



COATED THROW-AWAY SPADE DRILL INSERT SPEED & FEED GUIDELINE

Material	Material Hardness BHN	Insert Substrate	HIGH SPEED STEEL											
			SFM					Feed						
			Coatings					0.375 to 0.500	0.501 to 0.687	0.688 to 0.937	0.938 to 1.375	1.376 to 1.875	1.876 to 2.562	2.563 to 4.500
			M4			T15, M48								
TiN	TiCN	TiAlN	Ultra-TiN	Life-Coat										
Free Machining Steel 1117, 1215, 12L14, etc.	100 - 150	M4 & T15	200	260	280	290	320	0.007	0.010	0.013	0.016	0.020	0.023	0.028
	151 - 200	M4 & T15	180	235	260	270	300	0.007	0.010	0.013	0.016	0.020	0.023	0.028
	201 - 250	M4 & T15	160	210	240	250	280	0.006	0.010	0.013	0.016	0.020	0.023	0.028
Low Carbon Steel 1010, 1020, 1144, etc.	85 - 125	M4 & T15	170	220	250	260	280	0.006	0.009	0.012	0.015	0.019	0.023	0.027
	126 - 175	M4 & T15	160	210	240	250	270	0.006	0.009	0.012	0.015	0.019	0.023	0.027
	176 - 225	M4 & T15	150	195	225	230	250	0.005	0.008	0.010	0.014	0.018	0.021	0.024
Medium Carbon Steel 1040, 1050, 1140, etc.	226 - 275	M4 & T15	140	180	210	220	230	0.005	0.008	0.010	0.014	0.018	0.021	0.024
	125 - 175	M4 & T15	160	210	240	250	270	0.006	0.009	0.012	0.015	0.019	0.023	0.027
	176 - 225	M4 & T15	150	195	225	230	250	0.005	0.008	0.010	0.014	0.018	0.021	0.024
Alloy Steel 4140, 5140, 8620, etc.	226 - 275	M4 & T15	140	180	210	220	230	0.005	0.008	0.010	0.014	0.018	0.021	0.024
	276 - 325	T15 & M48	--	--	--	195	220	0.004	0.007	0.009	0.012	0.016	0.019	-
	326 - 375	T15 & M48	--	--	--	155	170	0.003	0.006	0.009	0.012	0.015	0.017	-
High strength Alloy 4340, 4330V, 300M, etc.	225 - 300	T15 & M48	--	--	--	110	115	0.005	0.007	0.009	0.010	0.014	0.017	-
	301 - 350	T15 & M48	--	--	--	85	90	0.004	0.007	0.009	0.010	0.014	0.017	-
	351 - 400	M48	--	--	--	70	70	0.003	0.006	0.008	0.009	0.012	0.015	-
Structural Steel A36, A285, A526, etc.	100 - 150	M4 & T15	140	180	200	210	210	0.006	0.010	0.012	0.014	0.018	0.021	-
	151 - 250	M4 & T15	120	155	170	180	175	0.005	0.009	0.010	0.012	0.016	0.019	-
	251 - 350	T15 & M48	--	--	--	140	150	0.004	0.008	0.009	0.010	0.014	0.017	-
High Temperature Alloy Hastelloy B, Inconel 600, etc.	140 - 220	T15 & M48	--	--	--	40	40	0.003	0.007	0.008	0.010	0.012	0.015	-
	221 - 310	M48	--	--	--	35	35	0.003	0.006	0.007	0.008	0.010	0.012	-
Stainless Steel 303, 416, 420, 17-4PH, etc.	135 - 185	M4 & T15	75	95	105	110	110	0.006	0.008	0.009	0.011	0.014	0.016	0.020
	186 - 275	M4 & T15	60	80	90	95	95	0.005	0.007	0.008	0.010	0.012	0.014	0.018
Tool Steel H13, H21, A4, etc.	150 - 200	T15	--	--	--	110	115	0.004	0.006	0.008	0.010	0.012	0.015	0.017
	201 - 250	T15 & M48	--	--	--	90	100	0.004	0.006	0.008	0.010	0.012	0.015	-
Aluminum	30	M4 & T15	600	750	850	870	--	0.008	0.013	0.016	0.020	0.022	0.025	0.025
	180	M4 & T15	300	400	450	470	--	0.008	0.013	0.016	0.018	0.022	0.025	0.025
Cast Iron Gray, Ductile, Nodular	120 - 150	M4 & T15	170	220	250	260	270	0.007	0.012	0.016	0.020	0.024	0.027	0.030
	151 - 200	M4 & T15	150	195	225	230	250	0.006	0.011	0.014	0.018	0.022	0.025	0.028
	201 - 220	M4 & T15	130	170	195	200	215	0.006	0.009	0.012	0.016	0.018	0.021	0.024
	221 - 260	T15 & M48	--	--	--	165	175	0.005	0.007	0.009	0.012	0.014	0.017	-
	261 - 320	T15 & M48	--	--	--	135	145	0.004	0.006	0.007	0.009	0.012	0.014	-

- These speeds and feeds are offered as guidelines. Equipment, horsepower, rigidity, fixturing, coolant volume and pressure, and material conditions will affect results.
- Overall conditions may require adjustment, up or down, to achieve the best performance.
- When using extended length toolholders reduce the speeds and feeds as depths increase.



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Material	Material Hardness BHN	Insert Substrate	CARBIDE						
			SFM		Feed				
			Coatings		0.375 to 0.500	0.501 to 0.687	0.688 to 0.937	0.938 to 1.375	1.376 to 1.875
			Ultra-TiN	Life-Coat					
Free Machining Steel 1117, 1215, 12L14, etc.	100 - 150	K20	420	470	0.008	0.012	0.015	0.018	0.021
	151 - 200	K20	360	410	0.007	0.011	0.014	0.016	0.019
	201 - 250	K20	340	380	0.006	0.010	0.013	0.015	0.017
Low Carbon Steel 1010, 1020, 1144, etc.	85 - 125	K20	390	440	0.008	0.010	0.013	0.017	0.019
	126 - 175	K20	340	380	0.007	0.010	0.013	0.016	0.018
	176 - 225	K20	310	350	0.006	0.009	0.012	0.015	0.017
Medium Carbon Steel 1040, 1050, 1140, etc.	226 - 275	K20	270	300	0.005	0.009	0.012	0.015	0.017
	125 - 175	K20	340	380	0.007	0.010	0.013	0.016	0.018
	176 - 225	K20	310	350	0.006	0.009	0.012	0.015	0.017
Alloy Steel 4140, 5140, 8620, etc.	226 - 275	K20	270	300	0.006	0.009	0.012	0.015	0.017
	276 - 325	K20	230	260	0.005	0.008	0.011	0.014	0.016
	276 - 325	K20	250	270	0.005	0.008	0.011	0.014	0.016
High strength Alloy 4340, 4330V, 300M, etc.	326 - 375	K20	220	240	0.004	0.007	0.010	0.013	0.015
	225 - 300	K20	200	210	0.006	0.009	0.010	0.012	0.015
	301 - 350	K20	180	190	0.005	0.008	0.009	0.011	0.014
Structural Steel A36, A285, A526, etc.	351 - 400	K20	160	170	0.004	0.007	0.008	0.010	0.012
	100 - 150	K20	310	330	0.008	0.011	0.014	0.016	0.018
	151 - 250	K20	250	260	0.006	0.010	0.012	0.014	0.016
High Temperature Alloy Hastelloy B, Inconel 600, etc.	251 - 350	K20	230	240	0.005	0.009	0.011	0.012	0.014
	140 - 220	K20	105	110	0.004	0.007	0.009	0.011	0.013
	221 - 310	K20	85	90	0.004	0.006	0.008	0.010	0.012
Stainless Steel 303, 416, 420, 17-4PH, etc.	135 - 185	K20	210	220	0.007	0.009	0.012	0.014	0.016
	186 - 275	K20	160	170	0.006	0.008	0.011	0.012	0.014
Tool Steel H13, H21, A4, etc.	150 - 200	K20	220	230	0.004	0.007	0.009	0.011	0.013
	201 - 250	K20	170	180	0.004	0.007	0.009	0.011	0.013
Aluminum	30	K20	1500	--	0.010	0.015	0.018	0.020	0.022
	180	K20	1000	--	0.009	0.013	0.016	0.018	0.020
Cast Iron Gray, Ductile, Nodular	120 - 150	K20	460	475	0.008	0.012	0.015	0.019	0.023
	151 - 200	K20	400	455	0.007	0.011	0.013	0.017	0.021
	201 - 220	K20	360	410	0.006	0.009	0.012	0.015	0.018
	221 - 260	K20	310	340	0.005	0.008	0.011	0.013	0.015
	261 - 320	K20	270	325	0.004	0.007	0.010	0.011	0.013

SPADE BLADES & HOLDERS

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