



Product Table: High Performance Chamfer Cutters - Helically Fluted
Characteristics: 4 Flute

Product Notes:
 Due to a varying diameter, an Effective Cutter Diameter is needed for Chip Load selection and RPM calculation:
 Effective Cutter Diameter = (Major Diameter + Minor Diameter)/2
 Or consider the actual diameter along the angle that is engaged with the workpiece.

Depth of Cut is shown as number of Passes with each pass resulting in a descending stepover

Chip Loads are given 3 ways:
 Traditional Edge Break of .010"-.015"
 Full Chamfer engagement for cutters with angles GREATER than 25° per side (50° included)
 Full Chamfer engagement for cutters with angles LESS than 25° per side (50° included)

Chip Loads within table pertain to machining on one side of workpiece.
 For machining on two sides, reduce Chip Loads to 60%-80% depending on contact length and finish
 For vertical plunging, reduce Chip Loads to 40%-50% depending on finish

Material Guide	Hardness	SFM	Operation	Chip Load (IPT) By Cutter Diameter										Depth of Cut Passes				
				1/16	5/64	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8		3/4	1		
Carbon Steel	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	29-37 Rc (279-344 HbN)	600	Edge Break	.0030	.0037	.0044	.0060	.0089	.0119	.0149	.0179	.0238	.0298	.0358	.0477	1	
				Full Chamfer (≥ 25°)	.0025	.0031	.0037	.0050	.0074	.0099	.0124	.0149	.0199	.0248	.0298	.0397	3	
				Full Chamfer (< 25°)	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	4	
Low Alloy Steel	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	29-37 Rc (279-344 HbN)	200	Edge Break	.0032	.0041	.0049	.0065	.0098	.0130	.0163	.0196	.0261	.0326	.0391	.0522	1	
				Full Chamfer (≥ 25°)	.0027	.0034	.0040	.0054	.0081	.0109	.0136	.0163	.0217	.0272	.0326	.0435	3	
				Full Chamfer (< 25°)	.0020	.0025	.0030	.0041	.0061	.0082	.0102	.0122	.0163	.0204	.0245	.0326	4	
Tool Steel	A, L, O, P, W series	29-37 Rc (279-344 HbN)	200	Edge Break	.0030	.0037	.0044	.0060	.0089	.0119	.0149	.0179	.0238	.0298	.0358	.0477	1	
				Full Chamfer (≥ 25°)	.0025	.0031	.0037	.0050	.0074	.0099	.0124	.0149	.0199	.0248	.0298	.0397	3	
				Full Chamfer (< 25°)	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	4	
	D, H, M, T, S series	38-45 Rc (353-421 HbN)	100	Edge Break	.0030	.0037	.0044	.0060	.0089	.0119	.0149	.0179	.0238	.0298	.0358	.0477	1	
				Full Chamfer (≥ 25°)	.0025	.0031	.0037	.0050	.0074	.0099	.0124	.0149	.0199	.0248	.0298	.0397	3	
				Full Chamfer (< 25°)	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	5	
Austenitic Stainless Steel	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	29-37 Rc (279-344 HbN)	450	Edge Break	.0032	.0041	.0049	.0065	.0098	.0130	.0163	.0196	.0261	.0326	.0391	.0522	1	
				Full Chamfer (≥ 25°)	.0027	.0034	.0040	.0054	.0081	.0109	.0136	.0163	.0217	.0272	.0326	.0435	3	
				Full Chamfer (< 25°)	.0020	.0025	.0030	.0041	.0061	.0082	.0102	.0122	.0163	.0204	.0245	.0326	4	
	Martensitic & Ferritic Stainless Steel	403, 410, 416, 420, 440, 430, 446	29-37 Rc (279-344 HbN)	200	Edge Break	.0030	.0037	.0044	.0060	.0089	.0119	.0149	.0179	.0238	.0298	.0358	.0477	1
					Full Chamfer (≥ 25°)	.0025	.0031	.0037	.0050	.0074	.0099	.0124	.0149	.0199	.0248	.0298	.0397	3
					Full Chamfer (< 25°)	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	4
PH Stainless Steel	15-5, 17-4, Carpenter 450, Carpenter 465	29-37 Rc (279-344 HbN)	150	Edge Break	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	1	
				Full Chamfer (≥ 25°)	.0015	.0019	.0023	.0031	.0046	.0062	.0078	.0093	.0124	.0155	.0186	.0248	3	
				Full Chamfer (< 25°)	.0012	.0015	.0017	.0023	.0035	.0047	.0058	.0070	.0093	.0116	.0140	.0186	4	
	Nickel Alloy	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	29-37 Rc (279-344 HbN)	70	Edge Break	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	1
					Full Chamfer (≥ 25°)	.0015	.0019	.0023	.0031	.0046	.0062	.0078	.0093	.0124	.0155	.0186	.0248	3
					Full Chamfer (< 25°)	.0012	.0015	.0017	.0023	.0035	.0047	.0058	.0070	.0093	.0116	.0140	.0186	4
Titanium Alloy	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	29-37 Rc (279-344 HbN)	150	Edge Break	.0018	.0023	.0028	.0037	.0056	.0075	.0093	.0112	.0149	.0186	.0224	.0298	1	
				Full Chamfer (≥ 25°)	.0015	.0019	.0023	.0031	.0046	.0062	.0078	.0093	.0124	.0155	.0186	.0248	3	
				Full Chamfer (< 25°)	.0012	.0015	.0017	.0023	.0035	.0047	.0058	.0070	.0093	.0116	.0140	.0186	4	
	Wrought Aluminum Alloy	2014, 5062, 6061, 7050, 7075, 7475	≤ 28 Rc (≤ 271 HbN)	1000	Edge Break	.0086	.0108	.0128	.0173	.0258	.0345	.0431	.0518	.0690	.0863	.1103	.1380	1
					Full Chamfer (≥ 25°)	.0071	.0090	.0107	.0144	.0215	.0288	.0359	.0431	.0575	.0719	.0863	.1150	2
					Full Chamfer (< 25°)	.0053	.0067	.0080	.0108	.0161	.0216	.0269	.0323	.0431	.0539	.0647	.0863	3
Cast Aluminum Alloy	3% - 5% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)	≤ 28 Rc (≤ 271 HbN)	750	Edge Break	.0077	.0097	.0116	.0155	.0232	.0311	.0388	.0466	.0621	.0776	.0932	.1242	1	
				Full Chamfer (≥ 25°)	.0064	.0081	.0096	.0129	.0194	.0259	.0323	.0388	.0518	.0647	.0776	.1035	2	
				Full Chamfer (< 25°)	.0048	.0061	.0072	.0097	.0145	.0194	.0242	.0291	.0388	.0485	.0582	.0776	3	
	Copper Alloy	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	≤ 28 Rc (≤ 271 HbN)	225-500	Edge Break	.0068	.0086	.0103	.0138	.0206	.0276	.0344	.0414	.0552	.0690	.0828	.1104	1
					Full Chamfer (≥ 25°)	.0057	.0072	.0086	.0115	.0172	.0230	.0287	.0345	.0460	.0575	.0690	.0920	2
					Full Chamfer (< 25°)	.0043	.0054	.0064	.0086	.0129	.0173	.0215	.0259	.0345	.0431	.0518	.0690	3
Magnesium Alloys	Zinc Alloys	≤ 28 Rc (≤ 271 HbN)	1500	Edge Break	.0086	.0108	.0128	.0173	.0258	.0345	.0431	.0518	.0690	.0863	.1103	.1380	1	
800			Full Chamfer (≥ 25°)	.0071	.0090	.0107	.0144	.0215	.0288	.0359	.0431	.0575	.0719	.0863	.1150	2		
				Full Chamfer (< 25°)	.0053	.0067	.0080	.0108	.0161	.0216	.0269	.0323	.0431	.0539	.0647	.0863	3	

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, Valor Holemaking has a team of technical experts available to assist you through even the most challenging applications. Please contact us at 866-840-1505 or Valortech@haveyperformance.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.