



Product Table: Combined Drill & Countersinks

Material Guide		Hardness	SFM	Chip Load (IPR) By Drill Diameter								
				1/64	1/32	3/64	1/16	5/64	3/32	1/8	3/16	1/4
Carbon Steel	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	29-37 Rc (279-344 HBn)	240	.00032	.00067	.00102	.00134	.00168	.00201	.00270	.00404	.00540
Low Alloy Steel	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	29-37 Rc (279-344 HBn)	150	.00035	.00073	.00111	.00146	.00184	.00220	.00295	.00442	.00591
Tool Steel	A, L, O, P, W series	29-37 Rc (279-344 HBn)	125	.00032	.00067	.00102	.00134	.00168	.00201	.00270	.00404	.00540
		38-45 Rc (353-421 HBn)	100	.00022	.00045	.00068	.00089	.00112	.00134	.00180	.00269	.00360
	D, H, M, T, S series	29-37 Rc (279-344 HBn)	90	.00020	.00042	.00063	.00084	.00105	.00126	.00169	.00252	.00338
		38-45 Rc (353-421 HBn)	75	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225
Austenitic Stainless Steel	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	29-37 Rc (279-344 HBn)	180	.00035	.00073	.00111	.00146	.00184	.00220	.00295	.00442	.00591
Martensitic & Ferritic Stainless Steel	403, 410, 416, 420, 440, 430, 446	29-37 Rc (279-344 HBn)	150	.00032	.00067	.00102	.00134	.00168	.00201	.00270	.00404	.00540
		38-45 Rc (353-421 HBn)	100	.00022	.00045	.00068	.00089	.00112	.00134	.00180	.00269	.00360
PH Stainless Steel	15-5, 17-4, Carpenter 450, Carpenter 465	29-37 Rc (279-344 HBn)	125	.00020	.00042	.00063	.00084	.00105	.00126	.00169	.00252	.00338
		38-45 Rc (353-421 HBn)	90	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225
Nickel Alloy	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	29-37 Rc (279-344 HBn)	70	.00020	.00042	.00063	.00084	.00105	.00126	.00169	.00252	.00338
		38-45 Rc (353-421 HBn)	50	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225
Titanium Alloy	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	29-37 Rc (279-344 HBn)	100	.00020	.00042	.00063	.00084	.00105	.00126	.00169	.00252	.00338
		38-45 Rc (353-421 HBn)	75	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225
Wrought Aluminum Alloy	2014, 5062, 6061, 7050, 7075, 7475	≤ 28 Rc (≤ 271 HBn)	600	.00041	.00084	.00127	.00167	.00211	.00251	.00338	.00505	.00675
	5% - 8% Si (4XXX)		600	.00036	.00075	.00114	.00151	.00190	.00226	.00304	.00454	.00608
	8% - 12% Si (4XXX)		480									
Cast Aluminum Alloy	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	≤ 28 Rc (≤ 271 HBn)	450	.00041	.00084	.00127	.00167	.00211	.00251	.00338	.00505	.00675
	3% - 5% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		450	.00036	.00075	.00114	.00151	.00190	.00226	.00304	.00454	.00608
	5% - 8% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		420									
	8% - 12% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		390									
	12% - 16% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		350									
Copper Alloy	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	≤ 28 Rc (≤ 271 HBn)	170-400	.00032	.00067	.00102	.00134	.00168	.00201	.00270	.00404	.00540
Magnesium Alloys		≤ 28 Rc (≤ 271 HBn)	900	.00041	.00084	.00127	.00167	.00211	.00251	.00338	.00505	.00675
Zinc Alloys	480											

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@harveypformance.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.