

Spade Drill Inserts - Flat Bottom



MATERIAL		Material Hardness		Vc (m/min)	fn (mm/rev)			
		Bhn	HRc		TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24
P	Low Carbon Steel	85-125	-	60	0.12	0.18	0.22	0.30
		125-175	>7	58	0.12	0.18	0.22	0.30
		175-225	7-20	55	0.10	0.15	0.19	0.27
		225-275	20-28	53	0.10	0.15	0.19	0.27
	Free Machining Steel	100-150	-	67	0.13	0.18	0.25	0.32
		150-200	>13	65	0.13	0.18	0.25	0.32
		200-250	13-24	58	0.11	0.18	0.25	0.30
	Medium Carbon Steel	125-175	>7	60	0.11	0.18	0.22	0.28
		175-225	7-20	55	0.10	0.15	0.18	0.27
		225-275	20-28	50	0.10	0.15	0.18	0.27
		275-325	28-34	46	0.08	0.14	0.17	0.22
	Structural Steel	100-150	-	50	0.11	0.18	0.23	0.28
		150-250	>24	44	0.10	0.18	0.19	0.22
		250-350	24-37	36	0.08	0.16	0.18	0.19
	Alloy Steel	125-175	>7	50	0.12	0.16	0.19	0.29
		175-225	7-20	46	0.10	0.16	0.19	0.29
225-275		20-28	45	0.10	0.13	0.18	0.28	
275-325		28-34	42	0.07	0.12	0.18	0.22	
325-375		34-40	37	0.06	0.12	0.17	0.22	
H	Tool Steel	150-200	>13	29	0.07	0.12	0.15	0.20
		200-250	13-24	23	0.07	0.12	0.15	0.20
	High Strength Alloy	225-300	>32	28	0.10	0.14	0.18	0.19
		300-350	32-37	22	0.08	0.14	0.18	0.19
		350-400	37-43	18	0.06	0.12	0.16	0.18
M	Stainless Steel	135-185	>9	29	0.12	0.18	0.20	0.23
		185-275	9-28	25	0.09	0.15	0.18	0.22
K	Cast Iron / S.G Iron	120-150	-	66	0.13	0.25	0.35	0.41
		150-200	>13	60	0.12	0.21	0.29	0.40
		200-220	13-19	51	0.12	0.20	0.25	0.36
		220-260	19-26	48	0.10	0.14	0.20	0.25
		260-320	26-34	37	0.10	0.13	0.13	0.20
S	High Temp Alloy	150-200	>13	29	0.07	0.12	0.15	0.20
		220-310	13-24	23	0.07	0.12	0.15	0.20
N	Aluminium	30	-	213	0.17	0.28	0.36	0.43
		180	>8	121	0.17	0.28	0.36	0.41

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

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

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

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.