

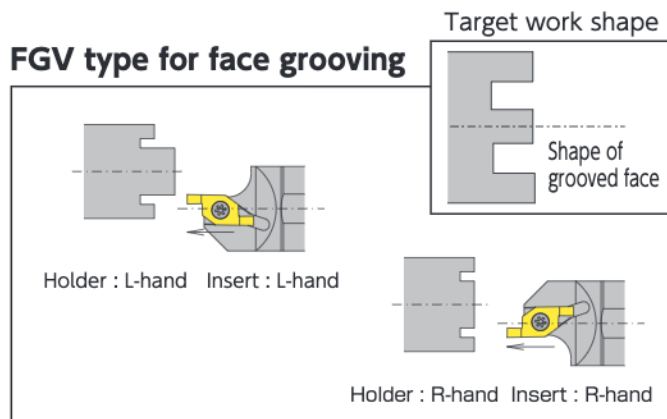
SATURN DUO

Face grooving tool

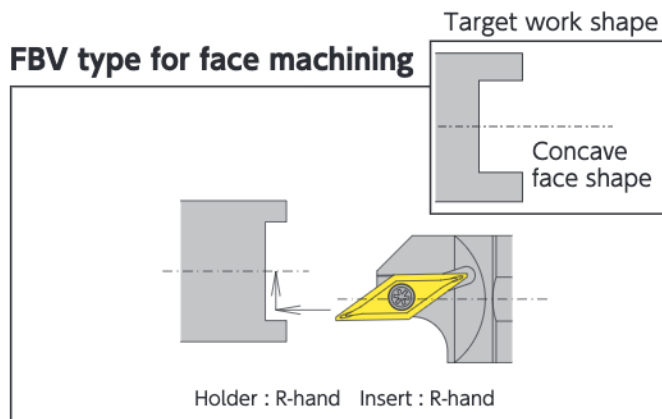
Features

- FGV type for face grooving and FBV type for face machining
- Economical double-corner specification
- Improved tool rigidity by optimizing the overhang and holder shape
- Gang-type, front-gang-type and sleeve holder types available

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- Grooving is possible under a wide range of cutting conditions due to strengthened rigidity of both insert and holder
- Minimum machining diameter of $\phi .236"$, and groove width of $.039"$
- Left-hand types available for machining work with a boss



- Further improved face machining efficiency
- Minimum machining diameter of $\phi .315"$

Recommended Cutting Condition for FGV Style Tooling (for Face Grooving)

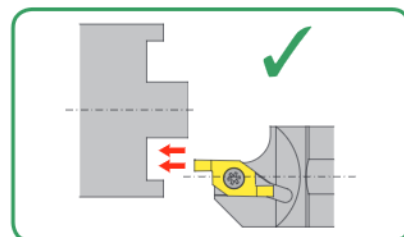
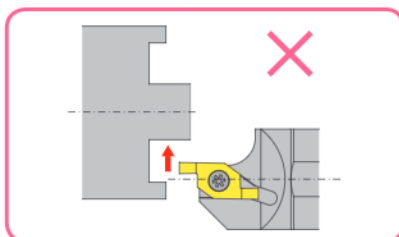
			Steel (Carbon Steel, Alloy Steel)	Stainless Steel (Excluding 303 SS)	Free Cutting Steel (Including 303 SS)	Non-ferrous Metals (Brass, Aluminum, Copper)
Speed (SFM)			160 (100 - 330)	130 (100 - 330)	200 (100 - 330)	260 (160 - 390)
Feed Rate (IPR)	Groove Depth (Inch)	.039	.001 (.0004-.002)	.0008 (.0004-.002)	.002 (.0004-.0025)	.002 (.0004-.0025)
		.059	.0008 (.0004-.002)	.0004 (.0002-.001)	.001 (.0004-.002)	.001 (.0004-.002)
		.079	.0004 (.0002-.001)	.0004 (.0002-.001)	.0008 (.0004-.002)	.0008 (.0004-.002)

☆Tips for Successful Face Grooving

- ① Run multiple passes if turning wider grooves.
Make sure to groove from outer diameter to inner diameter to avoid any interference.
- ② If lines appear on the boss section, slow down feed rate when retracting the tool.
- ③ If scratch appears at the end of the boss, slow down the feed rate.
- ④ If groove surface looks torn, either slow down feed rate or increase speed.
- ⑤ If groove bottom looks torn with a speed and feed condition, increase the speed.

☆Note

Side turning cannot be performed with FGV style tooling



Recommended Cutting Conditions for FBV Style Tooling (for Face Grooving)

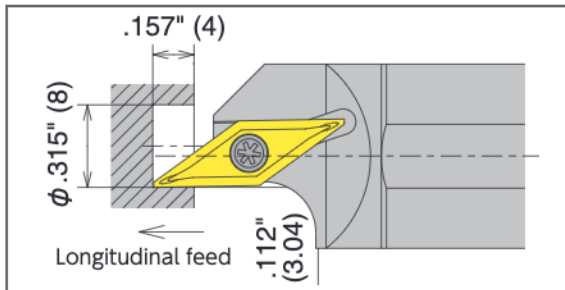
Minimum machining diameter: $\phi .315"$ (8mm) WET

			Steel (Carbon Steel, Alloy Steel)	Stainless Steel (Excluding 303 SS)	Free Cutting Steel (Including 303 SS)	Non-ferrous Metals (Brass, Aluminum, Copper)
Speed (SFM)			160 (100 - 330)	130 (100 - 330)	200 (100 - 330)	260 (160 - 390)
Feed Rate (IPR)	Groove Depth (Inch)	.039	.001 (.0004-.002)	.0008 (.0004-.002)	.002 (.0004-.0025)	.002 (.0004-.0025)
		.059	.0008 (.0004-.002)	.0004 (.0002-.001)	.001 (.0004-.002)	.001 (.0004-.002)
		.079	.0004 (.0002-.001)	.0004 (.0002-.001)	.0008 (.0004-.002)	.0008 (.0004-.002)

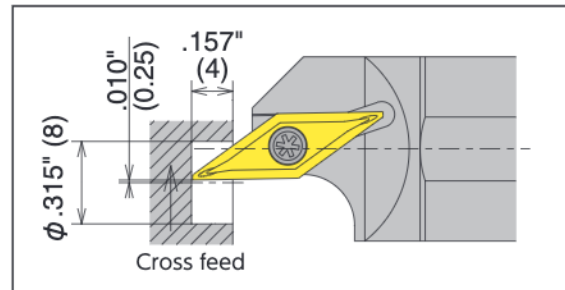
* When machining difficult materials where chip control is problematic (such as 304SS), it is recommended that the machining be carried out in several stages.

☆Machining process

- For materials with good machinability, it is possible to machine up to $.157"$ (4mm) deep at a low feed rate in a single pass for both longitudinal feed and cross feed.



Cutting in Z direction : Longitudinal feed



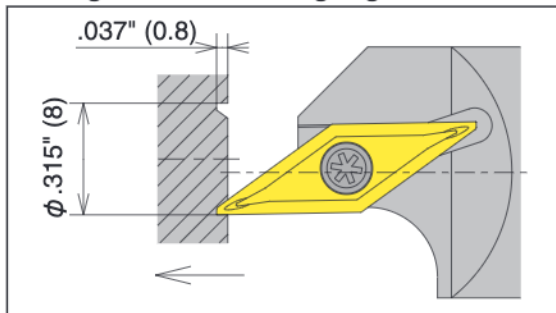
Cutting in X direction : Cross feed

☆Useful tips for machining

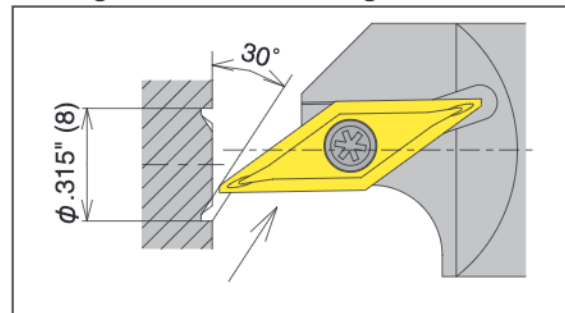
When burrs occur on ID surface, it is recommended to perform the cut in 2 passes, one for roughing and one for finishing as shown in the following procedure:

☆Example of 2-pass machining: Leave $.008"$ (0.2mm) on roughing then run a finish cut

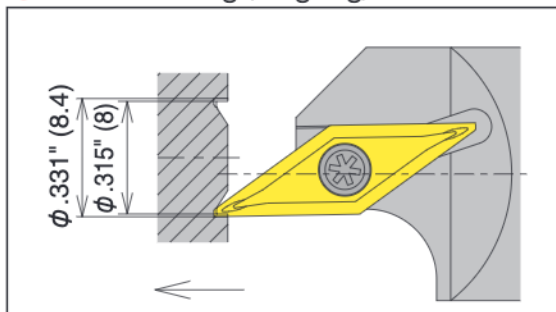
① Longitudinal feed (roughing)



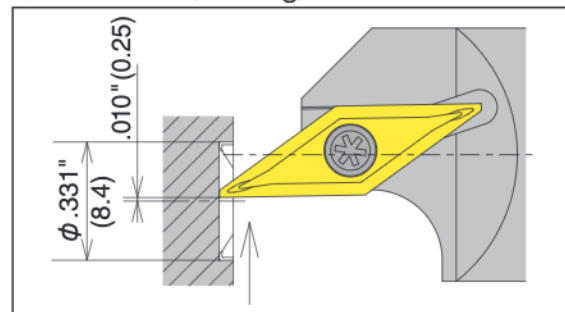
② Longitudinal feed (finishing)



③ Slant machining (roughing)



④ Cross feed (finishing)



FGV Series

FGV

For Gang-style machine

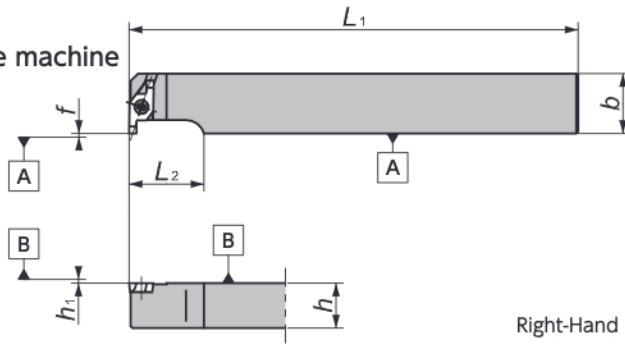
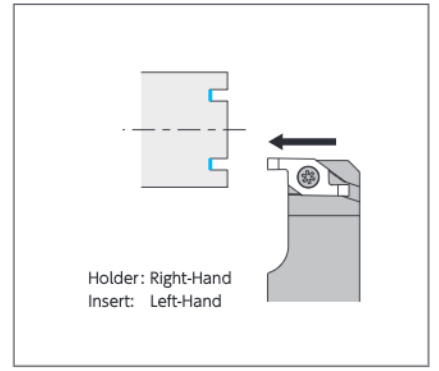


Figure-1

Right-Hand style shown
Takes Left-Hand insert



CH-FGV

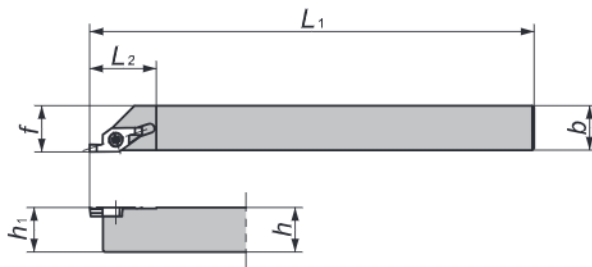
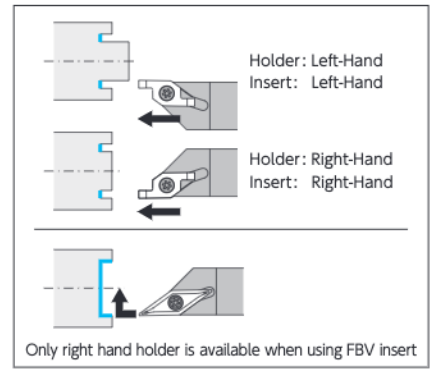


Figure-2

Right-Hand style shown



DS-FGV

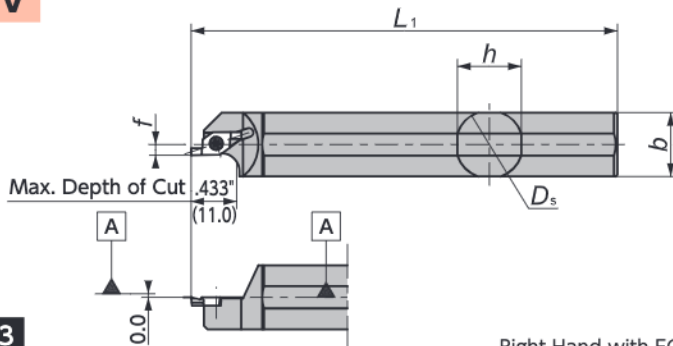
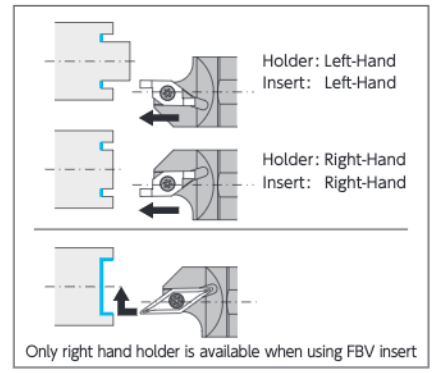


Figure-3

Right-Hand with FGV style shown



FGV - Toolholders

FGV

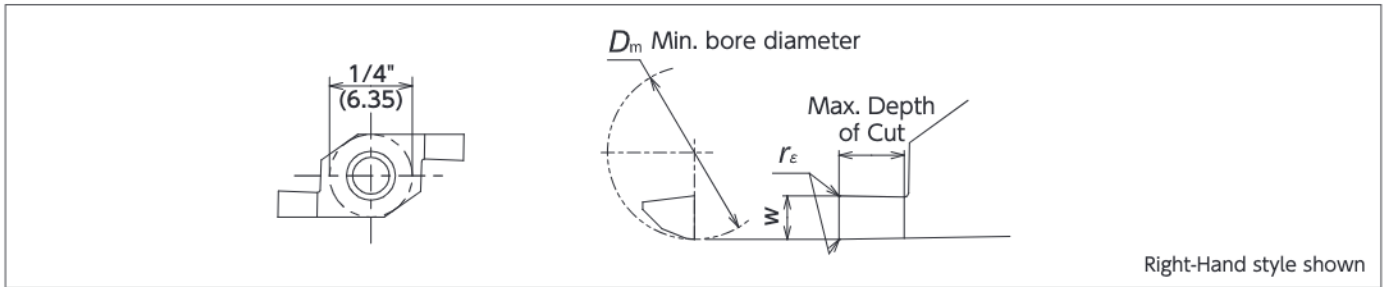
Gage Insert	Item Number	Figure	Stock	h	b	h_1	L_1	f	L_2	Clamp Screw	Wrench
			R L	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)		
FGV...L	FGV%1016	1	○	.413 10	.630 16	0 0.0	4.724 120	0 0.0	.787 20	LRIS-2.5 × 7	CLR-15S
	FGV%1216	1	○	.472 12	.630 16	0 0.0	4.724 120	0 0.0	.787 20	LRIS-2.5 × 7	CLR-15S
	FGV%1616	1	○	.630 16	.630 16	0 0.0	4.724 120	0 0.0	.787 20	LRIS-2.5 × 7	CLR-15S
FGV FBV	CH-FGV%1010	2	○ ○	.413 10	.394 10	.394 10	4.724 120	.413 10.5	.709 18	LRIS-2.5 × 7	CLR-15S
	CH-FGV%1212	2	○ ○	.472 12	.472 12	.472 12	4.724 120	.492 12.5	.709 18	LRIS-2.5 × 7	CLR-15S
	CH-FGV%1616	2	○ ○	.630 16	.630 16	.630 16	4.724 120	.650 16.5	.709 18	LRIS-2.5 × 7	CLR-15S

DS-FGV

Gage Insert	Item Number	Figure	Stock	D_s	h	b	L_1	f	Clamp Screw	Wrench
			R L	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)	(Inch) (mm)		
FGV FBV	DS-FGV%16-012	3	○ ○	.630 16.000	.591 15	.591 15	3.150 80	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%19	3	○ ○	3/4 19.050	.709 18	.709 18	4.724 120	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%20	3	○ ○	.787 20.000	.748 19	.748 19	4.724 120	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%22	3	○ ○	.866 22.000	.827 21	.827 21	4.724 120	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%22M	1	○ ○	.866 22.000	.827 21	.827 21	5.906 150	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%25-MET	3	○ ○	.984 25.000	.945 24	.945 24	5.906 150	.118 3.0	LRIS-2.5 × 7	CLR-15S
	DS-FGV%25	3	○ ○	1 25.400	.965 24.5	.965 24.5	4.724 120	.118 3.0	LRIS-2.5 × 7	CLR-15S

FGV - Inserts

FGV

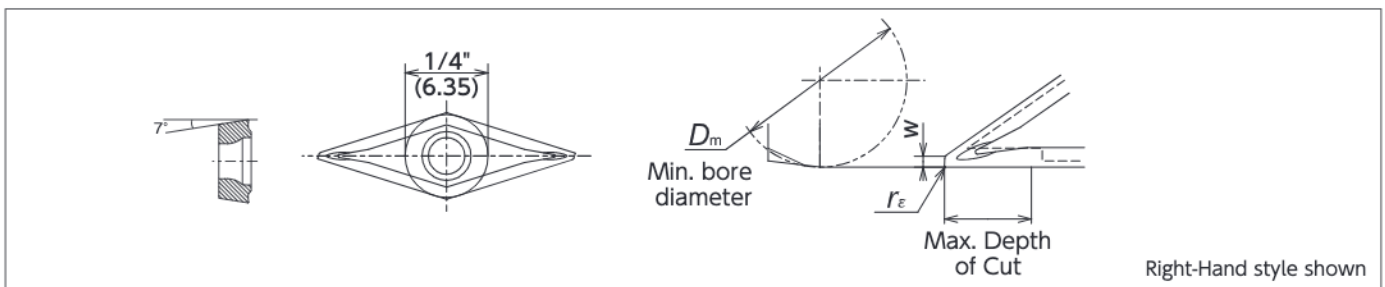


Shape	Item Number	Groove Width w		Min. Bore Diameter		Max Depth of Cut		Thickness		r_{ϵ}		Coated Carbide	
												TM4	
		(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	R	L
	FGV100RB00D6	.039	1.0	.236	6.0	.059	1.5	3/32	2.38	.000	0.00	○	
	FGV100RB05D6	.039	1.0	.236	6.0	.059	1.5	3/32	2.38	.002	0.05	○	
	FGV150RB00D6	.059	1.5	.236	6.0	.079	2.0	3/32	2.38	.000	0.00	○	
	FGV150RB05D6	.059	1.5	.236	6.0	.079	2.0	3/32	2.38	.002	0.05	○	
	FGV200RB00D6	.079	2.0	.236	6.0	.118	3.0	3/32	2.38	.000	0.00	○	
	FGV200RB05D6	.079	2.0	.236	6.0	.118	3.0	3/32	2.38	.002	0.05	○	
	FGV100LB00D6	.039	1.0	.236	6.0	.059	1.5	3/32	2.38	.000	0.00		○
	FGV100LB05D6	.039	1.0	.236	6.0	.059	1.5	3/32	2.38	.002	0.05		○
	FGV150LB00D6	.059	1.5	.236	6.0	.079	2.0	3/32	2.38	.000	0.00		○
	FGV150LB05D6	.059	1.5	.236	6.0	.079	2.0	3/32	2.38	.002	0.05		○
	FGV200LB00D6	.079	2.0	.236	6.0	.118	3.0	3/32	2.38	.000	0.00		○
	FGV200LB05D6	.079	2.0	.236	6.0	.118	3.0	3/32	2.38	.002	0.05		○

Grooving /
Side-Turning

FBV - Inserts

FBV



Shape	Item Number	Groove Width w		Min. Bore Diameter		Max Depth of Cut		Thickness		r_{ϵ}		Coated Carbide	
												TM4	
		(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	R	L
	FBV40%05D8AM3	.020	0.5	.315	8.0	.157	4.0	.102	2.58	.002	0.05	○	
	FBV40%15D8AM3	.020	0.5	.315	8.0	.157	4.0	.102	2.58	.006	0.15	○	

Note: Only CH-FGVR and DS-FGVR can take FBV Right hand insert.

Cutting condition **T18**

● : Stock
● : Stock (Newly added)
■ □ R L : White stocks last

R L : Stock (Right / Left-hand only)
R L : Stock (Right / Left-hand only, Newly added)
⊙ : Mirror finish

○ : 1-2 week delivery
○ : 1-2 week delivery (Newly added)
⬇ : Coolant through

Ⓡ Ⓛ : 1-2 week delivery (Right / Left-hand only)
Ⓡ Ⓛ : 1-2 week delivery (Right / Left-hand only, Newly added)