suttontools

world class cutting tools

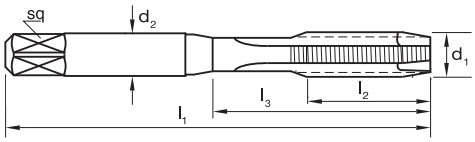
JIS HIGH PERFORMANCE

BLACKMAGIC

JIS Taps Metric, Gun

suttontools BLACKMAGIC

- Universal high performance tapping
- PM-HSSE V3 offers superior tool life
- Use in stainless, high strength steels and aluminium alloys up to 850N/mm²
- Through holes up to 3 x d_1
- Suitable for synchronous tapping in machine operations



Catalogue Code	T817
Discount Group	D0610
Material	PM-HSSE V3
Surface Finish	TiCN
Sutton Designation	UNI
Geometry	-
Chamfer Lead	5 x P

Size Ref.	d_1	Pitch	Limit	l_1	l_2	l_3	d_2	sq	z	drill Ø	Item #
0300	M 3	x 0.5	P2	46	11	19	4.0	3.2	3	2.5	T817 0300
0400	M 4	x 0.7	P3	52	13	21	5.0	4.0	3	3.3	T817 0400
0500	M 5	x 0.8	P3	60	16	24	5.5	4.5	3	4.2	T817 0500
0600	M 6	x 1	P3	62	19	28	6.0	4.5	3	5.0	T817 0600
0800	M 8	x 1.25	P3	70	22	-	6.2	5.0	3	6.8	T817 0800
1000	M 10	x 1.5	P3	75	24	-	7.0	5.5	3	8.5	T817 1000
1006	MF10	x 1.25	P3	75	24	-	7.0	5.5	3	8.8	T817 1006
1200	M 12	x 1.75	P4	82	29	-	8.5	6.5	3	10.2	T817 1200
1206	MF12	x 1.25	P3	82	29	-	8.5	6.5	3	10.8	T817 1206
1207	MF12	x 1.5	P3	82	29	-	8.5	6.5	3	10.5	T817 1207

ISO	P													M			K						N								S												H					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
T817	●	●	●	○		●	○			●		●	○	●	●		○	○	○	○	○	○	●	●	●	○	○	○	○																			

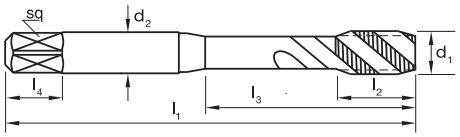
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metals S Titanium & Super Alloys H Hard Materials

● Optimal ○ Effective

JIS Taps Metric, Spiral

suttontools BLACKMAGIC

- Universal high performance tapping
- PM-HSSE V3 offers superior tool life
- Use in stainless, high strength steels and aluminium alloys up to 850N/mm²
- Blind holes up to 3 x d_1
- Suitable for synchronous tapping in machine operations



Catalogue Code	**T818**
Discount Group	D0610
Material	**PM-HSSE V3**
Surface Finish	***TiCN***
Sutton Designation	UNI
Geometry	R50
Chamfer Lead	2.5 x P

Size Ref.	d_1	Pitch	Limit	l_1	l_2	l_3	d_2	sq	z	drill Ø	Item #
0300	M 3	x 0.5	P2	46	11	18	4.0	3.2	3	2.5	T818 0300
0400	M 4	x 0.7	P3	52	13	20	5.0	4.0	3	3.3	T818 0400
0500	M 5	x 0.8	P3	60	16	25	5.5	4.5	3	4.2	T818 0500
0600	M 6	x 1	P3	62	19	28	6.0	4.5	3	5.0	T818 0600
0800	M 8	x 1.25	P3	70	22	6.2	5.0	5.0	3	6.8	T818 0800
1000	M 10	x 1.5	P3	75	24	7.0	5.5	5.5	3	8.5	T818 1000
1006	MF10	x 1.25	P3	75	24	-	7.0	5.5	3	8.8	T818 1006
1200	M 12	x 1.75	P4	82	29	8.5	6.5	6.5	3	10.2	T818 1200
1206	MF12	x 1.25	P3	82	29	-	8.5	6.5	3	10.8	T818 1206
1207	MF12	x 1.5	P3	82	29	-	8.5	6.5	3	10.5	T818 1207

ISO	P													M			K						N								S												H				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41
T818	●	●	●	○		●	○			●		●	○	●	●		○	○	○	○	○	○	●	●	●	○	○	○	○																			

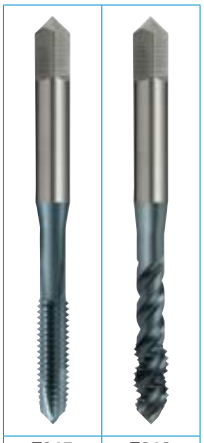
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metals S Titanium & Super Alloys H Hard Materials

● Optimal ○ Effective

Application Chart

ISO	VDI	Material Group	Sutton	
P	A	Steel	N	UNI
M	R	Stainless Steel	VA	
K	F	Cast Iron	GG	
N	N	Non-Ferrous Metals, Aluminiums & Coppers	Al	W
S	S	Titaniums & Super Alloys	Ti	Ni
H	H	Hard Materials (≥ 45 HRC)	H	

^ VDI 3323 material groups can also be determined by referring to the material cross reference listing in the application guide at the back of this catalogue.



Catalogue Code	**T817**	**T818**
Material	**PM-HSSE V3**	**PM-HSSE V3**
Surface Finish	***TiCN***	***TiCN***
Sutton Designation	**UNI**	**UNI**
Tapping Depth	**≤ 3xØ**	**≤ 3xØ**

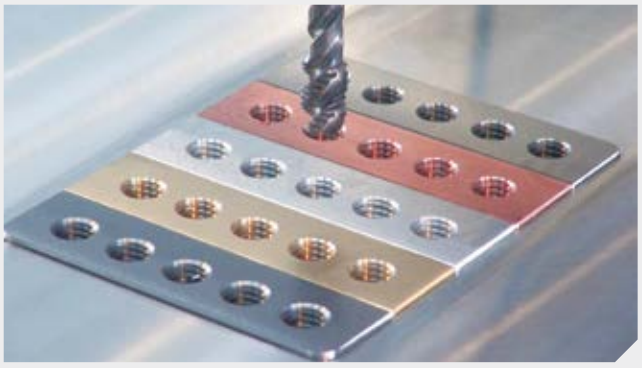
ISO	VDI^ 3323	Material		Condition	HB	N/mm²	Vc	Vc
P	1	Steel - Non-alloy, cast & free cutting	~ 0.15 %C	A	125	440	**17**	**22**
	2		~ 0.45 %C	A	190	640	**17**	**22**
	3			QT	250	840	**14**	**18**
	4		~ 0.75 %C	A	270	910	16	20
	5			QT	300	1010	-	-
	6	Steel - Low alloy & cast < 5% of alloying elements		A	180	610	**17**	**22**
	7			QT	275	930	12	14
	8			QT	300	1010	-	-
	9			QT	350	1180	-	-
	10	Steel - High alloy, cast & tool		A	200	680	**12**	**14**
	11			HT	325	1100	-	-
	12	Steel - Corrosion resistant & cast	Ferritic / Martensitic	A	200	680	**7**	**9**
	13		Martensitic	QT	240	810	4	5
M	14.1	Stainless Steel	Austenitic	AH	180	610	**9**	**11**
	14.2		Duplex		250	840	**6**	**7**
	14.3		Precipitation Hardening		250	840	-	-
K	15	Cast Iron - Grey (GG)	Ferritic / Pearlitic		180	610	17	22
	16		Pearlitic		260	880	14	18
	17	Cast Iron - Nodular (GGG)	Ferritic		160	570	17	22
	18		Pearlitic		250	840	14	18
	19	Cast Iron - Malleable	Ferritic		130	460	22	27
	20		Pearlitic		230	780	17	22
N	21	Aluminum & Magnesium - wrought alloy	Non Heat Treatable		60	210	**17**	**22**
	22		Heat Treatable	AH	100	360	**22**	**27**
	23	Aluminum & Magnesium - cast alloy ≤12% Si	Non Heat Treatable		75	270	**22**	**27**
	24		Heat Treatable	AH	90	320	22	27
	25	Al & Mg - cast alloy >12% Si	Non Heat Treatable		130	460	14	18
	26	Copper & Cu alloys (Brass/Bronze)	Free cutting, Pb > 1%		110	390	12	14
	27		Brass (CuZn, CuSnZn)		90	320	26	32
	28		Bronze (CuSn)		100	360	-	-
	29	Non-metallic - Thermosetting & fiber-reinforced plastics					-	-
	30	Non-metallic - Hard rubber, wood etc.					-	-
S	31	High temp. alloys	Fe based	A	200	680	-	-
	32			AH	280	950	-	-
	33		Ni / Co based	A	250	840	-	-
	34			AH	350	1180	-	-
	35			C	320	1080	-	-
	36	Titanium & Ti alloys	CP Titanium		400 MPa		-	-
	37.1		Alpha alloys		860 MPa		-	-
	37.2		Alpha / Beta alloys	A	960 MPa		-	-
	37.3			AH	1170 MPa		-	-
	37.4		Beta alloys	A	830 MPa		-	-
	37.5			AH	1400 MPa		-	-
H	38.1	Hardened steel		HT	45 HRC		-	-
	38.2			HT	55 HRC		-	-
	39.1			HT	58 HRC		-	-
	39.2			HT	62 HRC		-	-
	40	Cast Iron	Chilled	C	400	1350	-	-
	41			HT	55 HRC		-	-

Condition: A (Annealed), **AH** (Age Hardened), **C** (Cast), **HT** (Hardened & Tempered), **QT** (Quenched & Tempered)
Blue = Optimal | **Black =** Effective

Case Study

TEST 1
Capable of tapping a wide range of material groups:

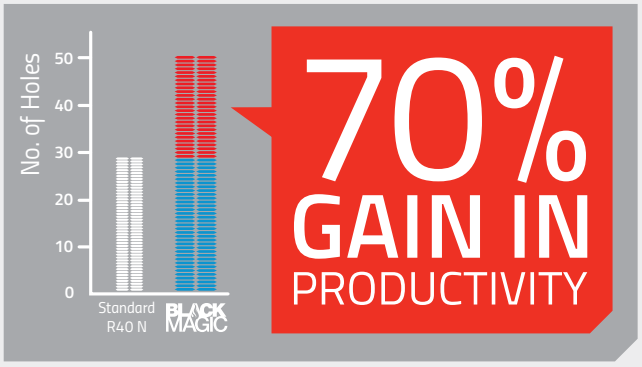
P Carbon Steels N Brass N Aluminium N Copper M Stainless Steel



TEST 2
Productivity Testing

Tap Size: M8 × 1.25
Lubricant: Minimum Quantity (MQL)
Material: AISI 1045 approximately 10HRC (medium carbon steel)

Standard R40 N	**Black Magic R50**
Vc = 10 m/min	Vc = 22 m/min
N = 400 rpm	N = 876 rpm
Fn = 1.25 mm/rev	Fn = 1.25 mm/rev
Vf = 500 mm/min	Vf = 1095 mm/min
Depth = 2.5 × D blind	Depth = 2.5 × D blind



IMPERIAL TAPS (inch size)

Ø = nominal tap size (inch)
TPI = thread count per inch (TPI)
n = spindle speed (RPM)
v_c = cutting speed (m/min)
v_f = feed rate (mm/min)
v_r = feed rate per rev (mm/rev)

$$n = \frac{v_c \times 1000}{Ø \times \pi \times 25.4} \simeq \frac{v_c}{Ø} \times 12.5$$

$$v_c = \frac{n \times Ø \times \pi \times 25.4}{1000} \simeq \frac{n \times Ø}{12.5}$$

$$v_f = \frac{n \times 25.4}{TPI}$$

METRIC TAPS (mm size)

Ø = nominal tap size (mm)
P = thread pitch (mm)
n = spindle speed (RPM)
v_c = cutting speed (m/min)
v_f = feed rate (mm/min)
v_r = feed rate per rev (mm/rev)

$$n = \frac{v_c \times 1000}{Ø \times \pi} \simeq \frac{v_c}{Ø} \times 318$$

$$v_c = \frac{n \times Ø \times \pi}{1000} \simeq \frac{n \times Ø}{318}$$

$$v_f = n \times P$$

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