

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	.00004	.00009	.00013	1 x Dia	.03 x Dia	.00015	.00019	.00023	.00031	.00046	.00062	.00093	.00124	1 x Dia	.08 x Dia
		Roughing	.00005	.00011	.00017	.11 x Dia	.15 x Dia	.00019	.00024	.00029	.00039	.00058	.00077	.00116	.00155	.20 x Dia	.15 x Dia
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	750	Slotting	.00004	.00008	.00012	1 x Dia	.03 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00111	1 x Dia	.08 x Dia
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	700	Slotting	.00004	.00008	.00012	1 x Dia	.03 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00111	1 x Dia	.08 x Dia
	650	Roughing	.00005	.00010	.00015	.11 x Dia	.15 x Dia	.00017	.00022	.00026	.00035	.00052	.00070	.00104	.00139	.20 x Dia	.15 x Dia
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	475	Slotting	.00004	.00008	.00012	1 x Dia	.03 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00111	1 x Dia	.08 x Dia
	1000	Finishing	.00012	.00025	.00038	.02 x Dia	1.5 x Dia	.00044	.00055	.00065	.00088	.00132	.00176	.00264	.00352	.04 x Dia	1.5 x Dia
Wrought - 5%-8% Si (4xxx)	800	Slotting	.00004	.00009	.00013	1 x Dia	.03 x Dia	.00015	.00019	.00023	.00031	.00046	.00062	.00093	.00124	1 x Dia	.08 x Dia
	1500	Roughing	.00005	.00011	.00017	.11 x Dia	.15 x Dia	.00019	.00024	.00029	.00039	.00058	.00077	.00116	.00155	.20 x Dia	.15 x Dia
MAGNESIUM ALLOYS	800	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	500	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
ZINC ALLOYS	500	Roughing	.00004	.00009	.00013	.11 x Dia	.15 x Dia	.00015	.00019	.00023	.00031	.00046	.00062	.00093	.00124	.20 x Dia	.15 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
COPPER ALLOYS	500	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
High Coppers - 90%+ (C1xxx)	500	Roughing	.00004	.00009	.00013	.11 x Dia	.15 x Dia	.00015	.00019	.00023	.00031	.00046	.00062	.00093	.00124	.20 x Dia	.15 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C69800)	500	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Phosphor Bronzes (Copper Tin alloys, C5xxx)	500	Roughing	.00004	.00009	.00013	.11 x Dia	.15 x Dia	.00015	.00019	.00023	.00031	.00046	.00062	.00093	.00124	.20 x Dia	.15 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Copper Nicksels, Nickel Silvers (Copper Nickel alloys, C7xxx)	500	Finishing	.00013	.00028	.00042	.02 x Dia	1.5 x Dia	.00048	.00061	.00073	.00098	.00146	.00196	.00293	.00391	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550	Finishing	.00011	.00022	.00034	.02 x Dia	1.5 x Dia	.00039	.00049	.00058	.00078	.00117	.00156	.00235	.00313	.04 x Dia	1.5 x Dia
	225	Slotting	.00003	.00007	.00011	1 x Dia	.03 x Dia	.00012	.00015	.00018	.00025	.00037	.00050	.00074	.00099	1 x Dia	.08 x Dia



**Product Table:** Miniature End Mills - Square - Long Reach, Stub Flute  
**Characteristics:** 30x Reach Multiple  
**Series:** 9720xx, 9736xx

**Please note:**  
All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased 10%-20% if coated. For ferrous materials with hardness ≤ 28 Rc, chip loads can be increased 10%-20%.

If you require additional information, Harvey Tool has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **800-645-5609** or [Harveytech@harveyperformance.com](mailto:Harveytech@harveyperformance.com).

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.

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	.00001	.00003	.00005	1 x Dia	.03 x Dia	.00005	.00007	.00008	.00011	.00016	.00021	.00032	.00043	1 x Dia	.08 x Dia
		Roughing	.00002	.00003	.00005	.11 x Dia	.15 x Dia	.00006	.00007	.00009	.00012	.00018	.00024	.00036	.00048	.20 x Dia	.15 x Dia
		Finishing	.00004	.00009	.00013	.02 x Dia	1.5 x Dia	.00015	.00019	.00023	.00031	.00046	.00061	.00082	.00122	.04 x Dia	1.5 x Dia
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xx, 9xxx	200	Slotting	.00001	.00003	.00004	1 x Dia	.03 x Dia	.00005	.00006	.00007	.00010	.00015	.00019	.00029	.00039	1 x Dia	.08 x Dia
		Roughing	.00002	.00003	.00005	.11 x Dia	.15 x Dia	.00005	.00007	.00008	.00011	.00016	.00022	.00033	.00044	.20 x Dia	.15 x Dia
		Finishing	.00004	.00008	.00012	.02 x Dia	1.5 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.04 x Dia	1.5 x Dia
STAINLESS STEELS	450	Slotting	.00001	.00003	.00005	1 x Dia	.03 x Dia	.00005	.00007	.00008	.00011	.00016	.00021	.00032	.00043	1 x Dia	.08 x Dia
		Roughing	.00002	.00003	.00005	.11 x Dia	.15 x Dia	.00006	.00007	.00009	.00012	.00018	.00024	.00036	.00048	.20 x Dia	.15 x Dia
		Finishing	.00004	.00009	.00013	.02 x Dia	1.5 x Dia	.00015	.00019	.00023	.00031	.00046	.00061	.00082	.00122	.04 x Dia	1.5 x Dia
201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502	200	Slotting	.00001	.00003	.00004	1 x Dia	.03 x Dia	.00005	.00006	.00007	.00010	.00015	.00019	.00029	.00039	1 x Dia	.08 x Dia
		Roughing	.00002	.00003	.00005	.11 x Dia	.15 x Dia	.00005	.00007	.00008	.00011	.00016	.00022	.00033	.00044	.20 x Dia	.15 x Dia
		Finishing	.00004	.00008	.00012	.02 x Dia	1.5 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.04 x Dia	1.5 x Dia
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	150	Slotting	.00001	.00002	.00003	1 x Dia	.03 x Dia	.00003	.00004	.00005	.00006	.00009	.00012	.00018	.00024	1 x Dia	.08 x Dia
		Roughing	.00001	.00002	.00003	.11 x Dia	.15 x Dia	.00003	.00004	.00005	.00007	.00010	.00014	.00021	.00027	.20 x Dia	.15 x Dia
		Finishing	.00002	.00005	.00008	.02 x Dia	1.5 x Dia	.00009	.00011	.00013	.00017	.00026	.00035	.00052	.00070	.04 x Dia	1.5 x Dia
TOOL STEELS	200	Slotting	.00001	.00003	.00004	1 x Dia	.03 x Dia	.00005	.00006	.00007	.00010	.00015	.00019	.00029	.00039	1 x Dia	.08 x Dia
		Roughing	.00002	.00003	.00005	.11 x Dia	.15 x Dia	.00005	.00007	.00008	.00011	.00016	.00022	.00033	.00044	.20 x Dia	.15 x Dia
		Finishing	.00004	.00008	.00012	.02 x Dia	1.5 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.04 x Dia	1.5 x Dia
A, L, O, P, W series	150	Slotting	.00001	.00002	.00003	1 x Dia	.03 x Dia	.00003	.00004	.00005	.00006	.00009	.00012	.00018	.00024	1 x Dia	.08 x Dia
		Roughing	.00001	.00002	.00003	.11 x Dia	.15 x Dia	.00003	.00004	.00005	.00007	.00010	.00014	.00021	.00027	.20 x Dia	.15 x Dia
		Finishing	.00002	.00005	.00008	.02 x Dia	1.5 x Dia	.00009	.00011	.00013	.00017	.00026	.00035	.00052	.00070	.04 x Dia	1.5 x Dia
D, H, M, T, S series	150	Slotting	.00001	.00002	.00003	1 x Dia	.03 x Dia	.00003	.00004	.00005	.00006	.00009	.00012	.00018	.00024	1 x Dia	.08 x Dia
		Roughing	.00001	.00002	.00003	.11 x Dia	.15 x Dia	.00003	.00004	.00005	.00007	.00010	.00014	.00021	.00027	.20 x Dia	.15 x Dia
		Finishing	.00002	.00005	.00008	.02 x Dia	1.5 x Dia	.00009	.00011	.00013	.00017	.00026	.00035	.00052	.00070	.04 x Dia	1.5 x Dia
TITANIUM ALLOYS	150	Slotting	.00001	.00002	.00003	1 x Dia	.03 x Dia	.00003	.00004	.00005	.00006	.00009	.00012	.00018	.00024	1 x Dia	.08 x Dia
		Roughing	.00001	.00002	.00003	.11 x Dia	.15 x Dia	.00003	.00004	.00005	.00007	.00010	.00014	.00021	.00027	.20 x Dia	.15 x Dia
		Finishing	.00002	.00005	.00008	.02 x Dia	1.5 x Dia	.00009	.00011	.00013	.00017	.00026	.00035	.00052			