

GENERAL PURPOSE

Solid Carbide End Mills For Ferrous And Non-Ferrous Materials



INTRO

MILLING

SPECIALTY

HOLEMAKING

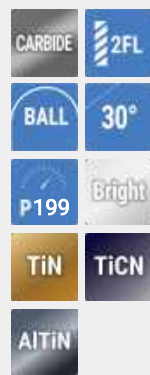
THREADING

INSERTS



2-Flute Ball Nose End Mills

- Universal application
- Sub-micron grade carbide substrate for wear resistance
- Multiple coating options
- Diameter Tol.: +0/-0.002"
- Shank Tol.: +0/-0.0005"



STEEL			STAINLESS		CAST IRON		NON-FERROUS		HSSA		HARDENED STEEL	
P1	P2	P3	M1	M2	K1	K2	N1	N2	S1	S2	H1	H2
○	○	○			○	○	○	○			○	

● Best ○ Good

Series 219 2FL | Multi Length | Ball Nose

Diameter(D ₁)	LOC(L ₁)	OAL(L)	Shank(D)	Bright	TiN	TiCN	AlTiN
1/64	3/64	1-1/2	1/8	221-001000	221-000995	221-000996	221-000997
1/32	1/16	1-1/2	1/8	219-001001	219-001002	219-001003	219-001004
1/32	1/8	1-1/2	1/8	221-001005	221-001006	221-001005	221-001016
3/64	3/32	1-1/2	1/8	219-001010	219-001011	219-001012	219-001013
3/64	1/8	1-1/2	1/8	221-001007	221-001004	221-001007	221-001013
1/16	1/8	1-1/2	1/8	219-001020	219-001021	219-001022	219-001023
1/16	1/4	1-1/2	1/8	221-001008AA	221-001002	221-000999	221-001003
5/64	5/32	1-1/2	1/8	219-001025	219-011025	219-021025	219-031025
5/64	1/4	1-1/2	1/8	221-001009	221-001008	221-021009	221-001018
3/32	3/16	1-1/2	1/8	219-001030	219-001031	219-001032	219-001033
3/32	3/8	1-1/2	1/8	221-001010	221-001011	221-001012	221-001019
7/64	7/32	1-1/2	1/8	219-001035	219-011035	219-021035	219-031035
7/64	3/8	1-1/2	1/8	221-001014	221-001015	221-021014	221-001017
1/8	1/4	1-1/2	1/8	219-001040	219-001041	219-001042	219-001043
1/8	1/2	1-1/2	1/8	221-001020	221-001021	221-001026	221-001023
1/8	1/2	1-1/2	1/8	282-125510	-	-	-
1/8	3/4	2-1/4	1/8	224-001001	224-001002	224-001003	224-001004
1/8	1	3	1/8	227-001001	227-001002	227-001003	227-001004
9/64	9/32	2	3/16	219-001045	219-011045	219-021045	219-031045
9/64	9/16	2	3/16	221-001024	221-001025	221-021024	221-001027
5/32	5/16	2	3/16	219-001050	219-001051	219-001052	219-001053
5/32	9/16	2	3/16	221-001030	221-001031	221-001032	221-001033
5/32	3/4	2-1/2	3/16	224-001005	224-001006	224-001007	224-001008
5/32	1-1/8	3	3/16	227-001005	227-001006	227-001007	227-001008
11/64	5/16	2	3/16	219-001055	219-011055	219-021055	219-031055
11/64	9/16	2	3/16	221-001034	221-001035	221-021034	221-001037
3/16	3/8	2	3/16	219-001060	219-001061	219-001062	219-001063
3/16	5/8	2	3/16	221-001040	221-001041	221-001042	221-001043
3/16	3/4	2-1/2	3/16	224-001012	224-001013	224-001014	224-001015
3/16	1-1/8	3	3/16	227-001010	227-001011	227-001012	227-001013
13/64	3/8	2	1/4	219-001065	219-011065	219-021065	219-031065
13/64	5/8	2-1/2	1/4	221-001044	221-001045	221-021044	221-001047
7/32	7/16	2	1/4	219-001070	219-001071	219-001072	219-001073
7/32	5/8	2-1/2	1/4	221-001050	221-001051	221-001052	221-001053
15/64	7/16	2	1/4	219-001075	219-011075	219-021075	219-031075
15/64	3/4	2-1/2	1/4	221-001054	221-001055	221-021054	221-001057
1/4	1/2	2	1/4	219-001080	219-001081	219-001082	219-001083
1/4	3/4	2-1/2	1/4	221-001060	221-001061	221-001059	221-001062
1/4	1-1/8	3	1/4	224-001020	224-001021	224-001022	224-001023
1/4	1-1/2	4	1/4	227-001020	227-001021	227-001022	227-001023
1/4	1-1/2	6	1/4	227-001025	227-001027	227-001028	227-001029
17/64	3/4	2-1/2	5/16	221-001063	221-001064	221-001065	221-001066
9/32	1/2	2	5/16	219-001085	-	-	-
9/32	3/4	2-1/2	5/16	221-001070	221-001071	221-001072	221-001073
19/64	13/16	2-1/2	5/16	221-001075	221-001076	221-001077	221-001078

*bold numbers are EDPs for ordering

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Diameter(D ₁)	LOC(L ₁)	OAL(L)	Shank(D)	Bright	TiN	TiCN	AlTiN
5/16	1/2	2	5/16	219-001090	219-001091	219-001092	219-001093
5/16	13/16	2-1/2	5/16	221-001080	221-001081	221-001082	221-001079
5/16	1-1/8	3	5/16	224-001030	224-001031	224-001032	224-001033
5/16	1-1/2	6	5/16	227-001033A	227-001033C	227-001033D	227-001033B
5/16	1-5/8	4	5/16	227-001030	227-001031	227-001032	227-001033
21/64	1	2-1/2	3/8	221-001083	221-001084	221-021083	221-031083
11/32	1	2-1/2	3/8	221-001085	221-001086	221-001165	221-001087
23/64	1	2-1/2	3/8	221-001088	221-001089	221-021088	221-031088
3/8	5/8	2	3/8	219-001100	219-001101	219-001102	219-001103
3/8	1	2-1/2	3/8	221-001090	221-001095	221-001167	221-001091
3/8	1-1/8	3	3/8	224-001040	224-001041	224-001042	224-001044
3/8	1-1/2	6	3/8	227-001035	227-001049	227-001037	227-001035A
3/8	1-3/4	4	3/8	227-001040	227-001041	227-001042	227-001043
25/64	1	2-3/4	7/16	221-001093	221-001094	221-021093	221-031093
13/32	1	2-3/4	7/16	221-001096	221-001097	221-021096	221-001118
27/64	1	2-3/4	7/16	221-001098	221-001099	221-021099	221-031099
7/16	5/8	2-1/2	7/16	219-001110	219-001111	219-001112	219-001113
7/16	1	2-3/4	7/16	221-001100	221-001101	221-001104	221-001119
7/16	2	4	7/16	224-001050	224-001051	224-001052	224-001053
7/16	3	6	7/16	227-001050	227-001051	227-001052	227-001053
29/64	1	3	1/2	221-001102	221-001103	221-021102	221-031102
15/32	1	3	1/2	221-001105	221-001106	221-021105	221-001123
31/64	1	3	1/2	221-001108	221-001109	221-021108	221-031108
1/2	5/8	2-1/2	1/2	219-001120	219-001121	219-001122	219-001123
1/2	1	3	1/2	221-001110	221-001115	221-001116	221-001117
1/2	1-1/2	4	1/2	224-001059	224-001059A	224-001059C	224-001059B
1/2	1-1/2	6	1/2	227-001053A	227-001057	227-001058	227-001059
1/2	2	4	1/2	224-001060	224-001061	224-001062	224-001063
1/2	3	6	1/2	227-001054	227-001061	227-001062	227-001064
9/16	1-1/4	3-1/2	9/16	221-001120	221-001121	221-001125	221-001124
5/8	3/4	3	5/8	219-001130	219-001131	219-001132	219-001133
5/8	1-1/4	3-1/2	5/8	221-001130	221-001131	221-001133	221-001134
5/8	1-1/2	6	5/8	227-001073A	227-001073C	227-001073D	227-001073B
5/8	2-1/4	5	5/8	224-001070	224-001071	224-001072	224-001073
5/8	3	6	5/8	227-001070	227-001071	227-001072	227-001074
11/16	1-1/2	4	3/4	221-001140	221-001141	221-021140	221-031140
3/4	1	3	3/4	219-001140	219-001141	219-001142	219-001143
3/4	1-1/2	4	3/4	221-001150	221-001151	221-001153	221-001154
3/4	1-1/2	6	3/4	227-001085	227-001085A	227-001085B	227-001086
3/4	2-1/4	5	3/4	224-001080	224-001081	224-001082	224-001083
3/4	3	6	3/4	227-001080	227-001081	227-001082	227-001084
3/4	4	7	3/4	227-001080A	-	-	-
7/8	1-1/2	4	7/8	221-001155	221-001156	221-021155	221-001158
1	1-1/2	4	1	221-001160	221-001161	221-001163	221-001164
1	1-1/2	6	1	227-001088	227-001088A	227-001088C	227-001089
1	2-1/4	5	1	224-001090	224-001091	224-001092	224-001093
1	3	6	1	227-001090	227-001091	227-001092	227-001094

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MILLING

SPECIALTY

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THREADING

INSERTS