

Spade Drill Inserts - Carbide



MATERIAL		Material Hardness		CARBIDE GRADE	Vc (m/min)		fn (mm/rev)				
		Bhn	HRc		TiN	TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24	Ø25-35	Ø36-47
P	Low Carbon Steel	85-125	-	P40	94	119	0.20	0.24	0.31	0.42	0.46
		125-175	>7	P40	82	107	0.18	0.24	0.31	0.39	0.43
		175-225	7-20	P40	76	96	0.15	0.22	0.29	0.36	0.40
		225-275	20-28	P40	62	84	0.13	0.22	0.29	0.36	0.40
	Free Machining Steel	100-150	-	P40	101	125	0.18	0.28	0.36	0.44	0.50
		150-200	>13	P40	88	110	0.16	0.26	0.33	0.39	0.45
		200-250	13-24	P40	82	101	0.14	0.23	0.31	0.41	0.42
	Medium Carbon Steel	125-175	>7	P40	82	102	0.17	0.24	0.31	0.37	0.42
		175-225	7-20	P40	75	93	0.15	0.22	0.28	0.36	0.40
		225-275	20-28	P40	66	84	0.15	0.22	0.28	0.36	0.40
		275-325	28-34	P40	56	67	0.13	0.19	0.26	0.33	0.37
	Structural Steel	100-150	-	P40	75	91	0.19	0.26	0.34	0.39	0.43
		150-250	>24	P40	62	75	0.15	0.24	0.29	0.33	0.37
		250-350	24-37	P40	55	73	0.13	0.23	0.27	0.29	0.33
	Alloy Steel	125-175	>7	P40	79	98	0.18	0.25	0.32	0.40	0.45
		175-225	7-20	P40	76	88	0.15	0.23	0.29	0.38	0.42
225-275		20-28	P40	66	81	0.15	0.21	0.28	0.37	0.41	
275-325		28-34	P40	62	78	0.12	0.20	0.27	0.33	0.40	
325-375		34-40	P40	53	64	0.10	0.18	0.23	0.30	0.38	
H	Tool Steel	150-200	>13	P40	50	67	0.09	0.18	0.22	0.28	0.31
		200-250	13-24	P40	37	50	0.09	0.18	0.22	0.28	0.31
	High Strength Alloy	225-300	>32	P40	49	62	0.15	0.23	0.25	0.29	0.38
		300-350	32-37	P40	43	55	0.12	0.20	0.23	0.27	0.35
		350-400	37-43	P40	38	47	0.10	0.18	0.20	0.24	0.30
M	Stainless Steel	135-185	>9	K20	50	62	0.19	0.19	0.21	0.24	-
		185-275	9-28	K20	38	46	0.15	0.17	0.20	0.21	-
K	Cast Iron / S.G Iron	120-150	-	K10, K20	98	137	0.18	0.30	0.37	0.46	-
		150-200	>13	K10, K20	95	125	0.17	0.26	0.32	0.42	-
		200-220	13-19	K10, K20	75	111	0.14	0.23	0.30	0.38	-
		220-260	19-26	K10, K20	66	93	0.13	0.18	0.28	0.33	-
		260-320	26-34	K10, K20	56	79	0.13	0.15	0.23	0.28	-
S	High Temp Alloy	150-200	>13	K20	26	30	0.10	0.17	0.23	0.27	-
		220-310	13-24	K20	20	24	0.10	0.14	0.20	0.24	-
N	Aluminium	30	-	K20	366	427	0.24	0.38	0.45	0.50	-
		180	>8	K20	244	291	0.22	0.33	0.40	0.45	-

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

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

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

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.