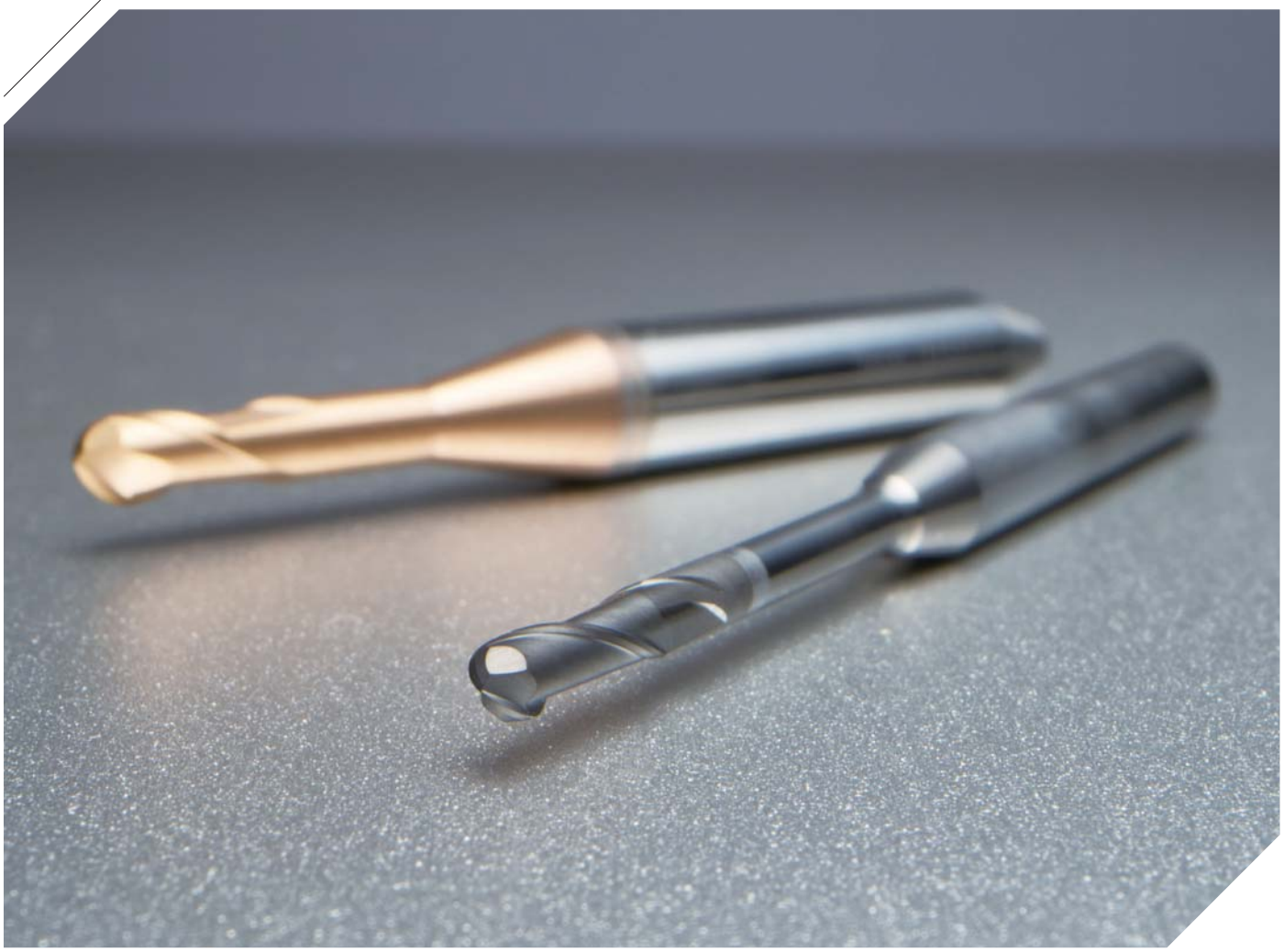
KORLOY
TECH-NEWS

T Endmill

Endmill for Machining Dental Prostheses

- Improved tool performance due to the optimized grade for each material
(*PC2010: Titanium, *PC2510: Co-Cr / *ND3000: Zirconia / Carbide: Wax, PMMA)
- Differentiated tools specialized for each type of domestic and overseas CNC machines for the dental purpose



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Endmill for Machining Dental Prostheses

T Endmill

The need for dental implants has grown steadily in step with the increase in the aging global population. Accordingly, many companies are now actively developing dental CAD/CAM machines, and they compete by developing their own proprietary tool shapes. To meet the demand, KORLOY has released the T Endmill that helps customers stay ahead of the competition with a customized tool for each machine.

Dental CAD/CAM technology is continuously developing by taking advantage of X-ray and oral scanners, and many manufacturers have commercialized CNC machines to automate the previous manual process of manufacturing implants. As a result, machining time is significantly reduced, resulting in improved productivity and demands for tools with longer life.

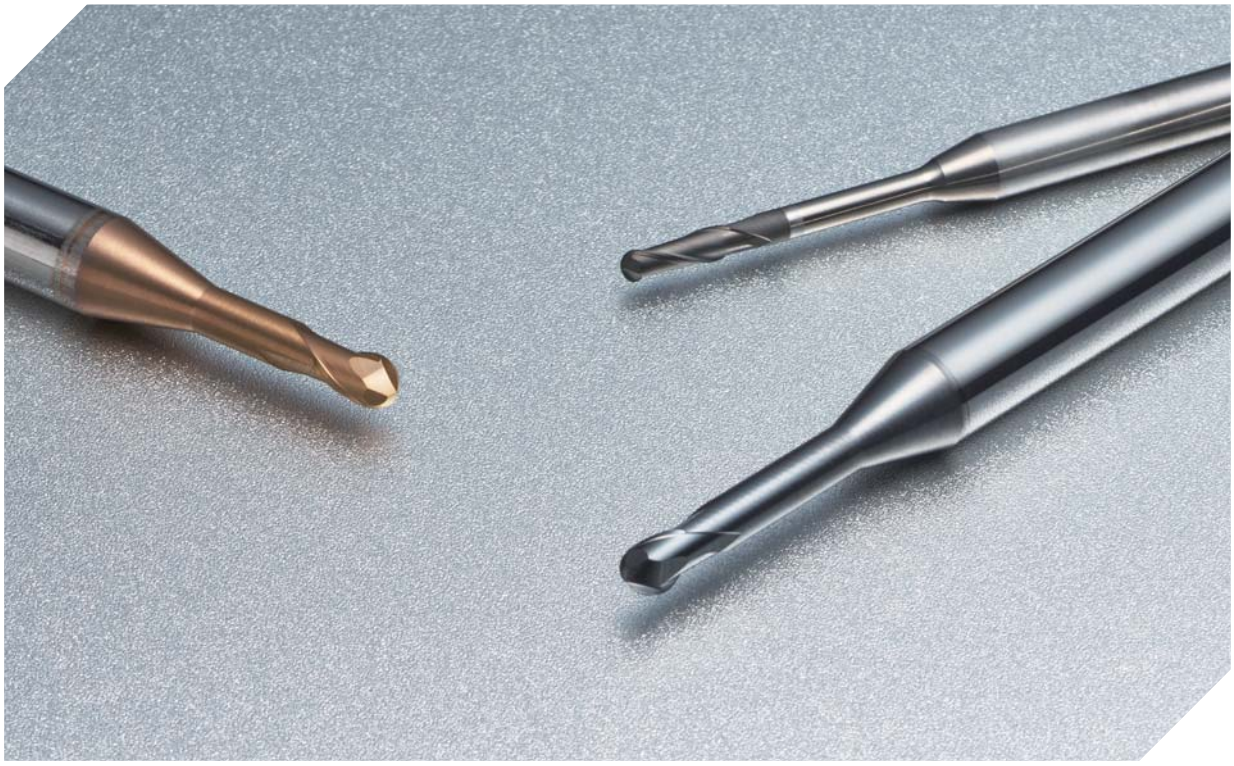
The typical materials of dental prostheses, such as zirconia, titanium, Co-Cr, wax, and PMMA, have different physical and mechanical properties, and each requires an optimized tool solution.

T Endmill uses a specialized grade for each workpiece: ND3000 for zirconia, PC2010 for titanium, PC2510 for Co-Cr, and carbide for Wax and PMMA which guarantees excellent machinability due to its optimized blade design.

» **A dedicated tool for each machine**
- Meets marketplace demands

» **Optimized cutting-edge design**
- Enables excellent machinability

» **A specialized grade for each workpiece**
- Provides optimized performance for various materials of implants



Code system

T Z BE 2 025 - 053 - N201 S06 (450i)

- **T** — T Endmill Dental
- **Z** — Workpiece
  - Z: Zirconia
  - T: Titanium, Co-Cr
  - W: Wax, PMMA
- **BE** — Type
  - BE: Ball Endmill
  - FE: Flat Endmill
  - RE: Radius Endmill
- **2** — Flute count
  - 2: 2 Flutes
  - 3: 3 Flutes
  - 4: 4 Flutes
- **025** — Cutting Diameter
  - 025: 2.5 mm
- **053** — Overall length
  - 053: 53 mm
- **N201** — Usable length
  - N201: 20.1 mm
- **S06** — Shank Diameter
  - S03: 3 mm
  - S04: 4 mm
  - S06: 6 mm
- **(450i)** — Machine maker/ model

E T R T 006 041 - S 4 M200 - T7

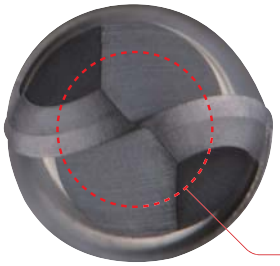
- **E T** — Electroplating Tool
- **R T** — Shape
- **006** — Cutting Diameter
  - 006: 0.6
  - 105: 10.5
- **041** — Tool length
  - 041: 41
  - 031: 31
  - 100: 100
- **S** — Shank Material
  - S: SCM440
  - T: Stainless steel
  - C: Carbide
  - H: HSS
- **4** — Shank Diameter
  - 4: ∅4
  - 6: ∅6
- **M200** — Grit size
  - M: Mesh
  - S: ISO(FEPA)
- **T7** — Tool lead angle
  - No code: None
  - T: Taper angle

Features

- For machining dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, etc.
- Optimized cutting performance by matching a proper grade with each type of material.
- Specialized tool shape for each machine type.

Tangential cutting-edge shape

- One-Pass Grinding applied.
- Inhibited unevenness and excellent finish in machined surfaces.

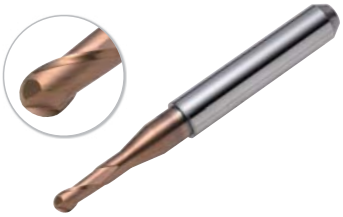


Center-Matched ball shape

- Optimized center shape ensures relief angle at the ball point.
- Cutting edges of the ball point shape provide excellent wear resistance and cutting performance.

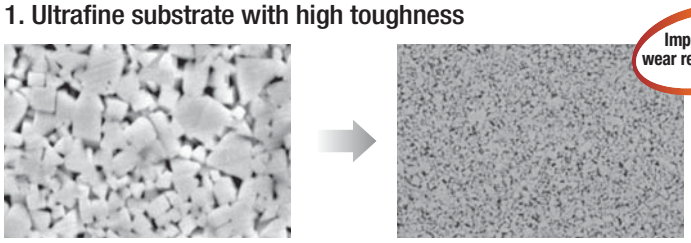
Grade for Titanium

- High hardness coating layer - Ensures stable cutting conditions from high Si contents and enhances wear resistance and frictional heat resistance through the application of AlTiSiN series coating layer.
- A grade optimized for interrupted machining of high hardness steels and wet cutting condition accompanying high thermal shock. The ultrafine substrate offers high toughness, ensuring stable performance.



PC2010 (Coated grade for high hardened steel)

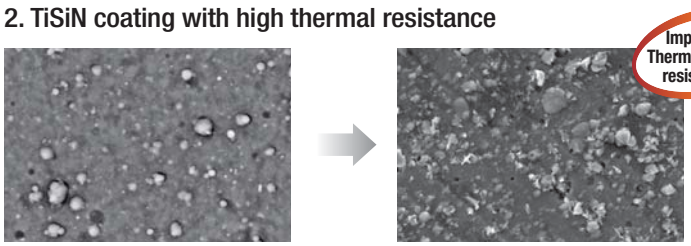
1. Ultrafine substrate with high toughness



[Fine grade] [Ultrafine grade]

» Its tough and wear-resistant substrate is optimized for absorbing thermal shock which is concentrated on cutting edges when machining Titanium.

2. TiSiN coating with high thermal resistance



[Conventional coating] [TiSiN coating]

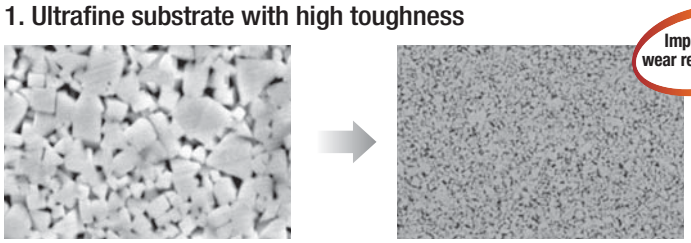
» Its high hardness TiSiN coating is optimized for machining Titanium that causes thermal shock due to its low thermal conductivity.

Grade for Co-Cr

- Post-coating treatment has been applied to improve surface finish.
- A grade optimized for interrupted machining of high hardness steels and wet cutting condition accompanying high thermal shock. The ultrafine substrate offers high toughness, ensuring stable performance.

PC2510 (Coated grade for high hardened steel)

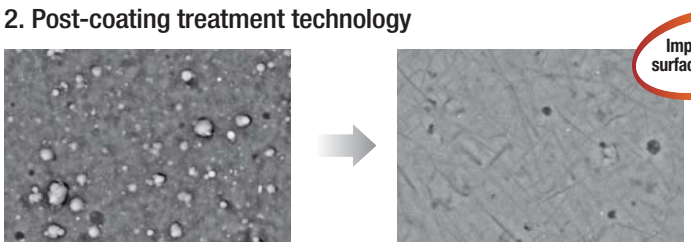
1. Ultrafine substrate with high toughness



[Fine grade] [Ultrafine grade]

» Its tough and wear-resistant substrate is optimized for absorbing thermal shock which is concentrated on cutting edges when machining Co-Cr.

2. Post-coating treatment technology



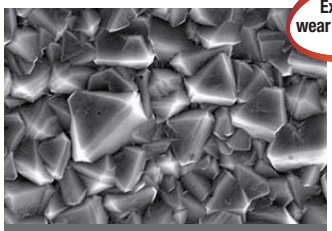
[Conventional coating] [Post-coating treatment]

» With the post-coating treatment, the cutting edge retains its sharpness and smoothness that result in longer tool life.

Grade for Zirconia

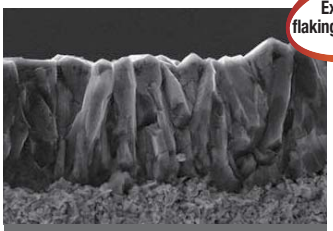
- High hardness diamond coating that is excellent in machining zirconia.
- Optimized for high speed and medium duty cutting due to its excellent grip to coated layers.

ND3000 (Diamond-coated grade)



Surface of ND3000

High hardness diamond coating (Hv 10,000) provides excellent wear resistance



Cross section of coated layers

Specialized grade for zirconia provides excellent adhesion

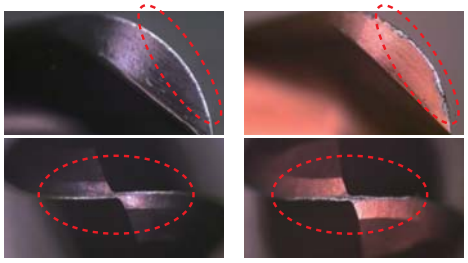
» Inhibiting excessive flank wear caused by friction between zirconia material and clearance surface of the tool.

» Under Ø1 tool diameter, we also use PC2510 for better accuracy.(ND3000 is possible on request)

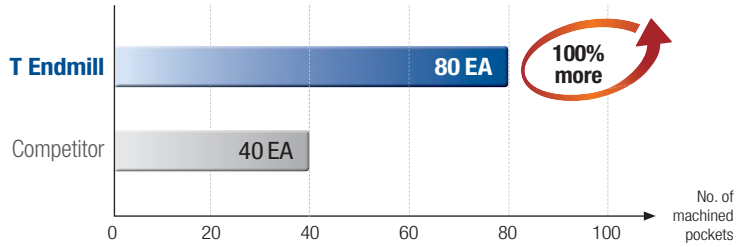
Performance evaluation

Co-Cr

Cutting condition	vc (m/min) = 150, fz (mm/t) = 0.08, ap (mm) = 0.13, ae (mm) = 0.7, wet
Tool	TTBE2030-050 (Tool dia. = Ø3, PC2510)



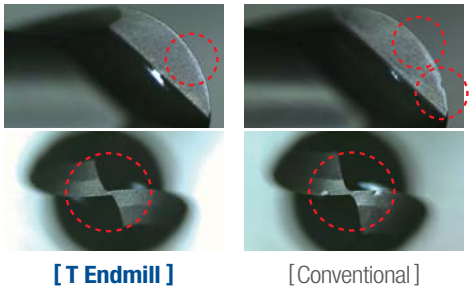
[T Endmill] [Competitor]



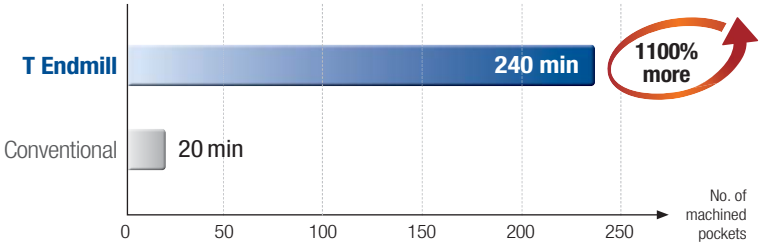
» Excellent resistance to toughness and wear due to the new grade PC2510

Zirconia

Cutting condition	vc (m/min) = 138, fz (mm/t) = 0.05, ap (mm) = 0.1, ae (mm) = 0.6, Air
Tool	TZBE2020-050 (Tool dia. = Ø2, ND3000)



[T Endmill] [Conventional]



Recommended cutting conditions _ Zirconia

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min^{-1})	vf (mm/min)
0.6			●	0.05	0.05	63500	630
1				0.1	0.2	38000	1050
			●	0.1	0.1	38000	1050
2	●			0.5	1	35000	1400
			●	0.15	0.15	35000	1400
2.5	●			0.5	1.25	28000	1400
			●	0.15	0.15	28000	1400
3	●			0.5	1.5	23500	1600
			●	0.15	0.15	23500	1600

Recommended cutting conditions _ Titanium

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min^{-1})	vf (mm/min)
0.6			●	0.02	0.02	47750	480
1		●		0.02	0.1	22000	900
			●	0.04	0.04	28500	1050
1.5	●	●		0.05	0.45	15000	1050
			●	0.07	0.07	19000	1150
2	●	●		0.1	0.6	11000	1050
			●	0.1	0.1	14500	1150
2.5	●	●		0.1	0.75	9500	1050
			●	0.1	0.1	11500	1150
3	●			0.15	1	9000	1150
			●	0.12	0.12	10500	1300

Recommended cutting conditions _ Co-Cr

Size(Ø)	Roughing	Pre-finishing	Finishing	ap (mm)	ae (mm)	rpm (min^{-1})	vf (mm/min)
0.6			●	0.02	0.02	63500	635
1		●		0.02	0.1	28500	1150
			●	0.04	0.04	38000	1500
1.5	●	●		0.05	0.45	19000	1500
			●	0.07	0.07	25000	2000
2	●	●		0.1	0.6	14500	1500
			●	0.1	0.1	19000	2000
2.5	●	●		0.1	0.75	11500	1375
			●	0.1	0.1	15500	1850
3	●			0.15	1	14000	1700
			●	0.12	0.12	15900	1900

Caution

- Please adjust the above cutting conditions according to the state of your machine, the target shape and your purpose.
- Workpieces should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio.

Application of tool

1. Zirconia/PMMA Crown

※ Tool picture example is ND3000 (Ø0.6 is PC2510)

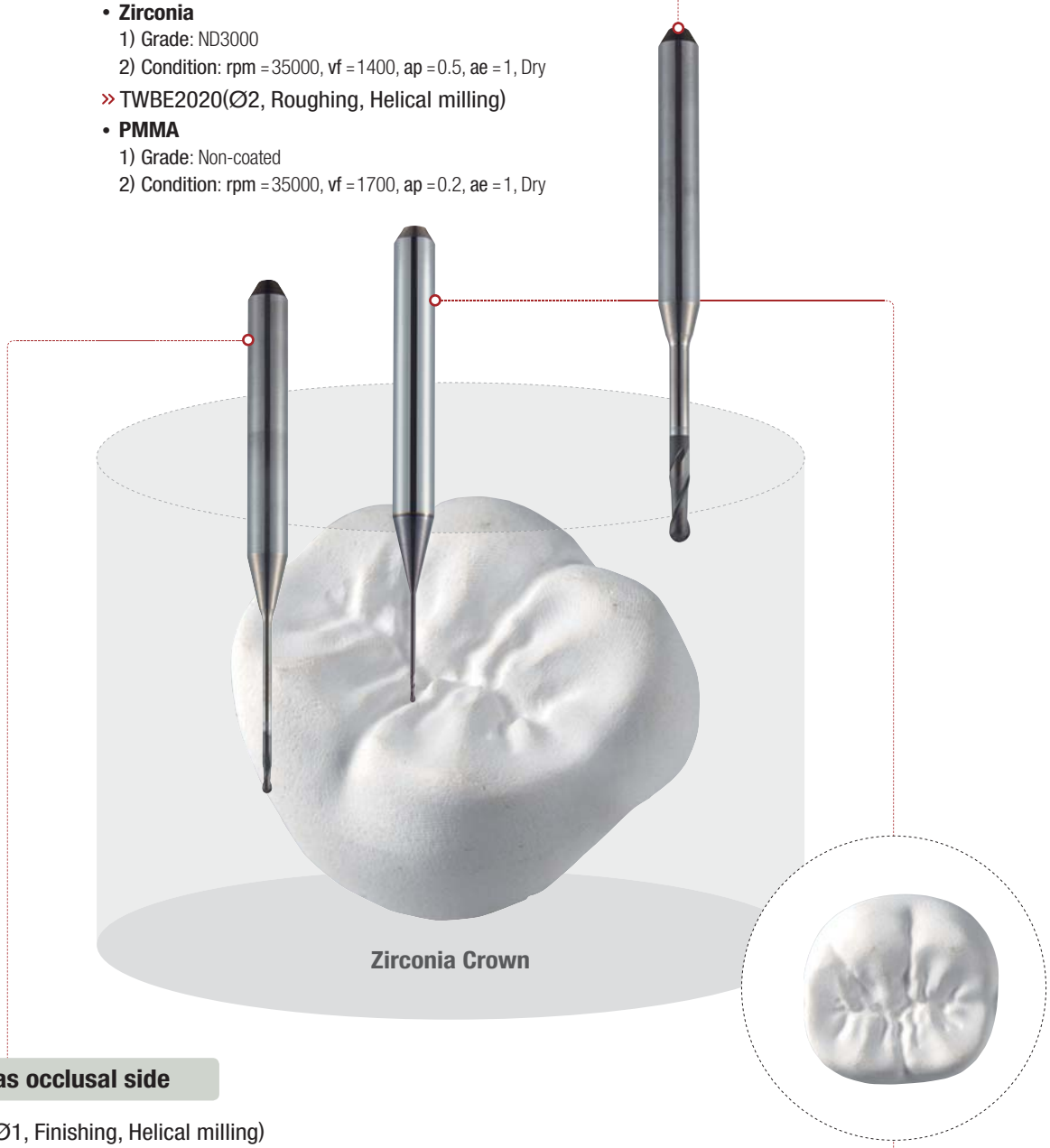
Occlusal side

» TZBE2020(Ø2, Roughing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 35000, vf = 1400, ap = 0.5, ae = 1, Dry

» TWBE2020(Ø2, Roughing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 35000, vf = 1700, ap = 0.2, ae = 1, Dry



Outer areas occlusal side

» TZBE2010(Ø1, Finishing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 38000, vf = 1050, ap = 0.1, ae = 0.1, Dry

» TWBE2010(Ø1, Finishing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 38000, vf = 1150, ap = 0.1, ae = 0.1, Dry

Top areas occlusal side

» TZBE2006(Ø0.6, Finishing, Profile milling)

- **Zirconia**
  1) Grade: ND3000(PC2510 under Ø1 for accuracy)
  2) Condition: rpm = 63500, vf = 630, ap = 0.05, ae = 0.05, Dry

» TWBE2006(Ø0.6, Finishing, Profile milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 63500, vf = 635, ap = 0.02, ae = 0.02, Dry

Application of tool

1. Zirconia/PMMA Crown

※ Tool picture example is ND3000 (Ø0.6 is PC2510)

Inner areas cavity side

» TZBE2010(Ø1, Finishing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 38000, vf = 1050, ap = 0.1, ae = 0.1, Dry

» TWBE2010(Ø1, Finishing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 38000, vf = 1150, ap = 0.1, ae = 0.1, Dry

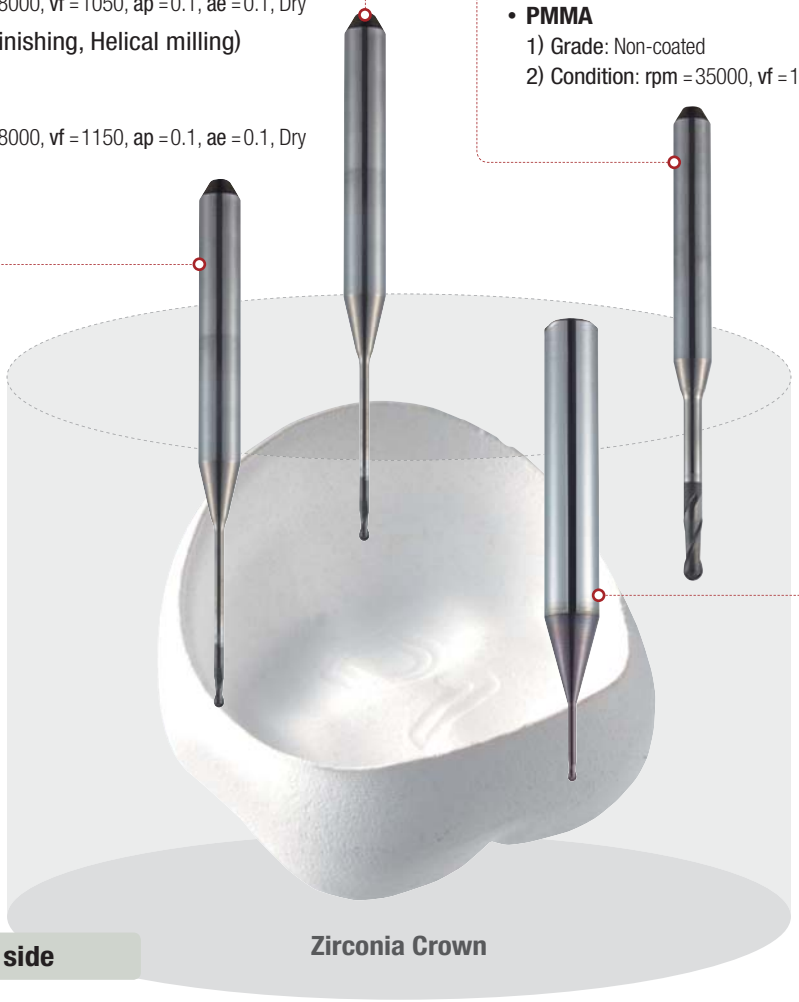
Cavity side

» TZBE2020(Ø2, Roughing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 35000, vf = 1400, ap = 0.5, ae = 1, Dry

» TWBE2020(Ø2, Roughing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 35000, vf = 1700, ap = 0.2, ae = 1, Dry



Zirconia Crown

Margin line cavity side

» TZBE2020(Ø2, Semi-finishing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 35000, vf = 1200, ap = 0.15, ae = 0.15, Dry

» TWBE2020(Ø2, Semi-finishing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 35000, vf = 1700, ap = 0.15, ae = 0.15, Dry

» TZBE2010(Ø1, Finishing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 38000, vf = 1050, ap = 0.1, ae = 0.1, Dry

» TWBE2010(Ø1, Finishing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 38000, vf = 1150, ap = 0.1, ae = 0.1, Dry

Margin line cavity side

» TZBE2010(Ø1, Finishing, Helical milling)

- **Zirconia**
  1) Grade: ND3000
  2) Condition: rpm = 38000 vf = 1050 ap = 0.1 ae = 0.1 Dry

» TWBE2010(Ø1, Finishing, Helical milling)

- **PMMA**
  1) Grade: Non-coated
  2) Condition: rpm = 38000 vf = 1150 ap = 0.1 ae = 0.1 Dry

Application of tool

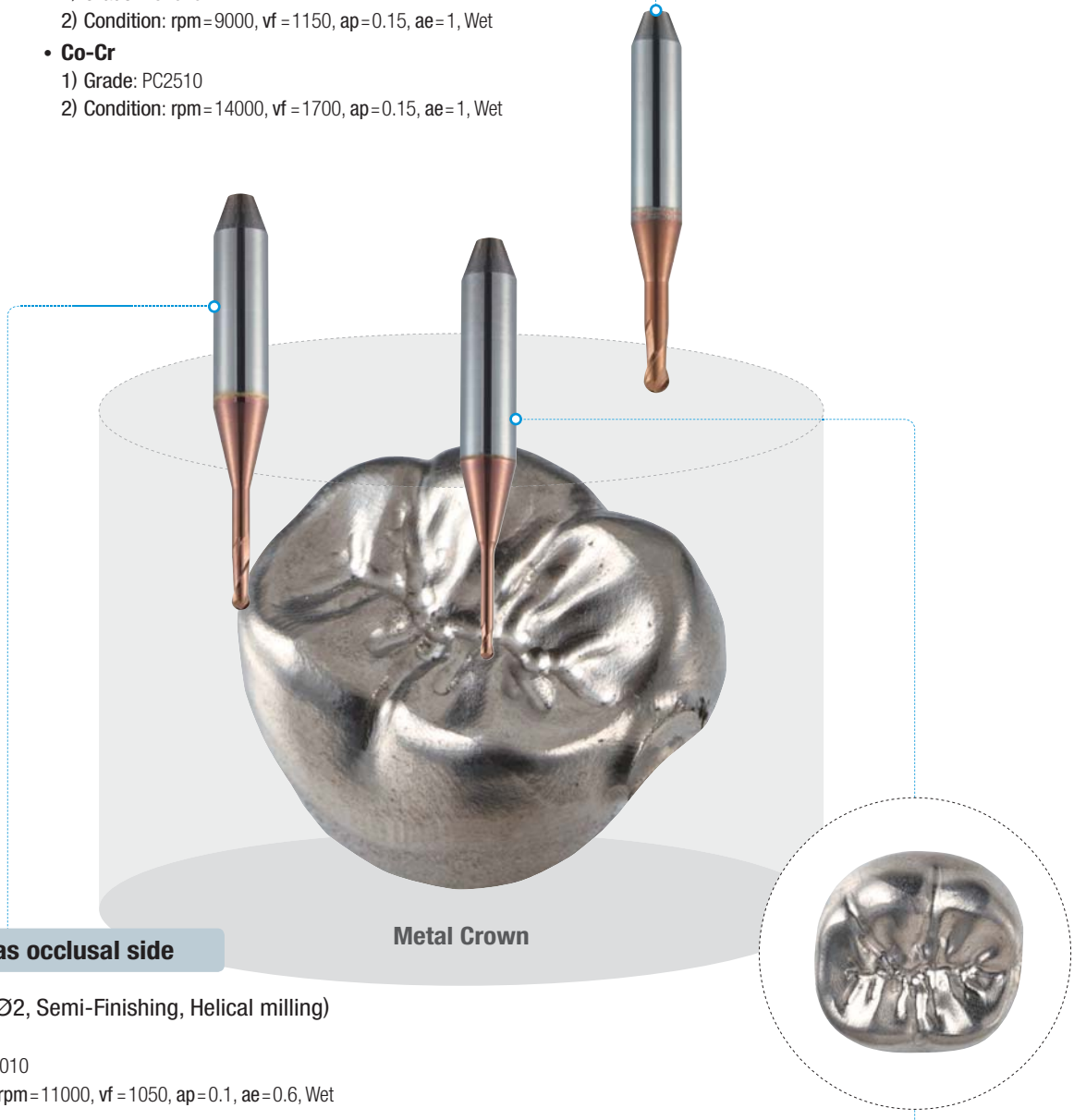
2. Titanium/Co-Cr Crown

※ Tool picture example is PC2010

Occlusal side

» TTBE2030(Ø3, Roughing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=9000, vf=1150, ap=0.15, ae=1, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=14000, vf=1700, ap=0.15, ae=1, Wet



Outer areas occlusal side

» TTBE2020(Ø2, Semi-Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=11000, vf=1050, ap=0.1, ae=0.6, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=14500, vf=1500, ap=0.1, ae=0.6, Wet

» TTBE2015(Ø1.5, Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=25000, vf=2000, ap=0.07, ae=0.07, Wet

Top areas occlusal side

» TTBE2010(Ø1, Finishing, Profile milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=28500, vf=1050, ap=0.04, ae=0.04, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=38000, vf=1500, ap=0.04, ae=0.04, Wet

Application of tool

2. Titanium/Co-Cr Crown

※ Tool picture example is PC2010

Inner areas cavity side

» TTBE2015(Ø1.5, Semi-Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=15000, vf=1050, ap=0.05, ae=0.45, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=19000, vf=1500, ap=0.05, ae=0.45, Wet

» TTBE2010(Ø1, Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=28500, vf=1050, ap=0.04, ae=0.04, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=38000, vf=1500, ap=0.04, ae=0.04, Wet

Cavity side

» TTBE2030(Ø3, Roughing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=9000, vf=1150, ap=0.15, ae=1, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=14000, vf=1700, ap=0.15, ae=1, Wet

Outer areas cavity side

» TTBE2020(Ø2, Semi-Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=11000, vf=1050, ap=0.1, ae=0.6, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=14500, vf=1500, ap=0.1, ae=0.6, Wet

» TTBE2015(Ø1.5, Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=25000, vf=2000, ap=0.07, ae=0.07, Wet

Margin line cavity side

» TTBE2015(Ø1.5, Semi-Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=15000, vf=1050, ap=0.05, ae=0.45, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=19000, vf=1500, ap=0.05, ae=0.45, Wet

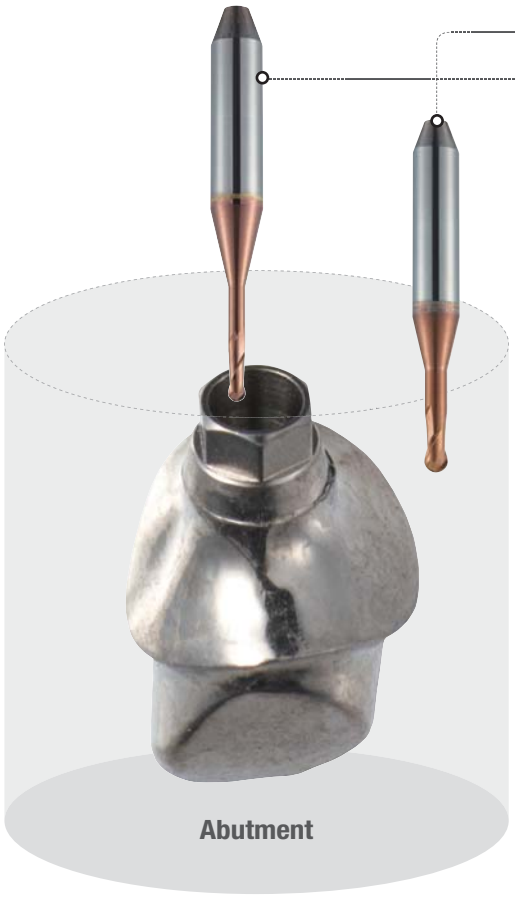
» TTBE2010(Ø1, Finishing, Helical milling)

- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=28500, vf=1150, ap=0.04, ae=0.04, Wet
- **Co-Cr**
  1) Grade: PC2510
  2) Condition: rpm=38000, vf=1500, ap=0.04, ae=0.04, Wet

Application of tool

2. Titanium abutment

※ Tool picture example is PC2010



Cavity side

» TTBE2030(Ø3, Roughing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=9000, vf=1150, ap=0.15, ae=1, Wet

» TTBE2020(Ø2, Semi-Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=11000, vf=1050, ap=0.1, ae=0.6, Wet

» TTBE2015(Ø1.5, Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet

Screwchannel cavity side

» TTBE2015(Ø1.5, Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet

Occlusal side

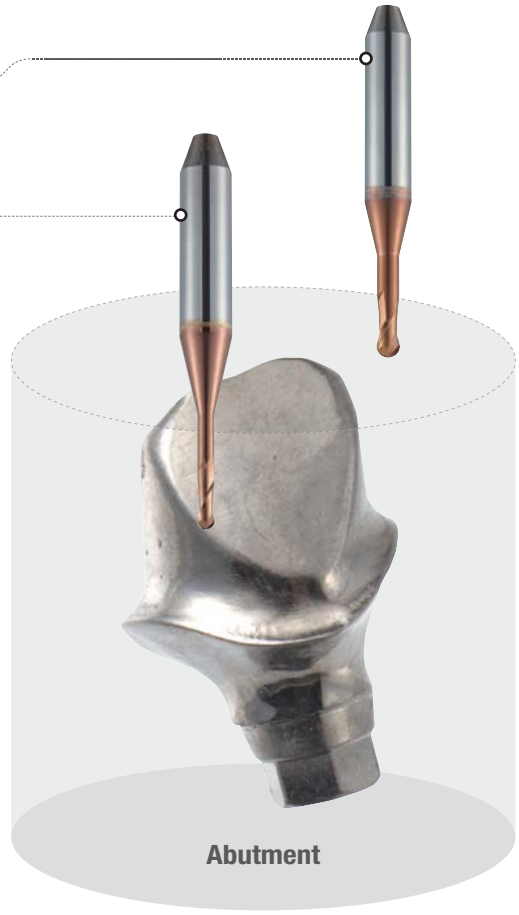
» TTBE2030(Ø3, Roughing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=9000, vf=1150, ap=0.15, ae=1, Wet

» TTBE2020(Ø2, Semi-Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=11000, vf=1050, ap=0.1, ae=0.6, Wet

» TTBE2015(Ø1.5, Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet

Screwchannel occlusal side

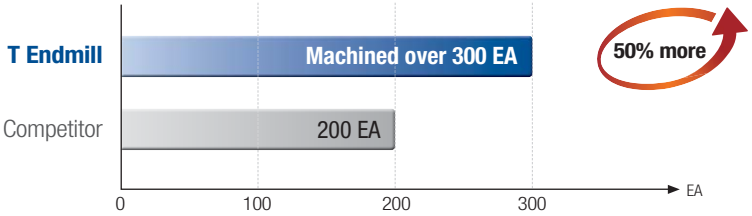
» TTBE2015(Ø1.5, Finishing, Helical milling)
- **Titanium**
  1) Grade: PC2010
  2) Condition: rpm=19000, vf=1150, ap=0.07, ae=0.07, Wet



Application examples

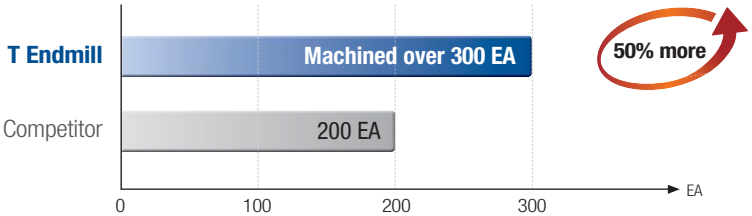
Zirconia crowns

Workpiece	Zirconia
Cutting condition	vc (m/min) = 140, fz (mm/t) = 0.05, ap (mm) = 0.1, ae (mm) = 0.6, dry
Tool	TZBE2020-044-N200S03 (DOF)



» 50% more crowns than the competitor

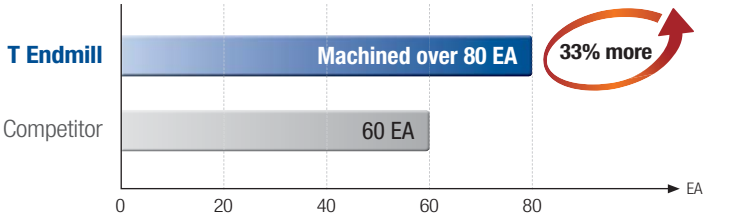
Workpiece	Zirconia
Cutting condition	vc (m/min) = 150, fz (mm/t) = 0.05, ap (mm) = 0.1, ae (mm) = 0.75, dry
Tool	TZBE2020-055-N200S06 (5X-200)



» 50% more crowns than the competitor

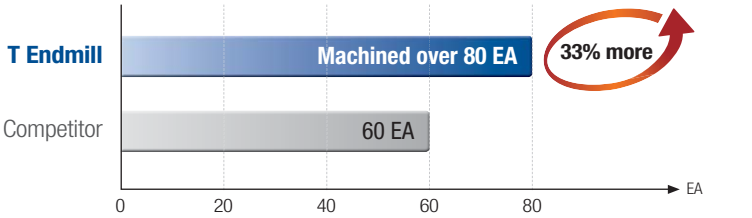
Titanium abutment

Workpiece	Titanium
Cutting condition	vc (m/min) = 150, fz (mm/t) = 0.05, ap (mm) = 0.1, ae (mm) = 0.5, dry
Tool	TTBE2030-050-N140S04 (X-MILL 300)



» 33% more crowns than the competitor

Workpiece	Titanium
Cutting condition	vc (m/min) = 170, fz (mm/t) = 0.05, ap (mm) = 0.12, ae (mm) = 0.3, dry
Tool	TTBE3030-040-N120S04 (BX-4)

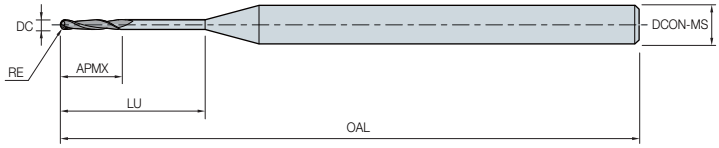


» 33% more crowns than the competitor

ROLAND Type (DWX-30, DWX-50, DWX-51D, DWX-52D)

2 | H·A 30° | h5 shank

Application	Grade	DC Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



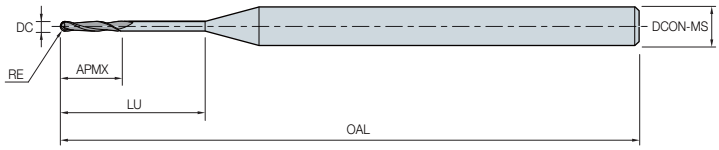
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3 mm ROLAND	TZBE2003-050-N226(ROLAND)	-	0.3	0.15	1.5	22.6	50	4
	0.6 mm ROLAND	TZBE2006-050-N12(ROLAND)	PC2510	0.6	0.3	1.5	12	50	4
	1 mm ROLAND	TZBE2010-050-N16(ROLAND)	ND3000	1	0.5	2	16	50	4
	2 mm ROLAND	TZBE2020-050-N20(ROLAND)	ND3000	2	1	3	20	50	4
PMMA	1 mm ROLAND PMMA	TWBE2010-050-N16(ROLAND)	-	1	0.5	2	16	50	4
	2 mm ROLAND PMMA	TWBE2020-050-N20(ROLAND)	-	2	1	3	20	50	4
HYBRID	0.6 mm ROLAND ULTIMATE	ETRE006050-S4M325-R(ROLAND)	Electronic Deposition DIA	0.6	0.3	10	10	50	4
	1 mm ROLAND ULTIMATE	ETRE010050-S4M170-R(ROLAND)		1	0.5	12	12	50	4
	2 mm ROLAND ULTIMATE	ETRE020050-S4M120-R(ROLAND)		2	1	17	17	50	4

IMES-ICORE Type (250i, 340i, 450i)

2 | H·A 30° | h5 shank

Application	Grade	DC Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



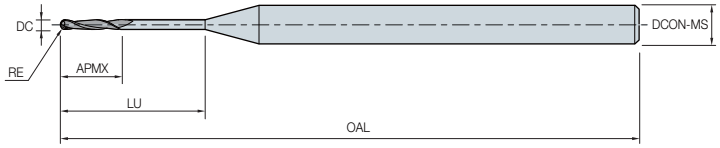
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3mm 250i 340i 450i	TZBE2003-048-N223S03(450I)	PC2510	0.3	0.15	1.8	22.3	48	3
	0.6 mm 250i 340i 450i	TZBE2006-048-N080S03(450I)	PC2510	0.6	0.3	1.5	8	48	3
	1 mm 250i 340i 450i	TZBE2010-048-N14(450I)	ND3000	1	0.5	4.5	14	48	3
	2.5 mm 250i 340i 450i	TZBE2025-048-N20(450I)	ND3000	2.5	1.25	6	20	48	3
	0.6 mm 250i 340i 450i-S6	TZBE2006-053-N090S06(450IS6)	PC2510	0.6	0.3	3	9	53	6
	1 mm 250i 340i 450i-S6	TZBE2010-053-N142S06(450IS6)	ND3000	1	0.5	4.5	14.2	53	6
	2.5 mm 250i 340i 450i-S6	TZBE2025-053-N201S06(450IS6)	ND3000	2.5	1.25	7.5	20.1	53	6
PMMA	1 mm 250i 340i 450i PMMA	TWBE2010-048-N140S03(250I340I450I)	-	1	0.5	4.5	14	48	3
	2.5 mm 250i 340i 450i PMMA	TWBE2025-048-N200S03(250I340I450I)	-	2.5	1.25	6	20	48	3
Titanium/ Co-Cr	1 mm 250i 340i 450i TiTAN	TTBE2010-040-N090S03(450i)	PC2010/ PC2510	1	0.5	2	9	40	3
	2 mm 250i 340i 450i TiTAN	TTBE2020-040-N120S03(450i)		2	1	4	12	40	3
	3 mm 250i 340i 450i TiTAN	TTBE2030-0385-N120S03(450i)		3	1.5	4	12	38.5	3
HYBRID	0.6 mm 250i 340i 450i ULTIMATE	ETND006039-S3M325-T5(450i)	Electronic Deposition DIA	0.6	0.3	10.3	10.3	39.8	3
	1 mm 250i 340i 450i ULTIMATE	ETRE010039-S3M230(450i)		1	0.5	10.2	10.2	39.8	3
	2.5 mm 250i 340i 450i ULTIMATE	ETRE025039-S3M120(450i)		2.5	1.25	13	13	39.8	3

WIELAND SELECT Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



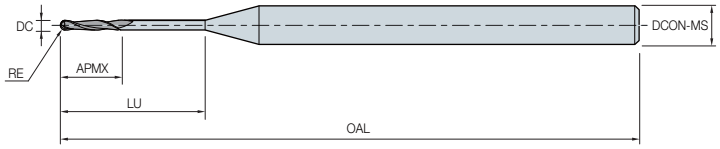
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.7mm WIELAND SELECT	TZBE2007-040-N145S03(WIELAND)	PC2510	0.7	0.35	2.5	14.5	40	3
	1mm WIELAND SELECT	TZBE2010-040-N145S03(WIELAND)	ND3000	1	0.5	4.5	14.5	40	3
	2.5mm WIELAND SELECT	TZBE2025-040-N200S03(WIELAND)	ND3000	2.5	1.25	7.5	20	40	3
PMMA	1mm WIELAND SELECT PMMA	TWBE2010-040-N145S03(WIELAND)	-	1	0.5	4.5	14.5	40	3
	2.5mm WIELAND SELECT PMMA	TWBE2025-040-N200S03(WIELAND)		2.5	1.25	7.5	20	40	3

WIELAND MINI Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



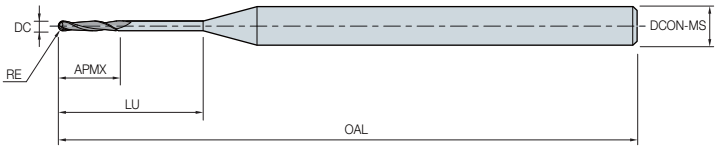
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm WIELAND MINI	TZBE2010-035-N140S03(WIELAND MINI)	-	1	0.5	4.5	14	35	3
	2.5 mm WIELAND MINI	TZBE2025-035-N200S03(WIELAND MINI)	-	2.5	1.25	6	20	35	3

AMANN GIRRBACH Type (Cera-Mill)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



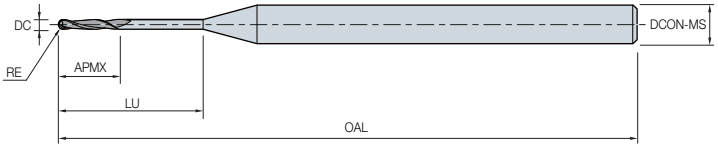
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm CERA-MILL	TZBE2006-047-N135S03(CERAMILL)	PC2510	0.6	0.3	2.4	13.5	47	3
	1 mm CERA-MILL	TZBE2010-047-N165S03(CERAMILL)	ND3000	1	0.5	2	16.5	47	3
	2.5 mm CERA-MILL	TZBE2025-047-N180S03(CERAMILL)	ND3000	2.5	1.25	4.5	18	47	3
PMMA	1mm CERA-MILL PMMA	TWBE2010-047-N165S03(CERAMILL)	-	1	0.5	2	16.5	47	3
	2.5mm CERA-MILL PMMA	TWBE2025-047-N180S03(CERAMILL)	-	2.5	1.25	4.5	18	47	3

VHF-S1 Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



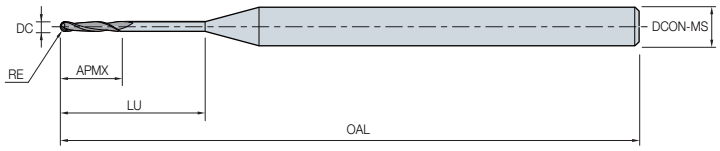
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm VHF-S1	TZBE2006-035-N120S03(VHFS1)	PC2510	0.6	0.3	1.5	12	35	3
	1 mm VHF-S1	TZBE2010-040-N145S03(VHFS1)	ND3000	1	0.5	5	14.5	40	3
	2 mm VHF-S1	TZBE2020-040-N160S03(VHFS1)	ND3000	2	1	4	16	40	3
PMMA	1 mm VHF-S1 PMMA	TWBE2010-040-N145S03(VHFS1)	-	1	0.5	5	14.5	40	3
	2 mm VHF-S1 PMMA	TWBE2020-040-N160S03(VHFS1)	-	2	1	4	16	40	3

VHF-K4/CM Type

2 | 3 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



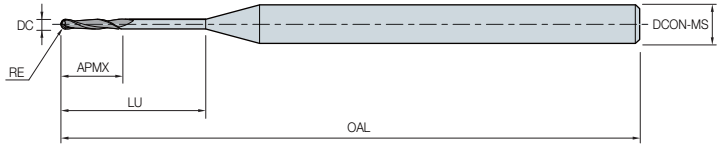
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
PMMA	0.6 mm VHF-K4	TWBE2006-035-N030S03(VHFK4)	-	0.6	0.3	1	3	35	3
	1 mm VHF-K4	TWBE2010-035-N160S03(VHFK4)	-	1	0.5	2	16	35	3
	2 mm VHF-K4	TWBE3020-035-N160S03(VHFK4)	-	2	1	4	16	35	3

CHARLY Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



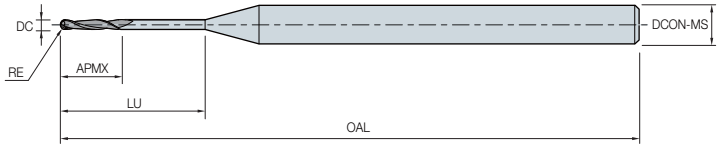
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CHARLY	TZBE2005-0385-N100S03(CHARLY)	PC2510	0.5	0.25	1.5	10	38.5	3
	1 mm CHARLY	TZBE2010-0385-N120S03(CHARLY)	ND3000	1	0.5	2	12	38.5	3
	1.5 mm CHARLY	TZBE2015-0385-N120S03(CHARLY)	ND3000	1.5	0.75	3	12	38.5	3
	3 mm CHARLY	TZFE2030-0385-N060S03(CHARLY)	ND3000	3	1.5	6	-	38.5	3
PMMA	1 mm CHARLY PMMA	TWBE2010-0385-N120S03(CHARLY)	-	1	0.5	2	12	38.5	3
	1.5 mm CHARLY PMMA	TWBE2015-0385-N120S03(CHARLY)	-	1.5	0.75	3	12	38.5	3
	3 mm CHARLY PMMA	TWBE2030-0385-N060S03(CHARLY)	-	3	1.5	6	-	38.5	3

ZIRKONZAHN M5 Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



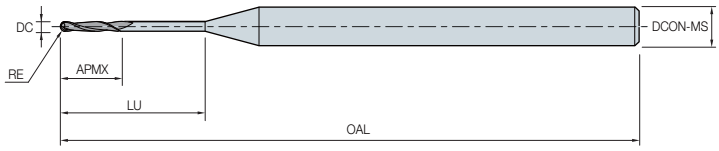
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1mm ZIRKONZHAN M5	TZBE2010-057-N120S03(ZIRKON)-DYD	ND3000	1	0.5	6	12	57	3
	2mm ZIRKONZHAN M5	TZBE2020-057-N180S03(ZIRKON)-DYD	ND3000	2	1	10	18	57	3
	0.3mm ZIRKONZHAN M5-N	TZBE2003-057-N060S03(ZIRKONZAHN)-DY	-	0.3	0.15	3	6	57	3
	0.5mm ZIRKONZHAN M5-N	TZBE2005-057-N100S03(ZIRKONZHAN)-DY	-	0.5	0.25	3	10	57	3
	1mm ZIRKONZHAN M5-N	TZBE2010-057-N120S03(ZIRKONZHAN)-DY	-	1	0.5	6	12	57	3
	2mm ZIRKONZHAN M5-N	TZBE2020-057-N180S03(ZIRKONZHAN)-DY	-	2	1	10	18	57	3

ZIRKONZAHN M1/M4 Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



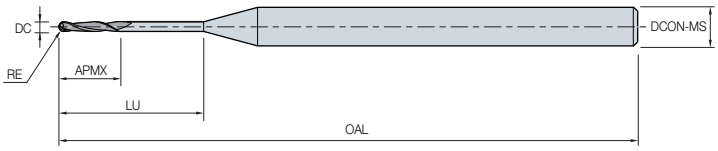
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm ZIRKONZHAN M1/M4	TZBE2005-050-N108S06(ZIRKONM1)	PC2510	0.5	0.25	3.5	10.8	50	6
	1 mm ZIRKONZHAN M1/M4	TZBE2010-050-N120S06(ZIRKONM1)	ND3000	1	0.5	6	12	50	6
	2 mm ZIRKONZHAN M1/M4	TZBE2020-050-N180S06(ZIRKONM1)	ND3000	2	1	10	18	50	6
	0.5 mm ZIRKONZHAN M1/M4-N	TZBE2005-050-N095S06(ZIRKON M1)	-	0.5	0.25	3	9.5	50	6
	1 mm ZIRKONZHAN M1/M4-N	TZBE2010-050-N120S06(ZIRKONM1)-N	-	1	0.5	6	12	50	6
	2 mm ZIRKONZHAN M1/M4-N	TZBE2020-050-N180S06(ZIRKONM1)-N	-	2	1	10	18	50	6
Titanium/ Co-Cr	1 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2010-050-N120S06(ZIRKON M1)	PC2010/ PC2510	1	0.5	1	12	50	6
	2 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2020-050-N120S06(ZIRKON M1)		2	1	3	12	50	6
	3 mm ZIRKONZHAN M1/M4 TiTAN	TTBE2030-050-N180S06(ZIRKON M1)		3	1.5	4	18	50	6

SIRONA Type (MC-X5)

2 | 4 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



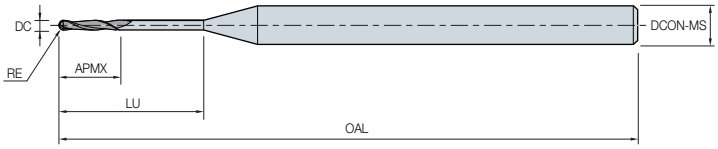
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm MC-X5	TZBE2005-042-N060S03(MC-X5)	PC2510	0.5	0.25	1	6	42	3
	1 mm MC-X5	TZBE2010-043-N170S03(MC-X5)	ND3000	1	0.5	3	17	43	3
	2.5 mm MC-X 5	TZBE4025-044-N240S03(MC-X5)	ND3000	2.5	1.25	5	24	44	3
PMMA	1 mm MC-X5 PMMA	TWBE2010-043-N170S03(MC-X5)	-	1	0.5	3	17	43	3
	2.5 mm MC-X5 PMMA	TWBE2025-044-N240S3(MC-X5)	-	2.5	1.25	5	24	44	3

YENA Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



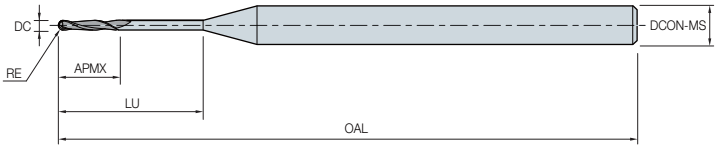
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm YENA	TZBE2010-045-N160S04(YENA)-DY	ND3000	1	0.5	3	16	45	4
	2 mm YENA	TZBE2020-045-N160S04(YENA)-DY	ND3000	2	1	3	16	45	4
PMMA	1 mm YENA PMMA	TWBE2010-045-N160S04(YENA)-DY	-	1	0.5	3	16	45	4
	2 mm YENA PMMA	TWBE2020-045-N160S04(YENA)-DY	-	2	1	3	16	45	4
Titanium/ Co-Cr	2 mm YENA TiTAN	TTBE2020-045-N122S04(YENA)	PC2010/ PC2510	2	1	3.6	12.2	45	4
	3 mm YENA TiTAN	TTBE2030-045-N125S04(YENA)		3	1.5	5.5	12.5	45	4

LEZIRTH Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



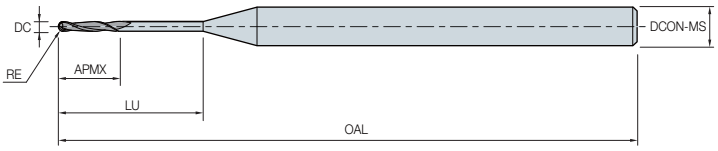
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1 mm LEZIRTH(Co-Cr)	TTBE2010-050-V1.2N8S6	PC2510	1	0.5	1.2	8	50	6
	1.5 mm LEZIRTH(Co-Cr)	TTBE2015-045-V1.7N8.5S6	PC2510	1.5	0.75	1.7	8.5	45	6
	2 mm LEZIRTH(Co-Cr)	TTBE2020-050-V2.2N12S6	PC2510	2	1	2.2	12	50	6
	3 mm LEZIRTH(Co-Cr)	TTBE2030-060-V3.5N16S6	PC2510	3	1.5	3.5	16	60	6

ARUM Type (4X/5X-100)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



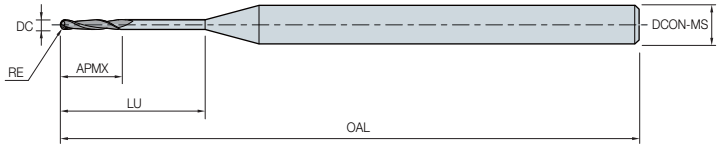
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 4X-100	TZBE2006-063-N120S06(4X-100)	PC2510	0.6	0.3	1.5	12	63	6
	1 mm 4X-100	TZBE2010-063-N160S06(4X-100)	ND3000	1	0.5	2.5	16	63	6
	2 mm 4X-100	TZBE2020-063-N200S06(4X-100)	ND3000	2	1	6	20	63	6
PMMA	1 mm 4X-100 PMMA	TWBE2010-063-N160S06(4X-100)	-	1	0.5	2.5	16	63	6
	2 mm 4X-100 PMMA	TWBE2020-063-N200S06(4X-100)	-	2	1	6	20	63	6

ARUM Type (5X-150)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



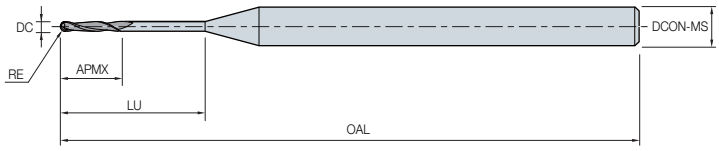
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 5X-150	TZBE2006-045-N100S04(5X-150)	PC2510	0.6	0.3	1.5	10	45	4
	1 mm 5X-150	TZBE2010-050-N161S04(5X-150)-K	ND3000	1	0.5	2.5	16.1	50	4
	2 mm 5X-150	TZBE2020-050-N181S04(5X-150)	ND3000	2	1	6.5	18.1	50	4
PMMA	1 mm 5X-150 PMMA	TWBE2010-050-N161S04(5X-150)	-	1	0.5	2.5	16.1	50	4
	2 mm 5X-150 PMMA	TWBE2020-050-N181S04(5X-150)	-	2	1	6.5	18.1	50	4
HYBRID	0.6 mm 5X-150 ULTIMATE	ETND006041-C4M325-T7(5X-150)	Electronic Deposition DIA	0.6	0.3	8	8	41	4
	1 mm 5X-150 ULTIMATE	ETND010044-C4M170(5X-150)		1	0.5	10	10	44.5	4
	1.5 mm 5X-150 ULTIMATE	ETND015044-C4M140(5X-150)		1.5	0.75	10	10	44.5	4
	2.5 mm 5X-150 ULTIMATE	ETND025044-C4M120(5X-150)		2.5	1.25	12	12	44.5	4

ARUM Type (5X-200)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



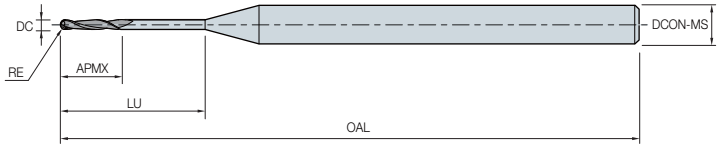
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm 5X-200	TZBE2006-050-N080S06(5X-200)	PC2510	0.6	0.3	1.6	8	50	6
	1 mm 5X-200	TZBE2010-053-N140S06(5X-200)	ND3000	1	0.5	2	14	53	6
	2 mm 5X-200	TZBE2020-055-N200S06(5X-200)	ND3000	2	1	6	20	55	6
PMMA	1 mm 5X-200 PMMA	TWBE2010-053-N140S06(5X-200)	-	1	0.5	2	14	53	6
	2 mm 5X-200 PMMA	TWBE2020-055-N200S06(5X-200)	-	2	1	6	20	55	6
HYBRID	0.6 mm 5X-200 ULTIMATE	ETND006050-H6M270-T7(5X-200)	Electronic Deposition DIA	0.6	0.3	8	8	50	6
	1 mm 5X-200 ULTIMATE	ETRE010050-H6M200(5X-200)		1	0.5	10	10	50	6
	1.5 mm 5X-200 ULTIMATE	ETRE015050-H6M170(5X-200)		1.5	0.75	10	10	50	6
	2.5 mm 5X-200 ULTIMATE	ETRE025050-H6M140(5X-200)		2.5	1.25	12	12	50	6

ARUM Type (5X-300)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



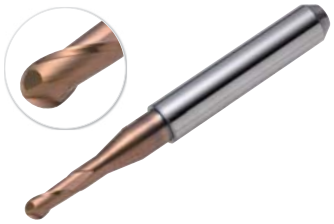
(mm)

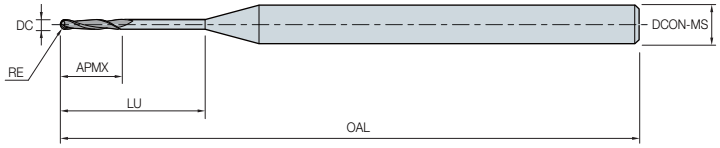
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.3 mm 5X-300	TZBE2003-045-N120S04(5X-300)	PC2510	0.3	0.15	0.6	12	45	4
	0.6 mm 5X-300	TZBE2006-045-N100S04(5X-300)	PC2510	0.6	0.3	1.2	10	45	4
	1 mm 5X-300	TZBE2010-050-N160S04(5X-300)	ND3000	1	0.5	2	16	50	4
	2 mm 5X-300	TZBE2020-050-N180S04(5X-300)	ND3000	2	1	6	18	50	4
PMMA	1 mm 5X-300 PMMA	TWBE2010-050-N160S04(5X-300)	-	1	0.5	2	16	50	4
	2 mm 5X-300 PMMA	TWBE2020-050-N180S04(5X-300)	-	2	1	6	18	50	4

ARUM Type (Metal tool)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015





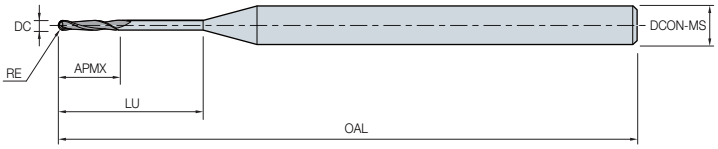
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1 mm ARUM TiTAN	TTBE2010-050-N100S06(ARUM)-DY	PC2010/ PC2510	1	0.5	2.5	10	50	6
	1.5 mm ARUM TiTAN	TTBE2015-050-N100S06(ARUM)-DY		1.5	0.75	3	10	50	6
	2 mm ARUM TiTAN	TTBE2020-050-N120S06(ARUM)-DY		2	1	4	12	50	6
	2.5 mm ARUM TiTAN	TTBE2025-050-N140S06(ARUM)C1		2.5	1.25	8	14	50	6
	3 mm ARUM TiTAN	TTBE2030-050-N120S06(ARUM)-DY		3	1.5	6	12	50	6

Z-MATCH/CAMELEON Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



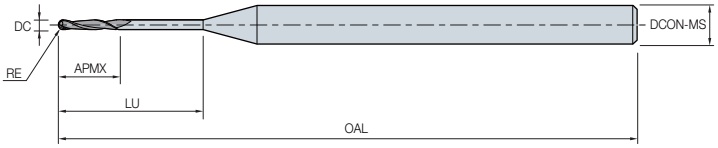
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm Z-MATCH	TZBE2005-055-N8(Z-MATCH)	PC2510	0.5	0.25	1.5	8	55	6
	1 mm Z-MATCH	TZBE2010-055-N16(Z-MATCH)	ND3000	1	0.5	3	16	55	6
	2 mm Z-MATCH	TZBE2020-055-N20(Z-MATCH)	ND3000	2	1	6	20	55	6
PMMA	1 mm Z-MATCH PMMA	TWBE2010-055-N160S06(Z-MATCH)	-	1	0.5	3	16	55	6
	2 mm Z-MATCH PMMA	TWBE2020-055-N200S06(Z-MATCH)	-	2	1	6	20	55	6

CAMELEON CS Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



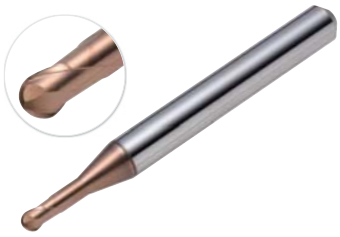
(mm)

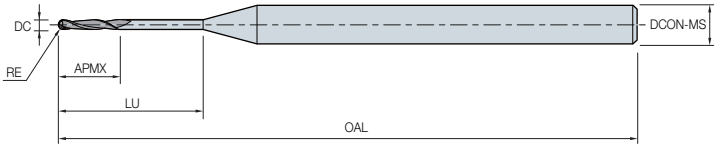
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CAMELEON CS	TZBE2005-040-N080S03(CAMELEON CS)	PC2510	0.5	0.25	1	8	40	3
	1 mm CAMELEON CS	TZBE2010-040-N160S03(CAMELEON CS)	ND3000	1	0.5	2	16	40	3
	2 mm CAMELEON CS	TZBE2020-040-N200S03(CAMELEON CS)	ND3000	2	1	4	20	40	3
PMMA	1 mm CAMELEON CS PMMA	TWBE2010-040-N160S03(CAMELEON CS)	-	1	0.5	2	16	40	3
	2 mm CAMELEON CS PMMA	TWBE2020-040-N200S03(CAMELEON CS)	-	2	1	4	20	40	3

CAMELEON Type (Metal tool)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015





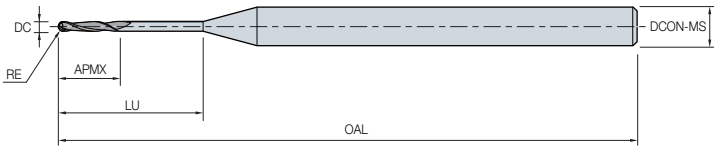
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5 mm CAMELEON TiTAN	TTBE2015-045-N7(Z-MATCH-M)	PC2010/ PC2510	1.5	0.75	3	7	45	6
	2 mm CAMELEON TiTAN	TTBE2020-045-N7(Z-MATCH-M)		2	1	3	7	45	6
	3 mm CAMELEON TiTAN	TTBE2030-045-N10(Z-MATCH-M)		3	1.5	4	10	45	6
	1.5 mm CAMELEON TiTAN-long	TTBE2015-055-N8(CAMELEON-M)		1.5	0.75	1.5	8	55	6
	2 mm CAMELEON TiTAN-long	TTBE2020-055-N8(CAMELEON-M)		2	1	2	8	55	6
	3 mm CAMELEON TiTAN-long	TTBE2030-055-N10(CAMELEON-M)		3	1.5	3	10	55	6

RND Type (DS200-5Z, DM-100, DS-4WA)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



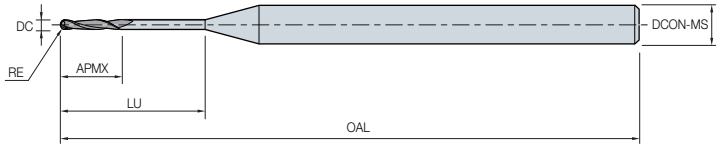
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm DS200-5Z	TZBE2006-045-N120S03(DS200-5Z)	PC2510	0.6	0.3	1.2	12	45	3
	1 mm DS200-5Z	TZBE2010-045-N180S03(DS200-5Z)	ND3000	1	0.5	3	18	45	3
	2 mm DS200-5Z	TZBE2020-045-N200S03(DS200-5Z)	ND3000	2	1	4	20	45	3
PMMA	1 mm DS200-5Z PMMA	TWBE2010-045-N180S03(DS200-5Z)	-	1	0.5	3	18	45	3
	2 mm DS200-5Z PMMA	TWBE2020-045-N200S03(DS200-5Z)	-	2	1	4	20	45	3
Titanium/ Co-Cr	1.5 mm RND DM-100	TTBE2015-050-N100S06(RND)-DY	PC2010/ PC2510	1.5	0.75	3	10	50	6
	2 mm RND DM-100	TTBE2020-050-N130S06(RND)-DY		2	1	4	13	50	6
	3 mm RND DM-100	TTBE2030-050-N120S06(RND)-DY		3	1.5	6	12	50	6

MANIX Type (ZX-5SD, MA-4)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



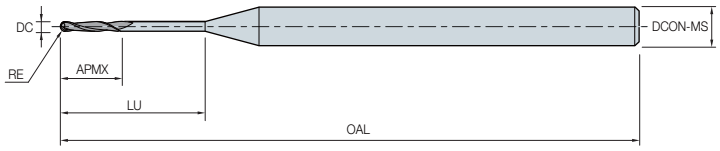
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm ZX-5SD	TZBE2006-045-N145S04(ZX-5SD)	PC2510	0.6	0.3	1	14.5	45	4
	1 mm ZX-5SD	TZBE2010-050-N160S04(ZX-5SD)	ND3000	1	0.5	3	16	50	4
	2 mm ZX-5SD	TZBE2020-050-N200S04(ZX-5SD)	ND3000	2	1	6	20	50	4
PMMA	1 mm MANIX ZX-5SD PMMA	TWBE2010-050-N165S04(MANIX)	-	1	0.5	2.8	16.5	50	4
	2 mm MANIX ZX-5SD PMMA	TWBE2020-050-N200S04(MANIX)	-	2	1	5	20	50	4
Titanium/ Co-Cr	1.5 mm MANIX TiTAN	TTBE2015-045-N105S06(MANIX)	PC2010/ PC2510	1.5	0.75	2	10.5	45	6
	2 mm MANIX TiTAN	TTBE2020-045-N125S06(MANIX)		2	1	4.8	12.5	45	6
	2.5 mm MANIX TiTAN	TTBE2025-045-N120S06(MANIX)		2.5	1.25	3	12	45	6
	3 mm MANIX TiTAN	TTBE2030-045-N125S06(MANIX)		3	1.5	4	12.5	45	6

SEUNGWON DI Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



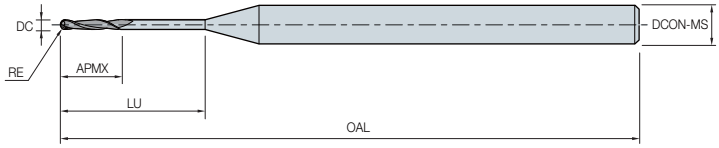
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5 mm SW DI TiTAN	TTBE2015-050-N100S06(SW DI-M)	PC2010/ PC2510	1.5	0.75	8	10	50	6
	2 mm SW DI TiTAN	TTBE2020-050-N120S06(SW DI-M)		2	1	8	12	50	6

PROTECH INNOTION Type (Proden, Prodia, Nexus)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



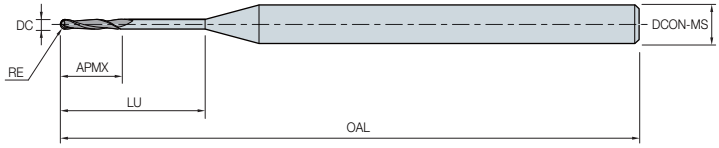
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm PRODEN	TZBE2006-060-N115S06(PRODEN)	PC2510	0.6	0.3	2.2	11.5	60	6
	1 mm PRODEN	TZBE2010-060-N180S06(PRODEN)	ND3000	1	0.5	3	18	60	6
	2 mm PRODEN	TZBE2020-060-N200S06(PRODEN)	ND3000	2	1	5	20	60	6
PMMA	1 mm PRODEN PMMA	TWBE2010-060-N180S06(PRODEN)	-	1	0.5	3	18	60	6
	2 mm PRODEN PMMA	TWBE2020-060-N200S06(PRODEN)	-	2	1	5	20	60	6

PROTECH INNOTION Type (Metal tool-Monster, Nexus, Protech)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



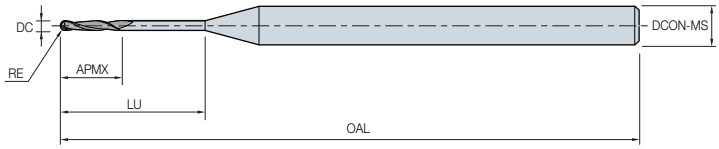
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1 mm NEXUS Co-Cr	TTBE2010-051-N100S06(NEXUS)	PC2510	1	0.5	2	10	51	6
	1.5 mm NEXUS Co-Cr	TTBE2015-051-N100S06(NEXUS)	PC2510	1.5	0.75	2	10	51	6
	2 mm NEXUS Co-Cr	TTBE2020-051-N120S06(NEXUS)	PC2510	2	1	3	12	51	6
	3 mm NEXUS Co-Cr	TTBE2030-051-N120S06(NEXUS)	PC2510	3	1.5	4.5	12	51	6

CERACUBE/TRION-Z Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



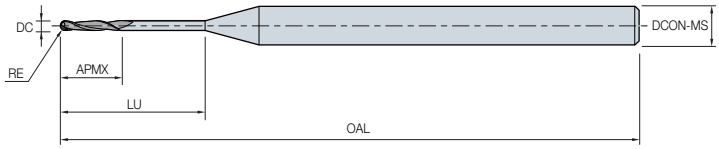
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5 mm CERACUBE/TRION-Z	TZBE2005-050-N22(TRION-Z)	PC2510	0.5	0.25	2	22	50	4
	1 mm CERACUBE/TRION-Z	TZBE2010-050-N18(TRION-Z)	ND3000	1	0.5	3	18	50	4
	2 mm CERACUBE/TRION-Z	TZBE2020-050-N20(TRION-Z)	ND3000	2	1	7	20	50	4
PMMA	1 mm CERACUBE/TRION-Z PMMA	TWBE2010-050-N180S04(TRION-Z)	-	1	0.5	3	18	50	4
	2 mm CERACUBE/TRION-Z PMMA	TWBE2020-050-N200S04(TRION-Z)	-	2	1	7	20	50	4

DENTIUM Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



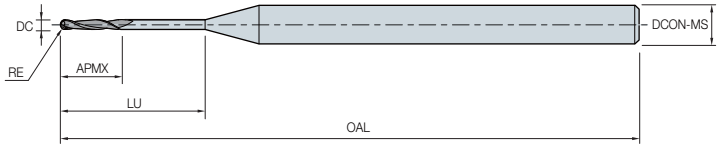
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.5mm RAINBOW	TZBE2005-050-N080S06(DENTIUM)	ND3000	0.5	0.25	2	8	50	6
	1mm RAINBOW	TZBE2010-050-N160S06(DENTIUM)	ND3000	1	0.5	3	16	50	6
	2mm RAINBOW	TZBE2020-050-N180S06(DENTIUM)	ND3000	2	1	6	18	50	6
	0.5mm RAINBOW-MILL	TZBE2005-043-N080S03(DENTIUM)	ND3000	0.5	0.25	2	8	43	3
	1mm RAINBOW-MILL	TZBE2010-050-N160S03(DENTIUM)	ND3000	1	0.5	3	16	50	3
	2mm RAINBOW-MILL	TZBE2020-050-N180S03(DENTIUM)	ND3000	2	1	6	18	50	3
	0.5mm RAINBOW-MILL Zr 2ND	TZBE2005-045-N080S04(DENTIUM)	ND3000	0.5	0.25	2	8	45	4
	1mm RAINBOW-MILL Zr 2ND	TZBE2010-045-N160S04(DENTIUM)	ND3000	1	0.5	3	16	45	4
	2.5mm RAINBOW-MILL Zr 2ND	TZBE2025-045-N180S04(DENTIUM)	ND3000	2.5	1.25	6	18	45	4
PMMA	0.5mm RAINBOW PMMA	TWBE2005-050-N080S06(DENTIUM)	-	0.5	0.25	2	8	50	6
	1mm RAINBOW PMMA	TWBE2010-050-N160S06(DENTIUM)	-	1	0.5	3	16	50	6
	2mm RAINBOW PMMA	TWBE2020-050-N180S06(DENTIUM)	-	2	1	6	18	50	6
	1mm RAINBOW-MILL PMMA	TWBE2010-050-N160S03(DENTIUM)	-	1	0.5	3	16	50	3
	2mm RAINBOW-MILL PMMA	TWBE2020-050-N180S03(DENTIUM)	-	2	1	6	18	50	3
	1mm RAINBOW-MILL Zr 2ND PMMA	TWBE2010-045-N160S04(DENTIUM)	-	1	0.5	3	16	45	4
	2.5mm RAINBOW-MILL Zr 2ND PMMA	TWBE2025-045-N180S04(DENTIUM)	-	2.5	1.25	6	18	45	4
Titanium/ Co-Cr	1mm RAINBOW TITAN	TTBE2010-050-N100S06(DENTIUM)	PC2010/ PC2510	1	0.5	2	10	50	6
	1.5mm RAINBOW TITAN	TTBE2015-050-N100S06(DENTIUM)		1.5	0.75	3	10	50	6
	2mm RAINBOW TITAN	TTBE2020-050-N120S06(DENTIUM)		2	1	4	12	50	6
	3mm RAINBOW TITAN	TTBE2030-050-N120S06(DENTIUM)		3	1.5	6	12	50	6
HYBRID	0.6mm RAINBOW ULTIMATE	ETRE006050-H6M325-D	Electronic Deposition DIA	0.6	0.3	6	6	50	6
	1mm RAINBOW ULTIMATE	ETRE010050-H6M170-D		1	0.5	10	10	50	6
	2mm RAINBOW ULTIMATE	ETRE020050-H6M120-D		2	1	12	12	50	6
	0.6mm RAINBOW-MILL ULTIMATE	ETRE006040-H3M325-D		0.6	0.3	6	6	40	3
	1mm RAINBOW-MILL ULTIMATE	ETRE010045-H3M170-D		1	0.5	10	10	45	3
	2mm RAINBOW-MILL ULTIMATE	ETRE020045-H3M120-D		2	1	12	12	45	3
	0.6mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE006045-H4M325-D		0.6	0.3	6	6	45	4
	1mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE010045-H4M170-D		1	0.5	10	10	45	4
	2mm RAINBOW-MILL Zr 2ND ULTIMATE	ETRE020045-H4M120-D		2	1	12	12	45	4

DOF Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



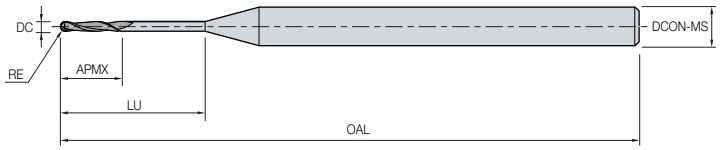
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	1 mm DOF	TZBE2010-044-N19(DOF)	ND3000	1	0.5	6	19	44	3
	2 mm DOF	TZBE2020-044-N20(DOF)	ND3000	2	1	8	20	44	3
PMMA	1 mm DOF PMMA	TWBE2010-044-N19(DOF)	-	1	0.5	6	19	44	3
	2 mm DOF PMMA	TWBE2020-044-N20(DOF)	-	2	1	8	20	44	3

ELBEN Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



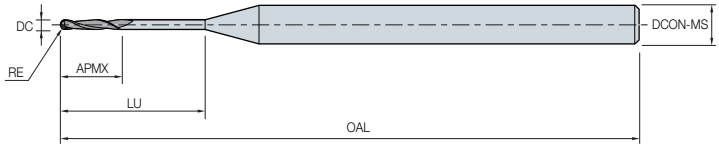
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.6 mm ELBEN	TZBE2006-043-N080S06(ELBEN)	PC2510	0.6	0.3	1.2	8	43	6
	1 mm ELBEN	TZBE2010-050-N160S06(ELBEN)	ND3000	1	0.5	3	16	50	6
	2 mm ELBEN	TZBE2020-050-N200S06(ELBEN)	ND3000	2	1	6	20	50	6
PMMA	1 mm ELBEN PMMA	TWBE2010-050-N160S06(ELBEN)	-	1	0.5	3	16	50	6
	2 mm ELBEN PMMA	TWBE2020-050-N200S06(ELBEN)	-	2	1	6	20	50	6
Titanium/ Co-Cr	1 mm ELBEN TiTAN	TTBE2010-045-N050S06(ELBEN)	PC2010/ PC2510	1	0.5	2	5	45	6
	2 mm ELBEN TiTAN	TTBE2020-045-N120S06(ELBEN)		2	1	4	12	45	6
	3 mm ELBEN TiTAN	TTBE2030-045-N150S06(ELBEN)		3	1.5	6	15	45	6

CEREC Type (MC-XL)

H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



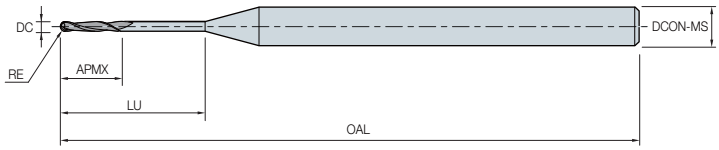
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
HYBRID	MC-XL12	ETRE018038-T35M230-12	Electronic Deposition DIA	1.73	0.865	8	12	38.1	3.5
	MC-XL12S	ETRE009038-T35M230-12S		0.9	0.45	4	12	38.1	3.5

UGINT Type (D-100, D-200)

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



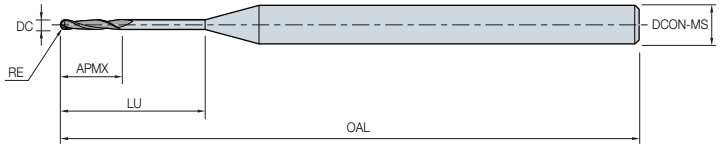
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
ZIRCONIA	0.7mm D-100	TZBE2007-040-N145S03(D-100)	PC2510	0.7	0.35	2.5	14.5	40	3
	1mm D-100	TZBE2010-040-N145S03(D-100)	ND3000	1	0.5	5	14.5	40	3
	2mm D-100	TZBE2020-040-N160S03(D-100)	ND3000	2	1	4	16	40	3
	0.6mm D-200	TZBE2006-043-N080S06(D-200)	PC2510	0.6	0.3	1.2	8	43	6
	1mm D-200	TZBE2010-050-N160S06(D-200)	ND3000	1	0.5	3	16	50	6
	2mm D-200	TZBE2020-050-N200S06(D-200)	ND3000	2	1	6	20	50	6
PMMA	1mm D-100 PMMA	TWBE2010-040-N145S03(D-100)	-	1	0.5	5	14.5	40	3
	2mm D-100 PMMA	TWBE2020-040-N160S03(D-100)	-	2	1	4	16	40	3
	1mm D-200 PMMA	TWBE2010-050-N160S06(D-200)	-	1	0.5	3	16	50	6
	2mm D-200 PMMA	TWBE2020-050-N200S06(D-200)	-	2	1	6	20	50	6
Titanium/ Co-Cr	1.5mm D-200 TiTAN	TTBE2015-050-N100S06(D-200)	PC2010/ PC2510	1.5	0.75	7.4	10	50	6
	2mm D-200 TiTAN	TTBE2020-050-N120S06(D-200)		2	1	7.6	12	50	6

PISTIS Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



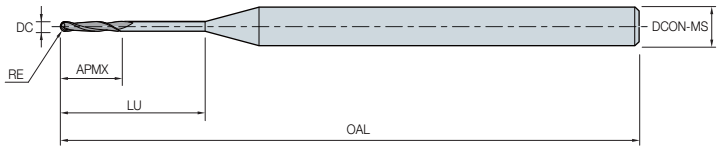
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Co-Cr	1mm PISTIS TiTAN	TTBE2010-049-N082S06(PISTIS)	PC2510	1	0.5	3	8.2	49	6
	1.5mm PISTIS TiTAN	TTBE2015-050-N102S06(PISTIS)	PC2510	1.5	0.75	3.5	10.2	50	6
	2mm PISTIS TiTAN	TTBE2020-050-N120S06(PISTIS)	PC2510	2	1	4	12	50	6
	3mm PISTIS TiTAN	TTBE2030-051-N120S06(PISTIS)	PC2510	3	1.5	5.5	12	51	6

DMG Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



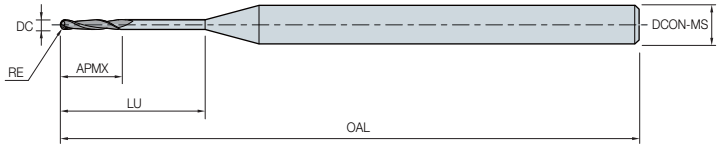
(mm)

Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1mm DMG TiTAN	TTBE2010-050-N080S06(DMG)	PC2010/ PC2510	1	0.5	1.2	8	50	6
	1.5mm DMG TiTAN	TTBE2015-050-N080S06(DMG)		1.5	0.75	4	8	50	6
	2mm DMG TiTAN	TTBE2020-050-N120S06(DMG)		2	1	5	12	50	6
	3mm DMG TiTAN	TTBE2030-050-N140S06(DMG)		3	1.5	8	14	50	6

MY CAM Type

2 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015



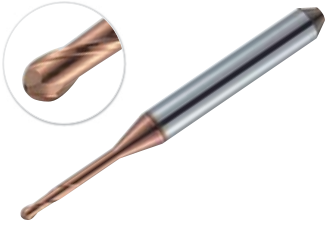
(mm)

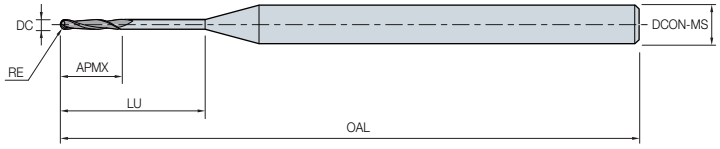
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1mm MYCAM TiTAN	TTBE2010-045-N040S06(MYCAM)	PC2010/ PC2510	1	0.5	2	4	45	6
	3mm MYCAM TiTAN	TTBE2030-050-N160S06(MYCAM)		3	1.5	4	16	50	6

Dental Plus Type (BX-4)

2 | 3 | H·A 30° | h5 shank

Application	Grade	ØD Tolerance
Zirconia	ND3000	0~-0.02
Titanium	PC2010	0~-0.015
Co-Cr	PC2510	0~-0.015





(mm)

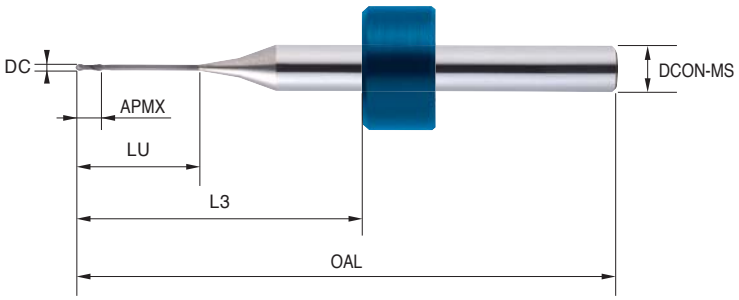
Application	Designation		Grade	DC	RE	APMX	LU	OAL	DCON-MS
Titanium/ Co-Cr	1.5mm BX-4 TiTAN	TTBE2015-040-N120S04(BX-4)	PC2010/ PC2510	1.5	0.75	4	12	40	4
	2mm BX-4 TiTAN	TTBE2020-040-N120S04(BX-4)		2	1	5	12	40	4
	3mm BX-4 TiTAN	TTBE3030-040-N120S04(BX-4)		3	1.5	6	12	40	4

Special T Endmill order form

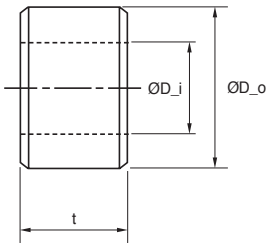
- Stop rings and other tool resources can be made to order

[Data Sheet]

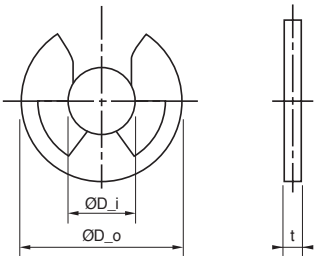
Type of machine	
Workpiece	
Dental material	
Cutting diameter (DC)	
Shank diameter (DCON-MS)	
Cutting length (APMX)	
Neck length (LU)	
Stop ring position (L3)	
Overall length (OAL)	
Stop ring shape	



[Stop ring specification]



< Plastic ring >



< E type ring >

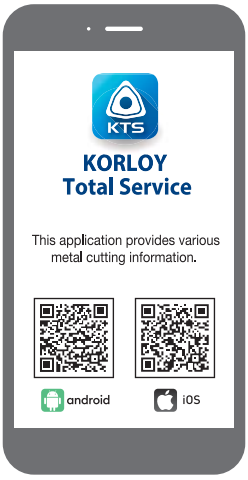
(mm)

Type	Stop ring			Shank diameter		
	ØD_o	ØD_i	t	Ø3	Ø4	Ø6
Plastic ring	Ø7.55	Ø3	4.45	●		
	Ø7.7	Ø4	5.0		●	
	Ø10.5	Ø6	6.5			●
E type ring	Ø6.0	Ø2.5	0.4	●		

※ Stop ring can be made to order when specified sizes are send to an adjacent KORLOY sales office

⚠ For the safe metalcutting

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



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