

END

COMPANY CATALOG





Endo specializes in the selling cemented carbide end mills that perform different Milling process such as slotting, profiling and side milling. Our products are widely used in machinery, electronics, chemical industry, construction, aerospace and other industries. The business aim is to provide reliable product quality, excellent product performance, high cost performance, high efficiency and high quality service system to build and maintain a trustful business relationship with all of our clients.

Description Table



Mark	Description
SEML	Square long length
SEMS	Square standard length
BEMS	Ball nose standard length
BEML	Ball Nose Long length
HM	Carbide (HARD METAL)
HSS	High Speed Steel
HSCO	High Speed Steel With Cobalt
	Side Milling and Face Milling Process
Z	NO. OF FLUTES
35°	Helix Angle
Coating ALTiN	Aluminium Titanium Nitride
Coating ALCrSiN	Aluminium Chromium Silicone Nitride
H6	Tolerance shank
	3 Directions
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-ferrous

GRADE A

- high wear resistance
- Suitable for oil cooling
- High temperature resistance
- High performance AlCrSiN coating
- Suitable for steel & cast iron ≤ 55 HRC



GRADE B

- Suitable for oil cooling
- Sharp cutting edges design, meet the cutting of soft material
- Suitable for steel & cast iron ≤ 45 HRC

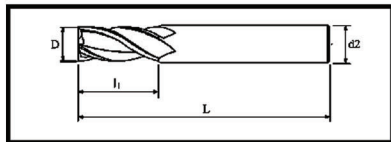


Square

End mill

Standard

Length

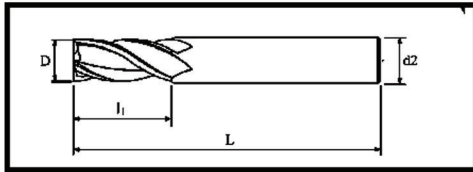


Code	D	L1	L	d2
SEMS 1.0	1	3	50	4
SEMS 1.0	1.5	4.5	50	4
SEMS 2.0	2	6	50	4
SEMS 3.0	3	8	50	4
SEMS 4.0	4	10	50	6
SEMS 4.5	4.5	13	50	6
SEMS 5.0	5	13	50	6
SEMS 5.5	5.5	15	50	6
SEMS 6.0	6	15	50	6
SEMS 7.0	7	20	60	8
SEMS 8.0	8	20	60	8
SEMS 9.0	9	25	75	10
SEMS 10.0	10	25	75	10
SEMS 11.0	11	30	75	12
SEMS 12.0	12	30	75	12
SEMS 14.0	14	40	75	14
SEMS 16.0	16	45	100	16
SEMS 18.0	18	45	100	18
SEMS 20.0	20	45	100	20

Work piece Material

P		M	K	N		
1234	5	123	123	123	4	5
Carbon Steel Alloy Steel (<45HRC)	Alloy steel Tool Steel (50HRC)	Stain- less Steel	Cast Iron	Alumi- num Alloys	Copper Alloys	Graph- ite

Square long length End mill



Grade A	HM		Z 4	35°	AlCrSiN	h6	
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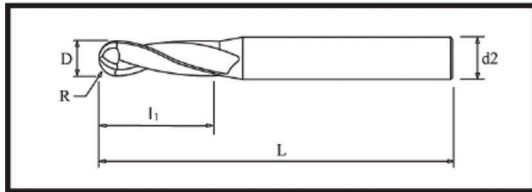
Grade B	HM		Z 4	35°	AlTiN	h6	
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Code	D	L1	L	d2
SEML 2.0	2	15	75	4
SEML 3.0	3	25	75	4
SEML 4.0	4	30	75	4
SEML 5.0	5	30	75	6
SEML 6.0	6	35	75	6
SEML 8.0	8	40	100	8
SEML 10.0	10	45	100	10
SEML 12.0	12	50	100	12
SEML 14.0	14	55	100	14
SEML 16.0	16	50	150	16
SEML 16.0	16	60	150	16
SEML 18.0	18	65	150	18
SEML 20.0	20	65	150	20

Work piece Material

P		M	K	N		
1234	5	123	123	123	4	5
Carbon Steel	Alloy steel	Stain- less Steel	Cast Iron	Alumi- num Alloys	Copper Alloys	Graph- ite
Alloy Steel (<45HRC)	Tool Steel (50HRC)					

Standard Ball Nose End mill



Grade A	HM		Z 2	35°	AlCrSiN	h6	
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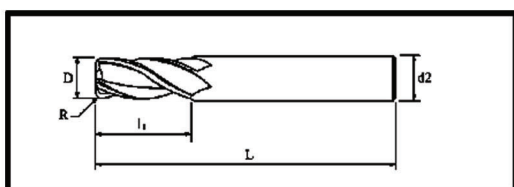
Grade B	HM		Z 2	35°	AlTiN	h6	
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Code	D	R	L1	L	d2
BEMS 3.00	3	1.5	6	50	6
BEMS 4.00	4	2.0	8	50	6
BEMS 5.00	5	2.5	10	50	6
BEMS 6.00	6	3.0	12	50	6
BEMS 8.00	8	4.0	16	60	8
BEMS 10.00	10	5.0	20	75	10
BEMS 12.00	12	6.0	24	75	12
BEMS 14.00	14	7.0	30	75	14
BEMS 16.00	16	8.0	32	100	16
BEMS 18.00	18	9.0	35	100	18
BEMS 20.00	20	10.0	40	100	20

Work piece Material

P		M	K	N		
1234	5	123	123	123	4	5
Carbon Steel	Alloy steel	Stain- less Steel	Cast Iron	Alumi- num Alloys	Copper Alloys	Graph- ite
Alloy Steel (<45HRC)	Tool Steel (50HRC)					

CORNER Radius End mill



Grade A	HM		Z 4	35°	AlCrSiN	h6	
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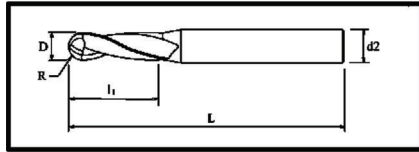
Grade B	HM		Z 4	35°	AlTiN	h6	
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Code	D	R	L1	L	d2
REMS 3.0 R0.5	3	0.5	6	50	4
REMS 4.0 R0.5	4	0.5	8	50	4
REMS 5.0 R0.5	5	0.5	10	50	6
REMS 6.0 R0.5	6	0.5	12	50	6
REMS 8.0 R0.5	8	0.5	16	60	8
REMS 10.0 R0.5	10	0.5	20	75	10
REMS 12.0 R0.5	12	0.5	24	75	12
REMS 14.0 R0.5	14	0.5	30	75	14
REMS 16.0 R0.5	16	0.5	32	100	16
REMS 18.0 R0.5	18	0.5	35	100	18
REMS 20.0 R0.5	20	0.5	40	100	20

Work piece Material

P		M	K	N		
1234	5	123	123	123	4	5
Carbon Steel Alloy Steel (<45HRC)	Alloy steel Tool Steel (50HRC)	Stain- less Steel	Cast Iron	Alumi- num Alloys	Copper Alloys	Graph- ite

Extra Long Ball Nose End mill



Code	D	d2	R	L	L1
BEML 2.00	2	6	1.0	75	4
BEML 2.00	2.5	6	1.25	75	5
BEML 3.00	3	6	1.5	75	6
BEML 3.00	3.5	6	1.75	75	7
BEML 4.00	4	6	2.0	75	8
BEML 5.00	5	6	2.5	75	10
BEML 5.00	5.5	6	2.75	75	11
BEML 6.00	6	6	3	75	12
BEML 7.00	7	8	3.5	75	14
BEML 8.00	8	8	4.0	100	16
BEML 9.00	9	10	4.5	100	18
BEML 10.00	10	10	5.0	100	20
BEML 12.00	12	12	6.0	100	24
BEML 14.00	14	14	7.0	100	30
BEML 16.00	16	16	8.0	150	32
BEML 20.00	20	20	10.0	150	40

Work piece Material

P		M	K	N		
1234	5	123	123	123	4	5
Carbon Steel	Alloy steel	Stain-	Cast	Alumi-	Copper	Graph-
Alloy Steel	Tool Steel	less	Iron	num	Alloys	ite
(<45HRC)	(50HRC)	Steel		Alloys		

Recommended Cutting Data

Grade B- SEMS Z2, BEMS Z4

For Steels, Cast Iron - Profiling



Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 0.2D	160	(min- 1)	50000	25480	12740	8490	6370	5100	4250	3190	2550
			ae≤ 0.3D		(mm/min)	920	920	970	990	970	970	980	960	920
		(50HRC)	ap≤ 0.2D	120	(min- 1)	38220	19110	9550	6370	4780	3820	3190	2390	1910
			ae≤ 0.25D		(mm/min)	460	460	540	590	620	610	640	570	570
	M	Stainless Steel	ap≤ 0.2D	110	(min- 1)	35030	17520	8760	5840	4380	3500	2920	2190	1750
			ae≤ 0.2D		(mm/min)	490	530	560	610	610	600	610	570	560
		(<32HRC)	ap≤ 0.2D	140	(min- 1)	44590	22290	11150	7430	5570	4460	3720	2790	2230
			ae≤ 0.2D		(mm/min)	620	670	710	770	780	760	780	730	710
	K	(35-45HRC)	ap≤ 0.3D	110	(min- 1)	35030	17520	8760	5840	4380	3500	2920	2190	1750
ae≤ 0.4D			(mm/min)		1400	1400	1400	1400	1400	1400	1400	1400	1400	

Grade B - SEMS Z2, SEML Z2, BEMS Z2

For Steels, Cast Iron - Slotting



Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 1D	80	(min- 1)	25480	12740	6370	4250	3190	2550	2120	1590	1270
			(mm/min)		510	510	510	430	380	360	340	380	380	
		(50HRC)	ap≤ 0.5D	60	(min- 1)	19110	9550	4780	3190	2390	1910	1590	1190	960
					(mm/min)	230	230	290	260	220	210	210	220	210
	M	Stainless Steel	ae≤ 0.3D	55	(min- 1)	17520	8760	4380	2920	2190	1750	1460	1100	880
					(mm/min)	250	180	150	190	190	190	190	160	150
		(<32HRC)	ae≤ 0.8D	55	(min- 1)	17520	8760	4380	2920	2190	1750	1460	1100	880
					(mm/min)	320	210	180	210	210	200	200	180	160
	K	(35-45HRC)	ae≤ 0.5D	55	(min- 1)	17520	8760	4380	2920	2190	1750	1460	1100	880
(mm/min)					250	180	150	190	190	190	190	160	150	

Grade B SEMS Z4, SEML Z4, BEMS Z4

For Steels, Cast Iron - Profiling



Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 1D	170	(min- 1)	50000	27070	13540	9020	6770	5410	4510	3380	2710
					(mm/min)	2820	2170	1790	1620	1680	1620	1530	1490	1300
		(50HRC)	ap≤ 0.5D	120	(min- 1)	38220	19110	9550	6370	4780	3820	3190	2390	1910
					(mm/min)	1070	920	960	970	1110	990	890	720	650
	M	Stainless Steel	ae≤ 0.3D	130	(min- 1)	41400	20700	10350	6900	5180	4140	3450	2590	2070
					(mm/min)	1660	1240	1240	1100	1240	1160	1100	930	830
		(<32HRC)	ae≤ 0.8D	150	(min- 1)	47770	23890	11940	7960	5970	4780	3980	2990	2390
					(mm/min)	1910	1530	1430	1430	1310	1240	1190	1080	960
	K	(35-45HRC)	ae≤ 0.5D	130	(min- 1)	41400	20700	10350	6900	5180	4140	3450	2590	2070
(mm/min)					1330	1080	990	1100	1040	990	970	830	750	

Recommended Cutting Data

Grade A - SEMS Z2, SEML Z2, BEMS Z

For Steels, Cast Iron - Side Milling



Workpiece Material

		(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
P	(<45HRC)	ap ≤ 1.5D	180	(min- 1)	19110	14330	12740	9550	7170	5730	4780	3580	2870
		ae ≤ 0.15D		(mm/min)	1070	1030	970	920	930	920	860	860	860
	(50HRC)	ap ≤ 1D	130	(min- 1)	13800	10350	9550	6900	5180	4140	3450	2590	2070
		ae ≤ 0.12D		(mm/min)	610	580	540	550	620	560	500	410	370
M	Stainless Steel	ap ≤ 1.5D	130	(min- 1)	13800	10350	8760	6900	5180	4140	3450	2590	2070
		ae ≤ 0.15D		(mm/min)	690	660	560	590	650	610	590	490	460
	(<32HRC)	ap ≤ 1.5D	160	(min- 1)	16990	12740	11150	8490	6370	5100	4250	3190	2550
		ae ≤ 0.15D		(mm/min)	850	820	710	820	750	700	680	610	560
K	(35-45HRC)	ap ≤ 1D	140	(min- 1)	14860	11150	8760	7430	5570	4460	3720	2790	2230
		ae ≤ 0.12D		(mm/min)	650	670	1400	670	620	580	560	500	460

Grade A - SEMS Z2, SEML Z2, BEMS Z

For Steels, Cast Iron - Slotting



Workpiece Material

		(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
P	(<45HRC)	ap ≤ 1D	80	(min- 1)	19110	12740	14330	9550	7170	5730	4780	3580	2870
				(mm/min)	1070	510	1030	920	930	920	860	860	860
	(50HRC)	ap ≤ 0.5D	60	(min- 1)	13800	9550	10350	6900	5180	4140	3450	2590	2070
				(mm/min)	610	230	580	550	620	560	500	410	370
M	Stainless Steel	ae ≤ 0.3D	55	(min- 1)	13800	8760	10350	6900	5180	4140	3450	2590	2070
				(mm/min)	690	180	660	590	650	610	590	490	460
	(<32HRC)	ae ≤ 0.8D	55	(min- 1)	16990	8760	12740	8490	6370	5100	4250	3190	2550
				(mm/min)	850	210	820	820	750	700	680	610	560
K	(35-45HRC)	ae ≤ 0.5D	50	(min- 1)	14860	8760	11150	7430	5570	4460	3720	2790	2230
				(mm/min)	650	180	670	670	620	580	560	500	460

Grade B - SEMS Z4, SEML Z4, BEMS Z4

For Steels, Cast Iron - Side Milling



Workpiece Material

		(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
P	(<45HRC)	ap ≤ 1D	170	(min- 1)	50000	27070	13540	9020	6770	5410	4510	3380	2710
		ae ≤ 0.12D		(mm/min)	2820	2170	1790	1620	1680	1620	1530	1490	1300
	(50HRC)	ap ≤ 1D	120	(min- 1)	38220	19110	9550	6370	4780	3820	3190	2390	1910
		ae ≤ 0.1D		(mm/min)	1070	920	960	970	1110	990	890	720	650
M	Stainless Steel	ap ≤ 1D	130	(min- 1)	41400	20700	10350	6900	5180	4140	3450	2590	2070
		ae ≤ 0.12D		(mm/min)	1660	1240	1240	1100	1240	1160	1100	930	830
	(<32HRC)	ap ≤ 1D	150	(min- 1)	47770	23890	11940	7960	5970	4780	3980	2990	2390
		ae ≤ 0.12D		(mm/min)	1910	1530	1430	1430	1310	1240	1190	1080	960
K	(35-45HRC)	ap ≤ 1D	130	(min- 1)	41400	20700	10350	6900	5180	4140	3450	2590	2070
		ae ≤ 0.1D		(mm/min)	1330	1080	990	1100	1040	990	970	830	750

Recommended Cutting Data



Grade A, SEMS Z4, SEML Z4, BEMS Z4 For Steels, Cast Iron - Side Milling

Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	3	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 1.5D	180	(min- 1)	19110	14330	9550	7170	5730	4780	3580	2870
			ae≤ 0.15D		(mm/min)	2140	2060	1830	1860	1830	1720	1720	1720
		(50HRC)	ap≤ 1D	130	(min- 1)	13800	10350	6900	5180	4140	3450	2590	2070
			ae≤ 0.12D		(mm/min)	1210	1160	1100	1240	1130	1010	830	750
	M	Stainless Steel	ap≤ 1.5D	130	(min- 1)	13800	10350	6900	5180	4140	3450	2590	2070
			ae≤ 0.15D		(mm/min)	1380	1330	1190	1300	1230	1170	980	710
		(<32HRC)	ap≤ 1.5D	160	(min- 1)	16990	12740	8490	6370	5100	4250	3190	2550
			ae≤ 0.15D		(mm/min)	1700	1630	1630	1500	1410	1360	1210	1120
	K	(35-45HRC)	ap≤ 1D	140	(min- 1)	14860	11150	7430	5570	4460	3720	2790	2230
ae≤ 0.12D			(mm/min)		1310	1340	1340	1250	1160	1120	1000	910	

Grade A- BEMS Z2 For Steels, Cast Iron - Profiling



Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 0.2D	160	(min- 1)	12740	10190	8490	7280	6370	5660	5100	4630	4250
			ae≤ 0.3D		(mm/min)	1020	1020	1020	1020	1020	1020	1020	1020	1020
		(50HRC)	ap≤ 0.15D	120	(min- 1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
			ae≤ 0.15D		(mm/min)	610	640	660	630	620	610	610	610	610
	M	Stainless Steel	ap≤ 0.2D	110	(min- 1)	8760	7010	5840	5010	4380	3890	3500	3190	2920
			ae≤ 0.2D		(mm/min)	610	630	640	630	630	620	630	640	640
		(<32HRC)	ap≤ 0.2D	140	(min- 1)	11150	8920	7430	6370	5570	4950	4460	4050	3720
			ae≤ 0.2D		(mm/min)	780	800	820	800	800	790	800	810	820
	K	(35-45HRC)	ap≤ 0.1D	120	(min- 1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
ae≤ 0.1D			(mm/min)		610	640	660	660	670	650	650	660	670	

Grade B- BEMS Z4 For Steels, Cast Iron - Profiling



Workpiece Material			(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
	P	(<45HRC)	ap≤ 0.2D	160	(min- 1)	50000	25480	12740	8490	6370	5100	4250	3190	2500
			ae≤ 0.3D		(mm/min)	1830	1830	1940	1970	1940	1940	1950	1910	1830
		(50HRC)	ap≤ 0.2D	120	(min- 1)	38220	19110	9550	6370	4780	3820	3190	2390	1910
			ae≤ 0.25D		(mm/min)	920	920	1070	1170	1240	1220	1270	1150	1150
	M	Stainless Steel	ap≤ 0.2D	110	(min- 1)	35030	17520	8760	5840	4380	3500	2920	2190	1750
			ae≤ 0.2D		(mm/min)	980	1050	1120	1210	1230	1190	1230	1140	1120
		(<32HRC)	ap≤ 0.2D	140	(min- 1)	44590	22290	11150	7430	5570	4460	3720	2790	2230
			ae≤ 0.2D		(mm/min)	1250	1340	1430	1550	1560	1520	1560	1450	1430
	K	(35-45HRC)	ap≤ 0.3D	110	(min- 1)	35030	17520	8760	5840	4380	3500	2920	2190	1750
ae≤ 0.4D			(mm/min)		2800	2800	2800	2800	2800	2800	2800	2800	2800	2800

Recommended Cutting Data

Grade A- BEMS Z4
For Steels, Cast Iron - Profiling



		(mm)	"VC m/min"	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20	
Workpiece Material	P	(<45HRC)	ap≤ 0.2D	80	(min- 1)	12740	10190	8490	7280	6370	5660	5100	4630	4250
			ae≤ 0.3D		(mm/min)	2040	2040	2040	2040	2040	2040	2040	2040	2040
		(50HRC)	ap≤ 0.15D	60	(min- 1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
			ae≤ 0.15D		(mm/min)	1220	1280	1330	1270	1240	1220	1220	1210	1210
	M	Stainless Steel	ap≤ 0.2D	55	(min- 1)	8760	7010	5840	5010	4380	3890	3500	3190	2920
			ae≤ 0.2D		(mm/min)	1230	1260	1290	1260	1260	1250	1260	1270	1290
		(<32HRC)	ap≤ 0.2D	55	(min- 1)	11150	8920	7430	6370	5570	4950	4460	4050	3720
			ae≤ 0.2D		(mm/min)	1560	1610	1640	1610	1610	1590	1310	1620	1640
K	(35-45HRC)	ap≤ 0.1D	50	(min- 1)	9550	7640	6370	5460	4780	4250	3820	3470	3190	
		ae≤ 0.1D		(mm/min)	1220	1280	1330	1310	1340	1310	1300	1320	1340	



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