KORLOY
TECH-NEWS

H-Star Endmill

Endmill for high hardness steel cutting

- Stable cutting from high hardness substrate and exclusive new coating layer with good wear resistance application
- Improved initial chipping resistance with optimized edge treatment for high hardness steel cutting

KORLOY

Endmill for high hardness steel cutting

H-Star Endmill

High hardness heat treated workpiece (HRC50~63) used for automobile, mold and general industries has features like high hardness, outstanding durability and excellent wear resistance.

Those features occur severe impact on the cutting edge so it makes hard to apply high speed cutting due to frequent chipping and fracture.

The **H-Star Endmill** improved wear resistance applying ultra-fine substrate and newly developed AlTiSiN coating layer which also ensures stability in cutting from frictional heat. In addition, the optimal cutting edge shape and special treatment on it improve chipping resistance in the beginning of cutting and realize stable cutting.

KORLOY recommends H-Star Endmill which is the optimal tool for high hardness heat treated workpiece machining to improve our customers' productivity.

» **Good wear resistance and heat resistance**
- Ultra-fine substrate and new coating layer

» **High precise measurement**
- Tight precision tolerance applied on tool diameter and radius

» **Good chipping resistance**
- Optimal cutting edge and special treatment on it

» **Various line-ups**
- Normal/rib type and neck type shape

Code system

ES	R	70	4	100	15	32	10
H-Star Endmill	Type	Length / shank type	No. of flute	Tool dia.	Corner R	Effective length	Shank dia.

Type
- B : Ball
- E : Flat
- R : Radius
- XE : Flat (irregular flute spacing)
- XR : Radius (irregular flute spacing)
- PM : Power mill
- RB : Rib ball
- RE : Rib flat
- RR : Rib radius
- LNB : Long neck ball
- TNB : Taper neck ball
- LNS : Long neck flat
- LNR : Long neck radius

Length / shank type
- 70 : Neck
- 71 : Straight, neck
- 72 : Long shank neck
- 73 : Long shank
- 74 : Helix 35°

No. of flute
- 2 : 2 flutes
- 3 : 3 flutes
- 4 : 4 flutes
- 6 : 6 flutes

Tool dia.
- 010 : Ø1.0 mm
- 060 : Ø6.0 mm
- 065 : Ø6.5 mm
- 100 : Ø10.0 mm

Corner R
- 05 : 0.5 mm
- 15 : 1.5 mm
- 20 : 2.0 mm

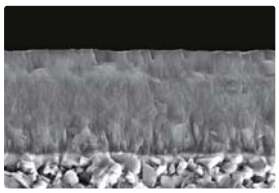
Effective length
- 10 : 10 mm
- 12 : 12 mm
- 32 : 32 mm

Shank dia.
- 6 : Ø6 mm
- 10 : Ø10 mm
- 12 : Ø12 mm

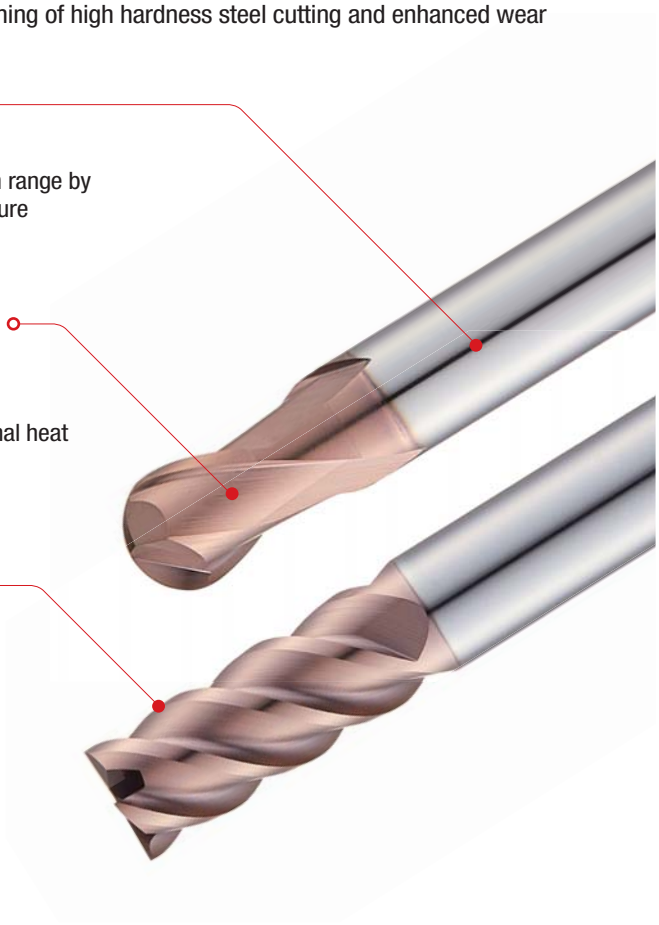
Features

- **High hardness coating layer** - Ensuring stable cutting from high Si content, increased wear resistance and frictional heat resistance due to applying a new AlTiSiN series coating layer
- **High hardness substrate** - Containing ultra-fine WC + Co 9% and expanded general application range by maximizing cutting edge feature
- **Edge treatment** - Increased chipping resistance in the beginning of high hardness steel cutting and enhanced wear resistance lead to stable cutting

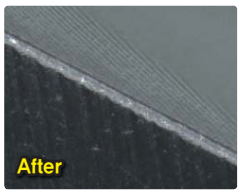
High hardness substrate
- Ultra-fine WC+Co 9%
- Expanded general application range by maximizing cutting edge feature

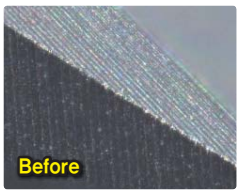


High hardness coating layer
- High Si content
- Enhanced wear resistance
- Stable cutting through frictional heat resistance increase



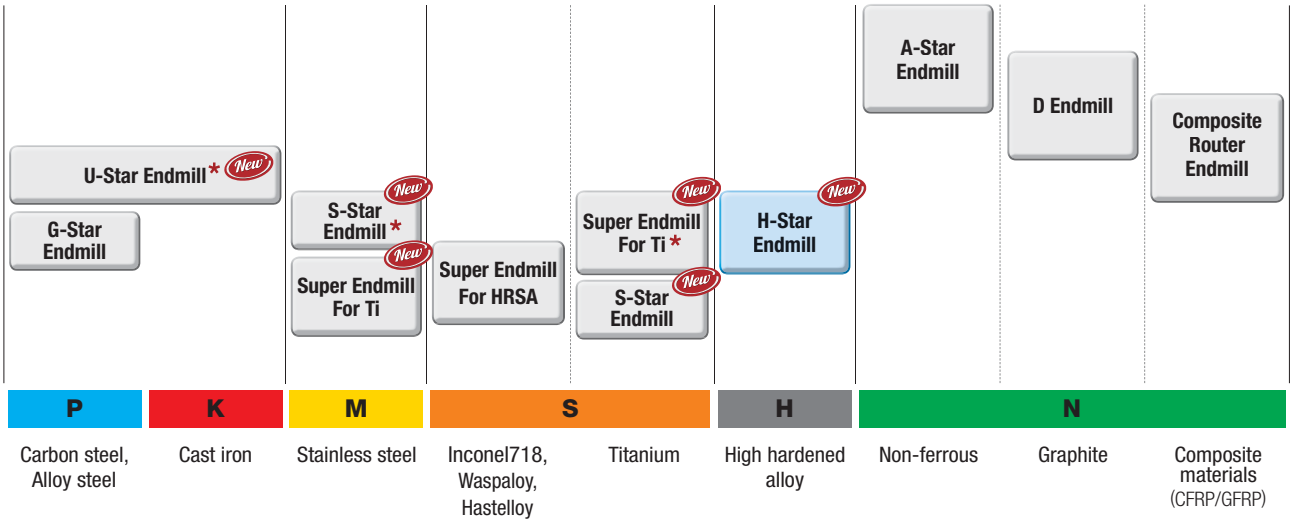
Edge treatment
- Enhancing chipping resistance in the beginning of high hardness steel cutting
- Increased wear resistance and stable cutting performance





Tool selection guide

★: 1st recommendation



• **Applicable workpiece**

◎: Excellent ○: Good

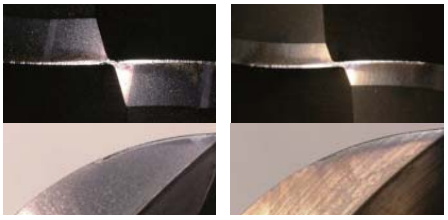
Carbon steel (~ HB225)	Alloy steel (HB225 ~ 325)	Pre-hardened steel (HRC30 ~ 50)	Hardened steel		Copper	Graphite	Cast iron ~ FCD500	Aluminum	Stainless steel
			SKD61 (~ HRC55)	SKD11 (HRC55 ~)					
		○	◎	◎	○				

Application examples

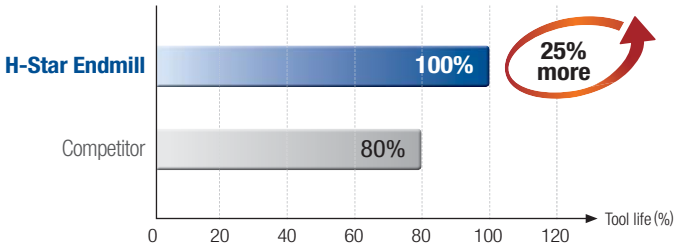
Hardened steel (STD61, HRC50~55)

Cutting conditions vc (m/min) = 130, fz (mm/t) = 0.06, ap (mm) = 12, ae (mm) = 0.4, dry

Tool ESB712120 (Diameter = Ø12 mm)



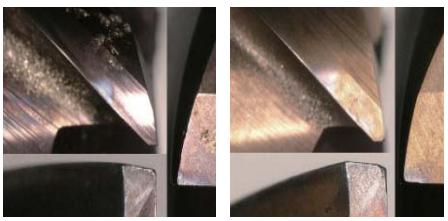
[H-Star Endmill] [Competitor]



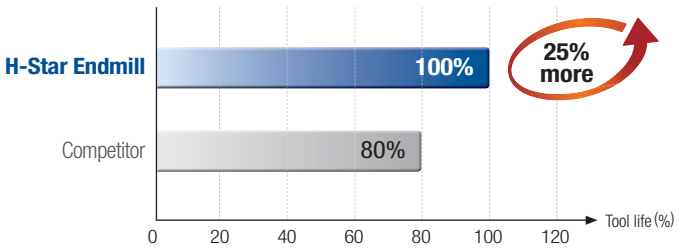
Hardened steel (STD11, HRC60~63)

Cutting conditions vc (m/min) = 70, fz (mm/t) = 0.04, ap (mm) = 12, ae (mm) = 0.4, dry

Tool ESE714120 (Diameter = Ø12 mm)



[H-Star Endmill] [Competitor]



Application examples

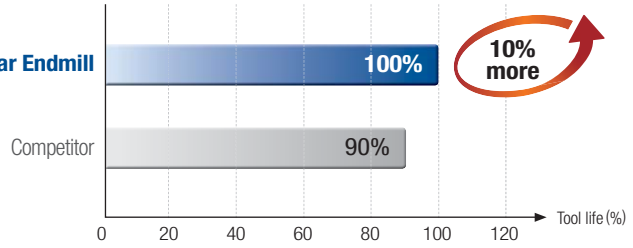
Hardened steel (STD61, HRC50~55)

Cutting conditions vc (m/min) = 200, fz (mm/t) = 0.15, ap (mm) = 0.5, ae (mm) = 0.5, dry

Tool ESB702101 (Diameter = Ø10 mm)

[H-Star Endmill]

[Competitor]



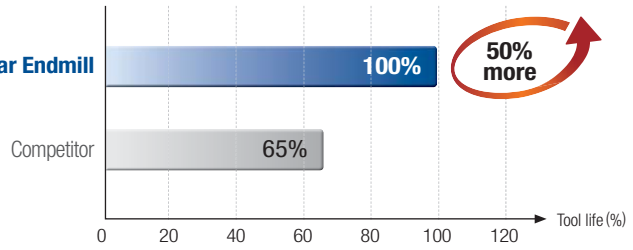
Hardened steel (STD11, HRC55~60)

Cutting conditions vc (m/min) = 70, fz (mm/t) = 0.1, ap (mm) = 10, ae (mm) = 0.3, dry

Tool ESXR7041001032 (Diameter = Ø10 mm)

[H-Star Endmill]

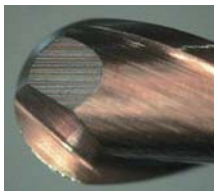
[Competitor]



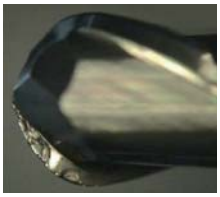
Hardened steel (SKH51, HRC60~63)

Cutting conditions vc (m/min) = 73, fz (mm/t) = 0.08, ap (mm) = 0.083, ae (mm) = 0.083, wet

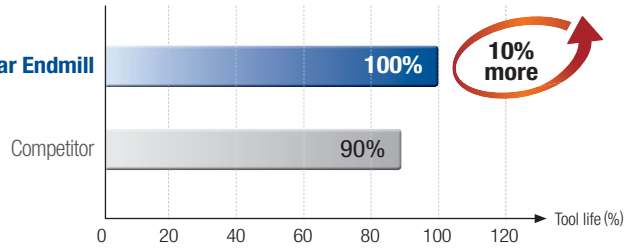
Tool ESB702015S4 (Diameter = Ø1.5 mm)



[H-Star Endmill]



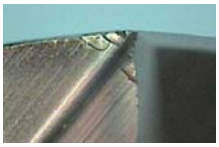
[Competitor]



Hardened steel (STD61, HRC48~50)

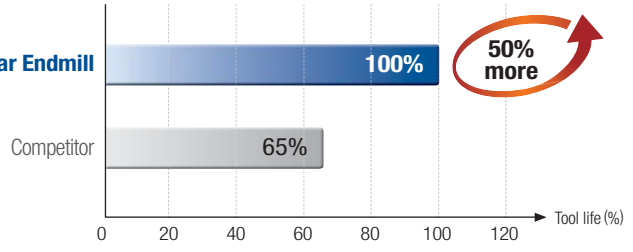
Cutting conditions vc (m/min) = 250, fz (mm/t) = 0.15, ap (mm) = 0.15, ae (mm) = 0.15, wet

Tool ESB702100 (Diameter = Ø10 mm)



[H-Star Endmill]

[Competitor]



Line-up

Type	Designations	Grade	Picture	Product name	No. of flute	Size (Ø)	
						Min	Max
Ball	ESB702	PC305H		2 flutes neck type ball Endmill	2	1.0	12.0
	ESB712	PC305H		2 flutes ball Endmill	2	1.0	12.0
	ESB703	PC305H		3 flutes neck type ball Endmill	3	2.0	12.0
	ESB734	PC305H		4 flutes 15° helix ball Endmill	4	2.0	10.0
Flat	ESE702	PC305H		2 flutes neck type flat Endmill	2	0.1	20.0
	ESE712	PC305H		2 flutes flat Endmill	2	1.0	6.0
	ESE704	PC305H		4 flutes neck type flat Endmill	4	1.0	20.0
	ESE714	PC305H		4 flutes high helix flat Endmill	4	1.0	12.0
	ESE724(6)	PC305H		4 & 6 flutes high helix flat Endmill	4/6	1.0	12.0
	ESE744	PC305H		4 flutes 35° helix flat Endmill	4	1.0	12.0
	ESE716	PC305H		6 flutes high helix flat Endmill	6	6.0	20.0
Radius	ESR702	PC305H		2 flutes neck type radius Endmill	2	1.0	12.0
	ESR732	PC305H		2 flutes long shank radius Endmill	2	1.0	12.0
	ESR704	PC305H		4 flutes neck type radius Endmill	4	1.0	12.0
	ESR714	PC305H		4 flutes radius Endmill	4	3.0	12.0
	ESR724	PC305H		4 flutes neck type radius Endmill	4	6.0	12.0
	ESR734	PC305H		4 flutes long shank radius Endmill	4	1.0	12.0
	ESR706	PC305H		6 flutes neck type radius Endmill	6	6.0	12.0
	ESR736	PC305H		6 flutes radius Endmill	6	6.0	12.0
Rib ball	ESRB712	PC305H		2 flutes rib ball Endmill	2	0.1	12.0
Rib flat	ESRE712	PC305H		2 flutes rib flat Endmill	2	0.1	12.0
	ESRE714	PC305H		4 flutes rib flat Endmill	4	0.5	12.0

Line-up

Type	Designations	Grade	Picture	Product name	No. of flute	Size (Ø)	
						Min	Max
Rib radius	**ESRR712**	PC305H		2 flutes rib radius Endmill	2	0.2	16.0
	ESRR714	PC305H		4 flutes rib radius Endmill	4	0.5	2.0
Flat	**ESXE704**	PC305H		4 flutes neck type flat Endmill	4	1.0	12.0
	ESXE714	PC305H		4 flutes flat Endmill	4	2.0	12.0
Radius	**ESXR704**	PC305H		4 flutes neck type radius Endmill	4	1.0	12.0
Rib ball	**ESLNB20**	PC305H		2 flutes long neck ball Endmill	2	1.0	5.0
	ESTNB20	PC305H		2 flutes taper neck ball Endmill	2	0.2	10.0
	ESTNB30	PC305H		3 flutes taper neck ball Endmill	3	2.0	5.0
Rib flat	**ESLNS20**	PC305H		2 flutes long neck flat Endmill	2	0.1	5.0
	ESLNS40	PC305H		4 flutes long neck flat Endmill	4	1.0	5.0
Rib radius	**ESLNR**	PC305H		2 flutes long neck radius Endmill	2	0.2	3.0
	ESTNR	PC305H		2 flutes taper neck radius Endmill	2	0.2	3.0
High feed	**ESPM4**	PC305H		4 flutes neck type radius Endmill	4	3.0	12.0

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess 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 inserts can be pulled out due to centrifugal force while high speed machining.

KORLOY

Head Office: Holystar B/D, 326, Seocho-daero, Seocho-gu, Seoul, 06633, Republic of Korea
Tel: +82-2-522-3181 Fax: +82-2-522-3184, +82-2-3474-4744 Web: www.korloy.com E-mail: sales.khq@korloy.com

KORLOY AMERICA
620 Maple Avenue, Torrance, CA 90503, USA
Tel: +1-310-782-3800 Toll Free: +1-888-711-0001 Fax: +1-310-782-3885
E-mail: sales.kai@korloy.com

KORLOY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1790 Fax: +91-124-405-0032
E-mail: sales.kip@korloy.com

KORLOY TURKIYE
Serifali Mahallesi, Burhan Sokak NO: 34
Dudullu OSB/Umraniye/Istanbul, 34775, Turkiye
Tel: +90-216-415-8874 E-mail: sales.ktl@korloy.com

KORLOY RUSSIA
Krasivy Dom office No. 305, Bld. 5, Novovladykinskiy proezd 8, 127106, Moscow, Russia
Tel: +7-495-280-1486 Fax: +7-495-280-1459 E-mail: sales.krc@korloy.com

KORLOY FACTORY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1818 Fax: +91-124-405-0032
E-mail: pro.kim@korloy.com

KORLOY EUROPE
Gablonzer Str. 25-27, 61440 Oberursel, Germany
Tel: +49-6171-27783-0 Fax: +49-6171-27783-59
E-mail: sales.keg@korloy.com

KORLOY BRASIL
Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil
Tel: +55-114-193-3810 Fax: +55-114-193-5837
E-mail: sales.kbl@korloy.com

KORLOY CHILE
Av. Providencia 1650, Office 1009, 7500027
Providencia-Santiago, Chile
Tel: +56-229-295-490 E-mail: sales.kcs@korloy.com

KORLOY MEXICO
Calle R. M. Clemencia Borja Taboada 522, Jurica Acueducto,
76230 Juriquilla, Qro., Mexico
Tel: +52-442-673-73-88 E-mail: sales.kml@korloy.com

PRINTED WITH SOY INK

TN105-EM-01 / 20221210