Machining titanium
STL.81 & STL.52

THREADING SOLUTIONS

THREADING SOLUTIONS

AVAILABILITY OF THE ARTICLES

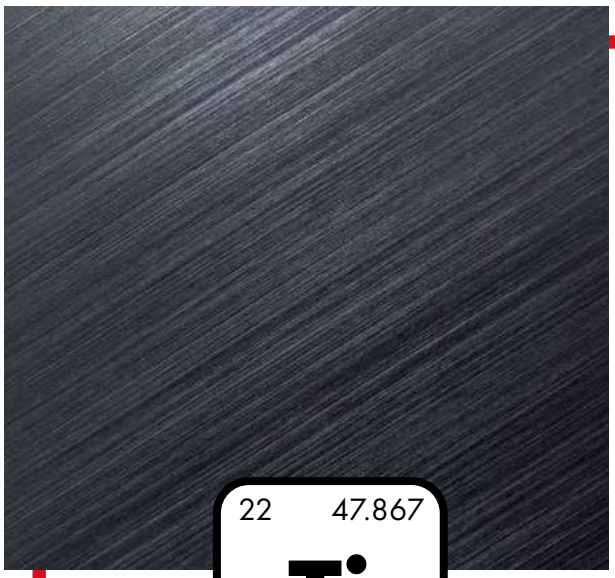
- ID Stock item
- ID Available at short notice

SOLUTION APPROACHES & FIELDS OF APPLICATION

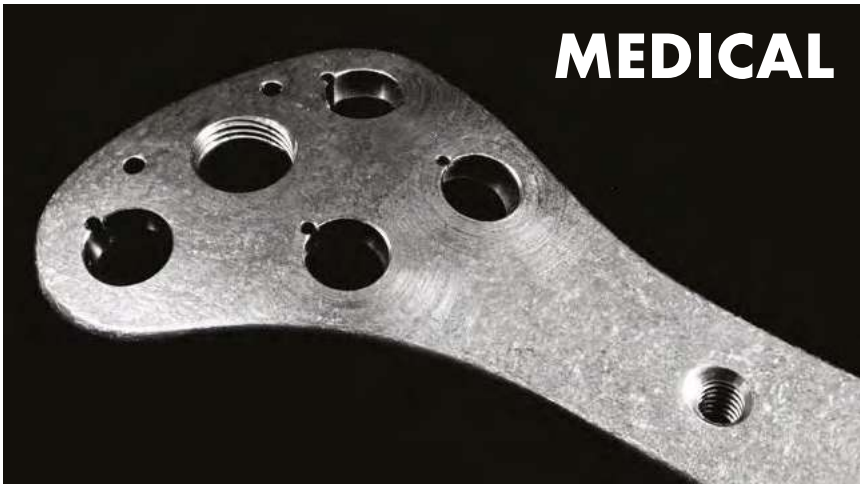
Titanium tends to clamp due to its ductility. Clamping increases friction. This results in sticking and welding.

When cutting, the reactivity with oxygen is noticeable as a negative point. The low thermal conductivity of titanium produces localised heat build-up. The tendency to stick together quickly (diffusion) increases considerably due to heating. The heat dissipation through the chip is 4 times lower compared to steel.

Due to the relatively low modulus of elasticity, vibrations can occur during machining. Chatter marks often occur during milling.



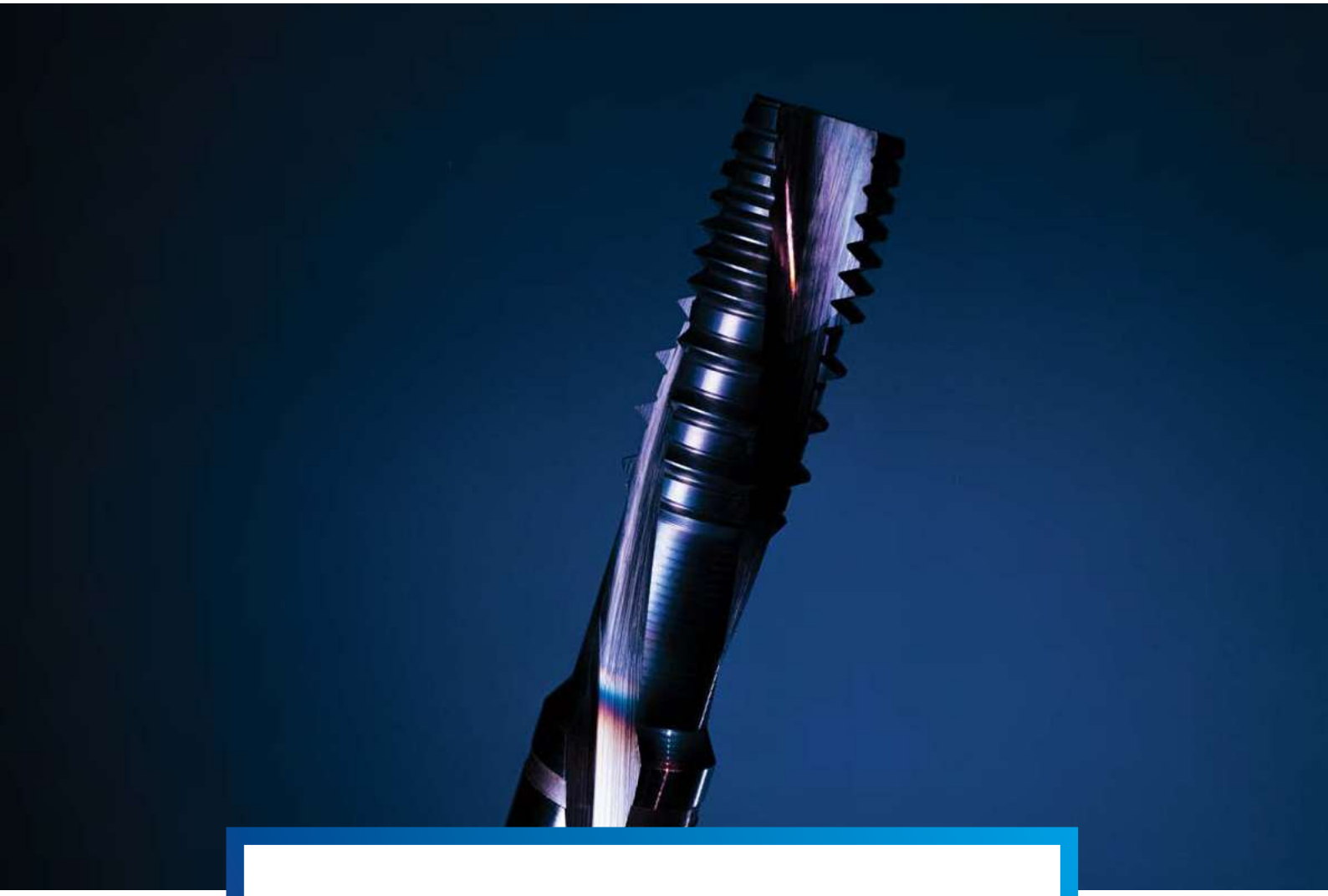
AEROSPACE



SOLUTION FOR THROUGH-HOLE MACHINING

GEOMETRIC FEATURES OF THE TAP **STL.81SUA-4**

- Innovative flute shape, **patent pending**
- Slow left-hand spiral flutes ~ 15°, with spiral point, for secure chip evacuation
- Conditioned, sharp-edged cutting edge, provides a clean and smooth cut
- Interrupted thread for good chip evacuation and to minimise the clamping effect
- Tribology - coating specially designed with our partner to prevent sticking, in rainbow colour



CUSTOMER BENEFITS **STL.81SUA-4**

- Innovative tool, **patent pending**
- High process reliability
- Through-hole thread up to 3 x D
- Stable thread quality over the entire tool life
- High, consistent tool performance

SOLUTION FOR BLIND-HOLE MACHINING

GEOMETRIC FEATURES OF THE TAP **STL.52SUA-3**

- Slow right-hand spiral flutes ~ 15°
- Conditioned, sharp-edged cutting edge, provides a clean and smooth cut
- Truncated thread, for good chip evacuation and minimisation of the clamping effect
- Tribology - coating specially designed with our partner to prevent sticking, in rainbow colour

CUSTOMER BENEFITS **STL.52SUA-3**

- High process reliability
- Blind hole thread up to 2 x D
- Stable thread quality over the entire tool life
- High, consistent tool performance

ALTERNATIVE MACHINING

THREAD MILLING

Types GF / GFS / GFM

THREAD WHIRLING

All these tools can be consulted online and in our catalogue "TM"!

THREAD CUTTING

TL.20VS-4

TL.51VS-3

Threading taps "TL" can be viewed online and in our catalogue "TC"!

APPLICATION CHART STL

STL381SUA-4

STL481SUA-4

41 | 42 | <3 x D

STL352SUA-3

STL452SUA-3

41 | 42

41 Pure titanium

3.7024	Grad1
3.7034	Grad2
3.7055	Grad3
3.7065	Grad4

42 Titanium alloys

3.7124	TiCu2.5 Ti6Al7Nb
3.7164	TiAl6V4 (Grad5)
3.7174	TiAl6V6Sn2

For material groups as per DC application chart

DC Material classification

	Material groups		Material designation	Hardness (HB)	Tensile strength Rm (N/mm²)	Elongation A (%)	Vc (m/min) < Ø 20 mm Guide Line Coated SUA
40	Titanium	41	Pure titanium	< 250	< 850	> 20	4 - 8
		42	Titanium alloys	> 250	> 850	< 20	3 - 5

Optimal with cutting oil E Suitable with emulsion

PICTOGRAPHS

DIN 371 — Reinforced shank as per DIN 371

DIN 376 — Reduced shank as per DIN 376

PM — HSSE-PM

Number of flutes (Z)

R15 — 15° right-hand spiral flutes

L15 — ~ 15° left-hand spiral flutes, with spiral point NEW

Truncated thread

Interrupted thread

Through hole, long chipping materials

Blind hole < 2 x D, long chipping materials

Core hole diameter

Radius on external diameter (J)

Thread EG (for wire screw thread inserts)

B 4 x P — 3.5 - 5.5 chamfered threads, lead form B

C 2.5 x P — 2 - 3 chamfered threads, lead form C

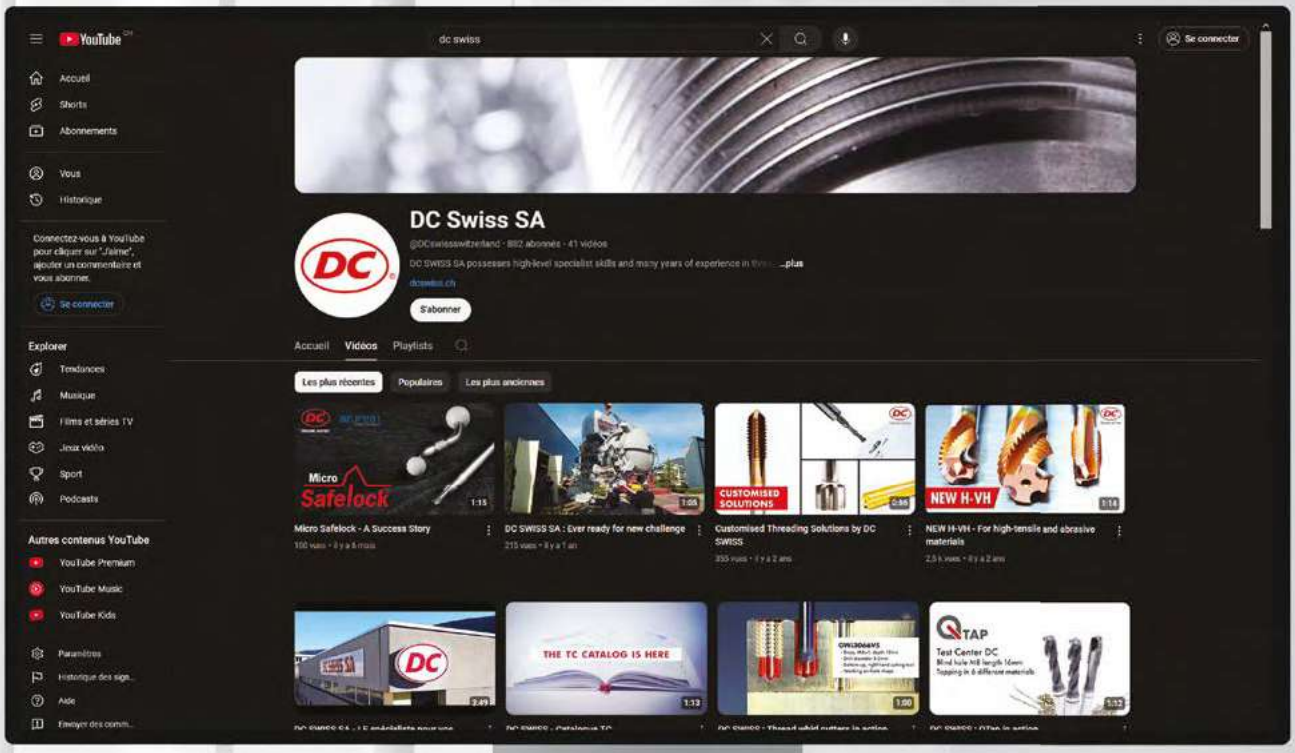
6HX — Tolerance class 6HX

SUA — "SUA"-coating NEW

Stock item

Available at short notice

VISIT OUR YOUTUBE CHANNEL...



... AND DISCOVER THE WORLD OF DC SWISS SA

M ISO DIN 13

PM

DIN 371

DIN 376

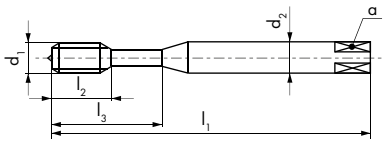
STL
Titanium

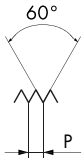
	STL381SUA-4		STL352SUA-3	STL452SUA-3
				
				
	B 4 x P		C 2.5 x P	C 2.5 x P
	4HX		4HX	

STL381SUA-4 — L15 — SUA — 41 / 42

STL352SUA-3 — R15 — SUA — 41 / 42

STL452SUA-3 — R15 — SUA — 41 / 42



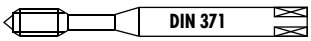


Ø d_1 M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
3	0.5	56	12		3.5	2.7	3	2.5	● 208886	● 208950
4	0.7	63	14		4.5	3.4	3	3.3	● 208887	● 208951
5	0.8	70	15		6	4.9	3	4.2	● 208888	● 208952
6	1	80	15	23	6	4.9	3	5	● 208889	● 208953
8	1.25	90	18	29	8	6.2	3	6.8	● 208890	● 208954
10	1.5	100	20	33	10	8	3	8.5	● 208891	● 208955

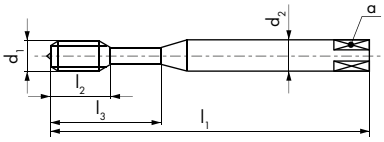
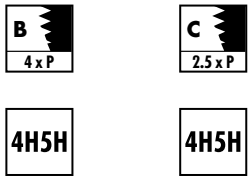
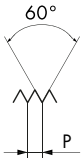
									6HX	6HX	6HX
Ø d_1 M	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID	ID
3	0.5	56	12		3.5	2.7	3	2.5	● 208892	● 208956	
4	0.7	63	14		4.5	3.4	3	3.3	● 208893	● 208957	
5	0.8	70	15		6	4.9	3	4.2	● 208894	● 208958	
6	1	80	15	23	6	4.9	3	5	● 208895	● 208959	
8	1.25	90	18	29	8	6.2	3	6.8	● 208896	● 208960	
10	1.5	100	20	33	10	8	3	8.5	● 208897	● 208961	
12	1.75	110	24		9	7	4	10.2			● 208962
14	2	110	28		11	9	4	12			● 208963
16	2	110	30		12	9	4	14			● 208964

MJ ISO 5855

PM



STL
Titanium

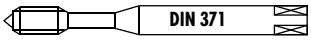
	STL381SUA-4	STL352SUA-3		
				
				
				
				
Ø d_1 MJ	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		
3	0.5	56	12		3.5	2.7	3	2.55
4	0.7	63	14		4.5	3.4	3	3.4
5	0.8	70	15		6	4.9	3	4.3
6	1	80	15	23	6	4.9	3	5.1
8	1	90	18	29	8	6.2	3	7.1
8	1.25	90	18	29	8	6.2	3	6.9
10	1.25	100	20	33	10	8	3	8.9
10	1.5	100	20	33	10	8	3	8.6

ID	ID
• 208878	• 208942
• 208879	• 208943
• 208880	• 208944
• 208881	• 208945
• 208882	• 208946
• 208883	• 208947
• 208884	• 208948
• 208885	• 208949

≤MJ5x0.8 = 4H6H

MF ISO DIN 13

PM

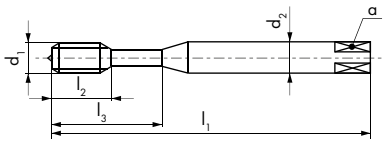


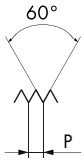
STL
Titanium

	STL381SUA-4	STL352SUA-3		
				
				

STL381SUA-4 — L15 — SUA — 41 / 42

STL352SUA-3 — R15 — SUA — 41 / 42





4HX — 4HX

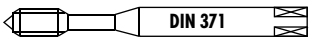
Ø d_1 MF	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
4	0.5	63	14		4.5	3.4	3	3.5	● 208898	● 208965
5	0.5	70	15		6	4.9	3	4.5	● 208899	● 208966
6	0.5	80	15	23	6	4.9	3	5.5	● 208900	● 208967
8	1	90	18	29	8	6.2	3	7	● 208901	● 208968
10	1	100	20	33	10	8	3	9	● 208902	● 208969

6HX — 6HX

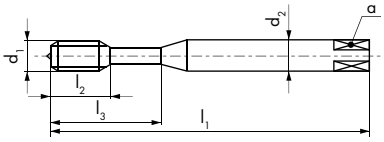
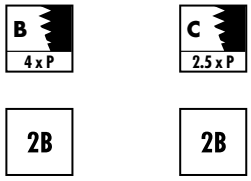
Ø d_1 MF	P mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
4	0.5	63	14		4.5	3.4	3	3.5	● 208903	● 208970
5	0.5	70	15		6	4.9	3	4.5	● 208904	● 208971
6	0.5	80	15	23	6	4.9	3	5.5	● 208905	● 208972
8	1	90	18	29	8	6.2	3	7	● 208906	● 208973
10	1	100	20	33	10	8	3	9	● 208907	● 208974

UNC ASME B1.1

PM



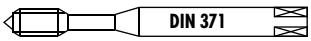
STL
Titanium

	STL381SUA-4	STL352SUA-3		
				
				
				
	B 4 x P	C 2.5 x P		
	2B	2B		

Ø" d_1 UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
4	40	2.84	56	12		3.5	2.7	3	2.25	● 208912	● 208979
5	40	3.17	56	12		3.5	2.7	3	2.55	● 208913	● 208980
6	32	3.5	56	13		4	3	3	2.75	● 208914	● 208981
8	32	4.16	63	14		4.5	3.4	3	3.4	● 208915	● 208982
10	24	4.82	70	15		6	4.9	3	3.8	● 208916	● 208983
1/4	20	6.35	80	15	23	7	5.5	3	5.1	● 208917	● 208984
5/16	18	7.93	90	18	29	8	6.2	3	6.5	● 208918	● 208985
3/8	16	9.52	100	20	33	10	8	3	8	● 208919	● 208986

UNJC ISO 3161/ASME B1.15

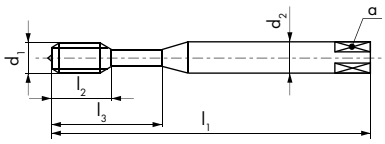
PM

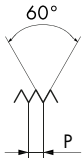


STL
Titanium

STL381SUA-4	L15		SUA	41 / 42
STL352SUA-3	R15		SUA	41 / 42

STL381SUA-4	STL352SUA-3		
			



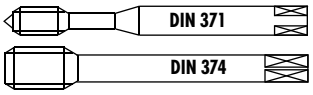


3B | 3B

Ø" d_1 UNJC	P TPI	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
6	32	3.5	56	13		4	3	3	2.8	• 208908	• 208975
8	32	4.16	63	14		4.5	3.4	3	3.45	• 208909	• 208976
10	24	4.82	70	15		6	4.9	3	3.9	• 208910	• 208977
1/4	20	6.35	80	15	23	7	5.5	3	5.2	• 208911	• 208978

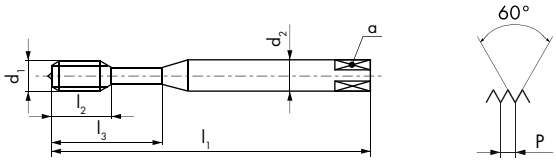
UNF, UNF(J) ASME B1.1

PM



STL
Titanium

	STL381SUA-4	STL481SUA-4	STL352SUA-3
	L15 SUA 41/42	L15 SUA 41/42	R15 SUA 41/42



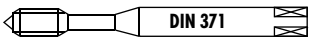
Ø" d_1 UNF	P TPI	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			STL381SUA-4 2B ID	STL481SUA-4 2B ID	STL352SUA-3 2B ID
10	32	4.82	70	15		6	4.9	3	4.05	● 208924		● 208991
1/4	28	6.35	80	15	23	7	5.5	3	5.5	● 208925		● 208992
5/16	24	7.93	90	18	29	8	6.2	3	6.9	● 208926		● 208993
3/8	24	9.52	100	20	33	10	8	3	8.5	● 208927		● 208994

Ø" d_1 UNF(J)	P TPI	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm		UNJF	STL381SUA-4 3B ID	STL481SUA-4 3B ID	STL352SUA-3 3B ID
10	32	4.82	70	15		6	4.9	3	4.1	● 208928		● 208995
1/4	28	6.35	80	15	23	7	5.5	3	5.55	● 208929		● 208996
5/16	24	7.93	90	18	29	8	6.2	3	7	● 208930		● 208997
3/8	24	9.52	100	20	33	10	8	3	8.6	● 208931		● 208998

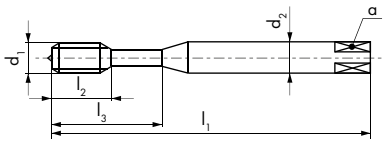
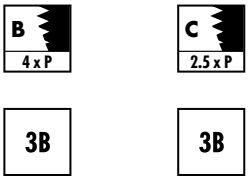
Ø" d_1 UNF(J)	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm	a mm		UNJF	STL381SUA-4	STL481SUA-4 3B ID	STL352SUA-3
1/2	20	12.7	100	24	9	7	4	11.55		● 208932	
9/16	18	14.28	100	24	11	9	4	13.05		● 208933	
5/8	18	15.87	100	26	12	9	4	14.6		● 208934	

UNJF ISO 3161/ASME B1.15

PM



STL
Titanium

	STL381SUA-4	STL352SUA-3		
				
				
				
	L15	R15		
	SUA	SUA		
	41 / 42	41 / 42		

Ø" d_1 UNJF	P TPI	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
10	32	4.82	70	15		6	4.9	3	4.1	● 208920	● 208987
1/4	28	6.35	80	15	23	7	5.5	3	5.55	● 208921	● 208988
5/16	24	7.93	90	18	29	8	6.2	3	7	● 208922	● 208989
3/8	24	9.52	100	20	33	10	8	3	8.6	● 208923	● 208990

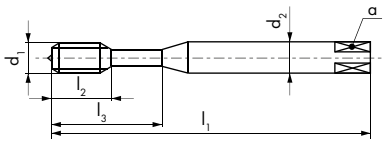
EG M ISO DIN 8140

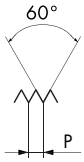
PM

~ DIN 40435

STL
Titanium

	STL381SUA-4	STL352SUA-3		
				
				
STL381SUA-4	L15		SUA	41 / 42
STL352SUA-3	R15		SUA	41 / 42





	B 4 x P	C 2.5 x P		
	6H mod	6H mod		

Ø d_1 EG M	P mm	d_1 mm	l_1 mm	l_2 mm	l_3 mm	d_2 mm	a mm			ID	ID
4	0.7	4.91	70	15		6	4.9	3	4.2	● 208935	● 208999
5	0.8	6.04	80	15	23	6	4.9	3	5.25	● 208936	● 209000
6	1	7.3	80	15	23	7	5.5	3	6.3	● 208937	● 209001
8	1.25	9.62	100	20	33	10	8	3	8.4	● 208938	● 209002

EG UNC ASME B18.29.1

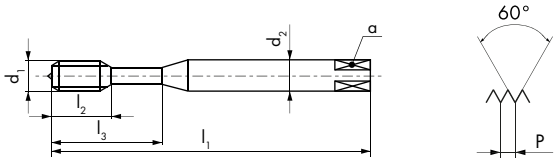
PM

~ DIN 2184-1

STL
Titanium

STL352SUA-3

R15 | SUA | 41 | 42



C
2.5 x P

3B

Ø d_1 EG UNC	P TPI	d_1 mm	l_1 mm	l_2 mm	d_2 mm	a mm			ID
4	40	3.67	56	13	4	3	3	3.05	● 209003
6	32	4.53	70	15	6	4.9	3	3.75	● 209004
8	32	5.19	70	15	6	4.9	3	4.45	● 209005

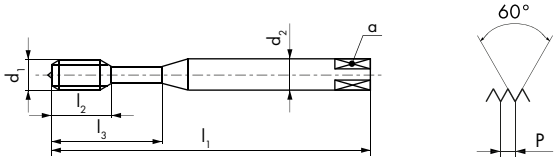
EG UNF ASME B18.29.1

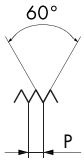
PM

~ DIN 2184-1

STL
Titanium

STL381SUA-4	L15		SUA	41 / 42
STL352SUA-3	R15		SUA	41 / 42





3B

3B

Ø" d1 EG UNF	P TPI	d1 mm	l1 mm	l2 mm	l3 mm	d2 mm	a mm			STL381SUA-4 ID	STL352SUA-3 ID
10	32	5.85	80	15	23	6	4.9	3	5.1	208939	209006
1/4	28	7.52	90	18	29	8	6.2	3	6.65	208940	209007
5/16	24	9.31	90	20	31	9	7	3	8.2	208941	209008

DELIVERY AND PAYMENT CONDITIONS

Orders	Orders, which cannot be delivered from stock, will be acknowledged. Items, which do not belong any more to our standard programme, although still featured in the catalogue, will be invoiced as «specials». Orders may only be cancelled by mutual written agreement.
Quotations and acknowledgements	For reasons of constant development in this field, all descriptions mentioned in our quotations, annexed documents, weight indications, measurements as well as illustrations and drawings are approximate indications. These technical data have binding value only if expressively specified.
Prices	Our prices are quoted for deliveries ex works Malleray, excluding VAT, packing, insurance, freight, customs' and legalisation duties. Should prices increase, we reserve the right to invoice tools already acknowledged at the new prices.
Payment	Payments must be made in advance or against irrevocable and confirmed documentary credit to be opened in our favour with a Swiss bank. All banking commissions and charges have to be borne by the buyer.
Right of ownership	We reserve the right of ownership of all goods supplied until the sales price, plus all incidental charges, have fully been paid.
Despatch	Deliveries take place at the purchaser's risk.
Delivery	Confirmed delivery dates are non-binding. We will do our utmost to maintain them. However, we cannot accept responsibility of direct or consequential losses due to delayed deliveries.
Special orders	For all special tools we reserve the right to over or under supply the ordered quantity by up to 15 %, or on small quantities by 1 or 2 pieces.
Guarantee	Tools recognised to be defective by DC will be replaced free of charge, but without prejudice.
Complaints	Complaints will be considered only within 15 days after receipt of the goods.
Drawings and sketches	The reproduction or transmission of drawings and other documents to a third party are prohibited. The information (drawings and prints) in our catalogue is for guidance only and is not binding.
Special conditions	In the case of partial or total disruption of our production; we reserve the right to partially or totally cancel our delivery commitments.
Tribunal	All disputes are subject to Swiss Law. The seat of court of law will be Moutier (Switzerland).

TECHNICAL QUESTIONNAIRE

Thread cutting and thread forming

Enquiry ☐ Test result ☐ Complaint ☐

Agency: _____ Contact: _____

Customer: _____ E-mail: _____

Phone or fax: _____ Date: _____

1. Tool type: _____ Thread size: _____

Particularity: _____ Class of tolerance: _____

2. Material group: _____

Material N°: _____ Hardness: _____ N/mm^2 / HB / HRC

Norm: _____ Elongation: _____ %

3. Thread: ☐blind hole ☐through hole Threaded length: _____ mm

Core hole Ø: _____ Depth: _____ mm

Counter-bore Ø: _____ Depth: _____ mm

4. Cutting speed (V_c): _____ m/min _____ 1/min

Feed (f): _____ %

5. Machine: _____ ☐internal coolant

Working position: ☐horizontal ☐vertical

Rigid Tapping: ☐"Soft Rigid Tapping" **Tapping spindle:** ☐axial compensation

☐collet ☐de-clutching

☐Weldon ☐reversible

☐hot / cold shrunk ☐sliding clutch

6. Lubricant: ☐emulsion ☐cutting oil ☐air ☐mist

Product: _____

7. Tool change reason: ☐tool wear ☐tool breakage

☐thread not correct (checked with thread plug gauge) ☐tooth breakage in the chamfer lead

☐machine error ☐tooth breakage in the guiding thread

8. Efficiency comparison:

Tool under test: _____

Performance and observations: _____

Remarks: _____

_____

Copy to be sent to DC SWISS SA - CH-2735 Malleray info@dcswiss.ch

ASK FOR YOUR PRINTED
CATALOGUE TC & TM !

DC®
THREADING SOLUTIONS

DC®

THREADING SOLUTIONS

dcswiss.com

SWISSQUALITY

WARNING

Thread tools can break or shatter either through technical failure or negligence, and can endanger the health of the operator. Always obey the safety and health regulations, also the wearing of safety glasses is compulsory.

The grinding of threading tools causes hazardous particles, and must be performed only under most rigorous safety standards.

We have made every effort to ensure that the information (drawings, prints, technical data) given is correct. However, we do not assume any responsibility for any errors, omissions or subsequent changes.

DC SWISS SA
Grand-Rue 19
CH-2735 Malleray
Tel. + 41 32 491 63 63
info@dcswiss.ch

DC Nano Tools SA
Grand-Rue 19
CH-2735 Malleray
Tel. + 41 32 491 63 63
info@dcswiss.ch

SWISSQUALITY

DC Swiss GmbH
Graseggerstrasse 125
DE-50737 Köln
Tel. + 49 221 995 532 0
info@dcswiss.de

DC Swiss s.r.l
Via Canova 10
IT-20017 Rho
Tel. + 39 02 669 40 41
info@dcswiss.it

DC Swiss UK Ltd
9 Orgreave Road
GB-Sheffield S13 9LQ
Tel. + 44 114 293 90 13
info@dcswiss.co.uk