YU-TCB25 **AMERICAS**

BEST VALUE IN THE WORLD OF CUTTING TOOLS

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YG

YG TAP
CHIP BREAKER
"The Trouble-Shooter"

TiN-COATED HSS-PM TAP

- Chip Breaker Technology
- 15˚ Helix Angle
- YG-1 Special Thread Structure

Chip Breaker

Special flute grinding process provides excellent performance with chip breaking to aid in chip evacuation

15° Helix Angle

Promotes efficient chip evacuation

YG-1 Special Thread Structure

Reduction in torque, wear, and the risk of overfeeding as compared to conventional taps

TiN Coating

Increased wear resistance by minimizing friction between the tap and the workpiece

HSS-PM Material

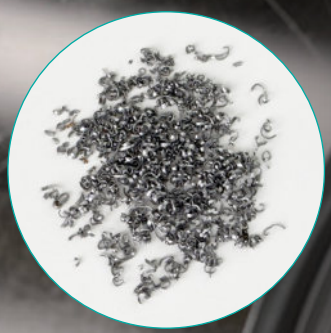
Powdered Metal Technology
for a tough-chipping resistant cutting edge
for long tool life and reliable thread finish

YG TAP CHIP BREAKER

"The Trouble-Shooter"

YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips, avoiding bird nesting.
Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.

Short Chip Obtained With YG Tap Chip Breaker!!



GUIDE TO ICONS

Working Material

Material groups VG

Heat treated and heat-resistant steels
850N/mm² ≤Rm≤1,200N/mm²

Tool Material

HSS PM

Chamfer Lead

C

Form C
(Chamfer Lead 2-3 Thread)

Class of Thread

D H

Thread Angle

60°

E

Form E
(Chamfer Lead 1.5-2 Thread)

Surface Treatment

TiN

Titanium Nitride Coating

Helix Angle

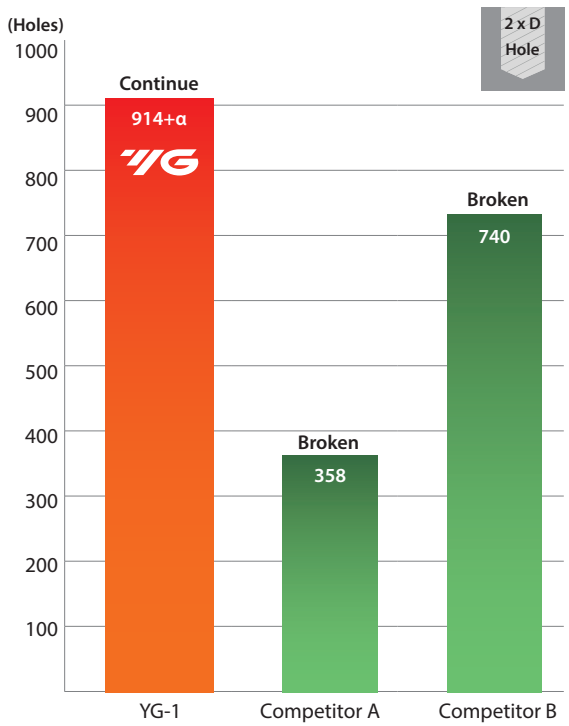
R15

Cutting Condition

TEST I YG TAP CHIP BREAKER (M8x1.25)

Cutting Condition

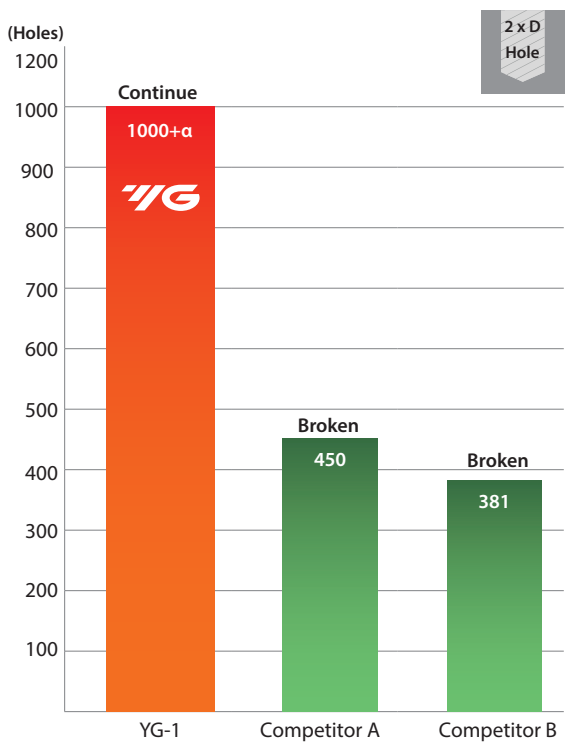
Material	DIN : 42CrMo4 / JIS : SCM440 / AISI : 4140		
Hardness	HRc30		
Machine	Machining Center (Horizontal)		
Cutting Fluid (Coolant)	Water Soluble (9%)		
Tool	YG-1	Competitor A	Competitor B
Dimension	M8 x 1.25		
Description	Spiral Flute		
Surface Treatment	TiN	TiCN	TiN
SFM	26		
Vc	26ft/min.		
Tapping Depth	.6299" (2xD)		
Tapping Holes	914+α	358	740



TEST II YG TAP CHIP BREAKER (M12x1.75)

Cutting Condition

Material	DIN : C45 / JIS : S45C / AISI : 1045		
Hardness	Below HRc20		
Machine	Machining Center (Horizontal)		
Cutting Fluid (Coolant)	Water Soluble (9%)		
Tool	YG-1	Competitor A	Competitor B
Dimension	M12 x 1.75		
Description	Spiral Flute		
Surface Treatment	TiN	TiCN	TiN
SFM	26		
Vc	26ft/min.		
Tapping Depth	.9449" (2xD)		
Tapping Holes	1000+α	450	381



SELECTION GUIDE

HSS-PM
YG TAP
CHIP BREAKER

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

HOLE TYPE			Max. 2.0xD Blind Hole		
TOOL MATERIAL			HSS-PM		
CHAMFER LEAD			2P~3P	1.5P~2P	2P~3P
FLUTE TYPE			Spiral Flute		
SPIRAL FLUTE ANGLE			R15		
SERIES	UNC/UNF	DIN Length-ANSI Shank	TTF21 (p.6)	TTF22 (p.9)	TTF23 (p.12)
	M/MF	DIN Length-ANSI Shank	TTF18 (p.8)	TTF19 (p.11)	TTF20 (p.14)
SURFACE TREATMENT / COATING			TiN		
MODEL					

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	Examples			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		S15C, C15, 1015	○ (23-39)	○ (23-39)	○ (23-45)
	2		About 0.45% C	Annealed	190	13	S45C, C45, 1045	◎ (23-39)	◎ (23-39)	◎ (23-45)
	3		About 0.45% C	Quenched & tempered	250	25		◎ (13-26)	◎ (13-26)	◎ (13-30)
	4		About 0.75% C	Annealed	270	28	SK5, Ck75, 1080			
	5		About 0.75% C	Quenched & tempered	300	32				
	6	Low alloy steel		Annealed	180	10	SCM440, 42CrMo4, 410	○ (23-39)	○ (23-39)	○ (23-45)
	7			Quenched & tempered	275	29		◎ (23-39)	◎ (23-39)	◎ (23-45)
	8			Quenched & tempered	300	32		◎ (13-26)	◎ (13-26)	◎ (13-30)
	9			Quenched & tempered	350	38		○ (13-26)	○ (13-26)	○ (13-30)
	10	High alloyed steel, and tool steel		Annealed	200	15	SKD, D2	○ (20-30)	○ (20-30)	○ (20-35)
	11			Quenched & Tempered	325	35	SKH, SUH, M42	○ (13-26)	○ (13-26)	○ (13-30)
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	SUS 420, X40Cr13, 420			
	13		Martensitic	Quenched & Tempered	240	23				
	14			Austenitic	180	10	SUS 316, 316, X5CrNiMo 17 12 2			
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3	FCD, GGG, EN-GJS-500-7			
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130		FCMW, FCMP, GTS, GJMB350-10			
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		SAE 1000, AlMg 1, 3.3315			
	22		Curable	Hardened	100		SAE 7050, AlCuMg 1, 3.1325			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		ADC12, G-AlSi12, 3.2581			
	24		≤ 12% Si, Curable	Hardened	90		C4BS, G-AlSi10Mg, 3.2381			
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		CuZn36Pb 3, 2.0375			
	27		CuZn, CuSnZn (Brass)		90		CuZn 15, 2.0240			
	28		CuSn, lead-free copper and electrolytic copper		100		G-CuZn40Fe, 2.0590			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				CFRP			
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	X12 NiCrSi 36-16, 1.4864			
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25	Inconel 718, NiCr20TiAl, 2.4631			
	34			Cured	350	38	NiCu30Al, 2.4375			
	35			Cast	320	34	G-X120Mn12, 1.3401			
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm		TiAl6V4, 3.7165			
H	38	Hardened steel		Hardened	550	55	SK3			
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

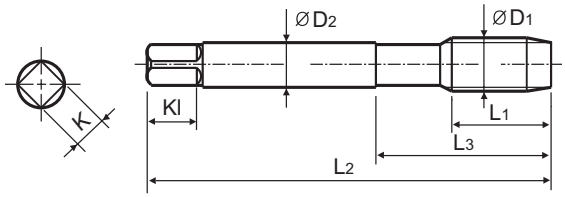
TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

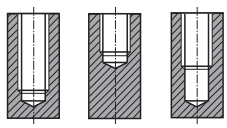
SERIES **TTF21**

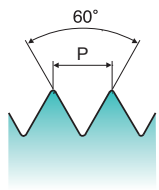
DIN / ANSI

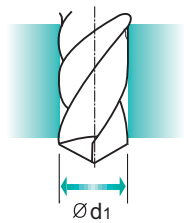
- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.



Hole type
2.0×D







Material groups **VG** | HSS PM | H | 60° | 2P~3P | TiN | R15 p.5

Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
#8	- 32	TTF21282R	H2	.311	2.48	.827	.168	.131	.236	3	-	3.4
#8	- 32	TTF21283R	H3	.311	2.48	.827	.168	.131	.236	3	-	3.4
#8	- 36	TTF21302R	H2	.280	2.48	.827	.168	.131	.236	3	-	3.5
#10	- 24	TTF21323R	H3	.417	2.76	.976	.194	.152	.236	3	-	3.9
#10	- 32	TTF21342R	H2	.311	2.76	.976	.194	.152	.236	3	-	4.1
#10	- 32	TTF21343R	H3	.311	2.76	.976	.194	.152	.236	3	-	4.1
#12	- 24	TTF21363R	H3	.417	3.15	1.177	.220	.165	.268	3	-	4.5
#12	- 28	TTF21383R	H3	.358	3.15	1.177	.220	.165	.268	3	-	4.7
1/4	- 20	TTF21403R	H3	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4	- 20	TTF21405R	H5	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4	- 28	TTF21423R	H3	.358	3.15	1.177	.255	.191	.310	3	-	5.5
1/4	- 28	TTF21424R	H4	.358	3.15	1.177	.255	.191	.310	3	-	5.5
5/16	- 18	TTF21443R	H3	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16	- 18	TTF21445R	H5	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16	- 24	TTF21463R	H3	.417	3.54	1.378	.318	.238	.380	3	-	7.0
5/16	- 24	TTF21464R	H4	.417	3.54	1.378	.318	.238	.380	3	-	7.0
3/8	- 16	TTF21483R	H3	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8	- 16	TTF21485R	H5	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8	- 24	TTF21503R	H3	.417	3.94	1.535	.381	.286	.440	3	-	8.6
3/8	- 24	TTF21504R	H4	.417	3.94	1.535	.381	.286	.440	3	-	8.6
7/16	- 14	TTF21523R	H3	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16	- 14	TTF21525R	H5	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16	- 20	TTF21543R	H3	.500	3.94	1.713	.323	.242	.394	3	-	10.0
7/16	- 20	TTF21545R	H5	.500	3.94	1.713	.323	.242	.394	3	-	10.0

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

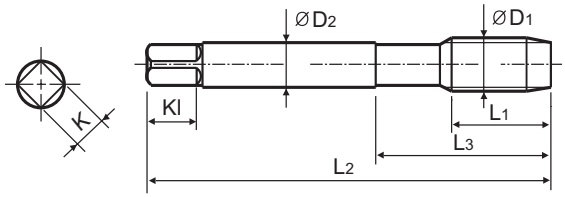
TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

SERIES **TTF21**

DIN / ANSI

- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.



Hole type
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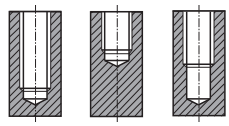

Material groups **VG** | HSS PM | H | 60° | 2P~3P | TiN | R15 | p.5

Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
1/2	- 13	TTF21563R	H3	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	- 13	TTF21565R	H5	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	- 20	TTF21583R	H3	.500	3.94	1.933	.367	.275	.440	3	-	11.6
1/2	- 20	TTF21585R	H5	.500	3.94	1.933	.367	.275	.440	3	-	11.6
9/16	- 12	TTF21603R	H3	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	- 12	TTF21605R	H5	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	- 18	TTF21623R	H3	.555	3.94	1.972	.429	.322	.500	3	-	13.0
9/16	- 18	TTF21625R	H5	.555	3.94	1.972	.429	.322	.500	3	-	13.0
5/8	- 11	TTF21643R	H3	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	- 11	TTF21645R	H5	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	- 18	TTF21663R	H3	.555	3.94	2.126	.480	.360	.560	3	-	14.6
5/8	- 18	TTF21665R	H5	.555	3.94	2.126	.480	.360	.560	3	-	14.6
3/4	- 10	TTF21703R	H3	1.00	4.92	2.433	.590	.442	.673	4	-	16.9
3/4	- 10	TTF21705R	H5	1.00	4.92	2.433	.590	.442	.673	4	-	16.9
3/4	- 16	TTF21723R	H3	.626	4.33	2.433	.590	.442	.673	4	-	17.7
3/4	- 16	TTF21725R	H5	.626	4.33	2.433	.590	.442	.673	4	-	17.7
7/8	- 9	TTF21744R	H4	1.110	5.51	2.654	.697	.523	.736	4	-	19.8
7/8	- 9	TTF21746R	H6	1.110	5.51	2.654	.697	.523	.736	4	-	19.8
7/8	- 14	TTF21764R	H4	.713	4.92	2.654	.697	.523	.736	4	-	20.5
7/8	- 14	TTF21766R	H6	.713	4.92	2.654	.697	.523	.736	4	-	20.5
1"	- 8	TTF21784R	H4	1.252	6.30	3.012	.800	.600	.800	4	-	22.7
1"	- 8	TTF21786R	H6	1.252	6.30	3.012	.800	.600	.800	4	-	22.7
1"	- 12	TTF21804R	H4	.835	5.51	3.012	.800	.600	.800	4	-	23.5
1"	- 12	TTF21806R	H6	.835	5.51	3.012	.800	.600	.800	4	-	23.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

SERIES **TTF18**

DIN / ANSI

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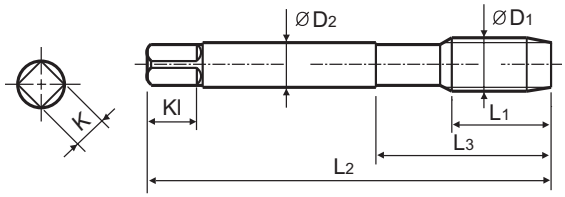
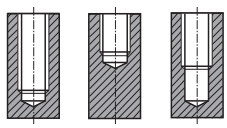


Hole type
2.0×D



Material groups **VG** | HSS PM | D | 60° | 2P~3P | TiN | R15 p.5

Unit : inch

SIZE ØD1	Pitch P	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Tapping Drill Diameter(Ød1) Metric
M4	x 0.7	TTF18244R	D4	.276	2.48	.823	.168	.191	.310	3	-	3.4
M5	x 0.8	TTF18284R	D4	.315	2.76	.988	.194	.191	.310	3	-	4.3
M6	x 1.0	TTF18315R	D5	.394	3.15	1.177	.255	.191	.310	3	-	5.1
M8	x 1.25	TTF18365R	D5	.512	3.54	1.378	.318	.238	.380	3	-	6.1
M8	x 1.0	TTF18375R	D5	.394	3.54	1.378	.318	.238	.380	3	-	6.9
M9	x 1.25	TTF18395R	D5	.512	3.54	1.378	.381	.286	.440	3	-	7.9
M9	x 1.0	TTF18405R	D5	.394	3.54	1.378	.381	.286	.440	3	-	8.1
M10	x 1.5	TTF18426R	D6	.591	3.94	1.535	.381	.286	.440	3	-	8.7
M10	x 1.25	TTF18435R	D5	.512	3.94	1.535	.381	.286	.440	3	-	8.9
M10	x 1.0	TTF18445R	D5	.394	3.54	1.378	.381	.286	.440	3	-	9.1
M12	x 1.75	TTF18506R	D6	.709	4.33	1.933	.367	.275	.440	3	-	10.5
M12	x 1.5	TTF18516R	D6	.591	3.94	1.933	.367	.275	.440	3	-	10.7
M12	x 1.25	TTF18525R	D5	.512	3.94	1.933	.367	.275	.440	3	-	10.9
M14	x 2.0	TTF18547R	D7	.787	4.33	1.972	.429	.322	.500	3	-	12.3
M14	x 1.5	TTF18556R	D6	.591	3.94	1.972	.429	.322	.500	3	-	12.7
M14	x 1.25	TTF18566R	D6	.512	3.94	1.972	.429	.322	.500	3	-	12.9
M16	x 2.0	TTF18607R	D7	.787	4.33	2.126	.480	.360	.560	3	-	14.3
M16	x 1.5	TTF18616R	D6	.591	3.94	2.126	.480	.360	.560	3	-	14.7
M18	x 2.5	TTF18657R	D7	.984	4.92	2.165	.542	.406	.610	4	-	15.8
M18	x 1.5	TTF18676R	D6	.591	4.33	2.165	.542	.406	.610	4	-	16.7
M20	x 2.5	TTF18708R	D8	.984	5.51	2.433	.652	.489	.673	4	-	17.8
M20	x 1.5	TTF18726R	D6	.591	4.92	2.433	.652	.489	.673	4	-	18.7
M22	x 2.5	TTF18748R	D8	.984	5.51	2.654	.697	.523	.736	4	-	19.8
M22	x 1.5	TTF18766R	D6	.591	4.92	2.654	.697	.523	.736	4	-	20.7
M24	x 3.0	TTF18788R	D8	1.181	6.30	2.693	.760	.570	.736	4	-	13.9
M24	x 1.5	TTF18806R	D6	.591	5.51	2.693	.760	.570	.736	4	27/32	-

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

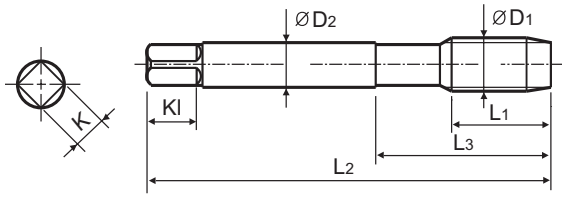
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

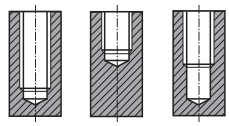
SERIES **TTF22**

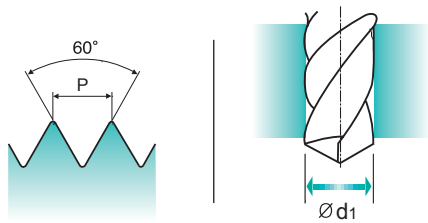
DIN / ANSI



- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.

Hole type
2.0×D





Material groups **VG** | HSS PM | H | 60° | 1.5P~2P | TiN | R15 | p.5

Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
#8 - 32		TTF22282R	H2	.311	2.48	.827	.168	.131	.236	3	-	3.4
#8 - 32		TTF22283R	H3	.311	2.48	.827	.168	.131	.236	3	-	3.4
#8 - 36		TTF22302R	H2	.280	2.48	.827	.168	.131	.236	3	-	3.5
#10 - 24		TTF22323R	H3	.417	2.76	.976	.194	.152	.236	3	-	3.9
#10 - 32		TTF22342R	H2	.311	2.76	.976	.194	.152	.236	3	-	4.1
#10 - 32		TTF22343R	H3	.311	2.76	.976	.194	.152	.236	3	-	4.1
#12 - 24		TTF22363R	H3	.417	3.15	1.177	.220	.165	.268	3	-	4.5
#12 - 28		TTF22383R	H3	.358	3.15	1.177	.220	.165	.268	3	-	4.7
1/4 - 20		TTF22403R	H3	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4 - 20		TTF22405R	H5	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4 - 28		TTF22423R	H3	.358	3.15	1.177	.255	.191	.310	3	-	5.5
1/4 - 28		TTF22424R	H4	.358	3.15	1.177	.255	.191	.310	3	-	5.5
5/16 - 18		TTF22443R	H3	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16 - 18		TTF22445R	H5	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16 - 24		TTF22463R	H3	.417	3.54	1.378	.318	.238	.380	3	-	7.0
5/16 - 24		TTF22464R	H4	.417	3.54	1.378	.318	.238	.380	3	-	7.0
3/8 - 16		TTF22483R	H3	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8 - 16		TTF22485R	H5	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8 - 24		TTF22503R	H3	.417	3.94	1.535	.381	.286	.440	3	-	8.6
3/8 - 24		TTF22504R	H4	.417	3.94	1.535	.381	.286	.440	3	-	8.6
7/16 - 14		TTF22523R	H3	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16 - 14		TTF22525R	H5	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16 - 20		TTF22543R	H3	.500	3.94	1.713	.323	.242	.394	3	-	10.0
7/16 - 20		TTF22545R	H5	.500	3.94	1.713	.323	.242	.394	3	-	10.0

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

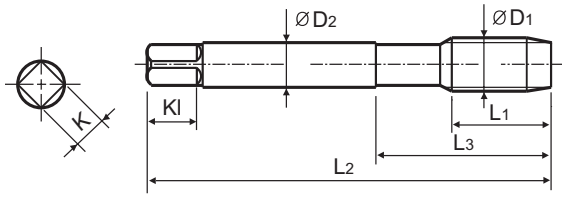
TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

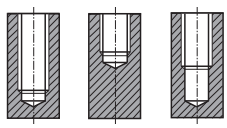
SERIES **TTF22**

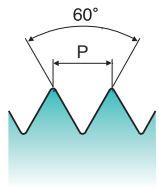
DIN / ANSI

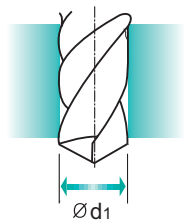
- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.



Hole type
2.0×D







Material groups **VG** | HSS PM | H | 60° | 1.5P~2P | TiN | R15 p.5

Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
1/2	13	TTF22563R	H3	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	13	TTF22565R	H5	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	20	TTF22583R	H3	.500	3.94	1.933	.367	.275	.440	3	-	11.6
1/2	20	TTF22585R	H5	.500	3.94	1.933	.367	.275	.440	3	-	11.6
9/16	12	TTF22603R	H3	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	12	TTF22605R	H5	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	18	TTF22623R	H3	.555	3.94	1.972	.429	.322	.500	3	-	13.0
9/16	18	TTF22625R	H5	.555	3.94	1.972	.429	.322	.500	3	-	13.0
5/8	11	TTF22643R	H3	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	11	TTF22645R	H5	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	18	TTF22663R	H3	.555	3.94	2.126	.480	.360	.560	3	-	14.6
5/8	18	TTF22665R	H5	.555	3.94	2.126	.480	.360	.560	3	-	14.6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

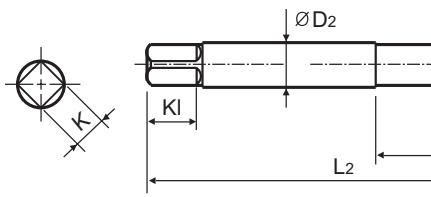
TIN-COATING, HSS-PM

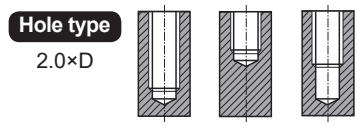
SPIRAL FLUTE TAPS with CHIP BREAKER

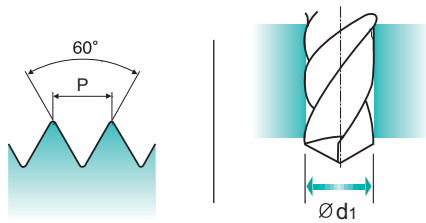
SERIES **TTF19**

DIN / ANSI

- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.







Material groups **VG** | HSS PM | D | 60° | 1.5P~2P | TiN | R15 | p.5

Unit : inch

SIZE ØD1	Pitch P	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
M4	x 0.7	TTF19244R	D4	.276	2.48	.823	.168	.191	.310	3	-	3.4
M5	x 0.8	TTF19284R	D4	.315	2.76	.988	.194	.191	.310	3	-	4.3
M6	x 1.0	TTF19315R	D5	.394	3.15	1.177	.255	.191	.310	3	-	5.1
M8	x 1.25	TTF19365R	D5	.512	3.54	1.378	.318	.238	.380	3	-	6.1
M9	x 1.25	TTF19395R	D5	.512	3.54	1.378	.381	.286	.440	3	-	7.9
M10	x 1.5	TTF19426R	D6	.591	3.94	1.535	.381	.286	.440	3	-	8.7
M10	x 1.25	TTF19435R	D5	.512	3.94	1.535	.381	.286	.440	3	-	8.9
M10	x 1.0	TTF19445R	D5	.394	3.54	1.378	.381	.286	.440	3	-	9.1
M12	x 1.75	TTF19506R	D6	.709	4.33	1.933	.367	.275	.440	3	-	10.5
M12	x 1.5	TTF19516R	D6	.591	3.94	1.933	.367	.275	.440	3	-	10.7
M12	x 1.25	TTF19525R	D5	.512	3.94	1.933	.367	.275	.440	3	-	10.9
M14	x 2.0	TTF19547R	D7	.787	4.33	1.972	.429	.322	.500	3	-	12.3
M14	x 1.5	TTF19556R	D6	.591	3.94	1.972	.429	.322	.500	3	-	12.7
M14	x 1.25	TTF19566R	D6	.512	3.94	1.972	.429	.322	.500	3	-	12.9
M16	x 2.0	TTF19607R	D7	.787	4.33	2.126	.480	.360	.560	3	-	14.3
M16	x 1.5	TTF19616R	D6	.591	3.94	2.126	.480	.360	.560	3	-	14.7
M18	x 2.5	TTF19657R	D7	.984	4.92	2.165	.542	.406	.610	4	-	15.8
M18	x 1.5	TTF19676R	D6	.591	4.33	2.165	.542	.406	.610	4	-	16.7

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

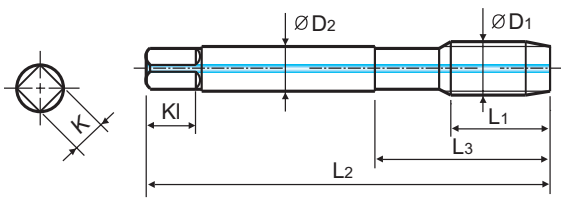
TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

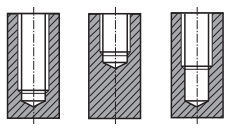
SERIES **TTF23**

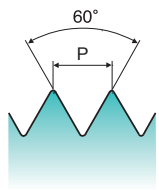
DIN / ANSI

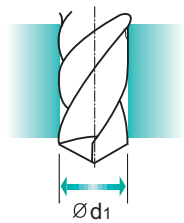
- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.



Hole type
2.0×D







with Internal Coolant

Material groups **VG** | HSS PM | H | 60° | 2P~3P | TiN | R15

p.5

Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
1/4	20	TTF23403R	H3	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4	20	TTF23405R	H5	.500	3.15	1.177	.255	.191	.310	3	-	5.2
1/4	28	TTF23423R	H3	.358	3.15	1.177	.255	.191	.310	3	-	5.5
1/4	28	TTF23424R	H4	.358	3.15	1.177	.255	.191	.310	3	-	5.5
5/16	18	TTF23443R	H3	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16	18	TTF23445R	H5	.555	3.54	1.378	.318	.238	.380	3	-	6.7
5/16	24	TTF23463R	H3	.417	3.54	1.378	.318	.238	.380	3	-	7.0
5/16	24	TTF23464R	H4	.417	3.54	1.378	.318	.238	.380	3	-	7.0
3/8	16	TTF23483R	H3	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8	16	TTF23485R	H5	.626	3.94	1.535	.381	.286	.440	3	-	8.1
3/8	24	TTF23503R	H3	.417	3.94	1.535	.381	.286	.440	3	-	8.6
3/8	24	TTF23504R	H4	.417	3.94	1.535	.381	.286	.440	3	-	8.6
7/16	14	TTF23523R	H3	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16	14	TTF23525R	H5	.713	3.94	1.713	.323	.242	.394	3	-	9.5
7/16	20	TTF23543R	H3	.500	3.94	1.713	.323	.242	.394	3	-	10.0
7/16	20	TTF23545R	H5	.500	3.94	1.713	.323	.242	.394	3	-	10.0
1/2	13	TTF23563R	H3	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	13	TTF23565R	H5	.768	4.33	1.933	.367	.275	.440	3	-	11.0
1/2	20	TTF23583R	H3	.500	3.94	1.933	.367	.275	.440	3	-	11.6
1/2	20	TTF23585R	H5	.500	3.94	1.933	.367	.275	.440	3	-	11.6
9/16	12	TTF23603R	H3	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	12	TTF23605R	H5	.835	4.33	1.972	.429	.322	.500	3	-	12.5
9/16	18	TTF23623R	H3	.555	3.94	1.972	.429	.322	.500	3	-	13.0
9/16	18	TTF23625R	H5	.555	3.94	1.972	.429	.322	.500	3	-	13.0

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

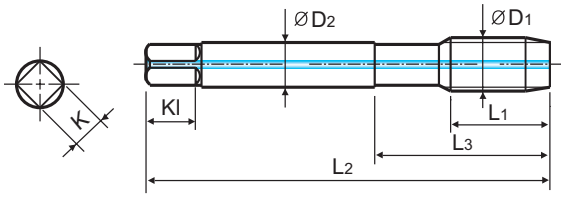
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

SERIES **TTF23**

DIN / ANSI

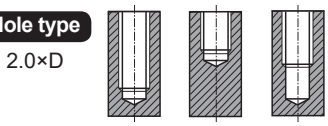


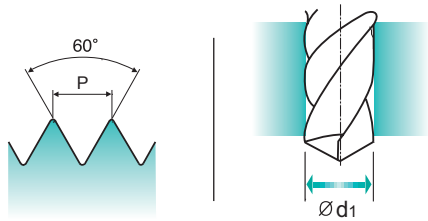
with Internal Coolant

Material groups **VG** | HSS PM | H | 60° | 2P~3P | TiN | R15 | p.5

- ▶ YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- ▶ Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.

Hole type
2.0×D





Unit : inch

SIZE ØD1	TPI	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
5/8	- 11	TTF23643R	H3	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	- 11	TTF23645R	H5	.909	4.33	2.126	.480	.360	.560	3	-	13.9
5/8	- 18	TTF23663R	H3	.555	3.94	2.126	.480	.360	.560	3	-	14.6
5/8	- 18	TTF23665R	H5	.555	3.94	2.126	.480	.360	.560	3	-	14.6
3/4	- 10	TTF23703R	H3	1.00	4.92	2.433	.590	.442	.673	4	-	16.9
3/4	- 10	TTF23705R	H5	1.00	4.92	2.433	.590	.442	.673	4	-	16.9
3/4	- 16	TTF23723R	H3	.626	4.33	2.433	.590	.442	.673	4	-	17.7
3/4	- 16	TTF23725R	H5	.626	4.33	2.433	.590	.442	.673	4	-	17.7
7/8	- 9	TTF23744R	H4	1.110	5.51	2.654	.697	.523	.736	4	-	19.8
7/8	- 9	TTF23746R	H6	1.110	5.51	2.654	.697	.523	.736	4	-	19.8
7/8	- 14	TTF23764R	H4	.713	4.92	2.654	.697	.523	.736	4	-	20.5
7/8	- 14	TTF23766R	H6	.713	4.92	2.654	.697	.523	.736	4	-	20.5
1"	- 8	TTF23784R	H4	1.252	6.30	3.012	.800	.600	.800	4	-	22.7
1"	- 8	TTF23786R	H6	1.252	6.30	3.012	.800	.600	.800	4	-	22.7
1"	- 12	TTF23804R	H4	.835	5.51	3.012	.800	.600	.800	4	-	23.5
1"	- 12	TTF23806R	H6	.835	5.51	3.012	.800	.600	.800	4	-	23.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

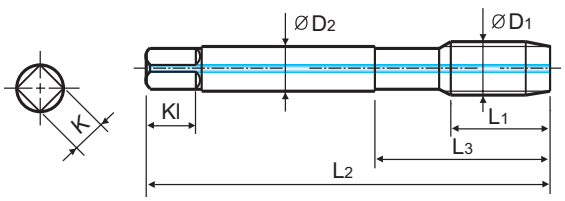
TIN-COATING, HSS-PM

SPIRAL FLUTE TAPS with CHIP BREAKER

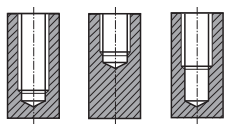
SERIES **TTF20**

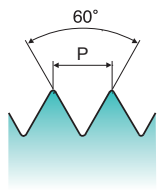
DIN / ANSI

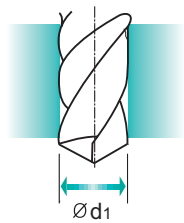
- YG Tap Chip Breaker provides a solution to solve the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel.



Hole type
2.0×D







with Internal Coolant

Material groups **VG** | HSS PM | D | 60° | 2P~3P | TiN | R15 | p.5

Unit : inch

SIZE ØD1	Pitch P	EDP No.	Limits	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter(Ød1) Inch	Metric
M6	x 1.0	**TTF20315R**	D5	.394	3.15	1.177	.255	.191	.310	3	-	5.1
M8	x 1.25	**TTF20365R**	D5	.512	3.54	1.378	.318	.238	.380	3	-	6.1
M8	x 1.0	**TTF20375R**	D5	.394	3.54	1.378	.318	.238	.380	3	-	6.9
M9	x 1.25	**TTF20395R**	D5	.512	3.54	1.378	.381	.286	.440	3	-	7.9
M9	x 1.0	**TTF20405R**	D5	.394	3.54	1.378	.381	.286	.440	3	-	8.1
M10	x 1.5	**TTF20426R**	D6	.591	3.94	1.535	.381	.286	.440	3	-	8.7
M10	x 1.25	**TTF20435R**	D5	.512	3.94	1.535	.381	.286	.440	3	-	8.9
M10	x 1.0	**TTF20445R**	D5	.394	3.54	1.378	.381	.286	.440	3	-	9.1
M12	x 1.75	**TTF20506R**	D6	.709	4.33	1.933	.367	.275	.440	3	-	10.5
M12	x 1.5	**TTF20516R**	D6	.591	3.94	1.933	.367	.275	.440	3	-	10.7
M12	x 1.25	**TTF20525R**	D5	.512	3.94	1.933	.367	.275	.440	3	-	10.9
M14	x 2.0	**TTF20547R**	D7	.787	4.33	1.972	.429	.322	.500	3	-	12.3
M14	x 1.5	**TTF20556R**	D6	.591	3.94	1.972	.429	.322	.500	3	-	12.7
M14	x 1.25	**TTF20566R**	D6	.512	3.94	1.972	.429	.322	.500	3	-	12.9
M16	x 2.0	**TTF20607R**	D7	.787	4.33	2.126	.480	.360	.560	3	-	14.3
M16	x 1.5	**TTF20616R**	D6	.591	3.94	2.126	.480	.360	.560	3	-	14.7
M18	x 2.5	**TTF20657R**	D7	.984	4.92	2.165	.542	.406	.610	4	-	15.8
M18	x 1.5	**TTF20676R**	D6	.591	4.33	2.165	.542	.406	.610	4	-	16.7
M20	x 2.5	**TTF20708R**	D8	.984	5.51	2.433	.652	.489	.673	4	-	17.8
M20	x 1.5	**TTF20726R**	D6	.591	4.92	2.433	.652	.489	.673	4	-	18.7
M22	x 2.5	**TTF20748R**	D8	.984	5.51	2.654	.697	.523	.736	4	-	19.8
M22	x 1.5	**TTF20766R**	D6	.591	4.92	2.654	.697	.523	.736	4	-	20.7
M24	x 3.0	**TTF20788R**	D8	1.181	6.30	2.693	.760	.570	.736	4	-	13.9
M24	x 1.5	**TTF20806R**	D6	.591	5.51	2.693	.760	.570	.736	4	27/32	-

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

TROUBLE SHOOTING GUIDE

Specific Problem	Cause	Solution
Dimensional Accuracy		
Oversize Pitch Diameter	Incorrect Tap	1. Use proper limits of taps 2. Use longer chamfered taps
	Chip Packing	1. Use spiral point or spiral fluted taps 2. Reduce number of flutes to provide extra chip room 3. Use larger hole size 4. If tapping a hole, allow deeper hole where applicable or shorten the thread length of the parts 5. Use proper lubricant
	Galling	1. Apply proper surface treatment such as Hardslick or chrome 2. Use proper cutting lubricant 3. Reduce tapping speed 4. Use proper cutting angle in accordance with material being tapped 5. Use large hole size
	Operating Conditions	1. Apply proper tapping speed 2. Correct alignment of tap and drill hole 3. Free cutting either tap or workpiece 4. Use proper tapping speed to avoid torn or rough threads 5. Use lead screw tapper 6. Use proper tapping machine with suitable power 7. Avoid misalignment of the tap and drill hole from loose spindle or worn holder
	Tool Condition	1. Obtain proper indexing angle for the flutes at the cutting edge 2. Grind proper cutting angle and chamfer angle 3. Avoid too narrow a land width 4. Remove burrs from regrinding
Oversize Internal Diameter	Hole Size	1. Use minimum hole size 2. Avoid tapered hole 3. Use proper chamfered taps
	Galling	1. Galling solutions 1 through 4 above can be applied to this specific problem
Undersize Pitch Diameter	Incorrect Tap	1. Use oversize taps 2. Apply proper chamfer angle 3. Increase cutting angle
	Damaged Thread	1. Use proper reversing speed to avoid damaging tapped thread on the way out of the hole
	Left-over Chips	1. Increase cutting performance to avoid any left over chips in the hole 2. Remove left over chips from the hole for gage checking
Undersize Internal Diameter	Hole Size	1. Use maximum drill size
Breakage	Incorrect Tap Selection	1. Avoid chip packing in the flutes or on the bottom of the hole Use spiral pointed or spiral fluted taps or fluteless taps 2. Apply correct surface treatment such as Hardslick or bright
	Excessive Tapping Torque	1. Use larger drill size 2. Try to shorten thread length 3. Increase cutting angle 4. Apply a tap with more thread relief and reduced land width 5. Apply correct surface treatment such as Hardslick

TROUBLE SHOOTING GUIDE

Specific Problem	Cause	Solution
Dimensional Accuracy		
Breakage	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and the hole and tapered hole 3. Use floating type of tapping holder 4. Use tapping holder with torque adjustment 5. Avoid hitting bottom of the hole with tap
	Tool Condition	1. Do not grind the bottom of the flute 2. Avoid too narrow a land width 3. Remove all worn sections when regrinding the flutes 4. Regrind tool more frequently
Chipping	Incorrect Tap Selection	1. Reduce cutting angle 2. Use a different kind of high-speed steel tap 3. Reduce hardness of the tap 4. Increase chamfer length 5. Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps
	Wear	1. Reduce tapping speed 2. Avoid misalignment between tap and hole 3. Avoid sudden return of reverse in blind hole tapping 4. Avoid galling 5. Use larger hole size
Wearx	Incorrect Tap Selection	1. Apply specially designed tap for tapping heat treated material 2. Change to a type of high-speed steel tap that contains vanadium 3. Apply special surface treatment such as TiCN, TiAlN or Hardslick 4. Increase chamfer length
	Operating Conditions	1. Reduce tapping speed 2. Apply proper cutting lubricants 3. Avoid work hardened hole 4. Use larger hole size
	Tool Condition	1. Grind proper cutting angle 2. Avoid hardness reduction from grinding process
Torn or Rough Thread	Chamfer Too Short	1. Increase chamfer length
	Wrong Cutting Angle	1. Apply proper cutting angle
	Galling	1. Use thread relieved taps 2. Reduce land width 3. Apply surface treatment such as Hardslick or chrome 4. Use proper cutting lubricant 5. Reduce tapping speed 6. Use larger hole size 7. Obtain proper alignment between tap and work
	Chip Packing	1. Use spiral pointed or spiral fluted taps 2. Use larger drill size
Chattering on Tapped Thread	Tool Free Cutting	1. Reduce cutting angle 2. Reduce amount of thread relief
	Tool Condition	1. Avoid too narrow land width 2. Do not grind the bottom of the flute

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