



Speeds & Feeds

**Product Table:** Miniature End Mills - Ball - Long Reach, Stub Flute  
**Characteristics:** 3x Reach Multiple  
**Series:** 479xx, 9785xx

MATERIAL		Hardness: ≤ 28 Rc (≤ 271 HBn)																	
		SFM	Chip Load (IPT) by Dia			Depth of Cut		Chip Load (IPT) by Cutter Dia							Depth of Cut				
			0.015	0.031	0.047	Radial	Axial	0.062	0.078	0.093	0.125	0.187	0.250	0.375	0.500	Radial	Axial		
ALUMINUM ALLOYS	750	Slotting	.00020	.00042	.00064	1 x Dia	.14 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	1 x Dia	.35 x Dia		
		Roughing	.00026	.00053	.00080	.33 x Dia	.45 x Dia	.00092	.00116	.00138	.00186	.00278	.00371	.00557	.00743	.65 x Dia	.45 x Dia		
		Finishing	.00038	.00078	.00118	.08 x Dia	1.5 x Dia	.00136	.00171	.00204	.00274	.00410	.00547	.00821	.01095	.15 x Dia	1.5 x Dia		
	1000	Slotting	.00018	.00038	.00058	1 x Dia	.14 x Dia	.00066	.00083	.00099	.00134	.00200	.00267	.00401	.00535	1 x Dia	.35 x Dia		
		Roughing	.00023	.00048	.00072	.33 x Dia	.45 x Dia	.00083	.00104	.00124	.00167	.00250	.00334	.00501	.00668	.65 x Dia	.45 x Dia		
MAGNESIUM ALLOYS	1500	Slotting	.00020	.00042	.00064	1 x Dia	.14 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	1 x Dia	.35 x Dia		
		Roughing	.00026	.00053	.00080	.33 x Dia	.45 x Dia	.00092	.00116	.00138	.00186	.00278	.00371	.00557	.00743	.65 x Dia	.45 x Dia		
		Finishing	.00038	.00078	.00118	.08 x Dia	1.5 x Dia	.00136	.00171	.00204	.00274	.00410	.00547	.00821	.01095	.15 x Dia	1.5 x Dia		
	800	Slotting	.00018	.00038	.00058	1 x Dia	.14 x Dia	.00066	.00083	.00099	.00134	.00200	.00267	.00401	.00535	1 x Dia	.35 x Dia		
		Roughing	.00023	.00048	.00072	.33 x Dia	.45 x Dia	.00083	.00104	.00124	.00167	.00250	.00334	.00501	.00668	.65 x Dia	.45 x Dia		
ZINC ALLOYS	225	Slotting	.00016	.00034	.00051	1 x Dia	.14 x Dia	.00059	.00074	.00088	.00119	.00178	.00238	.00356	.00475	1 x Dia	.35 x Dia		
		Roughing	.00020	.00042	.00064	.33 x Dia	.45 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	.65 x Dia	.45 x Dia		
		Finishing	.00026	.00053	.00080	.08 x Dia	1.5 x Dia	.00104	.00136	.00171	.00204	.00274	.00410	.00547	.00821	.01095	.15 x Dia	1.5 x Dia	
	500	Slotting	.00016	.00034	.00051	1 x Dia	.14 x Dia	.00059	.00074	.00088	.00119	.00178	.00238	.00356	.00475	1 x Dia	.35 x Dia		
		Roughing	.00020	.00042	.00064	.33 x Dia	.45 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	.65 x Dia	.45 x Dia		
COPPER ALLOYS	225	Slotting	.00016	.00034	.00051	1 x Dia	.14 x Dia	.00059	.00074	.00088	.00119	.00178	.00238	.00356	.00475	1 x Dia	.35 x Dia		
		Roughing	.00020	.00042	.00064	.33 x Dia	.45 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	.65 x Dia	.45 x Dia		
		Finishing	.00026	.00053	.00080	.08 x Dia	1.5 x Dia	.00104	.00136	.00171	.00204	.00274	.00410	.00547	.00821	.01095	.15 x Dia	1.5 x Dia	
	550	Slotting	.00016	.00034	.00051	1 x Dia	.14 x Dia	.00059	.00074	.00088	.00119	.00178	.00238	.00356	.00475	1 x Dia	.35 x Dia		
		Roughing	.00020	.00042	.00064	.33 x Dia	.45 x Dia	.00074	.00093	.00110	.00149	.00222	.00297	.00446	.00594	.65 x Dia	.45 x Dia		
HIGH TEMP ALLOYS	70	Slotting	.00004	.00008	.00013	1 x Dia	.14 x Dia	.00014	.00018	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia		
		Roughing	.00005	.00009	.00014	.33 x Dia	.45 x Dia	.00016	.00020	.00024	.00033	.00049	.00066	.00098	.00131	.65 x Dia	.45 x Dia		
		Finishing	.00007	.00014	.00021	.08 x Dia	1.5 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.15 x Dia	1.5 x Dia		
	800	Slotting	.00004	.00008	.00013	1 x Dia	.14 x Dia	.00014	.00018	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia		
		Roughing	.00005	.00009	.00014	.33 x Dia	.45 x Dia	.00016	.00020	.00024	.00033	.00049	.00066	.00098	.00131	.65 x Dia	.45 x Dia		
CARBON STEELS	600	Slotting	.00007	.00015	.00022	1 x Dia	.14 x Dia	.00025	.00032	.00038	.00051	.00076	.00102	.00153	.00204	1 x Dia	.35 x Dia		
		Roughing	.00008	.00016	.00025	.33 x Dia	.45 x Dia	.00028	.00036	.00043	.00057	.00086	.00115	.00172	.00230	.65 x Dia	.45 x Dia		
		Finishing	.00012	.00024	.00037	.08 x Dia	1.5 x Dia	.00042	.00053	.00064	.00086	.00128	.00171	.00257	.00342	.15 x Dia	1.5 x Dia		
	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia		
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia		
STAINLESS STEELS	450	Slotting	.00007	.00015	.00022	1 x Dia	.14 x Dia	.00025	.00032	.00038	.00051	.00076	.00102	.00153	.00204	1 x Dia	.35 x Dia		
		Roughing	.00008	.00016	.00025	.33 x Dia	.45 x Dia	.00028	.00036	.00043	.00057	.00086	.00115	.00172	.00230	.65 x Dia	.45 x Dia		
		Finishing	.00012	.00024	.00037	.08 x Dia	1.5 x Dia	.00042	.00053	.00064	.00086	.00128	.00171	.00257	.00342	.15 x Dia	1.5 x Dia		
	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia		
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia		
TOOL STEELS	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia		
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia		
		Finishing	.00011	.00022	.00034	.08 x Dia	1.5 x Dia	.00039	.00049	.00058	.00078	.00117	.00156	.00235	.00313	.15 x Dia	1.5 x Dia		
	150	Slotting	.00004	.00008	.00013	1 x Dia	.14 x Dia	.00014	.00018	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia		
		Roughing	.00005	.00009	.00014	.33 x Dia	.45 x Dia	.00016	.00020	.00024	.00033	.00049	.00066	.00098	.00131	.65 x Dia	.45 x Dia		
TITANIUM ALLOYS	150	Slotting	.00004	.00008	.00013	1 x Dia	.14 x Dia	.00014	.00018	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia		
		Roughing	.00005	.00009	.00014	.33 x Dia	.45 x Dia	.00016	.00020	.00024	.00033	.00049	.00066	.00098	.00131	.65 x Dia	.45 x Dia		
		Finishing	.00007	.00014	.00021	.08 x Dia	1.5 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.15 x Dia	1.5 x Dia		
	75	Slotting	.00002	.00004	.00006	1 x Dia	.14 x Dia	.00007	.00009	.00011	.00015	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia
		Roughing	.00002	.00005	.00007	.33 x Dia	.45 x Dia	.00008	.00010	.00012	.00016	.00025	.00033	.00049	.00066	.65 x Dia	.45 x Dia		
HIGH TEMP ALLOYS	70	Slotting	.00004	.00008	.00013	1 x Dia	.14 x Dia	.00014	.00018	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia		
		Roughing	.00005	.00009	.00014	.33 x Dia	.45 x Dia	.00016	.00020	.00024	.00033	.00049	.00066	.00098	.00131	.65 x Dia	.45 x Dia		
		Finishing	.00007	.00014	.00021	.08 x Dia	1.5 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.15 x Dia	1.5 x Dia		
	50	Slotting	.00002	.00004	.00006	1 x Dia	.14 x Dia	.00007	.00009	.00011	.00015	.00022	.00029	.00044	.00058	.00087	.00117	1 x Dia	.35 x Dia
		Roughing	.00002	.00005	.00007	.33 x Dia	.45 x Dia	.00008	.00010	.00012	.00016	.00025	.00033	.00049	.00066	.65 x Dia	.45 x Dia		

MATERIAL		Hardness: 29-37 Rc (279-344 HBn)															
		SFM	Chip Load (IPT) by Dia			Depth of Cut		Chip Load (IPT) by Cutter Dia							Depth of Cut		
			0.015	0.031	0.047	Radial	Axial	0.062	0.078	0.093	0.125	0.187	0.250	0.375	0.500	Radial	Axial
CARBON STEELS	600	Slotting	.00007	.00015	.00022	1 x Dia	.14 x Dia	.00025	.00032	.00038	.00051	.00076	.00102	.00153	.00204	1 x Dia	.35 x Dia
		Roughing	.00008	.00016	.00025	.33 x Dia	.45 x Dia	.00028	.00036	.00043	.00057	.00086	.00115	.00172	.00230	.65 x Dia	.45 x Dia
		Finishing	.00012	.00024	.00037	.08 x Dia	1.5 x Dia	.00042	.00053	.00064	.00086	.00128	.00171	.00257	.00342	.15 x Dia	1.5 x Dia
	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia
STAINLESS STEELS	450	Slotting	.00007	.00015	.00022	1 x Dia	.14 x Dia	.00025	.00032	.00038	.00051	.00076	.00102	.00153	.00204	1 x Dia	.35 x Dia
		Roughing	.00008	.00016	.00025	.33 x Dia	.45 x Dia	.00028	.00036	.00043	.00057	.00086	.00115	.00172	.00230	.65 x Dia	.45 x Dia
		Finishing	.00012	.00024	.00037	.08 x Dia	1.5 x Dia	.00042	.00053	.00064	.00086	.00128	.00171	.00257	.00342	.15 x Dia	1.5 x Dia
	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia
TOOL STEELS	200	Slotting	.00006	.00013	.00020	1 x Dia	.14 x Dia	.00023	.00029	.00035	.00047	.00070	.00093	.00140	.00187	1 x Dia	.35 x Dia
		Roughing	.00007	.00015	.00023	.33 x Dia	.45 x Dia	.00026	.00033	.00039	.00052	.00079	.00105	.00157	.00210	.65 x Dia	.45 x Dia
		Finishing	.00011	.00022	.00034	.08 x Dia	1.5 x Dia	.00039	.00049	.00058							