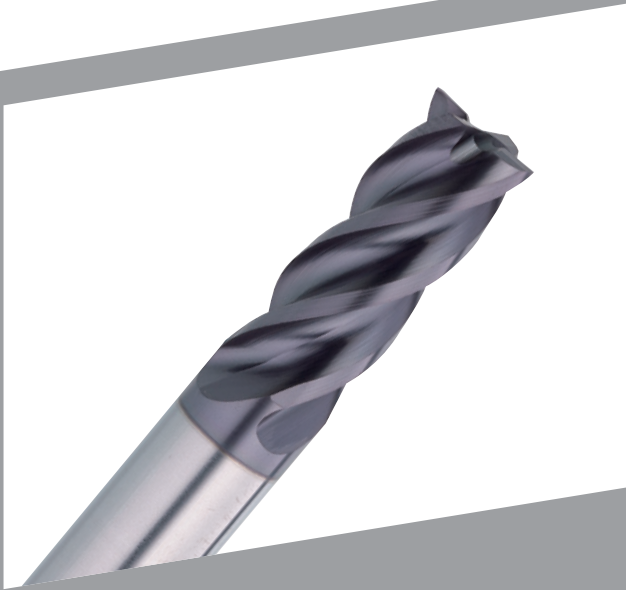


SOLID CARBIDE END MILLS

Popular Product

Fully automatic, the most advance capacity

S428X1

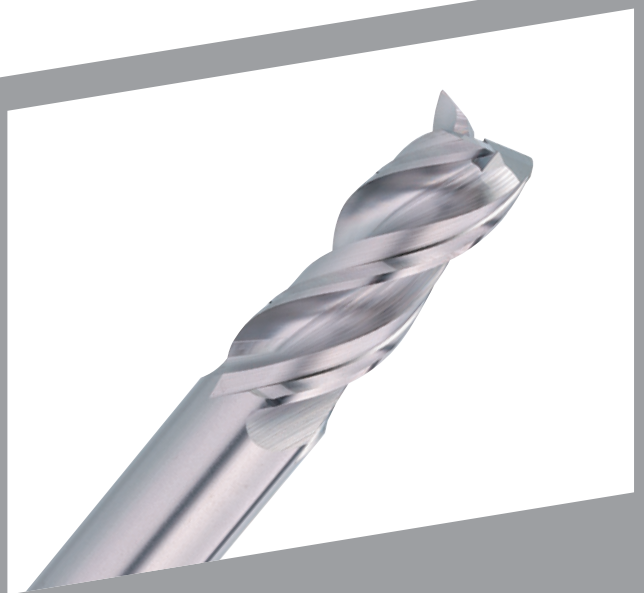


Feature of product

S428X1 Multipurpose end mills with two variable helix geometry, two unequal flutes, a small edge cutting land with the relief angle, able to perform high efficiency cutting as well for unstable cutting conditions.

Various applications from roughing to finishing cutting, drilling, ramping... in different materials.

S450



Feature of product

S450 Strong and rigid Aluminum end mills design with three variable helix and three unequal flutes geometric, improve the efficiency for slotting and with excellent finishing on side milling.

S445HX



Feature of product

S445HX Almighty end mills with three variable helix geometry, three unequal flutes with high chip removal rate, and sharp cutting edge. Suitable for roughing, finishing, drilling, and ramping. Work on any cutting direction with high speed condition.

S554-3.0X1



Feature of product

S554-3.0X1 High-Efficiency and High-Precision End Mills with three variable helix geometry, and double groove with high rigidity design. It has excellent performance in roughing and finishing.










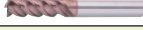


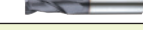






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

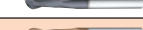

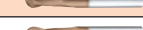



High Performance

2			S428XI	Super Cut End Mills	AITIXN
4			S450	Alu Cut End Mills	Bright
5			S554-3.0XI	Premium Cut End Mills	AITIXN
5			S428-3.0XI	Super Cut End Mills	AITIXN
5			S450-3.0	Alu Cut End Mills	Bright
6			S445HX	Easy Cut End Mills	AITICrN
6			S445SX	Easy Cut End Mills	AITIXN+ZrN

Finishing

7			S245-3.0	End Mills For Aluminium	Bright
7			S245-3.0ZX	End Mills For Aluminium	ZrN
8			S250-3.0	End Mills For Aluminium	Bright
8			S250-3.0ZX	End Mills For Aluminium	ZrN
8			S255-3.0	End Mills For Aluminium	Bright
8			S255-3.0ZX	End Mills For Aluminium	ZrN
9			S215-3.0TX	High Performance End Mills	AITISIN
10			S225-3.0TX	High Performance End Mills	AITISIN
11			S200F	Universal End Mills	TiAIN
11			S204F	Finishing End Mills	TiAIN
12			S202F	Universal End Mills	TiAIN
12			S206F	Finishing End Mills	TiAIN

Mold & Die

13			S630X	Universal End Mills	AITIXN
13			S630TX	Universal End Mills	AITISIN
14			S650X	Universal End Mills	AITIXN
14			S650TX	Universal End Mills	AITISIN
15			S640X	Finishing End Mills	AITIXN
15			S640TX	Finishing End Mills	AITISIN
16			S660X	Finishing End Mills	AITIXN
16			S660TX	Finishing End Mills	AITISIN
17			S645TX	High Performance End Mills	AITISIN
17			S676ATX	High Performance End Mills	AITISIN
18			S665TX	High Performance End Mills	AITISIN
18			S678ATX	High Performance End Mills	AITISIN
19			S208F	Ball Nose End Mills	TiAIN
19			S210F	Ball Nose End Mills	TiAIN
20			S618X	Ball Nose End Mills	AITIXN
20			S618TX	Ball Nose End Mills	AITISIN
20			S618ATX	Ball Nose End Mills	AITISIN

Work Materials (◎ The most recommended/ ○ recommended)														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
		-48HRC	-56HRC	-68HRC										

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






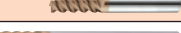



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Mold & Die

21			S620X	Ball Nose End Mills	AITIXN
21			S620TX	Ball Nose End Mills	AITiSiN
21			S620ATX	Ball Nose End Mills	AITiSiN
22			S618ZX	Ball Nose End Mills For Aluminium	ZrN
22			S620ZX	Ball Nose End Mills For Aluminium	ZrN
23			B265TX	End Mills With Corner Radius	AITiSiN
25			B267TX	End Mills With Corner Radius	AITiSiN
27			B266TX	End Mills With Corner Radius	AITiSiN
29			B268TX	End Mills With Corner Radius	AITiSiN
31			B276ATX	High Performance End Mills With Corner Radius	AITiSiN
33			B278ATX	High Performance End Mills With Corner Radius	AITiSiN

Drill

34			S290XI	NC Spot Drills 90°	AITIXN
34			S291XI	NC Spot Drills 120°	AITIXN
35			S292XI-2	High Performance Drills	AITIXN
37			S292XI-3	High Performance Drills	AITIXN

HSS

39			S336	Roughing End Mills	Bright
39			S336C	Roughing End Mills	TiCN
40			S337	Roughing End Mills	Bright
40			S337C	Roughing End Mills	TiCN
41			S334	Roughing End Mills	Bright
41			S334C	Roughing End Mills	TiCN
42			S335	Roughing End Mills	Bright
42			S335C	Roughing End Mills	TiCN

Work Materials (☉ The most recommended/○ recommended)														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
		-30HRC	-48HRC	-56HRC	-68HRC									

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Improve heat and wear resistance

Enhance cutter tool life by our in house advance coating facilities.



Improve cutting surface finishing

Smooth grinding on the helix fluting surface, reduce cutting force and enhance surface finishing.

Faster chip removal rate

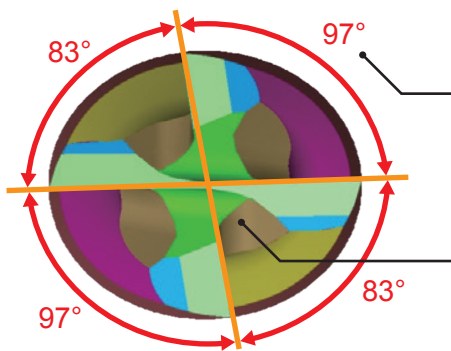
Bigger helix fluting design, better chip removal in high speed machining.

Anti-breakage

By the unique design of variable helix geometry, enhance anti-breakage and reduce cutting force in HPC and HSC machining.

Heat and impact resistance

Selected superior carbide grade, improved heat and impact resistance.



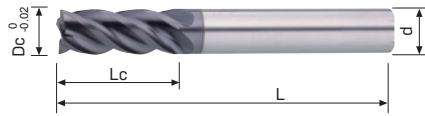
Anti- vibrations

By uneven flutes distribution, reduce vibrations in HPC and HSC machining.

Better chip evacuations at front end surface

Big rake angle design at front end surface to provide better chip removal rate, can easily perform drilling and plunging operations.

S428X1



Tool Material/ Coating Type	MG Carbide	AITiXN					Type of Operation							
Specification	40° 4 N 90°					Work Materials [◎ The most recommended/ ○ recommended]								
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel		Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium		Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
	◎	◎			◎	◎	○	○				○	○	○

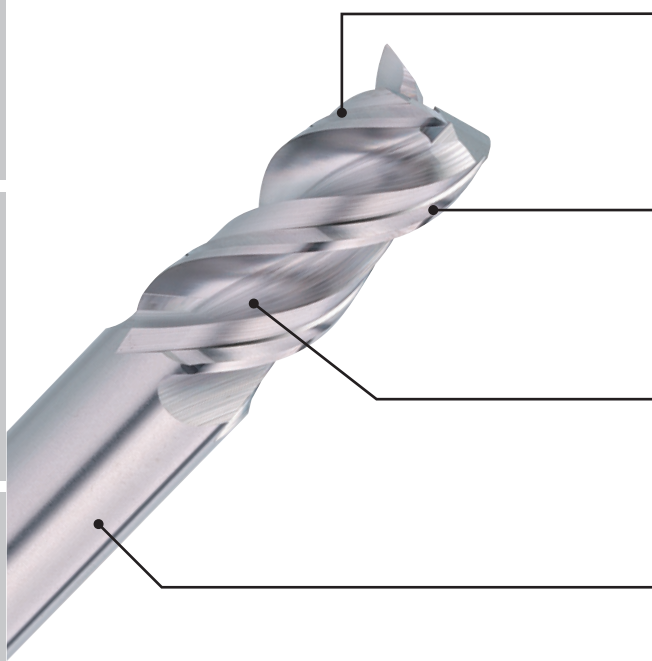
※ Feature of product

S428X1 - Multipurpose End Mills with two variable helix geometry, two unequal flutes, a small edge cutting land with the relief angle, able to perform in high efficiency cutting as well for unstable cutting conditions.

Various applications from roughing to finishing cutting, drilling, ramping... in different materials.

Code No. S428X1-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S428X1 MG AITiXN
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3 A	8	50	4	●
4 A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
14	32	90	16	●
16	40	100	16	●
18	NEW45(40)	100	20	●
20	NEW50(40)	100	20	●



Anti-brooken

Have anti-brooken with variable helix geometry and big capacity slot.

Good quality of tip surface

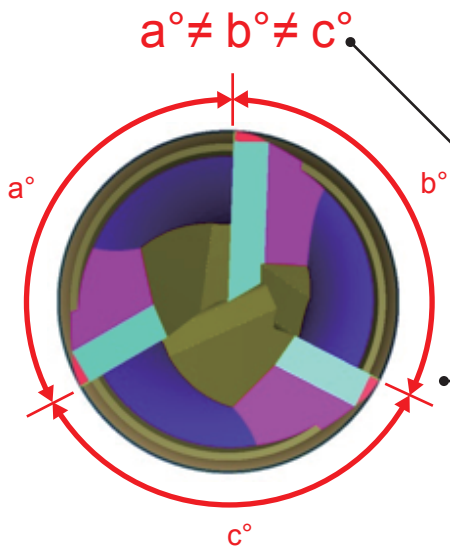
Mirror ultra-finish on tip surface, no remaining and no shadow on surface during working.

High-chipping removal

Slot with big capacity with high-chipping removal.

Flexural strength

Selected superior carbide grade, improved heat and impact resistance.



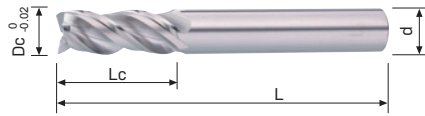
Vibration resistance

Uneven flutes distribution decreases the vibration during working.

Unique edge design

Have high flatness and precision in high feed cutting without chipping.

S450



Tool Material/ Coating Type	MG Carbide	Uncoated Bright					Type of Operation						
Specification	40°	3	N	90°									
Work Materials [◎ The most recommended/ ○ recommended]													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC			◎						

※ Feature of product

S450 - Strong and rigid Aluminum End Mills design with three variable helix and three unequal flutes in geometric, improve the efficiency for slotting and with excellent finishing on side milling.

Code No. S450-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S450 MG Bright
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	75	10	●
12	30	75	12	●
16	NEW45(40)	100	16	●
20	NEW50(40)	100	20	●

S554-3.0X1		S428-3.0X1		S450-3.0									
Tool Material/ Coating Type	MG Carbide	AITiXN Bright			Type of Operation 								
Specification													
Work Materials (◎ The most recommended / ○ recommended)													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	-30HRC	-48HRC	-56HRC	-68HRC									
S554-3.0X1	◎	◎			◎	◎					○	○	○
S428-3.0X1	◎	◎			◎	◎					○	○	○
S450-3.0							◎						

※ Feature of product

S554-3.0X1 - High-Efficiency and High-Precision End Mills with three variable helix geometry, and double groove with high rigidity design. It has excellent performance in roughing and finishing. Variable applications from roughing to finishing cutting... in different materials. Good wear resistance and lubrication with Nano multilayer coating.

S428-3.0X1 - Multipurpose End Mills with two variable helix geometry, two unequal flutes, a small edge cutting land with the relief angle, able to perform in high efficiency cutting as well for unstable cutting conditions. Various applications from roughing to finishing cutting, drilling, ramping... in different materials.

S450-3.0 - Strong and rigid Aluminum End Mills design with three variable helix and three unequal flutes in geometric, improve the efficiency for slotting and with excellent finishing on side milling.

Code No. S554-3.0X1-Dc / S428-3.0X1-Dc / S450-3.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S554-3.0X1 MG AITiXN	S428-3.0X1 MG AITiXN	S450-3.0 MG Bright
3	9	50	6	●	●	●
4	12	50	6	●	●	●
5	15	50	6	●	●	●
6	18	50	6	●	●	●
8	24	60	8	●	●	●
10	30	75	10	●	●	●
12	36	75	12	●	●	●
16	50	100	16	●	●	●
20	60	120	20	●	●	●

S445HX		S445SX											
Tool Material/ Coating Type	MG Carbide AlTiCrN AlTiXN+ZrN	Type of Operation 											
Specification	36° ~ 38° 4 N 90°												
Work Materials (◎ The most recommended / ○ recommended)													
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC									
S445HX	◎	◎			◎	◎					○	○	○
S445SX	◎	◎			◎	◎					○	○	○

※ Feature of product

S445HX、S445SX - Almighty End Mills with three variable helix geometry, three unequal flutes with high chip removal rate, and sharp cutting edge.

Suitable for roughing, finishing, drilling, and ramping. Work on any cutting direction with high speed condition.

Code No. S445HX-Dc / S445SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S445HX MG AlTiCrN	S445SX MG AlTiXN+ZrN
1	3	50	4	●	●
1.5	5	50	4	●	●
2	6	50	4	●	●
2.5	8	50	4	●	●
3A	8	50	4	●	●
4A	11	50	4	●	●
3	8	50	6	●	●
4	11	50	6	●	●
5	13	50	6	●	●
6	16	50	6	●	●
8	20	60	8	●	●
10	25	75	10	●	●
12	30	75	12	●	●
14	32	90	16	●	●
16	40	100	16	●	●
18	NEW45(40)	100	20	●	●
20	NEW50(40)	100	20	●	●

End Mills For Aluminium

S245-3.0		S245-3.0ZX										
Tool Material/ Coating Type	MG Carbide	Bright ZrN	Type of Operation 									
Specification	45° 3 N 90°											
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
	S245-3.0					◎	◎					
	S245-3.0ZX					◎	◎					

※ Feature of product

S245-3.0 - General Alu End Mills

With 45° helix angle and sharp cutting edge are designed for various applications in machining Aluminium from roughing to finishing which could have a good cutting quality.

S245-3.0ZX - General Alu End Mills with 45° helix angle and sharp cutting edge design for various applications on Aluminium cutting, machining from roughing to finishing, which could have a good cutting quality.

Adopting with ZrN coating which is excluded AlTi formula would prevent from chemical affinity with Alu metal and to have better surface hardness, smoothness and reduce friction rates to enhance tool life.

Code No. S245-3.0-Dc / S245-3.0ZX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S245-3.0 MG Bright	S245-3.0ZX MG ZrN
1	3	50	4	○	●
1.5	5	50	4	○	●
2	6	50	4	○	●
2.5	8	50	4	○	●
3A	9	50	4	○	●
4A	12	50	4	○	●
3	9	50	6	○	●
4	12	50	6	○	●
5	15	50	6	○	●
6	18	50	6	○	●
8	24	60	8	○	●
10	30	75	10	○	●
12	36	75	12	○	●
16	50	100	16	○	●
20	60	120	20	○	●

※ Mark ○ : On request, no stock

End Mills For Aluminium

S250-3.0 / S250-3.0ZX				S255-3.0 / S255-3.0ZX								
Tool Material/ Coating Type	MG Carbide	Bright ZrN	50°	55°	Type of Operation							
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials	
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium
	-30HRC	-48HRC	-56HRC	-68HRC								
S250-3.0							◎					
S250-3.0ZX							◎					
S255-3.0							◎					
S255-3.0ZX							◎					

※ Feature of product

S250-3.0ZX - General Round Groove End Mills for Aluminium with special curvature, the mirror surface of small edge cutting land is designed for various applications on Aluminium materials. Machining in high efficiency from roughing to finishing obtain a good mirror surface.

Adopting with ZrN coating which is excluded AlTi formula would prevent from chemical affinity with Alu metal and to have better surface hardness, smoothness and reduce friction rates to enhance tool life.

S255-3.0ZX High-Helix End Mills for Aluminium- 3 Flutes Mirror surface of 55° helix angle and small edge cutting land are designed for various applications from semi-finishing to finishing which could have a good mirror surface.

Adopting with ZrN coating which is excluded AlTi formula would prevent from chemical affinity with Alu metal and to have better surface hardness, smoothness and reduce friction rates to enhance tool life.

Code No. S250-3.0-Dc / S250-3.0ZX-Dc / S255-3.0-Dc / S255-3.0ZX-Dc

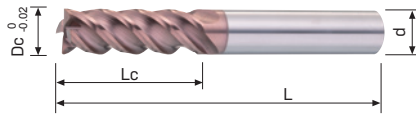
Dc 0 -0.02	Lc mm	L mm	d h6	S250-3.0 MG Bright	S250-3.0ZX MG ZrN	S255-3.0 MG Bright	S255-3.0ZX MG ZrN
3A	9	50	4	○	●	○	●
4A	12	50	4	○	●	○	●
3	9	50	6	○	●	○	●
4	12	50	6	○	●	○	●
5	15	50	6	○	●	○	●
6	18	50	6	○	●	○	●
8	24	60	8	○	●	○	●
10	30	75	10	○	●	○	●
12	36	75	12	○	●	○	●
16	50	100	16	○	●	○	●
20	60	120	20	○	●	○	●

※ Mark ○ : On request, no stock

S215-3.0TX

High Performance End Mills

S215-3.0TX



Tool Material/ Coating Type	MG Carbide	AlTiSiN					Type of Operation						
Specification	 42° 45°	 4	 N	 90°									
Work Materials (◎ The most recommended/ ○ recommended)													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	-30HRC	-48HRC	-56HRC	-68HRC									
	◎	◎	○		◎	◎					○	○	○

※ Feature of product

S215-3.0TX - Round Groove with double Helix End Mills

42°/45° Helix angle, unequal flutes, and high-rigidity round groove with anti-vibration are designed for various applications from roughing to semi- finishing to obtain good quality surface while finishing in high performance cutting applications.

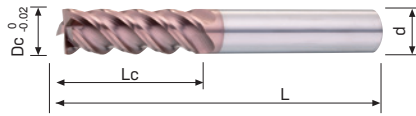
Positive rake angle with AlTiSiN coating performs excellent wear resistance.

It is able to machine on various steels up to HRC52.

Code No. S215-3.0TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S215-3.0TX MG AlTiSiN
3A	9	50	4	●
4A	12	50	4	●
3	9	50	6	●
4	12	50	6	●
5	15	50	6	●
6	18	50	6	●
8	24	60	8	●
10	30	75	10	●
12	36	75	12	●
16	50	100	16	●
20	60	120	20	●

S225-3.0TX



材質	MG Carbide	AlTiSiN					Type of Operation						
様式	45°	4	N	90°									
Work Materials [◎ The most recommended / ○ recommended]													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC									
	◎	◎	○		◎	◎					○	○	○

※ Feature of product

S225-3.0TX - General Round Groove End Mills

Designed with 45° helix angle and the round groove with high-rigidity for various applications from roughing to semi-finishing...etc. to obtain good quality surface while finishing in general cutting applications.

Positive rake angle with AlTiSiN coating performs excellent wear resistance.

It is able to machine on various steels up to HRC52.

Code No. S225-3.0TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S225-3.0TX MG AlTiSiN
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	9	50	4	●
4A	12	50	4	●
3	9	50	6	●
3.5	11	50	6	●
4	12	50	6	●
4.5	14	50	6	●
5	15	50	6	●
6	18	50	6	●
7	21	60	8	●
8	24	60	8	●
9	27	75	10	●
10	30	75	10	●
12	36	75	12	●
16	50	100	16	●
20	60	120	20	●

S200F		S204F											
Tool Material/ Coating Type	MG Carbide TiAlN	2											
Specification	35° N 90°	4											
Work Materials (◎ The most recommended / ○ recommended)													
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC									
S200F	◎	◎			○	◎		○					
S204F	◎	◎			○	◎		○					

※ Feature of product

S200F Universal Standard Length End Mills- 2 Flutes

General cutting applications for side milling, slotting, drilling... etc.

Good wear resistance and lubrication with Nano multilayer coating.

S204F Standard Length Finishing End Mills- 4 Flutes

Good quality surface finishing on precision side and surface milling.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S200F-Dc / S204F-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S200F MG TiAlN <45HRC	S204F MG TiAlN <45HRC
1	3	50	4	●	●
1.5	5	50	4	●	●
2	6	50	4	●	●
2.5	8	50	4	●	●
3A	8	50	4	●	●
4A	11	50	4	●	●
3B	8	50	3	●	●
3	8	50	6	●	●
3.5	10	50	6	●	●
4	11	50	6	●	●
4.5	11	50	6	●	●
5	13	50	6	●	●
6	16	50	6	●	●
7	20	60	8	●	●
8	20	60	8	●	●
9	25	75	10	●	●
10	25	75	10	●	●
12	30	75	12	●	●
14	32	90	16	●	●
16	40	100	16	●	●
18	NEW45(40)	100	20	●	●
20	NEW50(40)	100	20	●	●

S202F		S206F										
Tool Material/ Coating Type	MG Carbide TiAlN	2										
Specification	35° N 90°	4										
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S202F	◎	◎			○	◎		○				
S206F	◎	◎			○	◎		○				

※ Feature of product

S202F Universal Long Length End Mills- 2 Flutes

General cutting applications for side milling, slotting, drilling... etc.

Good wear resistance and lubrication with Nano multilayer coating.

S206F Finishing Long Length End Mills- 4 Flutes

Good quality surface finishing on precision side and surface milling.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S202F-Dc / S206F-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S202F MG TiAlN <45HRC	S206F MG TiAlN <45HRC
3A	12	70	4	●	●
4A	15	70	4	●	●
3	12	70	6	●	●
4	15	70	6	●	●
5	20	80	6	●	●
6	20	80	6	●	●
8	25	100	8	●	●
10	30	100	10	●	●
12	40	110	12	●	●
16	50	140	16	●	●
20	60	160	20	●	●

S630X / S630TX

Universal End Mills

S630X

S630TX

Tool Material/ Coating Type	UMG Carbide	AITiXN AITiSiN					Type of Operation									
Specification	35°	2	N	90°												
Work Materials (◎ The most recommended/ ○ recommended)																
Carbon Steel		Tool Steel		Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel		Pre-hardend Steel		Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
~30HRC				~48HRC	~56HRC	~68HRC										
S630X		◎		◎	◎											
S630TX		◎		◎	◎	○										

※ Feature of product

S630X、S630TX Universal Standard Length End Mills- 2 Flutes
 General cutting applications for side milling, slotting, drilling...etc.
 Good wear resistance and lubrication with Nano multilayer coating.

Code No. S630X-Dc / S630TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S630X UMG AITiXN <55HRC	S630TX UMG AITiSiN <62HRC
1	3	50	4	●	●
1.5	5	50	4	●	●
2	6	50	4	●	●
2.5	8	50	4	●	●
3A	8	50	4	●	●
4A	11	50	4	●	●
3B	8	50	3	●	●
3	8	50	6	●	●
4	11	50	6	●	●
5	13	50	6	●	●
6	16	50	6	●	●
8	20	60	8	●	●
10	25	75	10	●	●
12	30	75	12	●	●
14	32	90	16	●	●
16	40	100	16	●	●
18	NEW45(40)	100	20	●	●
20	NEW50(40)	100	20	●	●

Universal End Mills

S650X		S650TX										
Tool Material/ Coating Type	UMG Carbide AITiXN AITiSiN	Type of Operation 										
Specification												
Work Materials (◎ The most recommended/ ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S650X	◎	◎	◎									
S650TX	◎	◎	◎	○								

※ Feature of product

S650X、S650TX Universal Long Length End Mills- 2 Flutes
 General cutting applications for side milling, slotting, drilling...etc.
 Good wear resistance and lubrication with Nano multilayer coating.

Code No. S650X-Dc / S650TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S650X UMG AITiXN <55HRC	S650TX UMG AITiSiN <62HRC
3A	12	70	4	●	●
4A	15	70	4	●	●
3	12	70	6	●	●
4	15	70	6	●	●
5	20	80	6	●	●
6	20	80	6	●	●
8	25	100	8	●	●
10	30	100	10	●	●
12	40	110	12	●	●
16	50	140	16	●	●
20	60	160	20	●	●

S640X		S640TX										
Tool Material/ Coating Type	UMG Carbide AITiXN AITiSiN	Type of Operation										
Specification	35° 4 N 90°											
Work Materials (◎ The most recommended/ ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S640X	◎	◎	◎									
S640TX	◎	◎	◎	○								

※ Feature of product

S640X、S640TX Standard Length Finishing End Mills- 4 Flutes

Good quality surface finishing on precision side and surface milling.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S640X-Dc / S640TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S640X UMG AITiXN <55HRC	S640TX UMG AITiSiN <62HRC
1	3	50	4	●	●
1.5	5	50	4	●	●
2	6	50	4	●	●
2.5	8	50	4	●	●
3A	8	50	4	●	●
4A	11	50	4	●	●
3B	8	50	3	●	●
3	8	50	6	●	●
3.5	10	50	6	●	●
4	11	50	6	●	●
4.5	11	50	6	●	●
5	13	50	6	●	●
6	16	50	6	●	●
7	20	60	8	●	●
8	20	60	8	●	●
9	25	75	10	●	●
10	25	75	10	●	●
12	30	75	12	●	●
14	32	90	16	●	●
16	40	100	16	●	●
18	NEW45(40)	100	20	●	●
20	NEW50(40)	100	20	●	●

S660X		S660TX										
Tool Material/ Coating Type	UMG Carbide	AITiXN AITiSiN	Type of Operation 									
Specification	35°	4 N 90°										
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S660X	◎	◎	◎									
S660TX	◎	◎	◎	○								

※ Feature of product

S660X、S660TX Finishing Long Length End Mills- 4 Flutes

Good quality surface finishing on precision side and surface milling.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S660X-Dc / S660TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S660X UMG AITiXN <55HRC	S660TX UMG AITiSiN <62HRC
3A	12	70	4	●	●
4A	15	70	4	●	●
3	12	70	6	●	●
4	15	70	6	●	●
5	20	80	6	●	●
6	20	80	6	●	●
8	25	100	8	●	●
10	30	100	10	●	●
12	40	110	12	●	●
16	50	140	16	●	●
20	60	160	20	●	●

S645TX		S676ATX										
Tool Material/ Coating Type		Type of Operation 										
Specification												
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	-30HRC	-48HRC	-56HRC	-68HRC								
S645TX	◎	◎	◎	○	○	○	○			○	○	○
S676ATX	◎	◎	◎	◎								

※ Feature of product

S645TX High Hardness Standard Length End Mills- 4 Flutes.
High efficiency with 45° helix angle for cutting high hardness material.
Negative rake angle with AlTiSiN coating which has excellent wear resistance.
It is able to machine pre-hardened and hardened steel up to HRC62.

S676ATX High Hardness End Mills With Standard Length- 4 Flutes.

High efficiency with 55° helix angle for cutting high hardness material.
Negative rake angle with AlTiSiN coating which has excellent wear resistance.
Cutting edge with small corner radius design increases tool life.
It is able to machine pre-hardened and hardened steel up to HRC70.

Code No. S645TX-Dc / S676ATX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S645TX UMG AlTiSiN <62HRC	S676ATX SMG AlTiSiN <70HRC
1	3	50	4	●	
1.5	5	50	4	●	
2	6	50	4	●	
2.5	8	50	4	●	
3A	8	50	4	●	
4A	11	50	4	●	
3	8	50	6	●	●
4	11	50	6	●	●
5	13	50	6	●	●
6	16	50	6	●	●
8	20	60	8	●	●
10	25	75	10	●	●
12	30	75	12	●	●
16	40	100	16	●	●
20	NEW50(40)	100	20	●	●

S665TX / S678ATX

High Performance End Mills

S665TX		S678ATX										
Tool Material/ Coating Type		Type of Operation										
Specification												
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S665TX	◎	◎	◎	○	○	○	○			○	○	○
S678ATX	◎	◎	◎	◎								

※ Feature of product

S665TX High Hardness Long Length End Mills- 4 Flutes.
 High efficiency with 45° helix angle for cutting high hardness material.
 Negative rake angle with AlTiSiN coating which has excellent wear resistance.
 It is able to machine pre-hardened and hardened steel up to HRC62.

S678ATX High Hardness End Mills With Long Length- 4 Flutes.
 High efficiency with 55° helix angle for cutting high hardness material.
 Negative rake angle with AlTiSiN coating which has excellent wear resistance.
 Cutting edge with small corner radius design increases tool life.
 It is able to machine pre-hardened and hardened steel up to HRC70.

Code No. S665TX-Dc / S678ATX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	S665TX UMG AlTiSiN <62HRC	S678ATX SMG AlTiSiN <70HRC
3A	12	70	4	●	
4A	15	70	4	●	
3	12	70	6	●	
4	15	70	6	●	
5	20	80	6	●	
6	20	80	6	●	●
8	25	100	8	●	●
10	30	100	10	●	●
12	40	110	12	●	●
16	50	140	16	●	●
20	60	160	20	●	●

S208F		S210F										
Tool Material/ Coating Type	MG Carbide	TiAlN	Type of Operation 									
Specification	30° 2 N U											
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S208F	◎	◎			○	◎		○				
S210F	◎	◎			○	◎		○				

※ Feature of product

S208F Standard Length Ball Nose End Mills- 2 Flutes.

Strong ball nose end mills with short helix groove is suitable to machine on various material.

S shape geometry designed is very rigid for continuous cutting.

Good wear resistance and lubrication with Nano multilayer coating.

S210F Long Length Ball Nose End Mills- 2 Flutes.

Strong ball nose end mills with short helix groove is suitable to machine on various material.

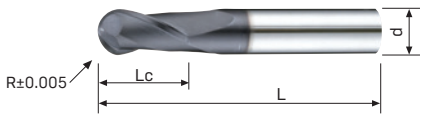
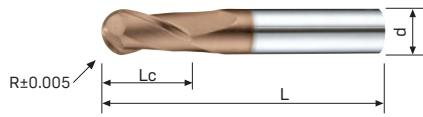
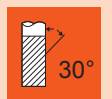






S shape geometry designed is very rigid for continuous cutting.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S208F-Dc / S210F-Dc

Dc 0 -0.02	R ±0.005	Lc mm	d h6	S208F MG TiAlN <45HRC		S210F MG TiAlN <45HRC	
				L		L	
1	0.5R	2	4	50	●		
1.5	0.75R	3	4	50	●		
2	1R	4	4	50	●		
2.5	1.25R	5	4	50	●		
3A	1.5R	6	4	50	●	70	●
4A	2R	8	4	50	●	70	●
3B	1.5R	6	3	50	●	-	-
3	1.5R	6	6	50	●	70	●
4	2R	8	6	50	●	70	●
5	2.5R	10	6	50	●	80	●
6	3R	12	6	50	●	80	●
8	4R	14	8	60	●	100	●
10	5R	18	10	75	●	100	●
12	6R	22	12	75	●	110	●
16	8R	30	16	100	●	140	●
20	10R	38	20	100	●	160	●

Ball Nose End Mills

S618X		S618TX / S618ATX												
														
Tool Material/ Coating Type	UMG/SMG Carbide	AITiXN AITiSiN								Type of Operation				
Specification														
Work Materials (◎ The most recommended / ○ recommended)														
Carbon Steel	Tool Steel		Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel			Aluminum			Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
S618X	○	◎	◎											
S618TX	◎	◎	◎	○										
S618ATX		◎	◎	◎										

※ **Feature of product**

S618X、S618TX、S618ATX Standard Length Ball Nose End Mills- 2 Flutes.

Strong ball nose end mills with short helix groove is suitable to machine on various material.

S shape geometry designed is very rigid for continuous cutting.

S618TX、S618ATX ball nose with a small edge cutting land can improve tool life and surface finishing.

Good wear resistance and lubrication with Nano multilayer coating.

Code No. S618X-Dc / S618TX-Dc / S618ATX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	S618X UMG AITiXN <55HRC	S618TX UMG AITiSiN <62HRC	S618ATX SMG AITiSiN 48~68HRC
1	0.5R	2	50	4	●	●	●
1.5	0.75R	3	50	4	●	●	●
2	1R	4	50	4	●	●	●
2.5	1.25R	5	50	4	●	●	●
3A	1.5R	6	50	4	●	●	●
4A	2R	8	50	4	●	●	●
3B	1.5R	6	50	3	●	●	●
3	1.5R	6	50	6	●	●	●
4	2R	8	50	6	●	●	●
5	2.5R	10	50	6	●	●	●
6	3R	12	50	6	●	●	●
8	4R	14	60	8	●	●	●
10	5R	18	75	10	●	●	●
12	6R	22	75	12	●	●	●
16	8R	30	100	16	●	●	●
20	10R	38	100	20	●	●	●

Ball Nose End Mills

S620X		S620TX / S620ATX											
Tool Material/ Coating Type	UMG/SMG Carbide	AITiXN AITiSiN								Type of Operation			
Specification													
Work Materials (◎ The most recommended / ○ recommended)													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC									
S620X	◎	◎	◎										
S620TX	◎	◎	◎	○									
S620ATX		◎	◎	◎									

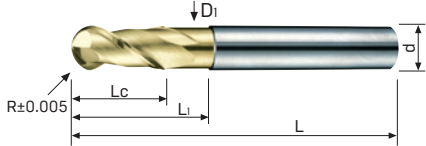
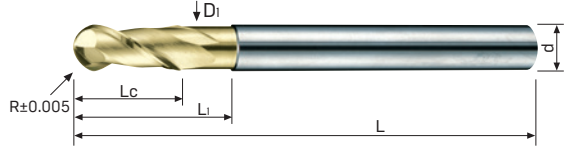





※ Feature of product

- S620X、S620TX、S620ATX Long Length Ball Nose End Mills- 2 Flutes
- Strong ball nose end mills with short helix groove is suitable to machine on various material.
- S shape geometry designed is very rigid for continuous cutting.
- S620TX、S620ATX ball nose with a small edge cutting land can improve tool life and surface finishing.
- Good wear resistance and lubrication with Nano multilayer coating.

Code No. S620X-Dc / S620TX-Dc / S620ATX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	S620X UMG AITiXN <55HRC	S620TX UMG AITiSiN <62HRC	S620ATX SMG AITiSiN 48~68HRC
3A	1.5R	6	70	4	●	●	●
4A	2R	8	70	4	●	●	●
3	1.5R	6	70	6	●	●	●
4	2R	8	70	6	●	●	●
5	2.5R	10	80	6	●	●	●
6	3R	12	80	6	●	●	●
8	4R	14	100	8	●	●	●
10	5R	18	100	10	●	●	●
12	6R	22	110	12	●	●	●
16	8R	30	140	16	●	●	●
20	10R	38	160	20	●	●	●

Ball Nose End Mills For Aluminium

S618ZX		S620ZX										
												
Tool Material/ Coating Type	UMG Carbide	ZrN	Type of Operation 									
Specification	 40°  2  N  U											
Work Materials (◎ The most recommended / ○ recommended)												
Carbon Steel	Tool Steel	Pre-hardend Steel		Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel				Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC								
S618ZX						◎						
S620ZX						◎						

※ **Feature of product**

S618ZX、S620ZX - Round Groove End Mills for Aluminium

40° helix with round cutting edge and mirror sharp grinding on side cutting edge.

Various applications on Aluminium for curved profile milling.

Adopting with ZrN coating which is excluded AlTi formula would prevent from chemical affinity with Alu metal and to have better surface hardness, smoothness and reduce friction rates to enhance tool life.

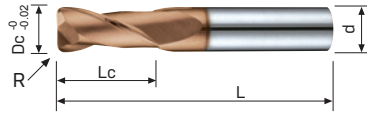
Code No. S618ZX-Dc / S620ZX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d mm	L1 mm	D1 h5	S618ZX UMG ZrN	S620ZX UMG ZrN
1	0.5R	2	50	4	3	0.9	●	
2	1R	4	50	4	6	1.9	●	
3	1.5R	6	57	6	9	2.8	●	
4	2R	8	57	6	12	3.7	●	
5	2.5R	10	57	6	15	4.6	●	
6	3R	12	57	6	20	5.5	●	
8	4R	16	63	8	26	7.4	●	
10	5R	20	72	10	31	9.2	●	
12	6R	24	83	12	37	11	●	
3	1.5R	6	70	6	9	2.8		●
4	2R	8	70	6	12	3.7		●
5	2.5R	10	80	6	15	4.6		●
6	3R	12	80	6	20	5.5		●
8	4R	16	100	8	26	7.4		●
10	5R	20	100	10	31	9.2		●
12	6R	24	110	12	37	11		●

B265TX

End Mills With Corner Radius

B265TX



Tool Material/ Coating Type	UMG Carbide	AlTiSiN					Type of Operation						
Specification	30°	2	N	R									
Work Materials [◎ The most recommended/ ○ recommended]													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC									
	◎	◎	◎	○									

※ Feature of product

- B265TX Standard Length End Mills with Corner Radius- 2 Flutes.
- Roughing and finishing applications on contour and profile machining.
- Low rake angle with AlTiSiN coating which has excellent wear resistance.
- It is able to machine pre-hardened and hardened steel up to HRC62.

Code No. B265TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B265TX UMG AlTiSiN
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●

End Mills With Corner Radius

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B265TX UMG AlTiSiN
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R1.5	22	72	10	●
10	R2	22	72	10	●
10	R3	22	72	10	●
12	R0.2	26	75	12	●
12	R0.3	26	75	12	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R1.5	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●

End Mills With Corner Radius

B267TX



Tool Material/ Coating Type	UMG Carbide	AlTiSiN					Type of Operation							
Specification	30°	2	N	R										
Work Materials [◎ The most recommended / ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
	◎	◎	◎	○										

※ Feature of product

B267TX Long Length End Mills with Corner Radius- 2 Flutes.
 Roughing and finishing applications on contour and profile machining.
 Low rake angle with AlTiSiN coating which has excellent wear resistance.
 It is able to machine pre-hardened and hardened steel up to HRC62.

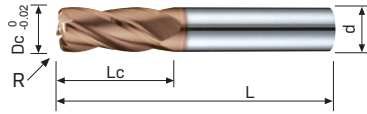
Code No. B267TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B267TX UMG AlTiSiN
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1.0	15	60	4	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●

End Mills With Corner Radius

D_c 0 -0.02	R ±0.01	L _c mm	L mm	d h6	B267TX UMG AlTiSiN
8	R1.5	25	100	8	●
8	R2	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	100	12	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●

B266TX



Tool Material/ Coating Type	UMG Carbide	AlTiSiN					Type of Operation					
Specification												
Work Materials [◎ The most recommended/ ○ recommended]												
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials	
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium
	~30HRC	~48HRC	~56HRC	~68HRC								
	◎	◎	◎	○								

※ Feature of product

- B266TX Standard Length End Mills with Corner Radius- 4 Flutes.
- Roughing and finishing applications on contour and profile machining.
- Low rake angle and a small edge cutting land with AlTiSiN coating which has excellent wear resistance.
- Excellent surface finishing on profile contour machining, able to cut pre-hardened and hardened steel up to HRC62.

Code No. B266TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B266TX UMG AlTiSiN
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●

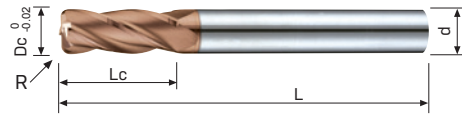
End Mills With Corner Radius

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B266TX UMG AlTiSiN
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	25	75	10	●
10	R0.3	25	75	10	●
10	R0.5	25	75	10	●
10	R1	25	75	10	●
10	R1.5	25	75	10	●
10	R2	25	75	10	●
10	R3	25	75	10	●
12	R0.2	30	75	12	●
12	R0.3	30	75	12	●
12	R0.5	30	75	12	●
12	R1	30	75	12	●
12	R1.5	30	75	12	●
12	R2	30	75	12	●
12	R3	30	75	12	●

B268TX

End Mills With Corner Radius

B268TX



Tool Material/ Coating Type	UMG Carbide	AlTiSiN					Type of Operation							
Specification	35°	4	71°30'	R										
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
	◎	◎	◎	○										

※ Feature of product

- B268TX Long Length End Mills with Corner Radius- 4 Flutes.
- Roughing and finishing applications on contour and profile machining.
- Low rake angle and a small edge cutting land with AlTiSiN coating which has excellent wear resistance.
- Excellent surface finishing on profile contour machining, able to cut pre-hardened and hardened steel up to HRC62.

Code No. B268TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B268TX UMG AlTiSiN
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1	15	60	4	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●

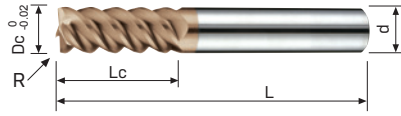
End Mills With Corner Radius

D_c 0 -0.02	R ± 0.01	Lc mm	L mm	d h6	B268TX UMG AlTiSiN
8	R1.5	25	100	8	●
8	R2	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	110	10	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●

B276ATX

High Performance End Mills With Corner Radius

B276ATX



Tool Material/ Coating Type	SMG Carbide	AlTiSiN					Type of Operation							
Specification	55°	4	N	$\gamma-10^\circ$	R									
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
		◎	◎	◎										

※ Feature of product

- B276ATX Standard Length End Mills with Corner Radius- 4 Flutes.
- Finishing application for high-hardness contour and profile machining.
- Negative rake angle and a small edge cutting land with AlTiSiN coating which has excellent wear resistance.
- Excellent surface finishing on profile contour machining, able to cut pre-hardened and hardened steel up to HRC70.

Code No. B276ATX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B276ATX SMG AlTiSiN
3	R0.2	8	50	6	●
3	R0.5	8	50	6	●
4	R0.2	11	50	6	●
4	R0.5	11	50	6	●
5	R0.2	13	50	6	●
5	R0.5	13	50	6	●
6	R0.2	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
8	R0.2	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R2	20	60	8	●
10	R0.2	25	75	10	●
10	R0.5	25	75	10	●
10	R1	25	75	10	●

High Performance End Mills With Corner Radius

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B276ATX SMG AlTiSiN
10	R2	25	75	10	●
12	R0.2	30	75	12	●
12	R0.5	30	75	12	●
12	R1	30	75	12	●
12	R2	30	75	12	●
16	R0.5	40	100	16	●
16	R1	40	100	16	●
16	R2	40	100	16	●
16	R3	40	100	16	●
20	R0.5	40	100	20	●
20	R1	40	100	20	●
20	R2	40	100	20	●
20	R3	40	100	20	●

B278ATX

High Performance End Mills With Corner Radius

B278ATX



Tool Material/ Coating Type	SMG Carbide	AlTiSiN					Type of Operation							
Specification	55°	4	N γ-10°	R										
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
		◎	◎	◎										

※ Feature of product

B278ATX Long Length End Mills with Corner Radius- 4 Flutes

Finishing application for high-hardness contour and profile machining.

Negative rake angle and a small edge cutting land with AlTiSiN coating which has excellent wear resistance.

Excellent surface finishing on profile contour machining, able to cut pre-hardened and hardened steel up to HRC70.

Code No. B278ATX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	B278ATX SMG AlTiSiN
6	R0.2	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
8	R0.2	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●
8	R2	25	100	8	●
10	R0.2	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R2	30	100	10	●
12	R0.2	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R2	40	110	12	●
16	R0.5	50	140	16	●
16	R1	50	140	16	●
16	R2	50	140	16	●
16	R3	50	140	16	●
20	R0.5	60	160	20	●
20	R1	60	160	20	●
20	R2	60	160	20	●
20	R3	60	160	20	●

NC Spot Drills 90° / 120°

S290X1

S291X1

Tool Material/ Coating Type	MG Carbide	AlTiXN					Type of Operation							
Specification	D	2	90°	120°										
被切削材料應用表 (◎最適用 / ○適用)														
碳鋼	工具鋼	預硬鋼			不鏽鋼	鑄鐵	非鐵金屬					航太材料		
合金鋼	預硬鋼	硬化鋼					鋁	銅	塑膠	複合材料	石墨	鈦合金	鎳	耐熱鋼
	~30HRC	~48HRC	~56HRC	~68HRC										
S290X1	◎	◎			○	◎	◎				○	○	○	
S291X1	◎	◎			○	◎	◎				○	○	○	

※ **Feature of product**

S290X1 - NC Spot Drills 90°

It can be widely applied on various steels for positioning and 45° chamfering before drilling.

Good wear resistance and lubrication with Nano multilayer coating.

S291X1 - NC Spot Drills 120°

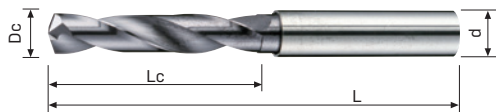
It can be widely applied on various steels for positioning and 30° chamfering before drilling.





Good wear resistance and lubrication with Nano multilayer coating.

Code No. S290X1-Dc / S291X1-Dc

Dc h6	Lc mm	L mm	d h6	S290X1 90°	S291X1 120°
3	10	38	3	●	●
4	12	50	4	●	●
5	15	50	5	●	●
6	20	50	6	●	●
8	25	60	8	●	●
10	25	75	10	●	●
12	30	75	12	●	●

S292X1-2



Tool Material/ Coating Type	MG Carbide	AITiXN			Type of Operation									
Specification														
Work Materials (◎ The most recommended / ○ recommended)														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
	◎	◎			○	◎					○	○	○	

※ Feature of product

S292X1-2 - 2XD High Performance Drills.

With new groove shape and combine with different curvature design of R value obtain higher cutting ability and keep stability while drilling.

It can be widely applied on drilling for different steels.

With AITiSiN coating has excellent wear resistance and lubrication.

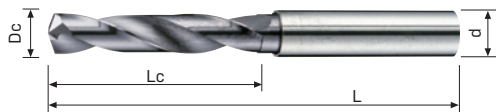
Code No. S292TX-2-Dc

Dc m7	Lc mm	L mm	d h6	S292X1-2 MG AITiXN
2	8	50	4	●
2.1	10	50	4	●
2.2	10	50	4	●
2.3	10	50	4	●
2.4	10	50	4	●
2.5	10	50	4	●
2.6	12	50	4	●
2.7	12	50	4	●
2.8	12	50	4	●
2.9	12	50	4	●
3	12	50	4	●
3.1	15	50	4	●
3.2	15	50	4	●
3.3	15	50	4	●
3.4	15	50	4	●
3.5	15	50	4	●
3.6	15	50	4	●
3.7	15	50	4	●
3.8	15	50	4	●
3.9	15	50	4	●
4	15	50	4	●
4.1	18	50	6	●
4.2	18	50	6	●
4.3	18	50	6	●
4.4	18	50	6	●
4.5	18	50	6	●

High Performance Drills

Dc m7	Lc mm	L mm	d h6	S292X1-2 MG AITiXN
4.6	18	50	6	●
4.7	18	50	6	●
4.8	18	50	6	●
4.9	18	50	6	●
5	18	50	6	●
5.1	20	50	6	●
5.2	20	50	6	●
5.3	20	50	6	●
5.4	20	50	6	●
5.5	20	50	6	●
5.6	20	50	6	●
5.7	20	50	6	●
5.8	20	50	6	●
5.9	20	50	6	●
6	20	50	6	●
6.1	25	60	8	●
6.2	25	60	8	●
6.3	25	60	8	●
6.4	25	60	8	●
6.5	25	60	8	●
6.6	25	60	8	●
6.7	25	60	8	●
6.8	25	60	8	●
6.9	25	60	8	●
7	25	60	8	●
7.1	28	60	8	●
7.2	28	60	8	●
7.3	28	60	8	●
7.4	28	60	8	●
7.5	28	60	8	●
7.6	28	60	8	●
7.7	28	60	8	●
7.8	28	60	8	●
7.9	28	60	8	●
8	28	60	8	●
8.1	32	75	10	●
8.2	32	75	10	●
8.3	32	75	10	●
8.4	32	75	10	●
8.5	32	75	10	●
8.6	32	75	10	●
8.7	32	75	10	●
8.8	32	75	10	●
8.9	32	75	10	●
9	32	75	10	●
9.1	35	75	10	●
9.2	35	75	10	●
9.3	35	75	10	●
9.4	35	75	10	●
9.5	35	75	10	●
9.6	35	75	10	●
9.7	35	75	10	●
9.8	35	75	10	●
9.9	35	75	10	●
10	35	75	10	●
10.2	38	75	12	●
10.5	38	75	12	●
10.8	38	75	12	●
11	38	75	12	●
11.5	40	75	12	●
12	40	75	12	●

S292X1-3



Tool Material/ Coating Type	MG Carbide	AITiXN					Type of Operation							
Specification			DIN 6537K											
Work Materials (◎ The most recommended / ○ recommended)														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
	◎	◎			○	◎					○	○	○	

※ Feature of product

S292X1-3 - 3XD Oil-Feed High Performance Drills

With new groove shape and combine with different curvature design of R value obtain higher cutting ability and keep stability while drilling.

It can be widely applied on drilling for different steels.

With AITiSiN coating has excellent wear resistance and lubrication.

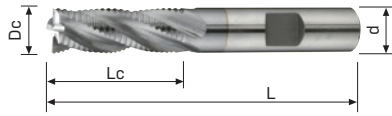
Code No. S292X1-3-Dc

Dc m7	Lc mm	L mm	d h6	S292X1-3 MG AITiXN
3	20	62	6	●
3.1	20	62	6	●
3.2	20	62	6	●
3.3	20	62	6	●
3.4	20	62	6	●
3.5	20	62	6	●
3.6	20	62	6	●
3.7	20	62	6	●
3.8	24	66	6	●
3.9	24	66	6	●
4	24	66	6	●
4.1	24	66	6	●
4.2	24	66	6	●
4.3	24	66	6	●
4.4	24	66	6	●
4.5	24	66	6	●
4.6	24	66	6	●
4.7	24	66	6	●
4.8	28	66	6	●
4.9	28	66	6	●
5	28	66	6	●
5.1	28	66	6	●

High Performance Drills

Dc m7	Lc mm	L mm	d h6	S292XI-3 MG AITiXN
5.2	28	66	6	●
5.3	28	66	6	●
5.4	28	66	6	●
5.5	28	66	6	●
5.6	28	66	6	●
5.7	28	66	6	●
5.8	28	66	6	●
5.9	28	66	6	●
6	28	66	6	●
6.1	34	79	8	●
6.2	34	79	8	●
6.3	34	79	8	●
6.4	34	79	8	●
6.5	34	79	8	●
6.6	34	79	8	●
6.7	34	79	8	●
6.8	34	79	8	●
6.9	34	79	8	●
7	34	79	8	●
7.1	41	79	8	●
7.2	41	79	8	●
7.3	41	79	8	●
7.4	41	79	8	●
7.5	41	79	8	●
7.6	41	79	8	●
7.7	41	79	8	●
7.8	41	79	8	●
7.9	41	79	8	●
8	41	79	8	●
8.1	47	89	10	●
8.2	47	89	10	●
8.3	47	89	10	●
8.4	47	89	10	●
8.5	47	89	10	●
8.6	47	89	10	●
8.7	47	89	10	●
8.8	47	89	10	●
8.9	47	89	10	●
9	47	89	10	●
9.1	47	89	10	●
9.2	47	89	10	●
9.3	47	89	10	●
9.4	47	89	10	●
9.5	47	89	10	●
9.6	47	89	10	●
9.7	47	89	10	●
9.8	47	89	10	●
9.9	47	89	10	●
10	47	89	10	●
10.2	55	102	12	●
10.5	55	102	12	●
10.8	55	102	12	●
11	55	102	12	●
11.5	55	102	12	●
12	55	102	12	●

S336 / S336C



Tool Material/ Coating Type	M42 HSS-CO	Bright TiCN					Type of Operation							
Specification	30°	4-6	HR											
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
S336	◎				○	◎	◎	○						
S336C	◎				○	◎	○	○						

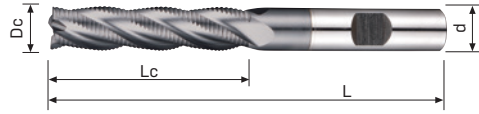
※ Feature of product

S336、S336C Standard Length HSS Fine Pitch End Mills for Roughing- 4 Flutes.
General roughing for hard materials.

Code No. S336-Dc / S336C-Dc

Dc K12	Lc mm	L mm	d h6	S336 M42 Bright	S336C M42 TiCN
6	15	60	6	●	●
8	20	65	8	●	●
10	25	75	10	●	●
12	30	80	12	●	●
14	35	90	12	●	●
16	40	95	16	●	●
18	40	105	16	●	●
20	45	110	20	●	●
22	45	110	20	●	●
25	50	120	25	●	●
30	55	140	32	●	●
32	60	145	32	●	●

S337 / S337C



Tool Material/ Coating Type	M42 HSS-CO	Bright TiCN					Type of Operation							
Specification	30°	4-6	HR											
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
S337	◎				○	◎	◎	○						
S337C	◎				○	◎	○	○						

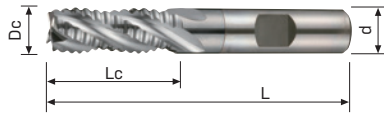
※ Feature of product

S337、S337C Long Length HSS Fine Pitch End Mills for Roughing- 4 Flutes.
General roughing for hard materials.

Code No. S337-Dc / S337C-Dc

Dc K12	Lc mm	L mm	d h6	S337 M42 Bright	S337C M42 TiCN
10	45	100	10	●	●
12	53	110	12	●	●
14	53	110	12	●	●
16	63	125	16	●	●
18	63	125	16	●	●
20	75	140	20	●	●
25	90	160	25	●	●
32	106	180	32	●	●

S334 / S334C



Tool Material/ Coating Type	M42 HSS-CO	Bright TiCN					Type of Operation							
Specification	30°	4-6	NR											
Work Materials [◎ The most recommended/ ○ recommended]														
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals					Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel	Heat-resistant Steel
	~30HRC	~48HRC	~56HRC	~68HRC										
S334	◎				○	◎	◎	○						
S334C	◎				○	◎	○	○						

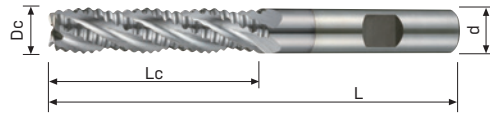
※ Feature of product

S334、S334C Standard Length HSS Coarse Pitch End Mills for Roughing- 4 flutes.
General roughing for general soft materials.

Code No. S334-Dc / S334C-Dc

Dc K12	Lc mm	L mm	d h6	S334 M42 Bright	S334C M42 TiCN
6	15	60	6	●	●
8	20	65	8	●	●
10	25	75	10	●	●
12	30	80	12	●	●
14	35	90	12	●	●
16	40	95	16	●	●
18	40	105	16	●	●
20	45	110	20	●	●
22	45	110	20	●	●
25	50	120	25	●	●
30	55	140	32	●	●
32	60	145	32	●	●

S335 / S335C



Tool Material/ Coating Type	M42 HSS-CO		Bright TiCN		Type of Operation								
Specification	30°	4-6	NR										
Work Materials [◎ The most recommended/ ○ recommended]													
Carbon Steel	Tool Steel	Pre-hardend Steel			Stainless Steel	Cast Steel	Nonferrous Metals				Aerospace Materials		
Alloy Steel	Pre-hardend Steel	Hardened Steel					Aluminium	Copper	Plastics	Composite Material	Graphite	Titanium	Nickel
	~30HRC	~48HRC	~56HRC	~68HRC									
S335	◎				○	◎	◎	○					
S335C	◎				○	◎	○	○					

※ Feature of product

S335 \ S335C Long Length HSS Coarse Pitch End Mills for Roughing- 4 Flutes.
General roughing for general soft materials.

Code No. S335-Dc / S335C-Dc

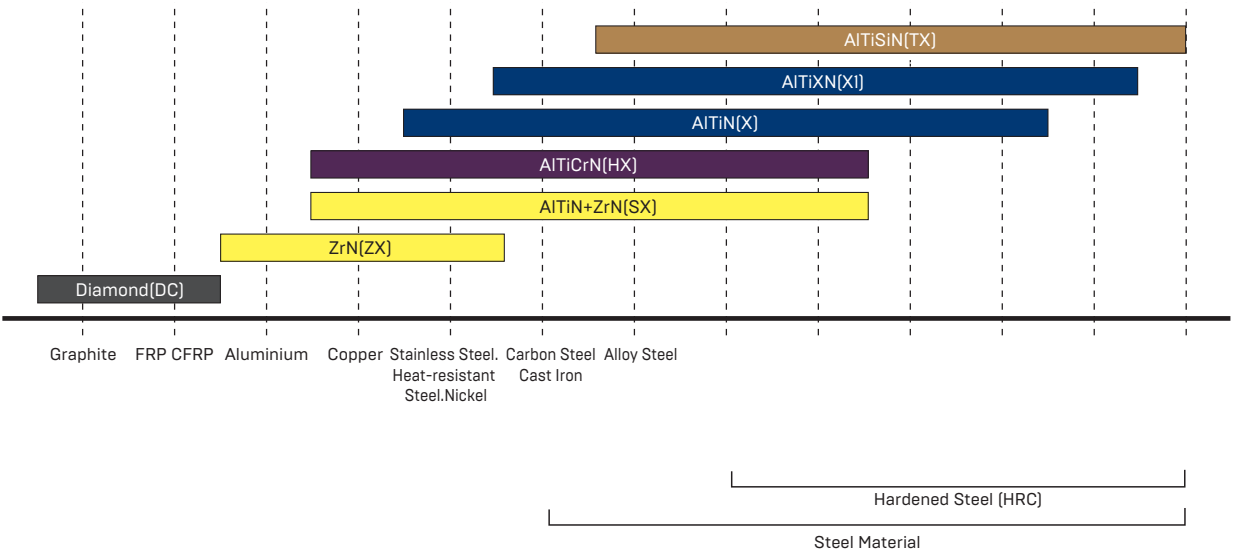
Dc K12	Lc mm	L mm	d h6	S335 M42 Bright	S335C M42 TiCN
10	45	100	10	●	●
12	53	110	12	●	●
14	53	110	12	●	●
16	63	125	16	●	●
18	63	125	16	●	●
20	75	140	20	●	●
25	90	160	25	●	●
32	106	180	32	●	●

Features of Coating

Type	Color	[HV] Hardness	(μm) Thickness	Coefficient of Friction	[$^{\circ}\text{C}$] Heat resistance	Cutting Tools Material	Application
AlTiSiN [TX]	Tan	4300	1~3	0.3	1200	Solid Carbide	Hardened steel HRC<70
AlTiN [X] AlTiXN [XI]	Blue black	4000	1~3	0.6	900	Solid Carbide	Carbon steel, Alloyed steel, Hardened steel, Cast iron HRC<60
AlTiN+ZrN [SX]	Yellow brown	3800	1~4	0.4	800	Solid Carbide	Carbon steel, Alloyed steel, Stainless steel, Cast iron HRC<48
AlTiCrN [HX]	Purple black	3800	1~4	0.25	800	Solid Carbide	Carbon steel, Alloyed steel, Stainless steel, Cast iron HRC<48
ZrN [ZX]	Yellow brown	2800	1~4	0.5	550	Solid Carbide	Aluminium, Copper, Stainless steel, Titanium, Hard-cut material
Diamond [DC]	Black	9000	6~13	0.15	600	Solid Carbide	Graphite
TiN [N]	Golden	2400	1~7	0.35	600	HSS	General steel, Wear parts
TiCN [C]	Blue gray	2800	1~4	0.2	400	HSS	General steel, Wear parts

Usage of each coating for Milling Steel

Cutting Tools Material: Solid Carbide



ISO Tolerance measure table (µm)

φ mm	<3	3-6	6-10	10-18	18-30	30-50	50-65	65-80
e7	- 14 - 24	- 20 - 32	- 25 - 40	- 32 - 50	- 40 - 61	- 50 - 75	- 60 - 90	- 60 - 90
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89	- 60 - 106	- 60 - 106
e9	- 14 - 39	- 20 - 50	- 25 - 61	- 32 - 75	- 40 - 92	- 50 - 112	- 60 - 134	- 60 - 134
h5	0 - 4	0 - 5	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 13
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16	0 - 19	0 - 19
h7	0 - 10	0 - 12	0 - 15	0 - 18	0 - 21	0 - 25	0 - 30	0 - 30
h8	0 - 14	0 - 18	0 - 22	0 - 27	0 - 33	0 - 39	0 - 46	0 - 46
h9	0 - 25	0 - 30	0 - 36	0 - 43	0 - 52	0 - 62	0 - 74	0 - 74
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84	0 - 100	0 - 120	0 - 120
h11	0 - 60	0 - 75	0 - 90	0 - 110	0 - 130	0 - 160	0 - 190	0 - 190
h16	0 - 600	0 - 750	0 - 900	0 - 1100	0 - 1300	0 - 1600	0 - 1900	0 - 1900
js14	+ 125 - 125	+ 150 - 150	+ 180 - 180	+ 215 - 215	+ 260 - 260	+ 310 - 310	+ 370 - 370	+ 370 - 370
js16	+ 300 - 300	+ 375 - 375	+ 450 - 450	+ 550 - 550	+ 650 - 650	+ 800 - 800	+ 950 - 950	+ 950 - 950
k11	+ 60 0	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0	+ 190 0	+ 190 0
k12	+ 100 0	+ 120 0	+ 150 0	+ 180 0	+ 210 0	+ 250 0	+ 300 0	+ 300 0
m6	+ 8 + 2	+ 12 + 4	+ 15 + 6	+ 18 + 7	+ 21 + 8	+ 25 + 9	+ 30 + 11	+ 30 + 11
m7	+ 12 + 2	+ 16 + 4	+ 21 + 6	+ 25 + 7	+ 29 + 8	+ 34 + 9	+ 41 + 11	+ 41 + 11
z9	+ 51 + 26	+ 65 + 35	+ 78 + 42	+ 103 + 60	+ 140 + 88	+ 198 + 136	+ 246 + 172	+ 284 + 210
H5	+ 4 0	+ 5 0	+ 6 0	+ 8 0	+ 9 0	+ 11 0	+ 13 0	+ 13 0
H6	+ 6 0	+ 8 0	+ 9 0	+ 11 0	+ 13 0	+ 16 0	+ 19 0	+ 19 0
H7	+ 10 0	+ 12 0	+ 15 0	+ 18 0	+ 21 0	+ 25 0	+ 30 0	+ 30 0
H8	+ 14 0	+ 18 0	+ 22 0	+ 27 0	+ 33 0	+ 39 0	+ 46 0	+ 46 0
H9	+ 25 0	+ 30 0	+ 36 0	+ 43 0	+ 52 0	+ 62 0	+ 74 0	+ 74 0
H10	+ 40 0	+ 48 0	+ 58 0	+ 70 0	+ 84 0	+ 100 0	+ 120 0	+ 120 0
H11	+ 60 0	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0	+ 190 0	+ 190 0
P6	- 6 - 12	- 9 - 17	- 12 - 21	- 15 - 26	- 18 - 31	- 21 - 37	- 26 - 45	- 26 - 45
P7	- 6 - 16	- 8 - 20	- 9 - 24	- 11 - 29	- 14 - 35	- 17 - 42	- 21 - 51	- 21 - 51
P9	- 6 - 31	- 12 - 42	- 15 - 51	- 18 - 61	- 22 - 74	- 26 - 88	- 32 - 106	- 32 - 106

High Performance

Finishing

Mold & Die

Drill

HSS

Technical Data

