



Flat

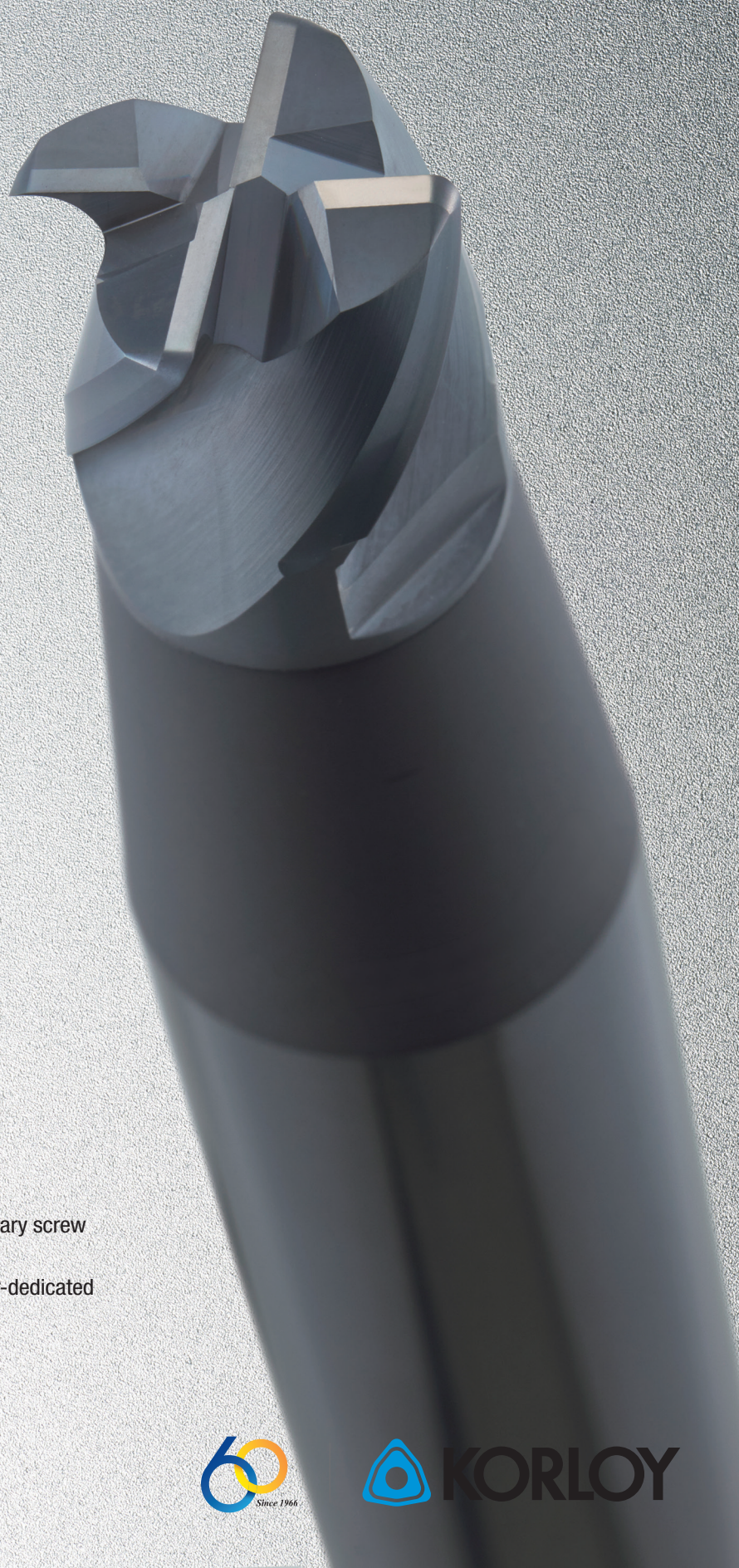


Radius

SQM Endmill

Super Quickfix Modular Endmill

- High-precision and strong fastening due to a proprietary screw fastening design
- Excellent performance achieved by applying modular-dedicated shape and material



Super Quickfix Modular Endmill

SQM Endmill

KORLOY has launched the next-generation modular system, the 'SQM Endmill,' designed to enhance efficiency and cost-effectiveness.

The **SQM Endmill (Super Quickfix Modular Endmill)** features a proprietary fastening structure that makes inventory management easier and more economical than traditional solid tools while delivering equal productivity. Notably, only the head needs to be replaced during tool changes, significantly reducing setup time.

With a variety of head shapes and holder combinations, it enables a wide range of machining applications. Its unique screw structure and dual guide surfaces ensure strong fastening and precise centering machining, maximizing deflection prevention. Additionally, the dual contact surfaces provide fastening stability and repeatable precision, resulting in consistent machining performance.

By integrating KORLOY's exclusive chip breaker design technology, the modular tool's common drawbacks such as vibration and initial chipping are minimized. The positive rake angle and unequal division geometry reduce cutting resistance and vibration, improving machining stability and tool life. Through shape-specific characteristics and customized design for different workpiece materials, tool changes are minimized and operational efficiency is maximized, delivering outstanding productivity.

» Maximized production efficiency

- rapid tool changes and minimizes equipment setup time

» Strong and precise clamping

- proprietary screw fastening structure delivers robust and accurate attachment
- achieving precision centering and preventing structural reinforcement by the application of dual guide surfaces

» Available various customized shapes

- flat, radius, ball, gooseneck, and chamfer types

» High productivity and excellent cost-effectiveness

- Outstanding productivity through optimized chip breaker design
- Enhances inventory management efficiency and minimizes maintenance costs

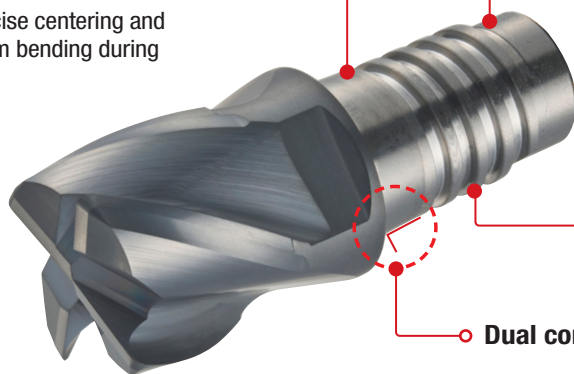


✓ Features of proprietary screw fastening structure

- High-precision and strong fastening, maintains fastening repeatability and accuracy
- Dual guide surfaces ensures precise centering and prevents from machining deflection
- Dual contact surfaces maximize fastening stability and repeatability

Dual guide surfaces

- Ensures precise centering and prevents from bending during machining



Exclusive screw clamping structure

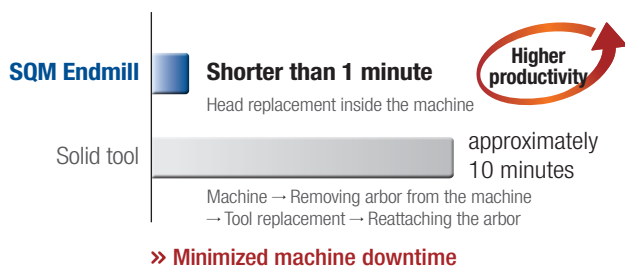
- High-precision and strong fastening

Dual contact surfaces

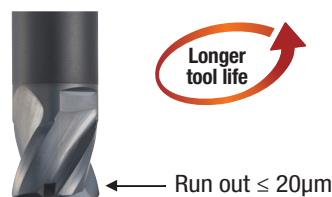
- Dual contact surfaces contact in both the Z-axis and radial directions, ensuring fastening stability and maintaining repeatability through high-precision, strong fastening



Reduces setup time due to fast and easy head replacement

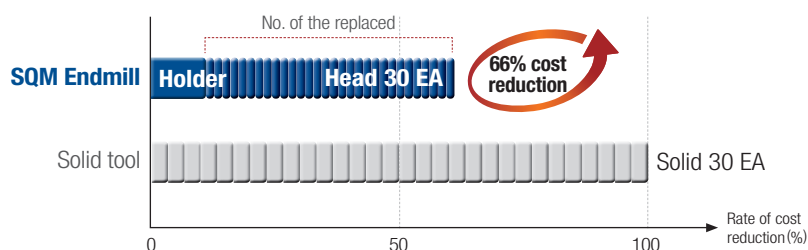


Ensures stable machining quality and consistent fastening integrity



» **stable machining quality and consistent fastening integrity**

Cost savings on tools



* Based on replacing 30 heads and solids

» **superior price competitiveness by allowing replacement of only worn heads**

✓ Code system

Head

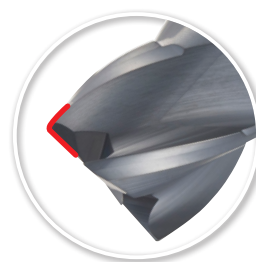
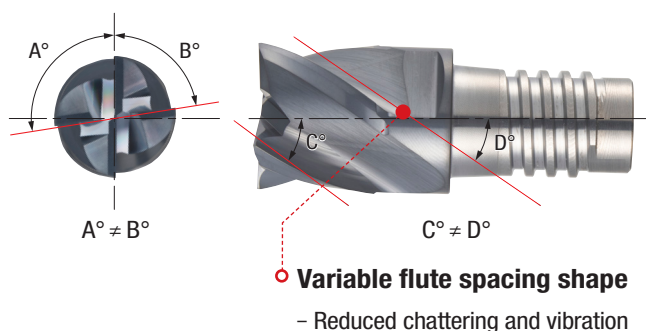
RE	4	160	(R05)	V012	-	SM16	(- □)
Type FE: Flat Endmill RE: Radius Endmill	No. of flute 4: 4flutes	Tool diameter 160: Ø16mm	Corner R R05: 0.5mm	Flute length V012: 12mm		Applicable modular system SM16: Super Quickfix Modular 16	Applicable workpiece material X: General N: Non-ferrous H: Hardened S: Heat-resistant

Holder

SM16	-	16	SS	N16	L110	S
Applicable modular system SM16: Super Quickfix Modular 16		Shank diameter 16: Ø16mm	Holder type SS: Straight Shank TS: Tapered Shank	Neck length 16: 16mm	Overall length 110: 110mm	Holder material S: Steel C: Carbide

✓ Features

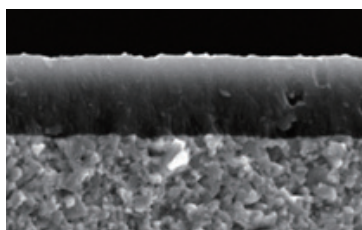
FE4000(Flat) / RE4000(Radius)-SM□□



- Applied strong cutting edge
 - Controls chipping and chattering
- Applied radius positive corner rake angle
 - Reduces cutting load

✓ Grade features

UE coating (Ultra Endurable coating)



- Enhanced chip control and welding resistance by exclusive lubrication coating technology
- High chipping resistance substrate

[UE coating application range]

◎: Excellent ○: Good

Workpiece	P					K	M	S	H	N
	Carbon steel	Alloy steel	Pre-hardened steel	Hardened steel		Cast iron	Stainless steel	HRSA	High hardened alloy	Non-ferrous
	Below HB225	HB225 ~325	HRC30 ~40	HRC40 ~45	HRC45 ~55	-	-	Inconel718, Waspaloy, Hastelloy	Ti, Ti Alloy	Copper, AL, Graphite, Acryl, CFRP
UE coating	○	◎	◎			○	◎			

Line-up

[Head]

Type	Designation	Grade	Picture	Product name	Tool diameter	Tool diameter (Ø)		page
						Min.	Max.	
Flat	FE□□□V□□□-SM□□	UE1		4-flute flat modular Endmil	4	10	25	8
Radius	RE□□□R□□□V□□□-SM□□	UE1		4-flute radius modular Endmill	4	10	25	8

※ Special orders are available for ball, gooseneck, and chamfer endmills. (Please refer to the Special Order Form on page 11.)

[Holder]

Type	Designation	Material	Picture	page
Cylinder-shaped	SM-SS / SM-SSC	Steel/ Carbide		9,10
High rigidity cylinder-shaped	SM-SS	Steel		9
Tapered cylinder-shaped	SM-TS	Steel		10

Method for Head Fastening and Replacement



① Blow off with air, then remove any foreign substances using a clean cloth. Pay special attention to gap.



② After wearing gloves, partially fasten the tool, leaving a slight gap.



③ Use a wrench, slowly tighten until the head surface contacts the holder.



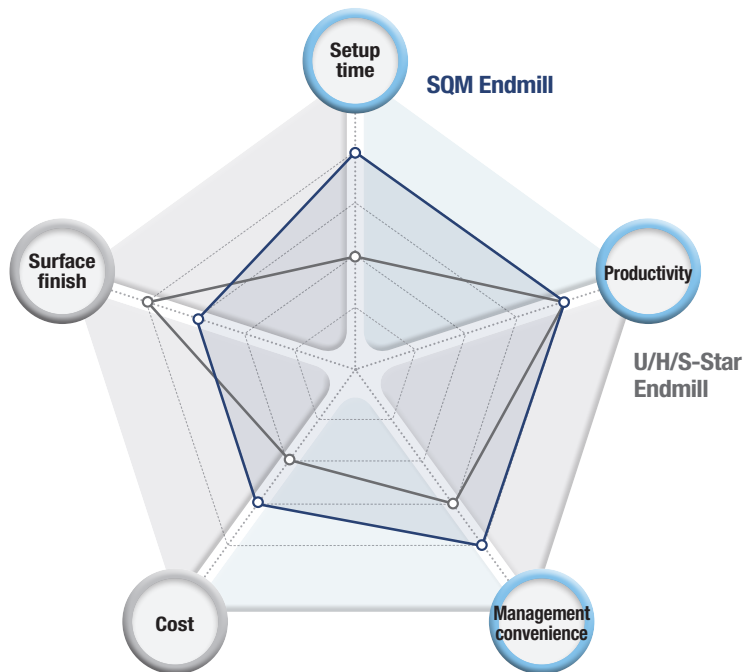
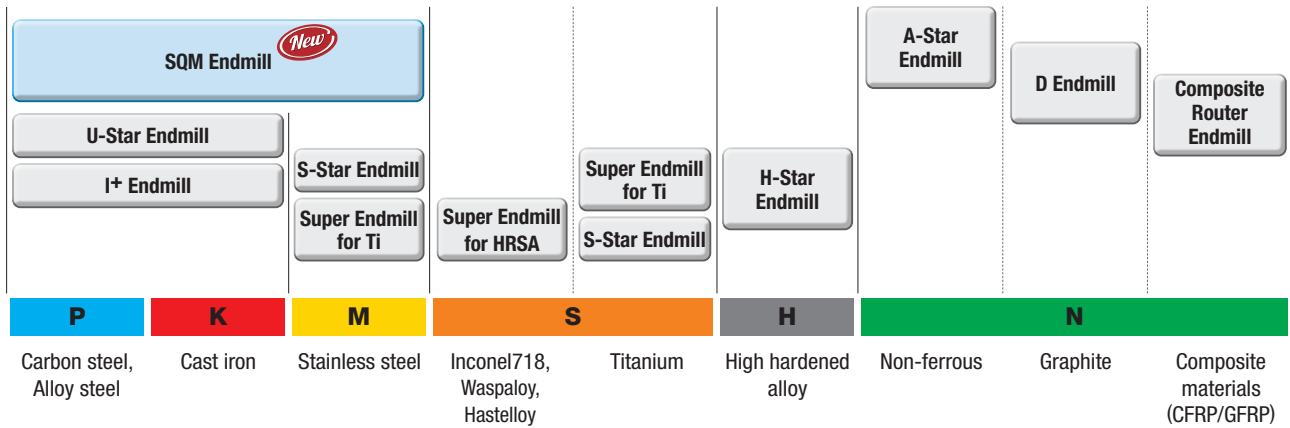
④ Once fastened tightly enough to eliminate any gaps, do not tighten further.

※ Never re-tighten or over-tighten. Excessive tightening may cause damage to the cutting head.
 ※ Do not apply lubricant to the connecting screw. Excessive fastening force could lead to breakage.

Precautions for Use

- As the SQM is a modular tool system with a connection interface, it is recommended to start from the manufacturer's recommended cutting conditions rather than directly applying high-load conditions used for solid endmills. Adjust conditions gradually while monitoring machining performance.
- Contamination on the connection interface or improper tightening torque may cause loosening, increase runout, or premature wear. Ensure the interface is clean and tighten to the specified torque when replacing the head.
- As overhang length increases, the load on the connection interface and the risk of vibration may also increase. Use the shortest and most rigid setup whenever possible, and apply conservative cutting depth and feed rates when necessary.
- In the event of overload or collision, microscopic damage may occur not only to the head but also to the holder interface. Even if no visible damage is found, inspect the connection interface carefully before reuse.

Tool selection guide



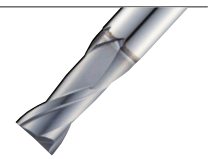
SQM Endmill *New*

- Enables rapid tool changes
- Supports efficient inventory management and reduces operating costs



U/H/S-Star Endmill

- Excellent productivity
- Suitable for high-precision machining



Tool	Setup time	Productivity	Management convenience	Cost	Surface finish
SQM Endmill <i>New</i>	★★★★★	★★★★★	★★★★★	★★★	★★★
U/H/S-Star Endmill	★★	★★★★	★★★	★★	★★★★★

✓ Recommended cutting conditions _ Flat/Radius

- The recommended conditions are based on a cylindrical holder with an overhang of L/D=3.
Please refer to the overhang (L/D) and holder-specific adjustment guide when changing the holder or overhang.

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm ²)	ap (mm)	ae (mm)	Machining	Cutting diameter	10	12	16	20	25
ISO	Workpiece material	KS	ISO (DIN)											
P	Carbon steel	SM20C SM40C SM45C	(C22) C40 C45	230	1500 ~ 1700	0.7D	0.06D	Shouldering 	vc	150	150	150	150	150
									fz	0.07	0.077	0.085	0.093	0.093
									rpm	4800	4000	3000	2400	1900
						0.5D	1D	Slotting 	feed	1340	1230	1020	890	710
									vc	90	90	90	90	90
									fz	0.056	0.062	0.068	0.075	0.075
	Alloy steel	SNCM220 SNCM430 SCM430 SCM440	20NiCrMo2 - - 42CrMo4	280	1700 ~ 1950	0.7D	0.06D	Shouldering 	rpm	2900	2400	1800	1400	1100
									feed	650	590	490	420	330
									vc	135	135	135	135	135
						0.5D	1D	Slotting 	fz	0.063	0.069	0.076	0.084	0.084
									rpm	4300	3600	2700	2100	1700
									feed	1080	1000	820	700	570
M	Pre-hardened steel	KP4 NAK80 KPS4 KPM2	- - 40CrMnNiMo8-6-4 40CrMnMo7	280	2200 ~ 2300	0.7D	0.06D	Shouldering 	vc	120	120	120	120	120
									fz	0.054	0.059	0.065	0.071	0.071
									rpm	3800	3200	2400	1900	1500
						0.5D	1D	Slotting 	feed	810	750	620	540	430
									vc	70	70	70	70	70
									fz	0.037	0.041	0.045	0.05	0.05
	Ferritic/ martensitic series	STS405 STS430 STS416 STS434	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1	200 330	1800 ~ 2850	0.7D	0.06D	Shouldering 	rpm	2500	2100	1600	1300	1000
									feed	500	470	390	350	270
									vc	120	120	120	120	120
		STS403 STS410	X12Cr13	330	2350	0.5D	1D	Slotting 	fz	0.059	0.065	0.071	0.078	0.078
									rpm	4100	3400	2600	2100	1700
									feed	970	880	740	660	530
K	Austenite series	STS303 STS304 STS316	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	200	2200 ~ 2450	0.7D	0.06D	Shouldering 	vc	80	80	80	80	80
									fz	0.047	0.052	0.057	0.063	0.063
									rpm	2500	2100	1600	1300	1000
						0.5D	1D	Slotting 	feed	470	440	360	330	250
									vc	100	100	100	100	100
									fz	0.045	0.05	0.054	0.06	0.06
	Cast iron	GC200 GCD500	200 EN-GJL-200 500-7 EN-GJS-800-7	180	800 ~ 900	0.7D	0.06D	Shouldering 	rpm	3200	2700	2000	1600	1300
									feed	580	530	440	380	310
									vc	60	60	60	60	60
						0.5D	1D	Slotting 	fz	0.036	0.04	0.044	0.048	0.048
									rpm	1900	1600	1200	1000	800
									feed	270	250	210	190	150

※ Stainless steel can be effectively machined using emulsion (water-soluble cutting fluid).

※ The above cutting conditions are based on ideal settings; please adjust them slightly according to your specific machining environment.

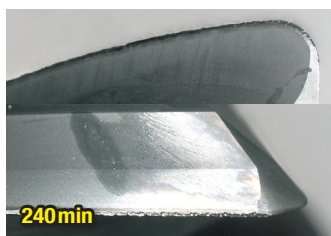
[Overhang (L/D) and holder-specific adjustment guide]

Holder type	Cylindrical Holder			High rigidity Cylindrical Holder			Taper Cylindrical Holder			Carbide holder		
L/D	Cutting speed (vc)	Feed (fz)	Cutting width (ae)	Cutting speed (vc)	Feed (fz)	Cutting width (ae)	Cutting speed (vc)	Feed (fz)	Cutting width (ae)	Cutting speed (vc)	Feed (fz)	Cutting width (ae)
2	100%	100%	100%	120%	120%	120%	-	-	-	-	-	-
3	100%	100%	100%	120%	120%	120%	-	-	-	-	-	-
4	80%	80%	70%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5	-	-	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
6	-	-	-	60%	80%	60%	80%	80%	70%	80%	80%	70%

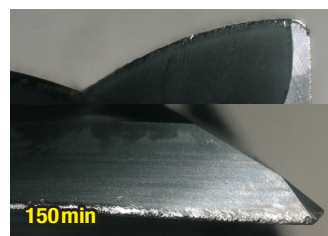
Performance evaluation

Wear resistance

Workpiece	Tool steel (KP4M, HRC30)	
Cutting condition	$vc(m/min) = 120$, $fz(mm/t) = 0.075$, $ap(mm) = 12$, $ae(mm) = 0.95$, Wet	
Tool	Head RE4160R10V015-SM16	Holder SM16-16SS16L110S



[SGM Endmill]

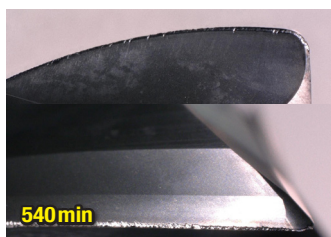


[Competitor]

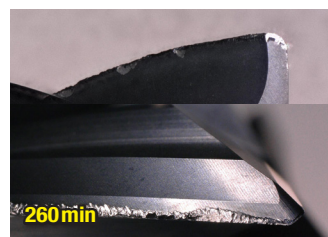
» 60% longer tool life compared to the competitor

Wear resistance

Workpiece	Carbon steel (SM45C, HRC200)	
Cutting condition	$vc(m/min) = 120$, $fz(mm/t) = 0.06$, $ap(mm) = 8$, $ae(mm) = 0.6$, Wet	
Tool	Head RE4120R05V009-SM12	Holder SM12-12SSN12L090S



[SGM Endmill]

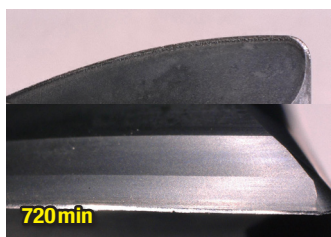


[Competitor]

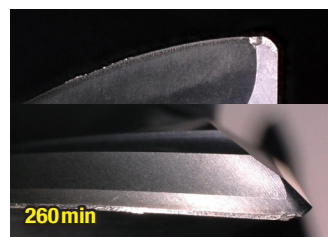
» 107% longer tool life compared to the competitor

Wear resistance

Workpiece	Stainless steel (STS304, HB200)	
Cutting condition	$vc(m/min) = 120$, $fz(mm/t) = 0.06$, $ap(mm) = 8$, $ae(mm) = 0.6$, Wet	
Tool	Head RE4120R05V009-SM12	Holder SM12-12SSN12L090S



[SGM Endmill]



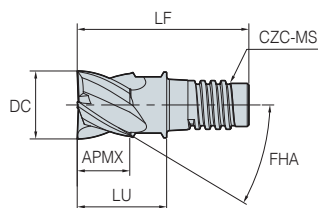
[Competitor]

» 277% longer tool life compared to the competitor

FE4000-SM(Flat)



DC	Tolerance
Ø10 ~ Ø25	0.00 ~ -0.03



(mm)

	Designation	Stock	NOF	DC	APMX	LU	LF	FHA	CZC-MS
FE	4100V007-SM10	●	4	10	7	13.8	25.9	34-36	SM10
	4120V009-SM12	●	4	12	9	15.8	30.3	34-36	SM12
	4160V012-SM16	●	4	16	12	20.4	39.5	34-36	SM16
	4200V015-SM20	●	4	20	15	25.6	49.4	34-36	SM20
	4250V018-SM25	●	4	25	18	32	57.6	34-36	SM25

●: Stock item

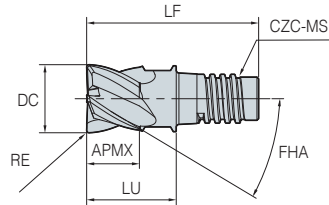
Parts

Designation	DC(mm)	CZC-MS	Wrench	Torque (N·m)
R(F)E□□□(R□□)V□□□-SM10	Ø10	SM10	SM1012-W	10 N·m
R(F)E□□□(R□□)V□□□-SM12	Ø12	SM12	SM1012-W	15 N·m
R(F)E□□□(R□□)V□□□-SM16	Ø16	SM16	SM1620-W	30 N·m
R(F)E□□□(R□□)V□□□-SM20	Ø20	SM20	SM1620-W	35 N·m
R(F)E□□□(R□□)V□□□-SM25	Ø25	SM25	SM25-W	40 N·m

RE4000-SM(Radius)



DC	Tolerance
Ø10 ~ Ø25	0.00 ~ -0.03



(mm)

	Designation	Stock	NOF	DC	RE	APMX	LU	LF	FHA	CZC-MS
RE	4100R03V007-SM10	●	4	10	0.3	7	13.8	25.9	34-36	SM10
	4100R05V007-SM10	●	4	10	0.5	7	13.8	25.9	34-36	SM10
	4100R10V007-SM10	●	4	10	1	7	13.8	25.9	34-36	SM10
	4100R15V007-SM10	●	4	10	1.5	7	13.8	25.9	34-36	SM10
	4100R20V007-SM10	●	4	10	2	7	13.8	25.9	34-36	SM10
	4120R03V009-SM12	●	4	12	0.3	9	15.8	30.3	34-36	SM12
	4120R05V009-SM12	●	4	12	0.5	9	15.8	30.3	34-36	SM12
	4120R10V009-SM12	●	4	12	1	9	15.8	30.3	34-36	SM12
	4120R15V009-SM12	●	4	12	1.5	9	15.8	30.3	34-36	SM12
	4120R20V009-SM12	●	4	12	2	9	15.8	30.3	34-36	SM12
	4160R05V012-SM16	●	4	16	0.5	12	20.4	39.5	34-36	SM16
	4160R10V012-SM16	●	4	16	1	12	20.4	39.5	34-36	SM16
	4160R15V012-SM16	●	4	16	1.5	12	20.4	39.5	34-36	SM16
	4160R20V012-SM16	●	4	16	2	12	20.4	39.5	34-36	SM16
	4200R05V015-SM20	●	4	20	0.5	15	25.6	49.4	34-36	SM20
	4200R10V015-SM20	●	4	20	1	15	25.6	49.4	34-36	SM20
	4200R15V015-SM20	●	4	20	1.5	15	25.6	49.4	34-36	SM20
	4200R20V015-SM20	●	4	20	2	15	25.6	49.4	34-36	SM20
	4250R05V018-SM25	●	4	25	0.5	18	32	57.6	34-36	SM25
	4250R10V018-SM25	●	4	25	1	18	32	57.6	34-36	SM25
	4250R15V018-SM25	●	4	25	1.5	18	32	57.6	34-36	SM25
	4250R20V018-SM25	●	4	25	2	18	32	57.6	34-36	SM25

●: Stock item

Parts

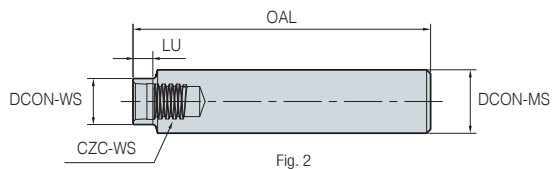
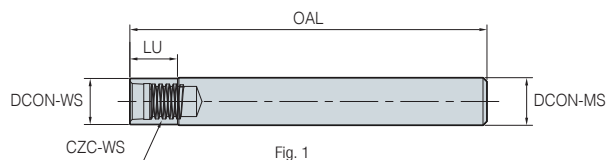
Designation	DC(mm)	CZC-MS	Wrench	Torque (N·m)
R(F)E□□□(R□□)V□□□-SM10	Ø10	SM10	SM1012-W	10 N·m
R(F)E□□□(R□□)V□□□-SM12	Ø12	SM12	SM1012-W	15 N·m
R(F)E□□□(R□□)V□□□-SM16	Ø16	SM16	SM1620-W	30 N·m
R(F)E□□□(R□□)V□□□-SM20	Ø20	SM20	SM1620-W	35 N·m
R(F)E□□□(R□□)V□□□-SM25	Ø25	SM25	SM25-W	40 N·m

SM-SS

Steel



Cylinder-shaped/High rigidity cylinder-shaped



(mm)

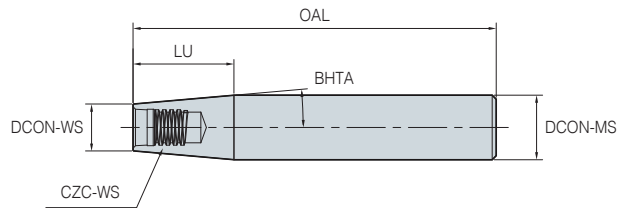
Designation	Stock	DCON-WS	DCON-MS	LU	OAL	CSC-WS	Fig.
SM10-10SSN10L070S	●	9.7	10	10	70	SM10	1
SM10-16SSN05L070S	●	9.7	16	5	70	SM10	2
SM12-12SSN12L090S	●	11.6	12	12	90	SM12	1
SM12-16SSN05L075S	●	11.6	16	5	75	SM12	2
SM16-16SSN16L110S	●	15.5	16	16	110	SM16	1
SM16-20SSN05L080S	●	15.5	20	5	80	SM16	2
SM20-20SSN20L120S	●	19.3	20	20	120	SM20	1
SM20-25SSN05L090S	●	19.3	25	5	90	SM20	2
SM25-25SSN25L130S	●	24.3	25	25	130	SM25	1
SM25-32SSN05L090S	●	24.3	32	5	90	SM25	2

●: Stock item

SM-TS

Tapered cylinder-shaped

Steel



(mm)

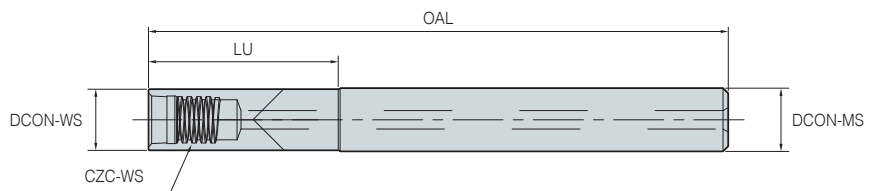
Designation	Stock	DCON-WS	DCON-MS	LU	OAL	BHTA	CSC-WS
SM10-16TSN36L100S	●	9.7	16	36	100	5°	SM10
SM10-20TSN58L120S	●	9.7	20	58	120	5°	SM10
SM12-16TSN25L090S	●	11.6	16	25	90	5°	SM12
SM12-20TSN48L110S	●	11.6	20	48	110	5°	SM12
SM16-20TSN25L090S	●	15.5	20	25	90	5°	SM16
SM16-25TSN54L120S	●	15.5	25	54	120	5°	SM16
SM20-25TSN32L100S	●	19.3	25	32	100	5°	SM20
SM25-32TSN44L110S	●	24.3	32	44	110	5°	SM25

●: Stock item

SM-SSC

Cylinder-shaped

Carbide

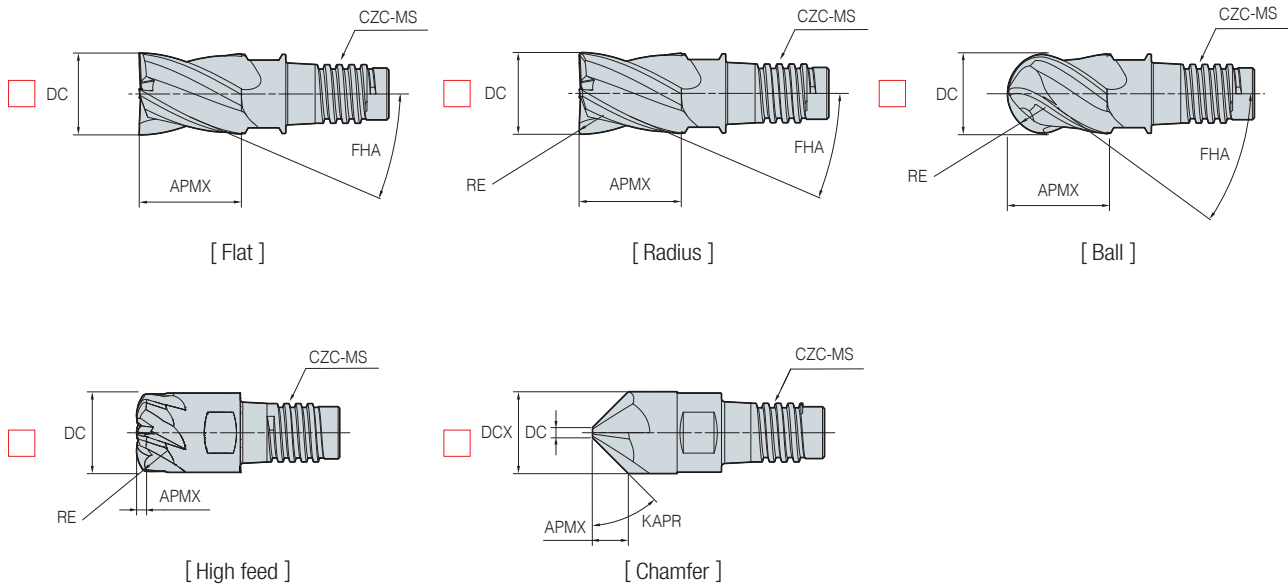


(mm)

Designation	Stock	DCON-WS	DCON-MS	LU	OAL	CSC-WS
SM10-10SSN30L090C	●	9.7	10	30	90	SM10
SM12-12SSN36L110C	●	11.6	12	36	110	SM12
SM16-16SSN48L130C	●	15.5	16	48	130	SM16
SM20-20SSN60L150C	●	19.3	20	60	150	SM20
SM25-25SSN75L180C	●	24.3	25	75	180	SM25

●: Stock item

Special endmill order form



(mm)

Item	Permissible input	Selection criteria (valid range)	Remark
DC (Tool diameter)		Ø10 ~ Ø25	—
NOF (No. of flutes)		Ø10 ~ Ø12 : 2flutes ~ 6flutes Ø16 ~ Ø25 : 2flutes ~ 8flutes	—
RE (Corner R)		0.1 ~ DC/2	EX: DC = 20 → RE ≤ 10
APMX (Max. cutting length)		< DC × 1.5	—
DCX (Max. tool diameter)		Ø10 ~ Ø25	Max. diameter of chamfer Endmill
KAPR (Chamfer angle)		10° ~ 75°	—

Machining information items	Entry Field
1. Current tool	
2. Life judgement criteria	
3. Current condition	
— Workpiece material	
— RPM or Cutting speed (vc, m/min)	
— Feed rate vf (mm/min) or Feed per tooth (mm/t)	
— Depth of cut ap (mm), Width of cut ae (mm)	
— Lubrication method (air, wet, mist)	
4. Equipment / Program :	
5. Other request :	

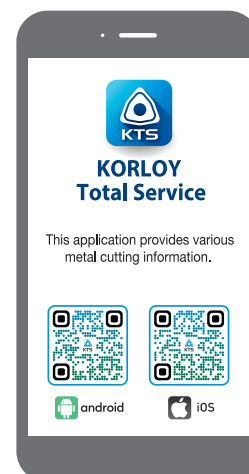
For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasses or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.
- Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.
- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the tools can be pulled out due to centrifugal force while high speed machining.



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