

Endmill



EndMill - Content structure

- Products are listed by application.
- Endmills in the catalog are our standard items.

How to use the page

Method 1.

Select the tool type at the index on the right page, choose the application (1), cutting edge shape (2), and the number of cutting edges (3), and check the designation you need (6) in the dimension table (5).

TUNGMEISTER

VEH...
4 flute, roughing - finishing, variable helix and pitch

Fig. 1

Fig. 2

Designation

	M715	AH725	NOF	FHA	DC	DCS	APMX	RE	CRKS	LF	Wrench
VEH08L05.0P0504505	●	4	41°-45°	8	7.7	5	0.5	505	10	KEYV-505	
VEH08L05.0P1004505	●	4	41°-45°	8	7.7	5	1	505	10	KEYV-505	
VEH10L07.0P1004505	●	4	41°-45°	10	9.7	7	1	505	12.8	KEYV-505	
VEH10L07.0P0504506	●	4	41°-45°	10	9.7	7	0.5	506	13	KEYV-506	
VEH10L07.0P1004506	●	4	41°-45°	10	9.7	7	1	506	13	KEYV-506	
VEH12L09.0P1004506	●	4	41°-45°	12	9.3	9	1	506	14.3	KEYV-506	
VEH12L09.0P0504508	●	4	41°-45°	12	11.7	9	0.5	508	16.5	KEYV-508	
VEH12L09.0P1004508	●	4	41°-45°	12	11.7	9	1	508	16.5	KEYV-508	
VEH16L12.0P1004508	●	4	41°-45°	16	11.7	12	1	508	20	KEYV-508	
VEH16L12.0P0504510	●	4	41°-45°	16	15.3	12	0.5	510	20.5	KEYV-510	
VEH16L12.0P1004510	●	4	41°-45°	16	15.3	12	1	510	20.5	KEYV-510	
VEH20L15.0P0504512	●	4	41°-45°	20	18.3	15	0.5	512	25.5	KEYV-512	
VEH20L15.0P1004512	●	4	41°-45°	20	18.3	15	1	512	25.5	KEYV-512	

VEH...
4 flute, roughing - finishing, long edge, variable helix and pitch

Fig. 1

Fig. 2

Designation

	M715	NOF	FHA	DC	DCS	APMX	RE	CRKS	LF	Wrench
VEH08L12.0P0504505	●	4	41°-45°	8	7.7	12	0.5	505	18	KEYV
VEH08L12.0P1004505	●	4	41°-45°	8	7.7	12	1	505	18	KEYV
VEH10L15.0P0504506	●	4	41°-45°	10	9.7	15	0.5	506	22	KEYV
VEH10L15.0P1004506	●	4	41°-45°	10	9.7	15	1	506	22	KEYV

Method 2.

Select the tool series name on I004 – I005 and check the details on the product page.

Main products

Solid Endmill

SOLIDMEISTER

Solid endmill for a wide variety of applications
ø0.4 mm - ø25 mm

I004 -

Exchangeable Head Endmill

TUNGMEISTER

Endmills with exchangeable heads
for reduced tool change time
ø5 mm - ø25 mm

I060 -

I004 tungaloy.com

Method 3.

Select the application and the cutting edge shape from Quick Guide on I006-I015 and I060 - I061, and see the details on each page.

Quick Guide **SOLIDMEISTER**

Edge shape	Name of the series	Designation	Appearance	Application	Tool diameter	No. of cutting edges
Square	TEC**HSM**CF-E			✓	ø6 - ø20	4
	TEC**EAL**CF			✓	ø1 - ø25	4
	TEC**ESL**CF			✓	ø6 - ø20	5
	TEC**H2**CF			✓	ø6 - ø20	7
	TEC**H3**CF			✓	ø6 - ø20	6-20
	TEC**H4**CF-R			✓	ø4 - ø20	4
	TEC**H4**CF-R			✓	ø6 - ø20	7, 9
	TEC**H4**CF-R			✓	ø6 - ø25	4
	TEC**H4**CF-R			✓	ø6 - ø20	4
	TEC**H4**CF-R			✓	ø1 - ø25	3
Variable Helix Endmill	TEC**H4**CF-R			✓	ø6 - ø18	4
	TEC**H4**CF-R			✓	ø6 - ø25	3
	TEPS**E4**CF			✓	ø6 - ø25	4
	TEPS**B44			✓	ø4 - ø25	4
	TECR**B5			✓	ø5 - ø20	4, 5, 7
	TECR**B5M			✓	ø5 - ø20	4, 5, 7
	TECR**B5MF			✓	ø6 - ø25	4, 6
	TECR**B5L			✓	ø6 - ø20	4, 5, 7

I008 tungaloy.com

Icon

Edge shape

Square

Ball nose

High feed

No. of cutting edges

2

3

4

5

6 or more

Head geometry

Square

Ball nose

Radius

Chamfering

Slotting

Threading

Application

Shoulder milling

Deep shoulder milling

Shoulder milling (with radius)

Face milling

Slotting

Slotting (with radius)

Side slotting

Side milling

Pocketing

Ramping

Profiling

Plunging

Hole enlarging

Holemaking

Counterboring

Hole chamfering

Chamfering

Cutting-off

4 **TUNGMEISTER**
VEH...
4 flute, roughing - finishing, variable helix and pitch

7

6

5

8

10

Reference pages: Standard cutting conditions → I073 - I074

1066 tungaloy.com

9 **STANDARD CUTTING CONDITIONS**

Shoulder milling
VEH, VEE: 3 flutes, VED / VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VED-R, VEE-C

ISO Workpiece material Hardness Cutting speed V_c (m/min) Feed per tooth f_z (mm/t) Tool diameter D_0 (mm) Depth of cut a_p (mm) Width of cut a_e (mm)

VED / VEE: 6 flutes, VED / VEE: 8, 10 flutes, VED: 7, 9 flutes

ISO Workpiece material Hardness Cutting speed V_c (m/min) Feed per tooth f_z (mm/t) Tool diameter D_0 (mm) Depth of cut a_p (mm) Width of cut a_e (mm)

Tungaloy I073

- 1: Application
- 2: Cutting edge shape
- 3: Number of cutting edges
- 4: Endmill series name
- 5: Dimension table
- 6: Endmill designation
- 7: Dimension drawing (conforming to ISO13399)
- 8: Spare parts
- 9: Standard cutting conditions
- 10: Reference page



Coolant hole

Workpiece material

P Steel**M** Stainless steel**K** Cast iron**N** Non-ferrous metal**S** Superalloy**H** Hard material

When ordering

- Please specify the designation and quantity for solid endmills.
e.g. **TEFS100E44-22C10CF72** ... 1 (one solid endmill per package)
- Please specify the designation and quantity for TungMeister heads.
e.g. **VEE08L05.0R00-3S05** ... 2 (two heads per package)
- Please specify the designation and quantity for TungMeister shanks.
e.g. **VSSD08L060805-S** ... 1 (one shank per package)

*Wrenches for TungMeister are sold separately.

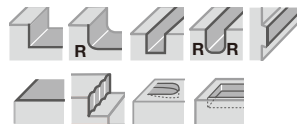
Main products

Solid Endmill



SOLIDMEISTER

Solid endmill for a wide variety of applications
ø0.4 mm - ø25 mm



I006 -

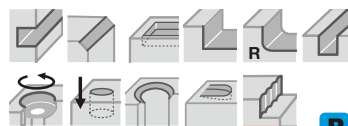
P M K N S H

Exchangeable Head Endmill



TUNGMEISTER

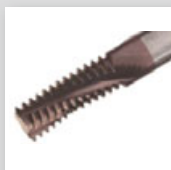
Endmills with exchangeable heads
for reduced tool change time
ø5 mm - ø32 mm



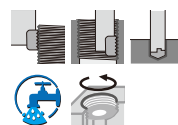
I060 -

P M K N S H

Threading Endmill



THREADMILLING



I106

P M K N S H



SOLIDTHREAD

Solid threading tool series for machining small diameters, such as M1x0.25 and 0-80UNF.

I107 -



TUNGMEISTER

Head-changeable milling tool for less down-time than solid tapping tools.

I060 -



Indexable thread milling cutter

Many different types of inserts for various threading diameters and pitches, leading to the tool integration and reduced tool cost.

I124 -

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index

A

B

C

D

E

F

G

H

I

J

K

L

M



Powerful endmill with excellent performance

VARIABLEMEISTER

High resistance to chatter leading to highly efficient machining

- Suitable for machining large cutting depth and width where chatter is likely to occur.
- Capability of machining with long overhang allows the operations on various parts of workpieces.

Stable, long tool life

- Impacts on cutting edges are softened due to reduced vibration, resulting in longer, stable tool life.
- The combination of PVD coated grade with high wear resistance and robust substance.



High resistance to chatter
= Machining large cutting width
= Machining large cutting depth
/ long overhang



FINISHMEISTER

Tool integration / Shortened tool change time

- Cutting depth at the level of roughing endmills is possible, and a single tool can handle semi-finishing to finishing with the conditions appropriately adjusted.
- A single tool completes the operation which used to require two tools, roughing and square endmills, shortening tool change time.

Hard to chatter, excellent chip control

- Variable pitch design increases the resistance to chatter, delivering high efficiency in machining with long overhang and at high cutting speed.
- Serrated cutting edges produce small chips and provide stable machining even in slotting.



Roughing and finishing with one tool
+ Variable pitch design



SHREDMEISTER

Significantly reduced time for roughing

- Long cutting edge and the capability of machining large depth of cut lead to highly efficient roughing.
- Unique serrated cutting edges produce small chips and provide high efficiency and stability in deep slotting.

Excellent sharpness and stable machining with long tool life

- Chamfer on corner tips that are easy to break is reinforced, providing stable machining even under high cutting conditions.
- The combination of PVD coated grade with high wear resistance and robust substance allows the design with high helix angle, providing excellent sharpness and long tool life.



Effective cutting edge length
= Tool diameter x 2



AH725

- High thermal and chemical stability.
- High hardness 3500 HV makes higher speeds, machining of harder materials, and dry machining possible. The TiAlN coating can be applied at 800° C.
- Recommended for hardened steel, high-temperature and steel alloys.
- Improves and expedites finishing on dies and molds.
- Longer tool life in high speed machining.

AH750 / AH710

- Excellent for machining hard steel up to 70 HRC and high temperature alloys.
- The small grain size improves cutting edge strength and tends to chip less.

KS15F

- Suited for aluminum alloys and non-ferrous metals.
- Excellent edge sharpness for super mirror surface finish quality.

FX510

- Suitable for nickel-based heat-resistnt superalloys.
- SiAlON ceramic grade enables high speed milling.
- Also good for cast iron and specialty graphite materials.

Grade priorities for solid carbide endmills

In most cases the best performance can be attained without using coolant for specific grades.

However, it should be noted that if for any reason coolant must be used, it could possibly affect tool life and sometimes cause insert failure, due to thermal shock.

						
Material Groups	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
	Steel	Stainless	Cast Iron	Non-ferrous	Superalloys	Hard Materials
	Harder ↑ AH750	Harder ↑	Harder ↑ AH750	Harder ↑	Harder ↑ AH750	Harder ↑ AH750
	AH725 ↓ Tougher	AH725 ↓ Tougher	AH725 ↓ Tougher	AH725 ↓ KS15F Tougher	AH725 ↓ KS15F Tougher	AH725 ↓ Tougher

Quick Guide **SOLIDMEISTER**

Edge shape	Name of the series	Designation	Appearance	Application			Tool diameter	No. of cutting edges	
				Finishing	Medium cutting	Roughing			
 Square	VARIABLEMEISTER	TEC**H4S/M**CF-E			✓	✓	ø6 - ø20	4	
		TEC**E4L**CF			✓	✓	ø1 - ø25	4	
		TEC**E5L**CF			✓	✓	ø6 - ø20	5	
		TEC**H7-CF		✓			ø6 - ø20	7	
		TEC**H**CF		✓			ø6 - ø20	6 - 20	
		TECK**H4M**CF-R			✓	✓	ø4 - ø20	4	
		TECK**H7/9M**CF-R			✓	✓	ø6 - ø20	7, 9	
		TEC**H4M**CF-R			✓	✓	ø6 - ø25	4	
		TEC**H4X**CF-R			✓	✓	ø6 - ø20	4	
		TECA**H3**CF-R			✓	✓	ø1 - ø25	3	
		TECA**H4**CF-R			✓	✓	ø6 - ø16	4	
		TECA**H3**CF-R**C			✓		ø6 - ø25	3	
	FINISHMEISTER	TEFS**E44**CF			✓	✓	ø6 - ø25	4	
		TEFS**B44			✓	✓	ø4 - ø25	4	
	SHREDMEISTER	TECR**B*S				✓	ø5 - ø20	4, 5, 7	
		TECR**B*M				✓	ø5 - ø20	4, 5, 7	
		TECR**B*MF				✓	ø6 - ø25	4, 6	
		TECR**B*L				✓	ø6 - ø20	4, 5, 7	

★ : First choice ☆ : Second choice												
	ap	Corner geometry	Helix angle	Pitch	Workpiece material						Remarks	Page
					P	M	K	N	S	H		
	1D, 2D	Chamfered/R	Variable	Variable	★	★	★	☆	☆	☆		I016
	2D	Chamfered/ Sharp edge	38	Variable	★	★	★	☆	☆	☆		I017
	2.5D	Chamfered	38	Variable	★	★	★	☆	★	☆		I017
	2D - 6D	Chamfered/ R/ Sharp edge	Variable	Variable	★	★	★	☆	☆	★		I018
	2D	Chamfered	Variable	Variable	★	★	☆	☆	☆	☆		I019
	2D	R	Variable	Variable	★	★	☆	☆	★	☆		I019
	2D	R	Variable	Variable	★	★	☆	☆	★	☆		I020
	2D	R	Variable	Variable	★	★	☆	☆	★	★		I020
	2D	R	Variable	Variable	★	★	☆	☆	★	☆		I021
	1.5D, 2D	R	Variable	Variable	☆	☆	☆	★	☆	☆		I022 - I023
	1.5D, 2D	R	Variable	Variable	☆	☆	☆	★	☆	☆		I024
	2D	R	Variable	Variable	☆	☆	☆	★	☆	☆		I024
	2D	Chamfered	38	Variable	★	☆	★	☆	☆	☆	Rough/Finish combination geometry	I026
	2D	Chamfered	45	Regular	★	★	☆	☆	★	☆	Rough/Finish combination geometry	I027
	1D	Chamfered	45	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I027
	2D	Chamfered/R	45	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I028
	2D	Chamfered	45	Regular	★	☆	☆	☆	★	★	Serrated cutting edge	I028
	2D	Chamfered	45	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I029

Quick Guide **SOLIDMEISTER**

Edge shape	Name of the series	Designation	Appearance	Application			Tool diameter	No. of cutting edges	
				Finishing	Medium cutting	Roughing			
 Square	SHREDMEISTER	TECR**B*X				✓	ø8 - ø16	4, 5	
		TERF**A/E3,4				✓	ø4 - ø20	3, 4	
		TECR**T4M				✓	ø6 - ø20	4	
		TECP**E*3/4L				✓	ø5 - ø20	3, 4	
		TEAP**H3**CFR**C				✓	ø10 - ø20	3	
		TERC**E3				✓	ø6 - ø25	3	
		TECR**B3**R				✓	ø6 - ø20	3	
	SOLIDMEISTER	TEC**B4/6L		✓			ø6 - ø20	4, 6	
		TEC**B4/6X		✓			ø10 - ø20	4, 6	
		TECC**A/B2		✓	✓	✓	ø2 - ø20	2	
		TECS/TECCS**E3		✓	✓	✓	ø2 - ø16	3	
		TECC**E3		✓	✓	✓	ø4 - ø20	3	
		TEC**B3			✓	✓	ø6 - ø18	3	
		TECC**A/B4		✓	✓	✓	ø2 - ø20	4	
		TEC**B4		✓	✓		ø2 - ø20	4	
		TEC**B4**R		✓	✓		ø6 - ø20	4	
		TEC**A2			✓		ø0.4 - ø3	2	
		TEC**A4			✓		ø4 - ø20	4	

★ : First choice ☆ : Second choice

	ap	Corner geometry	Helix angle	Pitch	Workpiece material						Remarks	Page
					P	M	K	N	S	H		
	1.5D	Chamfered	45	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I029
	2D	Chamfered	30/38	Regular	★	★	★	☆	☆	★	Serrated cutting edge	I029
	2D	Chamfered	20	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I030
	2D	Chamfered	38	Regular	★	☆	★	☆	☆	★	Serrated cutting edge	I030
	1.5D, 2D	R	Variable	Variable	☆	☆	☆	★	☆	☆	Notched cutting edge	I031
	2D	Chamfered	38	Regular	☆	☆	☆	★	☆	☆	Serrated cutting edge	I031
	1D	R	45	Regular	☆	☆	☆	★	☆	☆	Serrated cutting edge	I032
	3D, 4D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I034
	4D, 5D, 6D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I034
	2D, 3D	Chamfered	30/45	Regular	★	★	★	☆	☆	☆		I035
	1D	Chamfered	38	Regular	★	★	★	☆	☆	☆		I035
	2D, 3D	Chamfered	38	Regular	★	★	★	☆	☆	☆		I036
	2D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I036
	2D	Chamfered	30/45	Regular	★	★	★	☆	☆	☆		I036
	2D, 3D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I037
	2D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I037
	1.5D	Sharp edge	30	Regular	★	☆	★	☆	☆	★		I038 - I039
	2D	Sharp edge	30	Regular	★	☆	★	☆	☆	★		I039

Quick Guide **SOLIDMEISTER**

Edge shape	Name of the series	Designation	Appearance	Application			Tool diameter	No. of cutting edges	
				Finishing	Medium cutting	Roughing			
 Square	SOLIDMEISTER	TECH**B6			✓		ø6 - ø20	6	
		TEC**B6			✓		ø6 - ø25	6	
		TEC**D6		✓			ø6 - ø20	6	
		TECA**B2		✓			ø4 - ø20	2	
		TECA**B3			✓	✓	ø4 - ø20	3	
		TECA**F2		✓			ø4 - ø25	2	
	ECOMEISTER	TEC**A2**E			✓		ø1 - ø20	2	
		TEC**A/E3**E			✓		ø2 - ø16	3	
		TEC**B3**W			✓		ø2 - ø20	3	
		TEC**A4**E			✓		ø2 - ø20	4	
 Ball	VARIABLEMEISTER	TEB**E4L**CF			✓	✓	ø3 - ø16	4	
	SHREDMEISTER	TEBRF**T3/4				✓	ø6 - ø20	3, 4	
	SOLIDMEISTER	TEB**A2-**C**M		✓	✓		ø0.4 - ø3	2	
		TEB**A2-**C**H		✓	✓		ø1 - ø20	2	
		TEB**A2-**C**M...		✓	✓		ø3 - ø16	2	

★ : First choice ☆ : Second choice

	ap	Corner geometry	Helix angle	Pitch	Workpiece material						Remarks	Page
					P	M	K	N	S	H		
	2D	Sharp edge	45	Regular	★	☆	★	☆	☆	★		I040
	4D	Sharp edge	45	Regular	★	☆	★	☆	☆	★		I040
	2D	Sharp edge	50	Regular	★	☆	★	☆	☆	★		I041
	2D, 3D	Sharp edge	45	Regular	☆	☆	☆	★	☆	☆		I041
	2D	R	45	Regular	☆	☆	☆	★	☆	☆		I042
	2D	Sharp edge	55	Regular	☆	☆	☆	★	☆	☆		I042
	1D, 1.5D, 2D, 3D, 4D	Sharp edge	30	Regular	★	★	★	☆	☆	☆		I043
	1D, 1.5D, 2D, 3D, 4D	Sharp edge	30/38	Regular	★	★	★	☆	☆	☆		I044
	1D	Sharp edge	45	Regular	★	★	★	☆	☆	☆		I045
	2D, 3D, 4D, 5D, 6D, 8D, 10D	Sharp edge	30	Regular	★	★	★	☆	☆	☆		I045-I046
	2D	R1.5 - R8	38	Variable	★	★	☆	☆	★	★		I048
	2D	R3 - R10	20	Regular	★	★	★	☆	☆	★	Serrated cutting edge	I048
	1.5D	R0.2 - R1.5	30	Regular	★	★	☆	☆	★	★		I049
	1D	R0.5 - R10	30	Regular	★	★	☆	☆	★	★		I050
	2D	R1.5 - R8	30	Regular	★	★	☆	☆	★	★		I050

Quick Guide **SOLIDMEISTER**

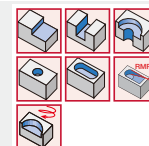
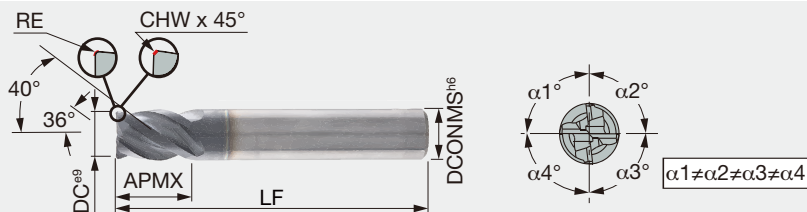
Edge shape	Name of the series	Designation	Appearance	Application			Tool diameter	No. of cutting edges	
				Finishing	Medium cutting	Roughing			
 Ball	SOLIDMEISTER	TEB**A2**/**/**C**M...		✓	✓		ø1 - ø10	2	
		TEB**A2**-**C**-...		✓	✓		ø3 - ø20	2	
		TEB**A3		✓	✓		ø3 - ø12	3	
		TEB**A4		✓	✓		ø3 - ø20	4	
	ECOMEISTER	TEB**A2**E		✓	✓		ø2 - ø20	2	
 High feed	FEEDMEISTER	TEFF**N4				✓	ø6 - ø20	4	
		TCFF**A3				✓	ø4 - ø20	3	
Toroidal	SOLIDMEISTER	TETR**A2**R				✓	ø2 - ø6	2	

★ : First choice ☆ : Second choice

	ap	Corner geometry	Helix angle	Pitch	Workpiece material						Remarks	Page
					P	M	K	N	S	H		
	2D	R0.5 - R5	30	Regular	★	★	☆	☆	★	★	Tapered ball nose	I051
	1D, 1.5D	R1.5 - R10	30	Regular	★	★	☆	☆	★	★		I051
	1D, 1.5D	R1.5 - R6	30	Regular	★	★	☆	☆	★	★		I051
	1D, 1.5D	R1.5 - R10	30	Regular	★	★	☆	☆	★	★		I052
	1D, 1.5D, 2D, 3D	R1 - R10	30	Regular	★	★	☆	☆	★	★		I052
	0.05D	R	-	Regular	★	★	☆	☆	★	★	For high feed milling	I055
	0.04D-0.05D	R	-	Regular			☆	☆	★		For high feed milling (ceramic grade)	I055
	0.5D, 1D	R	-	Regular	★	★	☆	☆	★	★		I056

VARIABLE MEISTER**TEC**H4S**CF-E**

4 flute chatter dampening endmill, variable helix and variable pitch, short type

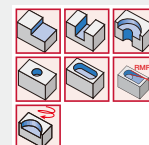
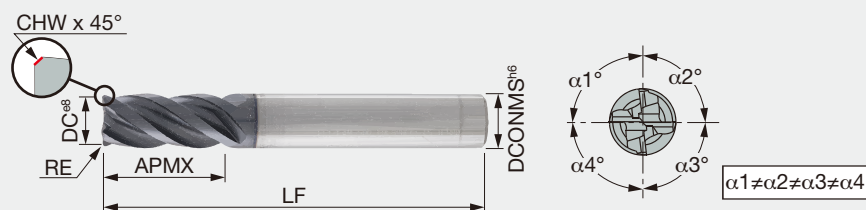


Designation	AH725	DC	DCONMS	NOF	CHW	RE	APMX	LF	Shank
TEC060H4S-06C06CF-E50	●	6	6	4	0.25	-	6	50	Cylindrical
TEC060H4S-06C06CF-R02E50	●	6	6	4	-	0.2	6	50	Cylindrical
TEC060H4S-06W06CF-E50	●	6	6	4	0.25	-	6	50	Weldon
TEC080H4S-08C08CF-E63	●	8	8	4	0.3	-	8	63	Cylindrical
TEC080H4S-08C08CF-R04E63	●	8	8	4	-	0.4	8	63	Cylindrical
TEC080H4S-08W08CF-E63	●	8	8	4	0.3	-	8	63	Weldon
TEC100H4S-10C10CF-E66	●	10	10	4	0.4	-	10	66	Cylindrical
TEC100H4S-10C10CFR.5E66	●	10	10	4	-	0.5	10	66	Cylindrical
TEC100H4S-10W10CF-E66	●	10	10	4	0.4	-	10	66	Weldon
TEC120H4S-12C12CF-E73	●	12	12	4	0.5	-	12	73	Cylindrical
TEC120H4S-12C12CF-R06E73	●	12	12	4	-	0.6	12	73	Cylindrical
TEC120H4S-12W12CF-E73	●	12	12	4	0.5	-	12	73	Weldon
TEC160H4S-16C16CF-E82	●	16	16	4	0.6	-	16	82	Cylindrical
TEC160H4S-16W16CF-E82	●	16	16	4	0.6	-	16	82	Weldon
TEC200H4S-20C20CF-E92	●	20	20	4	0.6	-	20	92	Cylindrical
TEC200H4S-20W20CF-E92	●	20	20	4	0.6	-	20	92	Weldon

● : Line up

TECH4M**CF-E**

4 flute chatter dampening endmill, variable helix and variable pitch



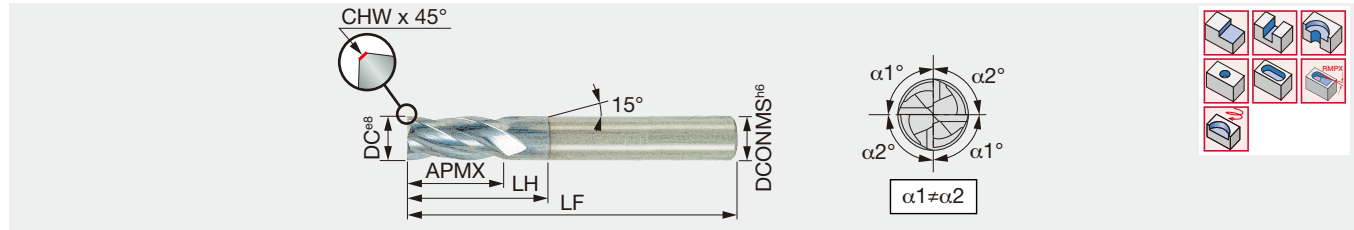
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TEC060H4M-12C06CF-E57	●	6	6	4	0.25	12	57	Cylindrical
TEC060H4M-12W06CF-E57	●	6	6	4	0.25	12	57	Weldon
TEC080H4M-16C08CF-E63	●	8	8	4	0.3	16	63	Cylindrical
TEC080H4M-16W08CF-E63	●	8	8	4	0.3	16	63	Weldon
TEC100H4M-20C10CF-E72	●	10	10	4	0.4	20	72	Cylindrical
TEC100H4M-20W10CF-E72	●	10	10	4	0.4	20	72	Weldon
TEC120H4M-24C12CF-E83	●	12	12	4	0.5	24	83	Cylindrical
TEC120H4M-24W12CF-E83	●	12	12	4	0.5	24	83	Weldon
TEC160H4M-32C16CF-E92	●	16	16	4	0.6	32	92	Cylindrical
TEC160H4M-32W16CF-E92	●	16	16	4	0.6	32	92	Weldon
TEC200H4M-40C20CF-E104	●	20	20	4	0.6	40	104	Cylindrical
TEC200H4M-40W20CF-E104	●	20	20	4	0.6	40	104	Weldon

● : Line up

Reference pages: Standard cutting conditions → **I025**

TEC**E4L**CF

4 flute chatter dampening endmill, 38° helix angle, variable pitch, short type

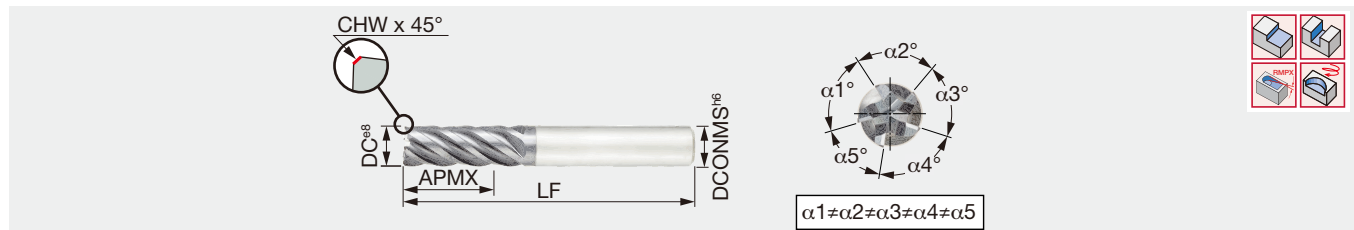


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TEC010E4L-2/04C04CF50	●	1	4	4	0.04	2.2	4	50	Cylindrical
TEC020E4L-4/06C04CF50	●	2	4	4	0.08	4.3	6.1	50	Cylindrical
TEC030E4L-8/11C06CF-57	●	3	6	4	0.1	8	11	57	Cylindrical
TEC040E4L-10/14C06CF-57	●	4	6	4	0.15	10	14	57	Cylindrical
TEC050E4L-12/17C06CF-57	●	5	6	4	0.18	12	17	57	Cylindrical
TEC060E4L-14/20C06CF-57	●	6	6	4	0.25	14	20	57	Cylindrical
TEC080E4L-18/26C08CFS63	●	8	8	4	-	18	26	63	Cylindrical
TEC080E4L-18/26C08CF-63	●	8	8	4	0.3	18	26	63	Cylindrical
TEC080E4L-18/26W08CF63	●	8	8	4	0.3	18	26	63	Weldon
TEC100E4L-22/32C10CFS72	●	10	10	4	-	22	32	72	Cylindrical
TEC100E4L-22/32C10CF-72	●	10	10	4	0.4	22	32	72	Cylindrical
TEC100E4L-22/32W10CF72	●	10	10	4	0.4	22	32	72	Weldon
TEC120E4L-26/38C12CFS83	●	12	12	4	-	26	38	83	Cylindrical
TEC120E4L-26/38C12CF-83	●	12	12	4	0.5	26	38	83	Cylindrical
TEC120E4L-26/38W12CF83	●	12	12	4	0.5	26	38	83	Weldon
TEC160E4L-34/50C16CF-100	●	16	16	4	0.6	34	50	100	Cylindrical
TEC160E4L-34/50W16CF-100	●	16	16	4	0.6	34	50	100	Weldon
TEC200E4L-42/60C20CF-110	●	20	20	4	0.6	42	60	110	Cylindrical
TEC200E4L-42/60W20CF-110	●	20	20	4	0.6	42	60	110	Weldon
TEC250E4L-50/65C25CF-121	●	25	25	4	0.6	50	65	121	Cylindrical
TEC250E4L-50/65W25CF121	●	25	25	4	0.6	50	65	121	Weldon

● : Line up

TEC**E5L**CF

5 flute chatter dampening endmill, 38° helix angle, variable pitch



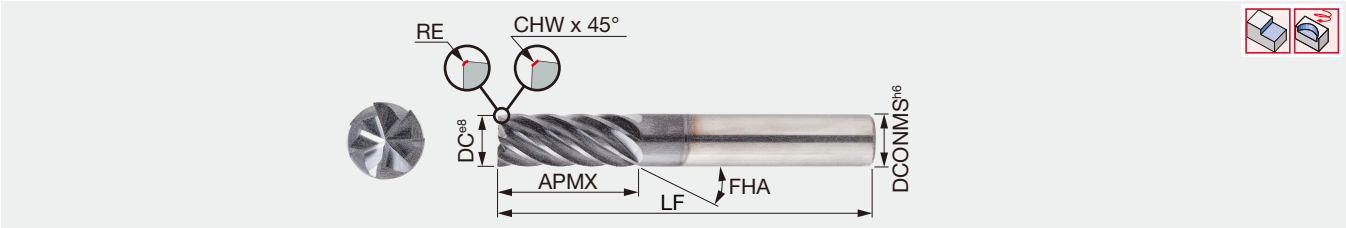
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TEC060E5L-15C06CF-57	●	6	6	5	0.2	15	57	Cylindrical
TEC080E5L-20C08CF-63	●	8	8	5	0.25	20	63	Cylindrical
TEC100E5L-25C10CF-72	●	10	10	5	0.3	25	72	Cylindrical
TEC120E5L-30C12CF-83	●	12	12	5	0.4	30	83	Cylindrical
TEC160E5L-40C16CF-100	●	16	16	5	0.5	40	100	Cylindrical
TEC200E5L-50C20CF-125	●	20	20	5	0.5	50	125	Cylindrical

● : Line up

VARIABLEMEISTER

TEC**H7**CF

7 flute chatter dampening endmill, variable helix and variable pitch, for high speed finishing



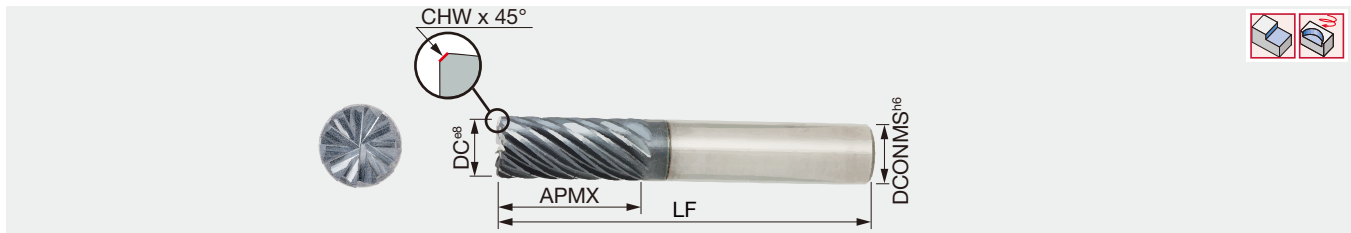
Designation	AH710	DC	DCONMS	NOF	RE	CHW	APMX	FHA	LF	Shank
TEC060H7-12C06CF-M57	●	6	6	7	-	-	12	37°	57	Cylindrical
TEC060H7-12C06CF-R02M57	●	6	6	7	0.2	-	12	37°	57	Cylindrical
TEC060H7-18C06CF-M65	●	6	6	7	-	0.2	18	37°	65	Cylindrical
TEC060H7-24C06CF-70	●	6	6	7	-	0.2	24	37°	70	Cylindrical
TEC060H7-36C06CF-90	●	6	6	7	-	0.2	36	37°	90	Cylindrical
TEC080H7-16C08CF-M63	●	8	8	7	-	-	16	37°	63	Cylindrical
TEC080H7-16C08CF-R04M63	●	8	8	7	0.4	-	16	37°	63	Cylindrical
TEC080H7-24C08CF-M90	●	8	8	7	-	0.2	24	37°	90	Cylindrical
TEC080H7-32C08CF-90	●	8	8	7	-	0.2	32	37°	90	Cylindrical
TEC080H7-48C08CF-110	●	8	8	7	-	0.2	48	37°	110	Cylindrical
TEC100H7-20C10CF-M72	●	10	10	7	-	-	20	37°	72	Cylindrical
TEC100H7-20C10CF-R05M72	●	10	10	7	0.5	-	20	37°	72	Cylindrical
TEC100H7-20W10CF-M72	●	10	10	7	-	-	20	37°	72	Weldon
TEC100H7-30C10CF-M85	●	10	10	7	-	0.3	30	37°	85	Cylindrical
TEC100H7-40C10CF-100	●	10	10	7	-	0.3	40	37°	100	Cylindrical
TEC100H7-60C10CF-130	●	10	10	7	-	0.3	60	37°	130	Cylindrical
TEC120H7-24C12CF-M83	●	12	12	7	-	-	24	37°	83	Cylindrical
TEC120H7-24C12CF-R06M83	●	12	12	7	0.6	-	24	37°	83	Cylindrical
TEC120H7-24W12CF-M83	●	12	12	7	-	-	24	37°	83	Weldon
TEC120H7-36C12CF-M95	●	12	12	7	-	0.3	36	37°	95	Cylindrical
TEC120H7-48C12CF-110	●	12	12	7	-	0.3	48	37°	110	Cylindrical
TEC120H7-72C12CF-140	●	12	12	7	-	0.3	72	37°	140	Cylindrical
TEC160H7-32C16CF-M92	●	16	16	7	-	-	32	37°	92	Cylindrical
TEC160H7-32C16CF-R08M92	●	16	16	7	0.8	-	32	37°	92	Cylindrical
TEC160H7-32W16CF-M92	●	16	16	7	-	-	32	37°	92	Weldon
TEC160H7-48C12CF-M110	●	16	16	7	-	0.3	48	37°	110	Cylindrical
TEC160H7-64C16CF-131	●	16	16	7	-	0.3	64	37°	131	Cylindrical
TEC160H7-96C16CF-175	●	16	16	7	-	0.3	96	37°	175	Cylindrical
TEC200H7-40C20CF-M104	●	20	20	7	-	-	40	37°	104	Cylindrical
TEC200H7-40C20CF-R10M104	●	20	20	7	1	-	40	37°	104	Cylindrical
TEC200H7-40W20CF-M104	●	20	20	7	-	-	40	37°	104	Weldon
TEC200H7-60C20CF-M140	●	20	20	7	-	0.4	60	37°	140	Cylindrical
TEC200H7-80C20CF-140	●	20	20	7	-	0.4	80	37°	140	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → I025

TEC**H**CF

6 - 20 flute chatter dampening endmill, variable helix and variable pitch, for high speed finishing

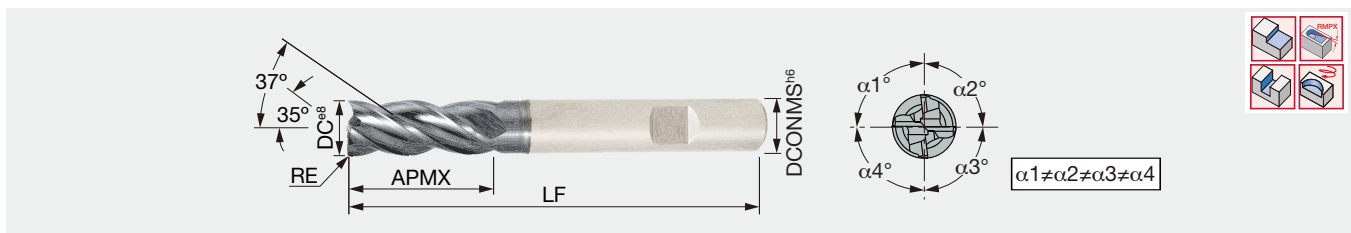


Designation	AH710	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TEC060H6-12C06CF-H57	●	6	6	6	0.2	12	57	Cylindrical
TEC080H8-16C08CF-H63	●	8	8	8	0.2	16	63	Cylindrical
TEC100H10-20C10CF-H72	●	10	10	10	0.3	20	72	Cylindrical
TEC120H12-24C12CF-H83	●	12	12	12	0.3	24	83	Cylindrical
TEC160H16-32C16CF-H92	●	16	16	16	0.3	32	92	Cylindrical
TEC200H20-40C20CFH104	●	20	20	20	0.4	40	104	Cylindrical

● : Line up

TECK**H4M**CF-R

4 flute chatter dampening endmill, variable helix and variable pitch, for titanium machining

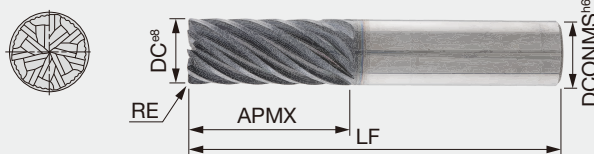


Designation	AH725	DC	DCONMS	NOF	RE	APMX	RMPX	LF	Shank
TECK040H4M-08C06CF-R02	●	4	6	4	0.2	8	5°	57	Cylindrical
TECK050H4M-10C06CF-R02	●	5	6	4	0.2	10	5°	57	Cylindrical
TECK060H4M-12C06CF-R02	●	6	6	4	0.2	12	5°	57	Cylindrical
TECK060H4M-12W06CF-R02	●	6	6	4	0.2	12	5°	57	Weldon
TECK080H4M-16C08CF-R04	●	8	8	4	0.4	16	5°	63	Cylindrical
TECK080H4M-16W08CF-R04	●	8	8	4	0.4	16	5°	63	Weldon
TECK100H4M-20C10CF-R05	●	10	10	4	0.5	20	5°	72	Cylindrical
TECK100H4M-20W10CF-R05	●	10	10	4	0.5	20	5°	72	Weldon
TECK120H4M-24C12CF-R06	●	12	12	4	0.6	24	5°	83	Cylindrical
TECK120H4M-24W12CF-R06	●	12	12	4	0.6	24	5°	83	Weldon
TECK160H4M-32C16CF-R08	●	16	16	4	0.8	32	5°	92	Cylindrical
TECK160H4M-32W16CF-R08	●	16	16	4	0.8	32	5°	92	Weldon
TECK200H4M-40C20CF-R10	●	20	20	4	1	40	5°	104	Cylindrical
TECK200H4M-40W20CF-R10	●	20	20	4	1	40	5°	104	Weldon

● : Line up

VARIABLE MEISTER**TECK**H7/9M**CF-R**

7 - 9 flute chatter dampening endmill, variable helix and variable pitch, for titanium machining

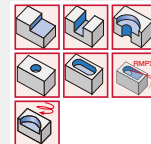
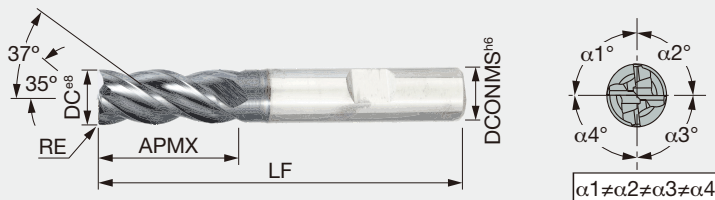


Designation	AH725	DC	DCONMS	NOF	RE	APMX	RMPX	LF	Shank
TECK060H7-13C06CF-R02T57	●	6	6	7	0.2	13	5°	57	Cylindrical
TECK060H7-13W06CF-R02T57	●	6	6	7	0.2	13	5°	57	Weldon
TECK080H7-19C08CF-R04T63	●	8	8	7	0.4	19	5°	63	Cylindrical
TECK080H7-19W08CF-R04T63	●	8	8	7	0.4	19	5°	63	Weldon
TECK100H7-22C10CF-R05T72	●	10	10	7	0.5	22	5°	72	Cylindrical
TECK100H7-22W10CF-R05T72	●	10	10	7	0.5	22	5°	72	Weldon
TECK120H7-26C12CF-R06T83	●	12	12	7	0.6	26	5°	83	Cylindrical
TECK120H7-26W12CF-R06T83	●	12	12	7	0.6	26	5°	83	Weldon
TECK160H9-32C16CF-R08T92	●	16	16	9	0.8	32	5°	92	Cylindrical
TECK160H9-32W16CF-R08T92	●	16	16	9	0.8	32	5°	92	Weldon
TECK200H9-38C20CF-R10T104	●	20	20	9	1	38	5°	104	Cylindrical
TECK200H9-38W20CF-R10T104	●	20	20	9	1	38	5°	104	Weldon

● : Line up

TECH4M**CF-R**

4 flute chatter dampening endmill, variable helix and variable pitch



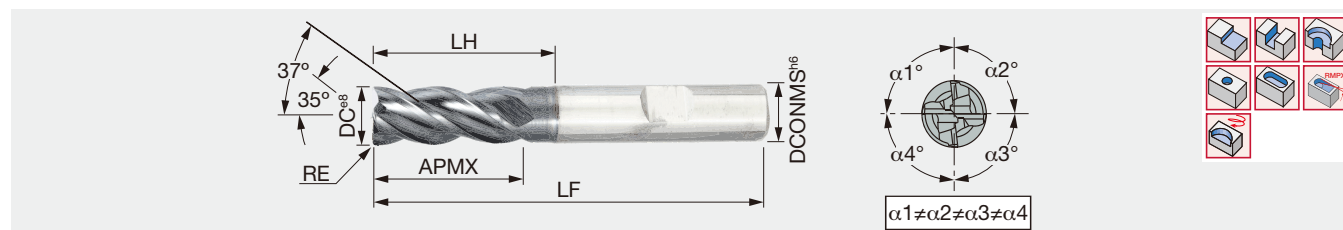
Designation	AH725	DC	DCONMS	NOF	RE	APMX	RMPX	LF	Shank
TEC060H4M-12C06CF-R02-57	●	6	6	4	0.2	12	5°	57	Cylindrical
TEC060H4M-12W06CF-R02-57	●	6	6	4	0.2	12	5°	57	Weldon
TEC080H4M-16C08CF-R04-63	●	8	8	4	0.4	16	5°	63	Cylindrical
TEC080H4M-16W08CF-R04-63	●	8	8	4	0.4	16	5°	63	Weldon
TEC100H4M-20C10CF-R05-72	●	10	10	4	0.5	20	5°	72	Cylindrical
TEC100H4M-20W10CF-R05-72	●	10	10	4	0.5	20	5°	72	Weldon
TEC120H4M-24C12CF-R06-83	●	12	12	4	0.6	24	5°	83	Cylindrical
TEC120H4M-24W12CF-R06-83	●	12	12	4	0.6	24	5°	83	Weldon
TEC140H4M-28C14CFR0.7-83	●	14	14	4	0.7	28	5°	83	Cylindrical
TEC140H4M-28W14CFR0.7-83	●	14	14	4	0.7	28	5°	83	Weldon
TEC160H4M-32C16CF-R08-92	●	16	16	4	0.8	32	5°	92	Cylindrical
TEC160H4M-32W16CF-R08-92	●	16	16	4	0.8	32	5°	92	Weldon
TEC200H4M-40C20CF-R10-104	●	20	20	4	1	40	5°	104	Cylindrical
TEC200H4M-40W20CF-R10-104	●	20	20	4	1	40	5°	104	Weldon
TEC250H4M-50C25CF-R12-121	●	25	25	4	1.2	50	5°	121	Cylindrical
TEC250H4M-50W25CF-R12-121	●	25	25	4	1.2	50	5°	121	Weldon

● : Line up

Reference pages: Standard cutting conditions → **I025**

TEC**H4X**CF-R

4 flute chatter dampening endmill, variable helix and variable pitch, extra long neck type



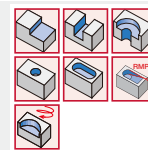
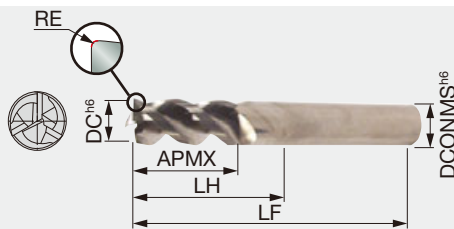
Designation	AH725	DC	DCONMS	NOF	RE	APMX	RMPX	LH	LF	Shank
TEC060H4X-12/25C06CF-R02	●	6	6	4	0.2	12	5°	25	61	Cylindrical
TEC060H4X-12/25W06CF-R02	●	6	6	4	0.2	12	5°	25	61	Weldon
TEC080H4X-16/32C08CF-R04	●	8	8	4	0.4	16	5°	32	68	Cylindrical
TEC080H4X-16/32W08CF-R04	●	8	8	4	0.4	16	5°	32	68	Weldon
TEC100H4X-20/40C10CF-R05	●	10	10	4	0.5	20	5°	40	80	Cylindrical
TEC100H4X-20/40W10CF-R05	●	10	10	4	0.5	20	5°	40	80	Weldon
TEC120H4X-24/50C12CF-R06	●	12	12	4	0.6	24	5°	50	95	Cylindrical
TEC120H4X-24/50W12CF-R06	●	12	12	4	0.6	24	5°	50	95	Weldon
TEC160H4X-32/64C16CF-R08	●	16	16	4	0.8	32	5°	64	115	Cylindrical
TEC160H4X-32/64W16CF-R08	●	16	16	4	0.8	32	5°	64	115	Weldon
TEC200H4X-40/75C20CF-R10	●	20	20	4	1	40	5°	75	125	Cylindrical
TEC200H4X-40/75W20CF-R10	●	20	20	4	1	40	5°	75	125	Weldon

● : Line up

VARIABLE MEISTER

TECA**H3**CF-R

3 flute endmill, 39°-41° variable helix and variable pitch, center cutting edge, for aluminium machining



Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LH	LF	Shank
TECA010H3-04C06CF-R05	●	1	6	3	0.05	4	6	57	Cylindrical
TECA015H3-04/06C06CF-R01	●	1.5	6	3	0.1	4	6	57	Cylindrical
TECA020H3-05/08C06CF-R01	●	2	6	3	0.1	5	8	57	Cylindrical
TECA025H3-05/08C06CF-R01	●	2.5	6	3	0.1	5	8	57	Cylindrical
TECA030H3-07/12C06CF-R01	●	3	6	3	0.1	7	12	57	Cylindrical
TECA040H3-10/16C06CF-R02	●	4	6	3	0.2	10	16	57	Cylindrical
TECA050H3-12/20C06CF-R02	●	5	6	3	0.2	12	20	57	Cylindrical
TECA060H3-09/18C06CF-R02	●	6	6	3	0.2	9	18	57	Cylindrical
TECA060H3-09/18C06CF-R04	●	6	6	3	0.4	9	18	57	Cylindrical
TECA060H3-09/18C06CF-R08	●	6	6	3	0.8	9	18	57	Cylindrical
TECA060H3-09/30C06CF-R02	●	6	6	3	0.2	9	30	65	Cylindrical
TECA060H3-09/30C06CF-R04	●	6	6	3	0.4	9	30	65	Cylindrical
TECA060H3-09/30C06CF-R08	●	6	6	3	0.8	9	30	65	Cylindrical
TECA060H3-14/24C06CF-R02	●	6	6	3	0.2	14	24	60	Cylindrical
TECA080H3-12/24C08CF-R02	●	8	8	3	0.2	12	24	63	Cylindrical
TECA080H3-12/24C08CF-R04	●	8	8	3	0.4	12	24	63	Cylindrical
TECA080H3-12/24C08CF-R08	●	8	8	3	0.8	12	24	63	Cylindrical
TECA080H3-12/24C08CF-R30	●	8	8	3	3	12	24	63	Cylindrical
TECA080H3-12/40C08CF-R02	●	8	8	3	0.2	12	40	79	Cylindrical
TECA080H3-12/40C08CF-R04	●	8	8	3	0.4	12	40	79	Cylindrical
TECA080H3-12/40C08CF-R08	●	8	8	3	0.8	12	40	79	Cylindrical
TECA080H3-18/32C08CF-R02	●	8	8	3	0.2	18	32	68	Cylindrical
TECA100H3-15/30C10CF-R02	●	10	10	3	0.2	15	30	72	Cylindrical
TECA100H3-15/30C10CF-R04	●	10	10	3	0.4	15	30	72	Cylindrical
TECA100H3-15/30C10CF-R08	●	10	10	3	0.8	15	30	72	Cylindrical
TECA100H3-15/30C10CF-R16	●	10	10	3	1.6	15	30	72	Cylindrical
TECA100H3-15/30C10CF-R30	●	10	10	3	3	15	30	72	Cylindrical
TECA100H3-15/50C10CF-R02	●	10	10	3	0.2	15	50	92	Cylindrical
TECA100H3-15/50C10CF-R04	●	10	10	3	0.4	15	50	92	Cylindrical
TECA100H3-15/50C10CF-R08	●	10	10	3	0.8	15	50	92	Cylindrical
TECA100H3-15/50C10CF-R16	●	10	10	3	1.6	15	50	92	Cylindrical
TECA100H3-15/50C10CF-R20	●	10	10	3	2	15	50	92	Cylindrical
TECA100H3-15/50C10CF-R30	●	10	10	3	3	15	50	92	Cylindrical
TECA100H3-22/40C10CF-R02	●	10	10	3	0.2	22	40	80	Cylindrical
TECA100H3-22/40C10CF-R30	●	10	10	3	3	22	40	80	Cylindrical
TECA120H3-18/36C12CF-R02	●	12	12	3	0.2	18	36	83	Cylindrical
TECA120H3-18/36C12CF-R04	●	12	12	3	0.4	18	36	83	Cylindrical
TECA120H3-18/36C12CF-R08	●	12	12	3	0.8	18	36	83	Cylindrical
TECA120H3-18/36C12CF-R16	●	12	12	3	1.6	18	36	83	Cylindrical
TECA120H3-18/36C12CF-R20	●	12	12	3	2	18	36	83	Cylindrical
TECA120H3-18/36C12CF-R25	●	12	12	3	2.5	18	36	83	Cylindrical
TECA120H3-18/60C12CF-R02	●	12	12	3	0.2	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R04	●	12	12	3	0.4	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R08	●	12	12	3	0.8	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R16	●	12	12	3	1.6	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R20	●	12	12	3	2	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R25	●	12	12	3	2.5	18	60	100	Cylindrical
TECA120H3-18/60C12CF-R30	●	12	12	3	3	18	60	100	Cylindrical
TECA160H3-24/48C16CF-R02	●	16	16	3	0.2	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R04	●	16	16	3	0.4	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R08	●	16	16	3	0.8	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R16	●	16	16	3	1.6	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R20	●	16	16	3	2	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R25	●	16	16	3	2.5	24	48	92	Cylindrical

●: Line up

Reference pages: Standard cutting conditions → **I025**

Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LH	LF	Shank
TECA160H3-24/48C16CF-R30	●	16	16	3	3	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R32	●	16	16	3	3.2	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R40	●	16	16	3	4	24	48	92	Cylindrical
TECA160H3-24/48C16CF-R50	●	16	16	3	5	24	48	92	Cylindrical
TECA160H3-24/80C16CF-R02	●	16	16	3	0.2	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R04	●	16	16	3	0.4	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R08	●	16	16	3	0.8	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R16	●	16	16	3	1.6	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R20	●	16	16	3	2	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R25	●	16	16	3	2.5	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R30	●	16	16	3	3	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R32	●	16	16	3	3.2	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R40	●	16	16	3	4	24	80	128	Cylindrical
TECA160H3-24/80C16CF-R50	●	16	16	3	5	24	80	128	Cylindrical
TECA160H3-34/64C16CF-R02	●	16	16	3	0.2	34	64	115	Cylindrical
TECA200H3-30/100C20CF-R02	●	20	20	3	0.2	30	100	150	Cylindrical
TECA200H3-30/100C20CF-R04	●	20	20	3	0.4	30	100	150	Cylindrical
TECA200H3-30/100C20CF-R08	●	20	20	3	0.8	30	100	150	Cylindrical
TECA200H3-30/100C20CF-R32	●	20	20	3	3.2	30	100	150	Cylindrical
TECA200H3-30/100C20CF-R40	●	20	20	3	4	30	100	150	Cylindrical
TECA200H3-30/100C20CF-R50	●	20	20	3	5	30	100	150	Cylindrical
TECA200H3-30/60C20CF-R02	●	20	20	3	0.2	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R04	●	20	20	3	0.4	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R08	●	20	20	3	0.8	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R16	●	20	20	3	1.6	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R20	●	20	20	3	2	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R32	●	20	20	3	3.2	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R40	●	20	20	3	4	30	60	110	Cylindrical
TECA200H3-30/60C20CF-R50	●	20	20	3	5	30	60	110	Cylindrical
TECA200H3-42/80C20CF-R02	●	20	20	3	0.2	42	80	130	Cylindrical
TECA250H3-38/125C25CF-R02	●	25	25	3	0.2	38	125	185	Cylindrical
TECA250H3-38/125C25CF-R08	●	25	25	3	0.8	38	125	185	Cylindrical
TECA250H3-38/125C25CF-R16	●	25	25	3	1.6	38	125	185	Cylindrical
TECA250H3-38/125C25CF-R20	●	25	25	3	2	38	125	185	Cylindrical
TECA250H3-38/125C25CF-R40	●	25	25	3	4	38	125	185	Cylindrical
TECA250H3-38/125C25CF-R50	●	25	25	3	5	38	125	185	Cylindrical
TECA250H3-38/75C25CF-R02	●	25	25	3	0.2	38	75	130	Cylindrical
TECA250H3-38/75C25CF-R04	●	25	25	3	0.4	38	75	130	Cylindrical
TECA250H3-38/75C25CF-R16	●	25	25	3	1.6	38	75	130	Cylindrical
TECA250H3-38/75C25CF-R20	●	25	25	3	2	38	75	130	Cylindrical
TECA250H3-38/75C25CF-R32	●	25	25	3	3.2	38	75	130	Cylindrical
TECA250H3-38/75C25CF-R50	●	25	25	3	5	38	75	130	Cylindrical
TECA250H3-52/100C25CF-R02	●	25	25	3	0.2	52	100	156	Cylindrical

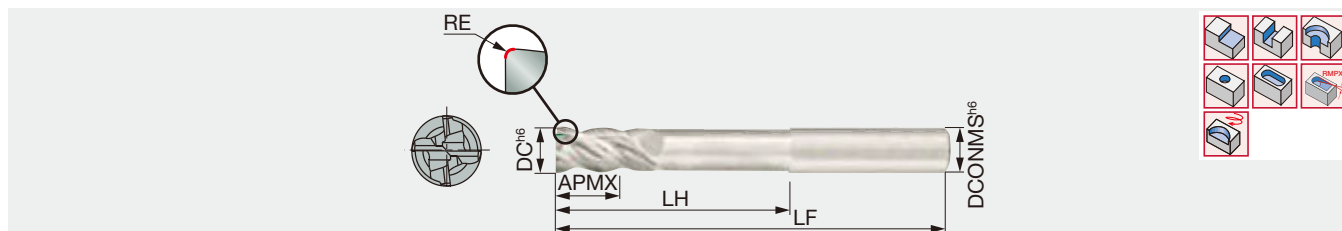
● : Line up

Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index



VARIABLE MEISTER**TECA**H4**CF-R**

4 flute endmill, variable helix and variable pitch, relieved neck type, for aluminium machining (1.5xD, 2xD)

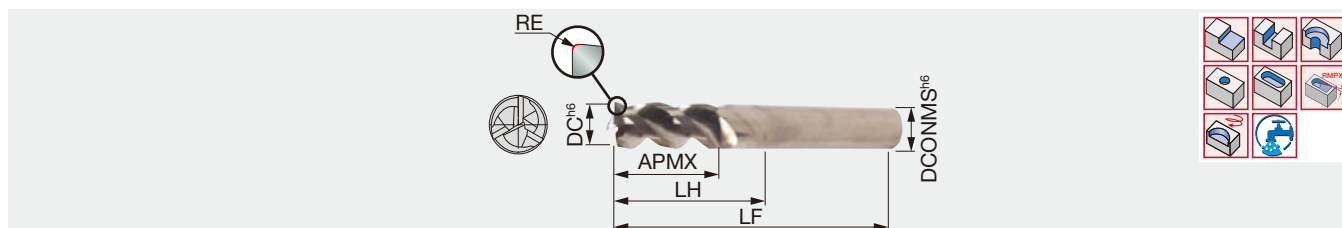


Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LH	LF	Shank
TECA060H4-09/30C06CF-R02	●	6	6	4	0.2	9	30	65	Cylindrical
TECA060H4-12/18C06CF-R02	●	6	6	4	0.2	12	18	57	Cylindrical
TECA080H4-12/40C08CF-R02	●	8	8	4	0.2	12	40	79	Cylindrical
TECA080H4-16/24C08CF-R02	●	8	8	4	0.2	16	24	63	Cylindrical
TECA100H4-15/50C10CF-R02	●	10	10	4	0.2	15	50	92	Cylindrical
TECA100H4-20/30C10CF-R02	●	10	10	4	0.2	20	30	72	Cylindrical
TECA120H4-18/60C12CF-R02	●	12	12	4	0.2	18	60	100	Cylindrical
TECA120H4-24/36C12CF-R02	●	12	12	4	0.2	24	36	83	Cylindrical
TECA160H4-24/80C16CF-R02	●	16	16	4	0.2	24	80	128	Cylindrical
TECA160H4-32/48C16CF-R02	●	16	16	4	0.2	32	48	100	Cylindrical

● : Line up

TECAH3**CF-R**C**

3 flute endmill, variable helix and variable pitch, center cutting edge, for aluminium machining



Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LH	LF	Coolant hole	Shank
TECA060H3-12/18C06CF-R02C	●	6	6	3	0.2	12	18	57	With	Cylindrical
TECA060H3-12/30C06CF-R02C	●	6	6	3	0.2	12	30	65	With	Cylindrical
TECA080H3-16/24C08CF-R02C	●	8	8	3	0.2	16	24	63	With	Cylindrical
TECA080H3-16/40C08CF-R02C	●	8	8	3	0.2	16	40	79	With	Cylindrical
TECA100H3-20/30C10CF-R02C	●	10	10	3	0.2	20	30	72	With	Cylindrical
TECA100H3-20/50C10CF-R02C	●	10	10	3	0.2	20	50	100	With	Cylindrical
TECA120H3-24/36C12CF-R02C	●	12	12	3	0.2	24	36	83	With	Cylindrical
TECA120H3-24/60C12CF-R02C	●	12	12	3	0.2	24	60	100	With	Cylindrical
TECA160H3-32/48C16CF-R02C	●	16	16	3	0.2	32	48	92	With	Cylindrical
TECA160H3-32/80C16CF-R02C	●	16	16	3	0.2	32	80	128	With	Cylindrical
TECA250H3-50/75C25CF-R02C	●	25	25	3	0.2	50	75	130	With	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I025**

STANDARD CUTTING CONDITIONS

Slotting / Roughing ($a_e = 0.4 \times D$ or over)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap (Slotting)
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	140 - 180	0.03 - 0.045	0.035 - 0.055	0.05 - 0.07	2xD
	Alloy steel	- 300 HB	70 - 150	0.025 - 0.04	0.035 - 0.055	0.05 - 0.07	2xD
M	Stainless steel	- 200 HB	60 - 100	0.025 - 0.045	0.035 - 0.05	0.04 - 0.065	1xD
K	Cast iron	150 - 200 HB	80 - 180	0.025 - 0.05	0.035 - 0.065	0.05 - 0.075	2xD
N	Aluminium alloy	-	300 - 750	0.025 - 0.05	0.035 - 0.065	0.035 - 0.09	2xD
S	Titanium alloy	- 40 HRC	20 - 50	0.025 - 0.04	0.03 - 0.05	0.035 - 0.085	1xD
H	Hardened steel	- 60 HRC	20 - 30	0.01 - 0.02	0.02 - 0.04	0.03 - 0.06	0.5xD

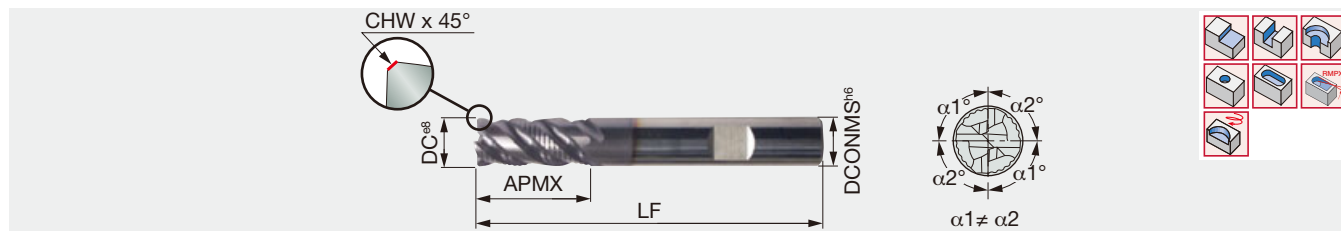
Semi-finishing / Shouldering ($a_e = 0.1 \sim 0.4 \times D$)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	150 - 220	0.035 - 0.075	0.075 - 0.09	0.085 - 0.1	2xD
	Alloy steel	- 300 HB	70 - 160	0.025 - 0.065	0.05 - 0.09	0.055 - 0.09	2xD
M	Stainless steel	- 200 HB	80 - 130	0.03 - 0.05	0.04 - 0.06	0.05 - 0.065	2xD
K	Cast iron	150 - 250 HB	130 - 220	0.035 - 0.065	0.05 - 0.075	0.075 - 0.09	2xD
N	Aluminium alloy	-	350 - 850	0.05 - 0.075	0.075 - 0.1	0.1 - 0.125	2xD
S	Titanium alloy	- 40 HRC	40 - 60	0.035 - 0.05	0.04 - 0.065	0.06 - 0.1	2xD
H	Hardened steel	- 60 HRC	30 - 70	0.015 - 0.045	0.03 - 0.05	0.05 - 0.075	2xD

Finishing (feed rate depending on required accuracy) / High feed machining at low depth of cut ($a_e = 0.05 \sim 0.1 \times D$)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	170 - 280	0.06 - 0.09	0.085 - 0.1	0.1 - 0.125	apmax
	Alloy steel	- 300 HB	110 - 220	0.06 - 0.09	0.085 - 0.1	0.1 - 0.125	apmax
M	Stainless steel	- 200 HB	100 - 160	0.035 - 0.055	0.05 - 0.065	0.055 - 0.075	apmax
K	Cast iron	150 - 250 HB	180 - 280	0.04 - 0.075	0.075 - 0.08	0.08 - 0.1	apmax
N	Aluminium alloy	-	350 - 900	0.055 - 0.09	0.085 - 0.125	0.125 - 0.18	apmax
S	Titanium alloy	- 40 HRC	50 - 70	0.04 - 0.065	0.05 - 0.075	0.075 - 0.11	apmax
H	Hardened steel	- 60 HRC	40 - 80	0.025 - 0.05	0.04 - 0.065	0.06 - 0.08	apmax

- When the depth of cut (a_e) is closer to the upper limit, please start with a lower limit value of cutting speed (Vc).
- Please set the cutting speed and the feed rate lower for the items with long slot according to how chattering occurs.
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed and feed at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed and feed by 20 to 40%.

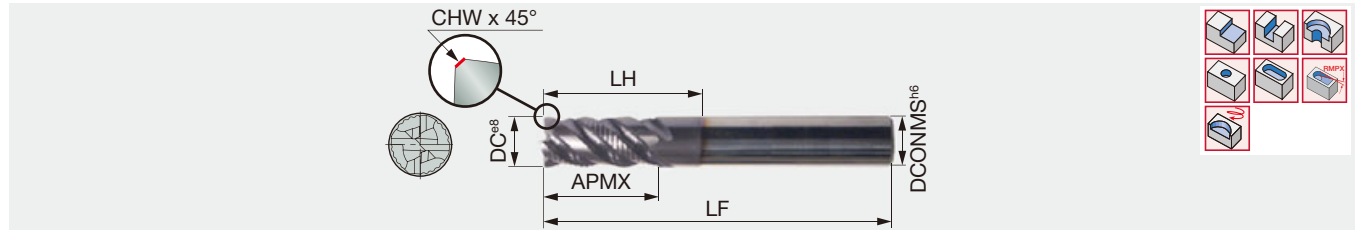


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TEFS060E44-14C06CF57	●	6	6	4	0.25	14	57	Cylindrical
TEFS060E44-14W06CF-57	●	6	6	4	0.25	14	57	Weldon
TEFS080E44-18C08CF63	●	8	8	4	0.3	18	63	Cylindrical
TEFS080E44-18W08CF-63	●	8	8	4	0.3	18	63	Weldon
TEFS100E44-22C10CF72	●	10	10	4	0.4	22	72	Cylindrical
TEFS100E44-22W10CF-72	●	10	10	4	0.4	22	72	Weldon
TEFS120E44-26C12CF83	●	12	12	4	0.5	26	83	Cylindrical
TEFS120E44-26W12CF-83	●	12	12	4	0.5	26	83	Weldon
TEFS140E44-30C14CF83	●	14	14	4	0.5	30	83	Cylindrical
TEFS140E44-30W14CF-83	●	14	14	4	0.5	30	83	Weldon
TEFS160E44-34C16CF92	●	16	16	4	0.6	34	92	Cylindrical
TEFS160E44-34W16CF-92	●	16	16	4	0.6	34	92	Weldon
TEFS200E44-42C20CF104	●	20	20	4	0.6	42	104	Cylindrical
TEFS200E44-42W20CF-104	●	20	20	4	0.6	42	104	Weldon
TEFS250E44-52C25CF121	●	25	25	4	0.6	52	121	Cylindrical
TEFS250E44-52W25CF-121	●	25	25	4	0.6	52	121	Weldon

● : Line up

TEFS**B44

4 flute endmill, 45° helix angle, roughing and finishing combination type



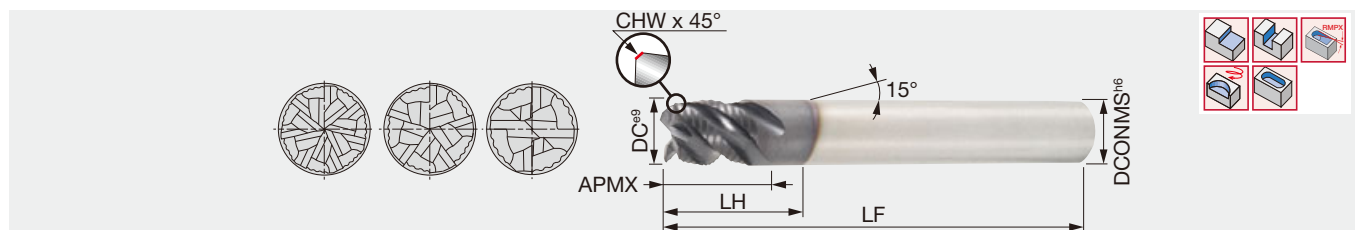
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TEFS040B44-10C06-57	●	4	6	4	0.12	10	-	57	Cylindrical
TEFS050B44-12C06-57	●	5	6	4	0.18	12	-	57	Cylindrical
TEFS060B44-14/20C06-57	●	6	6	4	0.25	14	20	57	Cylindrical
TEFS060B44-14/20W06-57	●	6	6	4	0.25	14	20	57	Weldon
TEFS060B44-14C06-57	●	6	6	4	0.25	14	-	57	Cylindrical
TEFS060B44-14W06-57	●	6	6	4	0.25	14	-	57	Weldon
TEFS080B44-18/26C08-63	●	8	8	4	0.3	18	26	63	Cylindrical
TEFS080B44-18/26W08-63	●	8	8	4	0.3	18	26	63	Weldon
TEFS080B44-18C08-63	●	8	8	4	0.3	18	-	63	Cylindrical
TEFS080B44-18W08-63	●	8	8	4	0.3	18	-	63	Weldon
TEFS100B44-22/32C10-72	●	10	10	4	0.3	22	32	72	Cylindrical
TEFS100B44-22/32W10-72	●	10	10	4	0.3	22	32	72	Weldon
TEFS100B44-22C10-72	●	10	10	4	0.3	22	-	72	Cylindrical
TEFS100B44-22W10-72	●	10	10	4	0.3	22	-	72	Weldon
TEFS120B44-26/38C12-83	●	12	12	4	0.4	26	38	83	Cylindrical
TEFS120B44-26/38W12-83	●	12	12	4	0.4	26	38	83	Weldon
TEFS120B44-26C12-83	●	12	12	4	0.4	26	-	83	Cylindrical
TEFS120B44-26W12-83	●	12	12	4	0.4	26	-	83	Weldon
TEFS140B44-30C14-83	●	14	14	4	0.4	30	-	83	Cylindrical
TEFS140B44-30W14-83	●	14	14	4	0.4	30	-	83	Weldon
TEFS160B44-34/50C16-100	●	16	16	4	0.6	34	50	100	Cylindrical
TEFS160B44-34/50W16-100	●	16	16	4	0.6	34	50	100	Weldon
TEFS160B44-34C16-92	●	16	16	4	0.6	34	-	92	Cylindrical
TEFS160B44-34W16-92	●	16	16	4	0.6	34	-	92	Weldon
TEFS200B44-42/62C20-125	●	20	20	4	0.6	42	62	125	Cylindrical
TEFS200B44-42/62W20-125	●	20	20	4	0.6	42	62	125	Weldon
TEFS200B44-42C20-104	●	20	20	4	0.6	42	-	104	Cylindrical
TEFS200B44-42W20-104	●	20	20	4	0.6	42	-	104	Weldon
TEFS250B44-52C25-121	●	25	25	4	0.6	52	-	121	Cylindrical
TEFS250B44-52W25-121	●	25	25	4	0.6	52	-	121	Weldon

● : Line up

SHREDMEISTER

TECR**B*S

4-7 flute roughing endmill, 45° helix angle, short type



Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TECR050B4S-05W06-57	●	5	6	4	0.2	5	10	57	Weldon
TECR060B4S-06W06-57	●	6	6	4	0.25	6	-	57	Weldon
TECR080B4S-08W08-63	●	8	8	4	0.25	8	-	63	Weldon
TECR100B4S-10W10-72	●	10	10	4	0.3	10	-	72	Weldon
TECR120B4S-12W12-83	●	12	12	4	0.35	12	-	83	Weldon
TECR160B5S-16W16-92	●	16	16	5	0.4	16	-	92	Weldon
TECR200B7S-20W20-104	●	20	20	7	0.4	20	-	104	Weldon

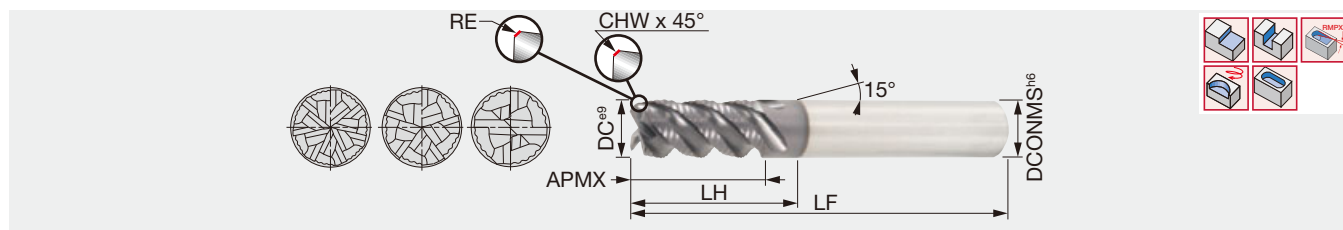
● : Line up

Reference pages: Standard cutting conditions → I033

SHREDMEISTER

TECR**B*M

4 - 7 flute roughing endmill, 45° helix angle

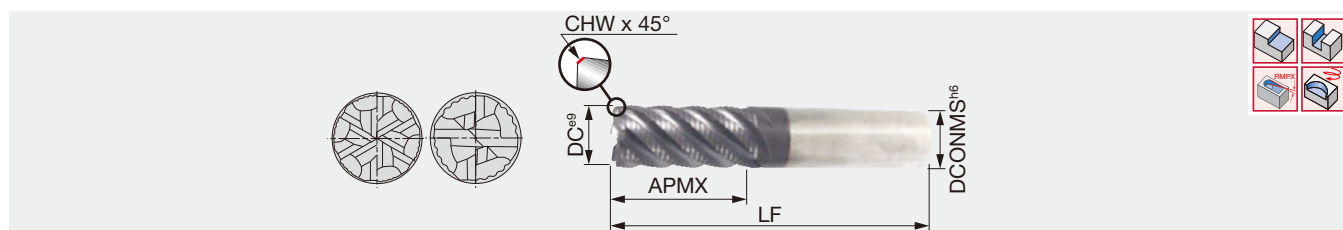


Designation	AH725	DC	DCONMS	NOF	CHW	RE	APMX	LH	LF		Shank
TECR050B4M-10C06-57	●	5	6	4	0.2	-	10	15	57	✓	Cylindrical
TECR050B4M-10W06-57	●	5	6	4	0.2	-	10	15	57	✓	Weldon
TECR060B4M-12C06-57	●	6	6	4	0.25	-	12	-	57	✓	Cylindrical
TECR060B4M-12W06-57	●	6	6	4	0.25	-	12	-	57	✓	Weldon
TECR080B4M-16C08-63	●	8	8	4	0.25	-	16	-	63	✓	Cylindrical
TECR080B4M-16W08-63	●	8	8	4	0.25	-	16	-	63	✓	Weldon
TECR100B4M-20C10-72	●	10	10	4	0.3	-	20	-	72	✓	Cylindrical
TECR100B4M-20C10-72R10	●	10	10	4	-	1	20	-	72	✓	Cylindrical
TECR100B4M-20W10-72	●	10	10	4	0.3	-	20	-	72	✓	Weldon
TECR120B4M-24C12-83	●	12	12	4	0.35	-	24	-	83	✓	Cylindrical
TECR120B4M-24C12-83R12	●	12	12	4	-	1.2	24	-	83	✓	Cylindrical
TECR120B4M-24W12-83	●	12	12	4	0.35	-	24	-	83	✓	Weldon
TECR120B4M-24W12-83R12	●	12	12	4	-	1.2	24	-	83	✓	Weldon
TECR160B5M-32C16-92	●	16	16	5	0.4	-	32	-	92		Cylindrical
TECR160B5M-32C16-92R16	●	16	16	5	-	1.6	32	-	92		Cylindrical
TECR160B5M-32W16-92	●	16	16	5	0.4	-	32	-	92		Weldon
TECR160B5M-32W16-92R16	●	16	16	5	-	1.6	32	-	92		Weldon
TECR200B7M-40C20-104	●	20	20	7	0.4	-	40	-	104		Cylindrical
TECR200B7M-40W20-104	●	20	20	7	0.4	-	40	-	104		Weldon

● : Line up

TECR**B*MF

4 - 6 flute roughing endmill, 45° helix angle



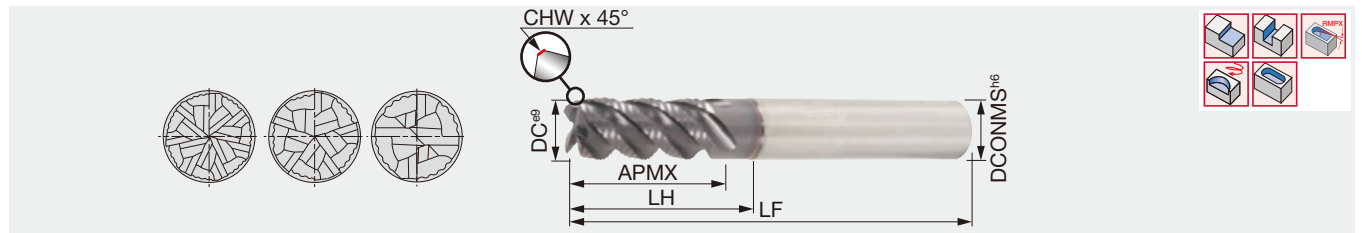
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TECR060B4MF-14W06-57	●	6	6	4	0.25	14	57	Weldon
TECR080B4MF-18W08-63	●	8	8	4	0.3	18	63	Weldon
TECR100B4MF-22W10-72	●	10	10	4	0.3	22	72	Weldon
TECR120B4MF-26W12-83	●	12	12	4	0.4	26	83	Weldon
TECR140B4MF-30W14-83	●	14	14	4	0.4	30	83	Weldon
TECR160B6MF-34W16-92	●	16	16	6	0.5	34	92	Weldon
TECR200B6MF-42W20-104	●	20	20	6	0.7	42	104	Weldon
TECR250B6MF-52W25-121	●	25	25	6	0.9	52	121	Weldon

● : Line up

Reference pages: Standard cutting conditions → **I033**

TECR**B*L

4 - 7 flute roughing endmill, 45° helix angle, long neck type (3xD)

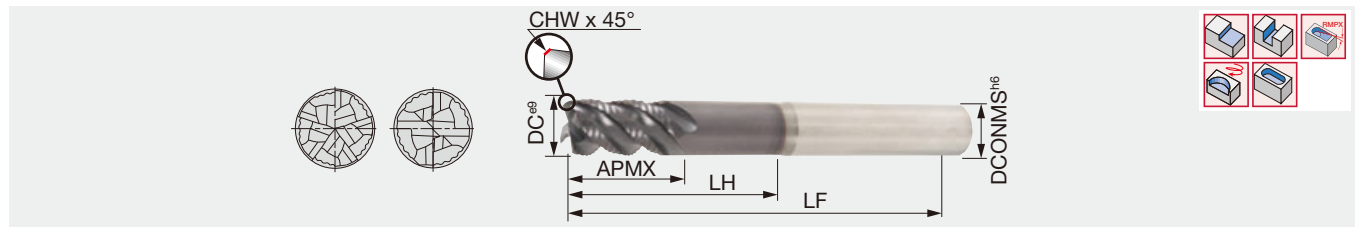


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF		Shank
TECR060B4L-12/18W06-57	●	6	6	4	0.25	12	18	57	✓	Weldon
TECR080B4L-16/24W08-63	●	8	8	4	0.25	16	24	63	✓	Weldon
TECR100B4L-20/30W10-72	●	10	10	4	0.3	20	30	72	✓	Weldon
TECR120B4L-24/36W12-83	●	12	12	4	0.35	24	36	83	✓	Weldon
TECR160B5L-32/48W16-100	●	16	16	5	0.4	32	48	100		Weldon
TECR200B7L-40/60W20-110	●	20	20	7	0.4	40	60	110		Weldon

● : Line up

TECR**B*X

4 - 5 flute roughing endmill, 45° helix angle, long neck type (4xD)

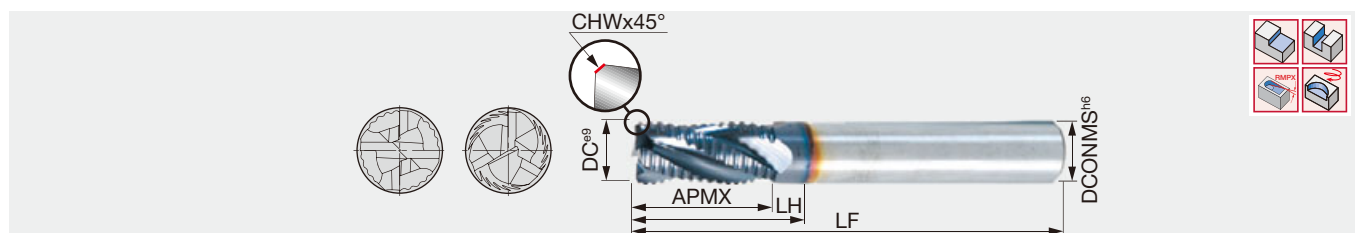


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF		Shank
TECR080B4X-12/32W08-68	●	8	8	4	0.25	12	32	68	✓	Weldon
TECR100B4X-15/40W10-80	●	10	10	4	0.3	15	40	80	✓	Weldon
TECR120B4X-18/48W12-100	●	12	12	4	0.35	18	48	100	✓	Weldon
TECR160B5X-24/64W16-115	●	16	16	5	0.4	24	64	115		Weldon

● : Line up

TERF**A/E

3 - 4 flute roughing endmill, 30° or 38 helix angle, for alloy steel and stainless steel



Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	FHA	Shank
TERF040E3-08C06-57	●	4	6	3	0.25	8	13	57	38°	Cylindrical
TERF050E3-10C06-57	●	5	6	3	0.3	10	17	57	38°	Cylindrical
TERF060E3-13C06-57	●	6	6	3	0.3	13	21	57	38°	Cylindrical
TERF070E3-20C08-63	●	7	8	3	0.3	20	26	63	38°	Cylindrical
TERF080E3-20C08-63	●	8	8	3	0.3	20	28	63	38°	Cylindrical
TERF090A4-22C10-72	●	9	10	4	0.3	22	30	72	30°	Cylindrical
TERF100A4-22C10-72	●	10	10	4	0.3	22	30	72	30°	Cylindrical
TERF110A4-25C12-83	●	11	12	4	0.3	25	32	83	30°	Cylindrical
TERF120A4-25C12-83	●	12	12	4	0.4	25	37	83	30°	Cylindrical
TERF140A4-25C14-83	●	14	14	4	0.5	25	37	83	30°	Cylindrical
TERF160A4-32C16-92	●	16	16	4	0.5	32	44	92	30°	Cylindrical
TERF180A4-32C18-92	●	18	18	4	0.5	32	44	92	30°	Cylindrical
TERF200A4-38C20-104	●	20	20	4	0.6	38	55	104	30°	Cylindrical

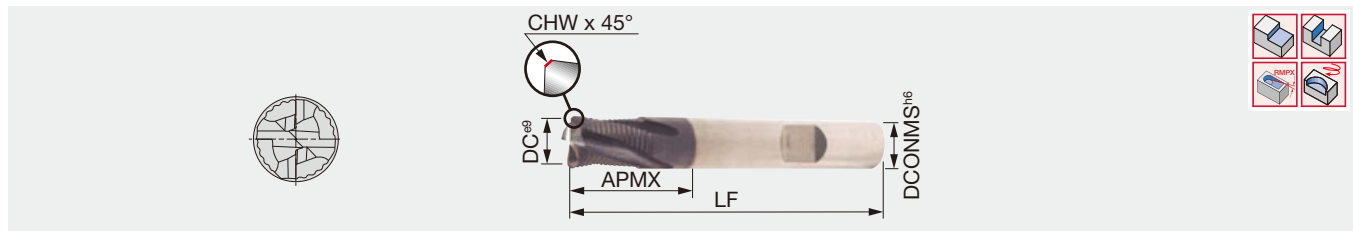
● : Line up

Reference pages: Standard cutting conditions → **I033**

SHREDMEISTER

TECR**T4M

4 flute roughing endmill, 20° helix angle

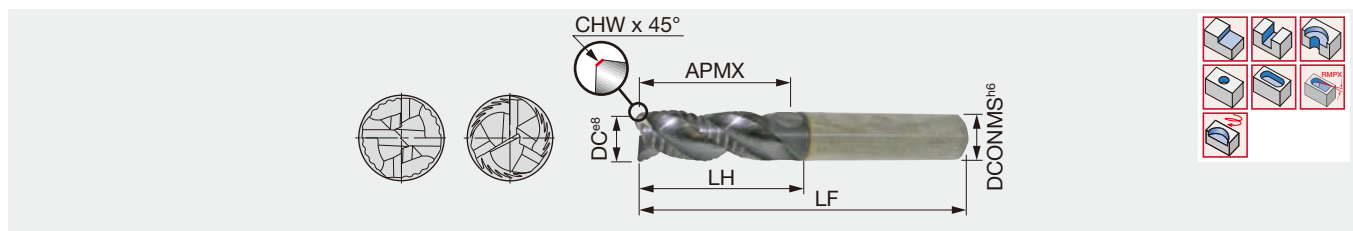


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	Shank
TECR060T4M-10W06-57	●	6	6	4	0.3	10	57	Weldon
TECR080T4M-16W08-63	●	8	8	4	0.4	16	63	Weldon
TECR100T4M-20W10-72	●	10	10	4	0.4	20	72	Weldon
TECR120T4M-24W12-83	●	12	12	4	0.4	24	83	Weldon
TECR160T4M-32W16-92	●	16	16	4	0.5	32	92	Weldon
TECR200T4M-40W20-104	●	20	20	4	0.5	40	104	Weldon

● : Line up

TECP**E*L

3 flute roughing endmill, 38° helix angle



Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TECP050E3L-12/17W06S57	●	5	6	3	0.3	12	17	57	Weldon
TECP060E3L-14/20W06S57	●	6	6	3	0.4	14	20	57	Weldon
TECP080E3L-18/26W08S63	●	8	8	3	0.4	18	26	63	Weldon
TECP100E3L-22/32W10S72	●	10	10	3	0.4	22	32	72	Weldon
TECP120E3L-26/38W12S83	●	12	12	3	0.4	26	38	83	Weldon
TECP140E3L-30/44W14S100	●	14	14	3	0.6	30	44	100	Weldon
TECP160E3L-34/50W16S100	●	16	16	3	0.5	34	50	100	Weldon
TECP200E3L-42/62W20S125	●	20	20	3	0.5	42	62	125	Weldon

4 flute roughing endmill, 38° helix angle

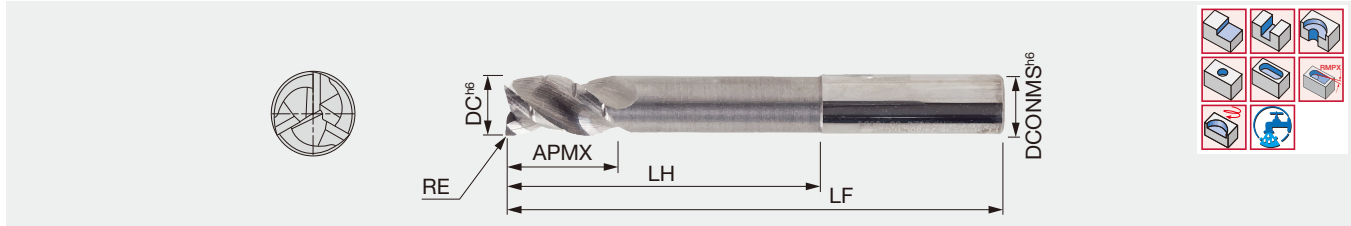
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TECP050E4L-12/17W06S57	●	5	6	4	0.3	12	17	57	Weldon
TECP060E4L-14/20W06S57	●	6	6	4	0.4	14	20	57	Weldon
TECP080E4L-18/26W08S63	●	8	8	4	0.4	18	26	63	Weldon
TECP100E4L-22/32W10S72	●	10	10	4	0.4	22	32	72	Weldon
TECP120E4L-26/38W12S83	●	12	12	4	0.4	26	38	83	Weldon
TECP140E4L-30/44W14S100	●	14	14	4	0.6	30	44	100	Weldon
TECP160E4L-34/50W16S100	●	16	16	4	0.5	34	50	100	Weldon
TECP200E4L-42/62W20S125	●	20	20	4	0.5	42	62	125	Weldon

● : Line up

Reference pages: Standard cutting conditions → **I033**

TEAP**H3**CFR**C

3 flute endmill, variable helix and variable pitch with chip splitter, relieved neck type, for aluminium machining

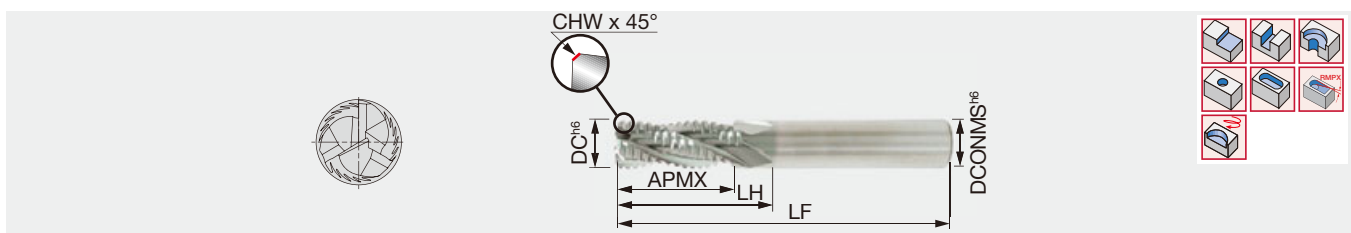


Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LH	LF	Coolant hole	Shank
TEAP100H3-15/50C10CFR02C	●	10	10	3	0.2	15	50	92	With	Cylindrical
TEAP100H3-22/40C10CFR02C	●	10	10	3	0.2	22	40	80	With	Cylindrical
TEAP120H3-18/60C12CFR02C	●	12	12	3	0.2	18	60	100	With	Cylindrical
TEAP120H3-26/48C12CFR02C	●	12	12	3	0.2	26	48	93	With	Cylindrical
TEAP160H3-24/80C16CFR02C	●	16	16	3	0.2	24	80	128	With	Cylindrical
TEAP160H3-34/64C16CFR02C	●	16	16	3	0.2	34	64	115	With	Cylindrical
TEAP200H3-42/80C20CFR02C	●	20	20	3	0.2	42	80	130	With	Cylindrical
TEAP200H3-30/100C20CFR02C	●	20	20	3	0.2	30	100	150	With	Cylindrical

● : Line up

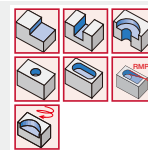
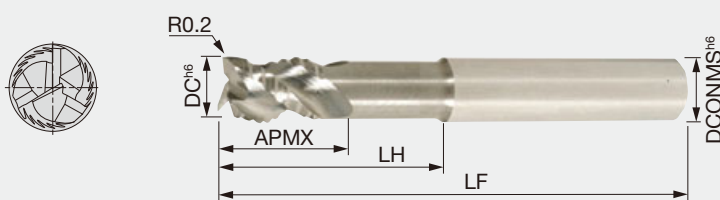
TERC**E3

3 flute roughing endmill, 38° helix angle, for aluminium alloy and non-ferrous metal



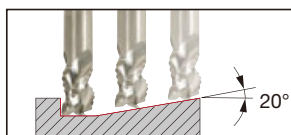
Designation	KS15F	DC	DCONMS	NOF	CHW	APMX	LH	LF	Shank
TERC060E3-13C06-57	●	6	6	3	0.5	13	21	57	Cylindrical
TERC080E3-20C08-63	●	8	8	3	0.5	20	28	63	Cylindrical
TERC100E3-22C10-72	●	10	10	3	0.6	22	30	72	Cylindrical
TERC120E3-25C12-83	●	12	12	3	0.6	25	37	83	Cylindrical
TERC140E3-25C14-83	●	14	14	3	0.6	25	37	83	Cylindrical
TERC160E3-32C16-92	●	16	16	3	0.6	32	44	92	Cylindrical
TERC200E3-38C20-104	●	20	20	3	0.7	38	55	104	Cylindrical
TERC250E3-45C25-121	●	25	25	3	0.7	45	64	121	Cylindrical

● : Line up



Designation	KS15F	DC	DCONMS	NOF	APMX	LH	LF	Shank
TECR060B3-09/21C06R02A57	●	6	6	3	9	21	57	Cylindrical
TECR060B3-09/21W06R02A57	●	6	6	3	9	21	57	Weldon
TECR060B3-09/30C06R02A65	●	6	6	3	9	30	65	Cylindrical
TECR060B3-09/30W06R02A65	●	6	6	3	9	30	65	Weldon
TECR080B3-12/27C08R02A63	●	8	8	3	12	27	63	Cylindrical
TECR080B3-12/27W08R02A63	●	8	8	3	12	27	63	Weldon
TECR080B3-12/40C08R02A78	●	8	8	3	12	40	78	Cylindrical
TECR080B3-12/40W08R02A78	●	8	8	3	12	40	78	Weldon
TECR100B3-12/31C10R02A72	●	10	10	3	12	31	72	Cylindrical
TECR100B3-12/31W10R02A72	●	10	10	3	12	31	72	Weldon
TECR100B3-12/50C10R02A100	●	10	10	3	12	50	100	Cylindrical
TECR100B3-12/50W10R02A100	●	10	10	3	12	50	100	Weldon
TECR120B3-12/37C12R02A83	●	12	12	3	12	37	83	Cylindrical
TECR120B3-12/37W12R02A83	●	12	12	3	12	37	83	Weldon
TECR120B3-14/55C12R02A100	●	12	12	3	14	55	100	Cylindrical
TECR120B3-14/55W12R02A100	●	12	12	3	14	55	100	Weldon
TECR160B3-14/43C16R02A92	●	16	16	3	14	43	92	Cylindrical
TECR160B3-14/43W16R02A92	●	16	16	3	14	43	92	Weldon
TECR160B3-18/80C16R02A150	●	16	16	3	18	80	150	Cylindrical
TECR160B3-18/80W16R02A150	●	16	16	3	18	80	150	Weldon
TECR200B3-17/53C20R02A104	●	20	20	3	17	53	104	Cylindrical
TECR200B3-17/53W20R02A104	●	20	20	3	17	53	104	Weldon
TECR200B3-22/80C20R02A150	●	20	20	3	22	80	150	Cylindrical
TECR200B3-22/80W20R02A150	●	20	20	3	22	80	150	Weldon

● : Line up



Rampdown angle

STANDARD CUTTING CONDITIONS

Slotting / Roughing ($a_e = 0.4 \times D$ or over)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap (Slotting)
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	140 - 180	0.035 - 0.055	0.045 - 0.07	0.06 - 0.0825	2xD
	Alloy steel	- 300 HB	70 - 150	0.03 - 0.045	0.045 - 0.07	0.06 - 0.0825	2xD
M	Stainless steel	- 200 HB	60 - 100	0.03 - 0.055	0.045 - 0.06	0.05 - 0.0675	1xD
K	Cast iron	150 - 200 HB	80 - 180	0.03 - 0.06	0.045 - 0.08	0.06 - 0.09	2xD
N	Aluminium alloy	-	300 - 750	0.03 - 0.06	0.045 - 0.08	0.04 - 0.105	2xD
S	Titanium alloy	- 40 HRC	20 - 50	0.03 - 0.045	0.04 - 0.06	0.04 - 0.105	1xD
H	Hardened steel	- 60 HRC	20 - 30	0.015 - 0.025	0.025 - 0.07	0.06 - 0.075	0.5xD

Semi-finishing / Shouldering ($a_e = 0.1 \sim 0.4 \times D$)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	150 - 220	0.045 - 0.09	0.09 - 0.11	0.1 - 0.12	2xD
	Alloy steel	- 300 HB	70 - 160	0.03 - 0.075	0.06 - 0.1	0.065 - 0.105	2xD
M	Stainless steel	- 200 HB	80 - 130	0.035 - 0.06	0.055 - 0.07	0.06 - 0.075	2xD
K	Cast iron	150 - 250 HB	130 - 220	0.045 - 0.075	0.06 - 0.09	0.09 - 0.105	2xD
N	Aluminium alloy	-	350 - 850	0.06 - 0.09	0.09 - 0.12	0.12 - 0.15	2xD
S	Titanium alloy	- 40 HRC	40 - 60	0.045 - 0.06	0.055 - 0.07	0.075 - 0.12	2xD
H	Hardened steel	- 60 HRC	30 - 70	0.02 - 0.055	0.045 - 0.07	0.06 - 0.09	2xD

Finishing (feed rate depending on required accuracy) / High feed machining at small width of cut ($a_e = 0.05 \sim 0.1 \times D$)

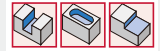
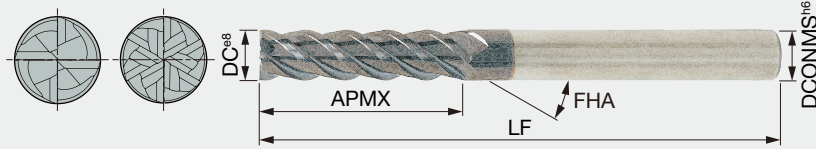
ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	170 - 280	0.075 - 0.11	0.11 - 0.12	0.12 - 0.15	apmax
	Alloy steel	- 300 HB	110 - 220	0.075 - 0.11	0.11 - 0.12	0.12 - 0.15	apmax
M	Stainless steel	- 200 HB	100 - 160	0.045 - 0.07	0.06 - 0.075	0.065 - 0.09	apmax
K	Cast iron	150 - 250 HB	180 - 280	0.05 - 0.09	0.09 - 0.1	0.09 - 0.12	apmax
N	Aluminium alloy	-	350 - 900	0.065 - 0.11	0.11 - 0.15	0.15 - 0.22	apmax
S	Titanium alloy	- 40 HRC	50 - 70	0.055 - 0.075	0.06 - 0.09	0.09 - 0.12	apmax
H	Hardened steel	- 60 HRC	40 - 80	0.03 - 0.06	0.05 - 0.09	0.075 - 0.105	apmax

- When the depth of cut (a_e) is closer to the upper limit, please start with a lower limit value of cutting speed (Vc).
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed and feed at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed and feed by 20 to 40%.

SOLIDMEISTER

TEC**B4/6L

4 - 6 flute endmill, 45° helix angle, long neck type

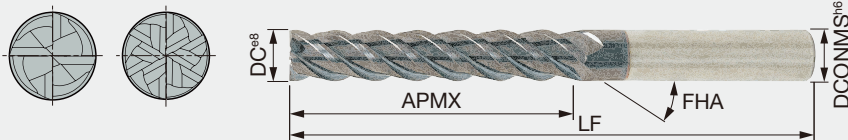


Designation	AH725	DC	DCONMS	NOF	APMX	FHA	LF		Shank
TEC060B4L-24C06-65	●	6	6	4	24	45°	65	✓	Cylindrical
TEC060B4L-24W06-65	●	6	6	4	24	45°	65	✓	Weldon
TEC080B4L-32C08-79	●	8	8	4	32	45°	79	✓	Cylindrical
TEC080B4L-32W08-79	●	8	8	4	32	45°	79	✓	Weldon
TEC100B4L-40C10-100	●	10	10	4	40	45°	100	✓	Cylindrical
TEC100B4L-40W10-100	●	10	10	4	40	45°	100	✓	Weldon
TEC120B4L-48C12-100	●	12	12	4	48	45°	100	✓	Cylindrical
TEC120B4L-48W12-100	●	12	12	4	48	45°	100	✓	Weldon
TEC140B4L-50C14-100	●	14	14	4	50	45°	100	✓	Cylindrical
TEC140B4L-50W14-100	●	14	14	4	50	45°	100	✓	Weldon
TEC160B6L-56C16-115	●	16	16	6	56	45°	115		Cylindrical
TEC160B6L-56W16-115	●	16	16	6	56	45°	115		Weldon
TEC200B6L-60C20-125	●	20	20	6	60	45°	125		Cylindrical
TEC200B6L-60W20-125	●	20	20	6	60	45°	125		Weldon

● : Line up

TEC**B4/6X

4 - 6 flute endmill, 45° helix angle, extra long neck type



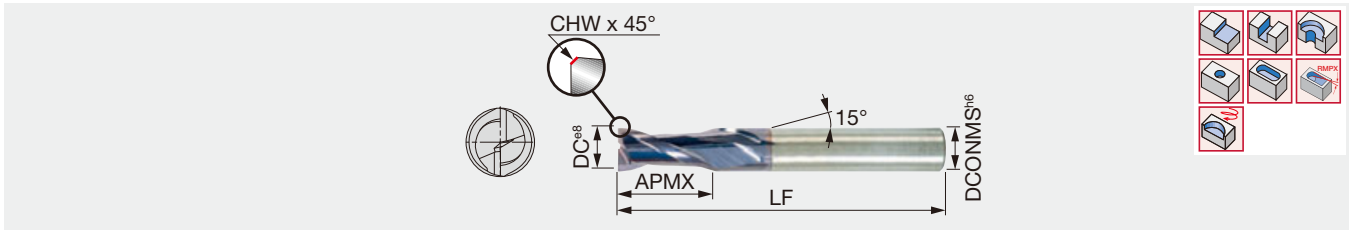
Designation	AH725	DC	DCONMS	NOF	APMX	FHA	LF		Shank
TEC100B4X-60C10-112	●	10	10	4	60	45°	112	✓	Cylindrical
TEC100B4X-60W10-112	●	10	10	4	60	45°	112	✓	Weldon
TEC120B4X-72C12-150	●	12	12	4	72	45°	150	✓	Cylindrical
TEC120B4X-72W12-150	●	12	12	4	72	45°	150	✓	Weldon
TEC160B6X-80C16-150	●	16	16	6	80	45°	150		Cylindrical
TEC160B6X-80W16-150	●	16	16	6	80	45°	150		Weldon
TEC200B6X-80C20-150	●	20	20	6	80	45°	150		Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

TECC**A/B2

2 flute slotting endmill, 30° or 45° helix angle

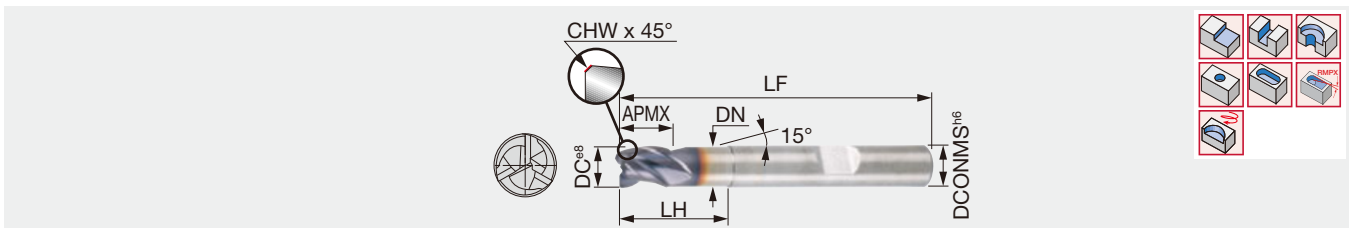


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	FHA	Shank
TECC020B2-07C03-38	●	2	3	2	0.1	7	38	45°	Cylindrical
TECC030A2-10C03-38	●	3	3	2	0.1	10	38	30°	Cylindrical
TECC040A2-12C04-50	●	4	4	2	0.1	12	50	30°	Cylindrical
TECC050A2-14C05-50	●	5	5	2	0.15	14	50	30°	Cylindrical
TECC060A2-16C06-57	●	6	6	2	0.15	16	57	30°	Cylindrical
TECC080A2-20C08-63	●	8	8	2	0.15	20	63	30°	Cylindrical
TECC100A2-22C10-72	●	10	10	2	0.15	22	72	30°	Cylindrical
TECC120A2-25C12-83	●	12	12	2	0.25	25	83	30°	Cylindrical
TECC160A2-32C16-92	●	16	16	2	0.25	32	92	30°	Cylindrical
TECC200A2-38C20-104	●	20	20	2	0.25	38	104	30°	Cylindrical

● : Line up

TECS/TECCS**E3

3 flute slotting endmill, 38° helix angle, short type



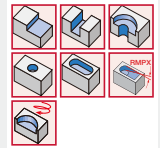
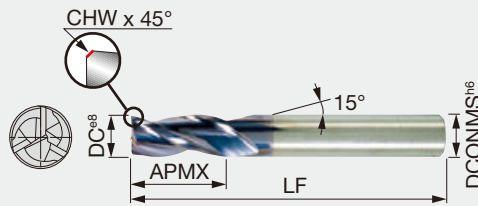
Designation	AH725	DC	DCONMS	NOF	CHW	DN	APMX	LH	LF	Shank
TECS020E3-03W06-57	●	2	6	3	0.1	1.9	3	7	57	Weldon
TECS030E3-04W06-57	●	3	6	3	0.1	2.9	4	10	57	Weldon
TECS040E3-05W06-57	●	4	6	3	0.1	3.9	5	12	57	Weldon
TECS050E3-06W06-57	●	5	6	3	0.15	4.9	6	14	57	Weldon
TECCS060E3-07W06-57	●	6	6	3	0.15	5.9	7	16	57	Weldon
TECCS080E3-09W08-63	●	8	8	3	0.15	7.6	9	20	63	Weldon
TECCS100E3-11W10-72	●	10	10	3	0.15	9.5	11	22	72	Weldon
TECCS120E3-12W12-83	●	12	12	3	0.25	11.3	12	25	83	Weldon
TECCS160E3-16W16-92	●	16	16	3	0.25	15.2	16	32	92	Weldon

● : Line up

SOLIDMEISTER

TECC**E3

3 flute slotting endmill, 38° helix angle

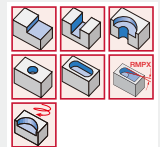
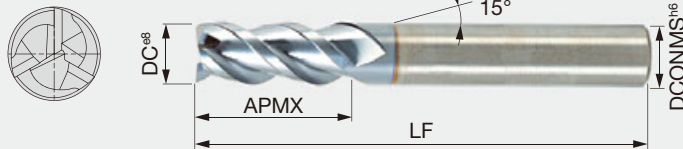


Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	FHA	Shank
TECC040E3-12C04-50	●	4	4	3	0.1	12	50	38°	Cylindrical
TECC050E3-14C05-50	●	5	5	3	0.15	14	50	38°	Cylindrical
TECC060E3-16C06-57	●	6	6	3	0.15	16	57	38°	Cylindrical
TECC080E3-20C08-63	●	8	8	3	0.15	20	63	38°	Cylindrical
TECC100E3-22C10-72	●	10	10	3	0.15	22	72	38°	Cylindrical
TECC120E3-25C12-83	●	12	12	3	0.25	25	83	38°	Cylindrical
TECC160E3-32C16-92	●	16	16	3	0.25	32	92	38°	Cylindrical
TECC200E3-38C20-104	●	20	20	3	0.25	38	104	38°	Cylindrical

● : Line up

TEC**B3

3 flute slotting endmill, 45° helix angle

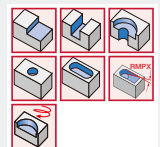
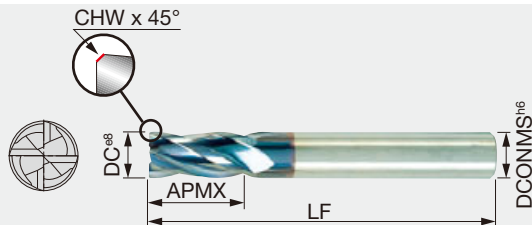


Designation	AH725	DC	NOF	DCONMS	APMX	LF	Shank
TEC060B3-16C06-57	●	6	3	6	16	57	Cylindrical
TEC080B3-20C08-63	●	8	3	8	20	63	Cylindrical
TEC090B3-20C09-67	●	9	3	9	20	67	Cylindrical
TEC100B3-22C10-72	●	10	3	10	22	72	Cylindrical
TEC120B3-25C12-83	●	12	3	12	25	83	Cylindrical
TEC180B3-32C18-92	●	18	3	18	32	92	Cylindrical

● : Line up

TECC**A/B4

4 flute endmill, 30° or 45° helix angle



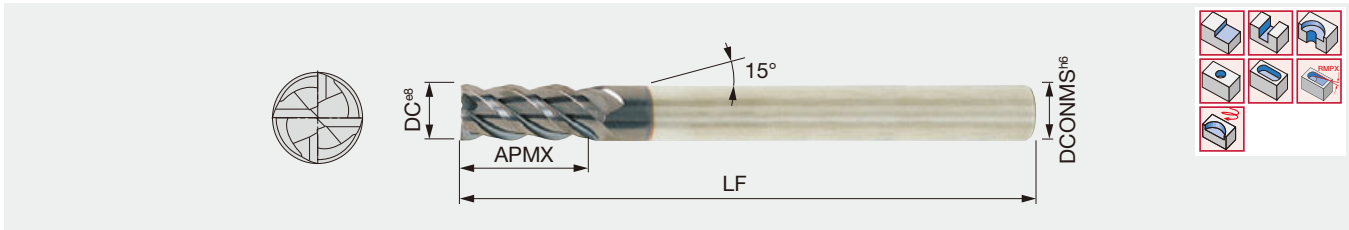
Designation	AH725	DC	DCONMS	NOF	CHW	APMX	LF	FHA	Shank
TECC020B4-07C03-38	●	2	3	4	0.1	7	38	45°	Cylindrical
TECC030A4-10C03-38	●	3	3	4	0.1	10	38	30°	Cylindrical
TECC040A4-12C04-50	●	4	4	4	0.1	12	50	30°	Cylindrical
TECC050A4-14C05-50	●	5	5	4	0.15	14	50	30°	Cylindrical
TECC060A4-16C06-57	●	6	6	4	0.15	16	57	30°	Cylindrical
TECC080A4-20C08-63	●	8	8	4	0.15	20	63	30°	Cylindrical
TECC100A4-22C10-72	●	10	10	4	0.15	22	72	30°	Cylindrical
TECC120A4-25C12-83	●	12	12	4	0.25	25	83	30°	Cylindrical
TECC160A4-32C16-92	●	16	16	4	0.25	32	92	30°	Cylindrical
TECC200A4-38C20-104	●	20	20	4	0.25	38	104	30°	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

TEC**B4

4 flute endmill, 45° helix angle

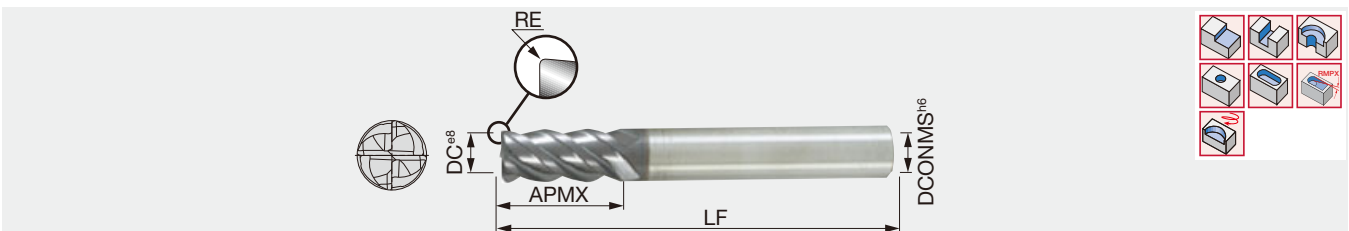


Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC020B4-07C06-57	●	2	6	4	7	57	Cylindrical
TEC030B4-10C06-57	●	3	6	4	10	57	Cylindrical
TEC040B4-12C06-57	●	4	6	4	12	57	Cylindrical
TEC050B4-14C06-57	●	5	6	4	14	57	Cylindrical
TEC060B4-16C06-57	●	6	6	4	16	57	Cylindrical
TEC080B4-20C08-63	●	8	8	4	20	63	Cylindrical
TEC100B4-22C10-72	●	10	10	4	22	72	Cylindrical
TEC120B4-25C12-83	●	12	12	4	25	83	Cylindrical
TEC140B4-25C14-83	●	14	14	4	25	83	Cylindrical
TEC160B4-32C16-92	●	16	16	4	32	92	Cylindrical
TEC180B4-32C18-92	●	18	18	4	32	92	Cylindrical
TEC200B4-38C20-104	●	20	20	4	38	104	Cylindrical

● : Line up

TEC**B4**R

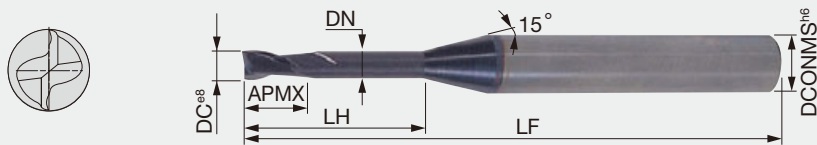
4 flute radius endmill, 45° helix angle



Designation	AH725	DC	DCONMS	NOF	RE	APMX	LF	Shank
TEC060B4-16C06R05-57	●	6	6	4	0.5	16	57	Cylindrical
TEC060B4-16C06R1-57	●	6	6	4	1	16	57	Cylindrical
TEC080B4-20C08R05-63	●	8	8	4	0.5	20	63	Cylindrical
TEC080B4-20C08R1-63	●	8	8	4	1	20	63	Cylindrical
TEC080B4-20C08R15-63	●	8	8	4	1.5	20	63	Cylindrical
TEC080B4-20C08R2-63	●	8	8	4	2	20	63	Cylindrical
TEC100B4-22C10R05-72	●	10	10	4	0.5	22	72	Cylindrical
TEC100B4-22C10R1-72	●	10	10	4	1	22	72	Cylindrical
TEC100B4-22C10R15-72	●	10	10	4	1.5	22	72	Cylindrical
TEC100B4-22C10R2-72	●	10	10	4	2	22	72	Cylindrical
TEC100B4-22C10R3-72	●	10	10	4	3	22	72	Cylindrical
TEC120B4-25C12R05-83	●	12	12	4	0.5	25	83	Cylindrical
TEC120B4-25C12R1-83	●	12	12	4	1	25	83	Cylindrical
TEC120B4-25C12R15-83	●	12	12	4	1.5	25	83	Cylindrical
TEC120B4-25C12R2-83	●	12	12	4	2	25	83	Cylindrical
TEC120B4-25C12R3-83	●	12	12	4	3	25	83	Cylindrical
TEC160B4-32C16R05-92	●	16	16	4	0.5	32	92	Cylindrical
TEC160B4-32C16R1-92	●	16	16	4	1	32	92	Cylindrical
TEC160B4-32C16R2-92	●	16	16	4	2	32	92	Cylindrical
TEC160B4-32C16R3-92	●	16	16	4	3	32	92	Cylindrical
TEC200B4-38C20R05-104	●	20	20	4	0.5	38	104	Cylindrical
TEC200B4-38C20R1-104	●	20	20	4	1	38	104	Cylindrical
TEC200B4-38C20R2-104	●	20	20	4	2	38	104	Cylindrical
TEC200B4-38C20R3-104	●	20	20	4	3	38	104	Cylindrical
TEC200B4-38C20R4-104	●	20	20	4	4	38	104	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → [I047](#)



Designation	AH750	DC	DCONMS	NOF	DN	APMX	LH	LF	Shank
TEC004A2-006/02C4M45	●	0.4	4	2	0.37	0.6	2	45	Cylindrical
TEC004A2-006/04C4M45	●	0.4	4	2	0.37	0.6	4	45	Cylindrical
TEC005A2-007/02C4M45	●	0.5	4	2	0.45	0.7	2	45	Cylindrical
TEC005A2-007/04C4M45	●	0.5	4	2	0.45	0.7	4	45	Cylindrical
TEC005A2-007/06C4M45	●	0.5	4	2	0.45	0.7	6	45	Cylindrical
TEC006A2-009/02C4M45	●	0.6	4	2	0.55	0.9	2	45	Cylindrical
TEC006A2-009/04C4M45	●	0.6	4	2	0.55	0.9	4	45	Cylindrical
TEC006A2-009/06C4M45	●	0.6	4	2	0.55	0.9	6	45	Cylindrical
TEC007A2-010/02C4M45	●	0.7	4	2	0.65	1	2	45	Cylindrical
TEC008A2-012/04C4M45	●	0.8	4	2	0.75	1.2	4	45	Cylindrical
TEC008A2-012/06C4M45	●	0.8	4	2	0.75	1.2	6	45	Cylindrical
TEC008A2-012/08C4M45	●	0.8	4	2	0.75	1.2	8	45	Cylindrical
TEC009A2-0135/06C4M45	●	0.9	4	2	0.85	1.35	6	45	Cylindrical
TEC009A2-0135/10C4M45	●	0.9	4	2	0.85	1.35	10	45	Cylindrical
TEC010A2-015/04C4M45	●	1	4	2	0.97	1.5	4	45	Cylindrical
TEC010A2-015/06C4M45	●	1	4	2	0.97	1.5	6	45	Cylindrical
TEC010A2-015/08C4M45	●	1	4	2	0.95	1.5	8	45	Cylindrical
TEC010A2-015/10C4M45	●	1	4	2	0.95	1.5	10	45	Cylindrical
TEC010A2-015/12C4M45	●	1	4	2	0.93	1.5	12	45	Cylindrical
TEC010A2-015/16C4M50	●	1	4	2	0.93	1.5	16	50	Cylindrical
TEC012A2-018/06C4M45	●	1.2	4	2	1.17	1.8	6	45	Cylindrical
TEC012A2-018/08C4M45	●	1.2	4	2	1.15	1.8	8	45	Cylindrical
TEC012A2-018/10C4M45	●	1.2	4	2	1.15	1.8	10	45	Cylindrical
TEC012A2-018/16C4M50	●	1.2	4	2	1.13	1.8	16	50	Cylindrical
TEC014A2-021/06C4M45	●	1.4	4	2	1.35	2.1	6	45	Cylindrical
TEC014A2-021/08C4M45	●	1.4	4	2	1.35	2.1	8	45	Cylindrical
TEC014A2-021/10C4M45	●	1.4	4	2	1.35	2.1	10	45	Cylindrical
TEC015A2-023/06C4M45	●	1.5	4	2	1.47	2.3	6	45	Cylindrical
TEC015A2-023/08C4M45	●	1.5	4	2	1.45	2.3	8	45	Cylindrical
TEC015A2-023/10C4M45	●	1.5	4	2	1.45	2.3	10	45	Cylindrical
TEC015A2-023/12C4M45	●	1.5	4	2	1.43	2.3	12	45	Cylindrical
TEC015A2-023/16C4M50	●	1.5	4	2	1.41	2.3	16	50	Cylindrical
TEC015A2-023/18C4M55	●	1.5	4	2	1.41	2.3	18	55	Cylindrical
TEC015A2-023/20C4M55	●	1.5	4	2	1.41	2.3	20	55	Cylindrical
TEC016A2-024/06C4M45	●	1.6	4	2	1.57	2.4	6	45	Cylindrical
TEC016A2-024/08C4M45	●	1.6	4	2	1.55	2.4	8	45	Cylindrical
TEC016A2-024/10C4M45	●	1.6	4	2	1.55	2.4	10	45	Cylindrical
TEC016A2-024/18C4M55	●	1.6	4	2	1.53	2.4	18	55	Cylindrical
TEC016A2-024/20C4M55	●	1.6	4	2	1.53	2.4	20	55	Cylindrical
TEC016A2-024/26C4M60	●	1.6	4	2	1.53	2.4	26	60	Cylindrical
TEC018A2-027/06C4M45	●	1.8	4	2	1.77	2.7	6	45	Cylindrical
TEC018A2-027/08C4M45	●	1.8	4	2	1.75	2.7	8	45	Cylindrical
TEC018A2-027/10C4M45	●	1.8	4	2	1.75	2.7	10	45	Cylindrical
TEC018A2-027/12C4M45	●	1.8	4	2	1.73	2.7	12	45	Cylindrical
TEC020A2-030/06C4M45	●	2	4	2	1.97	3	6	45	Cylindrical
TEC020A2-030/08C4M45	●	2	4	2	1.95	3	8	45	Cylindrical
TEC020A2-030/10C4M45	●	2	4	2	1.95	3	10	45	Cylindrical
TEC020A2-030/12C4M45	●	2	4	2	1.93	3	12	45	Cylindrical
TEC020A2-030/16C4M50	●	2	4	2	1.91	3	16	50	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

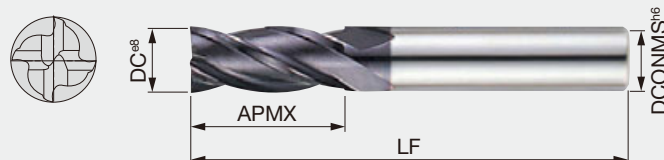
Designation	AH750	DC	DCONMS	NOF	DN	APMX	LH	LF	Shank
TEC020A2-030/20C4M55	●	2	4	2	1.89	3	20	55	Cylindrical
TEC020A2-030/30C4M70	●	2	4	2	1.89	3	30	70	Cylindrical
TEC025A2-037/08C4M45	●	2.5	4	2	2.4	3.7	8	45	Cylindrical
TEC025A2-037/10C4M45	●	2.5	4	2	2.4	3.7	10	45	Cylindrical
TEC025A2-037/12C4M45	●	2.5	4	2	2.4	3.7	12	45	Cylindrical
TEC025A2-037/16C4M55	●	2.5	4	2	2.4	3.7	16	55	Cylindrical
TEC025A2-037/20C4M60	●	2.5	4	2	2.4	3.7	20	60	Cylindrical
TEC025A2-037/30C4M80	●	2.5	4	2	2.4	3.7	30	80	Cylindrical
TEC030A2-045/08C6M45	●	3	6	2	2.85	4.5	8	45	Cylindrical
TEC030A2-045/10C6M45	●	3	6	2	2.85	4.5	10	45	Cylindrical
TEC030A2-045/12C6M45	●	3	6	2	2.85	4.5	12	45	Cylindrical
TEC030A2-045/16C6M55	●	3	6	2	2.85	4.5	16	55	Cylindrical
TEC030A2-045/20C6M60	●	3	6	2	2.85	4.5	20	60	Cylindrical
TEC030A2-045/30C6M70	●	3	6	2	2.85	4.5	30	70	Cylindrical
TEC030A2-045/40C6M90	●	3	6	2	2.85	4.5	40	90	Cylindrical

● : Line up

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TEC**A4

4 flute endmill, 30° helix angle, for hardened steel up to 65 HRC



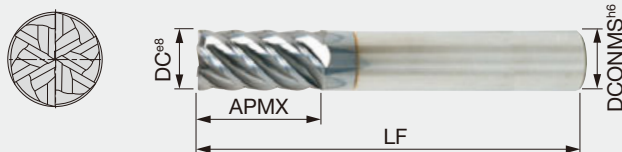
Designation	AH750	DC	DCONMS	NOF	APMX	LF	Shank
TEC040A4-11C06-50	●	4	6	4	11	50	Cylindrical
TEC050A4-13C06-50	●	5	6	4	13	50	Cylindrical
TEC060A4-13C06-50	●	6	6	4	13	50	Cylindrical
TEC070A4-16C08-63	●	7	8	4	16	63	Cylindrical
TEC080A4-19C08-63	●	8	8	4	19	63	Cylindrical
TEC090A4-19C10-72	●	9	10	4	19	72	Cylindrical
TEC100A4-22C10-72	●	10	10	4	22	72	Cylindrical
TEC120A4-26C12-73	●	12	12	4	26	73	Cylindrical
TEC140A4-26C14-83	●	14	14	4	26	83	Cylindrical
TEC160A4-32C16-92	●	16	16	4	32	92	Cylindrical
TEC180A4-32C18-100	●	18	18	4	32	100	Cylindrical
TEC200A4-38C20-104	●	20	20	4	38	104	Cylindrical

● : Line up

SOLIDMEISTER

TECH**B6

6 flute endmill, 45° helix angle, for finishing operation



Designation	AH725	AH750	DC	DCONMS	NOF	APMX	LF	Shank
TECH060B6-16C06-57	●	●	6	6	6	16	57	Cylindrical
TECH060B6-16W06-57	●		6	6	6	16	57	Weldon
TECH080B6-20C08-63	●	●	8	8	6	20	63	Cylindrical
TECH080B6-20W08-63	●		8	8	6	20	63	Weldon
TECH100B6-22C10-72	●	●	10	10	6	22	72	Cylindrical
TECH100B6-22W10-72	●		10	10	6	22	72	Weldon
TECH120B6-25C12-83	●	●	12	12	6	25	83	Cylindrical
TECH120B6-25W12-83	●		12	12	6	25	83	Weldon
TECH160B6-32C16-92	●	●	16	16	6	32	92	Cylindrical
TECH160B6-32W16-92	●		16	16	6	32	92	Weldon
TECH200B6-38C20-104	●	●	20	20	6	38	104	Cylindrical
TECH200B6-38W20-104	●		20	20	6	38	104	Weldon

● : Line up

TEC**B6

6 flute endmill, 45° helix angle, extra long neck type, for hardened steel up to 65 HRC



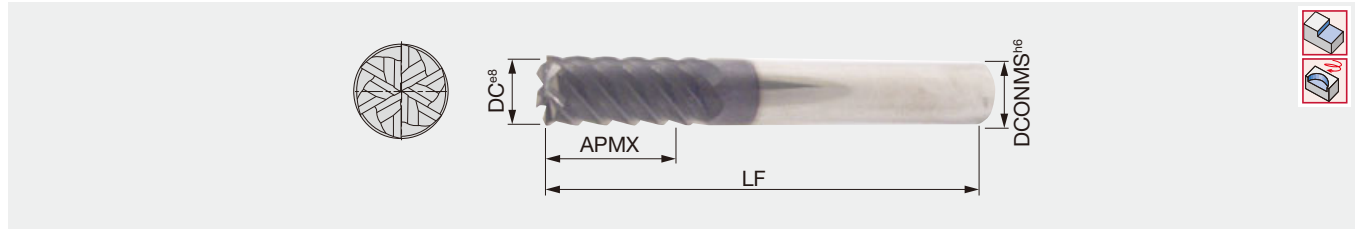
Designation	AH750	DC	DCONMS	NOF	APMX	LF	Shank
TEC060B6-26C06-70	●	6	6	6	26	70	Cylindrical
TEC080B6-36C08-90	●	8	8	6	36	90	Cylindrical
TEC100B6-46C10-100	●	10	10	6	46	100	Cylindrical
TEC120B6-56C12-110	●	12	12	6	56	110	Cylindrical
TEC160B6-66C16-130	●	16	16	6	66	130	Cylindrical
TEC200B6-76C20-140	●	20	20	6	76	140	Cylindrical
TEC250B6-92C25-180	●	25	25	6	92	180	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

TEC**D6

6 flute endmill, 50° helix angle, for hardened steel up to 65 HRC

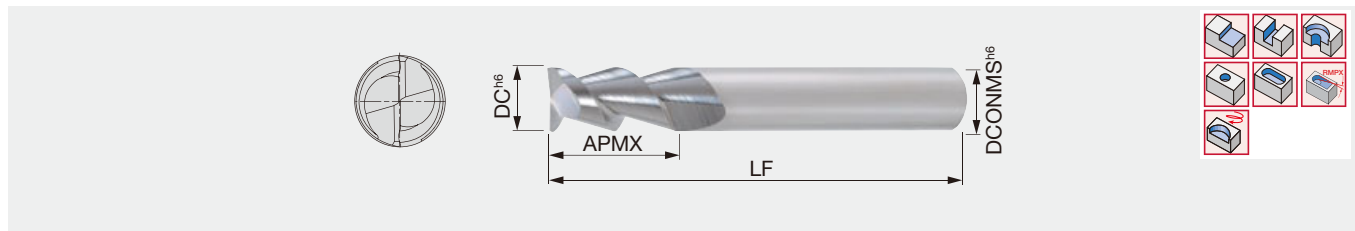


Designation	AH750	DC	DCONMS	NOF	APMX	LF	Shank
TEC060D6-13C06H57	●	6	6	6	13	57	Cylindrical
TEC080D6-20C08H63	●	8	8	6	20	63	Cylindrical
TEC100D6-22C10H72	●	10	10	6	22	72	Cylindrical
TEC120D6-25C12H83	●	12	12	6	25	83	Cylindrical
TEC140D6-30C14H83	●	14	14	6	30	83	Cylindrical
TEC160D6-32C16H92	●	16	16	6	32	92	Cylindrical
TEC200D6-38C20H104	●	20	20	6	38	104	Cylindrical

● : Line up

TECA**B2

2 flute slotting endmill, 45° helix angle, for aluminium machining



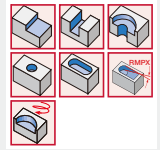
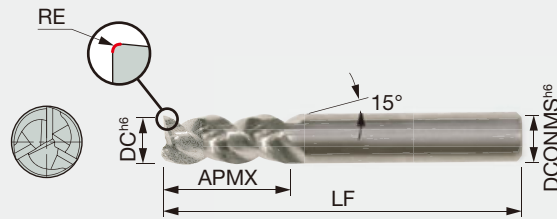
Designation	KS15F	DC	DCONMS	NOF	APMX	LF	Shank
TECA040B2-12C06-57	●	4	6	2	12	57	Cylindrical
TECA050B2-14C06-57	●	5	6	2	14	57	Cylindrical
TECA060B2-16C06-57	●	6	6	2	16	57	Cylindrical
TECA080B2-20C08-63	●	8	8	2	20	63	Cylindrical
TECA100B2-22C10-72	●	10	10	2	22	72	Cylindrical
TECA120B2-25C12-83	●	12	12	2	25	83	Cylindrical
TECA160B2-32C16-92	●	16	16	2	32	92	Cylindrical
TECA200B2-38C20-104	●	20	20	2	38	104	Cylindrical

● : Line up

SOLIDMEISTER

TECA**B3

3 flute endmill, 45° helix angle, for aluminium machining

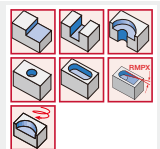
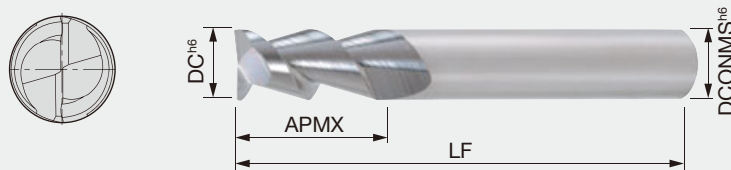


Designation	KS15F	DC	DCONMS	NOF	RE	APMX	LF	Shank
TECA040B3-12C06-57	●	4	6	3	0.1	12	57	Cylindrical
TECA040B3-12W06-57	●	4	6	3	0.1	12	57	Weldon
TECA050B3-14C06-57	●	5	6	3	0.2	14	57	Cylindrical
TECA050B3-14W06-57	●	5	6	3	0.2	14	57	Weldon
TECA060B3-16C06-57	●	6	6	3	0.2	16	57	Cylindrical
TECA060B3-16W06-57	●	6	6	3	0.2	16	57	Weldon
TECA080B3-20C08-63	●	8	8	3	0.2	20	63	Cylindrical
TECA080B3-20C08R30-63	●	8	8	3	3	20	63	Cylindrical
TECA080B3-20W08-63	●	8	8	3	0.2	20	63	Weldon
TECA100B3-22C10-72	●	10	10	3	0.2	22	72	Cylindrical
TECA100B3-22W10-72	●	10	10	3	0.2	22	72	Weldon
TECA100B3-25C10R30-72	●	10	10	3	3	25	72	Cylindrical
TECA100B3-25C10R40-72	●	10	10	3	4	25	72	Cylindrical
TECA120B3-25C12-83	●	12	12	3	0.2	25	83	Cylindrical
TECA120B3-25W12-83	●	12	12	3	0.2	25	83	Weldon
TECA120B3-30C12R30-83	●	12	12	3	3	30	83	Cylindrical
TECA120B3-30C12R40-83	●	12	12	3	4	30	83	Cylindrical
TECA140B3-30C14-83	●	14	14	3	0.2	30	83	Cylindrical
TECA140B3-30W14-83	●	14	14	3	0.2	30	83	Weldon
TECA160B3-32C16-92	●	16	16	3	0.2	32	92	Cylindrical
TECA160B3-32W16-92	●	16	16	3	0.2	32	92	Weldon
TECA200B3-38C20-104	●	20	20	3	0.2	38	104	Cylindrical
TECA200B3-38W20-104	●	20	20	3	0.2	38	104	Weldon

● : Line up

TECA**F2

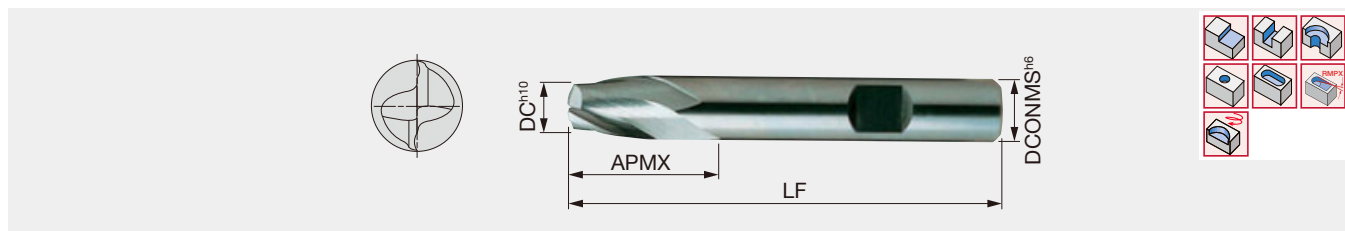
2 flute slotting endmill, 55° helix angle, for aluminium machining



Designation	KS15F	DC	DCONMS	NOF	APMX	LF	Shank
TECA040F2-11C04-50	●	4	4	2	11	50	Cylindrical
TECA060F2-13C06-57	●	6	6	2	13	57	Cylindrical
TECA080F2-20C08-63	●	8	8	2	20	63	Cylindrical
TECA100F2-22C10-72	●	10	10	2	22	72	Cylindrical
TECA120F2-25C12-83	●	12	12	2	25	83	Cylindrical
TECA160F2-32C16-92	●	16	16	2	32	92	Cylindrical
TECA200F2-38C20-104	●	20	20	2	38	104	Cylindrical
TECA250F2-45C25-121	●	25	25	2	45	121	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

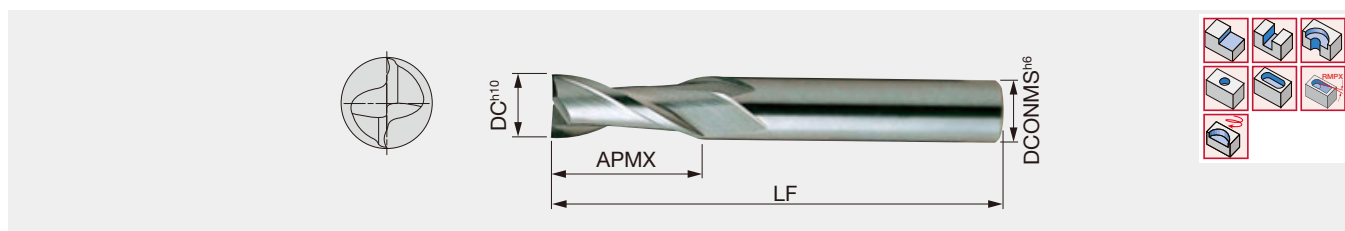


Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC020A2-03W06-E50	●	2	6	2	3	50	Weldon
TEC030A2-04W06-E50	●	3	6	2	4	50	Weldon
TEC040A2-05W06-E54	●	4	6	2	5	54	Weldon
TEC045A2-05W06-E54	●	4.5	6	2	5	54	Weldon
TEC050A2-06W06-E54	●	5	6	2	6	54	Weldon
TEC060A2-07W06-E54	●	6	6	2	7	54	Weldon
TEC080A2-09W08-E58	●	8	8	2	9	58	Weldon
TEC100A2-11W10-E66	●	10	10	2	11	66	Weldon
TEC200A2-20W20-E92	●	20	20	2	20	92	Weldon

● : Line up

TEC**A2**E

2 flute endmill, 30° helix angle



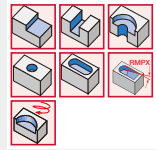
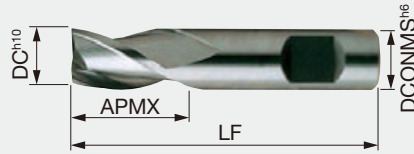
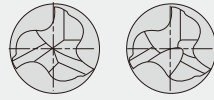
Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC010A2-03C04-E50	●	1	4	2	3	50	Cylindrical
TEC015A2-04C04-E50	●	1.5	4	2	4.5	50	Cylindrical
TEC020A2-08C02-E32	●	2	2	2	8	32	Cylindrical
TEC025A2-08C025-E32	●	2.5	2.5	2	8	32	Cylindrical
TEC030A2-12C03-E38	●	3	3	2	12	38	Cylindrical
TEC035A2-12C035-E32	●	3.5	3.5	2	12	32	Cylindrical
TEC040A2-12C04-E50	●	4	4	2	12	50	Cylindrical
TEC050A2-14C05-E50	●	5	5	2	14	50	Cylindrical
TEC055A2-16C055-E50	●	5.5	5.5	2	16	50	Cylindrical
TEC060A2-16C06-E50	●	6	6	2	16	50	Cylindrical
TEC070A2-20C07-E60	●	7	7	2	20	60	Cylindrical
TEC080A2-20C08-E63	●	8	8	2	20	63	Cylindrical
TEC090A2-20C09-E60	●	9	9	2	20	60	Cylindrical
TEC100A2-22C10-E72	●	10	10	2	22	72	Cylindrical
TEC120A2-22C12-E73	●	12	12	2	22	73	Cylindrical
TEC140A2-25C14-E75	●	14	14	2	25	75	Cylindrical
TEC160A2-25C16-E92	●	16	16	2	25	92	Cylindrical
TEC200A2-32C20-E100	●	20	20	2	32	100	Cylindrical

● : Line up

ECOMEISTER

TEC**A/E3**E

3 flute endmill, 30° or 38° helix angle, short type

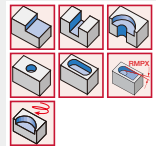
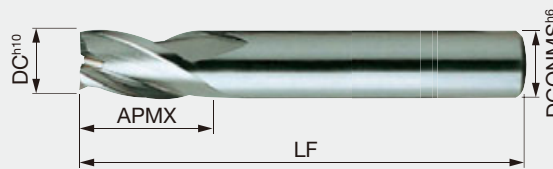


Designation	AH725	DC	DCONMS	NOF	APMX	LF	FHA	Shank
TEC020E3-04C06-E35	●	2	6	3	4	35	38°	Cylindrical
TEC025E3-05C06-E36	●	2.5	6	3	5	36	38°	Cylindrical
TEC030E3-05C06-E36	●	3	6	3	5	36	38°	Cylindrical
TEC035A3-06W06-E37	●	3.5	6	3	6	37	30°	Weldon
TEC040E3-07C06-E39	●	4	6	3	7	39	38°	Cylindrical
TEC045A3-08W06-E38	●	4.5	6	3	8	38	30°	Weldon
TEC050A3-08C06-E39	●	5	6	3	8	39	30°	Cylindrical
TEC055A3-08W06-E39	●	5.5	6	3	8	39	30°	Weldon
TEC060E3-08C06-E39	●	6	6	3	8	39	38°	Cylindrical
TEC070A3-10W08-E42	●	7	8	3	10	42	30°	Weldon
TEC080E3-11C08-E43	●	8	8	3	11	43	38°	Cylindrical
TEC090A3-11W10-E48	●	9	10	3	11	48	30°	Weldon
TEC100E3-13C10-E50	●	10	10	3	13	50	38°	Cylindrical

● : Line up

TEC**A/E3**E

3 flute endmill, 30° or 38° helix angle



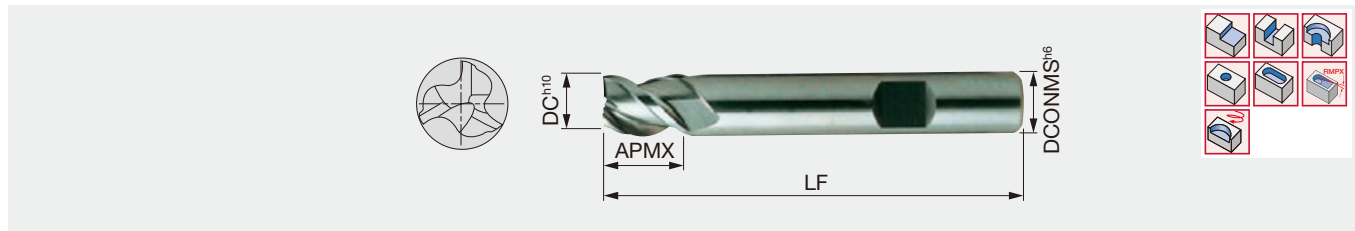
Designation	AH725	DC	DCONMS	NOF	APMX	LF	FHA	Shank
TEC020E3-08C02-E32	●	2	2	3	8	32	38°	Cylindrical
TEC030E3-12C03-E38	●	3	3	3	12	38	38°	Cylindrical
TEC040E3-12C04-E50	●	4	4	3	12	50	38°	Cylindrical
TEC050E3-14C05-E50	●	5	5	3	14	50	38°	Cylindrical
TEC060E3-16C06-E50	●	6	6	3	16	50	38°	Cylindrical
TEC070E3-20C07-E60	●	7	7	3	20	60	38°	Cylindrical
TEC080E3-20C08-E63	●	8	8	3	20	63	38°	Cylindrical
TEC090A3-20C09-E60	●	9	9	3	20	60	30°	Cylindrical
TEC100E3-22C10-E72	●	10	10	3	22	72	38°	Cylindrical
TEC120E3-22C12-E73	●	12	12	3	22	73	38°	Cylindrical
TEC140A3-25C14-E75	●	14	14	3	25	75	30°	Cylindrical
TEC160A3-25C16-E75	●	16	16	3	25	75	30°	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I047**

TEC**B3**W

3 flute endmill, 45° helix angle, short type

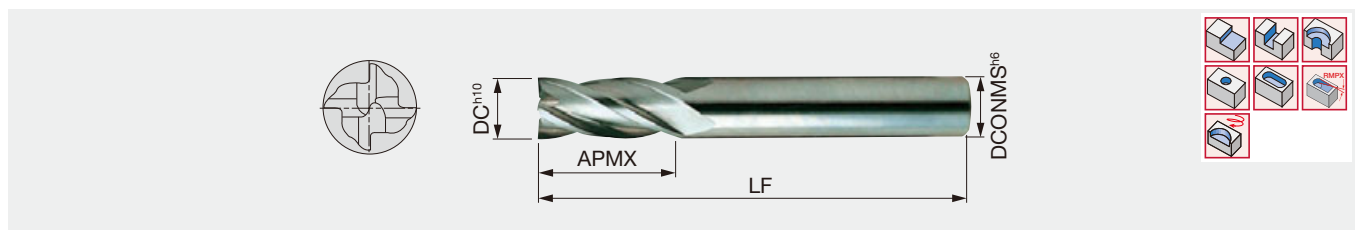


Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC020B3-03W06-50	●	2	6	3	3	50	Weldon
TEC030B3-04W06-50	●	3	6	3	4	50	Weldon
TEC040B3-05W06-54	●	4	6	3	5	54	Weldon
TEC050B3-06W06-54	●	5	6	3	6	54	Weldon
TEC060B3-07W06-54	●	6	6	3	7	54	Weldon
TEC080B3-09W08-58	●	8	8	3	9	58	Weldon
TEC100B3-11W10-66	●	10	10	3	11	66	Weldon
TEC120B3-12W12-73	●	12	12	3	12	73	Weldon
TEC140B3-14W14-75	●	14	14	3	14	75	Weldon
TEC160B3-16W16-82	●	16	16	3	16	82	Weldon
TEC200B3-20W20-92	●	20	20	3	20	92	Weldon

● : Line up

TEC**A4**E

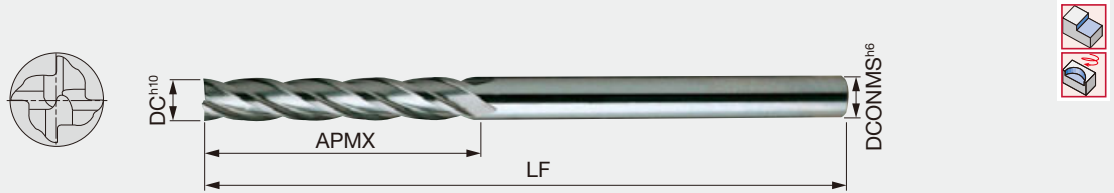
4 flute endmill, 30° helix angle



Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC020A4-08C02-E32	●	2	2	4	8	32	Cylindrical
TEC025A4-08C025-E32	●	2.5	2.5	4	8	32	Cylindrical
TEC030A4-12C03-E38	●	3	3	4	12	38	Cylindrical
TEC040A4-12C04-E50	●	4	4	4	12	50	Cylindrical
TEC050A4-14C05-E50	●	5	5	4	14	50	Cylindrical
TEC055A4-16C055-E50	●	5.5	5.5	4	16	50	Cylindrical
TEC060A4-16C06-E50	●	6	6	4	16	50	Cylindrical
TEC070A4-20C07-E60	●	7	7	4	20	60	Cylindrical
TEC080A4-20C08-E60	●	8	8	4	20	60	Cylindrical
TEC090A4-20C09-E60	●	9	9	4	20	60	Cylindrical
TEC100A4-22C10-E72	●	10	10	4	22	72	Cylindrical
TEC120A4-22C12-E73	●	12	12	4	22	73	Cylindrical
TEC140A4-25C14-E83	●	14	14	4	25	83	Cylindrical
TEC160A4-25C16-E82	●	16	16	4	25	82	Cylindrical
TEC200A4-32C20-E104	●	20	20	4	32	104	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → [I047](#)



Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEC030A4-30C03-E75	●	3	3	4	30	75	Cylindrical
TEC040A4-30C04-E75	●	4	4	4	30	75	Cylindrical
TEC050A4-40C05-E100	●	5	5	4	40	100	Cylindrical
TEC060A4-50C06-E150	●	6	6	4	50	150	Cylindrical
TEC080A4-50C08-E150	●	8	8	4	50	150	Cylindrical
TEC100A4-60C10-E150	●	10	10	4	60	150	Cylindrical
TEC120A4-75C12-E150	●	12	12	4	75	150	Cylindrical
TEC140A4-65C14-E150	●	14	14	4	65	150	Cylindrical
TEC160A4-65C16-E150	●	16	16	4	65	150	Cylindrical
TEC200A4-65C20-E150	●	20	20	4	65	150	Cylindrical

● : Line up

STANDARD CUTTING CONDITIONS

Slotting / Roughing

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap (Slotting)
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	140 - 180	0.025 - 0.035	0.03 - 0.045	0.04 - 0.055	1xD
	Alloy steel	- 300 HB	70 - 150	0.02 - 0.03	0.03 - 0.045	0.04 - 0.055	1xD
M	Stainless steel	- 200 HB	60 - 100	0.02 - 0.035	0.03 - 0.04	0.035 - 0.045	0.5xD
K	Cast iron	150 - 250 HB	80 - 180	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	1xD
N	Aluminium alloy	-	300 - 750	0.02 - 0.04	0.03 - 0.05	0.03 - 0.07	1xD
S	Titanium alloy	-	20 - 50	0.02 - 0.03	0.025 - 0.04	0.03 - 0.07	0.25xD
H	Hardened steel	- 60 HRC	20 - 30	0.01 - 0.015	0.02 - 0.045	0.04 - 0.05	0.2xD

Semi-finishing / Shouldering (ae = 0.1-0.4 x D)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	150 - 220	0.03 - 0.06	0.06 - 0.07	0.07 - 0.08	2xD
	Alloy steel	- 300 HB	70 - 160	0.02 - 0.05	0.04 - 0.065	0.045 - 0.07	2xD
M	Stainless steel	- 200 HB	80 - 130	0.025 - 0.04	0.035 - 0.045	0.04 - 0.05	2xD
K	Cast iron	150 - 250 HB	130 - 220	0.03 - 0.05	0.04 - 0.06	0.06 - 0.07	2xD
N	Aluminium alloy	-	350 - 850	0.04 - 0.06	0.06 - 0.08	0.08 - 0.1	2xD
S	Titanium alloy	-	40 - 60	0.03 - 0.04	0.035 - 0.05	0.05 - 0.08	2xD
H	Hardened steel	- 60 HRC	30 - 70	0.015 - 0.035	0.035 - 0.055	0.045 - 0.06	2xD

Finishing (feed rate depending on required accuracy) / High feed machining at low depth of cut (ae = 0.05-0.1 x D)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø6 - ø8	ø10 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	170 - 280	0.05 - 0.07	0.07 - 0.08	0.08 - 0.1	apmax
	Alloy steel	- 300 HB	110 - 220	0.05 - 0.07	0.07 - 0.08	0.08 - 0.1	apmax
M	Stainless steel	- 200 HB	100 - 160	0.03 - 0.045	0.04 - 0.05	0.045 - 0.06	apmax
K	Cast iron	150 - 250 HB	180 - 280	0.035 - 0.06	0.06 - 0.065	0.065 - 0.08	apmax
N	Aluminium alloy	-	350 - 900	0.045 - 0.07	0.07 - 0.1	0.1 - 0.15	apmax
S	Titanium alloy	-	50 - 70	0.035 - 0.05	0.04 - 0.06	0.06 - 0.085	apmax
H	Hardened steel	- 60 HRC	40 - 80	0.02 - 0.04	0.04 - 0.06	0.05 - 0.07	apmax

- When the depth of cut (ae) is closer to the upper limit, please start with a lower limit value of cutting speed (Vc).
- The items with long slot (2xD or over) and the items with 5 cutting edges or more are not suitable for slotting operation.
- When using AH750, reducing cutting speed by 20 to 30% is effective for extending tool life.
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed and feed at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed and feed by 20 to 40% (Variable/FinishMeister is recommended for such operations).
- In slotting of high hardened steel, heat-resistant alloy, and some types of stainless steel, start with ap=0.2xD and increase the value gradually while checking the status of the operation.
- In shoulder milling of high hardened steel and heat-resistant alloy, the cutting width should be started at ae=0.05xD and increase the value gradually while checking the status of the operation.
- The items with many cutting edges are good for finishing and high feed machining of small width of cut.
- VariableMeister is suitable for machining large depth of cut.
- Low feed in finishing is recommended for good surface roughness.

VARIABLE MEISTER

TEB**E4L**CF

4 flute chatter dampening ball nose endmill (2xD), 38° helix angle, variable pitch, relieved neck type, for hardened steel



Designation	AH710	DC	DCONMS	NOF	APMX	LH	LF	Shank
TEB030E4L-06/09C06CFH57	●	3	6	4	6	9	57	Cylindrical
TEB040E4L-08/12C06CFH57	●	4	6	4	8	12	57	Cylindrical
TEB050E4L-10/15C06CFH57	●	5	6	4	10	15	57	Cylindrical
TEB060E4L-12/18C06CFH57	●	6	6	4	12	18	57	Cylindrical
TEB080E4L-16/24C08CFH63	●	8	8	4	16	24	63	Cylindrical
TEB100E4L-20/30C10CFH72	●	10	10	4	20	30	72	Cylindrical
TEB120E4L-24/36C12CFH83	●	12	12	4	24	36	83	Cylindrical
TEB160E4L-32/48C16CFH92	●	16	16	4	32	48	92	Cylindrical

● : Line up

SHRED MEISTER

TEBRF**T3/4

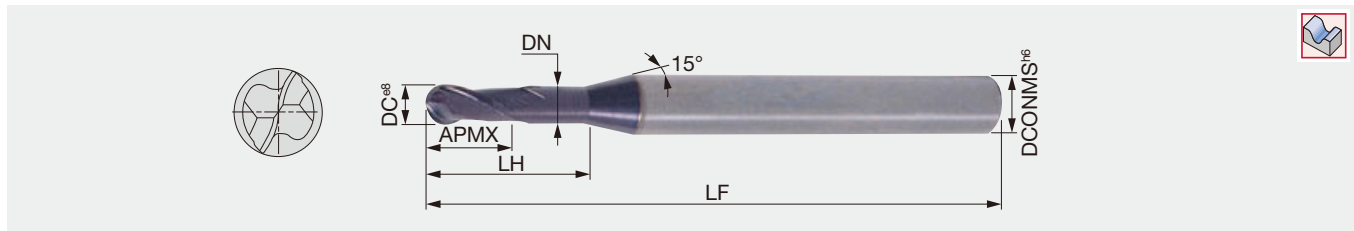
3 - 4 flute ball nose roughing endmill, 20° helix angle, long edge type, for hardened steel



Designation	AH750	DC	DCONMS	NOF	RE	APMX	LF	Shank
TEBRF060T3-16C06M57	●	6	6	3	3	16	57	Cylindrical
TEBRF080T3-16C08M63	●	8	8	3	4	16	63	Cylindrical
TEBRF100T4-22C10M72	●	10	10	4	5	22	72	Cylindrical
TEBRF120T4-26C12M83	●	12	12	4	6	26	83	Cylindrical
TEBRF140T4-26C14M83	●	14	14	4	7	26	83	Cylindrical
TEBRF160T4-32C16M92	●	16	16	4	8	32	92	Cylindrical
TEBRF180T4-32C18M92	●	18	18	4	9	32	92	Cylindrical
TEBRF200T4-38C20M104	●	20	20	4	10	38	104	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → [I053](#), Technical guide → [I054](#)



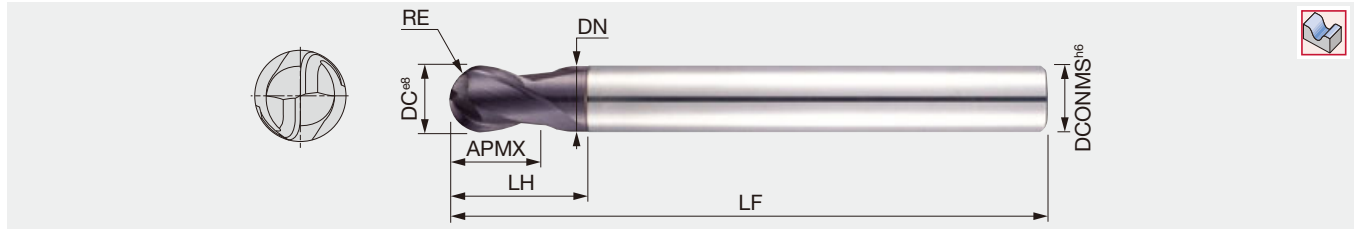
Designation	AH750	DC	DCONMS	NOF	DN	APMX	LH	LF	Shank
TEB004A2-006/02C4M45	●	0.4	4	2	0.36	0.6	2	45	Cylindrical
TEB004A2-006/03C4M45	●	0.4	4	2	0.36	0.6	3	45	Cylindrical
TEB005A2-007/02C4M45	●	0.5	4	2	0.45	0.7	2	45	Cylindrical
TEB005A2-007/04C4M45	●	0.5	4	2	0.45	0.7	4	45	Cylindrical
TEB005A2-007/06C4M45	●	0.5	4	2	0.45	0.7	6	45	Cylindrical
TEB006A2-009/02C4M45	●	0.6	4	2	0.55	0.9	2	45	Cylindrical
TEB006A2-009/04C4M45	●	0.6	4	2	0.55	0.9	4	45	Cylindrical
TEB008A2-012/04C4M45	●	0.8	4	2	0.75	1.2	4	45	Cylindrical
TEB008A2-012/06C4M45	●	0.8	4	2	0.75	1.2	6	45	Cylindrical
TEB010A2-015/04C4M45	●	1	4	2	0.97	1.5	4	45	Cylindrical
TEB010A2-015/06C4M45	●	1	4	2	0.97	1.5	6	45	Cylindrical
TEB010A2-015/08C4M45	●	1	4	2	0.95	1.5	8	45	Cylindrical
TEB010A2-015/10C4M45	●	1	4	2	0.95	1.5	10	45	Cylindrical
TEB010A2-015/12C4M45	●	1	4	2	0.93	1.5	12	45	Cylindrical
TEB010A2-015/16C4M50	●	1	4	2	0.93	1.5	16	50	Cylindrical
TEB012A2-018/08C4M45	●	1.2	4	2	1.17	1.8	8	45	Cylindrical
TEB012A2-018/12C4M45	●	1.2	4	2	1.13	1.8	12	45	Cylindrical
TEB014A2-021/08C4M45	●	1.4	4	2	1.35	2.1	8	45	Cylindrical
TEB014A2-021/16C4M50	●	1.4	4	2	1.31	2.1	16	50	Cylindrical
TEB015A2-023/06C4M45	●	1.5	4	2	1.47	2.3	6	45	Cylindrical
TEB015A2-023/08C4M45	●	1.5	4	2	1.45	2.3	8	45	Cylindrical
TEB015A2-023/10C4M45	●	1.5	4	2	1.45	2.3	10	45	Cylindrical
TEB015A2-023/12C4M45	●	1.5	4	2	1.43	2.3	12	45	Cylindrical
TEB015A2-023/20C4M55	●	1.5	4	2	1.39	2.3	20	55	Cylindrical
TEB016A2-024/08C4M45	●	1.6	4	2	1.55	2.4	8	45	Cylindrical
TEB016A2-024/12C4M45	●	1.6	4	2	1.53	2.4	12	45	Cylindrical
TEB018A2-027/08C4M45	●	1.8	4	2	1.75	2.7	8	45	Cylindrical
TEB018A2-027/12C4M45	●	1.8	4	2	1.73	2.7	12	45	Cylindrical
TEB018A2-027/16C4M50	●	1.8	4	2	1.71	2.7	16	50	Cylindrical
TEB020A2-030/06C4M45	●	2	4	2	1.97	3	6	45	Cylindrical
TEB020A2-030/10C4M45	●	2	4	2	1.93	3	10	45	Cylindrical
TEB020A2-030/12C4M50	●	2	4	2	1.93	3	12	50	Cylindrical
TEB020A2-030/16C4M50	●	2	4	2	1.91	3	16	50	Cylindrical
TEB020A2-030/20C4M55	●	2	4	2	1.89	3	20	55	Cylindrical
TEB020A2-030/30C4M70	●	2	4	2	1.89	3	30	70	Cylindrical
TEB030A2-045/08C6M50	●	3	6	2	2.85	4.5	8	50	Cylindrical
TEB030A2-045/10C6M50	●	3	6	2	2.85	4.5	10	50	Cylindrical
TEB030A2-045/12C6M50	●	3	6	2	2.85	4.5	12	50	Cylindrical
TEB030A2-045/16C6M55	●	3	6	2	2.85	4.5	16	55	Cylindrical
TEB030A2-045/20C6M60	●	3	6	2	2.85	4.5	20	60	Cylindrical
TEB030A2-045/30C6M70	●	3	6	2	2.85	4.5	30	70	Cylindrical
TEB030A2-045/35C6M80	●	3	6	2	2.85	4.5	35	80	Cylindrical

● : Line up

SOLIDMEISTER

TEB**A2-**C**H

2 flute ball nose endmill, 30° helix angle, short type, for hardened steel

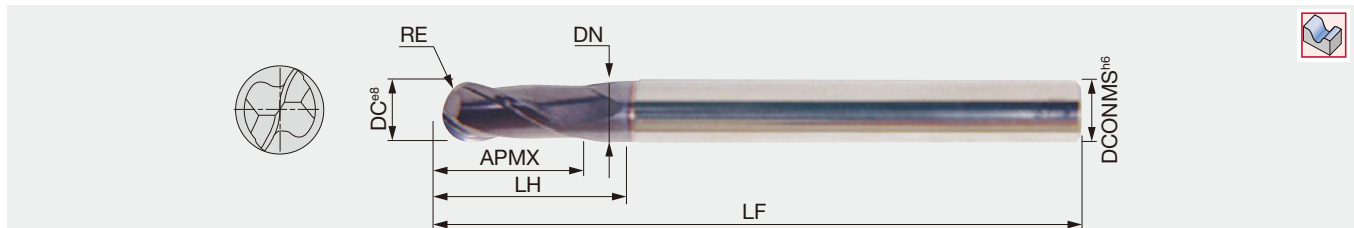


Designation	AH750	DC	DCONMS	NOF	DN	RE±0.01	APMX	LH	LF	Shank
TEB010A2-01/02C04H50	●	1	4	2	0.95	0.5	1	2.2	50	Cylindrical
TEB020A2-02/04C06H50	●	2	6	2	1.9	1	2	4	50	Cylindrical
TEB030A2-03/06C06H60	●	3	6	2	2.9	1.5	3	6	60	Cylindrical
TEB040A2-04/08C06H70	●	4	6	2	3.9	2	4	8	70	Cylindrical
TEB050A2-05/10C06H80	●	5	6	2	4.9	2.5	5	10	80	Cylindrical
TEB060A2-06/12C06H90	●	6	6	2	5.9	3	6	12	90	Cylindrical
TEB080A2-08/16C08H100	●	8	8	2	7.9	4	8	16	100	Cylindrical
TEB100A2-10/20C10H100	●	10	10	2	9.9	5	10	20	100	Cylindrical
TEB120A2-12/24C12H110	●	12	12	2	11.9	6	12	24	110	Cylindrical
TEB200A2-20/40C20H160	●	20	20	2	19.8	10	20	40	160	Cylindrical

● : Line up

TEB**A2-**C**M...

2 flute ball nose rib processing endmill, 30° helix angle, for hardened steel



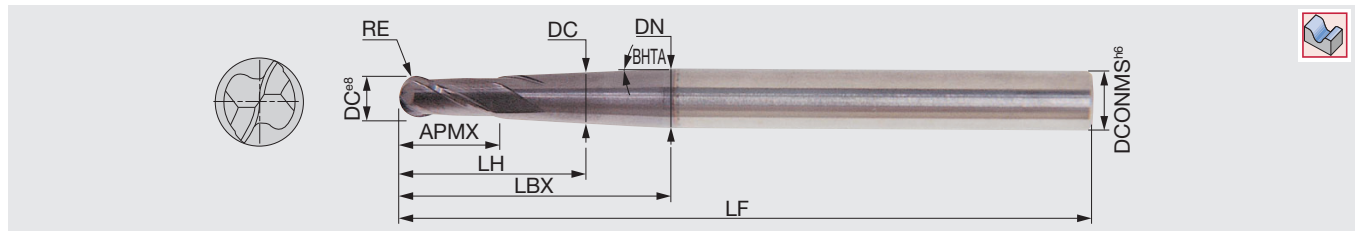
Designation	AH750	DC	DCONMS	NOF	DN	RE	APMX	LH	LF	Shank
TEB030A2-08C03M100	●	3	3	2	-	1.5	8	-	100	Cylindrical
TEB030A2-08C06M70	●	3	6	2	-	1.5	8	-	70	Cylindrical
TEB040A2-08C06M70	●	4	6	2	-	2	8	-	70	Cylindrical
TEB040A2-08C04M100	●	4	4	2	-	2	8	-	100	Cylindrical
TEB050A2-12C06M80	●	5	6	2	-	2.5	12	-	80	Cylindrical
TEB060A2-10C06M120	●	6	6	2	-	3	10	-	120	Cylindrical
TEB060A2-12/22C06M80	●	6	6	2	5.8	3	12	22	80	Cylindrical
TEB080A2-14/27C08M90	●	8	8	2	7.8	4	14	27	90	Cylindrical
TEB100A2-18/31C10M100	●	10	10	2	9.8	5	18	31	100	Cylindrical
TEB120A2-22/35C12M110	●	12	12	2	11.8	6	22	35	110	Cylindrical
TEB160A2-30/50C16M140	●	16	16	2	15.8	8	30	50	140	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → [I053](#), Technical guide → [I054](#)

TEB**A2/**/**C**M...

2 flute ball nose endmill, 30° helix angle, tapered neck type, for hardened steel

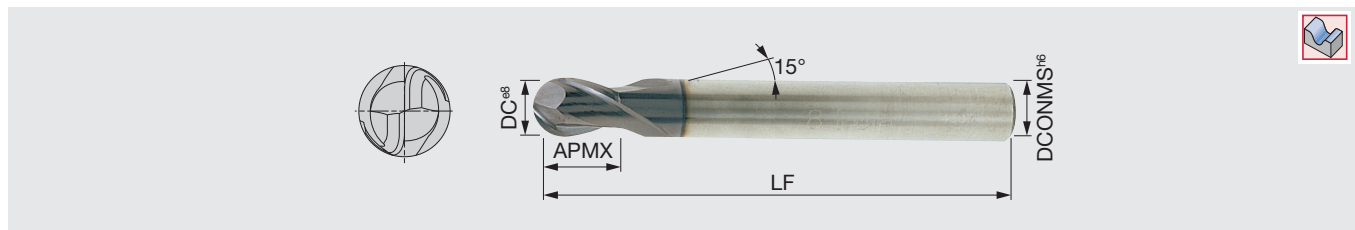


Designation	AH750	DC	DCONMS	NOF	DN	RE±0.01	APMX	LH	LBX	BHTA	LF	Shank
TEB010A2-02/04/3.0C06M80	●	1	6	2	5	0.5	2	4	42	3°	80	Cylindrical
TEB020A2-04/06/3.0C06M80	●	2	6	2	5.7	1	4	6	41	3°	80	Cylindrical
TEB030A2-06/08/3.0C06M70	●	3	6	2	5.6	1.5	6	8	32	3°	70	Cylindrical
TEB040A2-08/10/1.5C06M90	●	4	6	2	6	2	8	10	49	1.5°	90	Cylindrical
TEB050A2-10/12/1.5C08M110	●	5	8	2	7.6	2.5	10	12	61	1.5°	110	Cylindrical
TEB060A2-12/15/1.5C08M110	●	6	8	2	8	3	12	15	53	1.5°	110	Cylindrical
TEB080A2-14/17/1.5C10M120	●	8	10	2	10	4	14	17	55	1.5°	120	Cylindrical
TEB100A2-18/21/1.5C12M130	●	10	12	2	12	5	18	21	59	1.5°	130	Cylindrical

● : Line up

TEB**A2-**C**-...

2 flute ball nose endmill, 30° helix angle, short type

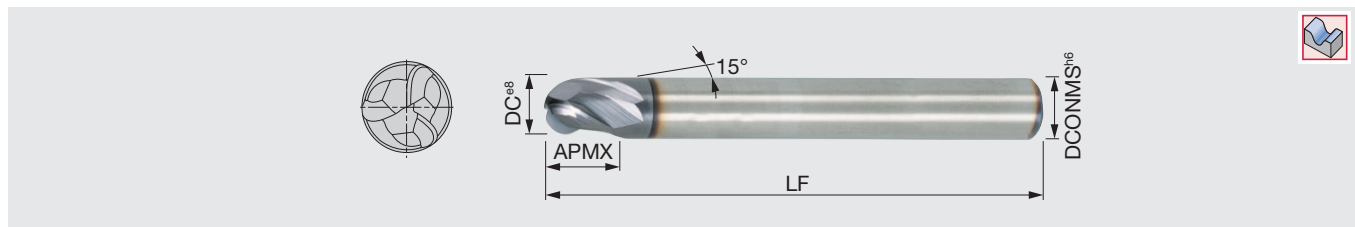


Designation	AH750	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEB030A2-05C06-57	●	●	3	6	2	5	57	Cylindrical
TEB040A2-07C06-57	●	●	4	6	2	7	57	Cylindrical
TEB050A2-08C06-57	●	●	5	6	2	8	57	Cylindrical
TEB060A2-08C06-57	●	●	6	6	2	8	57	Cylindrical
TEB080A2-11C08-63	●	●	8	8	2	11	63	Cylindrical
TEB100A2-13C10-72	●	●	10	10	2	13	72	Cylindrical
TEB120A2-14C12-83	●	●	12	12	2	14	83	Cylindrical
TEB160A2-16C16-92	●	●	16	16	2	16	92	Cylindrical
TEB200A2-20C20-104	●	●	20	20	2	20	104	Cylindrical

● : Line up

TEB**A3

3 flute ball nose endmill, 30° helix angle, short type



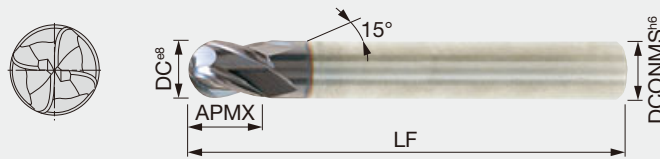
Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEB030A3-05C06-57	●	3	6	3	5	57	Cylindrical
TEB040A3-07C06-57	●	4	6	3	7	57	Cylindrical
TEB050A3-08C06-57	●	5	6	3	8	57	Cylindrical
TEB060A3-08C06-57	●	6	6	3	8	57	Cylindrical
TEB080A3-11C08-63	●	8	8	3	11	63	Cylindrical
TEB100A3-13C10-72	●	10	10	3	13	72	Cylindrical
TEB120A3-14C12-83	●	12	12	3	14	83	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → [I053](#), Technical guide → [I054](#)

SOLIDMEISTER**TEB**A4**

4 flute ball nose endmill, 30° helix angle, short type

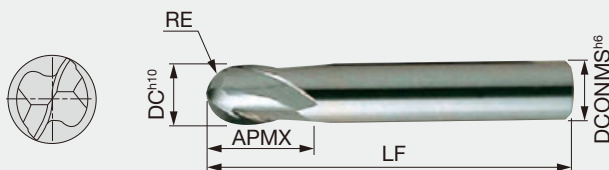


Designation	AH725	DC	DCONMS	NOF	APMX	LF	Shank
TEB030A4-05C06-57	●	3	6	4	5	57	Cylindrical
TEB040A4-07C06-50	●	4	6	4	7	50	Cylindrical
TEB050A4-08C06-57	●	5	6	4	8	57	Cylindrical
TEB060A4-08C06-57	●	6	6	4	8	57	Cylindrical
TEB080A4-11C08-63	●	8	8	4	11	63	Cylindrical
TEB100A4-13C10-72	●	10	10	4	13	72	Cylindrical
TEB120A4-14C12-83	●	12	12	4	14	83	Cylindrical
TEB200A4-20C20-104	●	20	20	4	20	104	Cylindrical

● : Line up

ECOMEISTER**TEB**A2**E**

2 flute ball nose endmill, 30° helix angle, short type



Designation	AH725	DC	DCONMS	NOF	RE	APMX	LF	Shank
TEB020A2-04C06-E48	●	2	6	2	1	4	48	Cylindrical
TEB020A2-06C03-E38	●	2	3	2	1	6	38	Cylindrical
TEB025A2-04C06-E48	●	2.5	6	2	1.25	4	48	Cylindrical
TEB030A2-04C06-E48	●	3	6	2	1.5	4	48	Cylindrical
TEB040A2-06C06-E50	●	4	6	2	2	6	50	Cylindrical
TEB040A2-08W06-E57	●	4	6	2	2	8	57	Weldon
TEB060A2-07C06-E51	●	6	6	2	3	7	51	Cylindrical
TEB060A2-10W06-E57	●	6	6	2	3	10	57	Weldon
TEB080A2-09C08-E63	●	8	8	2	4	9	63	Cylindrical
TEB100A2-10C10-E66	●	10	10	2	5	10	66	Cylindrical
TEB120A2-14C12-E71	●	12	12	2	6	14	71	Cylindrical
TEB200A2-20C20-E82	●	20	20	2	10	20	82	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I053**, Technical guide → **I054**

VARIABLEMEISTER SHREDMEISTER SOLIDMEISTER ECOMEISTER

STANDARD CUTTING CONDITIONS - Ball nose type

Shape machining (Roughing to semi-finishing)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø3 - ø6	ø8 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	125 - 200	0.02 - 0.055	0.04 - 0.08	0.06 - 0.11	0.05 - 0.12xD
	Alloy steel	- 300 HB	100 - 150	0.01 - 0.035	0.03 - 0.05	0.045 - 0.06	0.04 - 0.1xD
M	Stainless steel	- 200 HB	110	0.015 - 0.03	0.03 - 0.04	0.05 - 0.06	0.05 - 0.1xD
K	Cast iron	150 - 250 HB	150 - 180	0.03 - 0.06	0.06 - 0.09	0.09 - 0.12	0.08 - 0.15xD
H	Hardened steel	- 49 HRC	70 - 80	0.008 - 0.02	0.025 - 0.03	0.03 - 0.04	0.04 - 0.08xD
	Hardened steel	50 - 60 HRC	30 - 40	0.005 - 0.008	0.007 - 0.013	0.009 - 0.02	0.03 - 0.06xD

Finishing

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			ap
				ø3 - ø6	ø8 - ø12	ø16 - ø20	
P	Carbon steel	- 300 HB	170 - 280	0.017 - 0.046	0.034 - 0.068	0.051 - 0.094	0.02xD
	Alloy steel	- 300 HB	120 - 165	0.008 - 0.03	0.025 - 0.043	0.038 - 0.051	0.01xD
M	Stainless steel	- 200 HB	150	0.012 - 0.026	0.025 - 0.034	0.042 - 0.051	0.01xD
K	Cast iron	150 - 250 HB	200 - 220	0.025 - 0.051	0.051 - 0.077	0.076 - 0.102	0.03xD
H	Hardened steel	- 49 HRC	100	0.007 - 0.017	0.021 - 0.026	0.025 - 0.034	0.01xD
	Hardened steel	50 - 60 HRC	40 - 50	0.004 - 0.007	0.006 - 0.011	0.007 - 0.017	0.01xD

- When using AH750, reducing cutting speed by 20 to 30% is effective for extending tool life.
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed and feed at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed and feed by 20 to 40% (VariableMeister is recommended for such operations).

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index

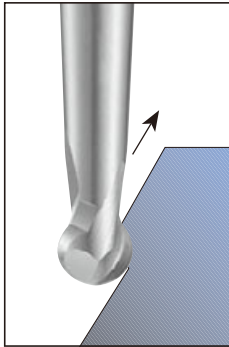
TECHNICAL GUIDE - Ball nose type

Ball Nose Characteristics

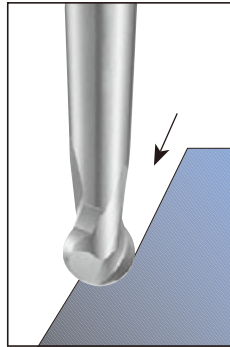
- Die & mold making, turbine manufacturing and aircraft industry, etc.
- Useful for intricate-shaped surfaces.
- Profiling of up to 70 HRC high hardened steels and alloy steels, nickel based alloys, titanium alloys.
- Ultra-fine grain carbide which increases both toughness and hardness.
- Suitable for dry and high speed cutting.
- Special sphere shaped tool geometry provides increased tool life and enables higher speed and feed operations.

Milling Features

- Operating angle: max 212°
- Excellent surface roughness and high milling process.
- Enables milling with high speed and feed in back milling mode.



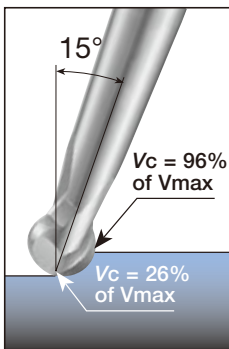
**Favorable
Back Milling** ✓



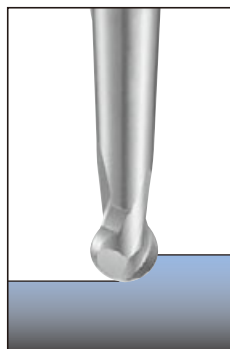
**Unfavorable
Milling**

Operating Recommendations

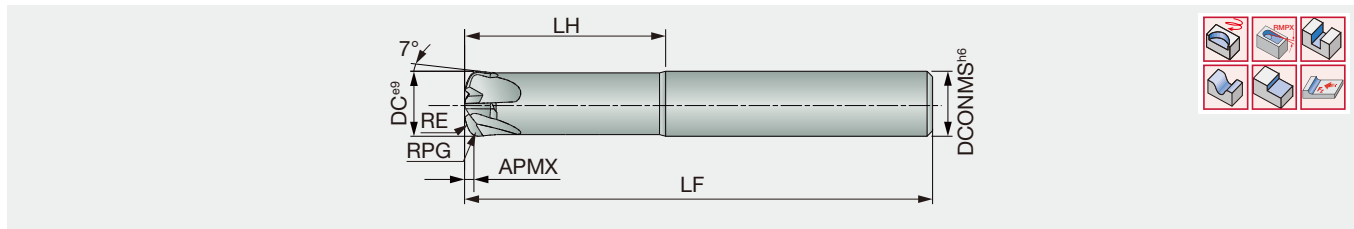
- It is recommended to machine with the tool inclined at a 15° angle. This technique eliminates cutting at nearly zero speed at the tool axis. Cutting is more efficient, and tool life substantially improves.
- Decreased cutting force.
- Excellent surface roughness and brightness.



**Favorable
Profiling** ✓



**Unfavorable
Profiling**



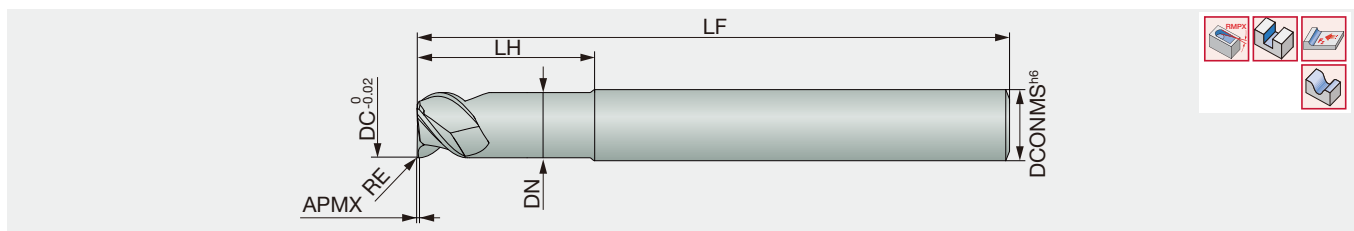
Designation	AH750	DC	DCONMS	NOF	RPG ⁽¹⁾	RE	APMX	LH	LF	Max. fz (mm/t)
TEFF060N4-030/20C06R10M	●	6	6	4	1.0	5.3	0.3	20	57	0.3
TEFF080N4-035/26C08R13M	●	8	8	4	1.3	7	0.4	26	63	0.4
TEFF100N4-040/30C10R16M	●	10	10	4	1.6	8.8	0.5	30	72	0.5
TEFF120N4-045/34C12R20M	●	12	12	4	2.0	10.6	0.6	34	83	0.5
TEFF160N4-055/42C16R26M	●	16	16	4	2.6	14	0.8	42	92	0.6
TEFF200N4-060/46C20R32M	●	20	20	4	3.2	17.7	1	46	104	0.7

(1) RPG should be used for programming.

● : Line up

TCFF**A3

3 flute high feed endmill



Designation	FX510	DC	DCONMS	NOF	DN	RE	APMX	LH	LF
TCFF060A3-06/15C6-50	●	6	6	3	5.5	0.42	0.25	15	50
TCFF080A3-08/20C8-57	●	8	8	3	7.5	0.56	0.4	20	57
TCFF100A3-08/25C10-65	●	10	10	3	9.5	0.7	0.5	25	65
TCFF120A3-10/30C12-72	●	12	12	3	11.5	1.1	0.6	30	72
TCFF160A3-12/35C16-83	●	16	16	3	15.5	1.9	0.75	35	83
TCFF200A3-15/40C20-93	●	20	20	3	19.5	2.5	1	40	93

Caution:

High speed machining generates heat in the tool and chuck holder.

Thermal expansion of the holder will often lead to tool damage. Use an air coolant during machining to cool the tool holder.

Milling chucks are recommended for the toolholder to be used.

*Use the above corner radius values (RE) for programming.

● : Line up

FEEDMEISTER

STANDARD CUTTING CONDITIONS

Shape machining (roughing) TEFF**N4...

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)		
				ø6 - ø8	ø10 - ø12	ø16 - ø20
P	Carbon steel	- 300 HB	140 - 180	0.25 - 0.48	0.35 - 0.67	0.52 - 0.9
	Alloy steel	- 300 HB	120 - 130	0.2 - 0.28	0.3 - 0.38	0.43 - 0.57
M	Stainless steel	- 200 HB	120	0.25 - 0.3	0.35 - 0.43	0.52 - 0.6
K	Cast iron	150 - 250 HB	160 - 180	0.3 - 0.45	0.45 - 0.6	0.6 - 0.8
H	Hardened steel	- 49 HRC	100	0.16 - 0.2	0.25 - 0.33	0.4 - 0.48
	Hardened steel	50 - 60 HRC	60 - 80	0.1 - 0.16	0.16 - 0.3	0.2 - 0.45

- Please be aware that the maximum depth of cut (APMX) and the feed (fz) will depend on each tool diameter.
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed (Vc) and feed (fz) at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed (Vc) and feed (fz) by 20 to 40%.

Shape machining (roughing) TCFF**A3...

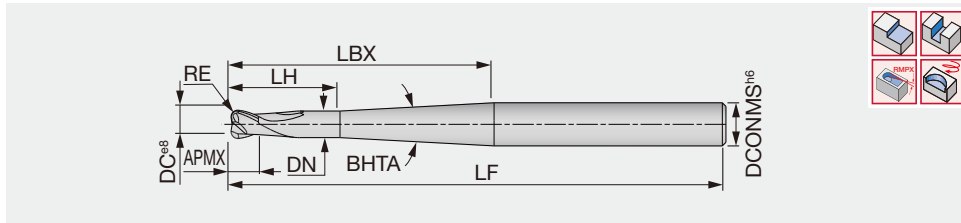
ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)		
				ø6 - ø8	ø10 - ø12	ø16 - ø20
K	Cast iron	150 - 250 HB	250 - 1000	0.1 - 0.15	0.17 - 0.19	0.23 - 0.25
	Ductile cast iron	150 - 250 HB	250 - 1000	0.1 - 0.15	0.17 - 0.19	0.23 - 0.25
	Malleable cast iron	150 - 250 HB	250 - 1000	0.1 - 0.15	0.17 - 0.19	0.23 - 0.25
N	Non-ferrous metal / Graphite	-	500 - 1500	0.1 - 0.15	0.17 - 0.19	0.23 - 0.25
S	Nickel based alloy	-	250 - 1000	0.1 - 0.13	0.15 - 0.18	0.20 - 0.22

*Dry cutting at the cutting speed more than 250m/min is recommended for machining nickel based alloy.

SOLIDMEISTER

TETR**A2**R

2 flute toroidal endmill



Designation	AH725	DC	DCONMS	NOF	DN	RE	APMX	LH	LBX	BHTA	LF	Shank
TETR020A2-2/08C06R05M80	●	2	6	2	1.9	0.5	2	8	40	3.6°	80	Cylindrical
TETR030A2-2/12C06R05M80	●	3	6	2	2.8	0.5	2	12	40	3.3°	80	Cylindrical
TETR040A2-3/16C06R1M80	●	4	6	2	3.7	1	3	16	40	2.8°	80	Cylindrical
TETR060A2-4/25C08R2M100	●	6	8	2	5.6	2	4	25	66	2.0°	100	Cylindrical

● : Line up

Reference pages: Standard cutting conditions → **I057**

Slotting / Roughing

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			
				ø2	ø3	ø4	ø6
P	Carbon steel	- 300 HB	140 - 180	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
	Alloy steel	- 300 HB	70 - 150	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
M	Stainless steel	- 200 HB	60 - 100	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
K	Cast iron	150 - 250 HB	80 - 180	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
N	Aluminium alloy	-	300 - 750	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
S	Titanium alloy	-	20 - 50	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
H	Hardened steel	- 60 HRC	20 - 30	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07

Semi-finishing / Shouldering (ae = 0.1-0.4 x D)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			
				ø2	ø3	ø4	ø6
P	Carbon steel	- 300 HB	150 - 220	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
	Alloy steel	- 300 HB	70 - 160	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
M	Stainless steel	- 200 HB	80 - 130	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
K	Cast iron	150 - 250 HB	130 - 220	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
N	Aluminium alloy	-	350 - 850	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
S	Titanium alloy	-	40 - 60	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
H	Hardened steel	- 60 HRC	30 - 70	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07

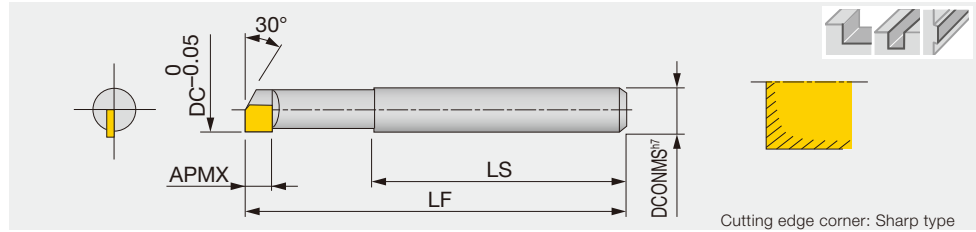
Finishing (feed rate depending on required accuracy) / High feed machining at low depth of cut (ae = 0.05-0.1 x D)

ISO	Workpiece material	Hardness	Vc (m/min)	fz (mm/t)			
				ø2	ø3	ø4	ø6
P	Carbon steel	- 300 HB	170 - 280	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
	Alloy steel	- 300 HB	110 - 220	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
M	Stainless steel	- 200 HB	100 - 160	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
K	Cast iron	150 - 250 HB	180 - 280	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
N	Aluminium alloy	-	350 - 900	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
S	Titanium alloy	-	50 - 70	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07
H	Hardened steel	- 60 HRC	40 - 80	0.01 - 0.03	0.01 - 0.04	0.02 - 0.05	0.03 - 0.07

- When the depth of cut (ae) is closer to the upper limit, please start with a lower limit value of cutting speed (Vc).
- The items with long slot (2xD or over) is not suitable for slotting operation.
- While air blow is recommended, water-soluble coolant will be good for stainless steel, titanium alloy, and heat-resistant alloy.
- When chattering occurs with low rigid machines or settings, reduce cutting speed and feed at an equal rate.
- When chattering occurs with long tool overhang, reduce cutting speed and feed by 20 to 40%.
- In slotting of high hardened steel, heat-resistant alloy, and some types of stainless steel, start with $ap=0.2xD$ and increase the value gradually while checking the status of the operation.
- In shoulder milling of high hardened steel and heat-resistant alloy, the cutting width should be started at $ae=0.05xD$ and increase the value gradually while checking the status of the operation.
- Low feed in finishing is recommended for good surface roughness.

DEB1000

T-DIA endmill for high speed aluminium machining



Cutting edge corner: Sharp type

Designation	DX140	DC	DCONMS	NOF	APMX	LS	LF
DEB1040	●	4	6	1	3.5	32	45
DEB1050	●	5	6	1	3.5	35	50
DEB1060	●	6	6	1	3.5	35	50
DEB1080	●	8	8	1	5	37	55
DEB1100	●	10	10	1	5	40	60
DEB1120	●	12	12	1	5	45	65

- The cutting edge is very sharp. Please handle it carefully. Do not directly measure the cutting edge with micrometer, etc. as it may cause chipping.
- Please keep the tool overhang from the milling chuck as short as possible.
- Please choose a machine that is as rigid as possible.

● : Line up

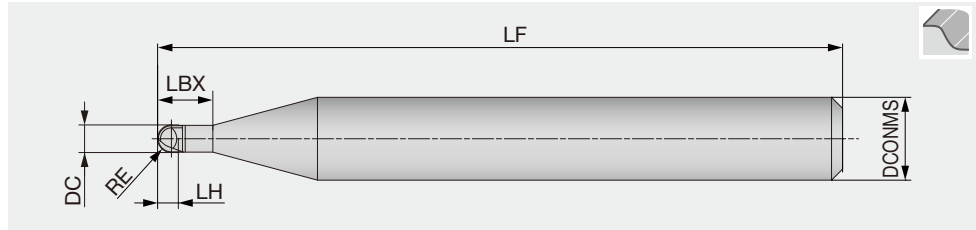
STANDARD CUTTING CONDITIONS**DEB1000**For side milling $a_p \leq 3D$, $a_e = 0.1$ mm

ISO	Workpiece material	Mill dia. (mm)	Cutting Speed V_c (m/min)	No. of revolutions n (min^{-1})	Table feed V_f (mm/min)
N	Aluminium alloys, Copper alloys	ø4	120 - 180	12,000	120
		ø5	120 - 180	9,600	120
		ø6	120 - 180	8,000	120
		ø8	120 - 180	6,000	120
		ø10	120 - 180	4,800	120
		ø12	120 - 180	4,000	100

- Keep the tool overhang as short as possible. When the overhang is long, please reduce the number of revolutions and feed to prevent chattering.
- Please adjust the number of revolutions and feed speed according to the cutting condition, such as depth of cut and machine rigidity.

BBB2000

T-CBN ball nose endmill for dies and molds



Designation	BX850	DC	DCONMS	NOF	RE	LH	LBX	LF
BBB2006	●	0.6	6	2	0.3	0.5	1.2	50
BBB2008	●	0.8	6	2	0.4	0.6	1.6	50
BBB2010	●	1	6	2	0.5	0.7	2	50
BBB2020	●	2	6	2	1	1.5	4	50

● : Line up

Tolerance (BBB2000)

R	R Tolerance	Tolerance on shank
0.3 ~ 1	±0.005	h6

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	No. of revolutions n (min ⁻¹)	Ball radius (RE)							
				0.3		0.4		0.5		1	
				Depth of cut APMX × pf (mm)	Feed rate (mm/min)	Depth of cut APMX × pf (mm)	Feed rate (mm/min)	Depth of cut APMX × pf (mm)	Feed rate (mm/min)	Depth of cut APMX × pf (mm)	Feed rate (mm/min)
H	Prehardened steel (NAK80, etc.) Die steel (JIS SKD61, etc.)	~ 52 HRC	50,000	0.02 × 0.03	2,000	0.03 × 0.05	2,000	0.05 × 0.05	3,000	0.10 × 0.10	5,000
	Die steel (JIS SKD11, DRM1 & 2, etc.)	~ 62 HRC	50,000	0.01 × 0.02	2,000	0.02 × 0.03	2,000	0.03 × 0.05	3,000	0.05 × 0.05	5,000
	High speed steel, Die steel (JIS SKH, DRM3, etc.)	~ 70 HRC	50,000	0.01 × 0.02	1,500	0.01 × 0.03	1,500	0.02 × 0.03	2,000	0.03 × 0.05	3,000

- Depths of cut (APMX) shown in the table are the allowable maximum values.
- Mist cooling or air blow is recommended.
- The maximum number of revolutions of the machine to be used is lower than 50,000 min⁻¹, the revolutions and feed rate should be modified at same rate.
- Use smallest possible overhang.

Ball radius (RE)	Inclined angle of workpiece (θ1) / Effective neck length (Z)			
0.3	0°30'/1.25	1°/1.30	2°/1.35	3°/1.45
0.4	0°30'/1.65	1°/1.70	2°/1.80	3°/1.90
0.5	0°30'/2.05	1°/2.10	2°/2.25	3°/2.40
1	0°30'/4.15	1°/4.25	2°/4.50	3°/4.80

Optimal tool combination for maximum productivity

Significantly reduced tool indexing time improves machining efficiency

1 Wide range of geometries

45 kinds of geometries are available. The head indexing is easy and highly accurate with the precision thread.

2 Three kinds of shank material

Users can choose the most suitable combination according to the machining parameters, length and application required.

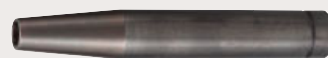
Steel: For general purpose

Carbide: For highly accurate machining due to excellent rigidity

Tungsten: Reduced chattering due to high vibration damping capacity



Straight shank & neck



Straight shank & taper neck



Straight shank & neck (carbide)



Straight (for slotting)



High rigidity shank



ER collet



Adaptor for TungFlex

No setup time

Machine downtime is decreased considerably. Simplified setup since only the head is indexed.

Increases productivity by 90%

Exchange time / Piece

TUNGMEISTER

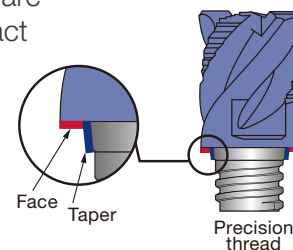
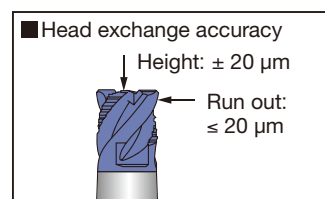
less than 1 minute

Solid endmill

10 minutes

High accuracy and repeatability

Repeatability and accuracy are maintained due to full contact of both taper and face.



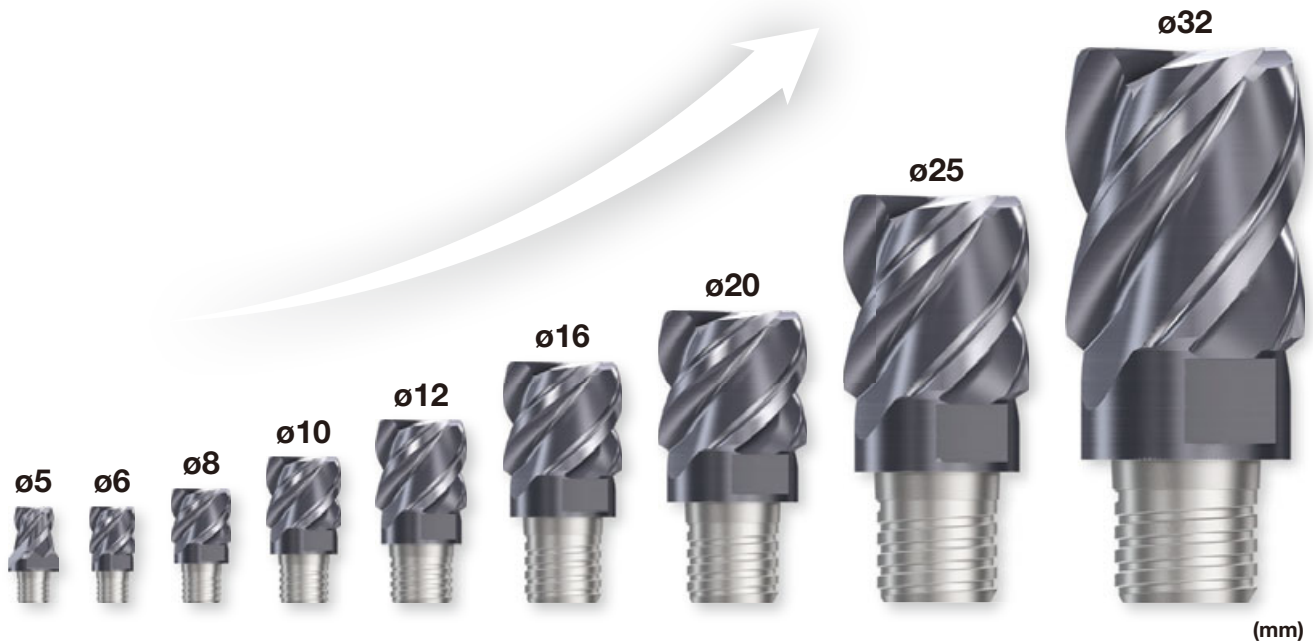


Square

VEH, VEE, VED

Extensive tool diameter range from 5 to 32 mm

Covers a broad range of applications from precision machining to large size parts.



Threading

VMT

Thread milling heads

With multiple teeth
for ISO, Unified, and Whitworth threads



ISO metric
VMT***IS



Unified
VMT***UN



Whitworth
VMT***W



Threading

VTR

Thread milling heads

With single tooth
for ISO and Whitworth threads



ISO metric
60° partial profile
VTR***IS



Whitworth
55° partial profile
VTR***W

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index

Quick Guide TUNGMEISTER

Square, Face mill, High feed

★ : First choice ☆ : Second choice

Head geometry	Designation	Appearance	Application			Tool dia. (mm)	No. of cutting edges	Cutting edge length		Corner geometry	Helix angle	Pitch	CRKS	Workpiece material						Remarks	Page
			Roughing	Semifinishing	Finishing			L/D	APMX (mm)					P	M	K	N	S	H		
Square	VEH...		✓	✓	✓	ø8 - ø20	4	0.6 - 0.8XD	5 - 15	R	Variable	Variable	S05 - S12	★	★	★	☆	★	☆		I066
	VEH...		✓	✓	✓	ø8 - ø32	4	1.2 - 1.5XD	12 - 38	R	Variable	Variable	S05 - S21	★	★	★	☆	★	☆	Long edge	I066
	VEE**-04... VED**-04...		✓	✓	✓	ø5 - ø20	4	0.8XD	4 - 15	R	30/45	Regular	S04 - S12	★	★	★	☆	★	☆	General	I067
	VEE**I...		✓	✓	✓	ø8 - ø25	4	0.6 - 0.8XD	5 - 22	R/ Chamfered	38	Variable	S05 - S15	★	★	★	☆	★	☆		I068
	VEE**-03...		✓	✓	✓	ø7.7 - ø19.7	3	0.5XD	4 - 12	Sharp edge	38/45	Regular	S05 - S12	★	★	★	☆	★	☆	For key way	I068
	VEE**A02...		✓	✓	✓	ø10 - ø12	2	0.7XD	7 - 9	R	45	Regular	S06 - S08			☆	★				I069
	VEE**A03...		✓	✓	✓	ø8 - ø20	3	0.6XD	5 - 12	R	45	Regular	S05 - S12			☆	★				I069
	VEE**R...		✓			ø8 - ø25	4, 5, 6	0.6 - 0.8XD	5 - 22	Chamfered	45	Regular	S05 - S15	★	★	★	☆	★	☆	Serrated cutting edge	I070
	VED**R...		✓			ø8 - ø25	4, 5, 6	1.5XD	12 - 37	Chamfered	47	Regular	S05 - S15	★	★	★	☆	★	☆	Serrated cutting edge/ Long edge	I070
	VEE**C...		✓	✓		ø8 - ø25	4	0.6 - 0.8XD	5 - 22	Chamfered	45	Regular	S05 - S15	★	★	★	☆	★	☆	Rough/ Finish combination geometry	I071
Face mill	VED**-06..., VEE**-06...		✓	✓	✓	ø8 - ø12	6	0.6 - 0.8XD	5 - 9	R/ Chamfered	30/45/ 50	Regular	S05 - S08	☆	☆	☆		★	★	Small width of cut	I071
	VED**-08/10..., VEE**-08/10...		✓	✓	✓	ø16 - ø25	8, 10	0.8XD	12 - 22	R/ Chamfered	30/50	Regular	S10 - S15	☆	☆	☆		★	★	Small width of cut	I072
	VED**-07/09...		✓	✓	✓	ø8 - ø25	7, 9	1.5XD	12 - 37	R	Variable	Variable	S05 - S15	☆	☆	☆		★	★	Small width of cut/Long edge	I072
	VFM...		✓	✓	✓	ø12 - ø25	6	0.3XD	3.6 - 7.5	R	-	Variable	S05 - S10	★	★	★	☆	★	☆		I075
High feed	VFX**-02...		✓			ø10 - ø20	2	0.06XD	0.6 - 1.5	-	-	Regular	S06 - S12	★	★	★	☆	★	★		I076
	VFX**-04/06...		✓			ø12, ø16	4, 6	0.05XD	0.6 - 1.05	-	-	Regular	S08 - S10	★	★	★	☆	★	★	With coolant hole	I076

Profiling (ball, radius, barrel)

★ : First choice ☆ : Second choice

Head geometry	Designation	Appearance	Application			Tool dia. (mm)	No. of cutting edges	Helix angle	Pitch	CRKS	Workpiece material						Remarks	Page
			Roughing	Semifinishing	Finishing						P	M	K	N	S	H		
 Ball	VBB**-BM...		✓	✓		ø8 - ø16	2	0	Regular	S05 - S10	★	★	★	☆	★	★	Economical type	1078
	VBB**-BG...				✓	ø8 - ø16	2	0	Regular	S05 - S10	★	★	★	☆	★	★	High accuracy h7	1078
	VBD**-BG...			✓	✓	ø8 - ø16	2	30	Regular	S05 - S10	★	★	★	☆	★	★	Low cutting force	1078
	VBD**-BG-04... VBE**-BG-04...		✓	✓	✓	ø5 - ø25	4	30/38	Regular	S04 - S15	★	★	★	☆	★	★	Low cutting force	1079
	VBB**-SG...		✓	✓	✓	ø10 - ø20	2	0	Regular	S05 - S10	★	★	★	☆	★	★	High accuracy h7/ Sphere cutting edge	1079
	VBE**-BGA...		✓	✓	✓	ø8 - ø20	2	45	Regular	S05 - S12				☆	★			1079
 Radius	VRB**-02... VRC**-02...		✓	✓		ø10 - ø20	2	0/15	Regular	S06 - S12	★	★	★	☆	★	☆	Economical type	1081
	VRD**-06...			✓	✓	ø8 - ø16	6	30	Regular	S05 - S10	★	★	★	☆	★	☆		1081
 Barrel	VBO...		✓	✓		ø8 - ø16	4, 5	30	Regular	S05 - S10	★	★	★	☆	★	☆	Profiling/ Long edge	1083
	VBO...		✓	✓		ø10 - ø16	4	30	Regular	S06 - S10	★	★	★	☆	★	☆	Profiling/ Short edge	1083
 Bull nose	VBN...		✓	✓		ø10 - ø16	6	35	Regular	S06 - S10	★	★	★	☆	★	☆	Profiling	1083
 Lens	VBL...		✓	✓		ø8 - ø16	6	30	Regular	S05 - S10	★	★	★	☆	★	☆	Profiling	1084

Quick Guide **TUNGMEISTER**

Multi-function (chamfering, spot drill, center hole, counterboring) ★ : First choice ☆ : Second choice

Head geometry	Designation	Appearance	Center edge (Z-feed capability)	Tool dia. (mm)	No. of cutting edges	Chamfering angle	Helix angle	Pitch	CRKS	Workpiece material						Remarks	Page
										P	M	K	N	S	H		
 Chamfering	VCA**-04/06...		Without	ø10 - ø20	4, 6	45	0	Regular	S06 - S12	★	★	★	☆	★	☆		I086
	VCW**-02...		Without	ø11.8	2	45	0	Regular	S06	★	★	★	☆	★	☆	Back chamfering capability	I086
	VCR**-02...		Without	ø8 - ø20	2	R	0	Regular	S05 - S12	★	★	★	☆	★	☆		I086
 Chamfering Spot drill	VCP**-02...		With	ø8 - ø16.5	2	30/45/60	0	Regular	S05 - S10	★	★	★	☆	★	☆		I088
	VDS...		With	ø8 - ø16	2	45	10	Regular	S05 - S10	★	★	★	☆	★	☆	Low cutting force	I088
 Center hole	VDP**-02...		With	ø1.07 - ø6.46	2	-	0	Regular	S04 - S12	★	★	★	☆	★	☆	For center hole	I090
 Counterboring	VGC**-02...		With	ø7.8 - ø16	2	-	10	Regular	S05 - S10	★	★	★	☆	★	☆	For counterboring	I091

Slotting

★ : First choice ☆ : Second choice

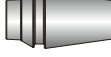
Head geometry	Designation	Appearance	Groove width (mm)	Tool dia. (mm)	No. of cutting edges	Edge shape	Helix angle	Pitch	CRKS	Workpiece material						Remarks	Page
										P	M	K	N	S	H		
 Slotting	VST**-3...		1.2 - 3.17	ø15.7 - ø17.7	3	R	0	Regular	S06	★	★	★	☆	★	☆		I092
	VST**-4/6...		0.76 - 10	ø21.7 - ø27.7	4, 6	R	0	Regular	S08, S10	★	★	★	☆	☆	☆		I093
	VST**A45...		3.4 - 5.5	ø17.7 - ø21.7	3, 4	Chamfered	0	Regular	S06, S08	★	★	★	☆	★	☆	For chamfering, 45° chamfer angle	I093
	VTB**-06...		2 - 8	ø13.5 - ø25	6	R	0	Regular	S05 - S10	★	★	★	☆	★	☆		I094
	VTB**C15-06...		2	ø13.5	6	Chamfered	0	Regular	S05	★	★	★	☆	★	☆	With 45° chamfer	I094

Threading

★ : First choice ☆ : Second choice

Head geometry	Designation	Appearance	Feature	Wiper edge	No. of cutting edges	Tool dia. (mm)	Internal/External	Thread type	Min. thread size	CRKS	Workpiece material						Page
											P	M	K	N	S	H	
 Threading	VMT***IS		Full profile	With	3 - 6	ø10 - ø16	Internal	ISO metric	M12X0.75	S05 - S08	★	★	★	☆	★	☆	I096
	VMT***UN		Full profile	With	3, 4, 5	ø10 - ø16	Internal	Unified	9/16-24 UNEF	S05 - S08	★	★	★	☆	★	☆	I096
	VMT***W		Full profile	With	4	ø10, 16	Internal/External	Whitworth	G1/4	S05, S08	★	★	★	☆	★	☆	I097
	VTR***IS		Partial profile	Without	3, 4	ø15.7 - ø21.7	Internal/External	60° partial profile	M20X0.5	S06, S08	★	★	★	☆	★	☆	I097
	VTR***W		Partial profile	Without	4	ø21.7	Internal/External	55° partial profile	G3/4	S08	★	★	★	☆	★	☆	I097

Shank

Shank	Neck	Appearance	Material				Page
			Steel	Carbide	Carbide (with coolant hole)	Tungsten (with coolant hole)	
Straight	Straight		✓	✓	✓	✓	I100, I101
Weldon	Straight		✓	-	-	-	I102
Straight	Taper		✓	✓	-	✓	I102, I103
High rigidity shank			✓	✓	-	-	I100
Straight (slotting)			✓	✓	✓	-	I103
Adaptor for TungFlex			✓	-	-	-	I104
ER collet			✓	-	-	-	I104

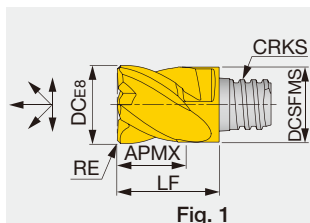


Fig. 1

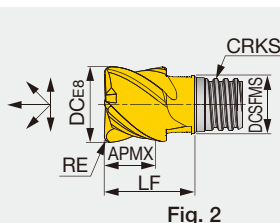
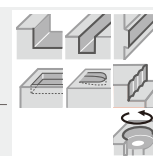
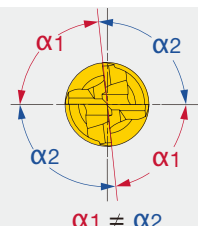


Fig. 2

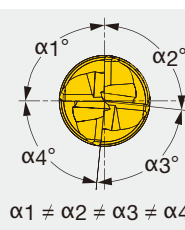
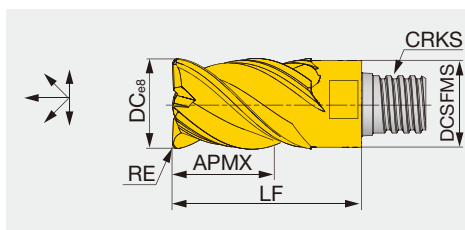


APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*	Fig.
VEH080L05.0R05I04S05	●		4	41° - 45°	8	7.7	5	0.5	S05	10	KEYV-S05	7	1
VEH080L05.0R10I04S05		●	4	41° - 45°	8	7.7	5	1	S05	10	KEYV-S05	7	1
VEH100L07.0R10I04S05	●		4	41° - 45°	10	7.7	7	1	S05	12.8	KEYV-S05	7	2
VEH100L07.0R05I04S06		●	4	41° - 45°	10	9.7	7	0.5	S06	13	KEYV-S06	10	1
VEH100L07.0R10I04S06		●	4	41° - 45°	10	9.7	7	1	S06	13	KEYV-S06	10	1
VEH120L09.0R10I04S06	●		4	41° - 45°	12	9.3	9	1	S06	14.3	KEYV-S06	10	2
VEH120L09.0R05I04S08		●	4	41° - 45°	12	11.7	9	0.5	S08	16.5	KEYV-S08	15	1
VEH120L09.0R10I04S08		●	4	41° - 45°	12	11.7	9	1	S08	16.5	KEYV-S08	15	1
VEH160L12.0R10I04S08	●		4	41° - 45°	16	11.7	12	1	S08	20	KEYV-S08	15	2
VEH160L12.0R05I04S10		●	4	41° - 45°	16	15.3	12	0.5	S10	20.5	KEYV-S10	28	1
VEH160L12.0R10I04S10		●	4	41° - 45°	16	15.3	12	1	S10	20.5	KEYV-S10	28	1
VEH200L15.0R05I04S12		●	4	41° - 45°	20	18.3	15	0.5	S12	25.5	KEYV-S12	28	1
VEH200L15.0R10I04S12		●	4	41° - 45°	20	18.3	15	1	S12	25.5	KEYV-S12	28	1

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up



$\alpha 1 \neq \alpha 2 \neq \alpha 3 \neq \alpha 4$

APMX = Max. depth of cut
CRKS = Connection screw size

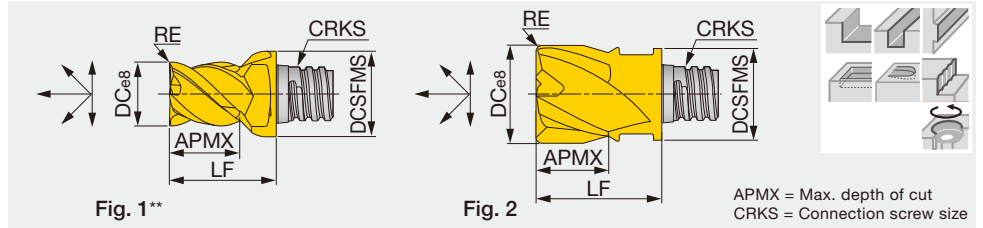
Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VEH080L12.0R05I04S05	●	4	41° - 45°	8	7.7	12	0.5	S05	18	KEYV-S05	7
VEH080L12.0R10I04S05	●	4	41° - 45°	8	7.7	12	1	S05	18	KEYV-S05	7
VEH100L15.0R05I04S06	●	4	41° - 45°	10	9.7	15	0.5	S06	22	KEYV-S06	10
VEH100L15.0R10I04S06	●	4	41° - 45°	10	9.7	15	1	S06	22	KEYV-S06	10
VEH120L18.0R05I04S08	●	4	41° - 45°	12	11.7	18	0.5	S08	27	KEYV-S08	15
VEH120L18.0R10I04S08	●	4	41° - 45°	12	11.7	18	1	S08	27	KEYV-S08	15
VEH160L24.0R05I04S10	●	4	41° - 45°	16	15.3	24	0.5	S10	33.5	KEYV-S10	28
VEH160L24.0R10I04S10	●	4	41° - 45°	16	15.3	24	1	S10	33.5	KEYV-S10	28
VEH200L30.0R05I04S12	●	4	41° - 45°	20	18.45	30	0.5	S12	41	KEYV-S12	28
VEH200L30.0R10I04S12	●	4	41° - 45°	20	18.45	30	1	S12	41	KEYV-S12	28
VEH250L37.0R05I04S15	●	4	41° - 45°	25	23.9	37	0.5	S15	52.5	KEYV-W20	40
VEH250L37.0R10I04S15	●	4	41° - 45°	25	23.9	37	1	S15	52.5	KEYV-W20	40
VEH320L38.0R00I04S21	●	4	41° - 45°	32	30	38	-	S21	55	KS-24	110
VEH320L38.0R10I04S21	●	4	41° - 45°	32	30	38	1	S21	55	KS-24	110

Torque*: Recommended clamping torque (N-m)
VEH080 ~ VEH160: 2 pieces per package
VEH200 ~ VEH320: 1 piece per package

● : Line up

VEE**-04..., VED**-04...

4 flute, roughing - finishing, general



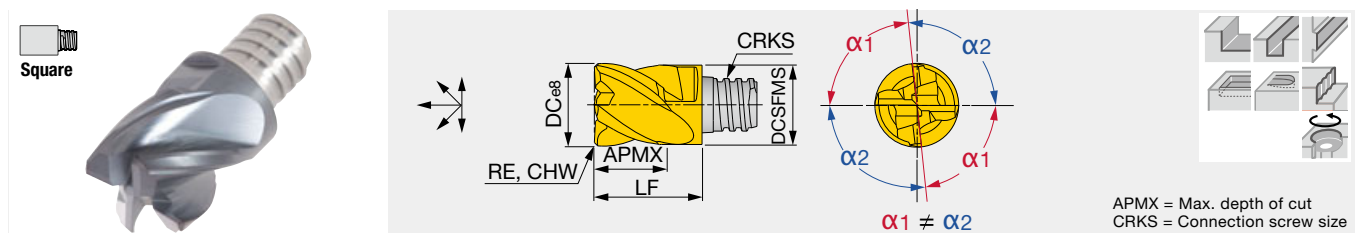
Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*	Fig.
VEE050L04.0R05-04S04	●		4	45°	5	6	4	0.5	S04	8.5	KEYV-S05	4	1
VEE060L04.0R05-04S04		●	4	45°	6	5.8	4	0.5	S04	8.5	KEYV-S05	4	2
VEE060L05.0R00-04S05	●	●	4	45°	6	8	5	-	S05	10	KEYV-S05	7	1
VEE080L05.0R00-04S05		●	4	45°	8	7.7	5	-	S05	10	KEYV-S05	7	2
VED080L05.0R05-04S05	●		4	30°	8	7.7	5	0.5	S05	10	KEYV-S05	7	2
VED080L05.0R10-04S05	●		4	30°	8	7.7	5	1	S05	10	KEYV-S05	7	2
VED080L05.0R15-04S05	●		4	30°	8	7.7	5	1.5	S05	10	KEYV-S05	7	2
VEE100L07.0R00-04S06		●	4	45°	10	9.7	7	-	S06	13	KEYV-S06	10	2
VED100L07.0R05-04S06		●	4	30°	10	9.7	7	0.5	S06	13	KEYV-S06	10	2
VEE100L07.0R05-04S06		●	4	45°	10	9.7	7	0.5	S06	13	KEYV-S06	10	2
VED100L07.0R10-04S06		●	4	30°	10	9.7	7	1	S06	13	KEYV-S06	10	2
VEE100L07.0R10-04S06		●	4	45°	10	9.7	7	1	S06	13	KEYV-S06	10	2
VEE120L09.0R00-04S08	●	●	4	45°	12	11.7	9	-	S08	16.5	KEYV-S08	15	2
VED120L09.0R05-04S08		●	4	30°	12	11.7	9	0.5	S08	16.5	KEYV-S08	15	2
VEE120L09.0R05-04S08		●	4	45°	12	11.7	9	0.5	S08	16.5	KEYV-S08	15	2
VED120L09.0R10-04S08	●	●	4	30°	12	11.7	9	1	S08	16.5	KEYV-S08	15	2
VEE120L09.0R10-04S08		●	4	45°	12	11.7	9	1	S08	16.5	KEYV-S08	15	2
VEE160L12.0R00-04S10	●	●	4	45°	16	15.3	12	-	S10	20.5	KEYV-S10	28	2
VED160L12.0R05-04S10	●	●	4	30°	16	15.3	12	0.5	S10	20.5	KEYV-S10	28	2
VEE160L12.0R05-04S10		●	4	45°	16	15.3	12	0.5	S10	20.5	KEYV-S10	28	2
VED160L12.0R10-04S10		●	4	30°	16	15.3	12	1	S10	20.5	KEYV-S10	28	2
VEE160L12.0R10-04S10		●	4	45°	16	15.3	12	1	S10	20.5	KEYV-S10	28	2
VED160L12.0R15-04S10		●	4	30°	16	15.3	12	1.5	S10	20.5	KEYV-S10	28	2
VEE160L12.0R15-04S10		●	4	45°	16	15.3	12	1.5	S10	20.5	KEYV-S10	28	2
VED160L12.0R20-04S10		●	4	30°	16	15.3	12	2	S10	20.5	KEYV-S10	28	2
VEE160L12.0R20-04S10		●	4	45°	16	15.3	12	2	S10	20.5	KEYV-S10	28	2
VED160L12.0R30-04S10		●	4	30°	16	15.3	12	3	S10	20.5	KEYV-S10	28	2
VEE160L12.0R30-04S10	●	●	4	45°	16	15.3	12	3	S10	20.5	KEYV-S10	28	2
VED160L12.0R40-04S10		●	4	30°	16	15.3	12	4	S10	20.5	KEYV-S10	28	2
VEE160L12.0R40-04S10		●	4	45°	16	15.3	12	4	S10	20.5	KEYV-S10	28	2
VEE200L15.0R00-04S12		●	4	45°	20	18.3	15	-	S12	25.5	KEYV-S12	28	2
VED200L15.0R05-04S12		●	4	30°	20	18.3	15	0.5	S12	25.5	KEYV-S12	28	2
VED200L15.0R10-04S12	●	●	4	30°	20	18.3	15	1	S12	25.5	KEYV-S12	28	2
VED200L15.0R20-04S12		●	4	30°	20	18.3	15	2	S12	25.5	KEYV-S12	28	2
VED200L15.0R30-04S12		●	4	30°	20	18.3	15	3	S12	25.5	KEYV-S12	28	2

Torque*: Recommended clamping torque (N-m)

**Fig. 1: Avoid interference with workpiece when using this cutting head. The shank diameter is larger than the cutter diameter when assembled.

2 pieces per package

● : Line up



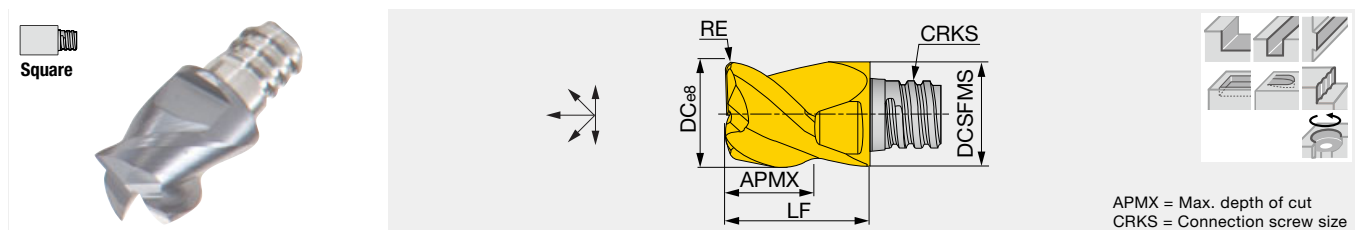
Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CHW	CRKS	LF	Wrench	Torque*
VEE080L05.0C30I04S05	●		4	38°	8	7.7	5	-	0.3	S05	10	KEYV-S05	7
VEE100L07.0C40I04S06	●		4	38°	10	9.7	7	-	0.4	S06	13	KEYV-S06	10
VEE120L09.0C50I04S08	●		4	38°	12	11.7	9	-	0.5	S08	16.5	KEYV-S08	15
VEE160L12.0C60I04S10	●	●	4	38°	16	15.3	12	-	0.6	S10	20.5	KEYV-S10	28
VEE200L15.0C60I04S12	●	●	4	38°	20	18.3	15	-	0.6	S12	25.5	KEYV-S12	28
VEE250L22.0C60I04S15	●	●	4	38°	25	23.9	22	-	0.6	S15	37	KEYV-W20	40
VEE250L22.0R00I04S15	●	●	4	38°	25	23.9	22	-	-	S15	37	KEYV-W20	40
VEE250L22.0R05I04S15	●	●	4	38°	25	23.9	22	0.5	-	S15	37	KEYV-W20	40
VEE250L22.0R10I04S15	●	●	4	38°	25	23.9	22	1	-	S15	37	KEYV-W20	40
VEE250L22.0R20I04S15	●	●	4	38°	25	23.9	22	2	-	S15	37	KEYV-W20	40
VEE250L22.0R30I04S15	●	●	4	38°	25	23.9	22	3	-	S15	37	KEYV-W20	40

Torque*: Recommended clamping torque (N-m)
VEE080 - VEE200: 2 pieces per package
VEE250: 1 piece per package

● : Line up

VEE**-03...

3 flute, roughing - finishing, general, for key way



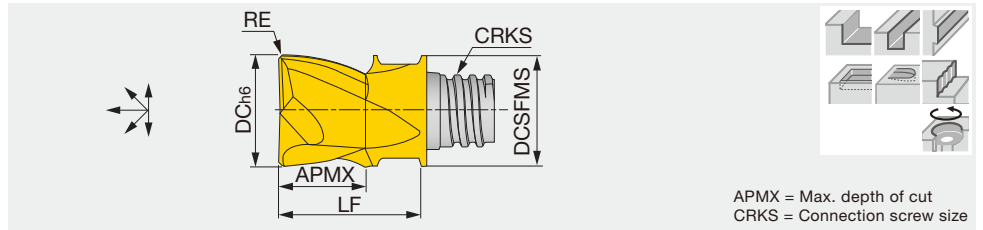
Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VEE077L04.0R02-03S05	●		3	38°	7.7	7.7	4	0.2	S05	10	KEYV-S05	7
VEE080L05.0R00-03S05	●		3	45°	8	7.7	5	-	S05	10	KEYV-S05	7
VEE097L05.0R03-03S06	●		3	38°	9.7	9.7	5	0.3	S06	13	KEYV-S06	10
VEE100L07.0R00-03S06	●		3	45°	10	9.7	7	-	S06	13	KEYV-S06	10
VEE117L07.0R03-03S08	●	●	3	38°	11.7	11.7	7	0.3	S08	16.5	KEYV-S08	15
VEE120L09.0R00-03S08	●	●	3	45°	12	11.7	9	-	S08	16.5	KEYV-S08	15
VEE157L08.0R03-03S10	●	●	3	38°	15.7	15.3	8	0.3	S10	20.5	KEYV-S10	28
VEE197L12.0R04-03S12	●	●	3	38°	19.7	18.3	12	0.4	S12	25.5	KEYV-S12	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

VEE**A02...

2 flute, roughing - finishing, for non-ferrous metal, general



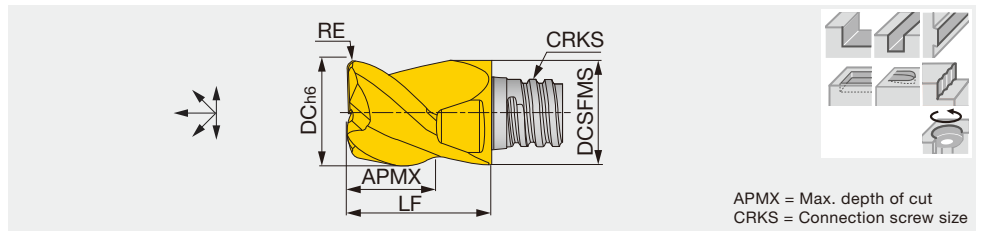
Designation	KS15F	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VEE100L07.0R05A02S06	●	2	45°	10	9.7	7	0.5	S06	13	KEYV-S06	10
VEE100L07.0R10A02S06	●	2	45°	10	9.7	7	1	S06	13	KEYV-S06	10
VEE120L09.0R05A02S08	●	2	45°	12	11.7	9	0.5	S08	16.5	KEYV-S08	15

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

VEE**A03...

3 flute, roughing - finishing, for non-ferrous metal, general



Designation	KS15F	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VEE080L05.0R05A03S05	●	3	45°	8	7.7	5	0.5	S05	10	KEYV-S05	7
VEE100L06.0R05A03S06	●	3	45°	10	9.7	6	0.5	S06	13	KEYV-S06	10
VEE100L06.0R10A03S06	●	3	45°	10	9.7	6	1	S06	13	KEYV-S06	10
VEE120L08.0R05A03S08	●	3	45°	12	11.7	8	0.5	S08	16.5	KEYV-S08	15
VEE120L08.0R10A03S08	●	3	45°	12	11.7	8	1	S08	16.5	KEYV-S08	15
VEE160L10.0R00A03S10	●	3	45°	16	15.3	10	-	S10	20.5	KEYV-S10	28
VEE160L10.0R10A03S10	●	3	45°	16	15.3	10	1	S10	20.5	KEYV-S10	28
VEE160L10.0R20A03S10	●	3	45°	16	15.3	10	2	S10	20.5	KEYV-S10	28
VEE200L12.0R05A03S12	●	3	45°	20	18.3	12	0.5	S12	25.5	KEYV-S12	28
VEE200L12.0R10A03S12	●	3	45°	20	18.3	12	1	S12	25.5	KEYV-S12	28
VEE200L12.0R20A03S12	●	3	45°	20	18.3	12	2	S12	25.5	KEYV-S12	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

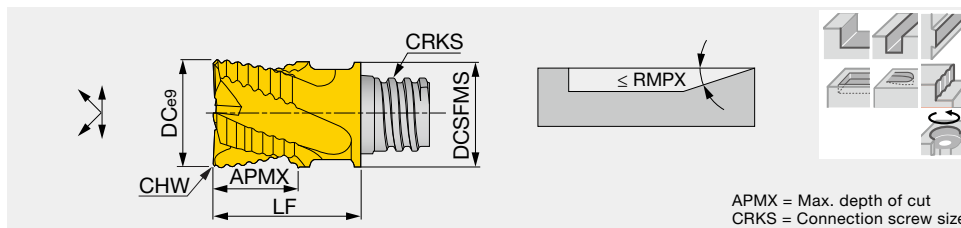
TUNGMEISTER

VEE**R...

4, 5, 6 flute, roughing, serrated cutting edge



Square



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	CHW	CRKS	LF	RMPX	Wrench	Torque*
VEE080L05.0C25R04S05	●	●	4	45°	8	7.7	5	0.25	S05	10	5°	KEYV-S05	7
VEE100L07.0C30R04S06	●	●	4	45°	10	9.7	7	0.3	S06	13	5°	KEYV-S06	10
VEE120L09.0C35R04S08	●	●	4	45°	12	11.7	9	0.35	S08	16.5	5°	KEYV-S08	15
VEE160L12.0C40R05S10	●	●	5	45°	16	15.3	12	0.4	S10	20.5	5°	KEYV-S10	28
VEE200L15.0C40R06S12	●	●	6	45°	20	18.3	15	0.4	S12	25.5	3°	KEYV-S12	28
VEE250L22.0C50R06S15	●	●	6	45°	25	23.9	22	0.5	S15	37	3°	KEYV-W20	40

Torque*: Recommended clamping torque (N-m)

VEE080 ~ VEE200: 2 pieces per package

VEE250: 1 piece per package

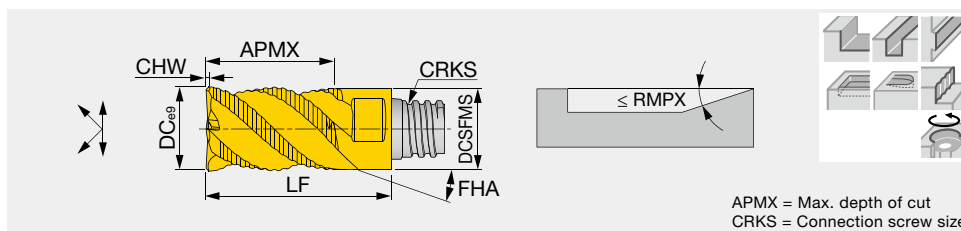
● : Line up

VED**R...

4, 5, 6 flute, roughing, long cutting edge, serrated cutting edge



Square



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	CHW	CRKS	LF	RMPX	Wrench	Torque*
VED080L12.0C25R04S05	●	4	46°	8	7.7	12	0.25	S05	18	5°	KEYV-S05	7
VED100L15.0C30R04S06	●	4	46°	10	9.6	15	0.3	S06	22	5°	KEYV-S06	10
VED120L18.0C35R04S08	●	4	46°	12	11.7	18	0.35	S08	27	5°	KEYV-S08	15
VED160L24.0C40R05S10	●	5	40°	16	15.3	24	0.4	S10	33.5	5°	KEYV-S10	28
VED200L30.0C40R06S12	●	6	47°	20	18.45	30	0.4	S12	41	3°	KEYV-S12	28
VED250L37.0C50I06S15	●	6	47°	25	23.9	37	0.5	S15	52.5	3°	KEYV-W20	40

Torque*: Recommended clamping torque (N-m)

VED080 ~ VED160: 2 pieces per package

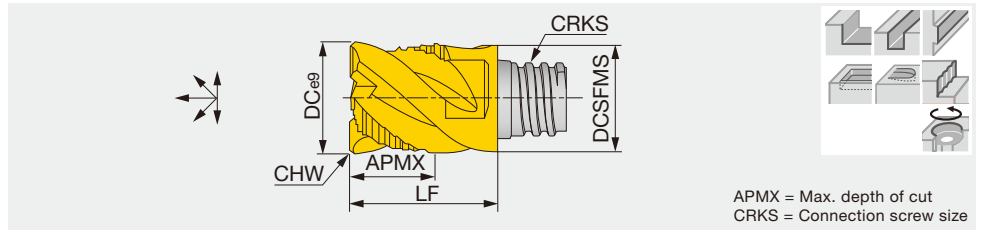
VED200, VED250: 1 piece per package

● : Line up

Reference pages: Standard cutting conditions → **I073 - I074**

VEE**C...

4 flute, roughing - semi finishing, roughing and finishing edge combination



Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	CHW	CRKS	LF	Wrench	Torque*
VEE080L05.0C30C04S05	●	4	45°	8	7.7	5	0.3	S05	10	KEYV-S05	7
VEE100L07.0C30C04S06	●	4	45°	10	9.7	7	0.3	S06	13	KEYV-S06	10
VEE120L09.0C40C04S08	●	4	45°	12	11.7	9	0.4	S08	16.5	KEYV-S08	15
VEE160L12.0C60C04S10	●	4	45°	16	15.3	12	0.6	S10	20.5	KEYV-S10	28
VEE200L15.0C60C04S12	●	4	45°	20	18.3	15	0.6	S12	25.5	KEYV-S12	28
VEE250L22.0C60C04S15	●	4	45°	25	23.9	22	0.6	S15	37	KEYV-W20	40

Torque*: Recommended clamping torque (N-m)

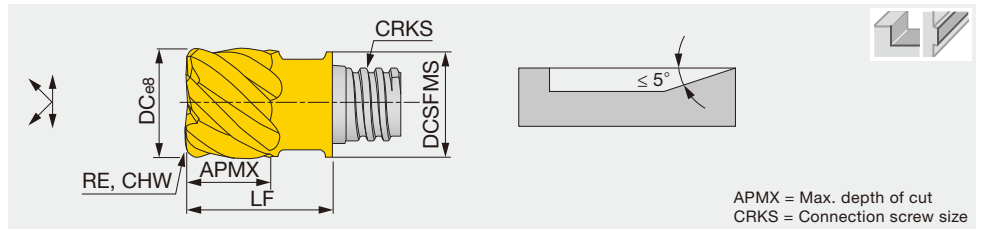
VEE080 - VEE200: 2 pieces per package

VEE250: 1 piece per package

● : Line up

VED**-06..., VEE**-06...

6 flute, roughing - finishing, small width of cut



Designation	AH725	AH750	NOF	FHA	DC	DCSFMS	APMX	RE	CHW	CRKS	LF	Wrench	Torque*
VEE080L05.0R05-06S05	●		6	45°	8	7.7	5	0.5	-	S05	10	KEYV-S05	7
VEE080L05.0R10-06S05	●		6	45°	8	7.7	5	1	-	S05	10	KEYV-S05	7
VEE080L05.0R15-06S05	●		6	45°	8	7.7	5	1.5	-	S05	10	KEYV-S05	7
VEE080L05.0C10-06S05		●	6	50°	8	7.7	5	-	0.1	S05	10	KEYV-S05	7
VED100L07.0R00-06S06	●		6	45°	10	9.7	7	-	-	S06	13	KEYV-S06	10
VED100L07.0R05-06S06	●		6	30°	10	9.7	7	0.5	-	S06	13	KEYV-S06	10
VED100L07.0R05-06S06	●		6	45°	10	9.7	7	0.5	-	S06	13	KEYV-S06	10
VED100L07.0R10-06S06	●		6	30°	10	9.7	7	1	-	S06	13	KEYV-S06	10
VED100L07.0R10-06S06	●		6	45°	10	9.7	7	1	-	S06	13	KEYV-S06	10
VED100L07.0R15-06S06	●		6	30°	10	9.7	7	1.5	-	S06	13	KEYV-S06	10
VED100L07.0R15-06S06	●		6	45°	10	9.7	7	1.5	-	S06	13	KEYV-S06	10
VED100L07.0C10-06S06		●	6	50°	10	9.7	7	-	0.1	S06	13	KEYV-S06	10
VEE120L09.0R00-06S08	●		6	45°	12	11.7	9	-	-	S08	16.5	KEYV-S08	15
VED120L09.0R05-06S08	●		6	30°	12	11.7	9	0.5	-	S08	16.5	KEYV-S08	15
VED120L09.0R10-06S08	●		6	30°	12	11.7	9	1	-	S08	16.5	KEYV-S08	15
VED120L09.0R10-06S08	●		6	45°	12	11.7	9	1	-	S08	16.5	KEYV-S08	15
VED120L09.0R15-06S08	●		6	45°	12	11.7	9	1.5	-	S08	16.5	KEYV-S08	15
VED120L09.0C10-06S08		●	6	50°	12	11.7	9	-	0.1	S08	16.5	KEYV-S08	15

Torque*: Recommended clamping torque (N-m)

2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I073 - I074**

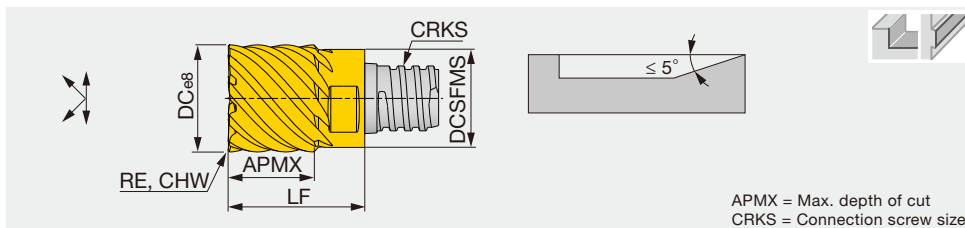
TUNGMEISTER

VED**-08/10..., VEE**-08/10...

8, 10 flute, roughing - finishing, small width of cut



Square



Designation	AH715	AH725	AH750	NOF	FHA	DC	DCSFMS	APMX	RE	CHW	CRKS	LF	Wrench	Torque*
VED160L12.0R05-08S10	●			8	30°	16	15.3	12	0.5	-	S10	20.5	KEYV-S10	28
VED160L12.0R10-08S10	●	●		8	30°	16	15.3	12	1	-	S10	20.5	KEYV-S10	28
VED160L12.0R16-08S10	●	●		8	30°	16	15.3	12	1.6	-	S10	20.5	KEYV-S10	28
VED160L12.0R20-08S10	●	●		8	30°	16	15.3	12	2	-	S10	20.5	KEYV-S10	28
VEE160L12.0C20-08S10			●	8	50°	16	15.3	12	-	0.2	S10	20.5	KEYV-S10	28
VED200L15.0R10-10S12	●	●		10	30°	20	18.3	15	1	-	S12	25.5	KEYV-S12	28
VED200L15.0R20-10S12	●	●		10	30°	20	18.3	15	2	-	S12	25.5	KEYV-S12	28
VEE200L15.0C20-10S12			●	10	50°	20	18.3	15	-	0.2	S12	25.5	KEYV-S12	28
VED250L22.0R10-10S15	●	●		10	30°	25	23.9	22	1	-	S15	37	KEYV-W20	40

Torque*: Recommended clamping torque (N·m)

VEE / VED160 - 200: 2 pieces per package

VED250: 1 piece per package

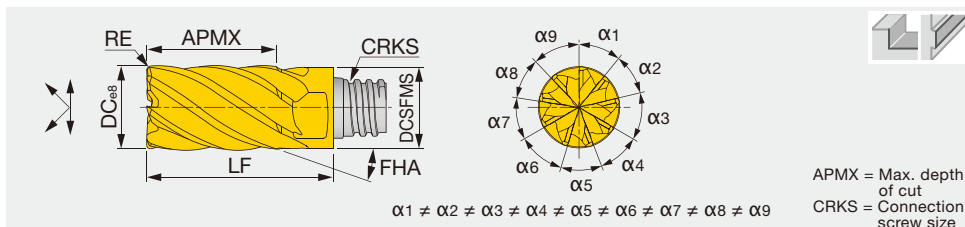
● : Line up

VED**-07/09...

7, 9 flute, roughing - finishing, long edge, variable helix and pitch, small width of cut



Square



Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VED080L12.0R05I07S05	●	7	34° - 40°	8	7.7	12	0.5	S05	18	KEYV-S05	7
VED100L15.0R05I07S06	●	7	34° - 40°	10	9.6	15	0.5	S06	22	KEYV-S06	10
VED120L18.0R05I07S08	●	7	34° - 40°	12	11.7	18	0.5	S08	27	KEYV-S08	15
VED160L24.0R08I09S10	●	9	34° - 40°	16	15.3	24	0.8	S10	33.5	KEYV-S10	28
VED200L30.0R10I09S12	●	9	34° - 40°	20	18.45	30	1	S12	41	KEYV-S12	28
VED250L37.0R10I09S15	●	9	34° - 40°	25	23.9	37	1	S15	52.5	KEYV-W20	40

Torque*: Recommended clamping torque (N·m)

VED080 - VED160: 2 pieces per package

VED200, VED250: 1 piece per package

● : Line up

Reference pages: Standard cutting conditions → **I073 - I074**

STANDARD CUTTING CONDITIONS

Shoulder milling

VEH, VEE: 3 flutes, VED / VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VED-R, VEE-C

ISO	Workpiece material	Hardness	Cutting speed V_c (m/min)	Feed per tooth: f_z (mm/t)									Depth of cut a_p (mm)	Width of cut a_e (mm)
				Tool diameter: DC (mm)										
				5	6	8	10	12	16	20	25	32		
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	60 - 140	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	60 - 120	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	40 - 100	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	80 - 200	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
N	Aluminium alloys Si < 13%	-	200 - 700	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Aluminium alloys Si ≥ 13%	-	100 - 300	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	40 - 80	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 60	0.03 - 0.07	0.03 - 0.07	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.1 - 0.18	0.6 x DC	0.25 x DC

VED / VEE: 6 flutes, VED / VEE: 8, 10 flutes, VED: 7, 9 flutes

ISO	Workpiece material	Hardness	Cutting speed V_c (m/min)	Feed per tooth: f_z (mm/t)						Depth of cut a_p (mm)	Width of cut a_e (mm)
				Tool diameter: DC (mm)							
				8	10	12	16	20	25		
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	60 - 120	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x DC	0.02 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	30 - 60	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x DC	0.02 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	80 - 160	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x DC	0.02 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	40 - 90	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	0.6 x DC	0.02 x DC



Slotting

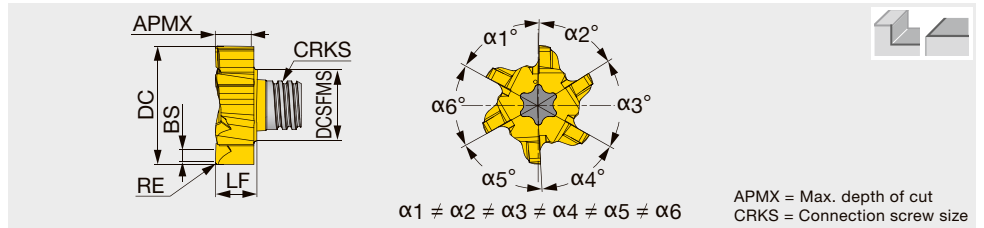
VEH, VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C

ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: f _z (mm/t)									Depth of cut a _p (mm)
				Tool diameter: DC (mm)									
				5	6	8	10	12	16	20	25	32	
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	50 - 70	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	40 - 80	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	40 - 70	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	30 - 60	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	50 - 120	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	50 - 120	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
N	Aluminium alloys Si < 13%	-	130 - 400	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Aluminium alloys Si ≥ 13%	-	70 - 200	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	20 - 40	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	10 - 20	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	25 - 60	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	10 - 30	0.03 - 0.04	0.03 - 0.04	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.5 x DC

VFM...

6 flute, roughing - finishing, for face milling

Face mill



Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	RE	BS	CRKS	LF	Wrench	Torque*
VFM120L03.6R02I06S05	●	6	10°	12	7.7	3.6	0.2	1.1	S05	4.4	KEYV-T20	7
VFM160L04.8R04I06S06	●	6	10°	16	9.7	4.8	0.4	1.7	S06	5.6	KEYV-T25	10
VFM200L06.0R04I06S08	●	6	10°	20	11.7	6	0.4	1.7	S08	7	KEYV-T40L	15
VFM250L07.5R04I06S10	●	6	10°	25	15.3	7.5	0.4	1.7	S10	8.55	KEYV-T50L	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

STANDARD CUTTING CONDITIONS

Face milling

VFM

ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: fz (mm/t)				Depth of cut a _p (mm)	Width of cut a _e (mm)
				Tool diameter: DC (mm)					
				12	16	20	25		
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	60 - 140	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	60 - 120	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	40 - 100	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	80 - 200	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	80 - 200	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
N	Aluminium alloys Si < 13%	-	200 - 700	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Aluminium alloys Si ≥ 13%	-	100 - 300	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	40 - 80	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 60	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.1 - 0.17	1	0.7 x DC

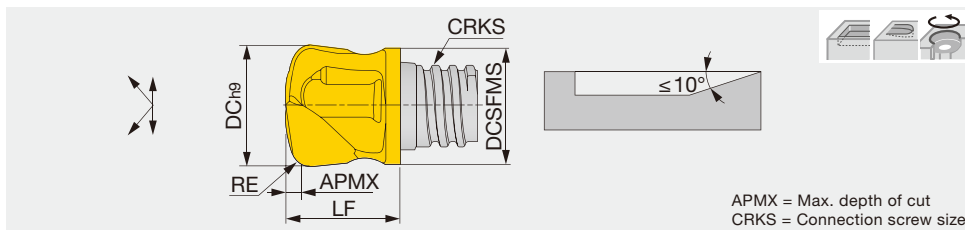
TUNGMEISTER

VFX**-02...

2 flute, roughing



High feed



Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE ⁽¹⁾	CRKS	LF	Wrench	Torque*	fz(mm/t)
VFX100L00.6R20-02S06	●	2	0°	10	9.6	0.6	2	S06	12.5	KEYV-S06	10	0.3 - 0.6
VFX120L01.0R25-02S08	●	2	0°	12	11.5	1.0	2.5	S08	11.1	KEYV-S08	15	0.5 - 1
VFX160L01.1R30-02S10	●	2	0°	16	15.2	1.1	3	S10	13.5	KEYV-S10	28	0.55 - 1.1
VFX200L01.5R33-02S12	●	2	0°	20	18.3	1.5	3.3	S12	17.5	KEYV-S12	28	0.75 - 1.5

Torque*: Recommended clamping torque (N-m)

(1) Corner radius for CAM programing

For VFX head, taper neck shank or Tungsten shank should be recommended.

2 pieces per package

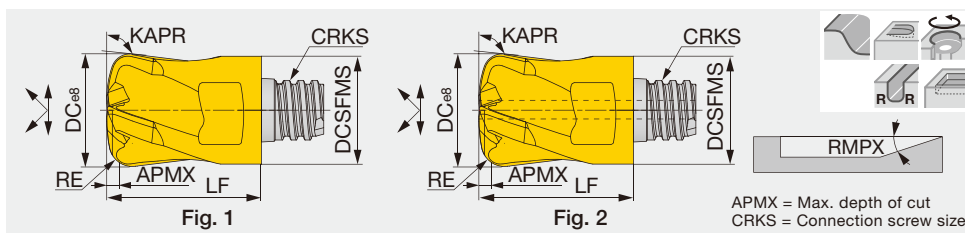
● : Line up

VFX**-04/06...

4, 6 flute, roughing



High feed



Designation	AH715	AH725	AH750	NOF	FHA	DC	DCSFMS	APMX	RE	KAPR	CRKS	LF	RMPX	Wrench	Torque*	fz(mm/t)	Fig.
VFX120L0.60R18E04S08	●			4	20°	12	11.5	0.6	1.8	97°	S08	16.5	5°	KEYV-S08	15	0.16 - 0.67	2
VFX120L0.60R18H04S08		●		4	20°	12	11.5	0.6	1.8	97°	S08	16.5	5°	KEYV-S08	15	0.16 - 0.67	1
VFX120L0.65R12E06S08			●	6	20°	12	11.5	0.65	0.6	97°	S08	12	3°	KEYV-S08	15	0.16 - 0.54	2
VFX160L0.80R22E04S10	●			4	20°	16	15.4	0.8	2.2	97°	S10	20.5	5°	KEYV-S10	28	0.2 - 0.75	2
VFX160L0.80R22H04S10		●		4	20°	16	15.4	0.8	2.2	97°	S10	20.5	5°	KEYV-S10	28	0.2 - 0.75	1
VFX160L1.05R20E06S10			●	6	20°	16	15.4	1.05	1	97°	S10	16	3°	KEYV-S10	28	0.2 - 0.65	2

Torque*: Recommended clamping torque (N-m)

Slot milling is not recommended for workpiece materials such as stainless steel where chips tend to adhere.

Also max. ae < 0.4D.

2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I077**

STANDARD CUTTING CONDITIONS

High feed milling

VFX: 2, 4, 6 flutes

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	ø10		ø12		ø16		ø20		Width of cut ae (mm)
				Feed per tooth fz (mm/t)	Depth of cut ap (mm)	Feed per tooth fz (mm/t)	Depth of cut ap (mm)	Feed per tooth fz (mm/t)	Depth of cut ap (mm)	Feed per tooth fz (mm/t)	Depth of cut ap (mm)	
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	100 - 200	0.3 - 0.7	0.5	0.4 - 0.8	0.5	0.5 - 0.9	0.75	0.6 - 1	1	0.6 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	80 - 180	0.2 - 0.6	0.5	0.3 - 0.7	0.5	0.4 - 0.8	0.75	0.5 - 0.9	1	0.6 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	80 - 160	0.2 - 0.5	0.4	0.2 - 0.5	0.4	0.3 - 0.6	0.5	0.3 - 0.6	0.75	0.6 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	60 - 100	0.2 - 0.6	0.4	0.2 - 0.6	0.4	0.3 - 0.7	0.5	0.3 - 0.7	0.75	0.6 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	100 - 220	0.3 - 0.7	0.5	0.4 - 0.8	0.75	0.5 - 0.9	0.75	0.6 - 1	1	0.6 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	100 - 220	0.2 - 0.6	0.5	0.3 - 0.7	0.75	0.4 - 0.8	0.75	0.5 - 0.9	1	0.6 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.2 - 0.5	0.4	0.2 - 0.5	0.4	0.2 - 0.6	0.5	0.2 - 0.6	0.5	0.25 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.1 - 0.3	0.3	0.1 - 0.3	0.3	0.1 - 0.3	0.4	0.1 - 0.3	0.4	0.25 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	40 - 80	0.2 - 0.4	0.3	0.2 - 0.4	0.3	0.3 - 0.5	0.4	0.3 - 0.5	0.4	0.45 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 60	0.1 - 0.2	0.2	0.1 - 0.2	0.2	0.1 - 0.3	0.3	0.1 - 0.3	0.3	0.25 x DC

Please note that the feed per tooth should not exceed the maximum feed per tooth for each product.

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index

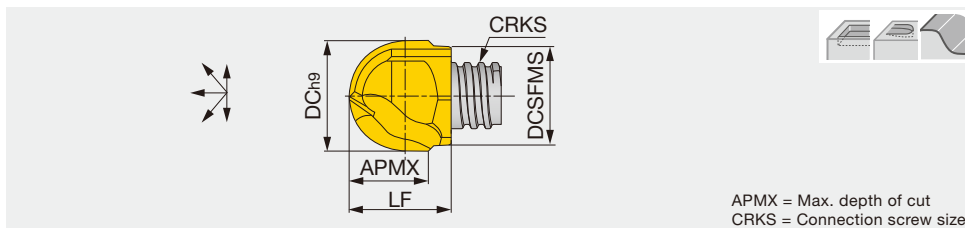
TUNGMEISTER

VBB**-BM...

2 flute, roughing - semi finishing, economical



Ball



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	CRKS	LF	Wrench	Torque*
VBB080L08.0-BM-02S05	●	2	0°	8	7.6	8	S05	10	KEYV-S05	7
VBB100L10.0-BM-02S06	●	2	0°	10	9.5	10	S06	12.4	KEYV-S06	10
VBB120L12.0-BM-02S08	●	2	0°	12	11.5	11.5	S08	15.3	KEYV-S08	15
VBB160L16.0-BM-02S10	●	2	0°	16	15.2	16	S10	19.1	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

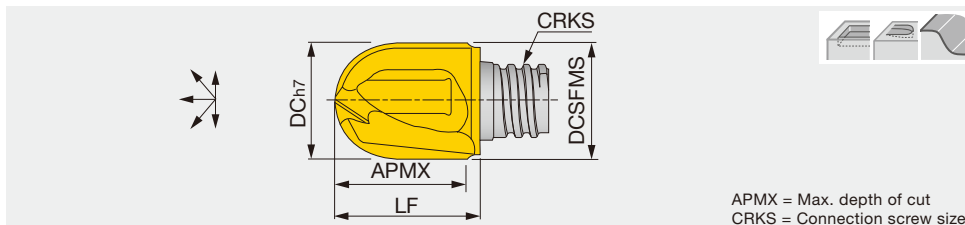
● : Line up

VBB**-BG...

2 flute, finishing, high accuracy (h7 tolerance), for hardened steel



Ball



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH750	NOF	FHA	DC	DCSFMS	APMX	CRKS	LF	Wrench	Torque*
VBB080L08.0-BG-02S05	●	2	0°	8	7.6	8	S05	10	KEYV-S05	7
VBB100L10.0-BG-02S06	●	2	0°	10	9.6	10	S06	12.4	KEYV-S06	10
VBB120L12.0-BG-02S08	●	2	0°	12	11.5	12	S08	15.3	KEYV-S08	15
VBB160L16.0-BG-02S10	●	2	0°	16	15.2	16	S10	19.1	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

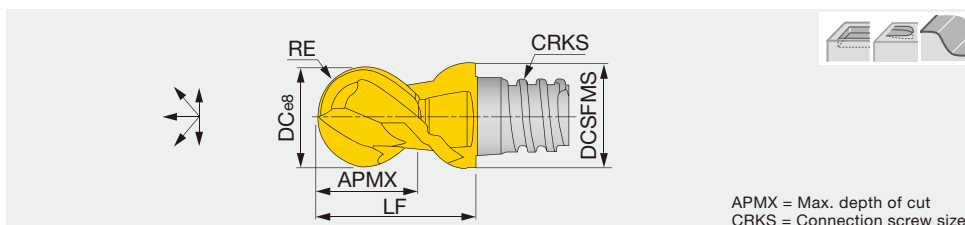
● : Line up

VBD**-BG...

2 flute, semi finishing - finishing, helix cutting edge



Ball



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VBD080L05.0-BG-02S05	●	2	30°	8	7.7	5	3.982 ⁽¹⁾	S05	10	KEYV-S05	7
VBD100L07.0-BG-02S06	●	2	30°	10	9.7	7	4.982 ⁽¹⁾	S06	13	KEYV-S06	10
VBD120L09.0-BG-02S08	●	2	30°	12	11.7	9	5.978 ⁽²⁾	S08	16.5	KEYV-S08	15
VBD160L09.5-BG-02S10	●	2	30°	16	15.3	9	7.978 ⁽²⁾	S10	20.5	KEYV-S10	28

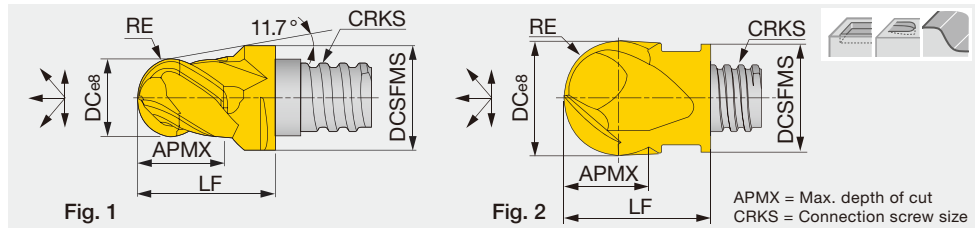
The tolerance of RE: (1) ± 0.01 (2) ± 0.012
Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I080**

VBD**-BG-04..., VBE**-BG-04...

4 flute, roughing - finishing, helix cutting edge



Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*	Fig.
VBE050L04.0-BG-04S04	●		4	38°	5	6	4	2.487 ⁽¹⁾	S04	8.5	KEYV-S05	4	1
VBE060L04.0-BG-04S04	●		4	38°	6	5.8	4	2.987 ⁽¹⁾	S04	8.5	KEYV-S05	4	2
VBE060L05.5-BG-04S05	●		4	38°	6	8	5.5	2.987 ⁽¹⁾	S05	10	KEYV-S05	7	1
VBD080L05.0-BG-04S05	●	●	4	30°	8	7.7	5	3.982 ⁽¹⁾	S05	10	KEYV-S05	7	2
VBD100L07.0-BG-04S06	●	●	4	30°	10	9.7	7	4.982 ⁽¹⁾	S06	13	KEYV-S06	10	2
VBD120L09.0-BG-04S08	●	●	4	30°	12	11.7	9	5.978 ⁽²⁾	S08	16.5	KEYV-S08	15	2
VBD160L12.0-BG-04S10	●	●	4	30°	16	15.3	12	7.978 ⁽²⁾	S10	20.5	KEYV-S10	28	2
VBD200L15.0-BG-04S12	●	●	4	30°	20	18.3	15	9.972 ⁽²⁾	S12	25.5	KEYV-S12	28	2

The tolerance of RE: (1) ± 0.01 (2) ± 0.012

Torque*: Recommended clamping torque (N·m)

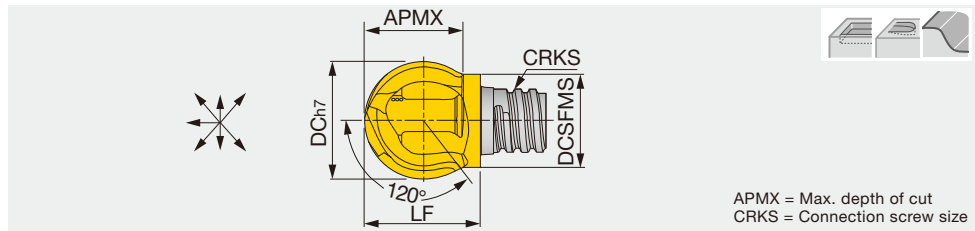
VBE060/VBD080 ~ VBD200: 2 pieces per package

VBD250: 1 piece per package

● : Line up

VBB**-SG...

2 flute, roughing - finishing, sphere cutting edge, high accuracy (h7 tolerance)



Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	CRKS	LF	Wrench	Torque*
VBB100L08.0-SG-02S05	●	2	0°	10	7.6	7.5	S05	10	KEYV-S05	7
VBB120L09.6-SG-02S06	●	2	0°	12	9.5	9	S06	11.6	***KEYV-S08	10
VBB160L12.9-SG-02S08	●	2	0°	16	12.2	12	S08	15.4	***KEYV-S10	15
VBB200L16.1-SG-02S10	●	2	0°	20	15.2	15	S10	18.4	KEYV-S10	28

Torque*: Recommended clamping torque (N·m)

*** The wrench size for these heads is different from the ones for the other head types.

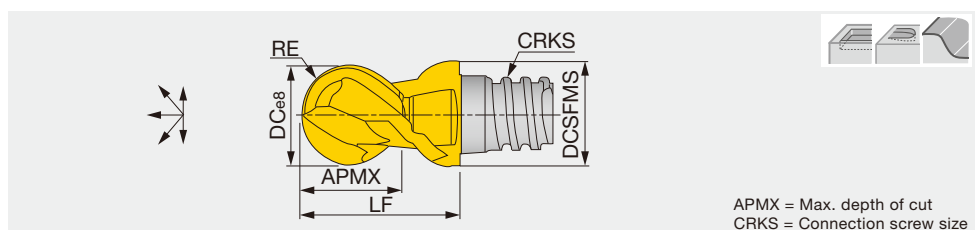
For pull-cutting on the vertical wall

2 pieces per package

● : Line up

VBE**-BGA...

2 flute, roughing - finishing, for non-ferrous metal, helix cutting edge



Designation	KS15F	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VBE080L05.0-BGA02S05	●	2	45°	8	7.7	5	3.982 ⁽¹⁾	S05	10	KEYV-S05	7
VBE100L07.0-BGA02S06	●	2	45°	10	9.7	7	4.982 ⁽¹⁾	S06	13	KEYV-S06	10
VBE120L09.0-BGA02S08	●	2	45°	12	11.7	9	5.987 ⁽²⁾	S08	16.5	KEYV-S08	15
VBE160L12.0-BGA02S10	●	2	45°	16	15.3	12	7.978 ⁽²⁾	S10	20.5	KEYV-S10	28
VBE200L15.0-BGA02S12	●	2	45°	20	18.3	15	9.972 ⁽²⁾	S12	25.5	KEYV-S12	28

The tolerance of RE: (1) ± 0.01 (2) ± 0.012

Torque*: Recommended clamping torque (N·m)

2 pieces per package

● : Line up

Solid Endmill

Exchangable Head Endmill

Threading Endmill

Milling Insert

Square

Ball

Radius

Chamfering

Slotting

Threading

Others

2

3

4

5

6 or more

STANDARD CUTTING CONDITIONS

Profiling for roughing

VBB-BM / BG / SG, VBD-BG, VBE-BGA

ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: fz (mm/t)								Depth of cut a _p (mm)	Pick feed P _f (mm)
				Tool diameter: DC (mm)									
				5	6	8	10	12	16	20	25		
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	100 - 200	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	80 - 180	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	80 - 160	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	60 - 100	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	100 - 220	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	100 - 220	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
N	Aluminium alloys Si < 13%	-	200 - 700	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
	Aluminium alloys Si ≥ 13%	-	100 - 300	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.4 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.2 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.2 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	40 - 80	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.2 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 60	0.03 - 0.07	0.03 - 0.07	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.08 - 0.15	0.08 - 0.15	0.3 x DC	0.2 x DC

Profiling for semi-finishing and finishing

VBB-BM / BG / SG, VBD-BG, VBE-BGA

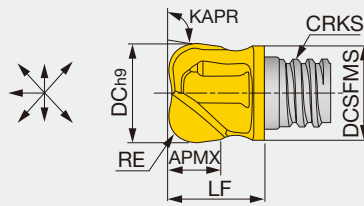
ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: fz (mm/t)								Depth of cut a _p (mm)	Pick feed P _f (mm)
				Tool diameter: DC (mm)									
				5	6	8	10	12	16	20	25		
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	120 - 250	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	100 - 220	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	100 - 200	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	80 - 120	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	120 - 280	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	120 - 280	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
N	Aluminium alloys Si < 13%	-	300 - 1000	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
	Aluminium alloys Si ≥ 13%	-	150 - 400	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.1 x DC	0.15 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	50 - 100	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x DC	0.1 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	30 - 50	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x DC	0.1 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	50 - 100	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x DC	0.1 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	30 - 80	0.04 - 0.09	0.04 - 0.09	0.06 - 0.11	0.07 - 0.12	0.08 - 0.13	0.09 - 0.16	0.1 - 0.18	0.1 - 0.18	0.08 x DC	0.1 x DC

VRB**-02..., VRC**-02...

2 flute, roughing - semi finishing, economical



Radius



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	KAPR	CRKS	LF	Wrench	Torque*
VRC100L07.0R10-02S06	●	2	15°	10	9.5	7	1	95°	S06	12.4	KEYV-S06	10
VRB100L06.0R20-02S06	●	2	0°	10	9.2	6	2	97°	S06	12.4	KEYV-S06	10
VRB120L05.7R30-02S06	●	2	0°	12	9.5	5.7	3	97°	S06	9.1	***KEYV-S08	10
VRB120L05.4R40-02S06	●	2	0°	12	9.5	5.4	4	97°	S06	9.1	***KEYV-S08	10
VRB120L06.3R16-02S08	●	2	0°	12	11.5	5.9	1.6	97°	S08	11.1	KEYV-S08	15
VRB120L06.2R20-02S08	●	2	0°	12	11.5	6.2	2	97°	S08	11.1	KEYV-S08	15
VRB120L06.1R25-02S08	●	2	0°	12	11.5	5.8	2.5	97°	S08	11.1	KEYV-S08	15
VRB120L06.1R30-02S08	●	2	0°	12	11.5	5.7	3	97°	S08	11.1	KEYV-S08	15
VRB120L05.9R40-02S08	●	2	0°	12	11.5	5.5	4	97°	S08	11.1	KEYV-S08	15
VRB160L08.0R50-02S10	●	2	0°	16	15.2	8	5	97°	S10	20.2	KEYV-S10	28
VRB200L11.1R30-02S12	●	2	0°	20	18.3	11	3	97°	S12	17	KEYV-S12	28
VRB200L11.5R40-02S12	●	2	0°	20	18.3	11.3	4	97°	S12	17.3	KEYV-S12	28
VRB200L11.5R50-02S12	●	2	0°	20	18.3	11.3	5	97°	S12	17.3	KEYV-S12	28
VRB200L11.4R60-02S12	●	2	0°	20	18.3	11.2	6	97°	S12	17.3	KEYV-S12	28
VRB200L11.3R80-02S12	●	2	0°	20	18.3	11.1	8	97°	S12	17.3	KEYV-S12	28

Torque*: Recommended clamping torque (N-m)

*** The wrench size for these heads is different from the ones for the other head types.

Suitable for contouring operation.

2 pieces per package

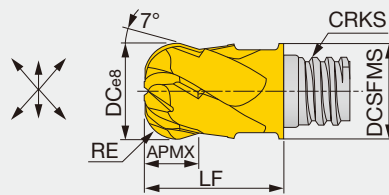
● : Line up

VRD**-06...

6 flute, semi finishing - finishing, helix cutting edge



Radius



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VRD080L04.0R20-06S05	●	6	30°	8	7.7	4	2	S05	10	KEYV-S05	7
VRD100L05.0R30-06S06	●	6	30°	10	9.7	5	3	S06	13	KEYV-S06	10
VRD120L07.0R40-06S08	●	6	30°	12	11.7	7	4	S08	16.5	KEYV-S08	15
VRD160L09.0R50-06S10	●	6	30°	16	15.3	9	5	S10	20.5	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)

2 pieces per package

● : Line up

Solid Endmill

Exchangable Head Endmill

Threading Endmill

Milling Insert

Square

Ball

Radius

Chamfering

Slotting

Threading

Others

STANDARD CUTTING CONDITIONS

Shoulder milling

VRB, VRC, VRD

ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: f _z (mm/t)					Depth of cut a _p (mm)	Width of cut a _e (mm)
				Tool diameter: DC (mm)						
				8	10	12	16	20		
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	60 - 140	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	60 - 120	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	40 - 100	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	80 - 200	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	80 - 200	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
N	Aluminium alloys Si < 13%	-	200 - 700	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Aluminium alloys Si ≥ 13%	-	100 - 300	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	40 - 80	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 60	0.05 - 0.09	0.07 - 0.12	0.08 - 0.13	0.09 - 0.15	0.1 - 0.17	0.6 x DC	0.25 x DC

Slotting

VRB, VRC, VRD

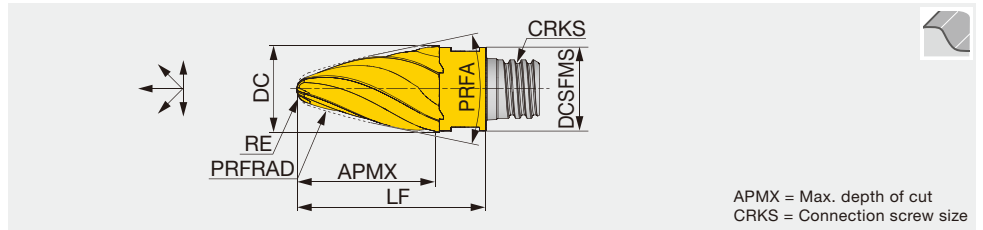
ISO	Workpiece material	Hardness	Cutting speed V _c (m/min)	Feed per tooth: f _z (mm/t)					Depth of cut a _p (mm)
				Tool diameter: D _C (mm)					
				8	10	12	16	20	
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	50 - 70	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	40 - 80	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	40 - 70	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	30 - 60	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	50 - 120	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	50 - 120	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
N	Aluminium alloys Si < 13%	-	130 - 400	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Aluminium alloys Si ≥ 13%	-	70 - 200	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	20 - 40	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	10 - 20	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	25 - 60	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	10 - 30	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.5 x D _C

VBO...

4, 5 flute, semi finishing - finishing, long edge, high productive profiling



Barrel



Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	RE	PRFRAD	PRFA	CRKS	LF	Wrench	Torque*
VBO080L12.0R900-4S05	●	4	30°	8	7.7	12	1	90	33.6°	S05	18	KEYV-S05	7
VBO100L15.0R850-5S06	●	5	30°	10	9.7	15	2	85	27.3°	S06	22	KEYV-S06	10
VBO120L19.0R800-5S08	●	5	30°	12	11.7	19	2	80	29.3°	S08	27	KEYV-S08	15
VBO160L25.0R750-5S10	●	5	30°	16	15.3	25	3	75	26.7°	S10	33.5	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

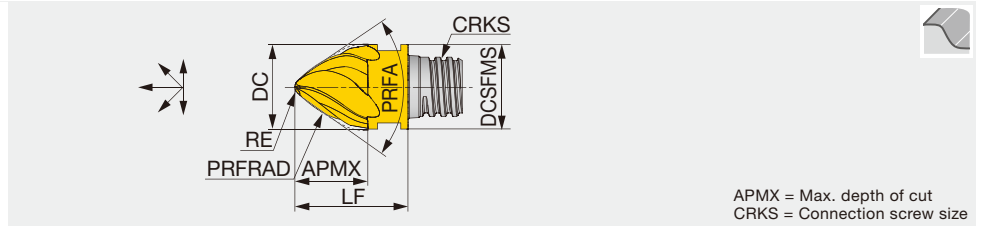
● : Line up

VBO...

4 flute, semi finishing - finishing, short edge, high productive profiling



Barrel



Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	RE	PRFRAD	PRFA	CRKS	LF	Wrench	Torque*
VBO100L08.0R250-4S06	●	4	30°	10	9.7	8	0.8	25	70.8°	S06	13	KEYV-S06	10
VBO120L09.0R300-4S08	●	4	30°	12	11.7	9	1.2	30	71.6°	S08	16.5	KEYV-S08	15
VBO160L13.0R400-4S10	●	4	30°	16	15.3	13	1.6	40	70.3°	S10	20.5	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

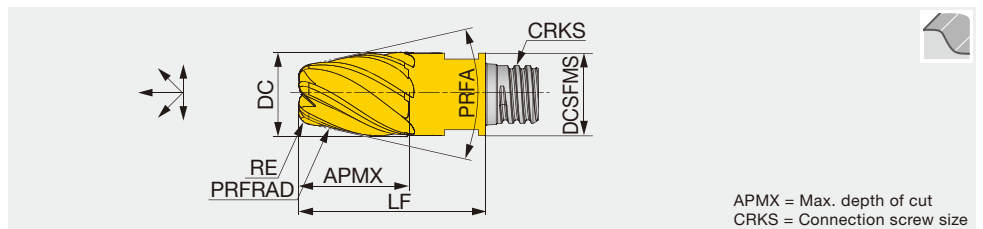
● : Line up

VBN...

6 flute, semi finishing - finishing, high productive profiling



Bull nose



Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	RE	PRFRAD	PRFA	CRKS	LF	Wrench	Torque*
VBN100L13.0R450-6S06	●	6	35°	10	9.7	13	1.5	45	15.1°	S06	22	KEYV-S06	10
VBN120L15.0R500-6S08	●	6	35°	12	11.7	15	2	50	15.1°	S08	27	KEYV-S08	15
VBN160L18.0R600-6S10	●	6	35°	16	15.3	18	2	60	15.1°	S10	33.5	KEYV-S10	28

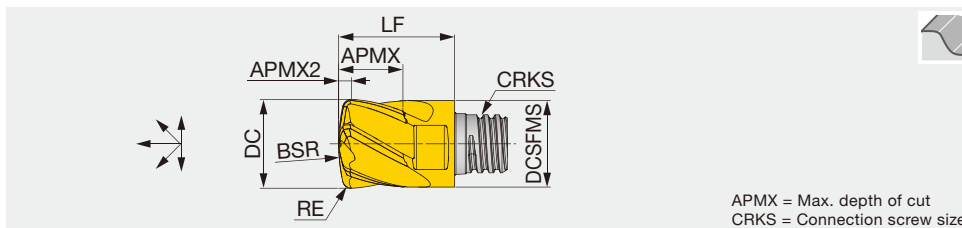
Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I085**



Lens



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	NOF	FHA	DC	DCSFMS	APMX	APMX2	RE	BSR	CRKS	LF	Wrench	Torque*
VBL080L0.90R160-6S05	●	6	30°	8	7.7	5.5	0.9	0.5	16	S05	10	KEYV-S05	7
VBL100L1.40R200-6S06	●	6	30°	10	9.7	7.5	1.42	1	20	S06	13	KEYV-S06	10
VBL120L1.50R240-6S08	●	6	30°	12	11.7	9	1.55	1	24	S08	16.5	KEYV-S08	15
VBL160L1.80R320-6S10	●	6	30°	16	15.3	12	1.8	1	32	S10	20.5	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

TARGET APPLICATIONS

VBO-short

Convex-curved surfaces, tapered surfaces, and surfaces consisting of combinations of a small corner radius and walls (the corner radius must be larger than the tool's nose radius).



VBO-long

Convex-curved and tapered surfaces in gentler profile than those of VBO-short.



VBN

Impellers, blisks, blades, and other aerospace parts.



STANDARD CUTTING CONDITIONS

Profiling

VBO, VBN, VBL

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	Feed per tooth: fz (mm/t)			Cusp height (mm)
				Tool diameter: DC (mm)			
				10	12	16	
P	Low carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	100 - 200	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	High carbon steel SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc.	- 300 HB	80 - 180	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	80 - 160	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	60 - 100	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
K	Grey cast iron FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	100 - 220	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	Ductile cast iron FCD400, etc. 400-15S, etc.	150 - 250 HB	100 - 220	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
N	Aluminium alloys Si < 13%	-	200 - 700	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	Aluminium alloys Si ≥13%	-	100 - 300	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 80	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	Heat-resistant alloys Inconel718, etc.	- 40 HRC	20 - 40	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
H	Hardened steel SKD61, SKT4, etc. X40CrMoV5-1, 55NiCrMoV7, etc.	-	40 - 80	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1
	Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc.	50 - 60 HRC	20 - 60	0.05 - 0.1	0.06 - 0.11	0.07 - 0.13	0.1

TIPS FOR USING ON 3-AXIS MACHINES

The **VBO/VBN** milling heads are designed for the use on 5-axis machines. However, they are also effective on 3-axis machining centers when either of the following conditions is satisfied.

1. The angled walls or curved surfaces to be machined have tilt angles within the range specified in the chart on the right.
2. Use as a regular tapered ball mill with only the nose radius of the tool tip, and not the radius on the tool side, to be used. Please note that the working diameter will be smaller than those of a ball mill of the same working diameter.

	Designation	Applicable ranges of tilt angles on workpiece		
		Min.	Mean	Max.
VBO-short	VBO100L08.0R250-4S06	56°	70.8°	85°
	VBO120L09.0R300-4S08	58°	71.6°	85°
	VBO160L13.0R400-4S10	56°	70.3°	85°
VBO-long	VBO100L15.0R850-5S06	20°	27.3°	35°
	VBO120L19.0R800-5S08	19°	29.3°	40°
	VBO160L25.0R750-5S10	10°	26.7°	43°
VBN	VBN100L13.0R450-6S06	0°	15.1°	29°
	VBN120L15.0R500-6S08	0°	15.1°	29°
	VBN160L18.0R600-6S10	0°	15.1°	29°

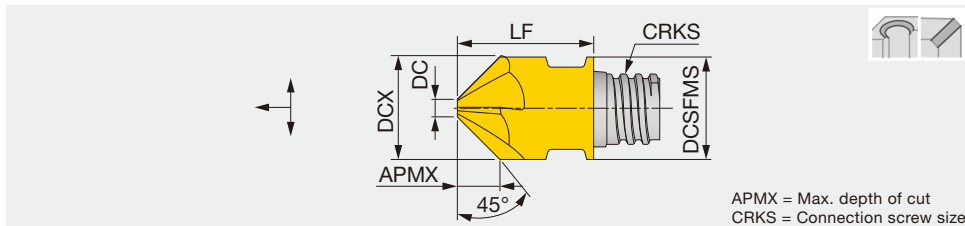
TUNGMEISTER

VCA**-04/06...

4, 6 flute, chamfering angle: 45°



Chamfering

APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	AH725	NOF	FHA	DCX	DCSFMS	APMX	DC	CRKS	LF	Wrench	Torque*
VCA100L04.0A45-04S06	●	●	4	0°	10	10	4	1.95	S06	13	KEYV-S06	10
VCA120L05.0A45-04S08	●	●	4	0°	12	12	5	1.95	S08	16.5	KEYV-S08	15
VCA127L05.3A45-04S08		●	4	0°	12.7	12.7	5.3	1.98	S08	16.5	KEYV-S08	15
VCA160L06.5A45-06S10	●	●	6	0°	16	16	6.5	3	S10	20.3	KEYV-S10	28
VCA200L07.5A45-06S12		●	6	0°	20	18.3	7.5	5	S12	25.5	KEYV-S12	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

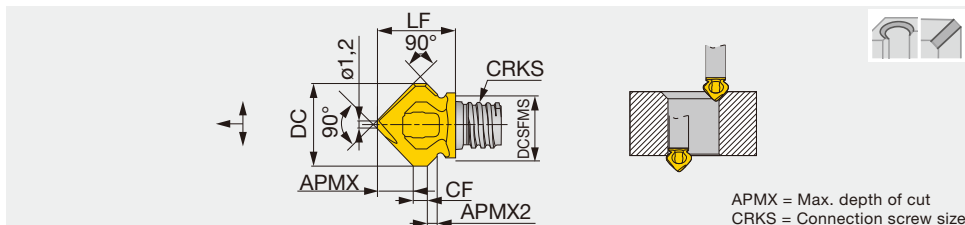
● : Line up

VCW**-02...

2 flute, chamfering angle: 45°, back chamfering capability



Chamfering

APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	AH725	NOF	FHA	DC	DCSFMS	APMX	APMX2	CF	CRKS	LF	Wrench	Torque*
VCW118L05.0A45-02S06	●	●	2	0°	11.8	9.3	5	1.2	2	S06	11.2	***KEYV-S08	10

Torque*: Recommended clamping torque (N-m)

*** The wrench size for these heads is different from the ones for the other head types.

Available for chamfering of reverse side.

2 pieces per package

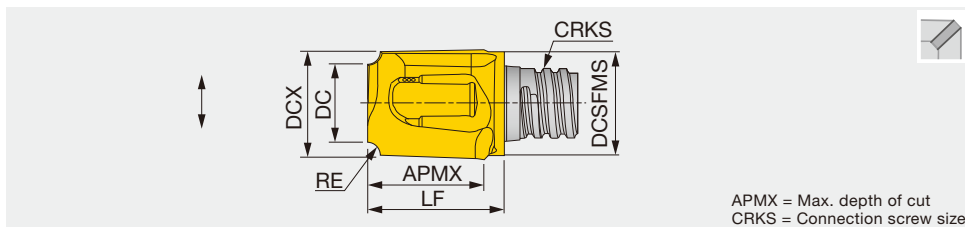
● : Line up

VCR**-02...

2 flute, radius chamfering



Chamfering

APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DCX	DCSFMS	DC	APMX	RE	CRKS	LF	Wrench	Torque*
VCR080L07.5R10-02S05	●	2	0°	8	7.6	5.8	7.5	1	S05	10.5	KEYV-S05	7
VCR100L09.5R16-02S06	●	2	0°	10	9.5	6.8	9.5	1.6	S06	12.5	KEYV-S06	10
VCR100L09.5R25-02S06	●	2	0°	10	9.5	5.1	9.5	2.5	S06	12.5	KEYV-S06	10
VCR127L12.0R30-02S08	●	2	0°	12.7	12.2	6.5	12	3	S08	15.6	KEYV-S08	15
VCR127L12.0R40-02S08	●	2	0°	12.7	12.2	4.7	12	4	S08	15.6	KEYV-S08	15
VCR160L15.0R50-02S10	●	2	0°	16	15.2	6.2	15	5	S10	19.1	KEYV-S10	28
VCR200L07.0R60-02S12	●	2	0°	20	18.3	8	7	6	S12	17.4	KEYV-S12	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → [I087](#)

STANDARD CUTTING CONDITIONS

Chamfering and countersinking (Milling, Z-feed chamfering)

VCA, VCW, VCR

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	60 - 100	0.03 - 0.06
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	50 - 80	0.03 - 0.06
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	40 - 70	0.03 - 0.06
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	30 - 50	0.03 - 0.06
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	80 - 120	0.03 - 0.06
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	80 - 120	0.03 - 0.06
N	Aluminium alloys	-	100 - 200	0.04 - 0.08
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	30 - 50	0.025 - 0.05
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.02 - 0.04
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	30 - 50	0.025 - 0.05
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 40	0.02 - 0.04

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

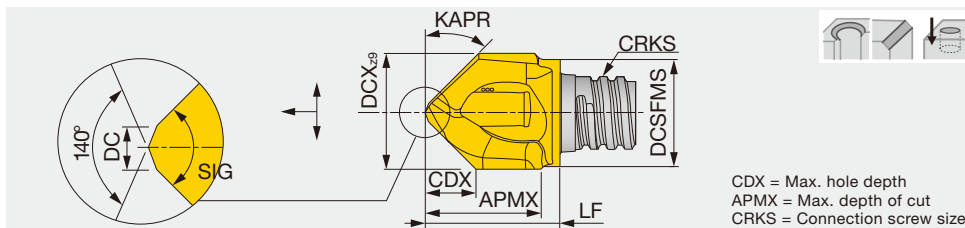
Index

TUNGMEISTER

VCP**-02...

2 flute, chamfering angle: 30°, 45°, 60°

Chamfering
Spot drill



CDX = Max. hole depth
APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH715	AH725	SIG	NOF	FHA	DCX	DCSFMS	APMX	CDX	CRKS	LF	DC	KAPR	Wrench	Torque*
VCP100L09.5A30-02S06	●	●	60°	2	0°	10	9.5	8.5	7.5	S06	11.75	1.5	60°	KEYV-S06	10
VCP120L12.0A30-02S08	●	●	60°	2	0°	12	11.5	11	9.2	S08	15.4	1.5	60°	KEYV-S08	15
VCP160L15.0A30-02S10	●	●	60°	2	0°	16	15.2	16	12	S10	20.2	2.5	60°	KEYV-S10	28
VCP080L07.7A45-02S05	●	●	90°	2	0°	8	7.6	7.5	3.7	S05	9.75	1	45°	KEYV-S05	7
VCP083L07.9A45-02S05	●	●	90°	2	0°	8.3	7.6	7.5	3.8	S05	10	1	45°	KEYV-S05	7
VCP100L09.0A45-02S06	●	●	90°	2	0°	10	9.5	9.5	4.4	S06	11.75	1.5	45°	KEYV-S06	10
VCP104L09.0A45-02S06	●	●	90°	2	0°	10.4	9.5	9.5	4.6	S06	11.75	1.5	45°	KEYV-S06	10
VCP120L12.0A45-02S08	●	●	90°	2	0°	12	11.5	11.5	5.4	S08	15.4	1.5	45°	KEYV-S08	15
VCP124L12.0A45-02S08	●	●	90°	2	0°	12.4	11.5	11.5	5.6	S08	15.4	1.5	45°	KEYV-S08	15
VCP160L15.0A45-02S10	●	●	90°	2	0°	16	15.2	15	7.1	S10	18.8	1.5	45°	KEYV-S10	28
VCP165L15.0A45-02S10	●	●	90°	2	0°	16.5	15.2	15	7.1	S10	18.8	1.5	45°	KEYV-S10	28
VCP100L09.5A60-02S06	●	●	120°	2	0°	10	9.5	9.5	2.7	S06	12.7	1.5	30°	KEYV-S06	10
VCP120L12.0A60-02S08	●	●	120°	2	0°	12	11.5	11.5	3.3	S08	15.2	1.5	30°	KEYV-S08	15
VCP160L15.5A60-02S10	●	●	120°	2	0°	16	15.2	16	4.4	S10	19.9	1.5	30°	KEYV-S10	28

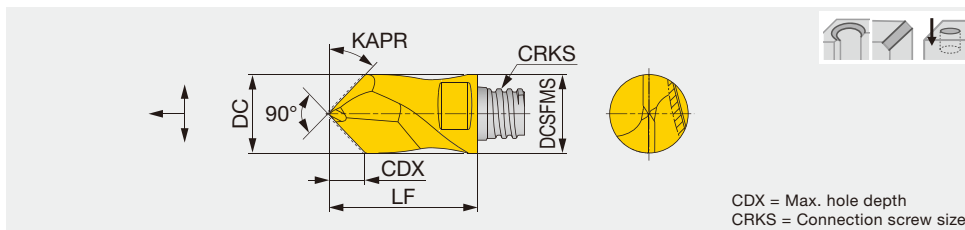
Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

VDS...

2 flute, chamfering angle: 45°, helix cutting edge

Chamfering
Spot drill



CDX = Max. hole depth
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	CDX	KAPR	CRKS	LF	Wrench	Torque*
VDS080A45-02S05	●	2	10°	8	7.7	3.7	45°	S05	15	KEYV-S05	7
VDS100A45-02S06	●	2	10°	10	9.7	4.4	45°	S06	19	KEYV-S06	10
VDS120A45-02S08	●	2	10°	12	11.7	5.4	45°	S08	23	KEYV-S08	15
VDS160A45-02S10	●	2	10°	16	15.3	7.1	45°	S10	28	KEYV-S10	28

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I089**

STANDARD CUTTING CONDITIONS

Spot drill

VCP, VDS

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	Feed f (mm/rev)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	60 - 100	0.06 - 0.12
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	50 - 80	0.06 - 0.12
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	40 - 70	0.06 - 0.12
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	30 - 50	0.06 - 0.12
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	80 - 120	0.06 - 0.12
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	80 - 120	0.06 - 0.12
N	Aluminium alloys	-	100 - 200	0.08 - 0.16
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	30 - 50	0.05 - 0.1
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	20 - 40	0.04 - 0.08
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	30 - 50	0.05 - 0.1
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	20 - 40	0.04 - 0.08

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index



Center hole

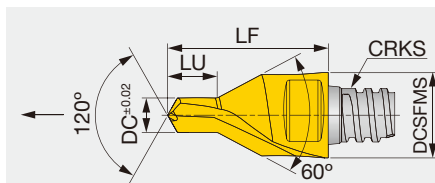


Fig. 1 Type A

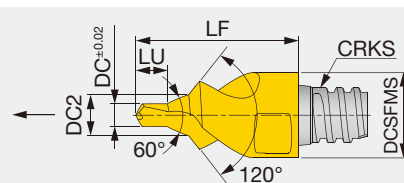


Fig. 2 Type B

CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC±0.02	DC2	DCSFMS	LU	CRKS	LF	Wrench	Torque*	Fig.
VDP107L1.60A30-02S04	●	2	0°	1.07	-	6	1.6	S04	10	KEYV-S05	4	1
VDP165L2.40A30-02S04	●	2	0°	1.65	-	6	2.4	S04	10	KEYV-S05	4	1
VDP207L2.90A30-02S04	●	2	0°	2.07	-	6	2.9	S04	10	KEYV-S05	4	1
VDP328L04.6A30-02S05	●	2	0°	3.28	-	8	4.6	S05	15	KEYV-S05	7	1
VDP412L05.9A30-02S06	●	2	0°	4.12	-	10	5.9	S06	19	KEYV-S06	10	1
VDP513L07.2A30-02S08	●	2	0°	5.13	-	12	7.2	S08	23	KEYV-S08	15	1
VDP646L08.9A30-02S10	●	2	0°	6.46	-	16	8.9	S10	28	KEYV-S10	28	1
VDP324L4.38B30-02S08	●	2	0°	3.24	6.77	12	4.4	S08	23	KEYV-S08	15	2
VDP409L5.60B30-02S08	●	2	0°	4.09	8.56	12.7	5.6	S08	23	KEYV-S08	15	2
VDP509L6.89B30-02S12	●	2	0°	5.09	10.69	18.45	6.9	S12	25.5	KEYV-S12	28	2
VDP641L8.63B30-02S12	●	2	0°	6.41	13.29	20	8.6	S12	25.5	KEYV-S12	28	2

Torque*: Recommended clamping torque (N·m)
2 pieces per package

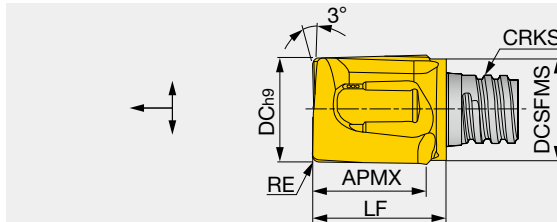
● : Line up

STANDARD CUTTING CONDITIONS

Center drill

VDP

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	Feed : f (mm/rev)						
				VDP107	VDP165	VDP2	VDP3	VDP4	VDP5	VDP6
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	40 - 80	0.02 - 0.04	0.025 - 0.05	0.025 - 0.05	0.04 - 0.08	0.05 - 0.1	0.05 - 0.1	0.06 - 0.12
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	30 - 50	0.02 - 0.04	0.025 - 0.05	0.025 - 0.05	0.04 - 0.08	0.05 - 0.1	0.05 - 0.1	0.06 - 0.12
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	20 - 30	0.02 - 0.04	0.025 - 0.05	0.025 - 0.05	0.04 - 0.08	0.05 - 0.1	0.05 - 0.1	0.06 - 0.12
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	15 - 25	0.015 - 0.03	0.02 - 0.04	0.02 - 0.04	0.04 - 0.08	0.05 - 0.1	0.05 - 0.1	0.06 - 0.12
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	60 - 100	0.02 - 0.04	0.025 - 0.05	0.025 - 0.05	0.05 - 0.09	0.07 - 0.12	0.07 - 0.12	0.12 - 0.18
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	60 - 100	0.02 - 0.04	0.025 - 0.05	0.025 - 0.05	0.04 - 0.08	0.05 - 0.1	0.05 - 0.1	0.1 - 0.15
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	15 - 25	0.01 - 0.02	0.01 - 0.02	0.015 - 0.03	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	10 - 20	0.01 - 0.02	0.01 - 0.02	0.015 - 0.03	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	15 - 25	-	-	-	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07	0.04 - 0.07
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	10 - 20	-	-	-	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06	0.03 - 0.06



APMX = Max. depth of cut
CRKS = Connection screw size

Designation	AH725	NOF	FHA	DC	DCSFMS	APMX	RE	CRKS	LF	Wrench	Torque*
VGC078L08.0R02-02S05	●	2	10°	7.8	7.6	8	0.2	S05	10	KEYV-S05	7
VGC080L08.0R04-02S05	●	2	10°	8	7.6	8	0.4	S05	10	KEYV-S05	7
VGC080L08.0R10-02S05	●	2	10°	8	7.6	8	1	S05	10	KEYV-S05	7
VGC080L08.0R20-02S05	●	2	10°	8	7.6	8	2	S05	10	KEYV-S05	7
VGC098L09.0R03-02S06	●	2	10°	9.8	9.5	9.5	0.3	S06	12.4	KEYV-S06	10
VGC100L09.0R04-02S06	●	2	10°	10	9.5	9.5	0.4	S06	12.4	KEYV-S06	10
VGC100L09.0R10-02S06	●	2	10°	10	9.5	9.5	1	S06	12.4	KEYV-S06	10
VGC100L09.0R20-02S06	●	2	10°	10	9.5	9.5	2	S06	12.4	KEYV-S06	10
VGC120L10.0R04-02S08	●	2	10°	12	11.5	10	0.4	S08	14.2	KEYV-S08	15
VGC120L10.0R10-02S08	●	2	10°	12	11.5	10	1	S08	14.2	KEYV-S08	15
VGC120L10.0R20-02S08	●	2	10°	12	11.5	10	2	S08	14.2	KEYV-S08	15
VGC160L15.0R04-02S10	●	2	10°	16	15.2	15	0.4	S10	19	KEYV-S10	28
VGC160L15.0R08-02S10	●	2	10°	16	15.2	15	0.8	S10	19	KEYV-S10	28

Can drill with step feed (Maximum depth: ap x 0.5)

Torque*: Recommended clamping torque (N·m)

2 pieces per package

● : Line up

STANDARD CUTTING CONDITIONS

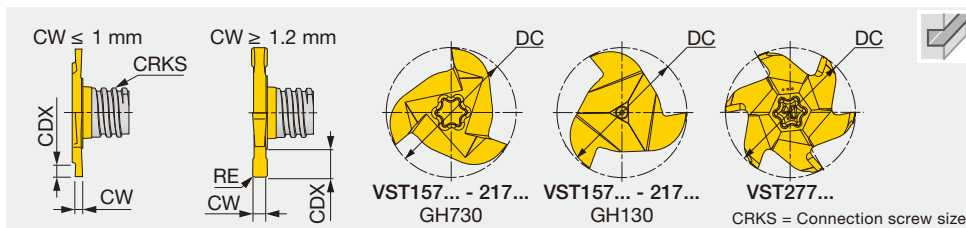
Counterboring

VGC

ISO	Workpiece material	Hardness	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	40 - 80	0.04 - 0.08
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	30 - 50	0.04 - 0.08
	Prehardened steel PX5, NAK80, etc.	30 - 40 HRC	20 - 30	0.04 - 0.08
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	15 - 25	0.04 - 0.08
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	60 - 100	0.05 - 0.09
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	60 - 100	0.04 - 0.08
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	15 - 25	0.04 - 0.07
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	10 - 20	0.03 - 0.06
H	Hardened steel SKD61, SKT4, etc. 55NiCrMoV7, etc.	40 - 50 HRC	15 - 25	0.04 - 0.07
	Hardened steel SKD11, SKH51, etc. HS6-5-2, etc.	50 - 60 HRC	10 - 20	0.03 - 0.06

When drilling, pecking operation should be applied with the depth of 0.3 - 0.5 mm per step.

Apply the same cutting conditions as the VEE type head when conducting shoulder milling or slotting operations.



Designation	GH730	AH735	GH130	NOF	FHA	DC	CW±0.02	RE	CRKS	CDX	Wrench	Torque*
VST157W1.50R010-3S06	●		▲	3	0°	15.7	1.5	0.1	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST157W1.57R020-3S06	●		▲	3	0°	15.7	1.57	0.2	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST157W2.00R020-3S06	●		▲	3	0°	15.7	2	0.2	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST157W2.39R020-3S06	●		▲	3	0°	15.7	2.39	0.2	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST157W2.50R020-3S06	●		▲	3	0°	15.7	2.5	0.2	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST157W3.00R020-3S06	●		▲	3	0°	15.7	3	0.2	S06	2.8	KEYV-177 ⁽²⁾ / KEYV-T25 ⁽³⁾	10
VST157W3.17R020-3S06			▲	3	0°	15.7	3.17	0.2	S06	2.8	KEYV-177	10
VST177W1.20R005-3S06	●		▲	3	0°	17.7	1.2 ⁽¹⁾	0.05	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W1.40R005-3S06	●		▲	3	0°	17.7	1.4 ⁽¹⁾	0.05	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W1.50R010-3S06	●		▲	3	0°	17.7	1.5	0.1	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W1.57R020-3S06	●		▲	3	0°	17.7	1.57	0.2	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W1.70R005-3S06	●		▲	3	0°	17.7	1.7 ⁽¹⁾	0.05	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W2.00R020-3S06	●		▲	3	0°	17.7	2	0.2	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W2.20R110-3S06			▲	3	0°	17.7	2.20	1.1	S06	3.8	KEYV-177	10
VST177W2.39R020-3S06			▲	3	0°	17.7	2.39	0.2	S06	3.8	KEYV-177	10
VST177W2.50R020-3S06	●		▲	3	0°	17.7	2.5	0.2	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T20 ⁽³⁾	10
VST177W3.00R020-3S06	●	▲	▲	3	0°	17.7	3	0.2	S06	3.8	KEYV-177 ⁽²⁾ / KEYV-T25 ⁽³⁾	10
VST177W3.17R020-3S06			▲	3	0°	17.7	3.17	0.2	S06	3.8	KEYV-177	10

(1) CW is based on DIN471 / 472

(2) Applicable for GH130, AH735

(3) Applicable for GH730

Torque*: Recommended clamping torque (N·m)

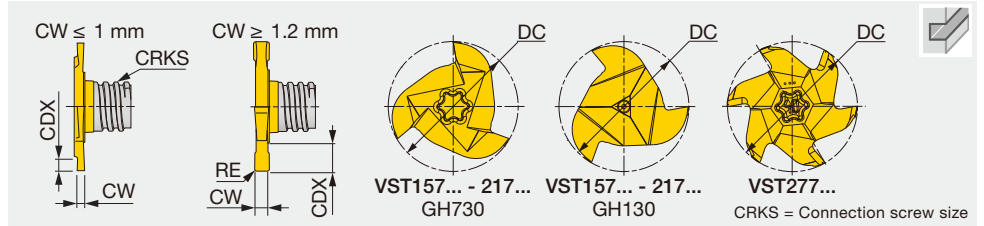
2 pieces per package

● : Line up
▲ : To be discontinued

VST**-4/6...

4, 6 flute, for slotting

Slotting



Designation	GH730	AH735	GH130	NOF	FHA	DC	CW±0.02	RE	CRKS	CDX	Wrench	Torque*
VST217W0.76R000-4S08	●		▲	4	0°	21.7	0.76 ⁽¹⁾	-	S08	1.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W0.86R000-4S08			▲	4	0°	21.7	0.86 ⁽¹⁾	-	S08	1.7	KEYV-217	15
VST217W0.96R000-4S08	●		▲	4	0°	21.7	0.96 ⁽¹⁾	-	S08	1.9	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.00R005-4S08	●		▲	4	0°	21.7	1	0.05	S08	2	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.20R005-4S08	●		▲	4	0°	21.7	1.2 ⁽¹⁾	0.05	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.40R005-4S08	●		▲	4	0°	21.7	1.4 ⁽¹⁾	0.05	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.57R000-4S08	●		▲	4	0°	21.7	1.57	-	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.70R010-4S08	●		▲	4	0°	21.7	1.7 ⁽¹⁾	0.1	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W1.95R020-4S08	●		▲	4	0°	21.7	1.95 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W2.00R020-4S08	●		▲	4	0°	21.7	2	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W2.25R020-4S08	●		▲	4	0°	21.7	2.25 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W2.39R020-4S08	●		▲	4	0°	21.7	2.39	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W2.50R020-4S08	●	▲	▲	4	0°	21.7	2.5	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W2.75R020-4S08	●		▲	4	0°	21.7	2.75 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T25 ⁽³⁾	15
VST217W3.00R020-4S08	●	▲	▲	4	0°	21.7	3	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W3.17R020-4S08	●		▲	4	0°	21.7	3.17	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W3.25R020-4S08	●		▲	4	0°	21.7	3.25 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W4.00R020-4S08	●		▲	4	0°	21.7	4	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W4.25R020-4S08	●		▲	4	0°	21.7	4.25 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W4.75R020-4S08	●		▲	4	0°	21.7	4.75	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST217W5.25R020-4S08	●		▲	4	0°	21.7	5.25 ⁽¹⁾	0.2	S08	4.5	KEYV-217 ⁽²⁾ / KEYV-T30L ⁽³⁾	15
VST277W2.50R020-6S10	●		▲	6	0°	27.7	2.5	0.2	S10	6	KEYV-T40L	28
VST277W5.25R020-6S10	●		▲	6	0°	27.7	5.25 ⁽¹⁾	0.2	S10	6	KEYV-T40L	28
VST277W10.0R020-6S10	●		▲	6	0°	27.7	10	0.2	S10	6	KEYV-T40L	28

(1) CW is based on DIN471 / 472

(2) Applicable for GH130, AH735

(3) Applicable for GH730

Torque*: Recommended clamping torque (N·m)

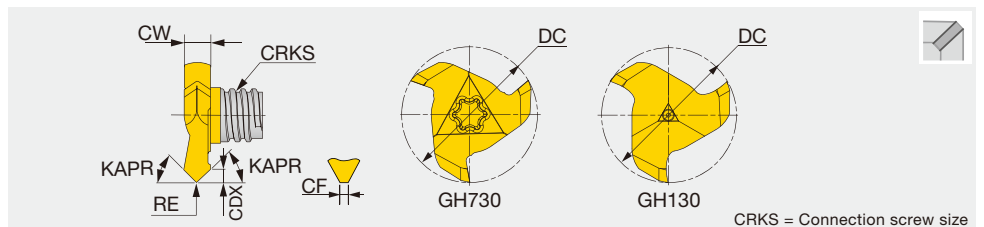
2 pieces per package

● : Line up
▲ : To be discontinued

VST**A45...

3, 4 flute, for slotting with 45° chamfer

Slotting



Designation	GH730	GH130	NOF	FHA	DC	CW	KAPR	CRKS	CDX	CF	RE	Wrench	Torque*
VST177L01.40A45-3S06	●	▲	3	0°	17.7	3.4	45°	S06	1.4	-	0.1	KEYV-177 ⁽¹⁾ / KEYV-T25 ⁽²⁾	10
VST217L01.70A45-4S08	●	▲	4	0°	21.7	5.5	45°	S08	1.7	1.5	-	KEYV-217 ⁽¹⁾ / KEYV-T30L ⁽²⁾	15

(1) Applicable for GH130

(2) Applicable for GH730

Torque*: Recommended clamping torque (N·m)

2 pieces per package

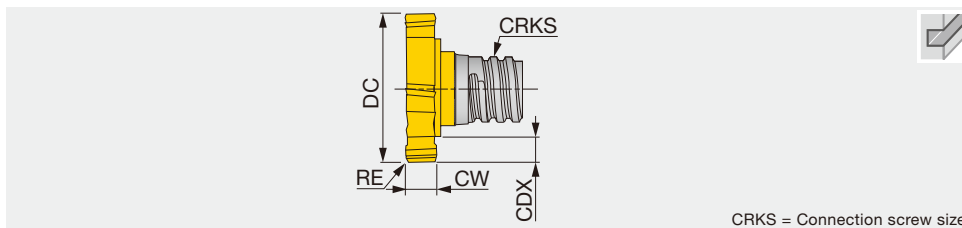
● : Line up
▲ : To be discontinued

Reference pages: Standard cutting conditions → I095

TUNGMEISTER

VTB-06...**

6 flute, for T-slotting



CRKS = Connection screw size

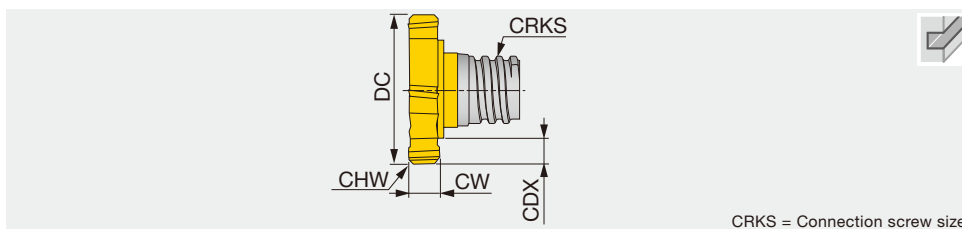
Designation	GH730	AH735	GH130	NOF	FHA	DC $-0.05^{+0.02}$	CW ± 0.02	CDX	CRKS	RE	Wrench	Torque*
VTB135W3.00R04-06S05	●		▲	6	0°	13.5	3	2.65	S05	0.4	KEYV-T20	7
VTB135W4.00R04-06S05	●		▲	6	0°	13.5	4	2.65	S05	0.4	KEYV-T20	7
VTB160W2.00R04-06S06	●		▲	6	0°	16	2	2.9	S06	0.4	KEYV-T20	10
VTB160W3.00R04-06S06	●		▲	6	0°	16	3	2.9	S06	0.4	KEYV-T25	10
VTB160W4.00R04-06S06	●		▲	6	0°	16	4	2.9	S06	0.4	KEYV-T25	10
VTB165W2.00R04-06S06	●		▲	6	0°	16.5	2	3.15	S06	0.4	KEYV-T20	10
VTB165W3.00R04-06S06	●		▲	6	0°	16.5	3	3.15	S06	0.4	KEYV-T25	10
VTB165W4.00R04-06S06	●		▲	6	0°	16.5	4	3.15	S06	0.4	KEYV-T25	10
VTB195W4.00R04-06S08	●		▲	6	0°	19.5	4	3.45	S08	0.4	KEYV-T30L	15
VTB195W5.00R04-06S08	●		▲	6	0°	19.5	5	3.45	S08	0.4	KEYV-T30L	15
VTB195W6.00R04-06S08	●		▲	6	0°	19.5	6	3.45	S08	0.4	KEYV-T30L	15
VTB225W5.00R04-06S08	●		▲	6	0°	22.5	5	4.95	S08	0.4	KEYV-T40L	15
VTB225W6.00R04-06S08	●		▲	6	0°	22.5	6	4.95	S08	0.4	KEYV-T40L	15
VTB225W8.00R04-06S08	●		▲	6	0°	22.5	8	4.95	S08	0.4	KEYV-T40L	15
VTB250W6.00R04-06S08	●		▲	6	0°	25	6	5.9	S08	0.4	KEYV-T50L	15
VTB250W8.00R04-06S08	●		▲	6	0°	25	8	5.9	S08	0.4	KEYV-T50L	15
VTB250W5.00R04-06S10	●		▲	6	0°	25	5	4.3	S10	0.4	KEYV-T50L	28
VTB250W6.00R04-06S10		▲	▲	6	0°	25	6	4.3	S10	0.4	KEYV-T50L	28
VTB250W8.00R04-06S10	●		▲	6	0°	25	8	4.3	S10	0.4	KEYV-T50L	28

 Torque*: Recommended clamping torque (N-m)
2 pieces per package

 ● : Line up
▲ : To be discontinued

VTBC15-06...**

6 flute, for T-slotting with 45° chamfer



CRKS = Connection screw size

Designation	GH730	GH130	NOF	FHA	DC $-0.05^{+0.02}$	CW ± 0.02	CDX	CRKS	CHW	Wrench	Torque*
VTB135W2.00C15-06S05	●	▲	6	0°	13.5	2	2.65	S05	0.15	KEYV-T20	7

 Torque*: Recommended clamping torque (N-m)
2 pieces per package

 ● : Line up
▲ : To be discontinued

 Reference pages: Standard cutting conditions → **I095**

STANDARD CUTTING CONDITIONS

Slotting

VST, VTB

ISO	Workpiece material	Hardness	VST		VTB	
			Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.	- 300 HB	80 - 180	0.05 - 0.15	80 - 180	0.08 - 0.18
	Alloy steel SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc.	- 300 HB	60 - 120	0.04 - 0.12	60 - 120	0.05 - 0.15
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc.	- 200 HB	50 - 120	0.04 - 0.12	50 - 120	0.05 - 0.15
K	Grey cast iron FC250, FC300, etc. 250, 300, etc., GG250, GG300, etc.	150 - 250 HB	100 - 200	0.05 - 0.15	100 - 200	0.08 - 0.18
	Ductile cast iron FCD450, etc. 450-10S, etc., GGG450, etc.	150 - 250 HB	100 - 200	0.04 - 0.12	100 - 200	0.05 - 0.15
N	Aluminium alloys Si < 13%	-	200 - 600	0.05 - 0.15	200 - 600	0.08 - 0.18
	Aluminium alloys Si ≥ 13%	-	100 - 300	0.03 - 0.13	100 - 300	0.05 - 0.15
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	40 - 60	0.04 - 0.12	40 - 60	0.05 - 0.15
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	15 - 35	0.02 - 0.1	15 - 35	0.02 - 0.1

Tolerance of tool diameter

Basic dimensions (mm)		Permissible dimensional deviations (μm)						
>	≤	e8	e9	h6	h7	h9	h10	z9
6	10	-25 -47	-25 -61	0 -9	0 -15	0 -36	0 -58	+78 +42
10	14	-32 -59	-32 -75	0 -11	0 -18	0 -43	0 -70	+93 +50
14	18	-32 -59	-32 -75	0 -11	0 -18	0 -43	0 -70	+103 +60
18	30	-40 -73	-40 -92	0 -13	0 -21	0 -52	0 -84	-

JISB0401-2: 1998 (ISO286-2: 1988) extract

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

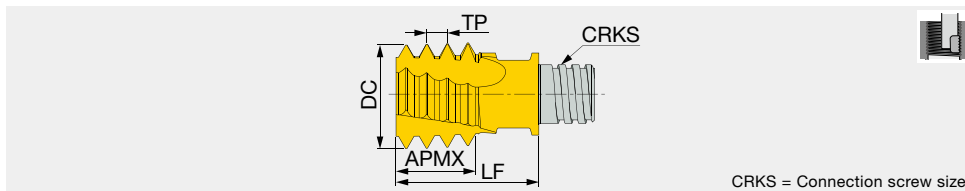
Index

TUNGMEISTER**ISO metric (M)****VMT***IS**

3 - 6 flute, full profile, for internal thread



Threading



CRKS = Connection screw size

Designation	AH725	TP	Application range	DC	NOF	APMX	LF	CRKS	Wrench	Torque*
VMT100L06IS07-4S05	●	0.75	≥ M12	10	4	6	12.8	S05	KEYV-S05	7
VMT100L06IS10-4S05	●	1	≥ M12	10	4	6	12.8	S05	KEYV-S05	7
VMT100L06IS15-4S05	●	1.5	≥ M13	10	4	6	12.8	S05	KEYV-S05	7
VMT120L08IS15-4S06	●	1.5	≥ M16	12	4	7.6	14.3	S06	KEYV-S06	10
VMT120L08IS20-4S06	●	2	≥ M16	12	4	8	14.3	S06	KEYV-S06	10
VMT160L12IS15-6S08	●	1.5	≥ M20	16	6	12	19	S08	KEYV-S08	15
VMT160L12IS20-5S08	●	2	≥ M19	16	5	12	19	S08	KEYV-S08	15
VMT154L13IS25-5S08	●	2.5	≥ M20	15.4	5	12.7	20	S08	KEYV-S08	15
VMT160L12IS30-3S08	●	3	≥ M20	16	3	12	19	S08	KEYV-S08	15

Torque*: Recommended clamping torque (N-m)
2 pieces per package

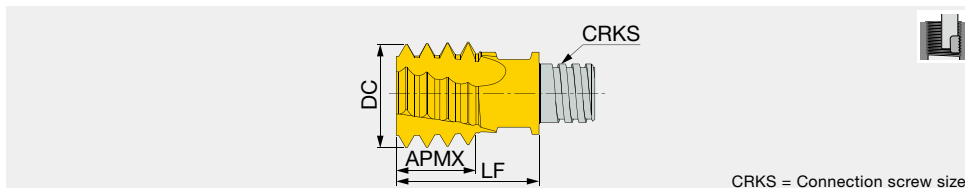
● : Line up

Unified (UN, UNC, UNF, UNEF, UNS)**VMT***UN**

3, 4, 5 flute, full profile, for internal thread



Threading



CRKS = Connection screw size

Designation	AH725	TPI	Application range	DC	NOF	APMX	LF	CRKS	Wrench	Torque*
VMT100L06UN24-4S05	●	24	≥ 1/2	10	4	5.3	12.8	S05	KEYV-S05	7
VMT100L06UN20-4S05	●	20	≥ 1/2	10	4	5.1	12.8	S05	KEYV-S05	7
VMT120L08UN16-4S06	●	16	≥ 5/8	12	4	8	14.3	S06	KEYV-S06	10
VMT120L10UN14-4S06	●	14	≥ 5/8	12	4	9	14.3	S06	KEYV-S06	10
VMT160L13UN12-5S08	●	12	≥ 13/16	16	5	12.7	19	S08	KEYV-S08	15
VMT150L13UN10-4S08	●	10	≥ 3/4	15.4	4	12.7	19	S08	KEYV-S08	15
VMT160L11UN09-3S08	●	9	≥ 7/8	16	3	11.3	19	S08	KEYV-S08	15
VMT160L13UN08-3S08	●	8	≥ 15/16	16	3	12.7	20	S08	KEYV-S08	15

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

Reference pages: Standard cutting conditions → **I098**

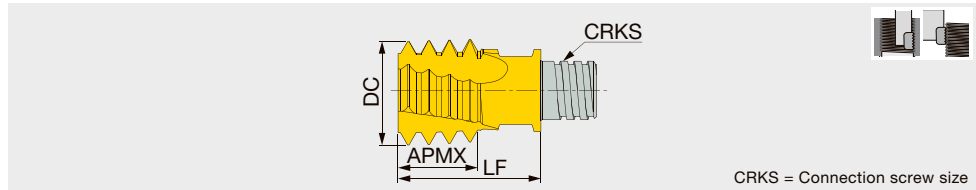
Whitworth (G, Rp, BSP, PF, PS)

VMT***W

4 flute, full profile, for internal/external thread



Threading



CRKS = Connection screw size

Designation	AH725	TPI	Application range	DC	NOF	APMX	LF	CRKS	Wrench	Torque*
VMT100L06W19-4S05	●	19	1/4, 3/8	10	4	5.3	12.8	S05	KEYV-S05	7
VMT160L13W14-4S08	●	14	1/2, 5/8, 3/4, 7/8	16	4	12.7	20	S08	KEYV-S08	15
VMT160L11W11-4S08	●	11	≥1	16	4	11.6	19	S08	KEYV-S08	15

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

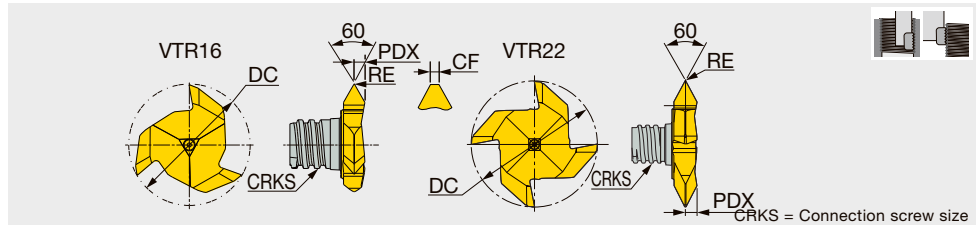
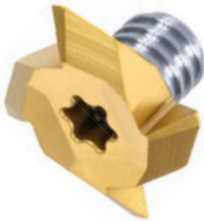
60° partial profile

VTR***IS

3, 4 flute, partial profile, for internal/external thread



Threading



CRKS = Connection screw size

Designation	GH730	GH130	TP		Smallest Possible thread	DC	NOF	RE	CF	PDX	CRKS	Wrench	Torque*
			TPN	TPX									
VTR160L12IS05-3S06	●	▲	0.5	2	M20	15.7	3	-	0.05	1.4	S06	KEYV-177 ⁽¹⁾ / KEYV-T25 ⁽²⁾	10
VTR160L12IS15-3S06	●	▲	1.5	2	M22	15.7	3	0.05	-	1.4	S06	KEYV-177 ⁽¹⁾ / KEYV-T25 ⁽²⁾	10
VTR220L28IS30-4S08	●	▲	3	4.5	M36	21.7	4	0.2	-	2.8	S08	KEYV-217 ⁽¹⁾ / KEYV-T30L ⁽²⁾	15

(1) Applicable for GH130

(2) Applicable for GH730

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

▲ : To be discontinued

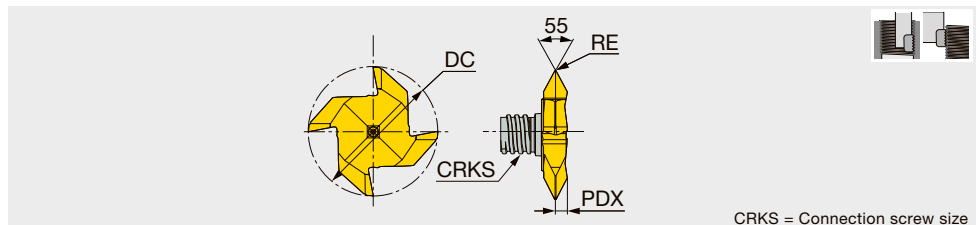
55° partial profile

VTR***W

4 flute, partial profile, for internal/external thread



Threading



CRKS = Connection screw size

Designation	GH730	GH130	TPI		Smallest Possible thread	DC	NOF	RE	PDX	CRKS	Wrench	Torque*
			TPIN	TPIX								
VTR220L24W14-4S08	●	▲	14	11	3/4	21.7	4	0.2	2.4	S08	KEYV-217 ⁽¹⁾ / KEYV-T30L ⁽²⁾	15

(1) Applicable for GH130

(2) Applicable for GH730

Torque*: Recommended clamping torque (N-m)
2 pieces per package

● : Line up

▲ : To be discontinued

Reference pages: Standard cutting conditions → [I098](#)



STANDARD CUTTING CONDITIONS

Threading

VMT, VTR

ISO	Material	Condition	Tensile strength [N/mm ²]	Hardness	Cutting speed Vc (m/min)	Tool dia. : DC (mm)			
						Feed per tooth: fz (mm/t)			
						ø10	ø12	ø15.4, ø15.7, ø16	ø21.7
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C Annealed	420	125 HB	100 - 250	0.08	0.09	0.12	0.15
		≥ 0.25 %C Annealed	650	190 HB	80 - 210	0.08	0.09	0.12	0.15
		< 0.55 %C Quenched and tempered	850	250 HB	65 - 170				
		≥ 0.55 %C Annealed	750	220 HB	110 - 180	0.07	0.08	0.1	0.12
		Quenched and tempered	1000	300 HB	95 - 160	0.07	0.08	0.1	0.12
	Low alloy steel and cast steel (less than 5% of alloying elements)	Annealed	600	200 HB	90 - 160	0.05	0.05	0.07	0.08
		Quenched and tempered	930	275 HB	65 - 200	0.05	0.05	0.07	0.08
			1000	300 HB	70 - 210	0.05	0.05	0.07	0.08
			1200	350 HB	95 - 160	0.05	0.05	0.07	0.08
	High alloyed steel, cast steel, and tool steel	Annealed	680	200 HB	130 - 170	0.05	0.05	0.07	0.08
		Quenched and tempered	1100	325 HB	75 - 100	0.05	0.05	0.07	0.08
	Stainless steel and cast steel	Ferritic/martensitic	680	200 HB	110 - 170	0.05	0.05	0.07	0.08
		Martensitic	820	240 HB	70 - 155	0.05	0.05	0.07	0.08
M	Stainless steel	Annealed	600	180 HB	85 - 100	0.05	0.05	0.07	0.08
K	Cast iron nodular (GGG)	Ferritic/martensitic		180 HB	120 - 160	0.08	0.09	0.12	0.15
		Pearlitic		260 HB	75 - 160	0.08	0.09	0.12	0.15
	Grey cast iron (GG)	Ferritic		160 HB	70 - 150	0.08	0.09	0.12	0.15
		Pearlitic		250 HB	110 - 140	0.08	0.09	0.12	0.15
	Malleable cast iron	Ferritic		130 HB	120 - 160	0.08	0.09	0.12	0.15
		Pearlitic		230 HB	110 - 140	0.08	0.09	0.21	0.15
N	Aluminium-wrought alloy	Not cureable		60 HB	160 - 300	0.08	0.09	0.12	0.15
		Cured		100 HB					
	Aluminium-cast, alloyed	≤12% Si Not cureable		75 HB	150 - 350	0.08	0.09	0.12	0.15
		Cured		90 HB					
		>12% Si High temperature		130 HB	100 - 250	0.05	0.05	0.07	0.08
	Copper alloys	>1% Pb Free cutting		110 HB					
		Brass		90 HB					
		Electrolitic copper		100 HB					
	Non-metallic	Duroplastics, fiber plastics			100 - 400	0.11	0.12	0.15	0.18
		Hard rubber							
S	High temp. alloys	Fe based	Annealed	200 HB					
			Cured	280 HB					
		Ni or Co based	Annealed	250 HB	20 - 80	0.03	0.03	0.04	0.04
			Cured	350 HB					
			Cast	320 HB					
	Titanium Ti alloys		RM 400						
		Alpha+beta alloys cured	RM 1050		20 - 80	0.03	0.03	0.04	0.04
H	Hardened steel	Hardened		55 HRC	55 - 65				
		Hardened		60 HRC	45 - 55				
	Chilled cast iron	Cast		400 HB	90 - 105				
	Cast iron	Hardened		55 HRC	55 - 65				

Thread Milling CNC Program for Internal Thread

Right-hand thread (climb milling) from bottom up. Program is based on tool center.

This method of programming needs no tool radius compensation value, other than an offset for wear.

General Program

```
G90 G00 G54 G43 H1X0 Y0 Z10 S (n : Number of revolutions)
G00 Z-(to thread depth)
G01 G91 G41 D1 X (A/2) Y-(A/2) Z0 F (Center of tool)
G03 X(A/2) Y(A/2) R (A/2) Z(1/8 pitch) F (Cutting edge)
G03 X0 Y0 I -(A) J0 Z (pitch)
G03 X-(A/2) Y(A/2) R (A/2) Z(1/8 pitch)
G01 G40 X -(A/2) Y-(A/2) Z0
G90 X0 Y0 Z0
```

Internal Thread

Example: M20x2.0 IN-RH (Thread depth 20 mm)

Tool : MTEC1010C27 2.0ISO

(Cutting dia. 10 mm)

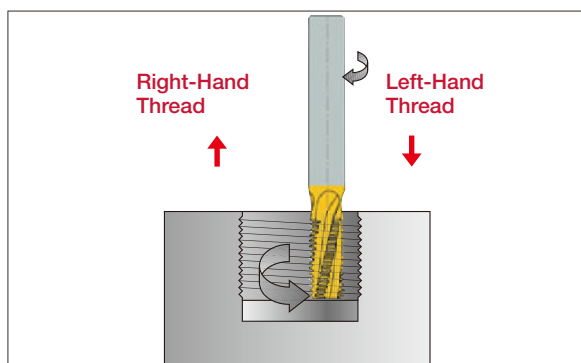
$A = (D_o - D) / 2 = (20 - 10) / 2 = 5$

$A/2 = 2.5$

(Tool compensation of radius=0)

```
G90 G0 G54 G43 G17 H1X0 Y0 Z10 S4000
G0 Z-20
G01 G91 G41 D1X 2.5 Y-2.5 Z0 F840
G03 X2.5 Y2.5 R2.5 Z0.25 F420
G03 X0 Y0 I-5.0 J0 Z2.0
G03 X-2.5 Y2.5 R2.5 Z0.25
G01 G40 X-2.5 Y-2.5 Z0
G90 G0 X0 Y0 Z0
M30
%
```

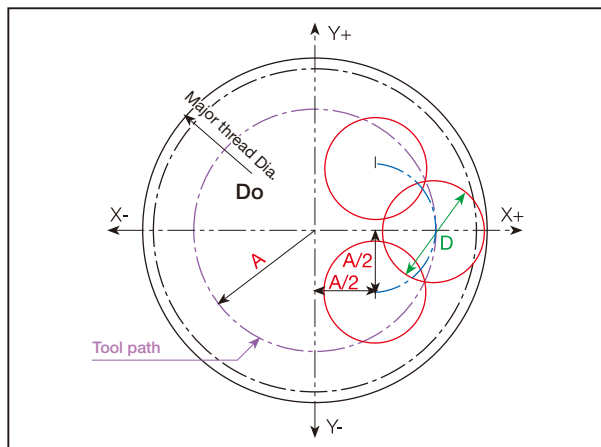
Internal Thread



A thread milling operation is applicable for thread cutting in non-symmetrical parts utilizing the advantage of helical interpolation programs on modern machining centers.



For more details, please check ThreadMilling advisor.



$$A = \frac{D_o - D}{2}$$

A = Radius of tool path

D_o = Major thread diameter

D = Cutting diameter

F (Center of tool) = $n \times f \times z$

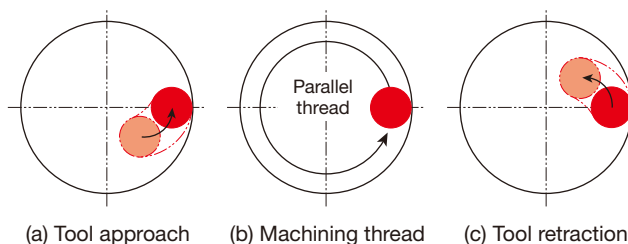
n : Number of revolutions

F (Cutting edge) = $\frac{D_o - D}{D_o} \times n \times f \times z$

f : rev / tooth

z : Number of edge

Machining procedure

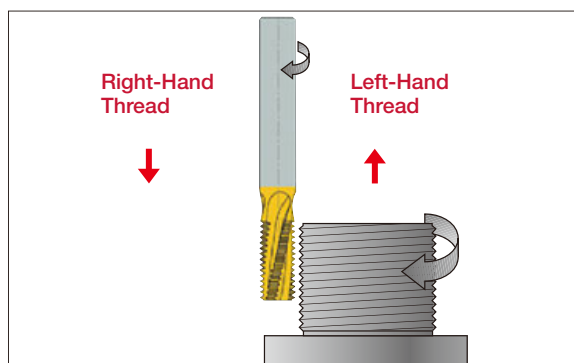


(a) Tool approach

(b) Machining thread

(c) Tool retraction

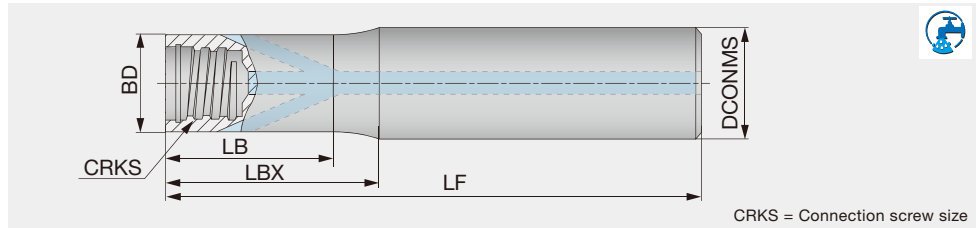
External Thread



TUNGMEISTER

VSSD**-W-A...

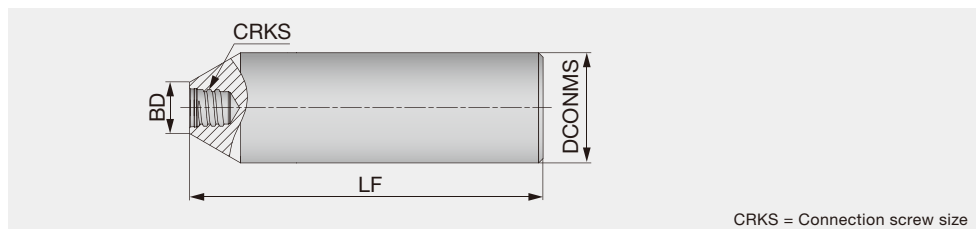
Straight shank and neck with coolant hole



Designation	DCONMS	BD	LF	LBX	LB	CRKS	Shank material
VSSD10L070S06-W-A	10	9.6	70	20	19	S06	Tungsten
VSSD10L090S06-W-A	10	9.6	90	40	39	S06	Tungsten
VSSD10L110S06-W-A	10	9.6	110	60	59	S06	Tungsten
VSSD12L070S08-W-A	12	11.6	70	20	19	S08	Tungsten
VSSD12L090S08-W-A	12	11.6	90	40	39	S08	Tungsten
VSSD12L110S08-W-A	12	11.6	110	60	59	S08	Tungsten
VSSD12L130S08-W-A	12	11.6	130	80	79	S08	Tungsten
VSSD16L070S10-W-A	16	15.3	70	20	18.5	S10	Tungsten
VSSD16L090S10-W-A	16	15.3	90	40	36.5	S10	Tungsten
VSSD16L110S10-W-A	16	15.3	110	60	58.5	S10	Tungsten
VSSD16L130S10-W-A	16	15.3	130	80	78.5	S10	Tungsten
VSSD20L090S12-W-A	20	18.3	90	40	37	S12	Tungsten
VSSD20L130S12-W-A	20	18.3	130	80	77	S12	Tungsten

VSSD...

High rigidity shank (straight)



Designation	DCONMS	BD	LF	CRKS	Shank shape	Shank material
VSSD10L055S05-S	10	7.6	55	S05	Cylindrical	Steel
VSSD12L065S06-S	12	9.6	65	S06	Cylindrical	Steel
VSSD16L065S08-S	16	11.6	65	S08	Cylindrical	Steel
VSSD20L070S10-S	20	15.3	70	S10	Cylindrical	Steel
VSSD25L075S12-S	25	18.3	75	S12	Cylindrical	Steel
VSSD32L100S15-S	32	23.9	100	S15	Cylindrical	Steel
VSSD40L100S21-S	40	30	100	S21	Cylindrical	Steel

VSSD...

Straight neck and cylindrical shank

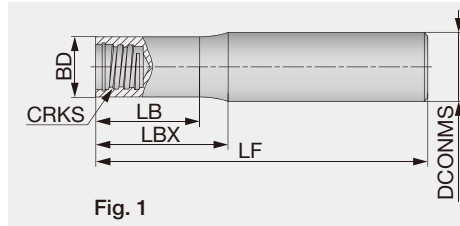


Fig. 1

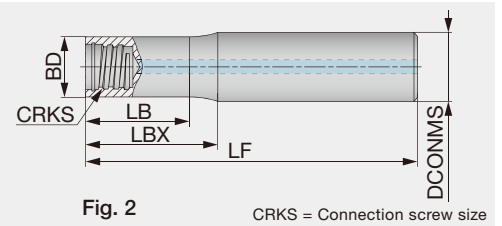


Fig. 2

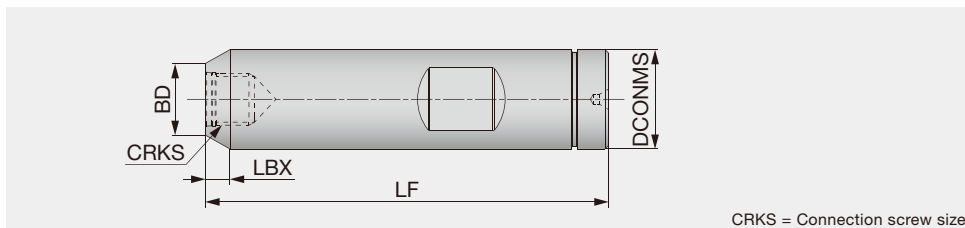
CRKS = Connection screw size

Designation	DCONMS	BD	LF	LBX	LB	CRKS	Shank shape	Shank material	Fig.
VSSD06L050S04-S	6	5.8	50	11	10	S04	Cylindrical	Steel	1
VSSD06L060S04-C	6	5.8	60	18	17	S04	Cylindrical	Carbide	1
VSSD08L050S04-S	8	5.8	50	14	10	S04	Cylindrical	Steel	1
VSSD08L060S04-C	8	5.8	60	20	17	S04	Cylindrical	Carbide	1
VSSD08L060S05-S	8	7.6	60	15	12.8	S05	Cylindrical	Steel	1
VSSD08L070S05-C	8	7.6	70	20	19	S05	Cylindrical	Carbide	1
VSSD08L090S05-C	8	7.6	90	40	39	S05	Cylindrical	Carbide	1
VSSD08L110S05-C	8	7.6	110	60	59	S05	Cylindrical	Carbide	1
VSSD10L070S06-C	10	9.6	70	20	18.5	S06	Cylindrical	Carbide	1
VSSD10L075S06-S	10	9.6	75	20	19.4	S06	Cylindrical	Steel	1
VSSD10L090S06-C	10	9.6	90	40	38.5	S06	Cylindrical	Carbide	1
VSSD10L110S06-C	10	9.6	110	60	58.5	S06	Cylindrical	Carbide	1
VSSD10L150S06-C	10	9.6	150	100	98.5	S06	Cylindrical	Carbide	1
VSSD12L070S08-C	12	11.6	70	20	17	S08	Cylindrical	Carbide	1
VSSD12L070S08-C-A	12	11.6	70	20	17	S08	Cylindrical	Carbide	2
VSSD12L090S08-C	12	11.6	90	40	37	S08	Cylindrical	Carbide	1
VSSD12L090S08-S	12	11.6	90	16	13.6	S08	Cylindrical	Steel	1
VSSD12L090S08-S-A	12	11.6	90	16	13.6	S08	Cylindrical	Steel	2
VSSD12L090LS08-C-A	12	11.6	90	40	37	S08	Cylindrical	Carbide	2
VSSD12L090LS08-S-A	12	11.6	90	42	37	S08	Cylindrical	Steel	2
VSSD12L110S08-C	12	11.6	110	60	58	S08	Cylindrical	Carbide	1
VSSD12L110S08-C-A	12	11.6	110	60	57	S08	Cylindrical	Carbide	2
VSSD12L130S08-C	12	11.6	130	80	78	S08	Cylindrical	Carbide	1
VSSD12L130S08-C-A	12	11.6	130	80	77	S08	Cylindrical	Carbide	2
VSSD16L090S10-C	16	15.3	90	40	38	S10	Cylindrical	Carbide	1
VSSD16L090S10-C-A	16	15.3	90	40	38	S10	Cylindrical	Carbide	2
VSSD16L100S10-S	16	15.3	100	20	18	S10	Cylindrical	Steel	1
VSSD16L100S10-S-A	16	15.3	100	20	18	S10	Cylindrical	Steel	2
VSSD16L100LS10-S-A	16	15.3	100	42	38	S10	Cylindrical	Steel	2
VSSD16L110S10-C	16	15.3	110	60	58	S10	Cylindrical	Carbide	1
VSSD16L110S10-C-A	16	15.3	110	60	58	S10	Cylindrical	Carbide	2
VSSD16L130S10-C	16	15.3	130	80	78	S10	Cylindrical	Carbide	1
VSSD16L130S10-C-A	16	15.3	130	80	78	S10	Cylindrical	Carbide	2
VSSD16L150S10-C	16	15.3	150	100	98	S10	Cylindrical	Carbide	1
VSSD20L090S12-C	20	18.3	90	40	37	S12	Cylindrical	Carbide	1
VSSD20L120S12-S	20	18.3	120	25	20.5	S12	Cylindrical	Steel	1
VSSD20L130S12-C	20	18.3	130	80	77	S12	Cylindrical	Carbide	1
VSSD20L200S12-C	20	18.3	200	120	117	S12	Cylindrical	Carbide	1
VSSD25L120S15-C	25	23.9	120	60	58	S15	Cylindrical	Carbide	1
VSSD25L135S15-S	25	23.9	135	35	33	S15	Cylindrical	Steel	1
VSSD25L170S15-C	25	23.9	170	100	98	S15	Cylindrical	Carbide	1
VSSD25L250S15-C	25	23.9	250	150	148	S15	Cylindrical	Carbide	1
VSSD32L100S21-S	32	30	100	35	32	S21	Cylindrical	Steel	1
VSSD32L150S21-S	32	30	150	54	50	S21	Cylindrical	Steel	1

TUNGMEISTER

VSSD**-W...

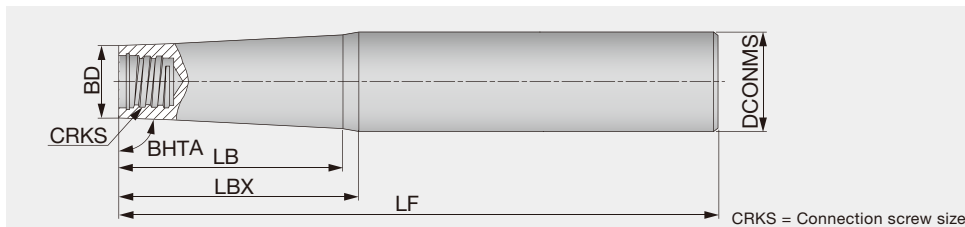
High rigidity shank (weldon)



Designation	DCONMS	BD	LF	LBX	CRKS	Shank shape	Shank material
VSSD12L055W05-S	12	7.6	55	3.8	S05	Weldon	Steel
VSSD16L065W06-S	16	9.6	65	6	S06	Weldon	Steel
VSSD16L065W08-S	16	11.6	65	4	S08	Weldon	Steel
VSSD20L070W10-S	20	15.3	70	4	S10	Weldon	Steel
VSSD25L075W12-S	25	18.3	75	6	S12	Weldon	Steel

VTSD...

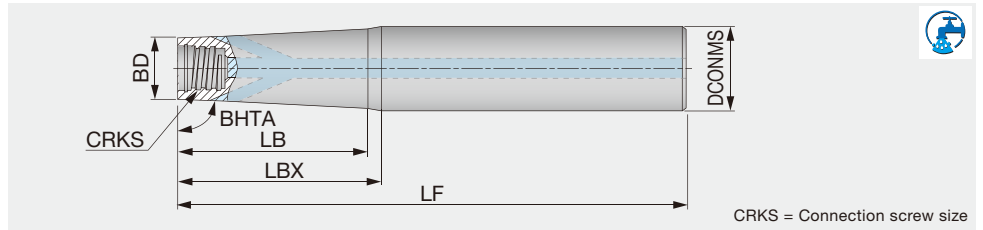
Taper neck and straight shank



Designation	BHTA	DCONMS	BD	LF	LBX	LB	CRKS	Shank material
VTSD08L080S04-S	87.4°	8	5.8	80	24	-	S04	Steel
VTSD12L080S05-S	85°	12	7.6	80	25	-	S05	Steel
VTSD12L100S05-S	89°	12	7.6	100	35	29	S05	Steel
VTSD12L110S05-C	89°	12	7.6	110	60	56	S05	Carbide
VTSD12L130S05-C	89°	12	7.6	130	80	77	S05	Carbide
VTSD16L125S06-S	85°	16	9.6	125	34	31	S06	Steel
VTSD16L130S08-C	89°	16	11.6	130	80	76.5	S08	Carbide
VTSD16L140S08-S	85°	16	11.6	140	22	19	S08	Steel
VTSD16L150S05-C	89°	16	7.6	150	100	91	S05	Carbide
VTSD16L150S06-C	89°	16	9.6	150	100	94.5	S06	Carbide
VTSD16L150S08-C	89°	16	11.6	150	100	98	S08	Carbide
VTSD16L160S06-S	89°	16	9.6	160	55	46.5	S06	Steel
VTSD16L170S06-C	89°	16	9.6	170	120	116.5	S06	Carbide
VTSD20L140S10-S	85°	20	15.3	140	27.5	-	S10	Steel
VTSD20L170S08-C	89°	20	11.6	170	120	112	S08	Carbide
VTSD20L170S08-S	89°	20	11.6	170	80	69.5	S08	Steel
VTSD20L170S10-C	89°	20	15.3	170	120	119	S10	Carbide
VTSD20L190S10-C	89°	20	15.3	190	140	-	S10	Carbide
VTSD20L190S10-S	89°	20	15.3	190	80	73	S10	Steel
VTSD20L210S10-C	89°	20	15.3	210	160	-	S10	Carbide
VTSD25L160S12-S	85°	25	18.3	160	40	-	S12	Steel
VTSD25L170S10-S	85°	25	15.3	170	56	-	S10	Steel
VTSD25L180S12-C	89°	25	18.3	180	120	115	S12	Carbide
VTSD25L210S12-S	89°	25	18.3	210	100	94.5	S12	Steel
VTSD25L250S12-C	89°	25	18.3	250	140	136.5	S12	Carbide
VTSD32L155S15-S	85°	32	23.9	155	45	-	S15	Steel
VTSD32L190S12-S	85°	32	18.3	190	80	-	S12	Steel
VTSD32L220S15-S	88°	32	23.9	220	100	-	S15	Steel
VTSD32L250S15-C	89°	32	23.9	250	150	145	S15	Carbide
VTSD32L300S15-C	89°	32	23.9	300	200	198	S15	Carbide
VTSD40L150S21-S	85°	40	30	150	57	-	S21	Steel

VTSD**-W-A...

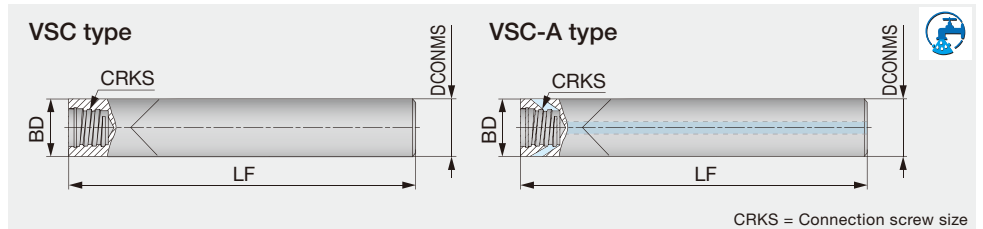
Straight shank and taper neck with coolant hole



Designation	BHTA	DCONMS	BD	LF	LBX	LB	CRKS	Shank material
VTSD12L110S06-W-A	89°	12	9.6	110	60	59	S06	Tungsten
VTSD16L170S06-W-A	89°	16	9.6	170	120	116	S06	Tungsten

VSC...

Straight shank for VST type slotting heads



Designation	DCONMS	BD	LF	CRKS	Air hole	Shank material
VSC100L100S06-C	10	10	100	S06	without	Carbide
VSC120L100S08-C-A	12	12	100	S08	with	Carbide

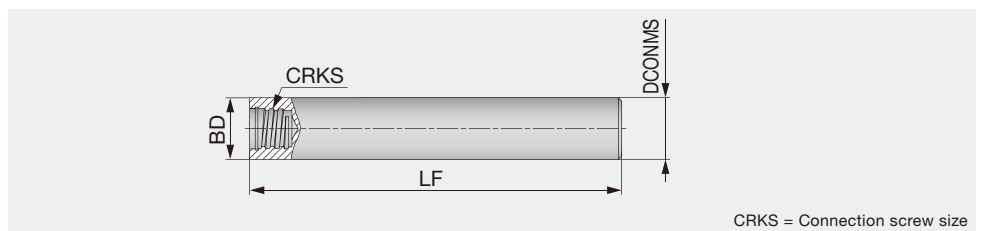
For VSC-C type shank, just VST slotting head is recommended.

If other heads are used on the VSC-C shank, the depth of cut must be smaller than the max. ap in each head.

The VSC-C type shank does not have external clearance, so the shank may interfere with the work piece.

VSTD...

Straight shank for VTB type T-slotting heads

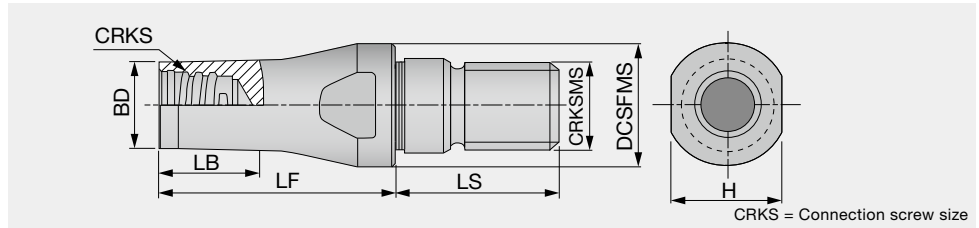


Designation	DCONMS	BD	LF	CRKS	Shank material
VSTD06L070S04-S	6	6	70	S04	Steel
VSTD08L070S05-S	8	8	70	S05	Steel
VSTD10L080S06-S	10	10	80	S06	Steel
VSTD12L090S08-S	12	12	90	S08	Steel
VSTD16L100S10-S	16	16	100	S10	Steel

For VSTD type shank, just VTB T-slotting head is recommended.

If other heads are used on the VSTD shank, the depth of cut must be smaller than the max. ap in each head.

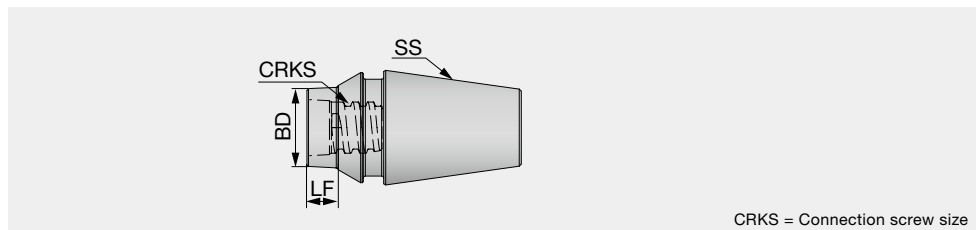
The VSTD type shank does not have external clearance, so the shank may interfere with the work piece.



Designation	BD	DCSFMS	LF	LS	LB	CRKS	CRKSMS	H	Shank material
VAD130L016S08-S-M8	11.7	13	16	17.5	6	S08	M8	11	Steel
VAD130L025S08-S-M8	11.7	13	25	17.5	20	S08	M8	11	Steel
VAD180L020S08-S-M10	11.7	18	20	20	12	S08	M10	13	Steel
VAD180L025S08-S-M10	11.7	18	25	20	15	S08	M10	11	Steel
VAD210L020S08-S-M12	11.7	21	20	20	10	S08	M12	12.75	Steel
VAD210L025S08-S-M12	11.7	21	25	20	13	S08	M12	12.75	Steel

VER...

Straight neck with ER11/16 collet



Designation	SS	BD	LF	CRKS	Shank material
VER11AL006S04-S	ER11	5.8	6	S04	Steel
VER11AL006S05-S	ER11	7.9	6	S05	Steel
VER11AL020S05-S	ER11	7.9	20	S05	Steel
VER16AL012S05-S	ER16	7.9	12	S05	Steel
VER16AL020S05-S	ER16	7.9	20	S05	Steel
VER16AL010S06-S	ER16	9.9	10	S06	Steel
VER16AL020S06-S	ER16	9.9	20	S06	Steel
VER16AL006S08-S	ER16	11.6	6	S08	Steel
VER16AL020S08-S	ER16	11.6	20	S08	Steel

WRENCH

Appearance	Designation	Connection screw size	Torque (N-m)	Applicable head
	KEYV-S05	S04	4	Square Ball Radius Drilling Chamfering Counterboring Barrel Lens Bull nose Indexable modular head
		S05	7	
	KEYV-S06	S06	10	
	KEYV-S08	S08	15	
	KEYV-S10	S10	28	
	KEYV-S12	S12	28	
	KEYV-W20	S15	40	Square Ball
	KS-24	S21	110	
	KEYV-177	S06	10	Slotting VST Threading VTR
	KEYV-217	S08	15	

Note: Wrenches are sold separately.

Appearance	Designation	Connection screw size	Torque (N-m)	Applicable head
	KEYV-T20	S05	7	Slotting VTB Face mill
		S06	10	
	KEYV-T25	S06	10	
	KEYV-T30L	S08	15	Slotting VST, VTB Face mill
	KEYV-T40L	S08	15	
		S10	28	
	KEYV-T50L	S08	15	Slotting VTB Face mill
		S10	28	

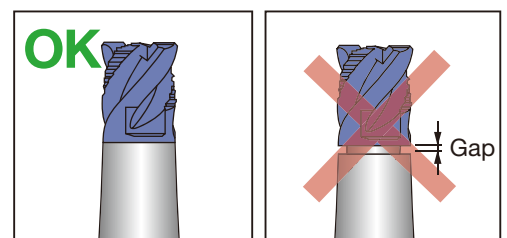
Note: Wrenches are sold separately.

TORQUE WRENCHES

Appearance	Designation	Stock	Connection screw size	TM Head description	Torque (N-m)
Handle 	TORQUEWRENCH5-50NM9x12	●	-	-	5 - 50
Open wrenches for cylindrical heads 	TM-WRENCH-6-05	●	S05	VEH, VED, VEE, VEE-I, VEE-R, VEE-C, VEE-A,	7
	TM-WRENCH-8-06	●	S06	VFX**-04/06, VRD,	10
	TM-WRENCH-10-08	●	S08	VBD-BG, VBE-BG,	15
	TM-WRENCH-13-10	●	S10	VBE-BGA, VDP,	28
	TM-WRENCH-16-12	●	S12	VDS, VCA,	28
	TM-WRENCH-20-15	●	S15	VBO, VBL, VBN, HPAV06-S	40
Open wrenches for 2 flute heads 	TM-WRENCH-4E-05	●	S05	VRB, VRC,	7
	TM-WRENCH-5E-06	●	S06	VFX**-02,	10
	TM-WRENCH-7E-08	●	S08	VBB-BM, VBB-BG,	15
	TM-WRENCH-8E-10	●	S10	VBB-SG, VCP,	28
	TM-WRENCH-9E-12	●	S12	VGC, VCW, VCR	28
90° adaptor for Torx bits 	INSERT-TOOL-9X12MM	●	-	-	-
Torx bits sockets 	BIT-SOCKET-T20-DRIVE	●	S05, S06	VFM120, VTB135, VTB160W2.00, VTB165W2.00	7, 10
	BIT-SOCKET-T25-DRIVE	●	S06	VFM160, VTB160W3.00, VTB160W4.00, VTB165W3.00, VTB165W4.00	10
	BIT-SOCKET-T30-DRIVE	●	S08	VTB195	15
	BIT-SOCKET-T40-DRIVE	●	S08, S10	VFM200, VST277, VTB225	15, 28
	BIT-SOCKET-T50-DRIVE	●	S08, S10	VFM250, VTB250	15, 28

CAUTIONARY POINTS IN USE

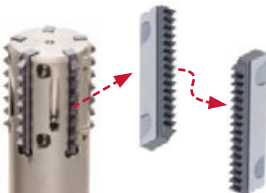
- The cutting heads specified by Tungaloy must be used. Avoid using alternate heads that are not Tungaloy products as this will damage the shank and can cause severe accident or injury.
- Before setting the head, clean the connection screw with an air blast or a wiping cloth to remove chips and other foreign matter that may remain.
- Do not apply the lubricant to the connection screw.
- Please use the correct wrench with the correct cutting head. Tighten the head slowly until the face of the head contacts the shank. (Please refer to the picture shown on the right.) Do not re-tightening or over-tightening. Excessive tightening may cause the cutting head to break.
- Do not apply excessive force or a hammer when tightening or exchanging the cutting heads.



THREADMILLING

Highly economical tool design

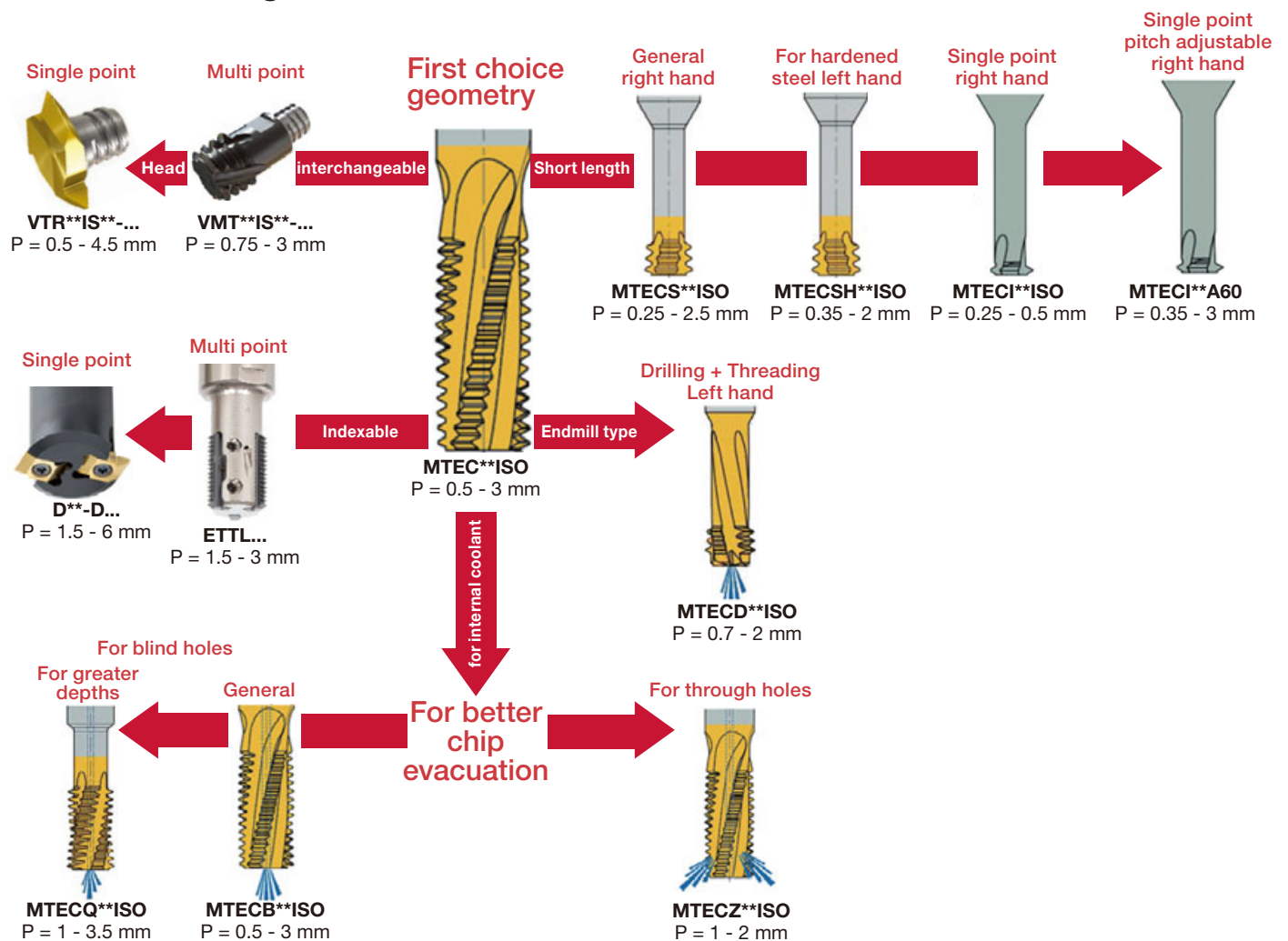
Cost reduction



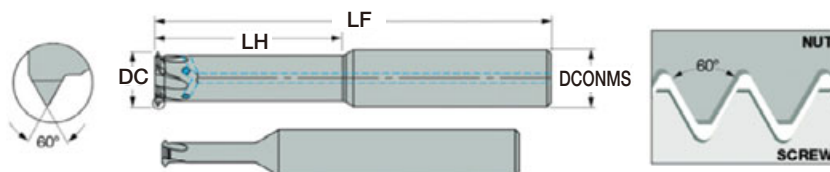
2-corner double sided inserts



Tool selection guide for internal ISO metric threads



Reference pages: **I107 - I129**



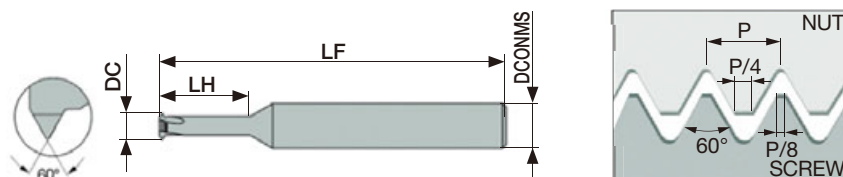
Designation	ISO Metric						Unified						DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
	Internal				External		Internal				External								
	Pitch		Application range		Pitch		TPI		Application range		TPI								
	min.	max.			min.	max.	min.	max.			min.	max.							
MTECI03019C5A60	0.35	0.6	≥M2.5x0.35 ≥M2.5x0.4 ≥M2.5x0.45 ≥M3x0.5 ≥M3x0.6	0.35	0.6	40	72	≥#3-72UN ≥#3-64UN ≥#3-56UN ≥#3-48UN ≥#4-44UN ≥#4-40UN	40	72	3	1.9	3	5.2	39	Without	AH710		
MTECI06032C9A60	0.5	1.0	≥M4x0.5 ≥M4x0.6 ≥M4x0.7 ≥M4.5x0.75 ≥M4.5x0.8 ≥M5x1	0.5	1.0	24	48	≥#8-48UN ≥#8-44UN ≥#8-40UN ≥#8-36UN ≥#8-48UN ≥#10-28UN ≥#10-24UN	24	48	6	3.2	3	9.5	57	Without	AH710		
MTECI0604C12A60	0.5	1.0	≥M5x0.5 ≥M5x0.6 ≥M5x0.7 ≥M5x0.75 ≥M5x0.8 ≥M6x1	0.5	1.0	24	48	≥#10-48UN ≥#10-44UN ≥#10-40UN ≥#10-36UN ≥#12-32UN ≥#12-28UN ≥#12-24UN	24	48	6	4	3	12.5	58	Without	AH710		
MTECI0605D20A60	0.5	0.8	≥M6	0.4	0.8	28	56	≥M1/4	32	64	6	5	4	20	58	With	AH725		
MTECI0808D28A60	0.5	0.8	≥M9	0.4	0.8	28	56	≥M3/8	32	64	8	8	4	28	64	With	AH725		
MTECI0808D30A60	1.0	1.75	≥M10	0.8	1.5	14	28	≥M7/16	16	32	8	8	4	30	64	With	AH725		
MTECI1010D35A60	1.0	1.75	≥M12	0.8	1.5	14	28	≥M1/2	16	32	10	10	4	35	73	With	AH725		
MTECI1212E40A60	2.0	3.0	≥M16	1.75	2.5	8	13	≥M11/16	10	15	12	12	5	40	84	With	AH725		
MTECI1616E50A60	2.0	3.0	≥M20	1.75	2.5	8	13	≥M13/16	10	15	16	16	5	50	101	With	AH725		

SOLIDTHREAD

ISO metric (M)

MTECI-ISO

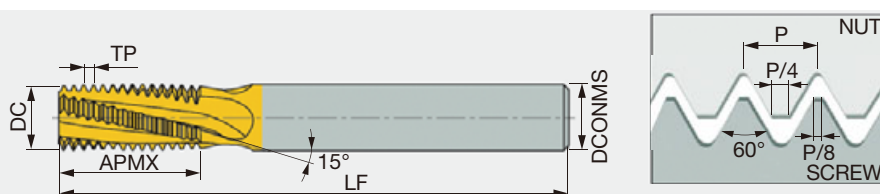
Solid carbide internal threading endmill, for ISO metric profile



Designation	Pitch	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECI03007C30.25ISO	0.25	≥M1	6	0.72	3	3.6	39	Without	AH710
MTECI03009C40.25ISO	0.25	≥M1.2	6	0.9	3	4.3	39	Without	AH710
MTECI03011C50.3ISO	0.3	≥M1.4	6	1.05	3	5.0	39	Without	AH710
MTECI03012C60.35ISO	0.35	≥M1.6	6	1.2	3	5.7	39	Without	AH710
MTECI03016C70.4ISO	0.4	≥M2	6	1.55	3	7.1	39	Without	AH710
MTECI03024C100.5ISO	0.5	≥M3	6	2.37	3	10.6	39	Without	AH710

MTEC-ISO

Solid carbide internal threading endmill, for ISO metric profile

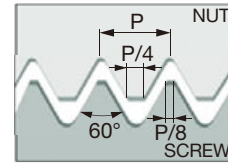
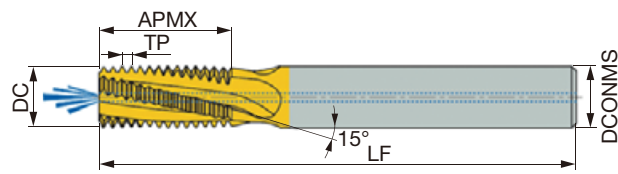


Designation	TP	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC06022C50.5ISO	0.5	≥ M3	6	2.2	3	5.3	58	Without	AH725
MTEC06038C100.5ISO	0.5	≥ M5	6	3.8	3	10.3	58	Without	AH725
MTEC06031C70.7ISO	0.7	≥ M4	6	3.1	3	7.4	58	Without	AH725
MTEC06045C100.75ISO	0.75	≥ M6	6	4.5	3	10	58	Without	AH725
MTEC06036C90.8ISO	0.8	≥ M5	6	3.6	3	9.2	58	Without	AH725
MTEC0604C101.0ISO	1	≥ M6	6	4	3	10.5	58	Without	AH725
MTEC0604C141.0ISO	1	≥ M6	6	4	3	14.5	58	Without	AH725
MTEC0606C121.0ISO	1	≥ M9	6	6	3	12.5	58	Without	AH725
MTEC0808D161.0ISO	1	≥ M10	8	8	4	16.5	64	Without	AH725
MTEC0605C141.25ISO	1.25	≥ M8	6	5	3	14.4	58	Without	AH725
MTEC0605C191.25ISO	1.25	≥ M8	6	5	3	19.4	58	Without	AH725
MTEC0807C171.5ISO	1.5	≥ M10	8	7	3	17.3	64	Without	AH725
MTEC0807C241.5ISO	1.5	≥ M10	8	7	3	24.8	76	Without	AH725
MTEC1010D211.5ISO	1.5	≥ M14	10	10	4	21.8	73	Without	AH725
MTEC1616F331.5ISO	1.5	≥ M20	16	16	6	33.8	105	Without	AH725
MTEC0808C201.75ISO	1.75	≥ M12	8	8	3	20.1	64	Without	AH725
MTEC0808C281.75ISO	1.75	≥ M12	8	8	3	28.9	76	Without	AH725
MTEC1010C272.0ISO	2	≥ M14	10	10	3	27	73	Without	AH725
MTEC1010C392.0ISO	2	≥ M14	10	10	3	39	105	Without	AH725
MTEC1212D272.0ISO	2	≥ M18	12	12	4	27	84	Without	AH725
MTEC2020F412.0ISO	2	≥ M24	20	20	6	41	105	Without	AH725
MTEC1414D332.5ISO	2.5	≥ M20	14	14	4	33.8	84	Without	AH725
MTEC1414D482.5ISO	2.5	≥ M20	14	14	4	48.8	105	Without	AH725
MTEC1616C403.0ISO	3	≥ M24	16	16	3	40.5	105	Without	AH725
MTEC1616C583.0ISO	3	≥ M24	16	16	3	58.5	120	Without	AH725

Reference pages: Standard cutting conditions → [I120](#) - [I122](#)

MTECB-ISO

Solid carbide internal threading endmill, with coolant hole, for ISO metric profile

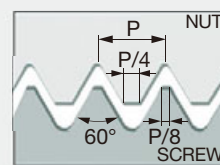
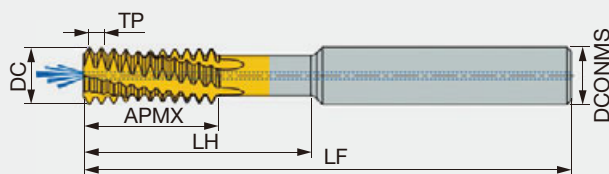


Designation	TP	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB06038C100.5ISO	0.5	≥ M5	6	3.8	3	10.3	58	With	AH725
MTECB06031C70.7ISO	0.7	≥ M4	6	3.1	3	7.4	58	With	AH725
MTECB06045C100.75ISO	0.75	≥ M6	6	4.5	3	10.1	58	With	AH725
MTECB1010D240.75ISO	0.75	≥ M12	10	10	4	24.4	73	With	AH725
MTECB06038C90.8ISO	0.8	≥ M5	6	3.8	3	9.2	58	With	AH725
MTECB06046C101.0ISO	1	≥ M6	6	4.6	3	10.5	58	With	AH725
MTECB06046C141.0ISO	1	≥ M6	6	4.6	3	14.5	58	With	AH725
MTECB0606C121.0ISO	1	≥ M9	6	6	3	12.5	58	With	AH725
MTECB0808D161.0ISO	1	≥ M10	8	8	4	16.5	64	With	AH725
MTECB1010D241.0ISO	1	≥ M12	10	10	4	24.5	73	With	AH725
MTECB0606C141.25ISO	1.25	≥ M8	6	6	3	14.4	58	With	AH725
MTECB0606C191.25ISO	1.25	≥ M8	6	6	3	19.4	58	With	AH725
MTECB08078C171.5ISO	1.5	≥ M10	8	7.8	3	17	64	With	AH725
MTECB08078C241.5ISO	1.5	≥ M10	8	7.8	3	24.8	76	With	AH725
MTECB1010D211.5ISO	1.5	≥ M14	10	10	4	21.8	73	With	AH725
MTECB1212D261.5ISO	1.5	≥ M16	12	12	4	26.3	84	With	AH725
MTECB1616F331.5ISO	1.5	≥ M20	16	16	6	33.8	105	With	AH725
MTECB1009C201.75ISO	1.75	≥ M12	10	9	3	20.1	73	With	AH725
MTECB1009C281.75ISO	1.75	≥ M12	10	9	3	28.9	73	With	AH725
MTECB1010C272.0ISO	2	≥ M14	10	10	3	27	73	With	AH725
MTECB12118D272.0ISO	2	≥ M16	12	11.8	4	27	84	With	AH725
MTECB12118D392.0ISO	2	≥ M16	12	11.8	4	39	105	With	AH725
MTECB1615E332.5ISO	2.5	≥ M20	16	15	5	33.8	105	With	AH725
MTECB1615E482.5ISO	2.5	≥ M20	16	15	5	48.8	105	With	AH725
MTECB2018D583.0ISO	3	≥ M24	20	18	4	58.5	120	With	AH725

SOLIDTHREAD

MTECQ-ISO

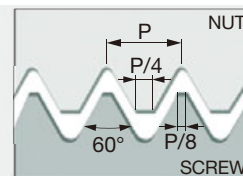
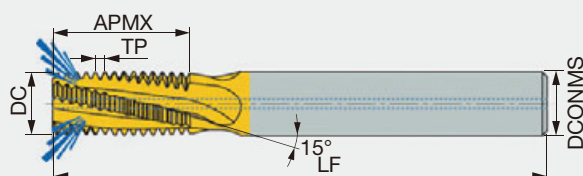
Solid carbide deep internal threading endmill, with internal coolant hole, for ISO metric profile



Designation	TP	Application range	DCONMS	DC	NOF	APMX	LH	LF	Coolant hole	Grade
MTECQ1212D381.0ISO	1	≥M14	12	12	4	21	38	84	With	AH725
MTECQ1010D301.5ISO	1.5	≥M13	10	10	4	18	30	73	With	AH725
MTECQ2020F562.0ISO	2	≥M24	20	20	6	34	56	105	With	AH725
MTECQ2020D453.5ISO	3.5	≥M26	20	20	4	28	45.5	105	With	AH725

MTECZ-ISO

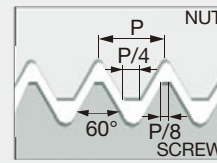
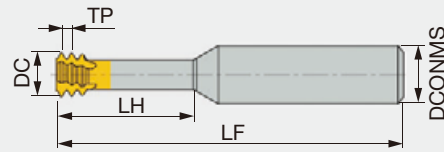
Solid carbide internal threading endmill for through hole, with coolant hole in the flute, for ISO metric profile



Designation	TP	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ06048C101.0ISO	1	≥ M6	6	4.8	3	10.5	58	With	AH725
MTECZ0808D161.0ISO	1	≥ M10	8	8	4	16.5	64	With	AH725
MTECZ0606C141.25ISO	1.25	≥ M8	6	6	3	14.4	58	With	AH725
MTECZ0606C191.25ISO	1.25	≥ M8	6	6	3	19.4	58	With	AH725
MTECZ08078C171.5ISO	1.5	≥ M10	8	7.8	3	17	64	With	AH725
MTECZ1010D211.5ISO	1.5	≥ M14	10	10	4	21.8	73	With	AH725
MTECZ1212D261.5ISO	1.5	≥ M16	12	12	4	26.3	84	With	AH725
MTECZ1616E331.5ISO	1.5	≥ M20	16	16	5	33.8	101	With	AH725
MTECZ1009C281.75ISO	1.75	≥ M12	10	9	3	28.9	73	With	AH725
MTECZ1010C272.0ISO	2	≥ M14	10	10	3	27	73	With	AH725
MTECZ12118D272.0ISO	2	≥ M16	12	11.8	4	27	84	With	AH725

MTECS-ISO

Small diameter solid carbide internal threading endmill, short edge type, for ISO metric profile

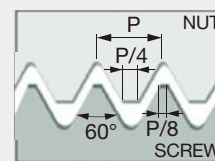
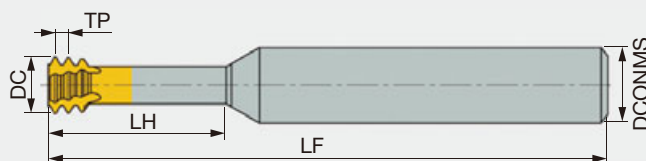


Designation	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS03007C20.25ISO	0.25	≥M1	3	0.72	3	2.5	39	Without	AH725
MTECS03009C30.25ISO	0.25	≥M1.2	3	0.9	3	3	39	Without	AH725
MTECS03011C40.3ISO	0.3	≥M1.4	3	1.05	3	4	39	Without	AH725
MTECS03012C50.35ISO	0.35	≥M1.6	3	1.2	3	4.8	39	Without	AH725
MTECS03016C60.4ISO	0.4	≥M2	3	1.53	3	6	39	Without	AH725
MTECS06016C40.4ISO	0.4	≥M2	6	1.53	3	4.5	58	Without	AH725
MTECS03017C70.45ISO	0.45	≥M2.2	3	1.65	3	7	39	Without	AH725
MTECS06017C50.45ISO	0.45	≥M2.2	6	1.65	3	5	58	Without	AH725
MTECS0602C50.45ISO	0.45	≥M2.5	6	1.95	3	5.5	58	Without	AH725
MTECS0602C70.45ISO	0.45	≥M2.5	6	1.95	3	7.5	58	Without	AH725
MTECS06024C60.5ISO	0.5	≥M3	6	2.37	3	6.5	58	Without	AH725
MTECS06024C90.5ISO	0.5	≥M3	6	2.37	3	9.5	58	Without	AH725
MTECS06024C90.5ISOL	0.5	≥M3	6	2.37	3	9.5	105	Without	AH725
MTECS03024C120.5ISO	0.5	≥M3	3	2.4	3	12.5	39	Without	AH725
MTECS03024C150.5ISO	0.5	≥M3	3	2.4	3	15.5	39	Without	AH725
MTECS06054D200.5ISO	0.5	≥M6	6	5.35	4	20	58	Without	AH725
MTECS06028C100.6ISO	0.6	≥M3.5	6	2.75	3	10.5	58	Without	AH725
MTECS06028C70.6ISO	0.6	≥M3.5	6	2.75	3	7.5	58	Without	AH725
MTECS06031C120.7ISO	0.7	≥M4	6	3.1	3	12.5	58	Without	AH725
MTECS06031C120.7ISOL	0.7	≥M4	6	3.1	3	12.5	105	Without	AH725
MTECS06031C160.7ISO	0.7	≥M4	6	3.1	3	16.7	58	Without	AH725
MTECS06031C90.7ISO	0.7	≥M4	6	3.1	3	9	58	Without	AH725
MTECS0808D250.75ISO	0.75	≥M10	8	8	4	25	64	Without	AH725
MTECS06038C120.8ISO	0.8	≥M5	6	3.8	3	12.5	58	Without	AH725
MTECS06038C160.8ISO	0.8	≥M5	6	3.8	3	16	58	Without	AH725
MTECS06038C160.8ISOL	0.8	≥M5	6	3.8	3	16	105	Without	AH725
MTECS06047C141.0ISO	1	≥M6	6	4.65	3	14	58	Without	AH725
MTECS06047C201.0ISO	1	≥M6	6	4.65	3	20	58	Without	AH725
MTECS06047C201.0ISOL	1	≥M6	6	4.65	3	20	105	Without	AH725
MTECS0606C181.25ISO	1.25	≥M8	6	6	3	18	58	Without	AH725
MTECS0606C241.25ISO	1.25	≥M8	6	6	3	24	58	Without	AH725
MTECS08078C231.5ISO	1.5	≥M10	8	7.8	3	23	64	Without	AH725
MTECS08078C311.5ISO	1.5	≥M10	8	7.8	3	31.5	64	Without	AH725
MTECS1009C261.75ISO	1.75	≥M12	10	9	3	26	73	Without	AH725
MTECS12118D352.0ISO	2	≥M16	12	11.8	4	35	84	Without	AH725
MTECS12118D502.0ISO	2	≥M16	12	11.8	4	50	105	Without	AH725
MTECS1615E432.5ISO	2.5	≥M20	16	15	5	43	100	Without	AH725

SOLIDTHREAD

MTECSH-ISO

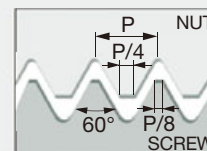
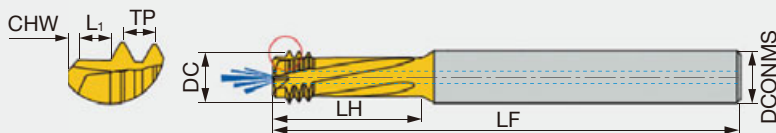
Small diameter solid carbide internal threading endmill, short edge type, left hand cutting, for ISO metric profile



Designation	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECSH03012C50.35ISO	0.35	≥M1.6	3	1.2	3	4.8	39	Without	AH750
MTECSH03016C60.4ISO	0.4	≥M2	3	1.55	3	6	39	Without	AH750
MTECSH06016C40.4ISO	0.4	≥M2	6	1.55	3	4.5	58	Without	AH750
MTECSH06017C50.45ISO	0.45	≥M2.2	6	1.65	3	5	58	Without	AH750
MTECSH0602C50.45ISO	0.45	≥M2.5	6	1.95	3	5.5	58	Without	AH750
MTECSH0602C70.45ISO	0.45	≥M2.5	6	1.95	3	7.5	58	Without	AH750
MTECSH06024C60.5ISO	0.5	≥M3	6	2.35	3	6.5	58	Without	AH750
MTECSH06024C90.5ISO	0.5	≥M3	6	2.35	3	9.5	58	Without	AH750
MTECSH06028C70.6ISO	0.6	≥M3.5	6	2.75	3	7.5	58	Without	AH750
MTECSH06031C120.7ISO	0.7	≥M4	6	3.1	3	12.5	58	Without	AH750
MTECSH06038C120.8ISO	0.8	≥M5	6	3.8	3	12.5	58	Without	AH750
MTECSH06047C141.0ISO	1	≥M6	6	4.65	3	14	58	Without	AH750
MTECSH06047C201.0ISO	1	≥M6	6	4.65	3	20	58	Without	AH750
MTECSH0606C181.25ISO	1.25	≥M8	6	5.95	3	18	58	Without	AH750
MTECSH0606C241.25ISO	1.25	≥M8	6	5.95	3	24	58	Without	AH750
MTECSH08078C231.5ISO	1.5	≥M10	8	7.8	3	23	64	Without	AH750
MTECSH1009C261.75ISO	1.75	≥M12	10	9	3	26	73	Without	AH750
MTECSH12118D352.0ISO	2	≥M16	12	11.8	4	35	84	Without	AH750

MTECD-ISO

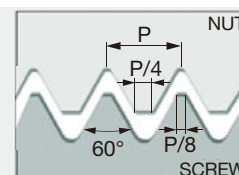
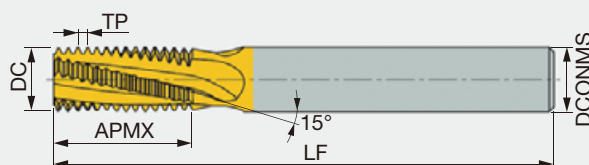
Small diameter solid carbide endmill for internal threading, drilling, and chamfering, short edge type, left hand cutting, for ISO metric profile



Designation	TP	Application range	DCONMS	DC	NOF	LH	LF	CHW	L1	Coolant hole	Grade
MTECD06032C110.7ISO	0.7	M4	6	3.15	3	11.6	58	0.2	0.7	Without	AH725
MTECD0604C140.8ISO	0.8	M5	6	4	3	14.4	58	0.3	0.8	Without	AH725
MTECD08047C141.0ISO	1	M6-M7	8	4.7	3	14	64	0.4	1	With	AH725
MTECD08061D181.25ISO	1.25	M8-M9	8	6.1	4	18	64	0.5	1.3	With	AH725
MTECD08078D231.5ISO	1.5	M10-M12	8	7.8	4	23	64	0.6	1.5	With	AH725
MTECD1009D261.75ISO	1.75	M12-M14	10	9	4	26	73	0.6	1.8	With	AH725
MTECD12118D352.0ISO	2	M16-M19	12	11.8	4	35	84	0.6	2	With	AH725

MTECE-ISO

Solid carbide external threading endmill, for ISO metric profile

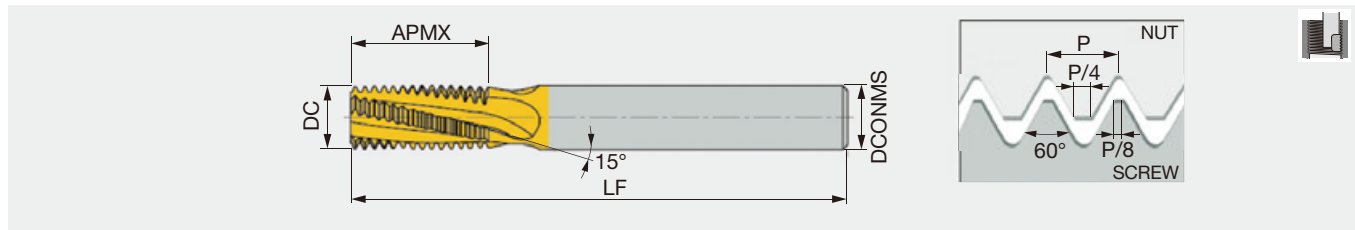


Designation	TP	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECE1010D161.0ISO	1	10	10	4	16.5	73	Without	AH725
MTECE1010D161.25ISO	1.25	10	10	4	16.9	73	Without	AH725
MTECE1010D151.5ISO	1.5	10	10	4	15.8	73	Without	AH725
MTECE1212D201.5ISO	1.5	12	12	4	20.3	84	Without	AH725
MTECE1212D201.75ISO	1.75	12	12	4	20.1	84	Without	AH725
MTECE1212D212.0ISO	2	12	12	4	21	84	Without	AH725

Unified (UN, UNC, UNF, UNFE, UNS)

MTEC-UN

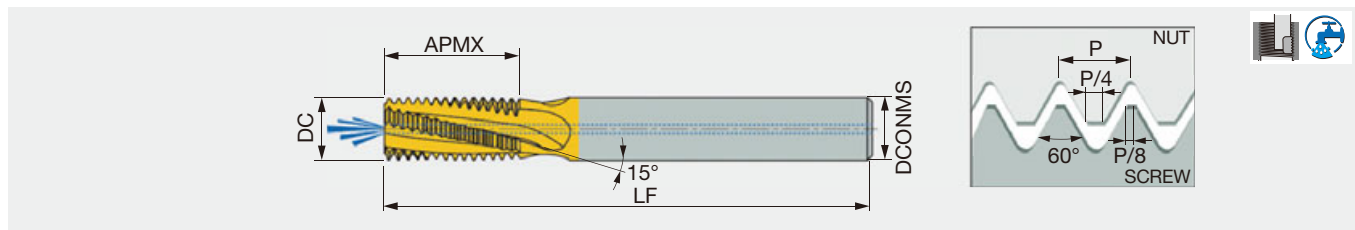
Solid carbide internal threading endmill, for UN profile



Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC06032C632UN	32	≤ #8 (0.164)	6	3.2	3	6.8	58	Without	AH725
MTEC0604C1128UN	28	≤ 1/4	6	4	3	11.3	58	Without	AH725
MTEC0606C1428UN	28	≤ 5/16	6	6	3	14.5	58	Without	AH725
MTEC0605C1424UN	24	≤ 5/16	6	5	3	14.3	58	Without	AH725
MTEC0807C2124UN	24	≤ 3/8	8	7	3	20	64	Without	AH725
MTEC06045C1220UN	20	≤ 1/4	6	4.5	3	12.1	58	Without	AH725
MTEC0807C2120UN	20	≤ 7/16	8	7	3	20	64	Without	AH725
MTEC1212E2720UN	20	≤ 11/16	12	12	5	27.3	84	Without	AH725
MTEC0605C1418UN	18	≤ 5/16	6	5	3	14.8	58	Without	AH725
MTEC1010D2618UN	18	≤ 9/16	10	10	4	26.1	73	Without	AH725
MTEC0606C1616UN	16	≤ 3/8	6	6	3	16.7	58	Without	AH725
MTEC1212D3116UN	16	≤ 5/8	12	12	4	30	84	Without	AH725
MTEC1615E3714UN	14	≤ 13/16	16	15	5	37.2	105	Without	AH725
MTEC0808C2213UN	13	≤ 1/2	8	8	3	22.5	64	Without	AH725
MTEC1010C2612UN	12	≤ 9/16	10	10	3	26.5	73	Without	AH725
MTEC1616E4112UN	12	≤ 13/16	16	16	5	41.3	105	Without	AH725
MTEC1010C2811UN	11	≤ 5/8	10	10	3	28.9	73	Without	AH725
MTEC1212C3410UN	10	≤ 11/16	12	12	3	34.3	84	Without	AH725
MTEC1615C389UN	9	≤ 7/8	16	15	3	38.1	105	Without	AH725
MTEC1616C428UN	8	≤ 15/16	16	16	3	42.9	105	Without	AH725

MTECB-UN

Solid carbide internal threading endmill, with coolant hole, for UN profile



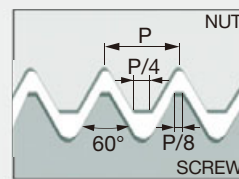
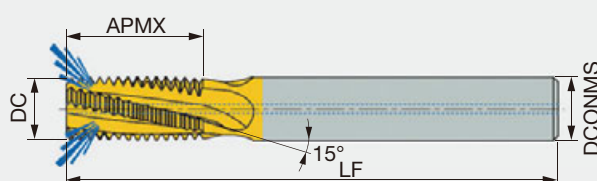
Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB06032C632UN	32	≥ #8 (0.164)	6	3.2	3	6.8	58	With	AH725
MTECB0606C1432UN	32	≥ 5/16	6	6	3	16	58	With	AH725
MTECB0605C1128UN	28	≥ 1/4	6	5	3	11.3	58	With	AH725
MTECB0806C1424UN	24	≥ 5/16	8	6.6	3	14.3	64	With	AH725
MTECB0808D2124UN	24	≥ 3/8	8	8	4	20.6	64	With	AH725
MTECB0808C2120UN	20	≥ 7/16	8	8	3	21	64	With	AH725
MTECB1010D2220UN	20	≥ 1/2	10	10	4	22.3	73	With	AH725
MTECB06056C1418UN	18	≥ 5/16	6	5.6	3	14.8	58	With	AH725
MTECB12113D2618UN	18	≥ 9/16	12	11.3	4	26.1	84	With	AH725
MTECB08067C1616UN	16	≥ 3/8	8	6.7	3	16.7	64	With	AH725
MTECB1212D3116UN	16	≥ 5/8	12	12	4	31	84	With	AH725
MTECB1616E3714UN	14	≥ 13/16	16	16	5	37.2	105	With	AH725
MTECB10092C2213UN	13	≥ 1/2	10	9.2	3	22.5	73	With	AH725
MTECB12114C2811UN	11	≥ 5/8	12	11.4	3	28.9	84	With	AH725
MTECB16144D3410UN	10	≥ 3/4	16	14.4	4	34.3	105	With	AH725
MTECB20195D428UN	8	≥ 1	20	19.5	4	42.9	105	With	AH725

Reference pages: Standard cutting conditions → [I120](#) - [I122](#)

SOLIDTHREAD

MTECZ-UN

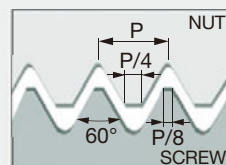
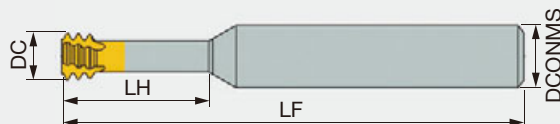
Solid carbide internal threading endmill, with coolant hole in the flute, for UN profile



Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ1010D2220UN	20	≥ 1/2	10	10	4	22.3	73	With	AH725
MTECZ12113D2618UN	18	≥ 9/16	12	11.3	4	26.1	84	With	AH725
MTECZ08067C1616UN	16	≥ 3/8	8	6.7	3	16.7	64	With	AH725
MTECZ16144D3410UN	10	≥ 3/4	16	14.4	4	34.3	101	With	AH725

MTECS-UN

Small diameter solid carbide internal threading endmill, short edge type, for UN profile



Designation	TPI	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS03012C880UN	80	≤ #0 (0.060)	3	1.15	3	8	39	Without	AH725
MTECS03015C672UN	72	≤ #1 (0.073)	3	1.45	3	6	39	Without	AH725
MTECS06016C656UN	56	≤ #2 (0.086)	6	1.65	3	6.6	58	Without	AH725
MTECS06016C456UN	56	≤ #2 (0.086)	6	1.65	3	4.4	58	Without	AH725
MTECS06019C548UN	48	≤ #3 (0.099)	6	1.9	3	5.2	58	Without	AH725
MTECS03021C1240UN	40	≤ #4 (0.112)	3	2.1	3	12	39	Without	AH725
MTECS06021C840UN	40	≤ #4 (0.112)	6	2.1	3	8	58	Without	AH725
MTECS06021C640UN	40	≤ #4 (0.112)	6	2.1	3	6.3	58	Without	AH725
MTECS06024C940UN	40	≤ #5 (0.125)	6	2.45	3	9.6	58	Without	AH725
MTECS06033C936UN	36	≤ #8 (0.164)	6	3.3	3	9	58	Without	AH725
MTECS06025C732UN	32	≤ #6 (0.138)	6	2.55	3	7.1	58	Without	AH725
MTECS06025C1032UN	32	≤ #6 (0.138)	6	2.55	3	10.5	58	Without	AH725
MTECS06032C932UN	32	≤ #8 (0.164)	6	3.2	3	9.5	58	Without	AH725
MTECS06032C1232UN	32	≤ #8 (0.164)	6	3.2	3	12.5	58	Without	AH725
MTECS06037C1032UN	32	≤ #10 (0.190)	6	3.7	3	10.5	58	Without	AH725
MTECS06037C1532UN	32	≤ #10 (0.190)	6	3.7	3	15	58	Without	AH725
MTECS0605C1428UN	28	≤ 1/4	6	5	3	14.5	58	Without	AH725
MTECS0605C1928UN	28	≤ 1/4	6	5	3	19	58	Without	AH725
MTECS08066C1724UN	24	≤ 5/16	8	6.6	3	17	64	Without	AH725
MTECS08066C2424UN	24	≤ 5/16	8	6.6	3	24	64	Without	AH725
MTECS06047C1420UN	20	≤ 1/4	6	4.75	3	14	58	Without	AH725
MTECS06047C1920UN	20	≤ 1/4	6	4.75	3	19	58	Without	AH725
MTECS06047C1920UN-L	20	≤ 1/4	6	4.75	3	19	105	Without	AH725
MTECS0808C2520UN	20	≤ 7/16	8	8	3	25	64	Without	AH725
MTECS0606C1718UN	18	≤ 5/16	6	6	3	17	58	Without	AH725
MTECS0606C2318UN	18	≤ 5/16	6	6	3	23	58	Without	AH725
MTECS1212D3518UN	18	≤ 5/8	12	12	4	35	84	Without	AH725
MTECS08067C2216UN	16	≤ 3/8	8	6.7	3	22	64	Without	AH725
MTECS08067C3016UN	16	≤ 3/8	8	6.7	3	30.2	64	Without	AH725
MTECS08077C2514UN	14	≤ 7/16	8	7.7	3	25	64	Without	AH725
MTECS10092C2713UN	13	≤ 1/2	10	9.2	3	27.5	73	Without	AH725
MTECS12114C3411UN	11	≤ 5/8	12	11.4	3	34.5	84	Without	AH725
MTECS12114C5011UN	11	≤ 5/8	12	11.4	3	50	105	Without	AH725

Reference pages: Standard cutting conditions → **I120 - I122**

MTECSH-UN

Small diameter solid carbide internal threading endmill, short edge type, left hand cutting, for UN profile, for hardened steel



Designation	TPI	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECSH06012C480UN	80	≥ #0 (0.060)	6	1.15	3	4	58	Without	AH725
MTECSH06016C656UN	56	≥ #2 (0.086)	6	1.65	3	6.6	58	Without	AH725
MTECSH06019C548UN	48	≥ #3 (0.099)	6	1.9	3	5.2	58	Without	AH725
MTECSH06021C640UN	40	≥ #4 (0.112)	6	2.1	3	6.3	58	Without	AH725
MTECSH06021C840UN	40	≥ #4 (0.112)	6	2.1	3	8	58	Without	AH725
MTECSH06024C740UN	40	≥ #5 (0.125)	6	2.45	3	7	58	Without	AH725
MTECSH06024C940UN	40	≥ #5 (0.125)	6	2.45	3	9.6	58	Without	AH725
MTECSH06025C1032UN	32	≥ #6 (0.138)	6	2.55	3	10.5	58	Without	AH725
MTECSH06032C932UN	32	≥ #8 (0.164)	6	3.2	3	9.5	58	Without	AH725
MTECSH06037C1032UN	32	≥ #10 (0.190)	6	3.7	3	10.5	58	Without	AH725
MTECSH06037C1532UN	32	≥ #10 (0.190)	6	3.7	3	15	58	Without	AH725
MTECSH06042C1128UN	28	≥ #12 (0.216)	6	4.2	3	11	58	Without	AH725
MTECSH0605C1428UN	28	≥ 1/4	6	5	3	14.5	58	Without	AH725
MTECSH06035C1024UN	24	≥ #10 (0.190)	6	3.5	3	10.6	58	Without	AH725
MTECSH08066C1724UN	24	≥ 5/16	8	6.6	3	17	64	Without	AH725
MTECSH08066C2424UN	24	≥ 5/16	8	6.6	3	24	64	Without	AH725
MTECSH06047C1920UN	20	≥ 1/4	6	4.75	3	19	58	Without	AH725
MTECSH0808C2520UN	20	≥ 7/16	8	8	3	25	64	Without	AH725
MTECSH0606C1718UN	18	≥ 5/16	6	6	3	17	58	Without	AH725
MTECSH0606C2318UN	18	≥ 5/16	6	6	3	23	58	Without	AH725
MTECSH08067C2216UN	16	≥ 3/8	8	6.7	3	22	64	Without	AH725
MTECSH08077C2514UN	14	≥ 7/16	8	7.7	3	25	64	Without	AH725
MTECSH10092C2713UN	13	≥ 1/2	10	9.2	3	27.5	73	Without	AH725
MTECSH12114C3411UN	11	≥ 5/8	12	11.4	3	34.5	84	Without	AH725

MTEC E-UN

Solid carbide external threading endmill, for UN profile



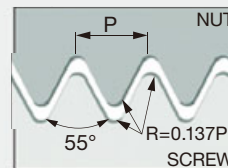
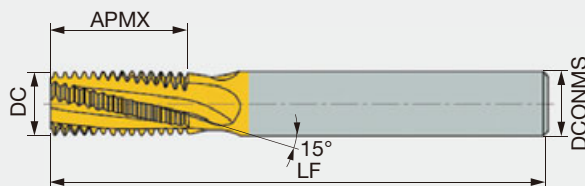
Designation	TPI	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECE1010D1624UN	24	10	10	4	16.4	73	Without	AH725
MTECE1212E2120UN	20	12	12	5	21	84	Without	AH725

SOLIDTHREAD

Whitworth parallel pipe thread (G, Rp, BSP, PF, PS)

MTEC-W

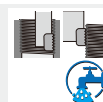
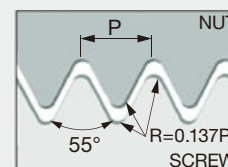
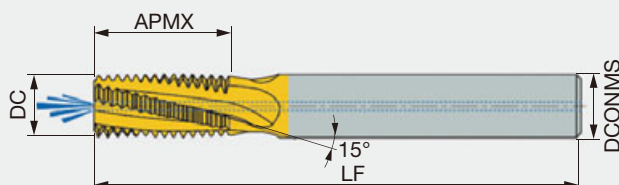
Solid carbide internal and external threading endmill, for G, BSP profile



Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C928W	28	1/16, 1/8	6	6	3	9.5	58	Without	AH725
MTEC0808C1419W	19	1/4, 3/8	8	8	3	14	64	Without	AH725
MTEC1212D1914W	14	1/2, 5/8, 3/4, 7/8	12	12	4	19.3	84	Without	AH725
MTEC1212D2614W	14	1/2, 5/8, 3/4, 7/8	12	12	4	26.3	84	Without	AH725
MTEC1212C2411W	11	≥ 1	12	12	3	24.2	84	Without	AH725
MTEC1616D3811W	11	≥ 1	16	16	4	38.1	105	Without	AH725

MTECB-W

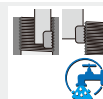
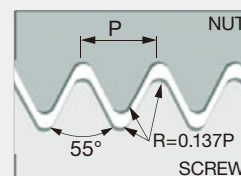
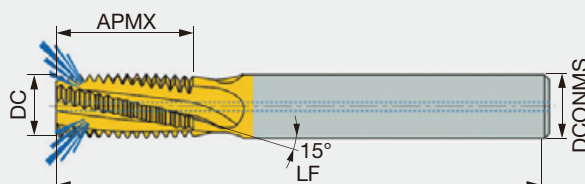
Solid carbide internal and external threading endmill, with coolant hole, for G, BSP profile



Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB08078C1428W	28	1/8	8	7.8	3	14.1	64	Without	AH725
MTECB1010D1619W	19	1/4, 3/8	10	10	4	16.7	73	Without	AH725
MTECB1616E2614W	14	1/2, 5/8, 3/4, 7/8	16	16	5	26.3	105	Without	AH725
MTECB1616D3811W	11	≥ 1	16	16	4	38.1	105	Without	AH725
MTECB2020E4711W	11	≥ 1	20	20	5	47.3	105	Without	AH725

MTECZ-W

Solid carbide internal and external threading endmill for through hole, with coolant hole, for G, BSP profile

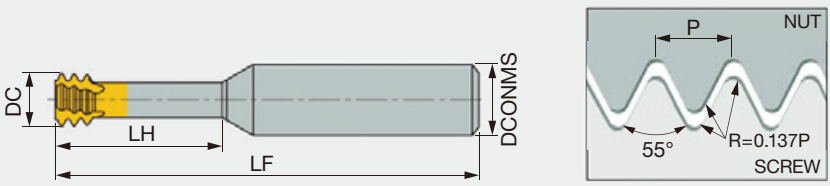


Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ08078C1428W	28	1/8	8	7.8	3	14.1	64	With	AH725
MTECZ1010D1619W	19	1/4, 3/8	10	10	4	16.7	73	With	AH725
MTECZ1616E2614W	14	1/2, 5/8, 3/4, 7/8	16	16	5	26.3	101	With	AH725

Reference pages: Standard cutting conditions → [I120](#) - [I122](#)

MTECS-W

Solid carbide internal and external threading endmill, short edge type, for G, BSP profile



Designation	TPI	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS08078C1928W	28	1/8	8	7.8	3	19.5	64	Without	AH725
MTECS1010D3019W	19	1/4, 3/8	10	10	4	30	73	Without	AH725
MTECS1212D3714W	14	1/2, 5/8, 3/4, 7/8	12	12	4	37	84	Without	AH725

Tapered pipe thread (R, Rc, RT, BSPT)

MTEC-BSPT

Solid carbide internal and external threading endmill. for R, RC, BSPT profile



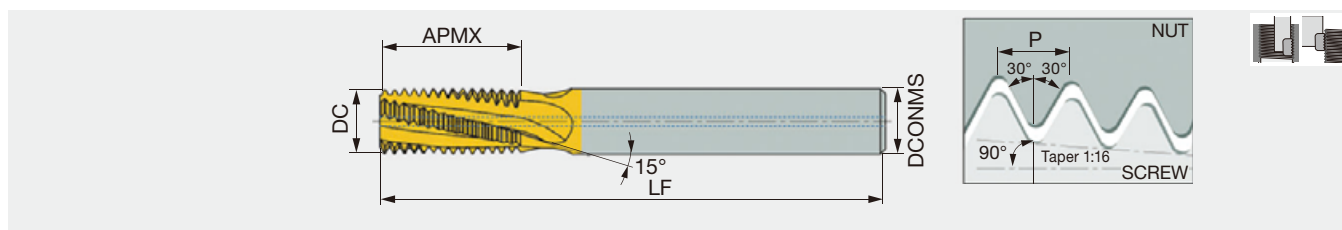
Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C928BSPT	28	1/8	6	6	3	9.5	58	Without	AH725
MTEC0808C1419BSPT	19	1/4, 3/4	8	8	3	14	64	Without	AH725
MTEC1212D1914BSPT	14	1/2, 7/8	12	12	4	19.1	84	Without	AH725
MTEC1616D2811BSPT ⁽¹⁾	11	1, 1 1/4, 1 1/2, 2, 2 1/2	16	16	4	28.9	105	Without	AH725

(1) When the hole depth to be threaded exceeds APMX, use ETTL025M022W25.0F043R03-RT instead.

SOLIDTHREAD

NPT MTEC-NPT

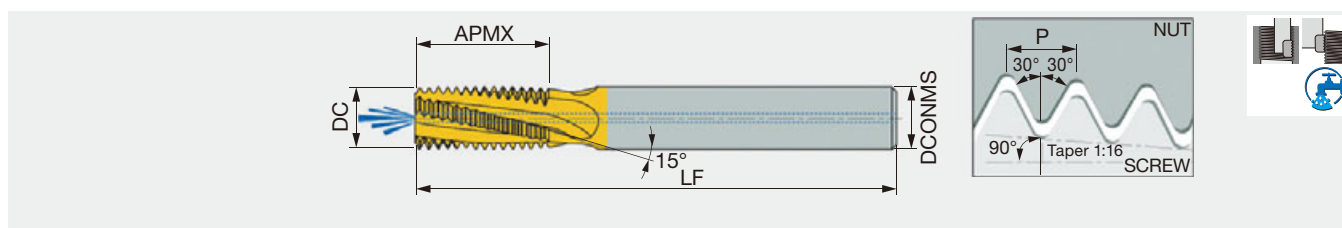
Solid carbide internal and external threading endmill. for NPT profile



Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C927NPT	27	1/16, 1/8	6	6	3	9.9	58	Without	AH725
MTEC0808C1418NPT	18	1/4, 3/8	8	8	3	14.8	64	Without	AH725
MTEC1212D2014NPT	14	1/2, 3/4	12	12	4	20.9	84	Without	AH725
MTEC1616D2711.5NPT	11.5	1, 1 1/4, 1 1/2, 2	16	16	4	27.6	105	Without	AH725
MTEC2020D398NPT ⁽¹⁾	8	2 1/2 - 6	20	20	4	39.7	105	Without	AH725

MTECB-NPT

Solid carbide internal and external threading endmill, with coolant hole, for NPT profile

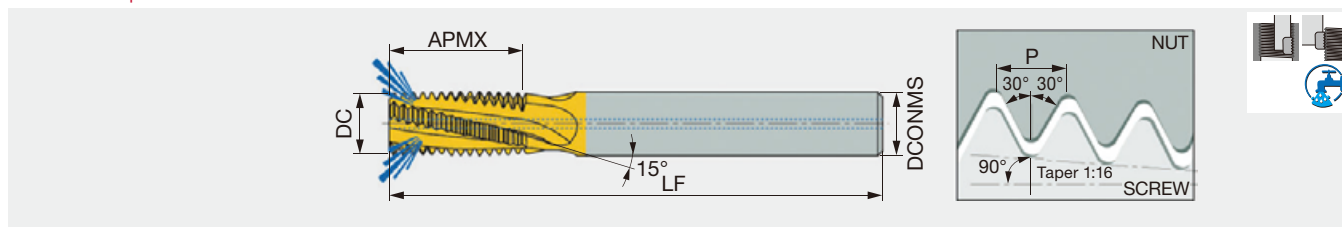


Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB08076C1027NPT	27	1/8	8	7.6	3	10.8	64	With	AH725
MTECB1010D1618NPT	18	1/4, 3/8	10	10	4	16.2	73	With	AH725
MTECB16155D2214NPT	14	1/2, 3/4	16	15.5	4	22.7	105	With	AH725

NPTF

MTECZ-NPTF

Solid carbide internal and external threading endmill for through hole, with coolant hole in the flute, for NPTF profile



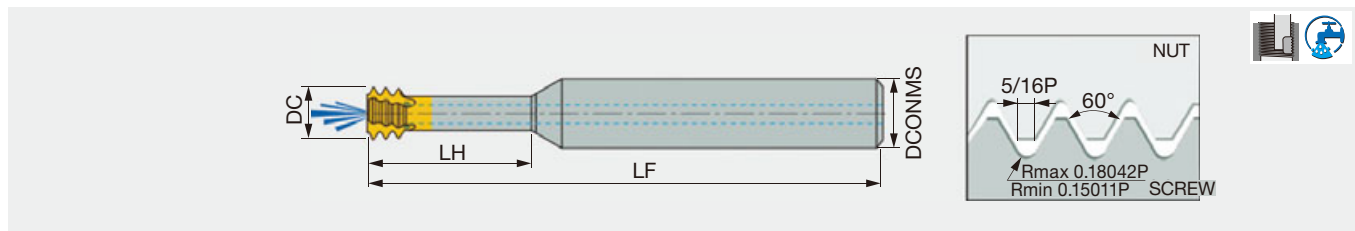
Designation	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ08076C1027NPTF	27	1/8	8	7.6	3	10.8	64	With	AH725
MTECZ1010D1618NPTF	18	1/4, 3/8	10	10	4	16.2	73	With	AH725

Reference pages: Standard cutting conditions → [I120](#) - [I122](#)

MJ

MTECS-MJ

Small diameter solid carbide internal threading endmill, short edge type, with coolant hole, for MJ profile

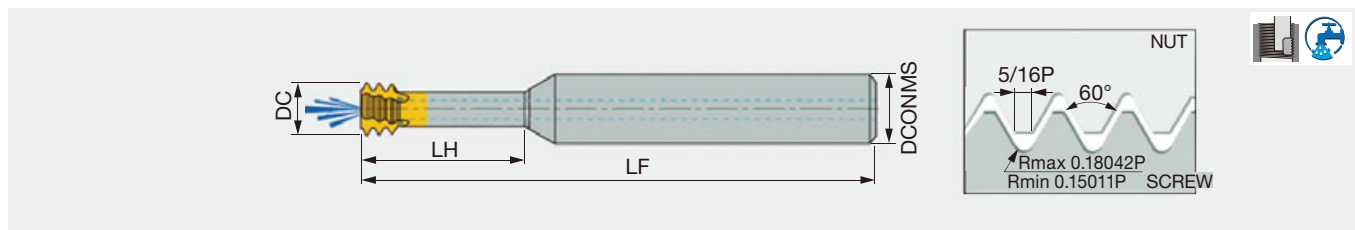


Designation	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS06032C100.7MJ	0.7	≥ 4	6	3.2	3	10	58	Without	AH725
MTECS06039C120.8MJ	0.8	≥ 5	6	3.9	3	12.5	58	Without	AH725
MTECS06048C151.0MJ	1	≥ 6	6	4.8	3	15	58	Without	AH725
MTECS08061C201.25MJ	1.25	≥ 8	8	6.1	3	20	64	With	AH725
MTECS0808C251.5MJ	1.5	≥ 10	8	8	3	25	64	With	AH725
MTECS10092C301.75MJ	1.75	≥ 12	10	9.2	3	30	73	With	AH725
MTECS1010C352.0MJ	2	≥ 14	10	10	3	35	73	With	AH725

UNJ (UNJ, UNJC, UNJF, UNJEF)

MTECS-UNJ

Small diameter solid carbide internal threading endmill, short edge type, with coolant hole, for UNJ profile



Designation	TPI	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS06033C1032UNJ	32	≥ #8	6	3.3	3	10.5	58	Without	AH725
MTECS08051C1628UNJ	28	≥ 1/4	8	5.1	3	16	64	With	AH725
MTECS08067C2024UNJ	24	≥ 5/16	8	6.7	3	20	64	With	AH725
MTECS06049C1620UNJ	20	≥ 1/4	6	4.9	3	16	58	Without	AH725
MTECS0808C2820UNJ	20	≥ 7/16	8	8	3	28	64	With	AH725
MTECS08061C2018UNJ	18	≥ 5/16	8	6.15	3	20	64	With	AH725
MTECS08069C2416UNJ	16	≥ 3/8	8	6.9	3	24	64	With	AH725
MTECS10094C2713UNJ	13	≥ 1/2	10	9.4	3	27.5	73	With	AH725

THREADMILLING

STANDARD CUTTING CONDITIONS

ISO	Material	Condition	Tensile strength [N/mm²]	Hardness HB	Cutting speed Vc (m/min)
					AH725
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C Annealed	420	125	100-250
		≥ 0.25 %C Annealed	650	190	80-210
		< 0.55 %C Quenched and tempered	850	250	65-170
		≥ 0.55 %C Annealed	750	220	110-180
	Low alloy steel and cast steel (less than 5% of alloying elements)	Quenched and tempered	1000	300	95-160
		Annealed	600	200	90-160
		Quenched and tempered	930	275	65-200
			1000	300	70-210
			1200	350	95-160
	High alloyed steel, cast steel, and tool steel	Annealed	680	200	130-170
		Quenched and tempered	1100	325	75-100
	Stainless steel and cast steel	Ferritic/martensitic	680	200	110-170
		Martensitic	820	240	70-155
M	Stainless steel	Austenitic	600	180	85-100
K	Cast iron nodular (GGG)	Ferritic/martensitic		180	120-160
		Pearlitic		260	75-160
	Grey cast iron (GG)	Ferritic		160	70-150
		Pearlitic		250	110-140
	Malleable cast iron	Ferritic		130	120-160
		Pearlitic		230	110-140
N	Aluminum- wrought alloy	Not cureable		60	160-300
		Cured		100	
	Aluminum-cast, alloyed	≤12% Si Not cureable		75	150-350
		Cured		90	
		>12% Si High temperature		130	100-250
	Copper alloys	>1% Pb Free cutting		110	
		Brass		90	
		Electrolitic copper		100	
S	High temp. alloys	Fe based Annealed		200	
				280	
		Ni or Co based Annealed		250	20-80
				350	
				320	
	Titanium Ti alloys		RM 400		
		Alpha+beta alloys cured	RM 1050		20-80
H	Hardened steel	Hardened		55 HRC	55-65
		Hardened		60 HRC	45-55
	Chilled cast iron	Cast		400	90-105
	Cast iron	Hardened		55 HRC	55-65

Tool dia.: DC (mm)											
Feed: f (mm/t)											
ø2	ø3	ø4	ø6	ø8	ø10	ø12	ø14	ø16	ø20	ø25	ø30
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18
0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10	0.12
0.05	0.06	0.07	0.09	0.1	0.11	0.12	0.13	0.15	0.18	0.22	0.25
0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05
0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05

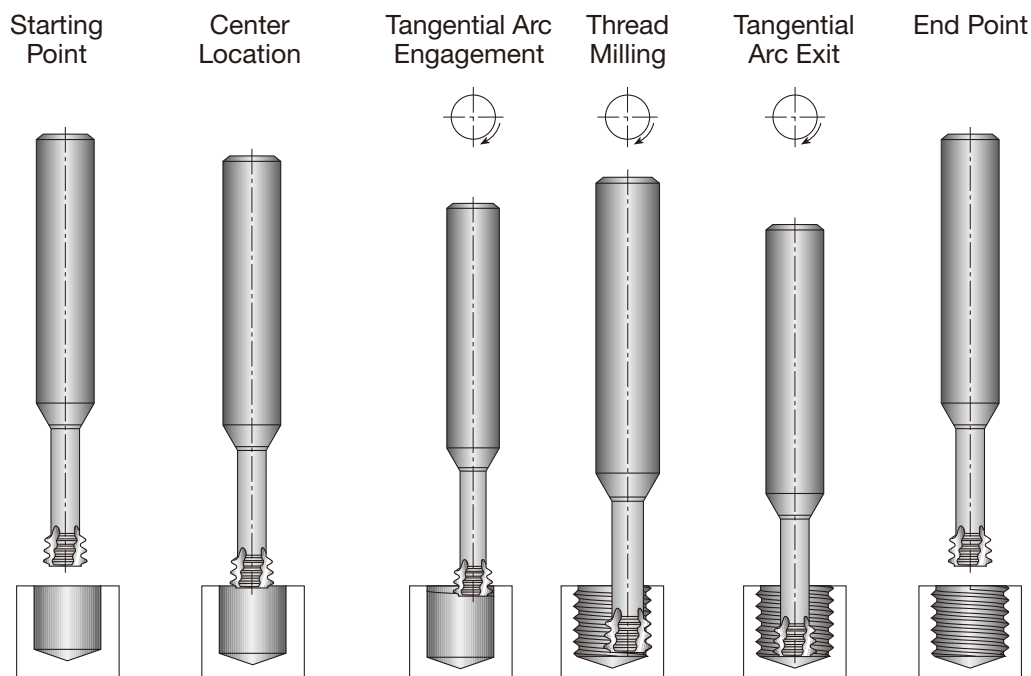
When using long edge type tools, Feed should be reduced to 40% of above table.

THREADMILLING

MTECS

Small Diameter, Short edge type

Thread Milling - Procedure



STANDARD CUTTING CONDITIONS

ISO	Material	Cutting speed V_c (m/min)	Feed: f (mm/t)												
			$\phi 1.5$	$\phi 2$	$\phi 3$	$\phi 4$	$\phi 5$	$\phi 6$	$\phi 7$	$\phi 8$	$\phi 9$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 15$
P	Low & medium carbon steels	60-120	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	High carbon steels	60-90	0.04	0.05	0.06	0.08	0.09	0.1	0.12	0.13	0.14	0.14	0.16	0.17	0.18
	Alloy steels, treated steels	50-80	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.1	0.12	0.13	0.14
	Cast steels	70-90	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.1	0.12	0.13	0.14
M	Stainless steels	60-90	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13
K	Cast iron	40-80	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
N	Aluminum	80-150	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	Synthetics, duroplastics, thermoplastics	50-200	0.1	0.11	0.12	0.14	0.16	0.18	0.19	0.19	0.19	0.19	0.19	0.2	0.2
S	Nickel alloys, titanium alloys	20-40	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08

MTECS Small Diameter, Short edge type

SolidThread MTECS is used for the production of small internal threads. These thread mills feature a short 3-tooth cutting zone with 3 flutes and a released neck between the cutting zone and the shank. This unique tool design offers very precise profiles and a high performance AH725 submicron carbide grade with PVD titanium aluminum nitride coating. The very short profile exerts a low force which minimizes tool bending. This facilitates parallel and high thread precision for the entire length.



Compared to taps, the **SOLIDTHREAD** is more accurate, thread machining is substantially faster and there is no danger of a broken tap being stuck in the hole.

SolidThread vs. Tap

Criteria	Thread mill	Taps
Thread surface quality	High	Medium
Thread geometry	Very accurate	Medium
Thread tolerance	4H, 5H, 6H with std. cutter	6H with standard tap, 4H with special tap
Machining time	Shorter or same as tap	Short
Machining load	Very low	High
Range of thread diameters	Wide range of diameters (able to thread a wide range of hole sizes)	Specific tap for each thread size
Right-/Left-hand threading	Same cutter	Specific tap for right- and left-hand

Features

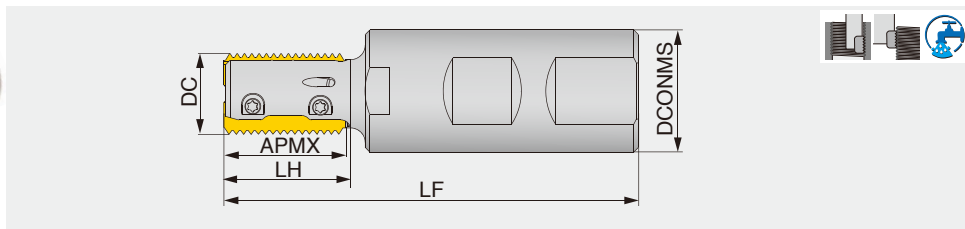
- Minimum thread size of MTECS: **M1x0.25** (0.75 mm pre hole diameter) up to M20x2.50
- 2xD and 3xD threading lengths
- High cutting speeds
- Short cycle time
- Low cutting forces due to the short contact profile resulting in accurate and parallel thread
- Prevents oval threads near thin walls
- No more dealing with broken taps
- Reliable threading in blind holes
- Excellent performance on hardened steel, high temperature alloys and titanium



THREADMILLING

Thread milling cutter

Indexable thread milling cutter, long edge type



Designation	DC	APMX	CICT	DCONMS	LH	LF	Oil hole	Insert
ETTL25M017W25.0F026R02 ⁽¹⁾	17	25	2	25	26	85	with	TL25D...
ETTL25M017W25.0F036R02 ⁽¹⁾	17	25	2	25	36	95	with	TL25D...
ETTL25M019W25.0F032R02	19	25	2	25	32	92	with	TL25D...
ETTL25M019W25.0F044R02	19	25	2	25	44	104	with	TL25D...
ETTL25M021W25.0F037R03	20.5	25	3	25	37	96	with	TL25D...
ETTL25M021W25.0F044R03	20.5	25	3	25	44	103	with	TL25D...
ETTL25M022W25.0F043R03	22	25	3	25	43	102	with	TL25D...
ETTL25M022W25.0F055R03	22	25	3	25	55	114	with	TL25D...
ETTL25M030W25.0F055R05	30	25	5	25	55	115	with	TL25D...

(1) Inserts with a thread pitch of ≥ 3 mm or ≥ 9 TPI are not mountable.

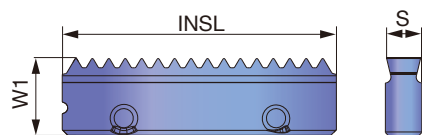
SPARE PARTS

Designation	Clamping screw	Wrench
ETTL25...	SSTM4-3.6P	T-8D

Recommended clamping torque: 1.2 N·m

INSERT

TL25D...



P	Steel	★
M	Stainless	☆
K	Cast iron	☆
N	Non-ferrous	☆
S	Superalloys	★
H	Hard materials	★

★ : First choice
☆ : Second choice

Thread type	Application	Designation	Pitch	Threads per inch	Number of threads per edge	Coated		INSL	W1	S	Applicable thread sizes for the given cutter diameters: DC (mm)				
						AH725					ø17	ø19	ø20.5	ø22	ø30
ISO Metric	Internal	TL25DIR1.5ISO	1.5	-	16	●		25	7	3.1	≥ M19	≥ M21	≥ M23	≥ M24	≥ M32
		TL25DIR2.0ISO	2	-	12	●		25	7	3.1	≥ M20	≥ M22	≥ M23	≥ M25	≥ M33
		TL25DIR3.0ISO ⁽²⁾	3	-	8	●		25	7	3.1	-	≥ M23	≥ M25	≥ M26	≥ M34
Unified	Internal	TL25DIR20UN	-	20	19	●		25	7	3.1	≥ 3/4	≥ 7/8	≥ 7/8	≥ 15/16	≥ 1 5/16
		TL25DIR12UN	-	12	11	●		25	7	3.1	≥ 13/16	≥ 7/8	≥ 15/16	≥ 1	≥ 1 5/16
		TL25DIR9UN ⁽²⁾	-	9	8	●		25	7	3.1	-	≥ 7/8	≥ 15/16	≥ 1	≥ 1 3/8
		TL25DIR8UN ⁽²⁾	-	8	7	●		25	7	3.1	-	≥ 15/16	≥ 1	≥ 1 1/16	≥ 1 3/8
Whitworth (parallel pipe)	Internal and external	TL25DEIR14W	-	14	13	●		25	7	3.1	≥ G1/2	≥ G5/8	≥ G3/4	≥ G3/4	-
		TL25DEIR11W	-	11	10	●		25	7	3.1	≥ G1	≥ G1	≥ G1	≥ G1	≥ G1

Do not use this tool when the hole depth to be threaded exceeds the cutter's LH value.

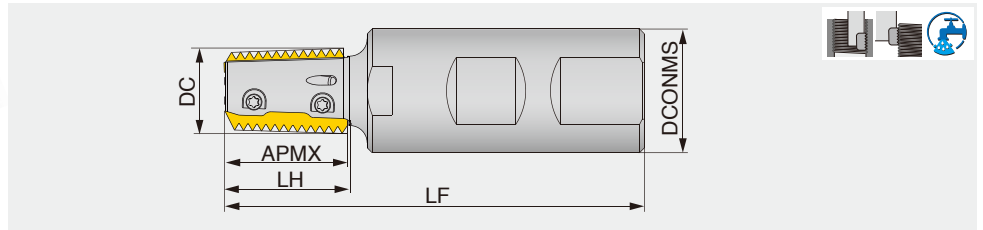
(2) Does not fit the DC = 17 mm holder

●: Line up

Reference pages: Standard cutting conditions → **I126**

Thread milling cutter

Indexable thread milling cutter, long edge type



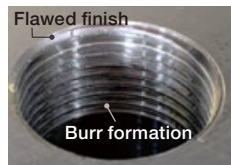
Designation	DC	APMX	CICT	DCONMS	LH	LF	Oil hole	Insert
ETTL25M017W25.0F026R02-PT	17.47	25	2	25	25.5	85	with	TL25SEIR...
ETTL25M022W25.0F043R03-PT	22.2	25	3	25	43	102	with	TL25SEIR...

SPARE PARTS

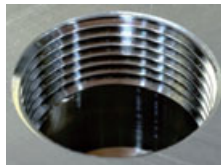
Designation	Clamping screw	Wrench
ETTL...-PT	SSTM4-3.6P	T-8D

Recommended clamping torque: 1.2 N·m

Excellent surface finish



Helical tap
(of HSS)

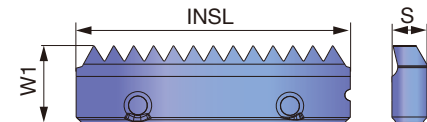


THREADMILLING
ETTL25M017W25.0F026R02-PT,
TL25SEIR11BSPT

Machine: BT50
Thread: Rc1

INSERT

TL25SEIR...



P	Steel	★
M	Stainless	☆
K	Cast iron	☆
N	Non-ferrous	☆
S	Superalloys	★
H	Hard materials	★

★ : First choice
☆ : Second choice

Thread type	Application	Designation	Pitch	Threads per inch	Number of threads per edge	Coated		INSL	W1	S	Applicable thread sizes for the given cutter diameters: DC (mm)	
						AH725					ø17.47	ø22.2
BSPT	Internal and external	TL25SEIR14BSPT	-	14	13	●		25	7	3.1	1/2, 3/4	3/4
		TL25SEIR11BSPT	-	11	10	●		25	7	3.1	≥ 1 ⁽¹⁾	≥ 1 ⁽¹⁾
NPT	Internal and external	TL25SEIR14NPT	-	14	13	●		25	7	3.1	1/2, 3/4	3/4
		TL25SEIR11.5NPT	-	11.5	11	●		25	7	3.1	1, 1 1/4, 1 1/2, 2 ⁽¹⁾	1, 1 1/4, 1 1/2, 2 ⁽¹⁾
NPTF	Internal and external	TL25SEIR14NPTF	-	14	13	●		25	7	3.1	1/2, 3/4	3/4

(1) Do not use this insert when the hole depth to be threaded exceeds the cutter's LH.

●: Line up

Reference pages: Standard cutting conditions → **I126**

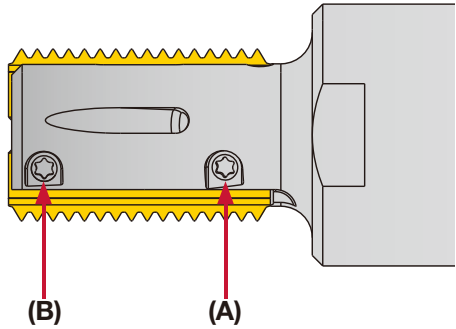
STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel	AH725	100 - 200	0.1 - 0.3
	High carbon steel	AH725	70 - 150	0.1 - 0.3
	High carbon steels	AH725	70 - 170	0.1 - 0.3
	Cast steel	AH725	70 - 170	0.1 - 0.3
M	Stainless steel	AH725	90 - 140	0.1 - 0.3
K	Cast iron	AH725	60 - 130	0.05 - 0.3
N	Aluminium alloys	AH725	80 - 400	0.1 - 0.4
S	Heat-resistant alloys	AH725	10 - 30	0.02 - 0.1
	Titanium alloy	AH725	20 - 90	0.02 - 0.1

Climb milling is recommended.

Insert installation

1. Use airgun or rag to thoroughly clean all the insert pockets free from dust or chips.
2. Lightly tighten Screw "A" first, then Screw "B" until the insert becomes stationary.
3. Lightly tighten the screws for other insert(s) in the same matter as mentioned in #1 and #2 above.
4. Firmly tighten Screw "A", then Screw "B".
Use the recommended torque strengths when tightening the screws.
5. Firmly tighten the screws for other insert(s) in the same manner as mentioned in #4 above.
6. Inspect to make sure there is no gap between the insert and the insert seat. Measure the radial runout before use.



MEMO

Index	User's Guide	Tooling System	Drilling tool	Endmill	Milling cutter	Miniature tool	Grooving	Threading	Int. Toolholder	Ext. Toolholder	Insert	Grade
M	L	K	J	I	H	G	F	E	D	C	B	A

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Grades	Cutting speed V _c (m/min)	Feed per tooth f _z (mm/t)
P	Mild steels , Unhardened steels	≥ 200 HB	GH330	150 - 200	0.3 - 0.4
	Carbon steels, Alloy steels	≥ 300 HB	GH330	150 - 200	0.17 - 0.26
	Die steels	≥ 50 HRC	GH330	30 - 50	0.14 - 0.2
M	Stainless steels	≥ 300 HB	GH330	150 - 200	0.05 - 0.12

Climb milling is recommended.

When threading a blind hole, use the right hand cutter in right-hand rotation. Cut up from the bottom to prevent chip recutting.

THREADING MILLS AND APPLICABLE THREADS

Internal threading - Metric threads (M)

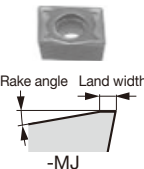
Designation	Insert	Pitch (mm)										
		1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6
D23-D25-45R	T1-R14	M28	M28	M29	M29	M30	M30	-	-	-	-	-
	T1-R28	-	-	-	-	M30	M30	-	-	-	-	-
D25-D25-45R	T1-R14	M30	M30	M31	M31	M32	M32	M36	M36	-	-	-
	T1-R28	-	-	-	-	M32	M32	M36	M36	-	-	-
D38-D32-85R	T1-R14	M43	M43	M44	M44	M45	M45	M46	M46	M48	M56	-
	T1-R28	-	-	-	-	M45	M45	M46	M46	M48	M56	-
D50-D42-100R	T1-R14	M55	M55	M56	M56	M57	M57	M58	M58	M59	M59	-
	T1-R28	-	-	-	-	M57	M57	M58	M58	M59	M59	-
D55-D42-100R	T2-R14	M60	M60	M61	M61	M62	M62	M63	M63	M64	M64	M65
	T2-R28	-	-	-	-	M62	M62	M63	M63	M64	M64	M65
D60-D42-100R	T2-R14	M65	M65	M66	M66	M67	M67	M68	M68	M69	M69	M70
	T2-R28	-	-	-	-	M67	M67	M68	M68	M69	M69	M70
D80-D42-100R	T2-R14	M85	M85	M86	M86	M87	M87	M88	M88	M89	M89	M90
	T2-R28	-	-	-	-	M87	M87	M88	M88	M89	M89	M90

Internal threading - Unified threads (UN, UNC, UNF, UNEF)

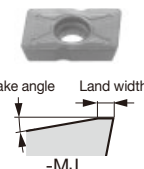
Designation	Insert	TPI												
		16	14	13	12	11	10	9	8	7	6	5	4.5	4
D23-D25-45R	T1-R14	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/16	1 3/16	1 3/16	1 3/16	-	-	-	-
	T1-R28	-	-	-	-	-	1 3/16	1 3/16	1 3/16	1 3/16	-	-	-	-
D25-D25-45R	T1-R14	1 3/16	1 3/16	1 3/16	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 5/16	1 3/8	1 3/4	-	-
	T1-R28	-	-	-	-	-	1 1/4	1 1/4	1 1/4	1 5/16	1 3/8	1 3/4	-	-
D38-D32-85R	T1-R14	1 11/16	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 13/16	1 13/16	1 7/8	2	-
	T1-R28	-	-	-	-	-	1 3/4	1 3/4	1 3/4	1 13/16	1 13/16	1 7/8	2	-
D50-D42-100R	T1-R14	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 3/8	2 3/8	2 3/8	-
	T1-R28	-	-	-	-	-	2 1/4	2 1/4	2 1/4	2 1/4	2 3/8	2 3/8	2 3/8	-
D55-D42-100R	T2-R14	2 3/8	2 3/8	2 3/8	2 3/8	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 5/8	2 5/8	2 3/4
	T2-R28	-	-	-	-	-	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 5/8	2 5/8	2 3/4
D60-D42-100R	T2-R14	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	2 3/4	2 7/8	3
	T2-R28	-	-	-	-	-	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	2 3/4	2 7/8	3
D80-D42-100R	T2-R14	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 5/8	3 3/4
	T2-R28	-	-	-	-	-	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 5/8	3 3/4

Milling Insert (Old item)

● ACMT**PR-MJ

Shape	Designation	Coated									Applicable mill
		AH120	AH140	GH330	T3130						
	ACMT060308PR-MJ	●	●	●	●						ELP07/09/12... (old item)
	ACMT07T308PR-MJ	●	●	●	●						
	ACMT100408PR-MJ	●	●	●	●						

● ADMT**PR-MJ

Shape	Designation	Coated									Applicable mill
		AH120	AH140	T3130							
	ADMT130308PR-MJ	●	●	●							ELP13/17/21... (old item)
	ADMT17T308PR-MJ	●	●	●							
	ADMT210408PR-MJ	●	●	●							

● AECW**PEFR, AECW**PESR, AEMW**PEFR, AEMW**PETR

Shape	Designation	Coated		Cermet		Uncoated			Applicable mill	
		AH120	GH330		NS740		UX30			TH10
	AECW1403PEFR							●		EPE4000/5000/ 6000... (old item)
	AECW1403PESR	●	●		●		●			
	AECW16T3PEFR							●		
	AECW16T3PESR	●	●		●		●			
	AECW1804PEFR							●		
	AECW1804PESR	●	●		●		●			
	AEMW1403PEFR							●		
	AEMW1403PETR		●		●		●			
	AEMW16T3PEFR							●		
	AEMW16T3PETR		●		●		●			
	AEMW1804PEFR							●		
	AEMW1804PETR		●		●		●			

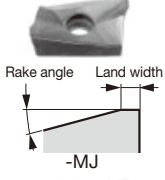
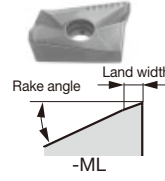
● ANEA542TN, ANEA642TN

Shape	Designation	Uncoated									Applicable mill
		UX30									
	ANEA542TN	●									VSN... (old item)
	ANEA642TN	●									

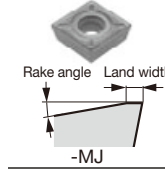
●: Line up

Milling Insert (Old item)

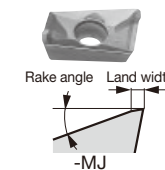
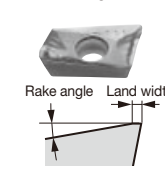
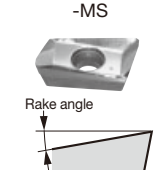
● ANMT**PPPR-MJ, ANMT**PPPR-ML

Shape	Designation	Coated				Applicable mill
		AH120	GH330	T3130		
 -MJ	ANMT09T3PPPR-MJ	●	●	●		EPN09 (old item)
	ANMT09T3PPPR-ML	●				
	ANMT1404PPPR-MJ	●	●	●		
	ANMT1404PPPR-ML	●				
 -ML						EPN14... TPN14... (old item)

● APMT**PN-MJ

Shape	Designation	Coated				Applicable mill
		AH120	AH140	GH330	T3130	
 -MJ	APMT070308PN-MJ	●	●	●	●	ELP07/09/12... (old item)
	APMT09T308PN-MJ	●	●	●	●	
	APMT120408PN-MJ	●	●	●	●	

● ASMT17**PDPR-MJ, ASGT17**PDFR-AJ, ASMT170508PDPR-MS

Shape	Designation	Coated						Cermet	Uncoated	Applicable mill
		AH120	AH130	AH140	T1115	T3130	DS1100	NS740	KS05F	
 -MJ	ASMT170504PDPR-MJ	●			●	●		●		TPS17... (old item)
	ASMT170508PDPR-MJ	●			●	●		●		
	ASMT170512PDPR-MJ	●				●				
	ASMT170516PDPR-MJ	●				●		●		
 -MS	ASMT170520PDPR-MJ	●								EPS17... (old item)
	ASMT170530PDPR-MJ	●								
	ASMT170532PDPR-MJ	●				●		●		
	ASMT170508PDPR-MS		●	●						
 -AJ	ASGT170504PDFR-AJ						●		●	
	ASGT170508PDFR-AJ						●		●	

●: Line up

Milling Insert (Old item)

● CPMW**-EN, CPMT**-EN

Shape	Designation	Coated		Uncoated						Applicable mill
		GH330		UX30						
	CPMW050208EN	●		●						EVP1000 (old item)
	CPMW06T208EN	●		●						
	CPMT080308EN	●		●						

● EDKW53ZTR

Shape	Designation	Coated		Uncoated						Applicable mill
		GH330		UX30						
	EDKW53ZTR	●		●						ESD5000 (old item)

● ENEQ**TN-T

Shape	Designation	Coated		Uncoated						Applicable mill
		AH120								
	ENEQ090508TN-T	●								VSNE09... (old item)
	ENEQ100508TN-T	●								VSNE10... (old item)
	ENEQ130608TN-T	●								VSNE13... (old item)
	ENEQ160608TN-T	●								VSNE16... (old item)

● GDMT**PDPR-MJ, GDGT**PDPR-AJ

Shape	Designation	Coated					Uncoated						Applicable mill
		AH120	AH140	AH330	T3130	DS1100	UX30	TH10					
 Rake angle Land width  -MJ  Rake angle -AJ	GDMT10H3PDPR-MJ	●	●	●	●		●						TSD10/17... (old item) ESD10/17... (old item) HSD10/17... (old item)
	GDMT17X6PDPR-MJ	●	●	●	●		●						
	GDGT10H3PDPR-AJ					●		●					
	GDGT17X6PDPR-AJ					●		●					

● HEHN532FN

Shape	Designation	Uncoated								Applicable mill
		TH10								
	HEHN532FN	●								QYE5300 (old item)

●: Line up

Response	Percentage
Doing a good job	45%
Not doing a good job	55%

Milling Insert (Old item)

● RFEN2004ZFTN, RFEN2004M0TN

Shape	Designation	Coated		Uncoated						Applicable mill
		AH120	GH330	UX30	KS20					
	RFEN2004ZFTN	●	●	●	●					TRF6000 (old item)
	RFEN2004M0TN		●	●	●					ERF6000 (old item)

● SDCN1504ZDSR, SDEN1504ZDSR, SDNN1504ZDSR

Shape	Designation	Coated								Applicable mill
		AH120	AH140	T1115	T3130					
	SDCN1504ZDSR	●	●		●					MILLFEED TXD15... (old item)
	SDEN1504ZDSR	●	●	●	●					
	SDNN1504ZDSR	●	●	●	●					

● SDCN42HTR, SDKN42HTR

Shape	Designation	Coated								Applicable mill
		GH330								
	SDCN42HTR	●								EUD4600 (old item)
	SDKN42HTR	●								

● SDKN42EF..., SDEN42EFTR24

Shape	Designation	Coated		Cermet	Uncoated					Applicable mill
		T3130		NS740	TH10	UX30				
	SDKN42EFTR	●		●						TMD4100I (old item)
	SDKN42EFFR				●					
	SDEN42EFTR24			●		●				

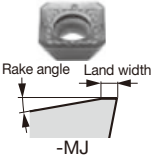
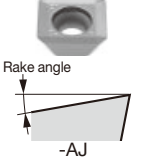
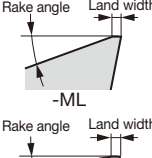
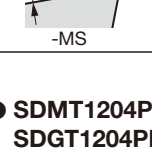
●SDCN53HTR, SDKN53HTR

Shape	Designation	Coated								Applicable mill
		GH330								
	SDCN53HTR	●								TUD5600 (old item)
	SDKN53HTR	●								

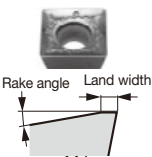
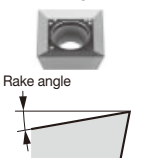
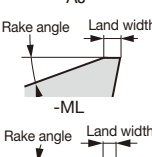
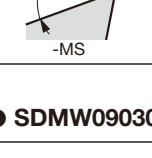
●: Line up

Milling Insert (Old item)

- SDMT1204AFPN-MJ, SDMT1204AFTN-MJ, SDMT1204AFPN-ML, SDMT1204AFPN-MS, SDGT1204AFTN-MJ, SDGT1204AFFN-AJ

Shape	Designation	Coated					Cermet		Uncoated	Applicable mill
		AH120	AH140	AH330	GH330	T3130	NS740		TH10	
 -MJ  -AJ  -ML  -MS	SDMT1204AFPN-MJ	●	●	●	●	●				TAD12... EAD12... (old item)
	SDMT1204AFTN-MJ						●			
	SDMT1204AFPN-ML	●		●						
	SDMT1204AFPN-MS		●							
	SDGT1204AFTN-MJ	●		●			●			
	SDGT1204AFFN-AJ								●	

- SDMT1204PDSR-MJ, SDMT1204PDTR-MJ, SDMT1204PDPR-ML, SDMT1204PDPR-MS, SDGT1204PDTR-MJ, SDGT1204PDRF-AJ

Shape	Designation	Coated					Cermet		Uncoated	Applicable mill
		AH120	AH140	AH330	GH330	T3130	NS740		TH10	
 -MJ  -AJ  -ML  -MS	SDMT1204PDSR-MJ	●	●	●	●	●				TPD12... EPD12... (old item)
	SDMT1204PDTR-MJ						●			
	SDMT1204PDPR-ML	●		●						
	SDMT1204PDPR-MS		●							
	SDGT1204PDTR-MJ	●		●			●			
	SDGT1204PDRF-AJ								●	

- SDMW090308TN, SDMW120408TN

Shape	Designation	Uncoated							Applicable mill
		UX30							
	SDMW090308TN	●							ELD3000
	SDMW120408TN	●							ELD4000 (old item)

●: Line up

Milling Insert (Old item)

● SECN422TN, SECN422FN, SEEN422TN, SEEN422FN, SECN422FN-DIA

Shape	Designation	ISO Designation (Metric)	Cermet			Uncoated			PCD			Applicable mill
			NS740	N308		UX30	TH10		DX140			
 -DIA	SECN422TN	SECN120308TN	●	●		●						EGE4000 (old item)
	SECN422FN	SECN120308FN					●					
	SEEN422TN	SEEN120308TN	●	●		●						QHE4000 (old item)
	SEEN422FN	SEEN120308FN					●					
	SECN422FN-DIA	SECN120308FN-D							●			

DX140: Packing quantity = 1pc.

● SEEN1203AFTNCR-14, SEKN42AFTN, SEKN42AFFN, SEKN42AFTN16, SEKR42AFSR-MJ, SEKR1203AFPN-MS, SEKR1203AFTN-MJ, SEMR1203AFTN-MJ

Shape	Designation	ISO Designation (Metric)	Coated					Cermet	Uncoated		Applicable mill
			AH120	AH130	AH140	GH330	T3130	NS740	TH10	UX30	
           Rake angle Land width SEKR-MJ SEMR-MJ -MS	SEEN1203AFTNCR-14							●			TGE4400I (old item)
	SEKN42AFTN	SEKN1203AFTN	●	●	●	●				●	
	SEKN42AFFN	SEKN1203AFFN							●		EGE4400 (old item)
	SEKN42AFTN16	SEKN1203AFTN-16					●	●			
	SEKR42AFSR-MJ	SEKR1203AFSR-MJ				●	●				
	SEKR1203AFPN-MS				●			●			
	SEKR1203AFTN-MJ							●			
	SEMR1203AFTN-MJ							●			

● SECN42EFTRCR, SEEN42EFTRCR, SEKN42EFTR, SEKN42EFFR

Shape	Designation	ISO Designation (Metric)	Coated		Cermet		Uncoated		Applicable mill
			GH330	T3130	NS740		UX30	TH10	
	SECN42EFTRCR	SECN1203EFTR			●				EGE4100 (old item)
	SEEN42EFTRCR	SEEN1203EFTR			●				
	SEKN42EFTR	SEKN1203EFTR	●	●	●				
	SEKN42EFFR	SEKN1203EFFR					●		

● SEKR1504AFSR-MJ

Shape	Designation	Coated					Applicable mill
		T3130					
 Rake angle Land width -MJ	SEKR1504AFSR-MJ	●					(old item)

Milling Insert (Old item)

● SF*N42ZFN, SFCN42ZFN-DIA

Shape	Designation	Uncoated		PCD						Applicable mill
		TH10		DX140						
 -DIA	SFCN42ZFN	●								THF4400RIA (old item)
	SFEN42ZFN	●								
	SFCN42ZFN-DIA			●						

DX140: Packing quantity = 1pc.

● SF*N53ZFN, SFCN53ZFN-DIA

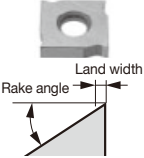
Shape	Designation	Uncoated		PCD						Applicable mill
		TH10		DX140						
 -DIA	SFCN53ZFN	●								THF5400RIA (old item)
	SFEN53ZFN	●								
	SFCN53ZFN-DIA			●						

DX140: Packing quantity = 1pc.

● SNCN43Z..., SNKF43Z..., SNKN43ZTN

Shape	Designation	Coated		Cermet		Ceramic	Uncoated				Applicable mill
		T1115	T3130	NS740	N308	FX105	UX30	TH10			
	SNCN43ZFN							●			TGN4200R-A (old item)
	SNCN43ZTN			●	●		●				
	SNKF43ZFN							●			
	SNKF43ZTN	●					●				
	SNKN43ZTN	●	●	●		●	●				

● SNEN12**Z...

Shape	Designation	Uncoated						Applicable mill
		UX30	TH10					
	SNEN12T2ZFN		●					SVN4000 (old item)
	SNEN12T2ZTN	●						
	SNEN1233ZFN		●					
	SNEN1233ZTN	●						

● SNMN1204**TN

Shape	Designation	Coated			Cermic	Uncoated				Applicable mill
		AH120	T1115	T3130	FX105	UX30				
	SNMN120408TN				●					TGN4200R-A (Old item)
	SNMN120412TN	●	●	●	●	●				
	SNMN120416TN				●					
	SNMN120420TN				●					
	SNMN120424TN				●					

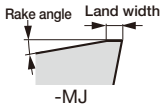
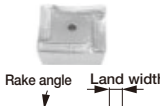
●: Line up

Milling Insert (Old item)

● SPGN120412TN

Shape	Designation	Coated		Ceramic						Applicable mill
		T1115		FX105						
	SPGN120412TN	●		●						QFP4000 (Old item)

● SPMR1605PPTR-MJ, SPMR1605PPPR-ML, SPMR1605PPTR-MH

Shape	Designation	Coated			Uncoated						Applicable mill
		GH330	T1115	T3130	UX30						
	SPMR1605PPTR-MJ	●	●	●	●						TPP16... (Old item)
	SPMR1605PPPR-ML	●									
	SPMR1605PPTR-MH	●		●	●						
	-MJ										
	-ML										
	-MH										

● TDMN**N

Shape	Designation	Cermet		Uncoated						Applicable mill
		NS740		TH10	UX30					
	TDMN110304TN	●			●					ESD2000 (Old item)
	TDMN110304FN			●						
	TDMN110308TN	●			●					

● TNKF64ZTR

Shape	Designation	Uncoated						Applicable mill
		UX30						
	TNKF64ZTR	●						TPN6400I (Old item)
								

●: Line up

Milling Insert (Old item)

●TNMN43ZENS

Shape	Designation	Uncoated							Applicable mill
		UX30							
	TNMN43ZENS	●							TSN4000 ESN4000 (Old item)

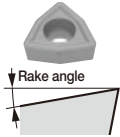
●TPCA43ZTRW1, TPMA432TNW1

Shape	Designation	Cermet		Uncoated				Applicable mill
		NS740		UX30	TH10			
	TPCA43ZTRW1				●			PES1500...
	TPMA432TNW1	●		●	●			(Old item)

●TPMN**TN

Shape	Designation	Cermet							Applicable mill
		NS740							
	TPMN110304TN	●							(Old item)
	TPMN110308TN	●							
	TPMN160308TN	●							
	TPMN160312TN	●							
	TPMN220408TN	●							
	TPMN220412TN	●							

●WCMT**-D4

Shape	Designation	Coated							Applicable mill
		AH120	AH140						
	WCMT050308-D4	●	●						EVX...
	WCMT06T308-D4	●	●						(Old item)
									HVX...
									(Old item)

●WFCN**ZFR-DIA

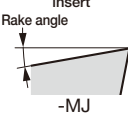
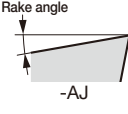
Shape	Designation	PCD							Applicable mill
		DX140							
	WFCN42ZFR-DIA	●							THF4400RIA
	WFCN53ZFR-DIA	●							(Old item)
									THF5400RIA
									(Old item)

DX140: Packing quantity = 1pc.

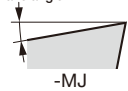
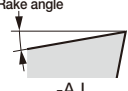
●: Line up

Milling Insert (Old item)

● XVGT**EC-MJ, XVGT**EP-MJ, XVGT**FC-AJ, XVGT**FP-AJ

Shape	Designation	Coated								Applicable mill
		AH730	DS1200							
 Center edge insert  Peripheral edge insert Rake angle  -MJ Rake angle  -AJ	XVGT06H205EC-MJ	●								HYBRIDTACMILL EVH... (Old item)
	XVGT07X305EC-MJ	●								
	XVGT09X405EC-MJ	●								
	XVGT06H205EP-MJ	●								
	XVGT07X305EP-MJ	●								
	XVGT09X405EP-MJ	●								
	XVGT06H205FC-AJ		●							
	XVGT07X305FC-AJ		●							
	XVGT09X405FC-AJ		●							
	XVGT06H205FP-AJ		●							
	XVGT07X305FP-AJ		●							
	XVGT09X405FP-AJ		●							

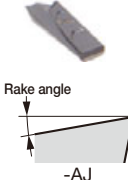
● XHGR**ER-MJ, XHGR**FR-AJ

Shape	Designation	Coated								Applicable mill
		AH730	DS1200							
 Rake angle  -MJ Rake angle  -AJ	XHGR110202ER-MJ	●								HYBRIDTACMILL EPH11/13/18... (Old item)
	XHGR110204ER-MJ	●								
	XHGR110205ER-MJ	●								
	XHGR110208ER-MJ	●								
	XHGR110210ER-MJ	●								
	XHGR110212ER-MJ	●								
	XHGR110215ER-MJ	●								
	XHGR110216ER-MJ	●								
	XHGR110220ER-MJ	●								
	XHGR130202ER-MJ	●								
	XHGR130204ER-MJ	●								
	XHGR130205ER-MJ	●								
	XHGR130208ER-MJ	●								
	XHGR130210ER-MJ	●								
	XHGR130212ER-MJ	●								
	XHGR130215ER-MJ	●								
	XHGR130216ER-MJ	●								
	XHGR130220ER-MJ	●								
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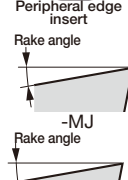
●: Line up

Milling Insert (Old item)

● XHGR**ER-MJ, XHGR**FR-AJ

Shape	Designation	Coated								Applicable mill
		AH730	DS1200							
	XHGR130212FR-AJ		●							HYBRIDTACMILL EPH11/13/18... (Old item)
	XHGR130215FR-AJ		●							
	XHGR130216FR-AJ		●							
	XHGR130220FR-AJ		●							
	XHGR18T200FR-AJ		●							
	XHGR18T202FR-AJ		●							
	XHGR18T204FR-AJ		●							
	XHGR18T205FR-AJ		●							
	XHGR18T208FR-AJ		●							
	XHGR18T210FR-AJ		●							
	XHGR18T212FR-AJ		●							
	XHGR18T215FR-AJ		●							
	XHGR18T216FR-AJ		●							
	XHGR18T220FR-AJ		●							

● XXGT**EC-MJ, XXGT**FC-AJ, XXGT**EP-MJ, XXGT**FP-AJ

Shape	Designation	Coated								Applicable mill
		AH730	DS1200							
 	XXGT06H205EC-MJ	●								HYBRIDTACMILL EXH... (Old item)
	XXGT07X305EC-MJ	●								
	XXGT09X408EC-MJ	●								
	XXGT06H205FC-AJ		●							
	XXGT07X305FC-AJ		●							
	XXGT09X408FC-AJ		●							
	XXGT06H205EP-MJ	●								
	XXGT07X305EP-MJ	●								
	XXGT09X408EP-MJ	●								
	XXGT06H205FP-AJ		●							
	XXGT07X305FP-AJ		●							
	XXGT09X408FP-AJ		●							

● YDEN1505ADFR-D, YDEN1505ADFR-WD

Shape	Designation	PCD								Applicable mill
		DX140								
 	YDEN1505ADFR-D	●								DAD15... (Old item)
	YDEN1505ADFR-WD	●								

DX140: Packing quantity = 1pc.

●: Line up

Milling Insert (Old item)

● YDEN1505PDFR-D, YDEN1505PDFR-WD

Shape	Designation	PCD						Applicable mill
		DX140						
 Regular edge	YDEN1505PDFR-D	●						DPD15... EDPD15... (Old item)
	YDEN1505PDFR-WD	●						
 Wiper edge								

DX140: Packing quantity = 1pc.

● YDEN2405PDFR-D, YDEN2405PDFR-WD, YDEN2405PDFR-BD

Shape	Designation	PCD						Applicable mill
		DX140						
 Regular edge	YDEN2405PDFR-D	●						DPD24... (Old item)
	YDEN2405PDFR-WD	●						
	YDEN2405PDFR-BD	●						
 Wiper edge								
 Wiper for burr removal								

DX140: Packing quantity = 1pc.

● ZDCA**TN

Shape	Designation	Uncoated						Applicable mill
		UX30						
	ZDCA0804TN	●						TBF1000 (Old item)
	ZDCA1105TN	●						

●: Line up

Milling Insert (Old item) CBN

● 2QP-SNGN..

Shape	Designation	CBN						Applicable mill
		BX910						
	2QP-SNGN090308	●						
	2QP-SNGN090312	●						

● 2QP-SPGW..., 2QP-SPGN...

Shape	Designation	CBN						Applicable mill
		BX910						
 2QP-SPGW	2QP-SPGW09T308	●						
	2QP-SPGW09T312	●						
	2QP-SPGW120408	●						
	2QP-SPGW120412	●						
 2QP-SPGN	2QP-SPGW120416	●						
	2QP-SPGN090308	●						
	2QP-SPGN090312	●						

● 3QP-TPGW..., 3QP-TPGN...

Shape	Designation	CBN						Applicable mill
		BX910						
 3QP-TPGW	3QP-TPGW110308	●						
	3QP-TPGN110308	●						
	3QP-TPGN110312	●						
 3QP-TPGN								

● S-CNGN..., S-RNGN..., S-SNGN..., S-TNGN...

Shape	Designation	CBN						Applicable mill
		BXC90						
 S-CNGN	S-CNGN090308	●						
	S-CNGN090312	●						
	S-CNGN120408	●						
	S-CNGN120412	●						
 S-RNGN	S-RNGN090300	●						
	S-RNGN120400	●						
	S-SNGN090308	●						
	S-SNGN090312	●						
 S-SNGN	S-SNGN120308	●						
	S-SNGN120312	●						
	S-SNGN120408	●						
	S-SNGN120412	●						
 S-TNGN	S-TNGN110308	●						
	S-TNGN110312	●						
	S-TNGN160408	●						
	S-TNGN160412	●						

●: Line up