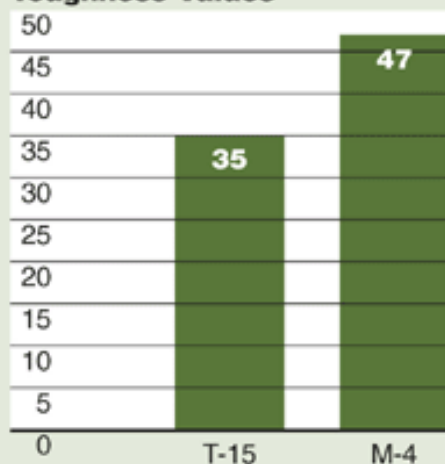
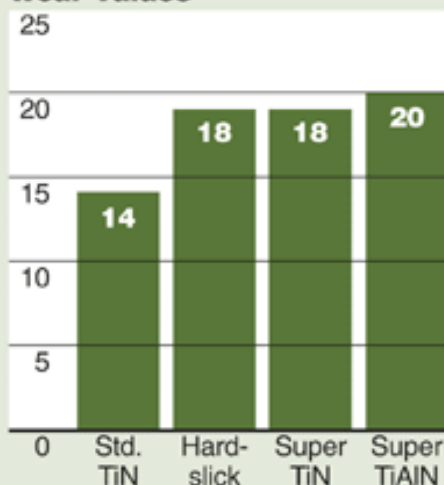


SPADE DRILL SELECTION & APPLICATIONS HSS

Toughness Values



Wear Values



• WHEN TO USE M-4

- Loose Machines
- Manual Machines
- If T-15 Breaks
- Cross Hole Drilling

• WHEN TO USE T-15

- On CNC Machines
- When M-4 Life needs to be Extended
- Abrasive Drilling

• WHEN TO USE HARDSLICK

- Soft Gummy Material
- When Torque needs to be Lowered
- When Slow SFM causes Chip Welding (Screw Machines)

SPEEDS – FEEDS AND COATING RECOMMENDATIONS HSS

Material	Material Hardness (BHN)	Coating ⊕ Super TiN ⊗ Super TiAlN ⊗ Hardslick	SFM Surface Footage	Feed (IPR)						
				3/8" to 1/2"	33/64" to 11/16"	45/64" to 15/16"	31/32" to 1-3/8"	1-13/32" to 1-7/8"	1-29/32" to 2-9/16"	2-19/32" to 4-1/2"
Free Machining Steel 1118, 1215, 12L14, etc.	100 - 150	⊗ ⊕	280	.007	.010	.013	.016	.020	.023	.028
	150 - 200		260	.007	.010	.013	.016	.020	.023	.028
	200 - 250		240	.007	.010	.013	.016	.020	.023	.028
Low & Medium Carbon Steel 1018, 1040, 1140, etc.	125 - 175	◆ ⊗ ⊕	240	.006	.009	.012	.015	.019	.023	.027
	175 - 225		225	.005	.008	.010	.014	.018	.021	.024
	225 - 275		210	.005	.008	.010	.014	.018	.021	.024
	275 - 325		195	.004	.007	.009	.012	.016	.019	.022
Alloy Steel 4140, 5140, 8640, etc.	125 - 175	⊗ ⊕	210	.006	.008	.010	.014	.017	.019	.022
	175 - 225		195	.005	.008	.010	.014	.017	.019	.022
	225 - 275		180	.005	.007	.010	.014	.017	.019	.022
	275 - 325		170	.004	.006	.009	.012	.015	.017	.020
	325 - 375		155	.003	.006	.009	.012	.015	.017	.020
High Strength Alloy Steel 4340, 4330V, 300M, etc.	225 - 300	⊗	110	.005	.007	.009	.010	.014	.017	.020
	300 - 350		85	.004	.007	.009	.010	.014	.017	.020
	350 - 400		70	.003	.006	.008	.009	.012	.015	.018
Structural Steel A36, A285, A516, etc.	100 - 150	⊕	200	.006	.010	.012	.014	.018	.021	.026
	150 - 250		170	.005	.009	.010	.012	.016	.019	.024
	250 - 350		140	.004	.008	.009	.010	.014	.017	.020
High Temp. Alloy Hastelloy B, Inconel 600, etc.	140 - 220	◆ ⊗ ⊕	40	.003	.006	.007	.008	.010	.012	.015
	220 - 310		35	.003	.006	.007	.008	.010	.012	.015
Stainless Steel 303, 416, 420, 17-4 PH, etc.	135 - 185	⊗	105	.006	.008	.009	.011	.014	.016	.020
	185 - 275		90	.005	.007	.008	.010	.012	.014	.018
Tool Steel H-13, H021, A04, O-2, S-3, etc.	150 - 200	⊗	110	.004	.006	.008	.010	.012	.015	.017
	200 - 250		90	.004	.006	.008	.010	.012	.015	.017
Aluminum	30	⊗	850	.008	.013	.016	.020	.022	.025	.025
	180		450	.008	.013	.016	.018	.022	.025	.025
Cast Iron Gray, Ductile, Nodular	120 - 150	⊗	250	.007	.012	.016	.020	.024	.027	.030
	150 - 200		225	.006	.011	.014	.018	.022	.025	.028
	200 - 220		195	.006	.009	.012	.016	.018	.021	.024
	220 - 260		165	.005	.007	.009	.012	.014	.017	.020
	260 - 320		135	.004	.006	.007	.009	.012	.014	.016

◆ On many materials two or sometimes all three coatings will interchange with excellent performance. All three are stocked.