NTK CUTTING TOOLS
TOOL NEWS
No.049

ST4

SUPER TOUGH COAT

For Stainless Steel

Extended tool life with new PVD coated carbide grades. 「ST4」 for stainless steels like SUS304.

NTK CUTTING TOOLS

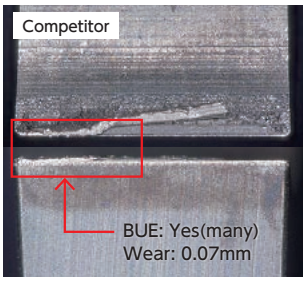
Stable and consistent performance when machining stainless steel

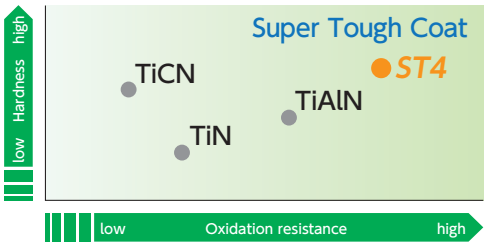
Low tool life , and unstable chip evacuation are factors preventing stable machining of stainless steel.
The New PVD coated carbide grade ST4 solves the issues related to machining stainless steel.

Higher hardness and oxidation resistance

NTK's unique coating technology creates a high-aluminum coated composition.
Extends tool life and allows high-speed machining of stainless steel.

NTK vs. competitor(cut off)
Workmaterial : SUS304(φ11) Vc=80m/min f=0.03mm after 200pcs cut-off



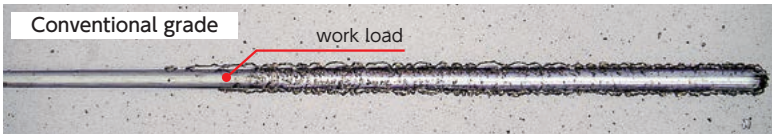


Stable machining, excellent surface finish ⇒ Extended tool life

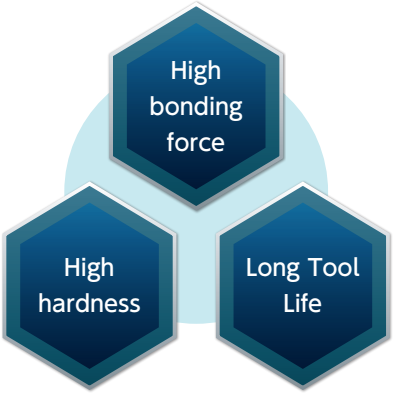
NTK new PVD coated carbide grades [ST4] improved bonding force and surface smoothness .
It prevents BUE trouble from stainless steel machining, and achived stable cutting.

Measurement (Scratch test on coating layer)

work load direction

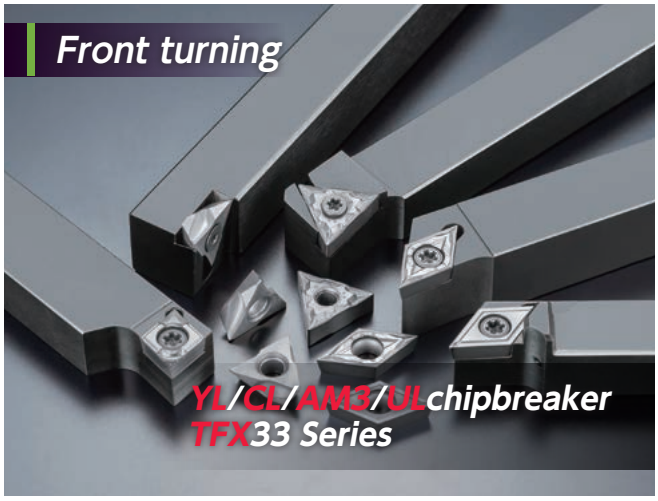


work load direction

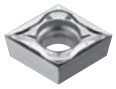
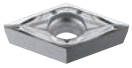
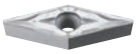
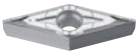
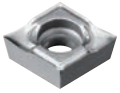
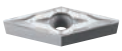
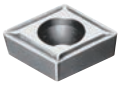


Super Tough Coat 「ST4」 × Chipbreaker for stainless steel

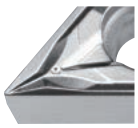
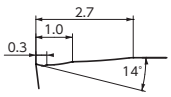
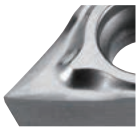
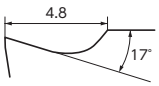
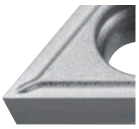
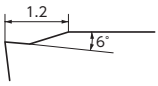
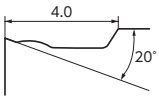
NTK's ST4 grade combined with unique chipbreakers meet the demands of your machining.



Front turning YL • CL • AM3 • ULchipbreaker

Shape	Item number		Corner R	Stock ST4	Dimensions (mm) I.C.	Dimensions (mm) Thickness
	CCGT	09T301M YL	0.08	●	9.525	3.97
		09T302M YL	0.18	●		
		09T304M YL	0.38	●		
		09T308M YL	0.78	●		
	DCGT	11T301M YL	0.08	●	9.525	3.97
		11T302M YL	0.18	●		
		11T304M YL	0.38	●		
		11T308M YL	0.78	●		
	VCGT	110301M YL	0.08	●	6.35	3.18
		110302M YL	0.18	●		
		110304M YL	0.38	●		
	VBGT	160402FN YL	0.2	●	9.525	4.76
		160404FN YL	0.4	●		
		160408FN YL	0.8	●		
	CCGT	060201M CL	0.08	●	6.35	2.38
		060202M CL	0.18	●		
		09T301M CL	0.08	●	9.525	3.97
		09T302M CL	0.18	●		
		09T304M CL	0.38	●		
	DCGT	070201M CL	0.08	●	6.35	2.38
		070202M CL	0.18	●		
		070204M CL	0.38	●		
		11T301M CL	0.08	●	9.525	3.97
		11T302M CL	0.18	●		
		11T304M CL	0.38	●		
	VCGT	110301M YL	0.08	●	6.35	3.18
		110302M YL	0.18	●		
		110304M YL	0.38	●		
	CCGT	060201M FN AM3	0.08	●	6.35	2.38
		060202M FN AM3	0.18	●		
		060204M FN AM3	0.38	●		
		09T301M FN AM3	0.08	●	9.525	3.97
		09T302M FN AM3	0.18	●		
		09T304M FN AM3	0.38	●		
	DCGT	070201M FN AM3	0.08	●	6.35	2.38
		070202M FN AM3	0.18	●		
		070204M FN AM3	0.38	●		
		11T301M FN AM3	0.08	●	9.525	3.97
		11T302M FN AM3	0.18	●		
		11T304M FN AM3	0.38	●		
	VCGT	110301M FN AM3	0.08	●	6.35	3.18
		110302M FN AM3	0.18	●		
		110304M FN AM3	0.38	●		
	VPGT	110301M FN AM3	0.08	●	6.35	3.18
		110302M FN AM3	0.18	●		
	TNGG	160401M FN UL	0.08	●	9.525	4.76
		160402M FN UL	0.18	●		
		160404M FN UL	0.38	●		
		160408M FN UL	0.78	●		

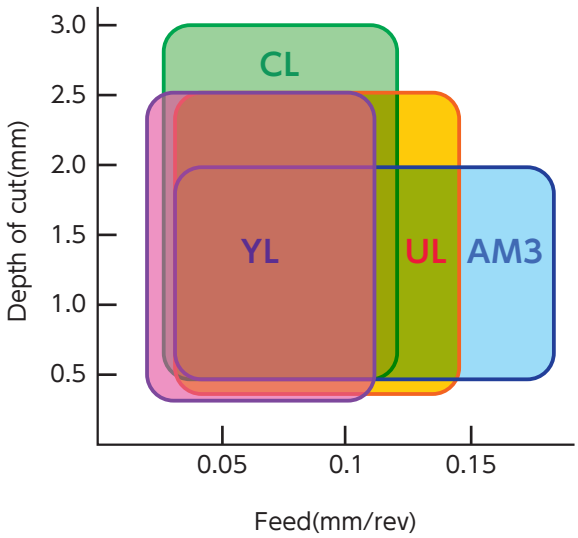
Features

Name	Chipbreker Geometry		Features
YL		 ※DCGT11T302MYL	• Great combination of sharpness and toughness • Covers extremely wide range • Excellent chip control
CL		 ※DCGT11T302M	• Sharpest molded chipbreaker • Excellent chip control • Less tool pressure
AM3		 ※DCGT11T302	• All purpose chipbreaker • Sharp edge with toughness
UL		 ※TNGG160401MFN	• Negative insert with a positive insert's chipbreaker • Reduced burrs • Improves microfinish • Superb advantage in cost per corner over positive inserts

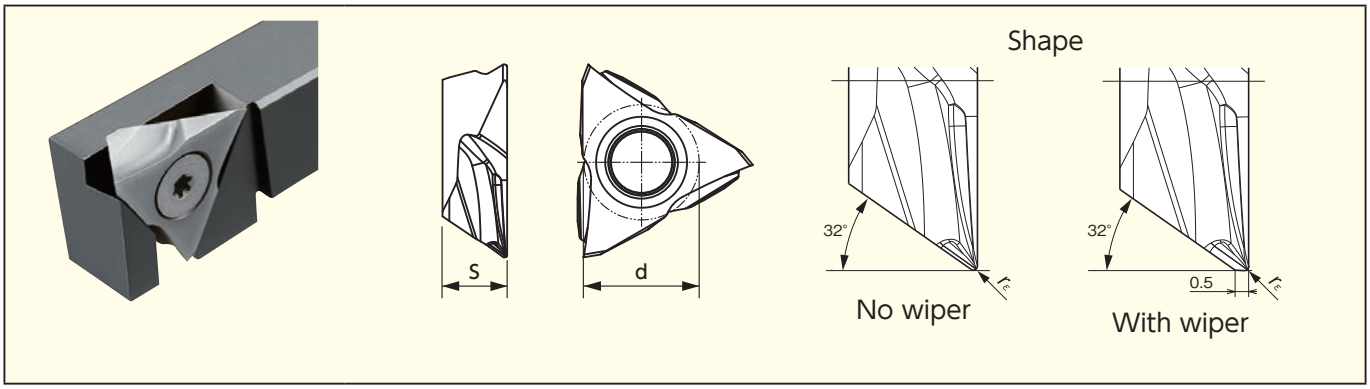
Chipbreker Geometry

Toolholder	CCGT Series	DCGT Series	VCGT Series	VPGT Series	TNGG Series
2019-2020 General catalogue	G24~G25	G26~G29	G30~G33	G34~G35	G40~G41
2018 SS catalogue	D22~D23	D24~D27	D28~D31	D32~D33	D36~D37

Chip Control Range



Front turning TFX Series

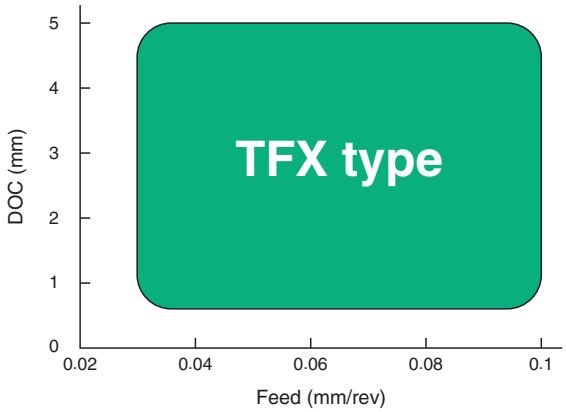


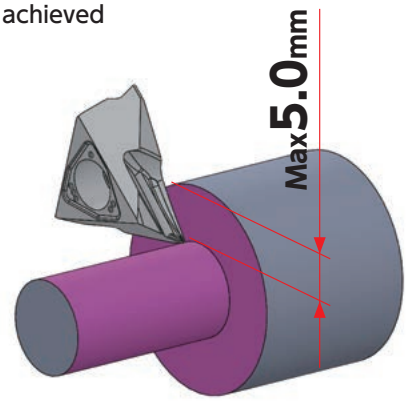
Wiper	Item number	r_ε (mm)	Stock ST4	Max. DOC (mm)	Dimensions (mm) d	Dimensions (mm) s	Toolholder 2019-2020 General catalogue
Yes	TFX 3301MR	0.08	●	5.0	9.525	4.76	G36
	3302MR	0.18	●				
	3304MR	0.38	●				
No	TFX 3301MRW	0.08	●	5.0	9.525	4.76	G36
	3302MRW	0.18	●				
	3304MRW	0.38	●				

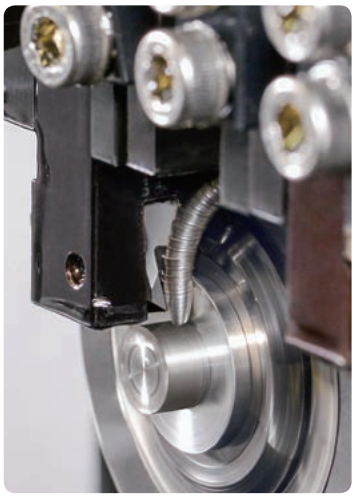
Features

Specially designed sharp chipbreaker provides 1 pass turning up to 5.0mm.

Reduce cutting force with high DOC turning, and achieved excellent chipcontrol with good surface finish.

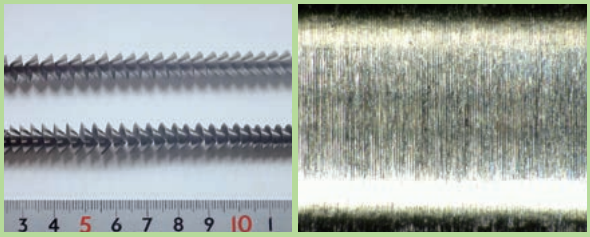






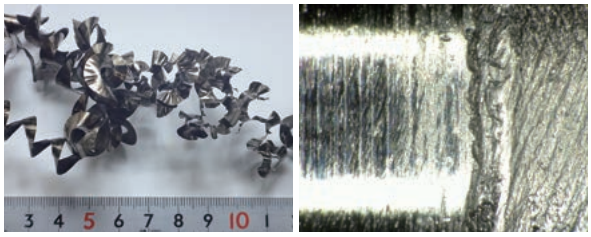
DOC 5.0mm Workmaterial : SUS304 Cutting condition : Vc=80m/min f=0.03mm/rev WET

NTK The Front Max



Good chip control and excellent machined surface finish

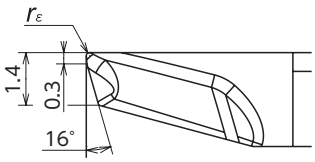
Competitor's chipbreaker designed for high DOC turning



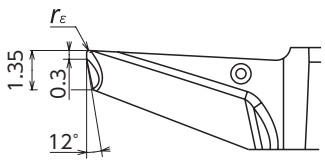
Rough surface

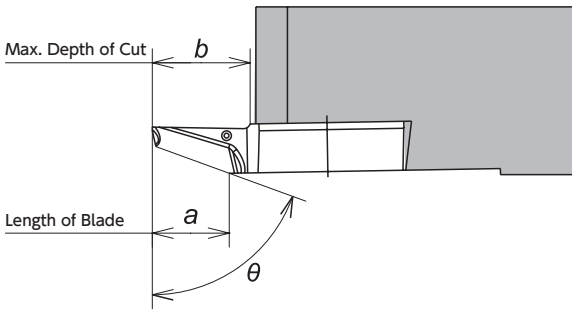
Back turning TBP/TBPA-BM Series

TBP-BM Series



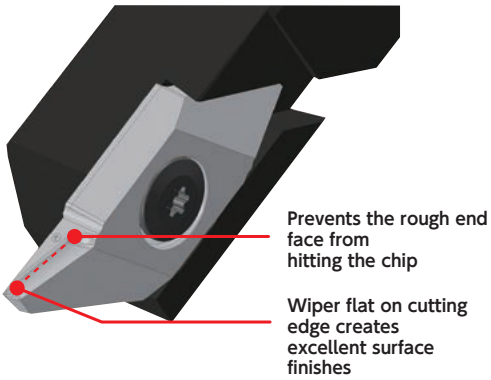
TBPA-BM Series





Item number	r_ε (mm)	Length of Blade a (mm)	Max. Depth of Cut b (mm)	Cutting edge angle θ	Stock ST4	Toolholder 2019-2020 General catalogue	Toolholder 2018 SS catalogue
TBP 72FR05-BM	0.05	3.5	5.3	72°	●	G54～G55	E12～E13
72FR10M-BM	0.08	3.5	5.3	72°	●		
72FR20M-BM	0.18	3.5	5.3	72°	●		
TBPA 70FR05-BM	0.05	5.5	6.5	70°	●	G56～G57	E14
70FR10M-BM	0.08	5.5	6.5	70°	●		
70FR20M-BM	0.18	5.5	6.5	70°	●		

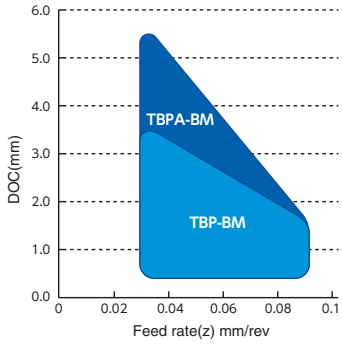
Features



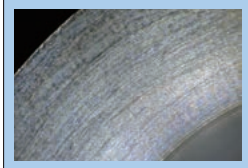
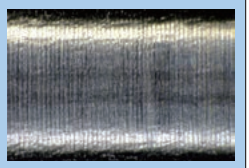
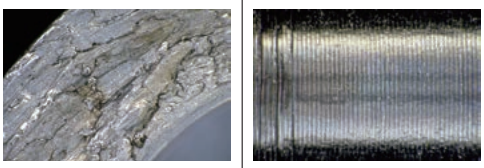
BM chipbreaker	Competitor's tool
Good chip control	Unstable chip control

Cutting condition: Vc=80m/min WET
Material: SUS304 ϕ16 Holder: TBPR12
Insert: TM4 TBP72FR10M-BM

Chip control range



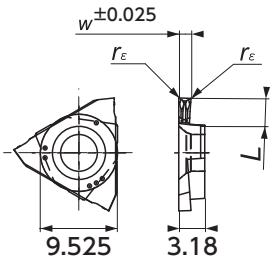
Superior Surface Finish

1 Pass	BM chipbreaker		Competitor's tool	
	End face	OD	End face	OD
				
	Excellent surface	Ra : 0.72 μm Rz : 4.46 μm	Rough surface	Ra : 1.65 μm Rz : 6.01 μm	

Cutting condition: Vc=80m/min f(x)=0.02mm/rev f(z)=0.08mm/rev ap=3.0mm WET
Material: SUS304 ϕ16 Holder: TBPR12 Insert: TM4 TBP72FR10M-BM

Grooving GTMH32-GX Series

side turning capability
Details
Front rake angle: 17degree
Side rake angle :14 degree



Groove width: ~ 1.0

Groove width : 1.5 ~

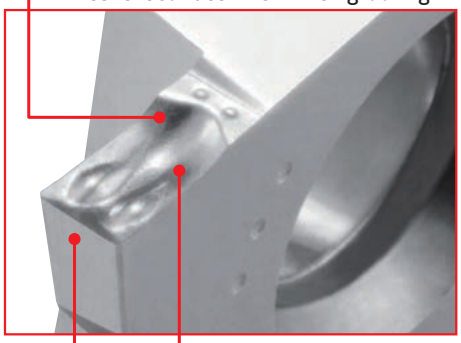
Item number	Dimension(mm)					Stock
	W	rε	L	Max Depth Grooving (mm)	Max Depth Side turning (mm)	ST4
GTMH32 033RGX	0.33	0.05	0.6	0.25	—	●
043RGX	0.43	0.05	1.2	0.9	—	●
050RGX	0.50	0.05	1.2	0.9	—	●
053RGX	0.53	0.05	1.2	0.9	—	●
075RGX	0.75	0.05	2.0	1.6	0.75	●
095RGX	0.95	0.05	2.0	1.6	1.5	●
100RGX	1.0	0.05	2.0	1.6	1.5	●
100RGX01	1.0	0.1	2.0	1.6	1.5	●
GTMH32 150RGX	1.5	0.05	3.0	2.7	2.0	●
150RGX01	1.5	0.1	3.0	2.7	2.0	●
150RGX02	1.5	0.2	3.0	2.7	2.0	●
200RGX	2.0	0.05	3.0	2.7	2.0	●
200RGX01	2.0	0.1	3.0	2.7	2.0	●
200RGX02	2.0	0.2	3.0	2.7	2.0	●
300RGX	3.0	0.05	3.0	2.7	2.0	●
300RGX02	3.0	0.2	3.0	2.7	2.0	●

Features

Typical Grooving Problems
- Chips remain at the bottom of groove
- Bird's nest of chips

Center bump and dent design improves chip control

Helps chip curl & control.
Excellent surface finish when grooving.



Improved chip control whe side turning.

Chip control performance at side turni improved (MAX. ap- 2.0mm)

Outer periiphery polishing offers excellent surface finish

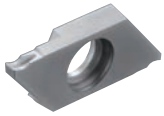
Sharpness equal to ground chipbreaker

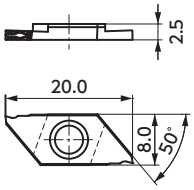
■ Toolholder

Toolholder	
2019-2020 General catalogue	2018 SS catalogue
H18 ~ H21	H8 ~ H11

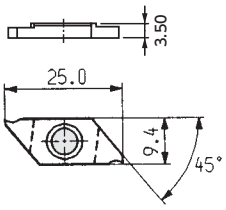
Cut off CTP/CTPA-CX Series

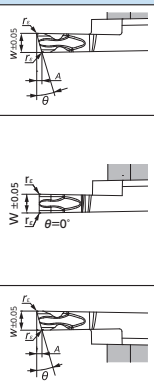
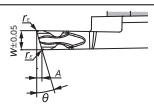
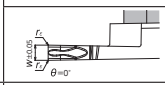
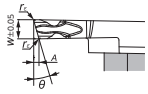
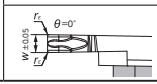
CTP-TH Series
(Max. Cut-off Dia. ～ϕ12)





CTPA-TH Series
(Max. Cut-off Dia. ～ϕ16)

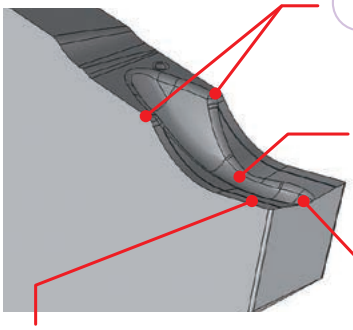


Type	Hand	Shape	Item number	Max. Cut-off Dia. (mm) ϕD	Dimension(mm)				Stock
					w	A	θ	r_ε	ST4
CTP Series	R		CTP 10FR-CX	12.0	1.0	0.32	16°	0.05	●
			13FR-CX	12.0	1.3	0.40	16°	0.05	●
			15FR-CX	12.0	1.5	0.46	16°	0.05	●
			CTP 10FRN-CX	12.0	1.0	—	0°	0.05	●
			13FRN-CX	12.0	1.3	—	0°	0.05	●
			13FRN02-CX	12.0	1.3	—	0°	0.2	●
			15FRN-CX	12.0	1.5	—	0°	0.05	●
			15FRN02-CX	12.0	1.5	—	0°	0.2	●
	L		CTP 10FLK-CX	11.0	1.0	0.32	16°	0.05	●
			13FLK-CX	11.0	1.3	0.40	16°	0.05	●
			15FLK-CX	11.0	1.5	0.46	16°	0.05	●
			CTP 10FLN-CX	12.0	1.0	—	0°	0.05	●
			13FLN-CX	12.0	1.3	—	0°	0.05	●
			13FLN02-CX	12.0	1.3	—	0°	0.2	●
			15FLN-CX	12.0	1.5	—	0°	0.05	●
			15FLN02-CX	12.0	1.5	—	0°	0.2	●
CTPA Series	R		CTPA 15FR-CX	16.0	1.5	0.46	16°	0.05	●
			CTPA 15FRN-CX	16.0	1.5	—	0°	0.05	●
	L		CTPA 15FLK-CX	14.5	1.5	0.46	16°	0.05	●
			CTPA 15FLN-CX	16.0	1.5	—	0°	0.05	●

※Max. Cut-off Dia. is indicates the cutting diameter of the insert when the top of the cutting edge is located on center

Features

Folds chip strongly from both ends and achieves superior machined surface finish.



1 Fold chips from both ends strongly.

4 Center groove guides the chips.

3 V-shape has 2 step action for keeping nose R sharp and fold ships.

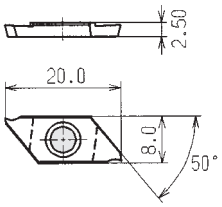
2 Up sharp edge like a ground inserts(Rake angle :15 degree)

■ Toolholder

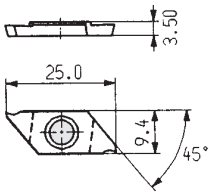
Catalogue	CTP Series	CTPA Series
2019-2020 General catalogue	G76～G77	G82～G83
2018 SS catalogue	F10～F11	F16～F17

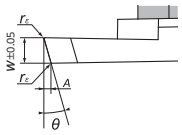
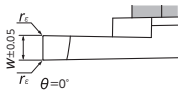
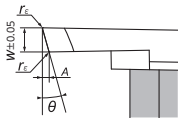
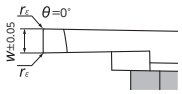
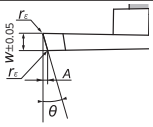
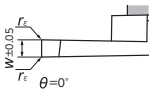
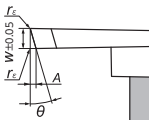
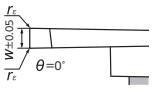
Cut-off CTP/CTPA-TH Series (Tough edge type)

CTP-TH Series
(Max. Cut-off Dia. ~φ12)



CTPA-TH Series
(Max. Cut-off Dia. ~φ16)

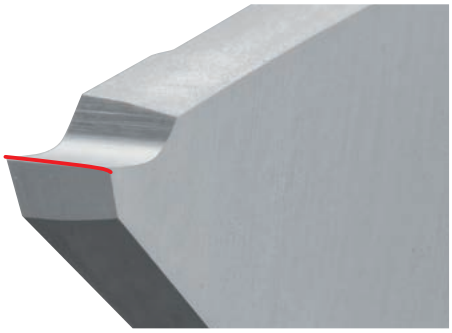


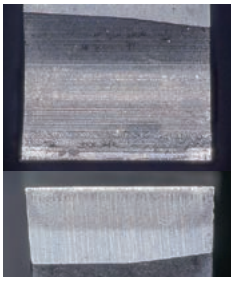
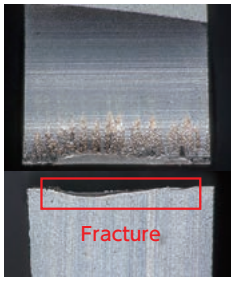
Type	Hand	Shape	Item number	Max. Cut-off Dia. (mm) φD	Dimension(mm) w	A	θ	r_ε	Stock ST4
CTP Series	R		CTP 10FR-TH	12.0	1.0	0.32	16°	0.05	●
			15FR-TH	12.0	1.5	0.46	16°	0.05	●
			20FR-TH	12.0	2.0	0.61	16°	0.05	●
			CTP 10FRN-TH	12.0	1.0	—	0°	0.05	●
			15FRN-TH	12.0	1.5	—	0°	0.05	●
			20FRN-TH	12.0	2.0	—	0°	0.05	●
	L		CTP 10FLK-TH	11.0	1.0	0.32	16°	0.05	●
			15FLK-TH	11.0	1.5	0.46	16°	0.05	●
			20FLK-TH	11.0	2.0	0.61	16°	0.05	●
			CTP 10FLN-TH	12.0	1.0	—	0°	0.05	●
			15FLN-TH	12.0	1.5	—	0°	0.05	●
			20FLN-TH	12.0	2.0	—	0°	0.05	●
CTPA Series	R		CTPA 15FR-TH	16.0	1.5	0.46	16°	0.05	●
			20FR-TH	16.0	2.0	0.61	16°	0.05	●
			CTPA 15FRN-TH	16.0	1.5	—	0°	0.05	●
			20FRN-TH	16.0	2.0	—	0°	0.05	●
	L		CTPA 15FLK-TH	14.5	1.5	0.46	16°	0.05	●
			20FLK-TH	14.5	2.0	0.61	16°	0.05	●
			CTPA 15FLN-TH	16.0	1.5	—	16°	0.05	●
			20FLN-TH	16.0	2.0	—	16°	0.05	●

※Max. Cut-off Dia. is indicates the cutting diameter of the insert when the top of the cutting edge is located on center

Features

[-TH] achieves superior fracture resistance.
Long tool life on stainless steel cut-off operation



Case sutdy	CTP-TH type	Competitor's tool
Material: SUS304 φ11 Cutting condition: Vc=80m/min f=0.03mm/rev Tools: Insert: CTP-TH Series 2.0mm width Holder: CTPR12		
	200pcs. machined	100pcs. machined

Toolholder

Catalogue	CTP Series	CTPA Series
2019-2020 General catalogue	G76 ~ G77	G82 ~ G83
2018 SS catalogue	F10 ~ F11	F16 ~ F17

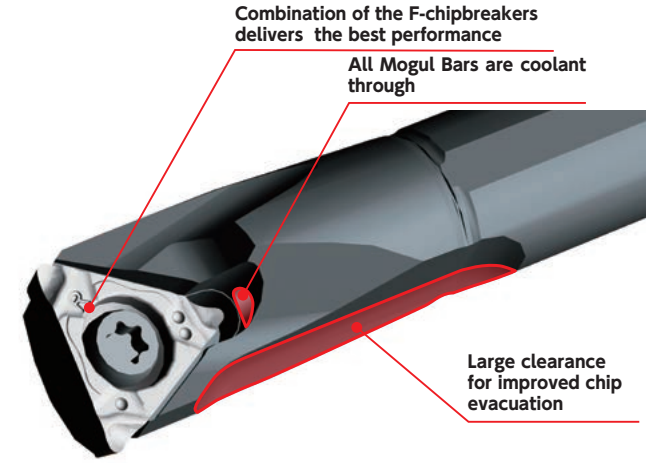
ID turning F05 • F1 • FG chipbreaker

Shape	Number		Corner R	Stock ST4	Dimensions (mm) I.C.	Dimensions (mm) Thickness
	TCGH	060101FR F05	0.1	●	3.97	1.59
		060102FR F05	0.2	●		
		060104FR F05	0.4	●		
	TPGH	090201FR F1	0.1	●	5.58	2.38
		090202FR F1	0.2	●		
		090204FR F1	0.4	●		
		090208FR F1	0.8	●		
		110302FR F1	0.2	●	6.35	3.18
		110304FR F1	0.4	●		
		110308FR F1	0.8	●		
	TPGH	090202R FG	0.2	●	5.56	2.38
		090204R FG	0.4	●		
		110302R FG	0.2	●	6.35	3.18
		110304R FG	0.4	●		
Angle 75°	MBL	005FR F1	0.05	●	3.60	2.38
		015FR F1	0.15	●		
Angle 75°	ERGHT	30101FR F1	0.1	●	3.97	1.59
		30102FR F1	0.2	●		
		30104FR F1	0.4	●		
	CPGH	040101FR F1	0.1	●	4.76	1.59
		040102FR F1	0.2	●		
		040104FR F1	0.4	●		
		060202FR F1	0.2	●	6.35	2.38
		060204FR F1	0.4	●		
	CCGT	060201FR F1	0.1	●	6.35	2.38
		060202FR F1	0.2	●		
		060204FR F1	0.4	●		
		09T302FR F1	0.2	●	9.525	3.97
		09T304FR F1	0.4	●		

■ Toolholder

Catalogue	TCGH Series	TPGH Series	MBL Series	ERGHT Series	CPGH Series	CCGT Series
2019-2020 General catalogue	K32 ~ K33	K32 ~ K33	K26 ~ K27	K28 ~ K29	K30 ~ K31	K30
2018 SS catalogue	K36 ~ K37	K36 ~ K37	K30 ~ K31	K32 ~ K33	K34 ~ D35	K34

Features

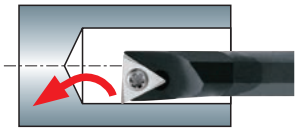


Features

- *[F] type chipbreaker allow chips to evacuate backward.*
- *Combination of the F-chipbreakers and Mogul Bar delivers the best performance*

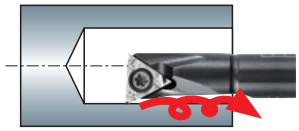
	DOC (mm)	Feed(mm/rev) 0.05	Feed(mm/rev) 0.1
FG chipbreaker ● Best for finishing ● Works for small DOC (ap-0.5mm) ● High rake angle	0.1		
	0.3		
F1 • F05 chipbreaker ● Covers wide range of conditions ● Ground chipbreaker	0.5		
Note: Right-hand inserts with FG and F1 chipbreakers should be used with right-hand holders	Material : SCM435 Holder : S10K-STUPR11D12-OH Insert : TPGH110304 Series Cutting condition : V_c=80m/min Bore diameter : ϕ12 External coolant **Depth of cut : 20mm**		

Typical inserts



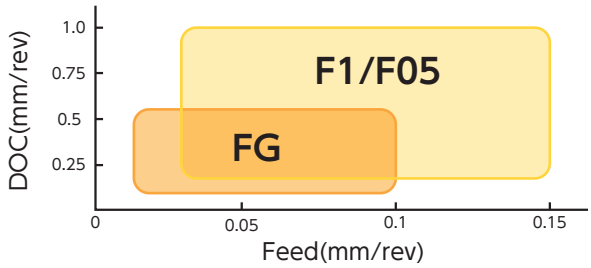
Direct flow chips forward. Then packed chips damage and break cutting edge.

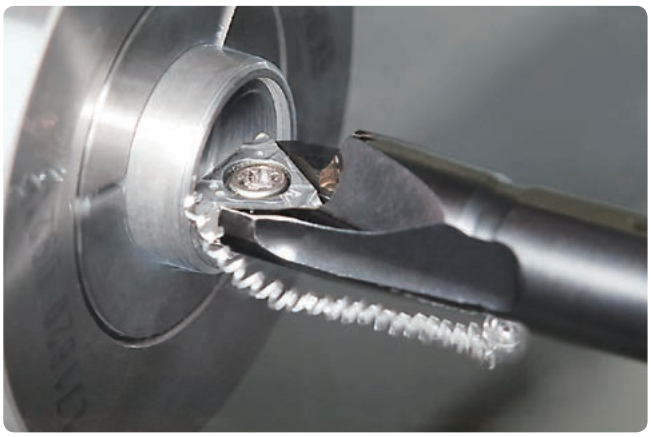
F05, F1, FG chipbreakers



Direct chips backwards and eliminate chipping on inserts.

Chip control range





Recommended Cutting Condition (Grooving, Cut-off)

GTMH32-GX Series

Width (mm)	Feed (mm/rev)				Cutting speed (mm/min)		
	Grooving		Side turning		SUS303	SUS304	SUS440C
	Range	SUS304	Range	SUS304			
0.33～0.53	0.01～0.03	0.02	No capability	No capability	60 100 150	50 70 100	30 60 80
0.75～1.0	0.02～0.05	0.03	0.015～0.04	0.02			
1.5～2.0	0.02～0.08	0.04	0.015～0.06	0.03			
3.0	0.03～0.10	0.05	0.025～0.08	0.04			

CTP/CTPA-CX Series

Width (mm)	Feed (mm/rev)		Cutting speed (mm/min)		
	Range	SUS304	SUS303	SUS304	SUS440C
1.0	0.02～0.04	0.02	60 100 150	50 70 100	30 60 80
1.3	0.02～0.05	0.03			
1.5	0.02～0.06	0.03			

CTP/CTPA-TH Series

Width (mm)	Feed (mm/rev)		Cutting speed (mm/min)		
	Range	SUS304	SUS303	SUS304	SUS440C
1.0	0.02～0.05	0.03	60 100 150	50 70 100	30 60 80
1.5	0.02～0.06	0.04			
2.0	0.02～0.07	0.04			

Recommended Cutting Condition (Front, back turning, cut-off)

〈Feed〉

Please see application pages in 2019-2020 general catalogue and set the cutting conditions for each work material.

〈Calculating of feed〉

$$\underset{\text{(mm/rev)}}{\text{Feed}} = \sqrt{\underset{(\mu\,\text{m})}{\text{Roughness needed}} \times \frac{8 \times \text{nose radius R}}{1000}}$$

〈Example〉

In case of using insert nose radius, and try to obtain roughness Rz3.2.
Calculate to determine feed as follows:

$$\sqrt{(3.2 \times (8 \times 0.2) \div 1000)} \fallingdotseq 0.07\text{mm/rev}$$

If turning with f=0.07mm/rev, it would not meet roughness Rz3.2.
So set feed 50% down.

〈Cutting speed〉

Please see each Grooving and cut-off application page of 2019-2020 general catalogue.