

GrooveLine

SM[★]TOOLS[®]

TUNG^{HEAVY}GROOVE

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Tungaloy Report No. 427-G

Effectively **reduces machining time!**

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ACCELERATED MACHINING



GrooveLine

TUNG^{HEAVY}GROOVE

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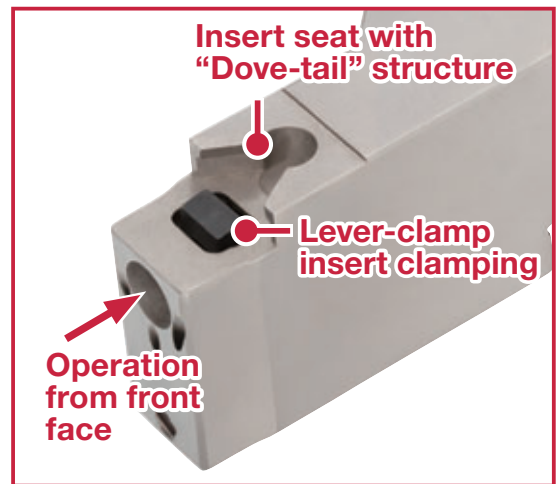
Unique system for wide grooving and wide profile grooving

Efficiently **reduces machining time** of wide width grooving and forming!

Effectively reduces the number of passes or machining time of complex profiles!

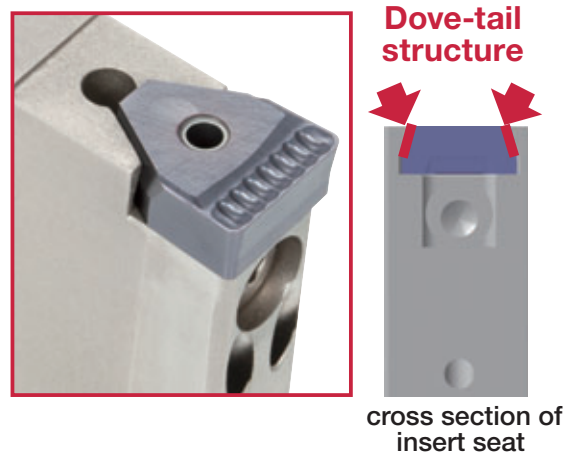
Easy insert clamp operated from front face

Indexing can be operated from front face of toolholder, reducing insert changing time and machine downtime.



Highly rigid lever-clamping provides stable grooving

Dove-tail structure prevents insert movement during wide grooving operations.



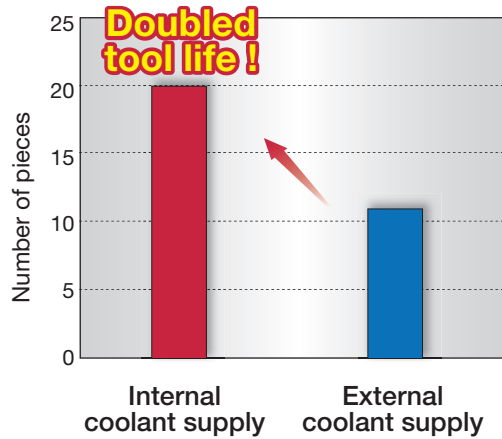
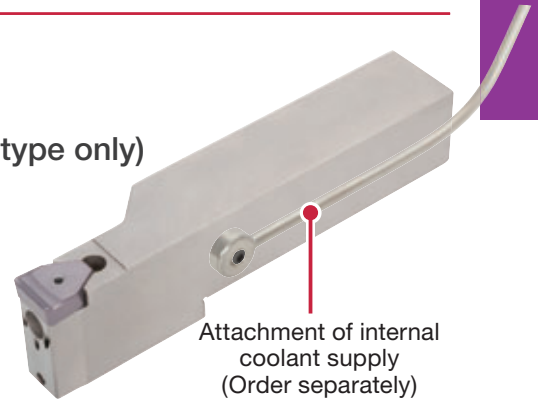
Open tool design, provides a clear path for chip evacuation

Excellent chip shape, due to the dimple shape chipbreaker design. Large rake angle reduces cutting forces.



Internal coolant supply is available (For FPGR type only)

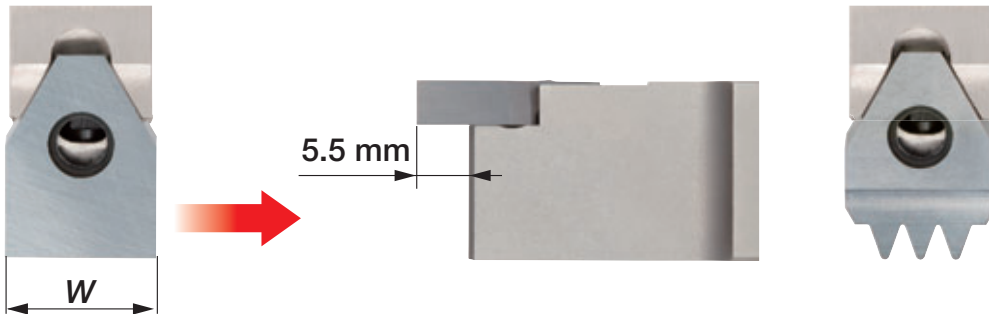
Internal coolant supply can be added on the FPGR/L type grooving toolholders. 2 or 3 coolant holes on front face (depending on toolholder size). Coolant is supplied directly to the cutting edge, reducing flank wear and improving tool life, as well as improves chip control.



Insert	: PSGM10-08
Grade	: AH725
Work material	: SCM415
Cutting speed	: $V_c = 100$ m/min
Feed	: $f = 0.3$ mm/rev
Groove depth	: $d = 20$ mm

Profile grooving inserts and tools

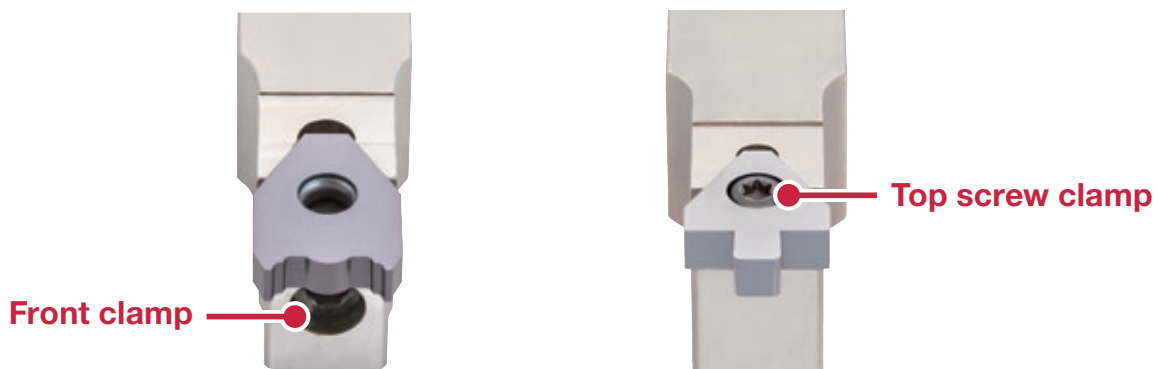
- Inserts are supplied in width (W) 10 - 25 mm.
- The insert length is extended for profile shapes up to 5.5 mm depth.



Two styles of tools are available!

■ Lever lock type

■ Screw on type



Inserts

■ For wide grooving



	Groove width W^* (mm)	Cat. No.	Grades		Dimensions (mm)		
			Coated		L	s	r_{ϵ}
			AH725				
	10	PSGM10-08	●		11	4.0	0.8
	15	PSGM15-15	●		15	5.0	1.5
	20	PSGM20-20	●		22	6.5	2.0
	25	PSGM25-20	●		22	6.5	2.0

* Tolerance of groove width $W = 10: \pm 0.08, W \geq 15: \pm 0.1$

■ Blanks for wide profile grooving*



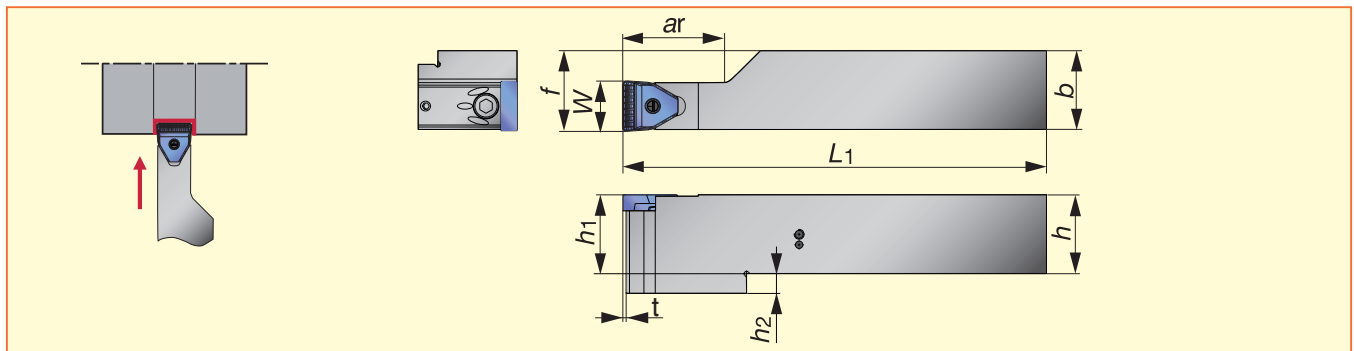
	Groove width $W \pm 0.025$ (mm)	Cat. No.	Grades		Dimensions (mm)	
			Carbide		L	s
			UX30	TH10		
	10.2	PSGB10	●	●	18	4.0
	15.2	PSGB15	●	●	20	5.0
	20.2	PSGB20	●	●	27	6.5
	25.2	PSGB25	●	●	27	6.5

*Stocked products are blanks (semi-finished) for formed inserts

Toolholders

FPG R

Lever lock type, for external wide grooving



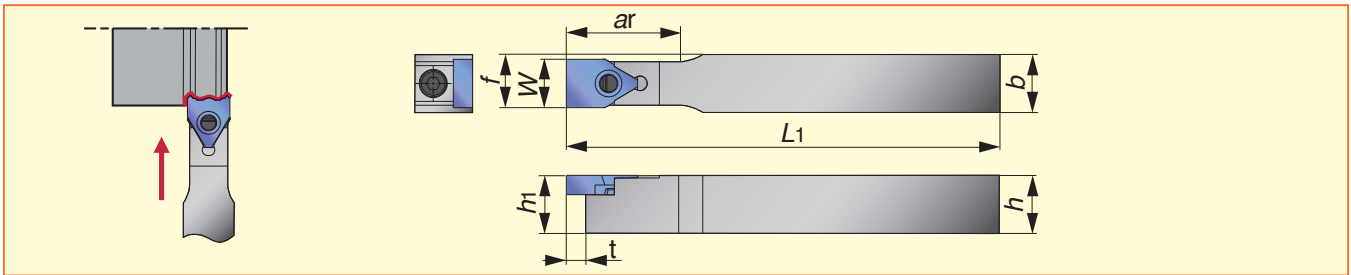
Groove width W (mm)	Cat. No.	Stock	Max. groove depth ar (mm)		Dimensions (mm)								Clamping screw (*) Insert	Lever Spring Wrench	
			PSGB	PSGM	h_1	b	h	L_1		f	h_2	t			
								PSGB	PSGM			PSGB			PSGM
10	FPGR2525M-10T20	●	25	20	25	25	25	155	150	25.5	-	5.5	0.5	PSG*10	FCS3 FCL4 BP-5 P-2.5
10	FPGR3232P-10T36	●	41	36	32	32	32	175	170	32.5	-	5.5	0.5	PSG*10	FCS3 FCL4 BP-5 P-2.5
15	FPGR2525M-15T20	●	25	20	25	25	25	155	150	25.5	-	5.5	0.5	PSG*15	FCS3 FCL4 BP-5 P-2.5
15	FPGR3232P-15T40	●	45	40	32	32	32	175	170	32.5	-	5.5	0.4	PSG*15	FCS3 FCL4 BP-5 P-2.5
20	FPGR3232P-20T40	●	45	40	32	32	32	175	170	32.5	8	5.5	0.4	PSG*20	FCS6 FCL8 BP-9 P-5
20	FPGR4040R-20T50	●	55	50	40	40	40	205	200	40.5	8	5.5	0.4	PSG*20	FCS6 FCL8 BP-9 P-5
25	FPGR3232P-25T40	●	45	40	32	32	32	175	170	32.5	8	5.5	0.4	PSG*25	FCS6 FCL8 BP-9 P-5
25	FPGR4040R-25T50	●	55	50	40	40	40	205	200	40.5	8	5.5	0.4	PSG*25	FCS6 FCL8 BP-9 P-5

(*) Can be used with both wide grooving and profile grooving inserts

● : Stocked items

FPGN

Lever lock type, for external wide profile grooving

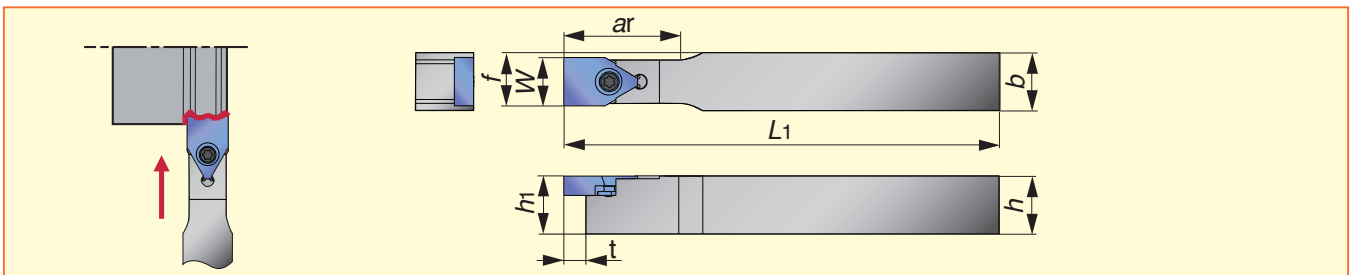


Groove width W (mm)	Cat. No.	Stock	Max. groove depth ar (mm)		Dimensions (mm)							Insert	Clamping screw	Lever	Spring	Wrench	
			PSGB	PSGM	h ₁	b	h	L ₁		f	t						
								PSGB	PSGM		PSGB						PSGM
10	FPGN1212X-10T20	●	25	20	12	12	12	125	120	11.0	5.5	0.5	PSG*10	FCS3	FCL4	BP-5	P-2.5
10	FPGN1616X-10T20	●	25	20	16	16	16	125	120	13.0	5.5	0.5	PSG*10	FCS3	FCL4	BP-5	P-2.5
10	FPGN2020K-10T20	●	25	20	20	20	20	130	125	15.0	5.5	0.5	PSG*10	FCS3	FCL4	BP-5	P-2.5
15	FPGN1616X-15T25	●	30	25	16	16	16	125	120	15.5	5.5	0.4	PSG*15	FCS3	FCL4	BP-5	P-2.5
15	FPGN2020K-15T25	●	30	25	20	20	20	130	125	17.5	5.5	0.4	PSG*15	FCS3	FCL4	BP-5	P-2.5
20	FPGN2020K-20T32	●	37	32	20	20	20	130	125	20.0	5.5	0.4	PSG*20	FCS6	FCL8	BP-9	P-5
20	FPGN2525M-20T32	●	37	32	25	25	25	155	150	22.5	5.5	0.4	PSG*20	FCS6	FCL8	BP-9	P-5
25	FPGN2525M-25T36	●	41	36	25	25	25	155	150	25.0	5.5	0.4	PSG*25	FCS6	FCL8	BP-9	P-5

(*1) Can be used with both wide grooving and profile grooving inserts

SPGN

Screw on type, for external wide profile grooving



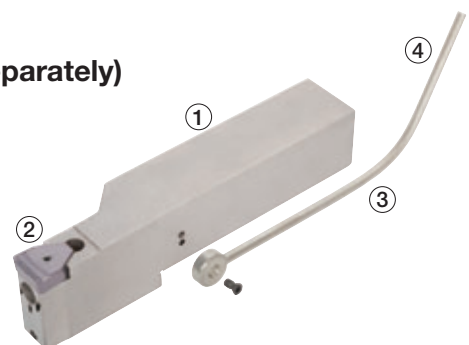
Groove width W (mm)	Cat. No.	Stock	Max. groove depth ar(mm)	Dimensions (mm)						Insert	Clamping screw	Wrench
				h ₁	b	h	L ₁	f	t			
10	SPGN1212X-10T20	●	25	12	12	12	125	11.0	5.5	PSGB10	CSTB-3L081	T-9F
10	SPGN1616X-10T20	●	25	16	16	16	125	13.0	5.5	PSGB10	CSTB-3L081	T-9F
10	SPGN2020K-10T20	●	25	20	20	20	130	15.0	5.5	PSGB10	CSTB-3L081	T-9F
15	SPGN1616X-15T25	●	30	16	16	16	125	15.5	5.5	PSGB15	CSTB-4	T-15F
15	SPGN2020K-15T25	●	30	20	20	20	130	17.5	5.5	PSGB15	CSTB-4	T-15F
20	SPGN2020K-20T32	●	37	20	20	20	130	20.0	5.5	PSGB20	CSTB-5	T-20F
20	SPGN2525M-20T32	●	37	25	25	25	155	22.5	5.5	PSGB20	CSTB-5	T-20F
25	SPGN2525M-25T36	●	41	25	25	25	155	25.0	5.5	PSGB25	CSTB-5	T-20F

(*2) Can be used with profile grooving inserts, only

● : Stocked items

■ Spare parts for internal coolant supply attachment (Order separately)

No.	Parts name	Designation	Note
①	Body	FPGR...	-
②	Insert	PSGM...	-
③	Coolant supply attachment	SGCU 341	-
④	Connector	Commercial items can be used	G 1/8 thread NPT 1/8 thread



Grades

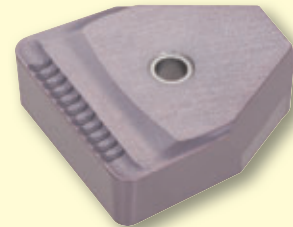


Wide grooving insert PSGM type

AH725



Steel



Recommended grade for grooving.

PVD coated grade featuring an excellent balance of strength and wear resistance.

- The combination of micro grain substrate and flash-coating with high heat resistance provides incredible performance in wide grooving.



Forming insert PSGB type

UX30

Uncoated



Steel



Stainless

TH10

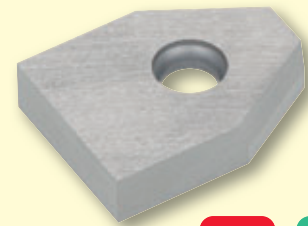
Uncoated



Cast Iron

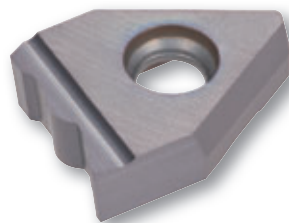


Non-ferrous



Cemented carbide grade with high fracture resistance.

Carbide grade for general purpose with excellent wear resistance.



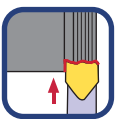
Specially tailored profile insert

Standard cutting conditions



Wide grooving

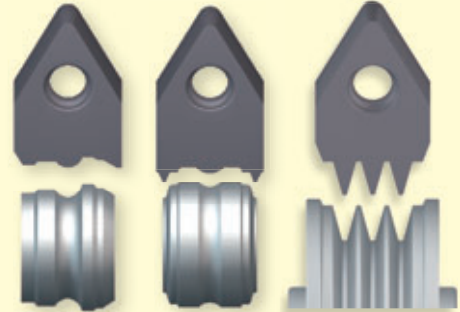
ISO	Workpiece materials	Hardness (HB)	Grade	Cutting speed Vc (m/min)
P	Alloy steels (SCM440 / 42CrMo4 etc.)	< 300	AH725	50 - 180
	Alloy steels (SCM440 / 42CrMo4 etc.)	< 300	UX30	50 - 120
PSGM type insert	Groove width: W (mm)			
	10	15	20	25
Feed: f (mm/rev)	0.2 - 0.4	0.2 - 0.4	0.3 - 0.5	0.3 - 0.5



Forming

ISO	Workpiece materials	Hardness (HB)	Grade	Cutting speed Vc (m/min)
P	Steels (S45C / C45 etc.)	< 200	UX30	50 - 150
	Alloy steels (SCM440 / 42CrMo4 etc.)	< 300	UX30	50 - 120
M	Stainless steels (SUS303 / X10CrNiS18-9 etc.)	< 200	UX30	50 - 120
K	Grey cast irons (FC250 / 250 etc.)	-	TH10	50 - 150
	Ductile cast irons (FCD450 / 450-10S etc.)	-	TH10	50 - 120
N	Aluminium alloy (Si < 12% etc.)	-	TH10	100 - 500

- Custom shaped inserts can be supplied on customer's request, according to the designated final shape on part drawing.
- Semi-finished blanks PSGB types are offered for purchase.



Practical examples

Workpiece type		Machine part	Engine part
Toolholder		FPGR3232P-10T36	FPGR3232P-10T36
Insert		PSGM10-08 (W = 10 mm)	PSGM10-08 (W = 10 mm)
Grade		AH725	AH725
Workpiece material		SCM415	Cast steel
Cutting conditions			
Cutting conditions	Cutting speed: Vc (m/min)	110	65
	Feed : f (mm/rev)	0.3	0.37
	Number of pass for 1 groove	2	3
	Method of machining	Grooving	Grooving
	Coolant	Wet	Wet
Results		<p>TUNGROOVE Competitor</p> <p>By using wider grooving tool, cycle times can be reduced to 1/3. 15 times longer tool life is achieved due to AH725 grade with high wear resistance.</p>	<p>TUNGROOVE Competitor</p> <p>Higher cutting conditions and continuous feeds without pecking cycles, drastically reduce machining times.</p>



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