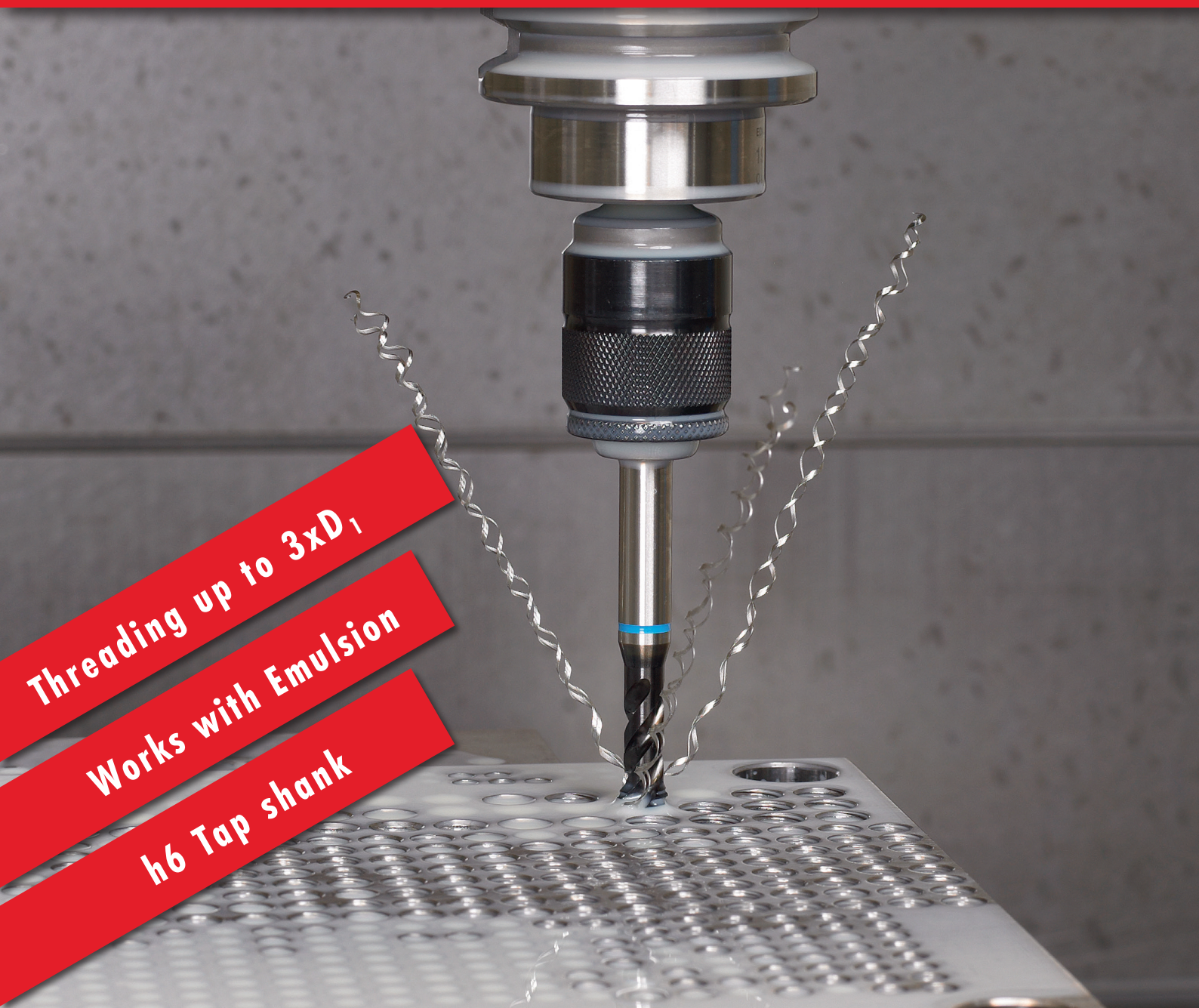


STAINLESS STEELS



Threading up to $3 \times D_1$

Works with Emulsion

h6 Tap shank



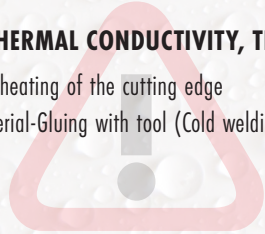
THREADING
TECHNOLOGY

THE CHALLENGE

WORKING WITH STAINLESS STEELS

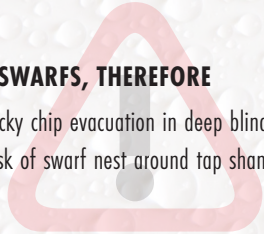
POOR THERMAL CONDUCTIVITY, THEREFORE

- Overheating of the cutting edge
- Material-Gluing with tool (Cold welding)



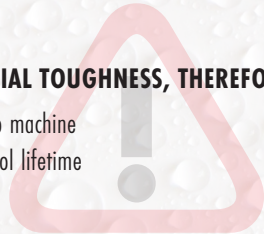
LONG SWARFS, THEREFORE

- Tricky chip evacuation in deep blind holes
- Risk of swarf nest around tap shank

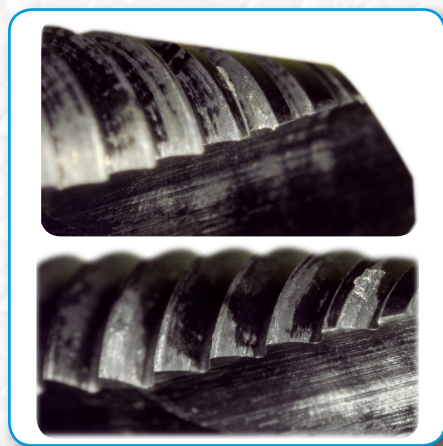


HIGH MATERIAL TOUGHNESS, THEREFORE

- Difficult to machine
- Limited tool lifetime



THE CONSEQUENCES



COLD WELDINGS



SWARF NESTS



DISSATISFIED CUSTOMER

THE SOLUTION

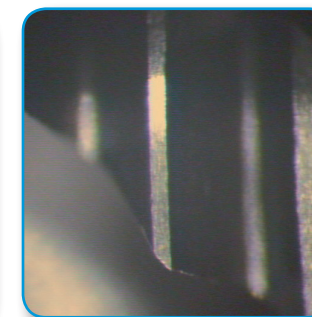
DC SWISS Z-INOX THREAD CUTTING

Z | I N O X



PROPERTIES

The tap is made from HSSE-PM and is available with or without internal lubrication. The flutes are helical R 45, for tapping blind holes up to $3 \times D_1$, in Stainless and alloy steels with high elongation and tensile strength up to $1'150 \text{ N/mm}^2$.



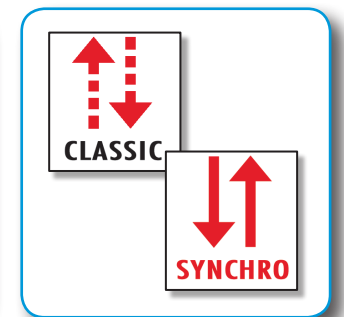
SUITABLE FOR SOLUBLE WATER

The VS surface coating provides protection against wear and cold welding. A high slip coefficient facilitates chip removal and reduces torque.



PROCESS SAFETY UP TO $3 \times D_1$

The cutting geometry and shape of the R45 flutes generate compact, regular chips, ensuring process safety.



IT'S YOUR CHOICE

The cutting geometry is suitable for classical tapping with a compensating spindle as well as for rigid tapping ($h6$ shank for shrinking).

APPLICATION CHART

Use

- Optimal with cutting oil
- Suitable with cutting oil
- Optimal with emulsion
- Suitable with emulsion



Material classification

Material groups	Material designation	Hardness (HB)	Tensile strength Rm (N/mm ²)	Elongation A (%)	Z. 70VS	Z. 73VS	Z. 20VS	Vc (m/min)
10 Steels	11 Free-cutting steels	< 200	< 700	< 10				
	12 Structural / cementation steels	< 200	< 700	< 30				
	13 Carbon steels	< 300	< 1000	< 20				
	14 Alloy steels < 850 N/mm ²	< 250	< 850	< 30				
	15 Alloy steels hard. / temp. > 850 - < 1150 N/mm ²	> 250	> 850	< 30				6 - 12
16 High tensile alloy steels	> 250	> 850	< 12					
20 Stainless Steels	21 Free machining stainless steels	< 250	< 850	< 25				20 - 30
	22 Austenitic stainless steels	< 250	< 850	> 20				6 - 12
	23 Ferritic and martensitic < 850 N/mm ²	< 250	< 850	> 20				6 - 12
	24 Ferritic and martens. > 850 - < 1150 N/mm ²	> 250	> 850	> 15				4 - 8
30 Cast iron	31 Cast iron	< 250	< 850	< 10				
	32 Spheroidal graphite + malleable cast iron	< 250	< 850	> 10				
40 Titan	41 Pure titanium	< 250	< 850	> 20				
	42 Titanium alloys	> 250	> 850	< 20				
50 Nickel	51 Nickel alloys 1 < 850 N/mm ²	< 250	< 850	> 25				6 - 12
	52 Nickel alloys 2 > 850 - < 1150 N/mm ²	> 250	> 850	< 25				4 - 8
	53 Nickel alloys 3 > 1150 - ≤ 1600 N/mm ²	> 340	> 1150	< 20				
60 Copper	61 Pure copper (electrolytic copper)	< 120	< 400	> 12				12 - 16
	62 Short chip brass, phosphor bronze, gun metal	< 200	< 700	< 12				
	63 Long chip brass	< 200	< 700	> 12				
70 Aluminium Magnesium	71 Al unalloyed	< 100	< 350	> 15				
	72 Al alloyed Si < 1.5 %	< 150	< 500	> 15				
	73 Al alloyed Si > 1.5 % - < 10 %	< 120	< 400	< 15				
	74 Al alloyed Si > 10 %, Mg-Alloys	< 120	< 400	< 10				

Reference: DIN

15 Alloy steels hard./temp. > 850 - < 1150 N/mm ²	21 Free machining stainless steels	22 Austenitic stainless steels	23 Ferritic and martensitic < 850 N/mm ²
1.3553 X82WCrV6-5-4 1.6580 30CrNiMo8 1.7220 34CrMo4 1.7225 42CrMo4 1.8507 34CrAlMo5	1.4005 X12CrS13 1.4104 X14CrMoS17 1.4305 X10CrNiS18-9	1.4301 X5CrNi18-10 1.4406 X2CrNiMoN17-12-2 1.4435 X2CrNiMo18-14-3 1.4541 X6CrNiTi18-10 1.4571 X6CrNiMoTi17-12-2	1.4112 X90CrMoV18 1.4540 X4CrNiCuNb16-4 1.4582 X4CrNiMoNb25-7 1.4762 X10CrAl24 1.4922 X20CrMo11-1
24 Ferritic and martensitic > 850 - < 1150 N/mm ²	51 Nickel alloys 1 < 850 N/mm ²	52 Nickel alloys 2 > 850 - < 1150 N/mm ²	61 Pure copper (electrolytic copper)
1.4057 X17CrNi17-2 1.4125 X105CrMo17 1.4542 X5CrNiCuNb16-4 1.4548 X5CrNiCuNb17-4-4 1.4748 X85CrMoV18-2	1.3912 Ni36 (Invar) 2.4360 NiCu30Fe (Monel 400) 2.4816 NiCr15Fe (Inconel 600) 1.4876 X10NiCrAlTi32-20	2.4375 NiCu30Al (MonelK500) 2.4631 NiCr20TiAl (Nimonic 80) 2.4668 NiCr19NbMo (Inconel718)	2.0060 E-Cu57 (E-Cu)

Reference: AISI/ASTM

15 Alloy steels hard./temp. > 850 - < 1150 N/mm ²	21 Free machining stainless steels	22 Austenitic stainless steels	23 Ferritic and martensitic < 850 N/mm ²
1.3553 - 1.6580 4340 1.7220 4135 1.7225 4140 1.8507 A355CLD (K23510)	1.4005 416 1.4104 430F 1.4305 303	1.4301 304 1.4406 316LN 1.4435 316L 1.4541 321 1.4571 316Ti	1.4112 440B 1.4540 XM12 (15-5PH) 1.4582 - 1.4762 446 1.4821 4922
24 Ferritic and martensitic > 850 - < 1150 N/mm ²	51 Nickel alloys 1 < 850 N/mm ²	52 Nickel alloys 2 > 850 - < 1150 N/mm ²	61 Pure copper (electrolytic copper)
1.4057 431 1.4125 440C 1.4542 630 (17-4PH) 1.4748 -	1.3912 K93600 2.4360 N04400 1.4816 N08800	2.4375 N05500 (B865) 2.4631 N07080 (B637) 2.4668 N07718 (B637)	2.0060 C11000

Pictographs

PM HSSE-PM

VS wear-protective coating

6HX Tolerance class 6HX

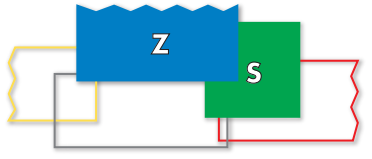


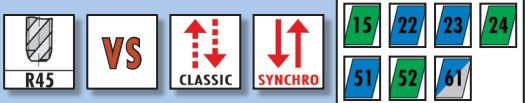
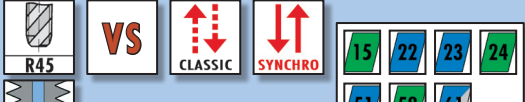
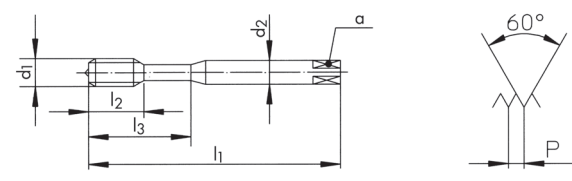


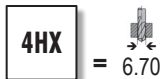
For Classic Tapping

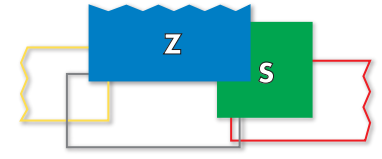


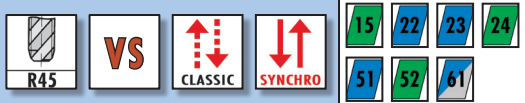

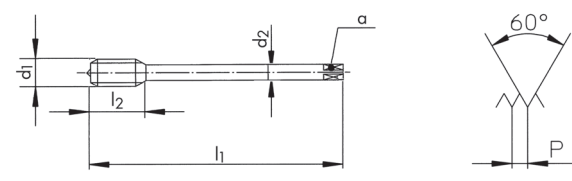


R45 45° right hand spiral flutes

C 2 - 3 chamfered threads, form C

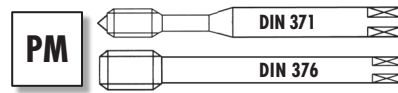
Blind hole < 3 x D_r, long chipping materials

For Rigid Tapping

										Z362VS-3	Z370VS-3	Z370VS-3	Z373VS-3																																																																																																
																																																																																																													
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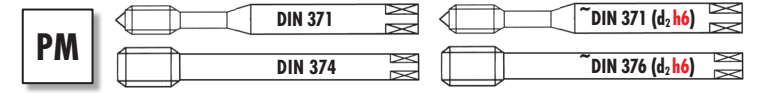
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<table border="1"> <thead> <tr> <th>Ø d₁</th> <th>P</th> <th>l₁</th> <th>l₂</th> <th>d₂ h6</th> <th>a</th> <th></th> <th></th> <th>ID</th> <th>ID</th> </tr> <tr> <th>M</th> <th>mm</th> <th>mm</th> <th>mm</th> <th>mm</th> <th>mm</th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr><td>12</td><td>1.75</td><td>110</td><td>14.0</td><td>*10.0</td><td>*8.0</td><td>4</td><td>10.20</td><td>162782</td><td>165242</td></tr> <tr><td>14</td><td>2.00</td><td>110</td><td>14.0</td><td>*12.0</td><td>*9.0</td><td>4</td><td>12.00</td><td>162783</td><td></td></tr> <tr><td>16</td><td>2.00</td><td>110</td><td>18.0</td><td>12.0</td><td>9.0</td><td>4</td><td>14.00</td><td>162784</td><td>165244</td></tr> <tr><td>18</td><td>2.50</td><td>125</td><td>21.0</td><td>14.0</td><td>11.0</td><td>4</td><td>15.50</td><td>170643</td><td></td></tr> <tr><td>20</td><td>2.50</td><td>140</td><td>24.0</td><td>16.0</td><td>12.0</td><td>4</td><td>17.50</td><td>162785</td><td>165234</td></tr> <tr><td>22</td><td>2.50</td><td>140</td><td>24.0</td><td>16.0</td><td>12.0</td><td>4</td><td>19.50</td><td>175190</td><td></td></tr> <tr><td>24</td><td>3.00</td><td>160</td><td>27.0</td><td>16.0</td><td>12.0</td><td>4</td><td>21.00</td><td>162786</td><td>165235</td></tr> </tbody> </table>										Ø d ₁	P	l ₁	l ₂	d ₂ h6	a			ID	ID	M	mm	mm	mm	mm	mm					12	1.75	110	14.0	*10.0	*8.0	4	10.20	162782	165242	14	2.00	110	14.0	*12.0	*9.0	4	12.00	162783		16	2.00	110	18.0	12.0	9.0	4	14.00	162784	165244	18	2.50	125	21.0	14.0	11.0	4	15.50	170643		20	2.50	140	24.0	16.0	12.0	4	17.50	162785	165234	22	2.50	140	24.0	16.0	12.0	4	19.50	175190		24	3.00	160	27.0	16.0	12.0	4	21.00	162786	165235			
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M ISO DIN 13



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∅ d ₁	P	l ₁	l ₂	l ₃	d ₂	α			ID	ID																																																																																																																																						
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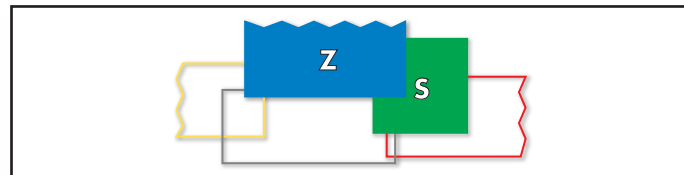
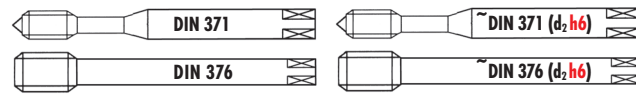
MF ISO DIN 13



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<p>Z320VS-4 VS </p> <p>Z420VS-4 VS </p> <p>Z370VS-3 VS CLASSIC SYNCHRO</p> <p>Z470VS-3 VS CLASSIC SYNCHRO</p>																																																																																																
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∅ d ₁	P	l ₁	l ₂	l ₃	d ₂	h ₆	α			ID	ID																																																																																					
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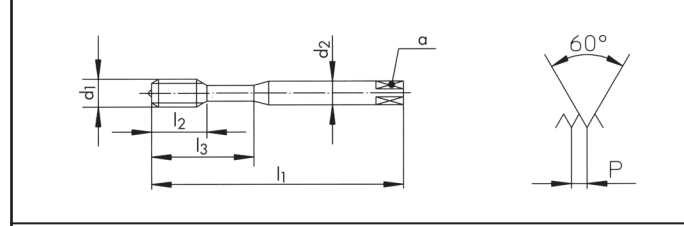
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Z470VS-3 R45 VS CLASSIC SYNCHRO [15] [22] [23] [24] [51] [52] [61]

Z320VS-4	Z420VS-4	Z370VS-3	Z470VS-3
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PM PM PM PM



B 4 x P B 4 x P C 2.5 x P C 2.5 x P

2B 2B 2BX 2BX

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10	24	4.82	70	15.0	25	6.0	4.9	3	3.80	111562	
1/4	20	6.35	80	17.0	30	7.0	5.5	3	5.10	111563	
5/16	18	7.93	90	20.0	35	8.0	6.2	3	6.50	111564	
3/8	16	9.52	100	22.0	39	10.0	8.0	3	8.00	111565	
1/2	13	12.70	110	24.0		9.0	7.0	3	10.80		111566
5/8	11	15.87	110	30.0		12.0	9.0	3	13.60		111567
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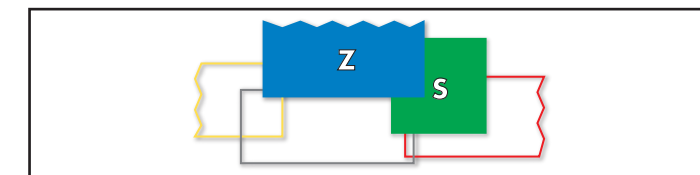
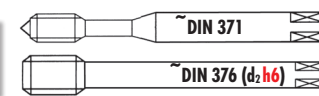
Ø" d ₁	P	d ₁	l ₁	l ₂	l ₃	d ₂ h6	a	3	4	ID	ID
UNC	TPI	mm	mm	mm	mm	mm	mm				
6	32	3.50	56	6.5	20	4.0(h9)	3.0	3	2.75		166123
8	32	4.16	63	7.5	21	4.5(h9)	3.4	3	3.40		166124
10	24	4.82	70	9.0	25	6.0	4.9	3	3.80		166125
1/4	20	6.35	80	11.0	30	*6.0	*4.9	3	5.10		166126
5/16	18	7.93	90	12.5	35	8.0	6.2	3	6.50		166127
3/8	16	9.52	100	14.0	39	10.0	8.0	3	8.00		166128
7/16	14	11.11	100	14.0		8.0	6.2	3	9.30		166129
1/2	13	12.70	110	14.0		*10.0	*8.0	4	10.80		166130
5/8	11	15.87	110	18.0		12.0	9.0	4	13.60		166131
3/4	10	19.05	125	21.0		14.0	11.0	4	16.60		166132
1	8	25.40	160	27.0		16.0	12.0	4	22.30		175703

* Norm DC

3B
UNC(J) See DC Main Catalogue

UNF ANSI B1.1

PM



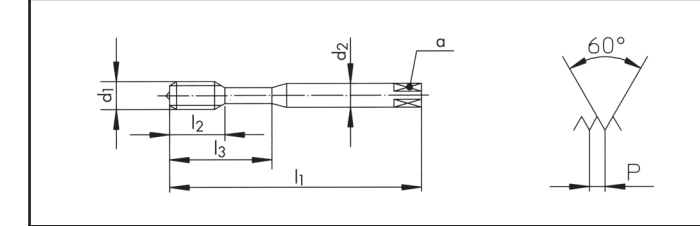
Z370VS-3 R45 VS CLASSIC SYNCHRO [15] [22] [23] [24] [51] [52] [61]

Z470VS-3 R45 VS CLASSIC SYNCHRO [15] [22] [23] [24] [51] [52] [61]

Z370VS-3	Z470VS-3
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PM PM



C 2.5 x P C 2.5 x P

2BX 2BX

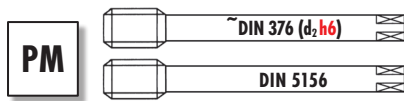
Ø" d ₁	P	d ₁	l ₁	l ₂	l ₃	d ₂ h6	a	3	4	ID	ID
UNF	TPI	mm	mm	mm	mm	mm	mm				
10	32	4.82	70	9.0	25	6.0	4.9	3	4.05	166136	
1/4	28	6.35	80	11.0	30	*6.0	*4.9	3	5.50	166135	
5/16	24	7.93	90	12.5	35	8.0	6.2	3	6.90	166134	
3/8	24	9.52	100	14.0	39	10.0	8.0	3	8.50	166133	
7/16	20	11.11	100	14.0		8.0	6.2	3	9.80		166138
1/2	20	12.70	110	14.0		*10.0	*8.0	4	11.40		166137

* Norm DC

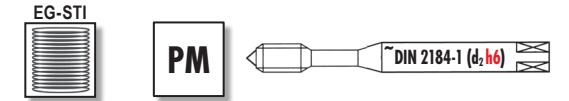
3B
UNF(J)

Ø" d ₁	P	d ₁	l ₁	l ₂	l ₃	d ₂ h6	a	3	4	ID
UNF	TPI	mm	mm	mm	mm	mm	mm			
10	32	4.82	70	9.0	25	6.0	4.9	3	4.15	165121
1/4	28	6.35	80	11.0	30	*6.0	*4.9	3	5.55	165122
5/16	24	7.93	90	12.5	35	8.0	6.2	3	7.00	165123
3/8	24	9.52	100	14.0	39	10.0	8.0	3	8.60	165124

* Norm DC



		Z420VS-4	Z470VS-3							
Z420VS-4										
Z470VS-3										
$\varnothing^{\prime\prime} d_1$	P	d_1	l_1	l_2	d_2	a			ID	
G	TPI	mm	mm	mm	mm	mm				
1/8	28	9.72	90	22.0	7.0	5.5	3	8.75	142800	
1/4	19	13.15	100	20.0	11.0	9.0	3	11.60	119303	
3/8	19	16.66	100	20.0	12.0	9.0	3	15.20	142802	
1/2	14	20.95	125	22.0	16.0	12.0	4	18.90	142803	
$\varnothing^{\prime\prime} d_1$	P	d_1	l_1	l_2	d_2	h_6	a			ID
G	TPI	mm	mm	mm	mm	mm	mm			
1/8	28	9.72	100	14.0	*8.0	*6.2	3	8.75	165198	
1/4	19	13.15	110	14.0	*12.0	*9.0	4	11.60	165199	
3/8	19	16.66	110	18.0	12.0	9.0	4	15.20	165200	
1/2	14	20.95	125	20.0	16.0	12.0	4	18.90	165201	



		Z370VS-3									
Z370VS-3											
$\varnothing^{\prime\prime} d_1$	P	d_1	l_1	l_2	l_3	d_2	h_6	a			ID
EG UNC	TPI	mm	mm	mm	mm	mm	mm	mm			
4	40	3.67	56	6.5	20	4.0(h9)	3.0	3	3.05		165126
6	32	4.53	70	9.0	25	6.0	4.9	3	3.75		165127
8	32	5.19	70	9.0	25	6.0	4.9	3	4.45		165128
$\varnothing^{\prime\prime} d_1$	P	d_1	l_1	l_2	l_3	d_2	h_6	a			ID
EG UNF	TPI	mm	mm	mm	mm	mm	mm	mm			
10	32	5.85	80	11.0	30	6.0	4.9	3	5.10		165129
1/4	28	7.52	90	12.5	35	8.0	6.2	3	6.65		165130
5/16	24	9.31	90	12.5	35	*8.0	*6.2	3	8.20		165131

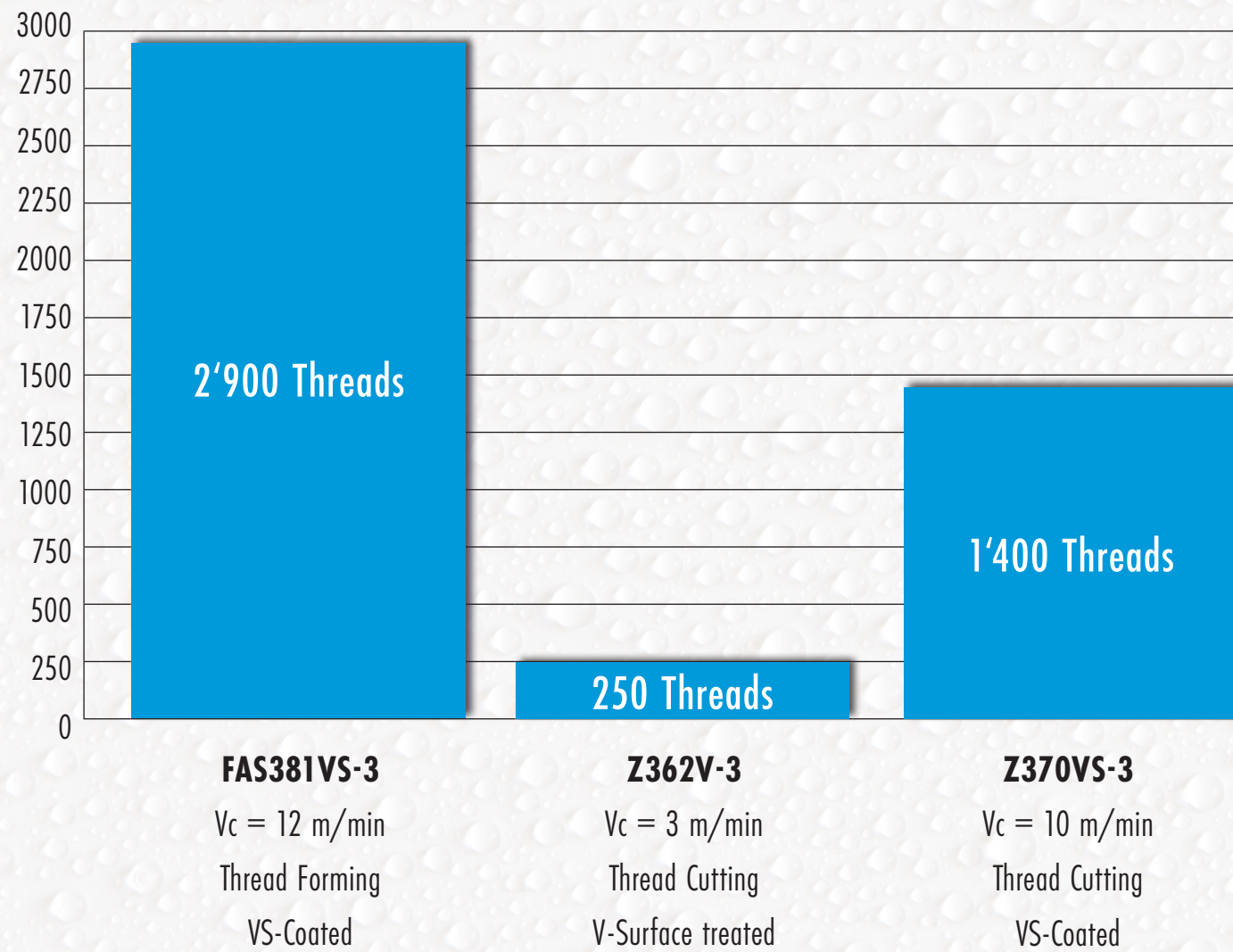
* Norm DC

APPLICATION 1

Material: Austenitic stainless steel
 DIN: 1.4301/ AISI 304
 Tensile strength: 500 - 700 N/mm²
 Blind hole: M10 6H
 Threading depth: 20 mm

Working method: Rigid Tapping
 Lubricant: Cutting oil

WITH CUTTING OIL

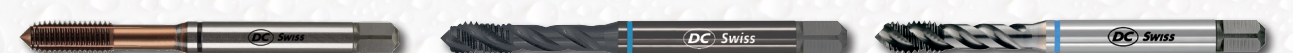
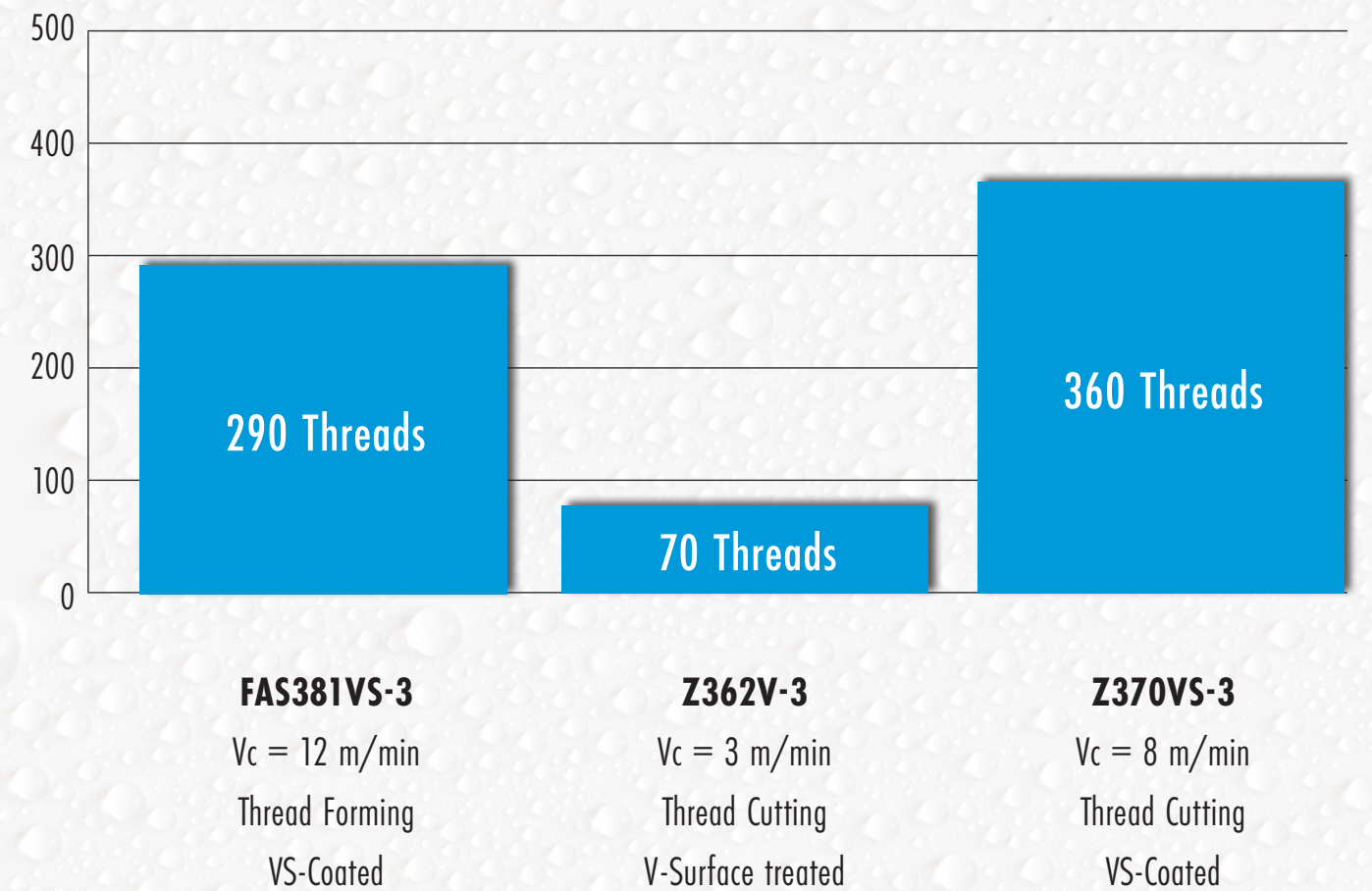


APPLICATION 2

Material: Austenitic stainless steel
 DIN: 1.4301/ AISI 304
 Tensile strength: 500 - 700 N/mm²
 Blind hole: M10 6H
 Threading depth: 20 mm

Working method: Rigid Tapping
 Lubricant: Emulsion 8 - 10%

WITH EMULSION





« THREAD CUTTING IS OFTEN THE LAST OPERATION ON THE WORKPIECE. PROCESS SECURITY IS THEREFORE MANDATORY. DC SWISS CAN OFFER US THE REQUIRED RELIABILITY, EVEN IN TOUGH MATERIALS. »

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