HARVEY TOOL

Speeds & Feeds

Product Table: Counterbores - Flat Bottom
Characteristics: 4 Flutes
Series: 233xx, 234xx

Product Notes:

Chip Loads are given 2 ways:

Full Plunge refers to vertically machining into solid material with no pilot hole

Finishing refers to vertically machining with an existing pilot hole greater than or equal to 50% of the Counterbore cutter diameter (≤ 25% on wall)

Full Plunge machining may require a peck cycle for proper chip evacuation

For Ferrous materials, pecking to a depth of 2x diameter is advised

For Non-Ferrous materials, pecking to a depth of 3x diameter is advised

General Notes:

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**.

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.

Hardness: ≤ 28 Rc (≤ 271 HBn)

MATERIAL	SFM		Chip Load (IPT) By Cutter Diameter													
			.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.437	.500	.625	.750
ALUMINUM ALLOYS Casting (2xx, 5xx, 7xx, 8xx)	750	Full Plunge	.00014	.00021	.00027	.00034	.00041	.00055	.00082	.00110	.00137	.00165	.00192	.00220	.00275	.00330
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000	Finishing	.00022	.00033	.00043	.00054	.00065	.00087	.00130	.00174	.00217	.00261	.00304	.00348	.00435	.00521
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	750	Full Plunge	.00012	.00019	.00025	.00031	.00037	.00050	.00074	.00099	.00124	.00149	.00173	.00198	.00248	.00297
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	700															
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	650	Finishing	.00019	.00029	.00039	.00049	.00058	.00078	.00117	.00156	.00195	.00235	.00273	.00313	.00391	.00469
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	475															
Wrought - 5%-8% Si (4xxx)	1000															
Wrought - 8%-12% Si (4xxx)	800															
MAGNESIUM ALLOYS	1500	Full Plunge	.00014	.00021	.00027	.00034	.00041	.00055	.00082	.00110	.00137	.00165	.00192	.00220	.00275	.00330
ZINC ALLOYS	800	Finishing	.00022	.00033	.00043	.00054	.00065	.00087	.00130	.00174	.00217	.00261	.00304	.00348	.00435	.00521
COPPER ALLOYS High Coppers - 90%+ (C1xxxx)	225	Full Plunge	.00011	.00017	.00022	.00027	.00033	.00044	.00066	.00088	.00110	.00132	.00154	.00176	.00220	.00264
Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)	500															
Phosphor Bronzes (Copper Tin alloys, C5xxxx)	225															
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500															
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Finishing	.00017	.00026	.00034	.00043	.00052	.00070	.00104	.00139	.00174	.00209	.00243	.00278	.00348	.00417
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	225															
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550															

Hardness: 29-37 Rc (279-344 HBn)

MATERIAL	SFM		Chip Load (IPT) By Cutter Diameter													
			.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.437	.500	.625	.750
CARBON STEELS Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	600	Full Plunge	.00005	.00007	.00009	.00012	.00014	.00019	.00028	.00038	.00047	.00057	.00066	.00076	.00095	.00113
		Finishing	.00007	.00010	.00013	.00017	.00020	.00027	.00041	.00054	.00068	.00082	.00095	.00109	.00136	.00163
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx & 52Lxxx, 6xxx, 8xxx, 9xxx	200	Full Plunge	.00004	.00006	.00009	.00011	.00013	.00017	.00026	.00035	.00043	.00052	.00060	.00069	.00086	.00104
		Finishing	.00006	.00009	.00012	.00016	.00018	.00025	.00037	.00050	.00062	.00075	.00087	.00099	.00124	.00149
STAINLESS STEELS 203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	450	Full Plunge	.00005	.00007	.00009	.00012	.00014	.00019	.00028	.00038	.00047	.00057	.00066	.00076	.00095	.00113
		Finishing	.00007	.00010	.00013	.00017	.00020	.00027	.00041	.00054	.00068	.00082	.00095	.00109	.00136	.00163
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	Full Plunge	.00004	.00006	.00009	.00011	.00013	.00017	.00026	.00035	.00043	.00052	.00060	.00069	.00086	.00104
		Finishing	.00006	.00009	.00012	.00016	.00018	.00025	.00037	.00050	.00062	.00075	.00087	.00099	.00124	.00149
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	150	Full Plunge	.00003	.00004	.00005	.00007	.00008	.00011	.00016	.00022	.00027	.00032	.00038	.00043	.00054	.00065
		Finishing	.00004	.00006	.00008	.00010	.00012	.00016	.00023	.00031	.00039	.00047	.00054	.00062	.00078	.00093
TOOL STEELS A, L, O, P, W series	200	Full Plunge	.00004	.00006	.00009	.00011	.00013	.00017	.00026	.00035	.00043	.00052	.00060	.00069	.00086	.00104
		Finishing	.00006	.00009	.00012	.00016	.00018	.00025	.00037	.00050	.00062	.00075	.00087	.00099	.00124	.00149
D, H, M, T, S series	150	Full Plunge	.00003	.00004	.00005	.00007	.00008	.00011	.00016	.00022	.00027	.00032	.00038	.00043	.00054	.00065
		Finishing	.00004	.00006	.00008	.00010	.00012	.00016	.00023	.00031	.00039	.00047	.00054	.00062	.00078	.00093
TITANIUM ALLOYS	150	Full Plunge	.00003	.00004	.00005	.00007	.00008	.00011	.00016	.00022	.00027	.00032	.00038	.00043	.00054	.00065
		Finishing	.00004	.00006	.00008	.00010	.00012	.00016	.00023	.00031	.00039	.00047	.00054	.00062	.00078	.00093
HIGH TEMP ALLOYS Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	Full Plunge	.00003	.00004	.00005	.00007	.00008	.00011	.00016	.00022	.00027	.00032	.00038	.00043	.00054	.00065
		Finishing	.00004	.00006	.00008	.00010	.00012	.00016	.00023	.00031	.00039	.00047	.00054	.00062	.00078	.00093

Hardness: 38-45 Rc (353-421 HBn)

SFM		Chip Load (IPT) By Cutter Diameter														
		.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.437	.500	.625	.750
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-
-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	Full Plunge	.00002	.00003	.00004	.00005	.00006	.00009	.00013	.00017	.00022	.00026	.00030	.00035	.00043	.00052
	Finishing	.00003	.00005	.00006	.00008	.00009	.00013	.00019	.00025	.00031	.00038	.00044	.00050	.00063	.00075
90	Full Plunge	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00011	.00013	.00016	.00019	.00022	.00027	.00032
	Finishing	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	.00020	.00023	.00027	.00031	.00039	.00047
100	Full Plunge	.00002	.00003	.00004	.00005	.00006	.00009	.00013	.00017	.00022	.00026	.00030	.00035	.00043	.00052
	Finishing	.00003	.00005	.00006	.00008	.00009	.00013	.00019	.00025	.00031	.00038	.00044	.00050	.00063	.00075
90	Full Plunge	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00011	.00013	.00016	.00019	.00022	.00027	.00032
	Finishing	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	.00020	.00023	.00027	.00031	.00039	.00047
75	Full Plunge	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00011	.00013	.00016	.00019	.00022	.00027	.00032
	Finishing	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	.00020	.00023	.00027	.00031	.00039	.00047
50	Full Plunge	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00011	.00013	.00016	.00019	.00022	.00027	.00032
	Finishing	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	.00020	.00023	.00027	.00031	.00039	.00047