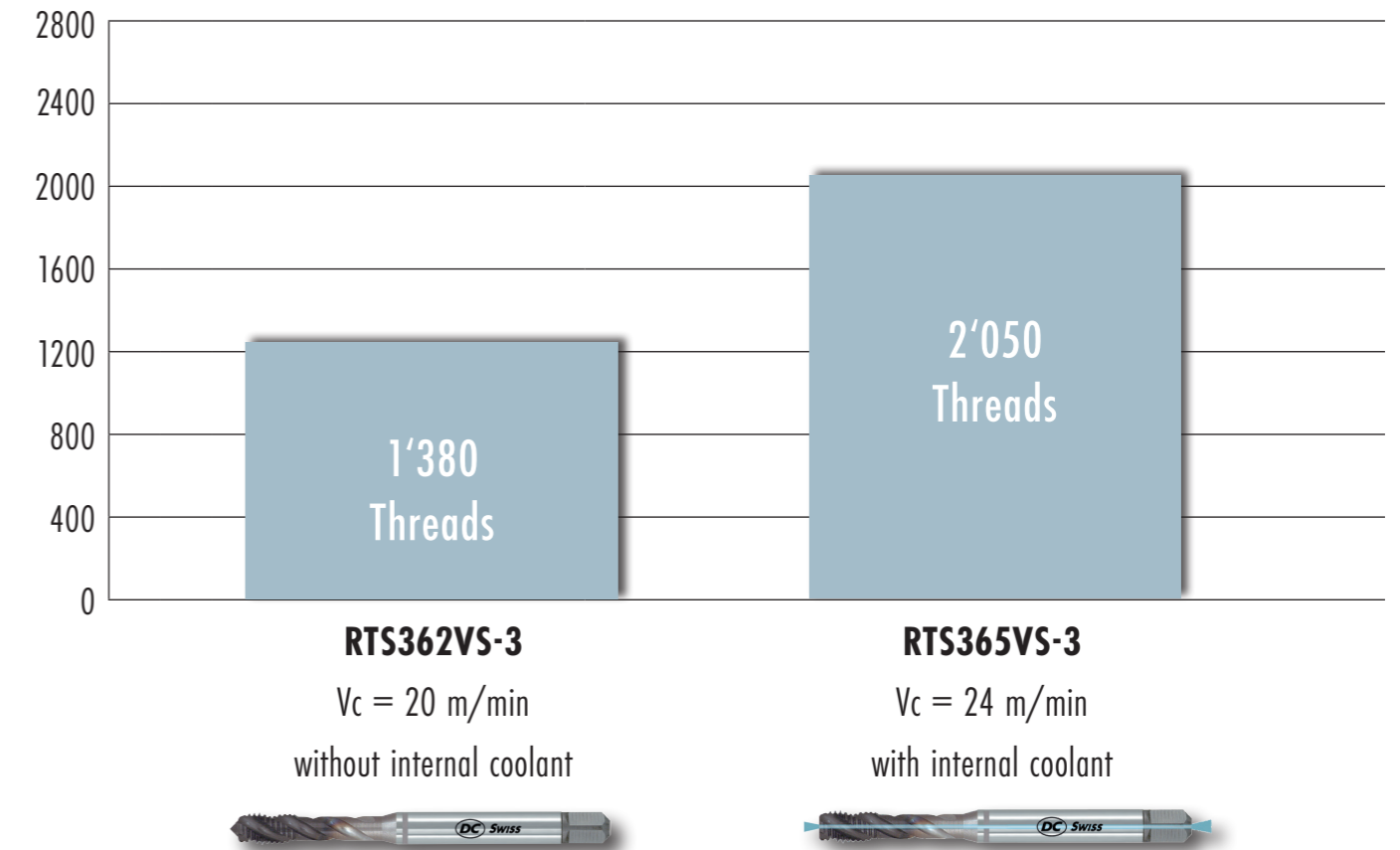


Strong relief



THE CHAMPION IN DETAIL

Material:	Alloy steel, 1.2363/ AISI A2	Core hole depth:	33 mm
Tensile strength:	850 N/mm ²	Threading depth:	25 mm
Thread size:	M10 6H	Working method:	Rigid Tapping
Kind of hole:	Blind hole	Position:	Vertical
		Lubricant:	Emulsion 10%



THE PERFECT CHOICE

DC Swiss offers a specific total solution adapted to this modern machining method; a tapping chuck with axial shock absorber, **type SRT**, Soft Rigid Tapping. This tapping chuck, suitable for quick change systems is able to overcome the axial pressure applied to the cutting edges when the spindle reverses, and therefore increasing the tap life.

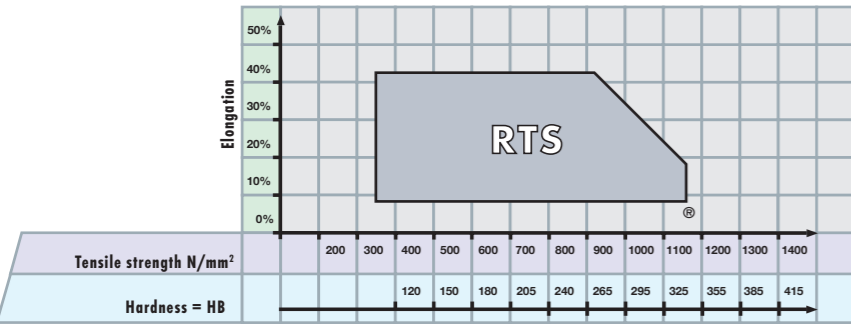


SRT tapping chucks see page 15

SRT

APPLICATION CHART FOR RIGID TAPPING

RTS Rigid Tapping



Use:

suitable with emulsion

optimal with emulsion

From page	RTS			
M	6	7	10	10
MF	11	11		
UNC	12	12		
UNF	13	13		
G		14		



Material classification

Material groups	Material designation	Hardness (HB)	Tensile strength Rm (N/mm²)	Elongation A (%)	Vc (m/min) < Ø 20 mm Guide line Coated VS	RTS .20VS RTS .23VS	RTS .62VS RTS .65VS	RTS523VS RTS623VS	RTS565VS RTS665VS	
10 Steels	11 Free-cutting steels	< 200	< 700	< 10	20 - 40					11
	12 Structural / cementation steels	< 200	< 700	< 30	20 - 40					12
	13 Carbon steels	< 300	< 1000	< 20	16 - 24					13
	14 Alloy steels < 850 N/mm²	< 250	< 850	< 30	16 - 24					14
	15 Alloy steels hard./temp. >850 - <1150 N/mm²	> 250	> 850	< 30	6 - 12					15
	16 High tensile alloy steels	> 250	> 850	< 12						16
20 Stainless Steels	21 Free machining stainless steels	< 250	< 850	< 25	20 - 40					21
	22 Austenitic stainless steels	< 250	< 850	> 20	6 - 12					22
	23 Ferritic and martensitic < 850 N/mm²	< 250	< 850	> 20						23
	24 Ferritic and martens. > 850 - < 1150 N/mm²	> 250	> 850	> 15						24
30 Cast iron	31 Cast iron	< 250	< 850	< 10	20 - 40					31
	32 Spheroidal graphite + malleable cast iron	< 250	< 850	> 10	20 - 40					32
40 Titanium	41 Pure titanium	< 250	< 850	> 20						41
	42 Titanium alloys	> 250	> 850	< 20						42
50 Nickel	51 Nickel alloys 1 < 850 N/mm²	< 250	< 850	> 25						51
	52 Nickel alloys 2 > 850 - < 1150 N/mm²	> 250	> 850	< 25						52
	53 Nickel alloys 3 > 1150 - ≤ 1600 N/mm²	> 340	> 1150	< 20						53
60 Copper	61 Pure copper (electrolytic copper)	< 120	< 400	> 12	10 - 20					61
	62 Short chip brass, phosphor bronze, gun metal	< 200	< 700	< 12						62
	63 Long chip brass	< 200	< 700	> 12	20 - 40					63
70 Aluminium Magnesium	71 Al unalloyed	< 100	< 350	> 15						71
	72 Al alloyed Si < 1.5 %	< 150	< 500	> 15	30 - 50					72
	73 Al alloyed Si > 1.5 % - < 10 %	< 120	< 400	< 15	20 - 40					73
	74 Al alloyed Si > 10 %, Mg-Alloys	< 120	< 400	< 10	20 - 40					74
80 Plastic compounds	81 Thermoplastics	-	-	-						81
	82 Duroplastics	-	-	-						82
	83 Glass fibre reinforced plastics	-	-	-						83

EXAMPLES FOR APPLICATION GROUPS

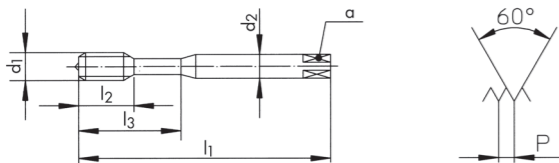
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15 Alloy steels hard./temp. >850 - <1150 N/mm² 1.3553 X82WMoCrV6-5-4 1.6580 30CrNiMo8 1.7220 34CrMo4 1.7225 42CrMo4 1.8507 34CrAlMo5	21 Free machining stainless steels 1.4005 X12CrS13 1.4104 X14CrMoS17 1.4305 X10CrNiS18-9	22 Austenitic stainless steels 1.4301 X5CrNi18-10 1.4406 X2CrNiMoN17-12-2 1.4435 X2CrNiMo18-14-3 1.4541 X6CrNiTi18-10 1.4571 X6CrNiMoTi17-12-2	31 Cast iron 0.6015 GG15 0.6020 GG20 0.6025 GG25 0.6030 GG30
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11 Free-cutting steels 1.0711 1212 1.0715 1213 1.0718 12L13 1.0726 1140 1.0737 12L14	12 Structural, cementation steels 1.0037 1015 1.0050 A570 Gr.50 1.0060 A572 Gr.65 1.5919 3115 1.7131 5115	13 Carbon steels 1.0503 1045 1.0535 1055 1.0601 1060 1.1545 W110 1.2067 L3	14 Alloy steels < 850 N/mm² 1.2363 A2 1.3551 M50 1.7218 4130 1.7220 4135 1.7225 4140
15 Alloy steels hard./temp. >850 - <1150 N/mm² 1.3553 - 1.6580 4340 1.7220 4135 1.7225 4140 1.8507 A355CLD (K23510)	21 Free machining stainless steels 1.4005 416 1.4104 430F 1.4305 303	22 Austenitic stainless steels 1.4301 304 1.4406 316LN 1.4435 316L 1.4541 321 1.4571 316Ti	31 Cast iron 0.6015 A48-25B 0.6020 A48-30B 0.6025 A48-40B 0.6030 A48-45B
32 Spheroidal graphite + malleable cast iron 0.7040 60-40-18 0.7043 - 0.7050 65-45-12 0.7060 80-55-06 0.7080 120-90-02	61 Pure copper (electrolytic copper) 2.0060 C11000	63 Long chip brass 2.0240 C23000 2.0265 C26000 2.0321 C27200	72 Al alloyed Si < 1.5 % 3.1255 2014 3.1355 2024 3.2315 6082 3.3206 6060 3.4345 7020
73 Al alloyed Si > 1.5 % - < 10 % 3.2161 380.1 3.2162 - 3.2341 - 3.2371 A 356.2	74 Al alloyed Si > 10 % Mg-Alloys 3.2381 A360 3.2382 - 3.2581 A413 3.2583 413.1	Reference: AISI	

RTS Rigid Tapping Synchro

RTS320VS-4 RTS420VS-4 RTS323VS-4 RTS423VS-4

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6HX **6HX** **6HX** **6HX**

∅ d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm			ID	ID	ID	ID
*2	0.40	45	8.0		2.8(h9)	2.1	2		143532			
2.5	0.45	50	10.0		2.8(h9)	2.1	3		143534			
3	0.50	56	5.5	18	3.5(h9)	2.7	3		150601			
4	0.70	63	7.5	21	4.5(h9)	3.4	3		150603			
5	0.80	70	9.0	25	6.0	4.9	3		150605		150606	
6	1.00	80	11.0	30	6.0	4.9	3		150610		150611	
8	1.25	90	12.5	35	8.0	6.2	3		150620		150621	
10	1.50	100	14.0	39	10.0	8.0	3		150635		150636	
12	1.75	110	14.0		*10.0	*8.0	3			151863		151864
14	2.00	110	14.0		*12.0	*9.0	3			162535		
16	2.00	110	18.0		12.0	9.0	3			150670		150671
20	2.50	140	24.0		16.0	12.0	4			150679		
24	3.00	160	27.0		16.0	12.0	4			162787		

* DC Norm

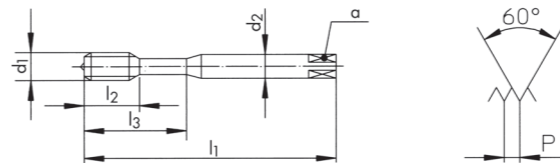
* RTS320VS-3 2.5 x P

sur demande
auf Anfrage
on request
su richiesta
sobre pedido
≥ Ø 6 mm

RTS Rigid Tapping Synchro

RTS362VS-3 RTS462VS-3 RTS365VS-3 RTS465VS-3

RTS362VS-3			VS	<table border="1"> <tr><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>21</td><td>22</td><td>31</td></tr> <tr><td>32</td><td>61</td><td>63</td><td>72</td></tr> <tr><td>73</td><td>74</td><td></td><td></td></tr> </table>	11	12	13	14	15	21	22	31	32	61	63	72	73	74			
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11	12	13	14																		
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6HX **6HX** **6HX** **6HX**

∅ d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm			ID	ID	ID	ID
*2	0.40	45	7.0		2.8(h9)	2.1	3		143536			
*2.5	0.45	50	9.0		2.8(h9)	2.1	3		143538			
3	0.50	56	5.5	18	3.5(h9)	2.7	3		150602		160477	
4	0.70	63	7.5	21	4.5(h9)	3.4	3		150604		160478	
5	0.80	70	9.0	25	6.0	4.9	3		150607		150608	
6	1.00	80	11.0	30	6.0	4.9	3		150612		150613	
8	1.25	90	12.5	35	8.0	6.2	3		150622		150623	
10	1.50	100	14.0	39	10.0	8.0	3		150637		150638	
12	1.75	110	14.0		*10.0	*8.0	3			151865		151866
14	2.00	110	14.0		*12.0	*9.0	3			151870		150663
16	2.00	110	18.0		12.0	9.0	3			150672		150673
20	2.50	140	24.0		16.0	12.0	4			150681		150682
24	3.00	160	27.0		16.0	12.0	4			151873		150690

* DC Norm

* RTS360VS-3 2.5 x P

sur demande
auf Anfrage
on request
su richiesta
sobre pedido
≥ Ø 6 mm



Uniquement pour taraudage synchrone
Nur für Synchrobearbeitung
Only for rigid tapping
Solo per maschiatura sincrona
Solo para roscado sincronizado



RTS
Rigid Tapping Synchro

RTS362VS-5



RTS365VS-5



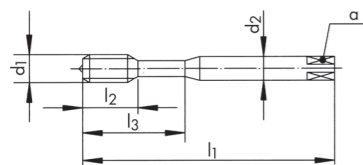
RTS362VS-5

RTS365VS-5



6HX

6HX



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm	6H	6H
3	0.50	56	5.5	18	3.5 (h9)	2.7	3	2.50
4	0.70	63	7.5	21	4.5 (h9)	3.4	3	3.30
5	0.80	70	9.0	25	6.0	4.9	3	4.20
6	1.00	80	11.0	30	6.0	4.9	3	5.00
8	1.25	90	12.5	35	8.0	6.2	3	6.80
10	1.50	100	14.0	39	10.0	8.0	3	8.50

ID

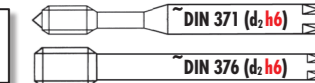
ID



sur demande
auf Anfrage
on request
su richiesta
sobre pedido
≥ Ø 6 mm



Uniquement pour taraudage synchrone
Nur für Synchrobearbeitung
Only for rigid tapping
Solo per maschiatura sincrona
Solo para roscado sincronizado



RTS
Rigid Tapping Synchro

RTS362VS-3



RTS462VS-3



RTS362VS-3

RTS462VS-3

RTS362VS-3

RTS462VS-3

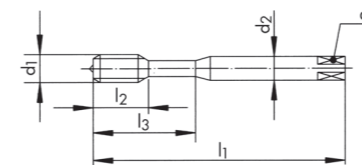


6GX

6GX

7GX

7GX



Ø d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm	6H	6H
3	0.50	56	5.5	18	3.5 (h9)	2.7	3	2.50
4	0.70	63	7.5	21	4.5 (h9)	3.4	3	3.30
5	0.80	70	9.0	25	6.0	4.9	3	4.20
6	1.00	80	11.0	30	6.0	4.9	3	5.00
8	1.25	90	12.5	35	8.0	6.2	3	6.80
10	1.50	100	14.0	39	10.0	8.0	3	8.50
12	1.75	110	14.0		*10.0	*8.0	3	10.20
16	2.00	110	18.0		12.0	9.0	3	14.00

* DC Norm

ID 6H

ID 6H

ID 6H

ID 6H



sur demande
auf Anfrage
on request
su richiesta
sobre pedido
≥ Ø 6 mm

RTS Rigid Tapping Synchro

RTS523VS-4 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS623VS-4 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS565VS-3 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

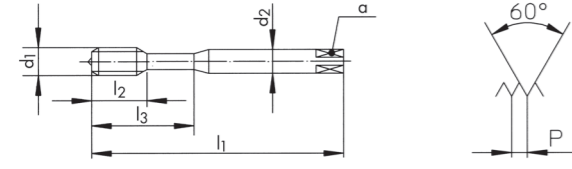
RTS665VS-3 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS523VS-4 RTS623VS-4 RTS565VS-3 RTS665VS-3



6HX **6HX** **6HX** **6HX**



∅ d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm		
5	0.80	125	9.0	25	6.0	4.9	3	4.20
6	1.00	125	11.0	30	6.0	4.9	3	5.00
8	1.25	140	12.5	35	8.0	6.2	3	6.80
10	1.50	160	14.0	39	10.0	8.0	3	8.50
12	1.75	180	14.0	*10.0	*8.0	8.0	3	10.20
16	2.00	200	18.0		12.0	9.0	3	14.00

* DC Norm

∅ d ₁ M	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm		
6	1.00	125	11.0	30	6.0	4.9	3	5.00
8	1.25	140	12.5	35	8.0	6.2	3	6.80
10	1.50	160	14.0	39	10.0	8.0	3	8.50
12	1.75	180	14.0	*10.0	*8.0	8.0	3	10.20
16	2.00	200	18.0		12.0	9.0	3	14.00

* DC Norm

sur demande
auf Anfrage
on request
su richiesta
sobre pedido
≥ ∅ 6 mm

RTS Rigid Tapping Synchro

RTS320VS-4 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS420VS-4 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS362VS-3 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

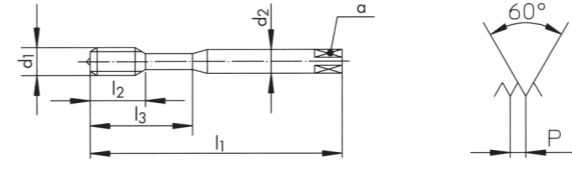
RTS462VS-3 VS

11	12	13	14
15	21	22	31
32	61	63	72
73	74		

RTS320VS-4 RTS420VS-4 RTS362VS-3 RTS462VS-3



6HX **6HX** **6HX** **6HX**



∅ d ₁ MF	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm		
8	1.00	90	12.5	35	8.0	6.2	3	7.00
10	1.00	100	14.0	39	10.0	8.0	3	9.00
12	1.50	110	14.0	*10.0	*8.0	8.0	3	10.50
14	1.50	110	14.0	*12.0	*9.0	9.0	3	12.50
16	1.50	110	18.0		12.0	9.0	3	14.50

* DC Norm

∅ d ₁ MF	P mm	l ₁ mm	l ₂ mm	l ₃ mm	d ₂ h ₆ mm	a mm		
8	1.00	90	12.5	35	8.0	6.2	3	7.00
10	1.00	100	14.0	39	10.0	8.0	3	9.00
12	1.50	110	14.0	*10.0	*8.0	8.0	3	10.50
14	1.50	110	14.0	*12.0	*9.0	9.0	3	12.50
16	1.50	110	18.0		12.0	9.0	3	14.50

* DC Norm

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Rigid Tapping Synchro

	RTS320VS-4	RTS420VS-4	RTS362VS-3	RTS462VS-3																																																																																																																																							
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sur demande auf Anfrage on request su richiesta sobre pedido

≥ Ø 6 mm

RTS



Rigid Tapping Synchro



	RTS320VS-4	RTS420VS-4	RTS362VS-3	RTS462VS-3																																																																																																									
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Ø" d ₁	P	d ₁	l ₁	l ₂	l ₃	d ₂ h6	a	α	φ	φ	ID	ID	ID	ID																																																																																															
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5/16	24	7.93	90	12.5	35	8.0	6.2	3	6.90		157411		157415																																																																																																
3/8	24	9.52	100	14.0	39	10.0	8.0	3	8.50		157412		157416																																																																																																
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sur demande auf Anfrage on request su richiesta sobre pedido

≥ Ø 6 mm


RTS
Rigid Tapping Synchro



RTS462VS-3   **VS**



RTS462VS-5   **VS**

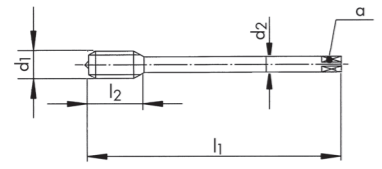
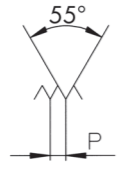
11	12	13	14
15	21	22	31
32	61	63	72
73	74		



RTS462VS-3 RTS462VS-5




 < 2.5 x D  < 2.5 x D

 **C** 2.5 x P  **E** 1.5 x P

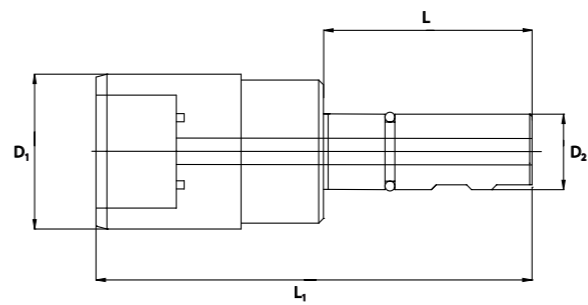
Ø" d ₁	P	d ₁	l ₁	l ₂	d ₂ h6	a			ID	ID
G	TPI	mm	mm	mm	mm	mm				
1/8	28	9.72	100	14.0	*8.0	*6.2	3	8.75	151861	170629
1/4	19	13.15	110	14.0	*12.0	*9.0	3	11.60	151868	170631
3/8	19	16.66	110	18.0	12.0	9.0	4	15.20	151872	170633
1/2	14	20.95	125	20.0	16.0	12.0	4	18.90	150685	170635


* DC Norm










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SRT DIN 1835 B short



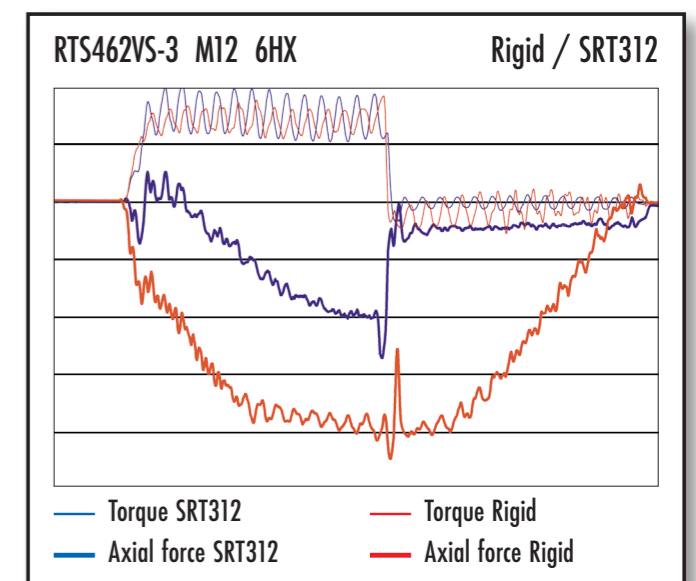
	D ₁	D ₂	L	L ₁	
	mm	mm	mm	mm	
M3 - M12	39	20	47	86.0	S1
M3 - M12	39	25	53	90.0	S1
M5 - M20	56	25	53	110.0	S2

SRT312-D20	SRT312-D25	SRT520-D25
		
		
		
<30 bar	<30 bar	<30 bar
ID	ID	ID
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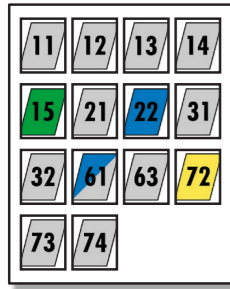
TOP PERFORMANCE DUE TO SRT-TAPPING CHUCKS

The graphic shows very clearly the reduction of the force in Z-axis, especially while reversing the spindle rotation, by using the **DC** tapping chuck with axial shock absorber type SRT.

-  **Integrated quick-change adapter**
-  **Strongly increased tool life**
-  **Improved process safety**



PICTOGRAPHS



For material groups as per DC application chart

Reinforced shank, ~DIN 371 (d₂ h₆)
 Reduced shank, ~DIN 376 (d₂ h₆)

Straight flutes with spiral point

40° right hand spiral flutes

PM HSSE-PM

Through holes for long chipping materials

Blind holes for long chipping materials < 2.5 x D

B 3.5 - 5 chamfered threads, form B

C 2 - 3 chamfered threads, form C

E 1.5 - 2 chamfered threads, form E

6HX Tolerance class 6HX

Internal coolant with radial outflow

Internal coolant with frontal outflow

Truncated thread

VS DC wear-protective coating

SYNCHRO Only for rigid tapping

THIS IS DC SWISS

Thread cutting

Crown tap

Thread milling

Tapping chucks

SWISS MADE

Thread forming

Thread gauges

Thread dies



« AS A MECHANICAL SUBCONTRACTOR WE ARE CONFRONTED TO A HUGE VARIETY OF DIFFERENT MATERIALS. THIS IS WHY WE NEED A RELIABLE AND ON THE SAME TIME UNIVERSAL TAPPING SOLUTION. WITH THE RTS WE FINALLY FOUND THE RIGHT ANSWER. »

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Fax +41 32 491 64 64
E-mail: info@dcswiss.ch



**THREADING
TECHNOLOGY**

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