

Spade Drill Inserts - HSS-E



MATERIAL		Material Hardness		HSS-E GRADE	Vc (m/min)		fn (mm/rev)						
		Bhn	HRc		TiN	TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24	Ø25-35	Ø36-47	Ø48-65	Ø66-114
P	Low Carbon Steel	85-125	-	C500, T15	54	75	0.15	0.22	0.28	0.37	0.46	0.56	0.67
		125-175	>7	C500, T15	51	72	0.15	0.22	0.28	0.37	0.46	0.56	0.67
		175-225	7-20	C500, T15	49	69	0.13	0.19	0.24	0.34	0.43	0.50	0.57
		225-275	20-28	C500, T15	45	66	0.13	0.19	0.24	0.34	0.43	0.50	0.57
	Free Machining Steel	100-150	-	C500, T15	63	84	0.16	0.23	0.31	0.40	0.48	0.55	0.67
		150-200	>13	C500, T15	58	81	0.16	0.23	0.31	0.40	0.48	0.55	0.67
		200-250	13-24	C500, T15	51	72	0.14	0.23	0.31	0.38	0.48	0.55	0.67
	Medium Carbon Steel	125-175	>7	C500, T15	52	75	0.14	0.22	0.28	0.35	0.45	0.55	0.65
		175-225	7-20	C500, T15	48	69	0.13	0.19	0.23	0.34	0.43	0.50	0.58
		225-275	20-28	C500, T15	45	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
		275-325	28-34	C500, T15	42	58	0.10	0.17	0.21	0.28	0.38	0.45	0.55
	Structural Steel	100-150	-	C500, T15	44	63	0.14	0.23	0.29	0.35	0.44	0.50	0.63
		150-250	>24	C500, T15	39	55	0.13	0.22	0.24	0.28	0.38	0.46	0.59
		250-350	24-37	C500, T15	32	41	0.10	0.20	0.22	0.24	0.34	0.40	0.48
	Alloy Steel	125-175	>7	C500, T15	48	63	0.15	0.20	0.24	0.36	0.43	0.47	0.55
175-225		7-20	C500, T15	45	58	0.13	0.20	0.24	0.36	0.42	0.46	0.53	
225-275		20-28	C500, T15	41	56	0.13	0.16	0.23	0.35	0.41	0.44	0.53	
275-325		28-34	C500, T15	39	53	0.09	0.15	0.22	0.28	0.38	0.41	0.51	
325-375		34-40	C500, T15	36	46	0.08	0.15	0.21	0.27	0.38	0.40	0.50	
H	Tool Steel	150-200	>13	C500, T15	25	34	0.09	0.15	0.19	0.25	0.28	0.36	0.41
			13-24	C500, T15	19	26	0.09	0.15	0.19	0.25	0.28	0.36	0.41
	High Strength Alloy	225-300	>32	C500, T15	25	35	0.13	0.18	0.23	0.24	0.36	0.43	0.5
		300-350	32-37	C500, T15	19	27	0.10	0.18	0.23	0.24	0.36	0.43	0.50
		350-400	37-43	C500, T15	16	21	0.08	0.15	0.20	0.22	0.30	0.40	0.46
M	Stainless Steel	135-185	>9	C500, T15	24	34	0.14	0.20	0.23	0.26	0.36	0.41	0.50
		185-275	9-28	C500, T15	20	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46
K	Cast Iron / S.G Iron	120-150	-	C500, T15	52	75	0.16	0.30	0.40	0.49	0.59	0.69	0.78
		150-200	>13	C500, T15	48	70	0.14	0.26	0.35	0.45	0.56	0.64	0.65
		200-220	13-19	C500, T15	42	58	0.14	0.23	0.30	0.41	0.46	0.52	0.60
		220-260	19-26	C500, T15	35	52	0.13	0.17	0.23	0.30	0.36	0.43	0.50
		260-320	26-34	C500, T15	29	41	0.10	0.15	0.16	0.23	0.28	0.35	0.40
S	High Temp Alloy	150-200	>13	C500, T15	9	12	0.08	0.17	0.20	0.24	0.30	0.37	0.39
		220-310	13-24	C500, T15	8	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
N	Aluminium	30	-	C500, T15	187	244	0.19	0.33	0.41	0.50	0.54	0.64	0.72
		180	>8	C500, T15	92	137	0.19	0.33	0.41	0.50	0.54	0.64	0.72

Vc	Cutting speed (m/min)
n	RPM (rev/min)
fn	Feed rate (mm/rev)
Ø	drill diameter (mm)

To calculate RPM from cutting speed: $n = \frac{v_c \cdot 1000}{\pi \cdot \phi}$

To calculate cutting speed from RPM: $v_c = \frac{n \cdot \pi \cdot \phi}{1000}$

P - Steel	H - Hardened Steel	M - Stainless Steel	K - Cast Iron	S - Superalloys & titanium	N - Non-ferrous metals and aluminium
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All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended when using extended length tools.