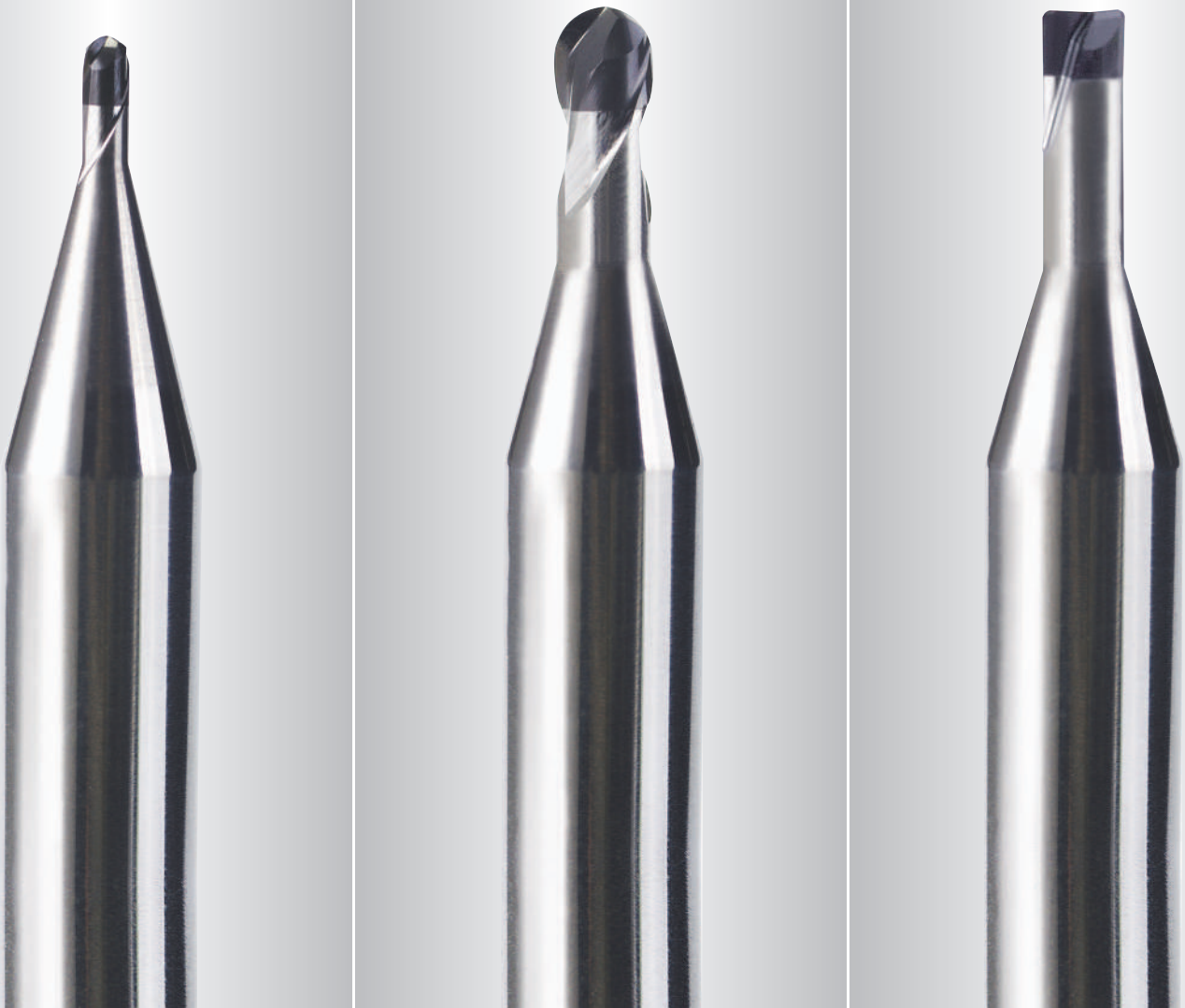


# CBN



Being the best through innovation





# CBN (Cubic Boron Nitride)

## CBN FRÄSER

- Cubic Boron Nitride, Machining High Hardened Steels up to HRc70, Mirror Finish
- Kubisches Bornitrid, Zum Fräsen hoch gehärteter Stähle bis HRc70. Spiegelglanz

# SELECTION GUIDE

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
<b>ESB94</b>		CBN, 2 FLUTE BALL NOSE CBN, 2 SCHNEIDEN STIRNRADIUS	R0.2	R1.5	<b>556</b>
<b>ESD02</b>		CBN, 2 FLUTE CORNER RADIUS CBN, 2 SCHNEIDEN ECKENRADIUS	D0.5	D2.0	<b>557</b>
RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN					<b>558</b>

# CBN END MILLS

◎ : Excellent, ○ : Good

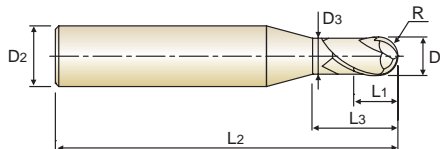
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
			HRc40~45	HRc45~55	HRc55~70							
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70							
				○	○							
				○	○							



## CBN, 2 FLUTE BALL NOSE CBN, 2 SCHNEIDEN STIRNRADIUS

- ▶ Achieve stable machining and higher accuracy for the duration.
- ▶ Save the setting time and cost due to reducing of frequent tool change.
- ▶ Improve repeatability in performance.
- ▶ Special designed geometry improves tool rigidity at High Speed Cutting.
- ▶ Tighter Radius Tolerance  $\pm 0.005\text{mm}$  higher accuracy and longer tool life.

- ▶ **Sichert dauerhaft stabile Bearbeitung und höhere Genauigkeit.**
- ▶ **Spart Rüstzeit und -kosten durch weniger Werkzeugwechsel.**
- ▶ **Verbessert die Wiederholgenauigkeit.**
- ▶ **Eine besondere Werkzeuggeometrie verbessert die Steifigkeit bei HSC-Bearbeitung.**
- ▶ **Engere Radiustoleranz  $\pm 0.005$ , höhere Genauigkeit und längere Werkzeuglebenszeit.**



CBN
2
30°
R
 $\pm 0.005$ 
PLAIN
P.558

Unit : mm

EDP No.	Radius of Ball Nose R ( $\pm 0.005$ )	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
ESB94004012	RO.2	0.4	4	0.3	1.2	50	0.37
ESB94005015	RO.25	0.5	4	0.4	1.5	50	0.46
ESB94006015	RO.3	0.6	4	0.5	1.5	50	0.56
ESB94008020	RO.4	0.8	4	0.6	2	50	0.76
ESB94010025	RO.5	1.0	4	0.6	2.5	50	0.95
ESB94010040	RO.5	1.0	4	0.6	4	50	0.95
ESB94010060	RO.5	1.0	4	0.6	6	50	0.95
ESB94012030	RO.6	1.2	4	0.8	3	50	1.15
ESB94015030	RO.75	1.5	4	0.95	3	50	1.45
ESB94015040	RO.75	1.5	4	0.95	4	50	1.45
ESB94015060	RO.75	1.5	4	0.95	6	50	1.45
ESB94020050	R1.0	2.0	4	1.2	5	50	1.95
ESB94020060	R1.0	2.0	4	1.2	6	50	1.95
ESB94030060	R1.5	3.0	4	1.8	6	50	2.85

Radius Tolerance(mm)	Shank Dia. Tolerance
$\pm 0.005$	h5

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70							
				○	○							

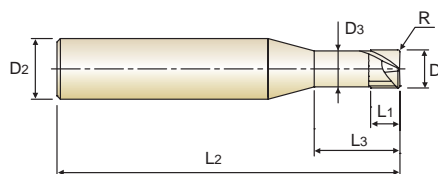
◎ : Excellent ○ : Good

# CBN, 2 FLUTE CORNER RADIUS

## CBN, 2 SCHNEIDEN ECKENRADIUS

- ▶ Achieve stable machining and higher accuracy for the duration.
- ▶ Save the setting time and cost due to reducing of frequent tool change.
- ▶ Improve repeatability in performance.
- ▶ Special designed geometry improves tool rigidity at High Speed Cutting.
- ▶ Tighter Radius Tolerance  $\pm 0.005\text{mm}$  higher accuracy and longer tool life.

- ▶ **Sichert dauerhaft stabile Bearbeitung und höhere Genauigkeit.**
- ▶ **Spart Rüstzeit und -kosten durch weniger Werkzeugwechsel.**
- ▶ **Verbessert die Wiederholgenauigkeit.**
- ▶ **Eine besondere Werkzeuggeometrie verbessert die Steifigkeit bei HSC-Bearbeitung.**
- ▶ **Engere Radiustoleranz  $\pm 0.005$ , höhere Genauigkeit und längere Werkzeuglebenszeit.**



CBN
2
0°
R ±0.005
PLAIN
P.558

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R ( $\pm 0.005$ )	D1	D2	L1	L3	L2	D3
ESD02005052	RO.05	0.5	4	0.3	2	50	0.46
ESD02005053	RO.05	0.5	4	0.3	3	50	0.46
ESD02010053	RO.05	1.0	4	0.7	3	50	0.95
ESD02010055	RO.05	1.0	4	0.7	5	50	0.95
ESD02010103	RO.1	1.0	4	0.7	3	50	0.95
ESD02010105	RO.1	1.0	4	0.7	5	50	0.95
ESD02015105	RO.1	1.5	4	1.0	5	50	1.45
ESD02015108	RO.1	1.5	4	1.0	8	50	1.45
ESD02015205	RO.2	1.5	4	1.0	5	50	1.45
ESD02015208	RO.2	1.5	4	1.0	8	50	1.45
ESD02020106	RO.1	2.0	4	1.2	6	50	1.95
ESD02020100	RO.1	2.0	4	1.2	10	50	1.95
ESD02020206	RO.2	2.0	4	1.2	6	50	1.95
ESD02020200	RO.2	2.0	4	1.2	10	50	1.95

Corner Radius Tolerance(mm)	Shank Dia. Tolerance
$\pm 0.005$	h5

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
~HB225	HB225~325	HRC30~40	HRc40~45	HRc45~55	HRC55~70							
				◎	◎							

**CBN, 2 FLUTE BALL NOSE  
CBN, 2 SCHNEIDEN STIRNRADIUS****ESB94** SERIES

MATERIAL HARDNESS DIAMETER	HARDENED STEELS		HIGH HARDENED STEELS	
	HRc50 ~ HRc60		HRc60 ~ HRc70	
	RPM	FEED	RPM	FEED
<b>R0.2</b> × <b>0.4</b>	50,000	1,200	50,000	1,200
<b>R0.25</b> × <b>0.5</b>	50,000	1,500	50,000	1,500
<b>R0.3</b> × <b>0.6</b>	50,000	2,000	50,000	2,000
<b>R0.4</b> × <b>0.8</b>	50,000	2,000	50,000	2,000
<b>R0.5</b> × <b>1.0</b>	50,000	3,000	50,000	3,000
<b>R0.6</b> × <b>1.2</b>	50,000	3,000	50,000	3,000
<b>R0.75</b> × <b>1.5</b>	50,000	3,000	50,000	3,000
<b>R1.0</b> × <b>2.0</b>	40,000	3,200	32,000	2,500
<b>R1.5</b> × <b>3.0</b>	26,500	2,100	21,500	1,700

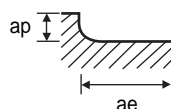
ap : R0.2 ~ R0.4 =0.005  
 R0.5 ~ R1.5 =0.01  
 ae : R0.2 ~ R0.4 =0.005  
 R0.5 ~ R1.5 =0.01



RPM = rev./min.  
 FEED = mm/min.

**CBN, 2 FLUTE CORNER RADIUS  
CBN, 2 SCHNEIDEN ECKENRADIUS****ESD02** SERIES

MATERIAL HARDNESS DIAMETER	HARDENED STEELS				HIGH HARDENED STEELS			
	HRc50 ~ HRc60				HRc60 ~ HRc70			
	RPM	FEED	DEPTH OF CUT		RPM	FEED	DEPTH OF CUT	
ae[mm]			ap[mm]	ae[mm]			ap[mm]	
<b>0.5</b>	50,000	700	0.10	0.01	50,000	550	0.06	0.005
<b>1.0</b>	43,000	1,000	0.20	0.01	30,000	700	0.10	0.10
<b>1.5</b>	30,000	1,000	0.40	0.02	19,000	700	0.20	0.20
<b>2.0</b>	22,000	900	0.60	0.03	14,000	800	0.30	0.30



RPM = rev./min.  
 FEED = mm/min.