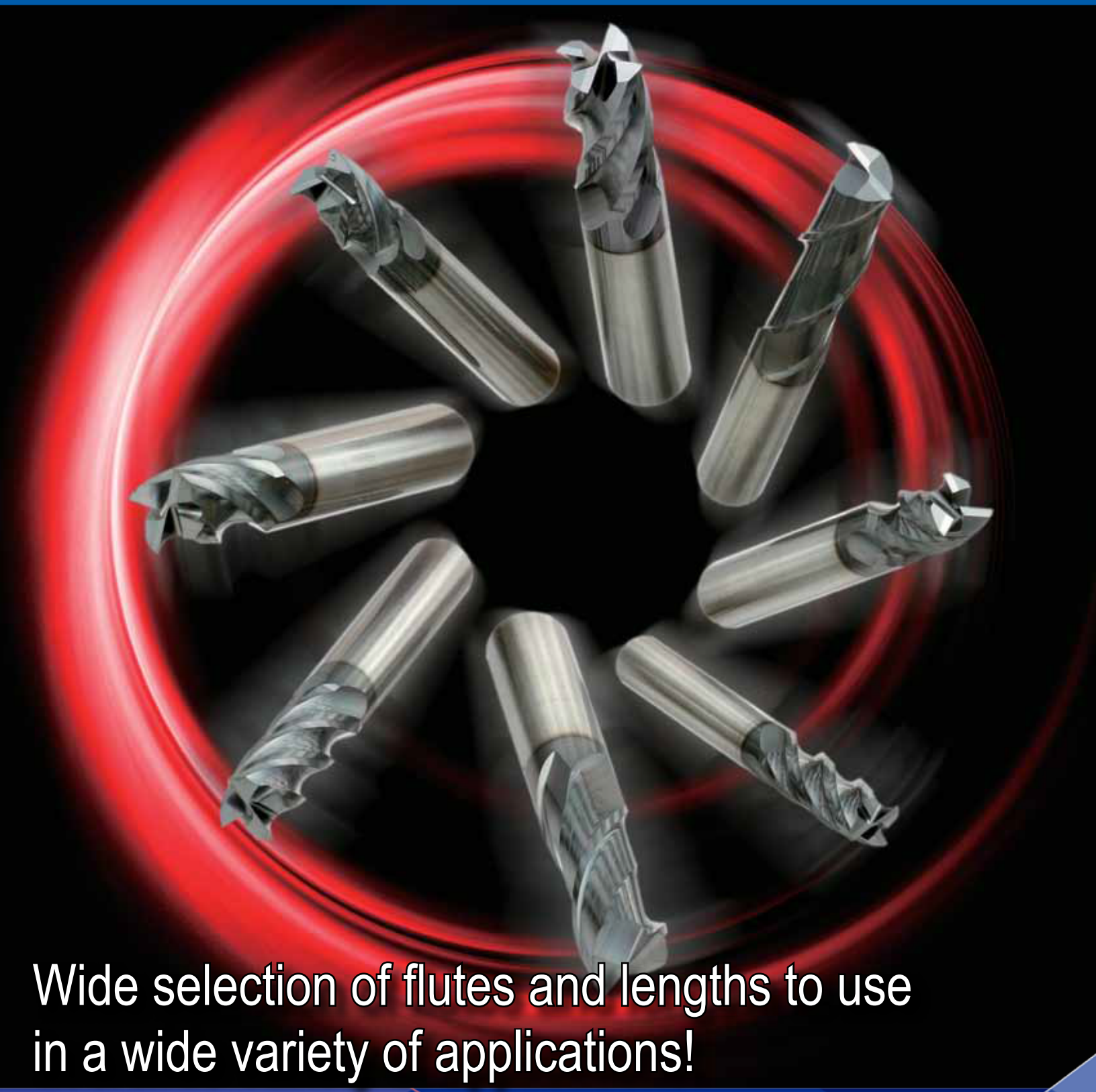
SUMITOMO

CARBIDE - CBN - DIAMOND

GSX Endmill Series



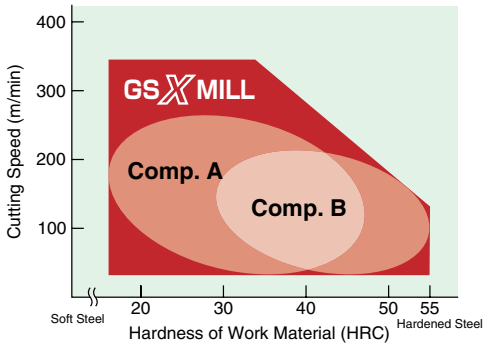
Wide selection of flutes and lengths to use in a wide variety of applications!

SUMITOMO ELECTRIC GROUP

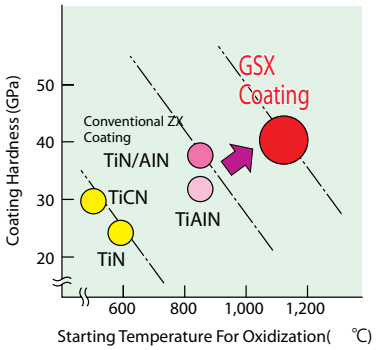
■ Features & Benefits

- Wide variation of three flute types and four flute lengths enable use in a wide variety of applications.
- Fine carbide substrate provides high traverse rupture strength and excellent thermal shock resistance improving reliability in wet cutting applications.
- GSX Coating provides improved reliability and longer tool life.
- Large rake angle and unique flute design improve sharpness and chip evacuation.
- Corner edge with gash land improves cutting edge strength.
- Sharper edge S type and fracture resistant C type added to the 2D size series.

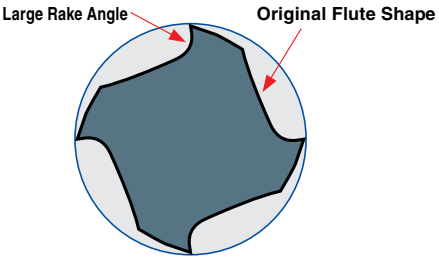
■ Wear Resistance



■ Thermal Resistance



■ Improved Chip Evacuation



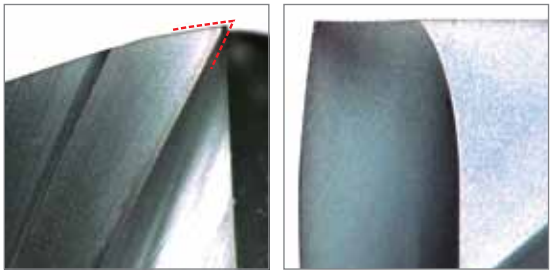
Large rake angle combined with our unique flute design improves sharpness and chip evacuation.

■ 2 cutting edge designs expand machining applications

Sharper edge S type and fracture resistant C type added to the 2D size series.

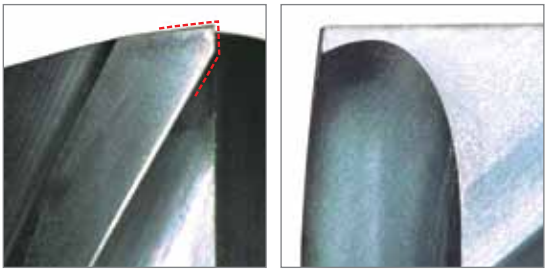
S Type

Sharp Corner: Sharper Edge Design



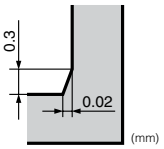
C Type

Gash Land: Fracture Resistant Design



Note: When using endmills with gash land, some material remains as shown on the right. If you need sharp corners, use the S Type.

Ex.: Corner on a ϕ10mm hole



■ Application Range

◎ : Best ○ : Good Blank : Not recommended

P					H			M	S			K	N			
					Hardened Steel											
General Structure Rolled Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Die Steel	45 to 55 HRC	55 to 60 HRC	60 HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron	Al Alloy	Copper Alloy	Graphite	CFRP
○	◎	◎	◎	◎	◎ *1			◎	○	○	○				

■ Recommended Milling Examples

Application	Surface Milling		Groove Milling		Groove Finishing	
Form						
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
S Type		◎		○ *2		◎
C Type	◎	○	◎	◎	◎	○

S Type is best for removing inside corners

*2 : Use with small depth of cut.

■ Product Range — Inch GSX Endmills

Application	Flutes	Flute Length					
		1.5D	2D		3D		4D
		C Type	S Type	C Type	S Type	C Type	C Type
General Purpose	2	GSX200C-1.5D φ1/16" to φ1 "	GSX200S-2D φ1/16" to φ1 "	GSX200C-2D φ1/16" to φ1 "	GSX200S-3D φ1/16" to φ1 "	GSX200C-3D φ1/16" to φ1 "	GSX200C-4D φ1/16" to φ1 "
	4	GSX400C-1.5D φ1/16" to φ1 "	GSX400S-2D φ1/16" to φ1 "	GSX400C-2D φ1/16" to φ1 "	GSX400S-3D φ1/16" to φ1 "	GSX400C-3D φ1/16" to φ1 "	GSX400C-4D φ1/16" to φ1 "

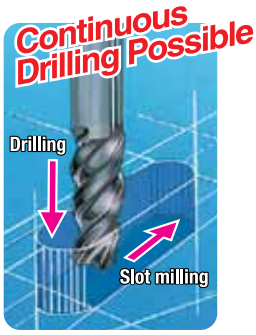
■ Product Range — Metric GSX Endmills

Application	Flutes	Flute Length					
		1.5D	2D		3D		4D
		C Type	S Type	C Type	S Type	C Type	C Type
General Purpose	2	GSX20000C-1.5D φ1.0 to φφ20.0mm	GSX20000S-2D φ0.5 to φφ20.0mm	GSX20000C-2D φ0.5 to φφ25.0mm	GSX20000S-3D φ0.5 to φφ20.0mm	GSX20000C-3D φ1.0 to φφ20.0mm	GSX20000C-4D φ1.0 to φφ20.0mm
	3	GSX30000C-1.5D φ1.0 to φφ20.0mm		GSX30000C-2D φ1.0 to φφ20.0mm			
	4	GSX40000C-1.5D φ1.0 to φφ20.0mm	GSX40000S-2D φ1.0 to φφ20.0mm	GSX40000C-2D φ1.0 to φφ25.0mm	GSX40000S-3D φ1.0 to φφ20.0mm	GSX40000C-3D φ1.0 to φφ20.0mm	GSX40000C-4D φ1.0 to φφ20.0mm

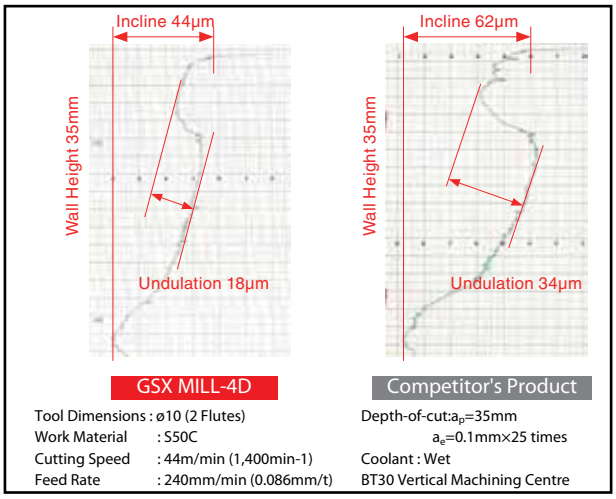
■ Multi-Purpose

Optimized flute design of slotted 3 flute (short) type reduces cutting resistance.

1. Allows drilling, slot milling and other continuous (compound) applications.
2. Perfect for use on thin walls and small machining centres.



■ Long, High Rigidity Flutes



GSX MILL-4D		Competitor's Product	
Tool Dimensions	: ø10 (2 Flutes)	Depth-of-cut: a_p	=35mm
Work Material	: S50C		a_e=0.1mm×25 times
Cutting Speed	: 44m/min (1,400min-1)	Coolant	: Wet
Feed Rate	: 240mm/min (0.086mm/t)	BT30 Vertical Machining Centre	

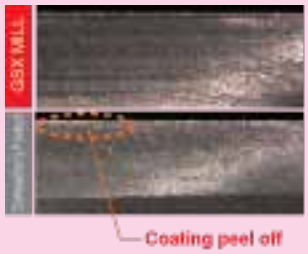
■ Application Examples

Carbon Steel Grooving with GSX20000C

Gash land for stronger cutting edge

Tool Dimension	φ6 (2 Flutes)
Work Material	S50C
Cutting Speed	87m/min (4615min⁻¹)
Feed Rate	553mm/min (0.06mm/t)
Depth-of-cut	a_p=3mm
	a_e=6mm
Coolant	Dry
Vertical Machining Centre	BT50

Stainless Steel Machining with GSX20000C



Improved reliability even under wet machining

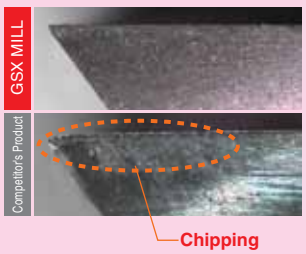
Tool Dimension	φ10 (2 Flutes)
Work Material	SUS304
Cutting Speed	50m/min (1591min⁻¹)
Feed Rate	127mm/min (0.04mm/t)
Depth-of-cut	a_p=10mm
	a_e=0.5mm
Coolant	Wet
Vertical Machining Centre	BT50

Cast Iron Grooving with GSX20000C

GSX Coat for improved wear resistance

Tool Dimension	φ10 (2 Flutes)
Work Material	Equivalent to FDC800
Cutting Speed	66m/min (2100min⁻¹)
Feed Rate	302mm/min (0.072mm/t)
Depth-of-cut	a_p=5mm×5 passes
	a_e=10mm
Coolant	Dry
Vertical Machining Centre	BT40

Surface Milling S50C with GSX20000S



S type delivers optimum cutting performance.

Tool Dimension	φ6 (2 Flutes)
Work Material	S50C
Cutting Speed	87m/min (4615min⁻¹)
Feed Rate	553mm/min (0.06mm/t)
Depth-of-cut	a_p=10mm
	a_e=0.3mm
Coolant	Dry
Vertical Machining Centre	BT50

Recommended Cutting Conditions - 1.5D, 2D, 3D & 4D

Speeds and Feeds reflect roughing and finishing applications

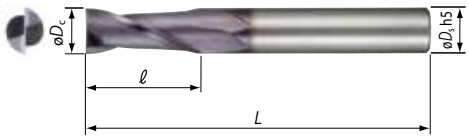
ISO	GSX 1.5D & 2D Endmills Material		Hardness (Bhn)	SFM	Cutting Diameter 1/8 Feed/Tooth	3/16 Feed/Tooth	1/4 Feed/Tooth	5/16 Feed/Tooth	3/8 Feed/Tooth	7/16 Feed/Tooth	1/2 Feed/Tooth	9/16 Feed/Tooth	5/8 Feed/Tooth	3/4 Feed/Tooth	1 Feed/Tooth
P	Low and Medium Carbon Steels		<250	150-400	.0005-.0024	.0007-.0025	.0008-.0035	.0008-.0037	.001-.0045	.0012-.0055	.0014-.0066	.0016-.0075	.002-.0095	.002-.010	.002-.0105
P	Medium Carbon Alloy Steels		<250	140-375	.0005-.0024	.0007-.0025	.0008-.0035	.0008-.0037	.001-.0045	.0012-.0055	.0014-.0066	.0016-.0075	.002-.0095	.002-.010	.002-.0105
P	Medium-High Carbon Steels		>250	175-300	.0005-.0015	.0007-.002	.0008-.003	.0008-.0033	.001-.0039	.0012-.0045	.0014-.0056	.0016-.0062	.002-.0075	.002-.008	.002-.009
P	Free Machining Steels and Alloys		<250	175-350	.0005-.002	.0008-.0025	.0008-.0035	.0008-.004	.001-.0045	.0012-.0055	.0014-.0058	.0016-.0072	.002-.0075	.002-.0085	.002-.009
P	Tool Steels		<250	150-300	.0005-.0017	.0005-.0024	.0008-.003	.0008-.0035	.001-.0045	.001-.0055	.0012-.0066	.0016-.0075	.002-.0075	.002-.0085	.002-.009
P	Tool Steels		250 - 350	100-225	.0005-.0015	.0005-.0019	.0008-.0025	.0008-.003	.001-.0036	.001-.0044	.0012-.0055	.0013-.0065	.0015-.0075	.002-.0085	.002-.0088
P	Tool Steels		>350	75-150	.0005-.001	.0005-.0012	.0006-.0014	.0008-.0017	.0008-.0022	.0008-.0028	.001-.0034	.001-.0041	.001-.0046	.0015-.0051	.002-.0055
M	Stainless Steel	Martensitic and Ferritic	<250	150-350	.0005-.0013	.0008-.0013	.0008-.0016	.0008-.0019	.001-.0025	.001-.0031	.001-.0037	.001-.0044	.001-.005	.001-.0055	.001-.0062
M	Stainless Steel	Martensitic and Ferritic	<250	150-350	.0005-.0013	.0005-.0013	.0005-.0016	.0008-.0019	.0008-.0025	.001-.0031	.001-.0037	.001-.0044	.001-.005	.001-.0055	.001-.0062
M	Stainless Steel	Austenitic	<250	150-325	.0005-.0013	.0005-.0018	.0008-.003	.001-.0033	.001-.0035	.0011-.0039	.0012-.0043	.0012-.0047	.0014-.0055	.0015-.006	.002-.007
M	Stainless Steel	Precipitation Hardening	<280	90-300	.0005-.0012	.0005-.0013	.0008-.0015	.001-.0019	.001-.0025	.001-.003	.001-.0035	.001-.0041	.001-.0048	.001-.0055	.001-.0065
K	Grey Cast Iron			250-400	.0008-.0024	.001-.0028	.001-.0031	.001-.0033	.001-.004	.001-.0045	.001-.006	.001-.0067	.001-.0075	.001-.0085	.001-.010
K	Ductile Iron			160-350	.0005-.0024	.0005-.0028	.0008-.0031	.001-.0033	.001-.004	.001-.0045	.001-.0059	.001-.0067	.001-.0075	.001-.0085	.001-.010
S	Exotic Alloys: Inconel, Hastalloy, Waspalloy, etc.			75-125	.0005-.0015	.0008-.0018	.0008-.0021	.0008-.0024	.001-.0028	.001-.0033	.001-.0036	.001-.004	.001-.0045	.001-.005	.001-.006
N	Non-Ferrous Material			600-1500	.001-.0024	.001-.003	.001-.0035	.001-.004	.001-.0045	.001-.005	.001-.006	.001-.008	.001-.0095	.001-.011	.001-.012

ISO	GSX 3D Endmills Material		Hardness (Bhn)	SFM	Cutting Diameter 1/8 Feed/Tooth	3/16 Feed/Tooth	1/4 Feed/Tooth	5/16 Feed/Tooth	3/8 Feed/Tooth	7/16 Feed/Tooth	1/2 Feed/Tooth	9/16 Feed/Tooth	5/8 Feed/Tooth	3/4 Feed/Tooth	1 Feed/Tooth
P	Low and Medium Carbon Steels		<250	125-280	.0005-.0021	.0007-.0022	.0008-.0031	.0008-.0034	.001-.0041	.0012-.005	.0014-.006	.0016-.0072	.002-.008	.002-.009	.002-.010
P	Medium Carbon Alloy Steels		<250	100-255	.0005-.0021	.0007-.0022	.0008-.0031	.0008-.0034	.001-.0041	.0012-.005	.0014-.006	.0016-.0072	.002-.008	.002-.009	.002-.010
P	Medium-High Carbon Steels		>250	90-200	.0005-.0014	.0007-.0018	.0008-.0027	.0008-.003	.001-.0036	.0012-.0041	.0014-.005	.0016-.0059	.002-.0069	.002-.008	.002-.009
P	Free Machining Steels and Alloys		<250	110-230	.0005-.0018	.0008-.0022	.0008-.0031	.0008-.0036	.001-.0041	.0012-.0049	.0014-.006	.0016-.0071	.002-.0081	.002-.0092	.002-.0103
P	Tool Steels		<250	100-200	.0005-.0015	.0005-.0019	.0008-.0027	.0008-.0031	.001-.0041	.001-.005	.0012-.0059	.0016-.0069	.002-.008	.002-.0091	.002-.0102
P	Tool Steels		250 - 350	85-165	.0005-.0013	.0005-.0017	.0008-.0022	.0008-.0029	.001-.0033	.001-.004	.0012-.0048	.0013-.0059	.0015-.007	.002-.0081	.002-.0092
P	Tool Steels		>350	75-145	.0005-.001	.0005-.0011	.0006-.0013	.0008-.0017	.001-.0023	.0008-.0026	.001-.003	.001-.0037	.001-.0042	.0015-.0047	.002-.0054
M	Stainless Steel	Martensitic and Ferritic	<250	90-230	.0005-.0013	.0008-.0011	.0008-.0015	.0008-.002	.001-.0025	.001-.0029	.001-.0033	.001-.004	.001-.0046	.001-.0051	.001-.0058
M	Stainless Steel	Martensitic and Ferritic	<250	90-230	.0005-.0013	.0005-.0011	.0005-.0015	.0008-.002	.0008-.0025	.001-.0029	.001-.0033	.001-.004	.001-.0046	.001-.0051	.001-.0058
M	Stainless Steel	Austenitic	<250	110-205	.0005-.0011	.0005-.0016	.0008-.002	.0008-.0024	.001-.0027	.0011-.0035	.0012-.0038	.0012-.0042	.0014-.0046	.0015-.005	.002-.006
M	Stainless Steel	Precipitation Hardening	<280	90-180	.0005-.0011	.0005-.0012	.0008-.0015	.0008-.0035	.001-.0022	.001-.0027	.001-.0032	.001-.0037	.001-.0043	.001-.005	.001-.006
K	Grey Cast Iron			250-280	.0008-.002	.001-.0025	.001-.0028	.0008-.0031	.001-.0035	.001-.0039	.001-.0046	.001-.005	.001-.0054	.001-.006	.001-.007
K	Ductile Iron			160-225	.0005-.002	.001-.0025	.001-.0028	.0015-.0031	.001-.0035	.001-.0039	.001-.0046	.001-.005	.001-.0054	.001-.006	.001-.007
S	Exotic Alloys: Inconel, Hastalloy, Waspalloy, etc.			75-115	.0005-.0012	.0008-.0015	.0008-.0018	.0008-.0021	.001-.0025	.001-.0029	.001-.0033	.001-.0038	.001-.0044	.001-.0051	.001-.0057
N	Non-Ferrous Material			550-1100	.001-.0021	.001-.0027	.001-.0031	.0008-.0036	.001-.0042	.001-.0053	.001-.0064	.001-.0075	.001-.0085	.001-.095	.001-.0105

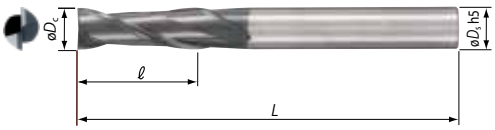
ISO	GSX 4D Endmills Material		Hardness (Bhn)	SFM	Cutting Diameter 1/8 Feed/Tooth	3/16 Feed/Tooth	1/4 Feed/Tooth	5/16 Feed/Tooth	3/8 Feed/Tooth	7/16 Feed/Tooth	1/2 Feed/Tooth	9/16 Feed/Tooth	5/8 Feed/Tooth	3/4 Feed/Tooth	1 Feed/Tooth
P	Low and Medium Carbon Steels		<250	115-260	.0005-.0018	.0007-.0019	.0008-.0028	.0008-.0031	.001-.0036	.0012-.0045	.0014-.0054	.0016-.0065	.002-.007	.002-.0075	.002-.009
P	Medium Carbon Alloy Steels		<250	90-235	.0005-.0018	.0007-.0019	.0008-.0028	.0008-.0031	.001-.0036	.0012-.0045	.0014-.0054	.0016-.0065	.002-.007	.002-.0075	.002-.009
P	Medium-High Carbon Steels		>250	80-180	.0005-.0013	.0007-.0016	.0008-.0024	.0008-.0027	.001-.0032	.0012-.0037	.0014-.0045	.0016-.0053	.002-.006	.002-.007	.002-.0081
P	Free Machining Steels and Alloys		<250	100-210	.0005-.0016	.0008-.002	.0008-.0027	.0008-.0032	.001-.0036	.0012-.004	.0014-.005	.0016-.006	.002-.007	.002-.008	.002-.009
P	Tool Steels		<250	90-160	.0005-.0013	.0005-.0017	.0008-.0024	.0008-.0027	.001-.0033	.001-.004	.0012-.005	.0016-.006	.002-.007	.002-.008	.002-.009
P	Tool Steels		250 - 350	85-145	.0005-.0011	.0005-.0015	.0008-.002	.0008-.0025	.001-.003	.001-.0035	.0012-.0043	.0013-.0052	.0015-.0062	.002-.0073	.002-.0084
P	Tool Steels		>350	75-125	.0005-.001	.0005-.0011	.0006-.0012	.0008-.0013	.0008-.0018	.0008-.0023	.001-.0027	.001-.0031	.001-.004	.0015-.0045	.002-.005
M	Stainless Steel	Martensitic and Ferritic	<250	85-210	.0005-.0011	.0008-.0011	.0008-.0012	.0008-.0015	.001-.002	.001-.0029	.001-.0033	.001-.004	.001-.0046	.001-.0051	.001-.0058
M	Stainless Steel	Martensitic and Ferritic	<250	85-210	.0005-.0011	.0005-.0011	.0005-.0012	.0008-.0015	.0008-.002	.001-.0029	.001-.0033	.001-.004	.001-.0046	.001-.0051	.001-.0058
M	Stainless Steel	Austenitic	<250	100-185	.0005-.0011	.0005-.0012	.0008-.0016	.001-.002	.001-.0024	.0011-.0028	.0012-.0032	.0012-.0036	.0014-.004	.0015-.0045	.002-.0052
M	Stainless Steel	Precipitation Hardening	<280	90-160	.0005-.0011	.0005-.0011	.0008-.0013	.001-.0015	.001-.0018	.001-.0024	.001-.0029	.001-.0033	.001-.0037	.001-.0041	.001-.0046
K	Grey Cast Iron			240-250	.0008-.002	.001-.0025	.001-.0027	.001-.0029	.001-.0033	.001-.0037	.001-.004	.001-.0044	.001-.0049	.001-.0055	.001-.0065
K	Ductile Iron			160-200	.0008-.002	.001-.0025	.001-.0027	.001-.0029	.001-.0033	.001-.0037	.001-.004	.001-.0044	.001-.0049	.001-.0055	.001-.0065
S	Exotic Alloys: Inconel, Hastalloy, Waspalloy, etc.			75-90	.0005-.001	.0008-.0012	.0008-.0015	.0008-.0018	.001-.0023	.001-.0026	.001-.003	.001-.0035	.001-.004	.001-.0046	.001-.0051
N	Non-Ferrous Material			500-1000	.001-.0017	.001-.0022	.001-.0027	.001-.0032	.001-.0038	.001-.0045	.001-.0042	.001-.005	.001-.0059	.001-.007	.001-.008

GSX Endmills - Sharp Edge (S) INCH Lineup

2X



3X



■ **Endmill Identification (GSX MILL Series Only)**

GSX 2 04 C -1.5D

1	2	3	4	5
Series Code	# of Flutes	Diameter in 64ths (4/64 = 0.0625")	Cutting Edge S: Sharp Edge C: Gash Land	Cutting Edge Length

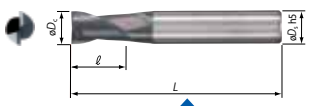
Sharp Edge (S)	Diameter φDc		Shank Diameter	2				3			
Cat. No.	Fraction	Inch	φDs Inch	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)
GSXΔ04S-ΔD	1/16	0.0625	0.1250	●	●	1.500	0.1250	●	●	1.500	0.1875
GSXΔ06S-ΔD	3/32	0.0938	0.1250	●	●	1.500	0.1875	●	●	1.500	0.2813
GSXΔ08S-ΔD	1/8	0.1250	0.1250	●	●	2.000	0.2500	●	●	2.000	0.3750
GSXΔ10S-ΔD	5/32	0.1563	0.1875	●	●	2.000	0.3125	●	●	2.000	0.4688
GSXΔ12S-ΔD	3/16	0.1875	0.1875	●	●	2.000	0.3750	●	●	2.000	0.5625
GSXΔ14S-ΔD	7/32	0.2188	0.2500	●	●	2.000	0.4376	●	●	2.000	0.6564
GSXΔ16S-ΔD	1/4	0.2500	0.2500	●	●	2.000	0.5000	●	●	2.000	0.7500
GSXΔ18S-ΔD	9/32	0.2813	0.3125	●	●	2.500	0.5626	●	●	3.000	0.8439
GSXΔ20S-ΔD	5/16	0.3125	0.3125	●	●	2.500	0.6250	●	●	3.000	0.9375
GSXΔ24S-ΔD	3/8	0.3750	0.3750	●	●	3.000	0.7500	●	●	3.500	1.1250
GSXΔ28S-ΔD	7/16	0.4375	0.4375	●	●	3.000	0.8750	●	●	3.500	1.3125
GSXΔ32S-ΔD	1/2	0.5000	0.5000	●	●	3.000	1.0000	●	●	3.500	1.5000
GSXΔ36S-ΔD	9/16	0.5625	0.5625	●	●	3.500	1.1250	●	●	4.500	1.6875
GSXΔ40S-ΔD	5/8	0.6250	0.6250	●	●	3.500	1.2500	●	●	4.500	1.8750
GSXΔ44S-ΔD	11/16	0.6875	0.6875	●	●	4.000	1.3750	●	●	4.500	2.0625
GSXΔ48S-ΔD	3/4	0.7500	0.7500	●	●	4.000	1.5000	●	●	5.000	2.2500
GSXΔ56S-ΔD	7/8	0.8750	0.8750	○	○	4.000	1.7500	○	○	5.000	2.6250
GSXΔ64S-ΔD	1	1.0000	1.0000	○	○	4.000	2.0000	○	○	5.500	3.0000

●: USA stock standard ○: Coming Soon

GSX Endmills - Gash Land (C) INCH Lineup

1.5X

2X



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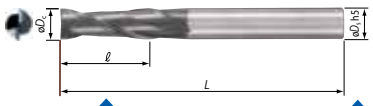

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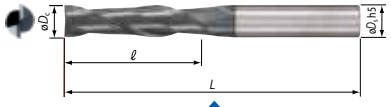
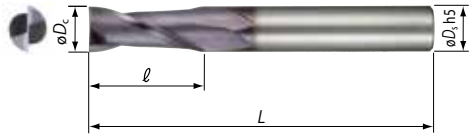


Gash Land (C)	Diameter φDc		Shank Diameter	1.5				2				3				4			
Cat. No.	Fraction	Inch	φDs (Inch)	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)	Flute 2	Flute 4	OAL L (Inch)	Flute Length ℓ (Inch)
GSXΔ04C-ΔD	1/16	0.0625	0.1250	●	●	1.500	0.0938	●	●	1.500	0.1250	●	●	1.500	0.1875	●	●	1.500	0.2500
GSXΔ06C-ΔD	3/32	0.0938	0.1250	●	●	1.500	0.1406	●	●	1.500	0.1875	●	●	1.500	0.2813	●	●	1.500	0.3750
GSXΔ08C-ΔD	1/8	0.1250	0.1250	●	●	2.000	0.1875	●	●	2.000	0.2500	●	●	2.000	0.3750	●	●	2.000	0.5000
GSXΔ10C-ΔD	5/32	0.1563	0.1875	●	●	2.000	0.2344	●	●	2.000	0.3125	●	●	2.000	0.4688	●	●	2.000	0.6250
GSXΔ12C-ΔD	3/16	0.1875	0.1875	●	●	2.000	0.2813	●	●	2.000	0.3750	●	●	2.000	0.5625	●	●	2.500	0.7500
GSXΔ14C-ΔD	7/32	0.2188	0.2500	●	●	2.000	0.3282	●	●	2.000	0.4376	●	●	2.000	0.6564	●	●	2.500	0.8752
GSXΔ16C-ΔD	1/4	0.2500	0.2500	●	●	2.000	0.3750	●	●	2.000	0.5000	●	●	2.000	0.7500	●	●	2.500	1.0000
GSXΔ18C-ΔD	9/32	0.2813	0.3125	●	●	2.500	0.4219	●	●	2.500	0.5626	●	●	3.000	0.8439	●	●	3.000	1.1252
GSXΔ20C-ΔD	5/16	0.3125	0.3125	●	●	2.500	0.4688	●	●	2.500	0.6250	●	●	3.000	0.9375	●	●	3.000	1.2500
GSXΔ24C-ΔD	3/8	0.3750	0.3750	●	●	3.000	0.5625	●	●	3.000	0.7500	●	●	3.500	1.1250	●	●	3.500	1.5000
GSXΔ28C-ΔD	7/16	0.4375	0.4375	●	●	3.000	0.6563	●	●	3.000	0.8750	●	●	3.500	1.3125	●	●	4.000	1.7500
GSXΔ32C-ΔD	1/2	0.5000	0.5000	●	●	3.000	0.7500	●	●	3.000	1.0000	●	●	3.500	1.5000	●	●	4.000	2.0000
GSXΔ36C-ΔD	9/16	0.5625	0.5625	●	●	3.500	0.8438	●	●	3.500	1.1250	●	●	4.500	1.6875	●	●	5.000	2.2500
GSXΔ40C-ΔD	5/8	0.6250	0.6250	●	●	3.500	0.9375	●	●	3.500	1.2500	●	●	4.500	1.8750	●	●	5.000	2.5000
GSXΔ44C-ΔD	11/16	0.6875	0.6875	●	●	4.000	1.0313	●	●	4.000	1.3750	●	●	4.500	2.0625	●	●	5.000	2.7500
GSXΔ48C-ΔD	3/4	0.7500	0.7500	●	●	4.000	1.1250	●	●	4.000	1.5000	●	●	5.000	2.2500	●	●	5.500	3.0000
GSXΔ56C-ΔD	7/8	0.8750	0.8750	○	○	4.000	1.3125	○	○	4.000	1.7500	○	○	5.000	2.6250	○	○	5.500	3.5000
GSXΔ64C-ΔD	1	1.0000	1.0000	○	○	4.000	1.5000	○	○	4.000	2.0000	○	○	5.500	3.0000	○	○	6.000	4.0000

●: USA stock standard ○: Coming Soon

GSX Endmills - Sharp Edge (S) METRIC Lineup

2X



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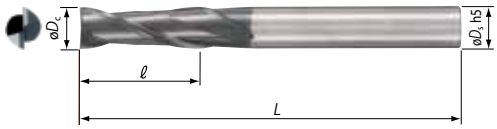


■ **Endmill Identification (GSXMILL Series Only)**

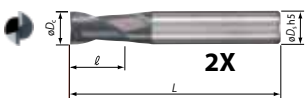
GSX 3 0100 C - 1.5D

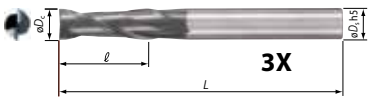
1	2	3	4	5
Series Code	No. of Teeth	Diameter x 100	Cutting Edge	Cutting Edge Length

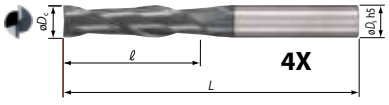
Sharp Edge (S) Cat. No.	Diameter φDc (mm)	Shank Diameter φDs (mm)	2 Flute 2	2 Flute 4	OAL L (mm)	Flute Length ℓ (mm)	3 Flute 2	3 Flute 4	OAL L (mm)	Flute Length ℓ (mm)
GSXΔ0050S-ΔD	0.5	4.0	★		40.0	1.3	★		40.0	1.5
GSXΔ0100S-ΔD	1.0	4.0	★	★	40.0	2.5	★	★	40.0	3.0
GSXΔ0150S-ΔD	1.5	3.0	★	★	40.0	3.8	★		40.0	4.5
GSXΔ0150S-ΔD-S3	1.5	4.0	★	★	38.0	3.8				
GSXΔ0200S-ΔD	2.0	4.0	★	★	40.0	5.0	★	★	40.0	6.0
GSXΔ0200S-ΔD-S3	2.0	3.0	★	★	38.0	5.0				
GSXΔ0250S-ΔD	2.5	4.0	★	★	40.0	6.3	★		40.0	7.5
GSXΔ0300S-ΔD	3.0	6.0	★	★	45.0	7.5	★	★	50.0	9.0
GSXΔ0300S-ΔD-S3	3.0	3.0	★	★	38.0	7.5				
GSXΔ0350S-ΔD	3.5	6.0	★	★	45.0	8.8				
GSXΔ0400S-ΔD	4.0	6.0	★	★	45.0	11.0	★	★	50.0	12.0
GSXΔ0400S-ΔD-S3	4.0	4.0	★	★	45.0	11.0				
GSXΔ0450S-ΔD	4.5	6.0	★	★	50.0	11.3				
GSXΔ0500S-ΔD	5.0	6.0	★	★	50.0	13.0	★	★	50.0	15.0
GSXΔ0550S-ΔD	5.5	6.0	★	★	50.0	13.0				
GSXΔ0600S-ΔD	6.0	6.0	★	★	50.0	13.0	★	★	50.0	18.0
GSXΔ0700S-ΔD	7.0	8.0	★	★	60.0	16.0		★	70.0	21.0
GSXΔ0800S-ΔD	8.0	8.0	★	★	60.0	19.0	★	★	70.0	24.0
GSXΔ0900S-ΔD	9.0	10.0	★	★	70.0	19.0				
GSXΔ1000S-ΔD	10.0	10.0	★	★	70.0	22.0	★	★	90.0	30.0
GSXΔ1200S-ΔD	12.0	12.0	★	★	75.0	26.0	★	★	90.0	36.0
GSXΔ1600S-ΔD	16.0	16.0	★	★	90.0	32.0	★	★	110.0	48.0
GSXΔ2000S-ΔD	20.0	20.0	★	★	100.0	40.0				

★ - World Wide Warehouse Item

GSX Endmills - Gash Land (C) METRIC Lineup







Gash Land (C) Cat. No.	Diameter φDc (mm)	Shank Diameter φDs (mm)	1.5 Flute 2	1.5 Flute 4	1.5 OAL L (mm)	1.5 Flute Length ℓ (mm)	2 Flute 2	2 Flute 4	2 OAL L (mm)	2 Flute Length ℓ (mm)	3 Flute 2	3 Flute 4	3 OAL L (mm)	3 Flute Length ℓ (mm)	4 Flute 2	4 Flute 4	4 OAL L (mm)	4 Flute Length ℓ (mm)	Flute 3	OAL L (mm)	1.5 Flute Length ℓ (mm)	2 Flute Length ℓ (mm)
GSXΔ0050C-ΔD	0.5	4.0					★		40.0	1.0												
GSXΔ0100C-ΔD	1.0	4.0	★	★	40.0	1.5	★	★	40.0	2.0	★	★	40.0	3.0	★	★	40.0	4.0	★	40.0	1.5	2.5
GSXΔ0150C-ΔD	1.5	4.0	★	★	40.0	2.3	★	★	40.0	3.0	★	★	40.0	4.5	★	★	40.0	6.0	★	40.0	2.3	3.8
GSXΔ0200C-ΔD	2.0	4.0	★	★	40.0	3.0	★	★	40.0	4.0	★	★	40.0	6.0	★	★	40.0	8.0	★	40.0	3.0	5.0
GSXΔ0250C-ΔD	2.5	4.0	★	★	40.0	3.8	★	★	40.0	5.0	★	★	40.0	7.5	★	★	50.0	10.0	★	40.0	3.8	6.3
GSXΔ0300C-ΔD	3.0	6.0	★	★	45.0	4.5	★	★	45.0	6.0	★	★	50.0	9.0	★	★	50.0	16.0	★	45.0	4.5	7.5
GSXΔ0350C-ΔD	3.5	6.0	★	★	45.0	5.3	★	★	45.0	7.0												
GSXΔ0400C-ΔD	4.0	6.0	★	★	45.0	6.0	★	★	45.0	8.0	★	★	50.0	12.0	★	★	50.0	20.0	★	45.0	6.0	11.0
GSXΔ0450C-ΔD	4.5	6.0	★	★	50.0	6.8	★	★	50.0	9.0												
GSXΔ0500C-ΔD	5.0	6.0	★	★	50.0	7.5	★	★	50.0	10.0	★	★	50.0	15.0	★	★	60.0	24.0	★	50.0	7.5	11.0
GSXΔ0550C-ΔD	5.5	6.0	★	★	50.0	9.3	★	★	50.0	11.0												
GSXΔ0600C-ΔD	6.0	6.0	★	★	50.0	9.0	★	★	50.0	12.0	★	★	50.0	18.0	★	★	60.0	24.0	★	50.0	9.0	13.0
GSXΔ0700C-ΔD	7.0	8.0	★	★	60.0	11.0	★	★	60.0	14.0									★	60.0	11.0	13.0
GSXΔ0800C-ΔD	8.0	8.0	★	★	60.0	12.0	★	★	60.0	16.0	★	★	70.0	24.0	★	★	80.0	32.0	★	60.0	12.0	19.0
GSXΔ0900C-ΔD	9.0	10.0	★	★	70.0	14.0	★	★	70.0	18.0									★	70.0	14.0	19.0
GSXΔ1000C-ΔD	10.0	10.0	★	★	70.0	15.0	★	★	70.0	20.0	★	★	90.0	30.0	★	★	90.0	40.0	★	70.0	15.0	22.0
GSXΔ1200C-ΔD	12.0	12.0	★	★	75.0	18.0	★	★	75.0	24.0	★	★	90.0	36.0	★	★	100.0	48.0	★	75.0	18.0	26.0
GSXΔ1600C-ΔD	16.0	16.0					★	★	90.0	32.0	★	★	110.0	48.0		★	120.0	64.0				
GSXΔ2000C-ΔD	20.0	20.0					★	★	100.0	40.0												
GSXΔ2500C-ΔD	25.0	25.0					★	★	120.0	50.0												

★ - World Wide Warehouse Item

Product Range - GSXB Ballnose Endmills

GSXB Endmills	
Application	Inch
General Purpose	GSXB200  φ1/16″ -φ 1″
	Metric
	GSXB2000  φ0.4mm -φ 20mm

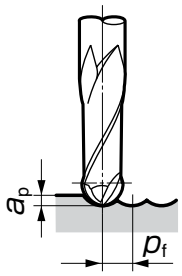
Recommended Cutting Conditions - GSXB

Speeds and Feeds reflect roughing and finishing applications

■ **Recommended Cutting Conditions**

1. If cutting noise and vibration are present, please change the cutting conditions accordingly.

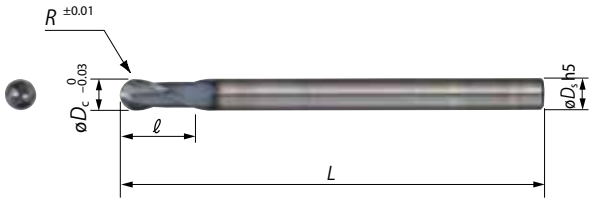
2. If the machine is not designed to achieve the recommended spindle speed, please use the max. spindle speed available.



■ **Radius Milling**

Work Material / Cutting Conditions / R(in)	Carbon Steel, Alloy Steel (Below 25HRC)		Carbon Steel, Alloy Steel (Below 50HRC)		Cast Iron Special Cast Iron		Stainless Steel Titanium Alloy	
	Spindle Speed (SFM)	Feed Rate (in/min)	Spindle Speed (SFM)	Feed Rate (in/min)	Spindle Speed (SFM)	Feed Rate (in/min)	Spindle Speed (SFM)	Feed Rate (in/min)
0.0313	200 - 450	98	100 - 400	53	210 - 550	98	120 - 400	82
0.0469		118		62		118		98
0.0625		118		65		126		98
0.0781		118		67		153		98
0.0938		118		67		153		98
0.1094		118		67		153		98
0.1250		149		82		161		106
0.1407		169		86		181		98
0.1563		185		98		208		98
0.1875		165		82		177		86
0.2188		137		75		157		75
0.2500		110		59		130		59
0.2813		94		49		110		49
0.3125		82		43		94		43
0.3438		70		37		82		37
0.3750		63		33		74		34
0.4375		57		29		67		29
0.5000		45		24		53		24
Standard Depth-of-cut a_p	0.02 x D_c		0.02 x D_c		0.02 x D_c		0.02 x D_c	
Standard Depth-of-cut p_f	0.05 x D_c		0.05 x D_c		0.05 x D_c		0.05 x D_c	

GSXB Ballnose Endmills



Ballnose (B) Cat. No.	Stock	φDc Inch	φDc mm	φDs Inch & *mm*	L Inch & *mm*	ℓ Inch & *mm*	R Inch & *mm*
GSXB204	●	0.063	1.588	0.1250	2.000	0.0938	0.0313
GSXB206	●	0.094	2.381	0.1250	2.500	0.1406	0.0469
GSXB208	●	0.125	3.175	0.1250	2.500	0.1875	0.0625
GSXB210	●	0.156	3.969	0.1875	3.000	0.2344	0.0781
GSXB212	●	0.188	4.763	0.1875	3.000	0.2813	0.0938
GSXB214	●	0.219	5.558	0.2500	3.000	0.3282	0.1094
GSXB216	●	0.250	6.350	0.2500	3.000	0.3750	0.1250
GSXB218	●	0.281	7.144	0.3125	3.500	0.4220	0.1407
GSXB220	●	0.313	7.938	0.3125	3.500	0.4688	0.1563
GSXB224	●	0.375	9.525	0.3750	4.000	0.5652	0.1875
GSXB228	●	0.438	11.113	0.4375	4.000	0.6563	0.2188
GSXB232	●	0.500	12.700	0.5000	4.500	0.7500	0.2500
GSXB236	●	0.563	14.288	0.5625	4.500	0.8438	0.2813
GSXB240	●	0.625	15.875	0.6250	5.500	0.9375	0.3125
GSXB244	●	0.688	17.463	0.6875	5.500	1.0313	0.3438
GSXB248	●	0.750	19.050	0.7500	6.000	1.1250	0.3750
GSXB256	○	0.875	22.225	0.8750	6.500	1.3125	0.4375
GSXB264	○	1.000	25.400	1.0000	7.000	1.5000	0.5000
GSXB20020	★	.0158	0.4	*4*	*50*	*0.6*	*0.20*
GSXB20030	★	.0237	0.6	*4*	*50*	*0.9*	*0.30*
GSXB20050	★	.0394	1.0	*4*	*50*	*1.5*	*0.50*
GSXB20075	★	.0591	1.5	*4*	*50*	*2.3*	*0.75*
GSXB20100	★	.0788	2.0	*6*	*60*	*3.0*	*1.00*
GSXB20125	★	.0985	2.5	*6*	*60*	*4.0*	*1.25*
GSXB20150	★	.1182	3.0	*6*	*60*	*4.5*	*1.50*
GSXB20200	★	.1575	4.0	*6*	*70*	*6.0*	*2.00*
GSXB20250	★	.1969	5.0	*6*	*80*	*7.5*	*2.50*
GSXB20300	★	.2363	6.0	*6*	*80*	*9.0*	*3.00*
GSXB20350	★	.2756	7.0	*8*	*90*	*11.0*	*3.50*
GSXB20400	★	.3150	8.0	*8*	*90*	*12.0*	*4.00*
GSXB20500	★	.3937	10.0	*10*	*100*	*15.0*	*5.00*
GSXB20600	★	.4725	12.0	*12*	*110*	*18.0*	*6.00*
GSXB20700	★	.5512	14.0	*16*	*110*	*21.0*	*7.00*
GSXB20800	★	.6300	16.0	*16*	*140*	*24.0*	*8.00*
GSXB20900	★	.7087	18.0	*20*	*140*	*27.0*	*9.00*
GSXB21000	★	.7874	20.0	*20*	*160*	*30.0*	*10.00*

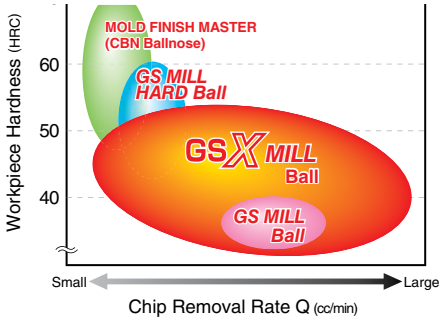
★ - World Wide Warehouse Item ●: USA stock standard ○: Coming Soon

■ Recommended Milling Examples

Application	Radius Milling		Copy Millimg		Pocket Millimg	
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
Ballnose Type	◎	◎	◎	◎	◎	◎

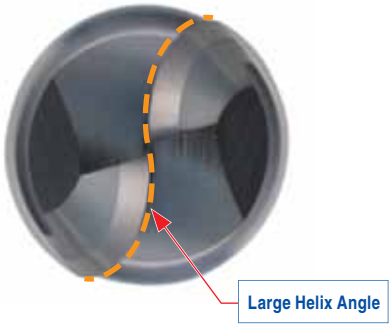
■ Diameter

■ Application Range



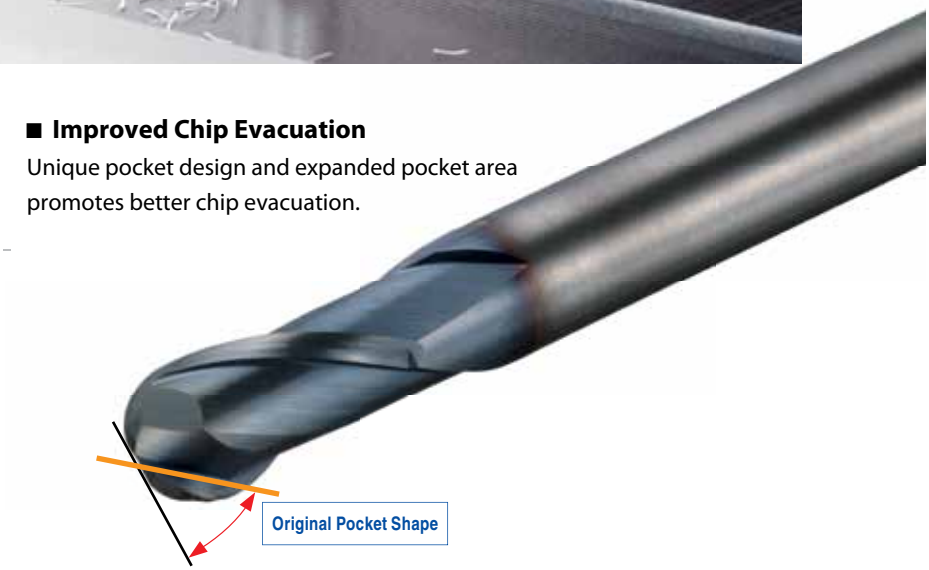
■ Reduced Cutting Resistance

Large helix angle on cutting edge reduces cutting resistance.



■ Improved Chip Evacuation

Unique pocket design and expanded pocket area promotes better chip evacuation.



Product Range - GSXVL Anti-vibratrion Type

GSXVL Endmills	
Application	Radius Type
General Purpose	GSXVL4000-R02-2.5D  φ3mm -φ 25mm
	Square Type
	 φ2mm -φ 25mm

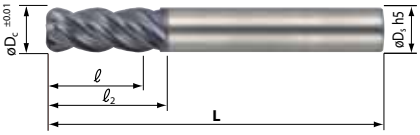
Recommended Cutting Conditions - GSXVL

Speeds and Feeds reflect roughing and finishing applications

ISO	GSXVL Endmills Material		Hardness (Bhn)	SFM	Cutting Diameter 1/8 Feed/Tooth	3/16 Feed/Tooth	1/4 Feed/Tooth	5/16 Feed/Tooth	3/8 Feed/Tooth	7/16 Feed/Tooth	1/2 Feed/Tooth	9/16 Feed/Tooth	5/8 Feed/Tooth	3/4 Feed/Tooth	1 Feed/Tooth
P	Low and Medium Carbon Steels		<250	200-450	.0005-.003	.0007-.0033	.0008-.0036	.0008-.0039	.001-.0042	.0012-.0055	.0014-.0066	.0016-.0085	.002-.0105	.002-.0118	.002-.0125
P	Medium Carbon Alloy Steels		<250	200-425	.0005-.003	.0007-.0033	.0008-.0035	.0008-.0038	.001-.0042	.0012-.0055	.0014-.0066	.0016-.0085	.002-.0105	.002-.0118	.002-.0125
P	Medium-High Carbon Steels		>250	175-350	.0005-.0027	.0007-.003	.0008-.0033	.0008-.0036	.001-.0042	.0012-.0045	.0014-.0066	.0016-.007	.002-.0079	.002-.0089	.002-.011
P	Free Machining Steels and Alloys		<250	200-375	.0005-.003	.0008-.0033	.0008-.0035	.0008-.0039	.001-.0042	.0012-.0055	.0014-.0066	.0016-.008	.002-.0088	.002-.0099	.002-.011
P	Tool Steels		<250	150-350	.0005-.003	.0005-.0033	.0008-.0035	.0008-.0039	.001-.0042	.001-.0055	.0012-.0066	.0016-.008	.002-.0088	.002-.0099	.002-.011
P	Tool Steels		250 - 350	100-275	.0005-.0025	.0005-.0028	.0008-.0031	.0008-.0034	.001-.0036	.001-.0044	.0012-.0055	.0013-.0067	.0015-.0077	.002-.0081	.002-.0095
P	Tool Steels		>350	75-175	.0005-.002	.0005-.0023	.0006-.0026	.0008-.0029	.0008-.0031	.0008-.0033	.001-.0036	.001-.0042	.001-.0047	.0015-.0055	.002-.0065
M	Stainless Steel	Martensitic and Ferritic	<250	150-375	.0005-.0025	.0008-.0028	.0008-.003	.0008-.0033	.001-.0036	.001-.0035	.001-.004	.001-.0046	.001-.0055	.001-.0065	.001-.0075
M	Stainless Steel	Martensitic and Ferritic	<250	150-375	.0005-.0025	.0005-.0028	.0005-.0031	.0008-.0033	.0008-.0036	.001-.0035	.001-.004	.001-.0046	.001-.0055	.001-.0065	.001-.0075
M	Stainless Steel	Austenitic	<250	150-350	.0005-.0025	.0005-.0028	.0008-.0031	.001-.0033	.001-.0037	.0011-.0042	.0012-.0049	.0012-.0055	.0014-.0061	.0015-.0068	.002-.0075
M	Stainless Steel	Precipitation Hardening	<280	90-325	.0005-.0022	.0005-.0025	.0008-.0028	.001-.0031	.001-.0033	.001-.0035	.001-.0038	.001-.0041	.001-.0048	.001-.0055	.001-.0065
K	Grey Cast Iron			250-550	.0008-.003	.001-.0033	.001-.0035	.001-.0037	.001-.004	.001-.0053	.001-.0062	.001-.007	.001-.0076	.001-.0089	.001-.0105
K	Ductile Iron			175-350	.0005-.003	.0005-.0033	.0008-.0035	.001-.0037	.001-.004	.001-.0053	.001-.0062	.001-.007	.001-.0076	.001-.0089	.001-.0105
S	Exotic Alloys: Inconel, Hastalloy, Waspalloy, etc.			75-125	.0005-.002	.0008-.0023	.0008-.0026	.0008-.0029	.001-.0032	.001-.0036	.001-.004	.001-.0046	.001-.0052	.001-.006	.001-.0071
N	Non-Ferrous Material			600-1500	.001-.003	.001-.0033	.001-.0033	.001-.0038	.001-.0045	.001-.0055	.001-.007	.001-.008	.001-.010	.001-.0115	.001-.0125

GSXVL Endmills - METRIC Anti-vibratrion Type

S-Square R-Radius

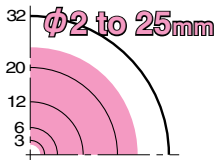


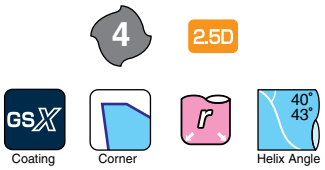
Catalog No.	Stock	Type	φDc mm	φDc mm	ℓ mm	ℓ2 mm	L mm	Corner Radius
GSXVL4030-R02-2.5D	★	R	3.0	6	8.0	9.5	50	0.2
GSXVL4030-R05-2.5D	★	R	3.0	6	8.0	9.5	50	0.5
GSXVL4040-R02-2.5D	★	R	4.0	6	10.0	11.5	50	0.2
GSXVL4040-R05-2.5D	★	R	4.0	6	10.0	11.5	50	0.5
GSXVL4040-R10-2.5D	★	R	4.0	6	10.0	11.5	50	1.0
GSXVL4050-R02-2.5D	★	R	5.0	6	13.0	14.5	60	0.2
GSXVL4050-R05-2.5D	★	R	5.0	6	13.0	14.5	60	0.5
GSXVL4050-R10-2.5D	★	R	5.0	6	13.0	14.5	60	1.0
GSXVL4060-R03-2.5D	★	R	6.0	6	15.0	-	60	0.3
GSXVL4060-R05-2.5D	★	R	6.0	6	15.0	-	60	0.5
GSXVL4060-R10-2.5D	★	R	6.0	6	15.0	-	60	1.0
GSXVL4060-R15-2.5D	★	R	6.0	6	15.0	-	60	1.5
GSXVL4080-R03-2.5D	★	R	8.0	8	20.0	-	80	0.3
GSXVL4080-R05-2.5D	★	R	8.0	8	20.0	-	80	0.5
GSXVL4080-R10-2.5D	★	R	8.0	8	20.0	-	80	1.0
GSXVL4080-R15-2.5D	★	R	8.0	8	20.0	-	80	1.5
GSXVL4080-R20-2.5D	★	R	8.0	8	20.0	-	80	2.0
GSXVL4100-R03-2.5D	★	R	10.0	10	25.0	-	90	0.3
GSXVL4100-R05-2.5D	★	R	10.0	10	25.0	-	90	0.5
GSXVL4100-R10-2.5D	★	R	10.0	10	25.0	-	90	1.0
GSXVL4100-R15-2.5D	★	R	10.0	10	25.0	-	90	1.5
GSXVL4100-R20-2.5D	★	R	10.0	10	25.0	-	90	2.0
GSXVL4120-R05-2.5D	★	R	12.0	12	30.0	-	90	0.5
GSXVL4120-R10-2.5D	★	R	12.0	12	30.0	-	90	1.0
GSXVL4120-R15-2.5D	★	R	12.0	12	30.0	-	90	1.5
GSXVL4120-R20-2.5D	★	R	12.0	12	30.0	-	90	2.0
GSXVL4120-R30-2.5D	★	R	12.0	12	30.0	-	90	3.0
GSXVL4160-R10-2.5D	★	R	16.0	16	40.0	-	115	1.0
GSXVL4160-R15-2.5D	★	R	16.0	16	40.0	-	115	1.5
GSXVL4160-R20-2.5D	★	R	16.0	16	40.0	-	115	2.0
GSXVL4160-R30-2.5D	★	R	16.0	16	40.0	-	115	3.0
GSXVL4200-R10-2.5D	★	R	20.0	20	50.0	-	125	1.0
GSXVL4200-R15-2.5D	★	R	20.0	20	50.0	-	125	1.5
GSXVL4200-R20-2.5D	★	R	20.0	20	50.0	-	125	2.0
GSXVL4200-R30-2.5D	★	R	20.0	20	50.0	-	125	3.0
GSXVL4250-R10-2.5D	★	R	25.0	25	63.0	-	140	1.0
GSXVL4250-R15-2.5D	★	R	25.0	25	63.0	-	140	1.5
GSXVL4250-R20-2.5D	★	R	25.0	25	63.0	-	140	2.0
GSXVL4250-R30-2.5D	★	R	25.0	25	63.0	-	140	3.0
GSXVL4020-2.5D	★	S	2.0	4	5.0	6.5	50	-
GSXVL4030-2.5D	★	S	3.0	6	8.0	9.5	50	-
GSXVL4040-2.5D	★	S	4.0	6	10.0	11.5	50	-
GSXVL4050-2.5D	★	S	5.0	6	13.0	14.5	60	-
GSXVL4060-2.5D	★	S	6.0	6	15.0	-	60	-
GSXVL4070-2.5D	★	S	7.0	8	18.0	20.0	70	-
GSXVL4080-2.5D	★	S	8.0	8	20.0	-	80	-
GSXVL4090-2.5D	★	S	9.0	10	23.0	25.0	90	-
GSXVL4100-2.5D	★	S	10.0	10	25.0	-	90	-
GSXVL4110-2.5D	★	S	11.0	12	28.0	30.5	90	-
GSXVL4120-2.5D	★	S	12.0	12	30.0	-	90	-
GSXVL4140-2.5D	★	S	14.0	16	35.0	37.5	110	-
GSXVL4150-2.5D	★	S	15.0	16	38.0	41.0	110	-
GSXVL4160-2.5D	★	S	16.0	16	40.0	-	115	-
GSXVL4180-2.5D	★	S	18.0	20	45.0	48.0	120	-
GSXVL4200-2.5D	★	S	20.0	20	50.0	-	125	-
GSXVL4250-2.5D	★	S	25.0	25	63.0	-	140	-

■ Recommended Milling Examples

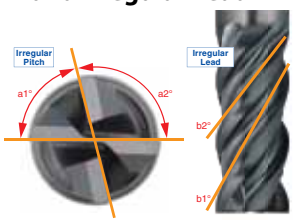
Application	Side Milling		Groove Milling		Groove Finishing	
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
Square Type	◎	○	◎	◎	◎	○
Radius Type	◎	○	◎	◎	◎	○

■ Diameter

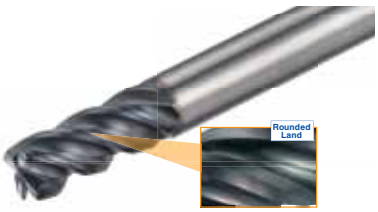




■ Irregular Pitch and Irregular Lead

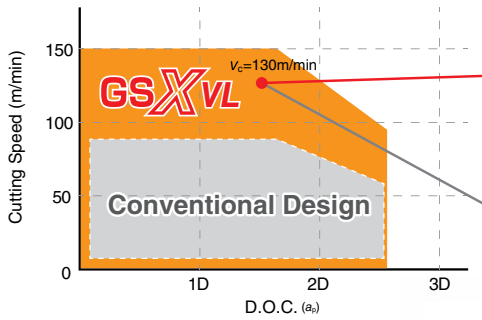


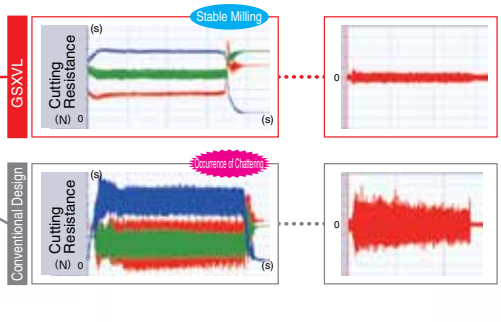
■ Drastically Improved Surface Quality



★ - World Wide Warehouse Item

■ Performance Data





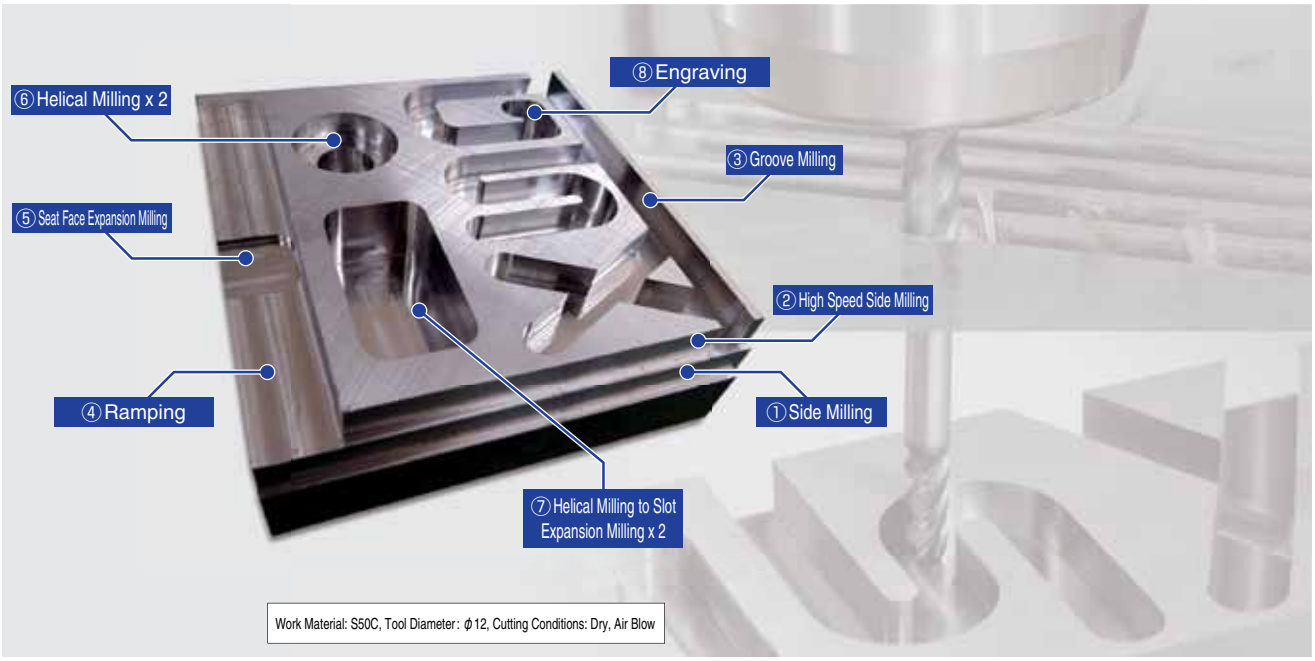
●Side Milling

Work Material: S50C Tool diameter : φ10

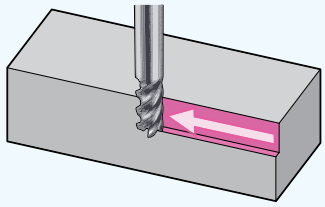
Cutting Conditions: n=4,100min⁻¹
Vf=1,450mm/min
ap=15mm, ae=2mm, Wet

Machine: BT50

■ Application Examples

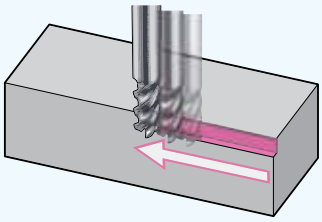


① Side Milling



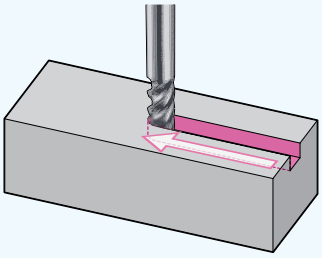
Cutting Conditions: V_c=102m/min (n=4,100min^{-1})
v_f=1,080mm/min (0.1mm/t)
a_p=24mm, a_e=2.0mm

② High Speed Side Milling



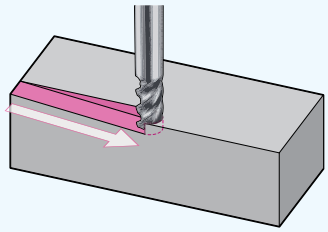
Cutting Conditions: V_c=151m/min (n=4,000min^{-1})
v_f=4,800mm/min (0.3mm/t)
a_p=12mm, a_e=2.0mm

③ Groove Milling



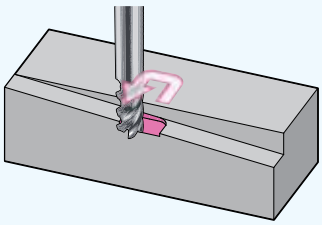
Cutting Conditions: V_c=90m/min (n=2,400min^{-1})
v_f=960mm/min (0.1mm/t)
a_p=12mm

④ Ramping



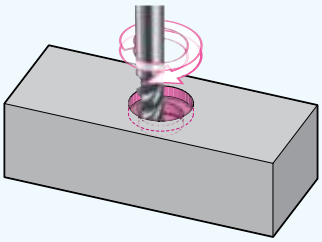
Cutting Conditions: V_c=90m/min (n=2,400min^{-1})
v_f=480mm/min (0.05mm/t)
Ramp Angle 5°

⑤ Seat Face Expansion Milling



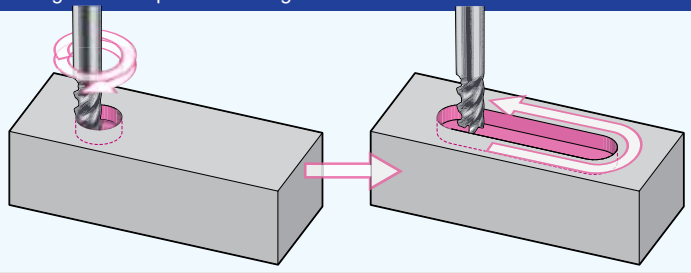
Cutting Conditions: V_c=90m/min (n=2,400min^{-1})
v_f=960mm/min (0.1mm/t)

⑥ Helical Milling x 2



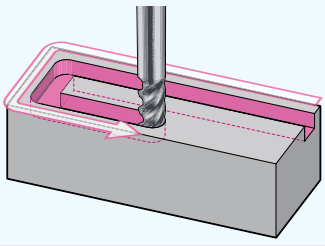
Cutting Conditions: V_c=90m/min (n=2,400min^{-1})
v_f=480mm/min (0.05mm/t)
Ramp Angle 3°

⑦ Helical Milling to Slot Expansion Milling x 2



Cutting Conditions: V_c=90m/min (n=2,400min^{-1})
[Helical] v_f=480mm/min (0.05mm/t) [Slot Expansion] v_f=672mm/min (0.07mm/t) [Finishing] v_f=1,920mm/min (0.2mm/t)
Ramp Angle 3°
a_p=24mm, a_e=0.1mm

⑧ Engraving



Cutting Conditions: V_c=79m/min (n=2,100min^{-1})
v_f=588mm/min (0.07mm/t)
a_p=12mm

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