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Material Group		Cutting Speed — vc Range — SFM			Recommended Feed Rate (f) by Diameter										
		min	–	max	Tool Diameter (inch)	.0469–3/64	.0781–5/64	.125–1/8	.188–3/16	.250–1/4	.313–5/16	.375–3/8	.500–1/2	.625–5/8	.750–3/4
P	1	200	–	330	IPR	.002–.004	.002–.005	.003–.006	.003–.006	.004–.009	.005–.010	.006–.012	.007–.014	.009–.017	.011–.021
	2, 3, 4, 6, 7	160	–	300	IPR	.002–.004	.002–.005	.003–.006	.004–.007	.005–.009	.006–.011	.007–.013	.009–.015	.010–.018	.013–.023
	5, 9, 10, 11	160	–	330	IPR	.002–.004	.002–.005	.003–.006	.003–.007	.005–.009	.006–.011	.007–.013	.007–.015	.009–.018	.011–.023
	12, 13	100	–	200	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.006	.004–.007	.005–.009	.005–.010	.007–.012	.009–.016
M	14.1	100	–	160	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.004–.005	.004–.006	.005–.006	.006–.007	.006–.008
	14.3	130	–	200	IPR	.001–.002	.001–.003	.002–.003	.002–.004	.003–.005	.004–.006	.004–.006	.005–.007	.006–.008	.006–.009
	14.2, 14.4	100	–	160	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.004–.005	.004–.006	.005–.006	.006–.007	.006–.008
K	15, 16	230	–	490	IPR	.003–.005	.003–.005	.003–.007	.004–.008	.005–.010	.006–.012	.007–.014	.008–.015	.010–.019	.012–.023
	17, 18, 19	300	–	390	IPR	.003–.004	.003–.005	.004–.005	.004–.006	.005–.008	.006–.010	.007–.011	.008–.013	.010–.015	.012–.019
	20	260	–	390	IPR	.002–.004	.002–.005	.003–.005	.003–.006	.004–.008	.004–.009	.005–.011	.006–.013	.008–.015	.009–.019
N	21	300	–	890	IPR	.002–.005	.003–.005	.003–.006	.004–.006	.005–.008	.006–.009	.008–.011	.009–.013	.011–.016	.013–.019
	22, 23, 24	300	–	890	IPR	.002–.003	.003–.005	.003–.006	.004–.008	.005–.009	.006–.011	.008–.013	.009–.014	.011–.017	.013–.020
	25	300	–	740	IPR	.004–.005	.004–.005	.005–.006	.005–.006	.006–.008	.006–.009	.008–.011	.009–.013	.011–.016	.013–.017
	26, 27, 28	300	–	890	IPR	.002–.003	.003–.005	.003–.006	.004–.008	.005–.009	.006–.011	.008–.013	.009–.014	.011–.016	.013–.019
S	31, 32	70	–	100	IPR	.001–.002	.001–.002	.001–.002	.002–.003	.002–.004	.003–.005	.004–.005	.004–.006	.005–.006	.006–.007
	33, 34, 35	30	–	100	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.003–.004	.003–.004	.004–.005	.004–.006	.004–.006
	36	70	–	130	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.003–.004	.004–.005	.004–.006
	37	70	–	160	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.003–.004	.003–.004	.004–.005	.004–.006	.004–.006

Inch tolerance

nominal size range	D1 tolerance	D tolerance h6
.0394–.1181	.0000/-.0006 (h8)	.0000/-.0002
>.1181–.2362	.0000/-.0005 (h7)	.0000/-.0003
>.2362–.3937	.0000/-.0006 (h7)	.0000/-.0004
>.3937–.7087	.0000/-.0007 (h7)	.0000/-.0004
>.7087–.7874	.0000/-.0008 (h7)	.0000/-.0005

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Material Group		Cutting Speed — vc Range — SFM			Recommended Feed Rate (f) by Diameter									
		min	–	max	Tool Diameter (inch)	.0469–3/64	.0781–5/64	.125–1/8	.188–3/16	.250–1/4	.313–5/16	.375–3/8	.500–1/2	.625–5/8	.750–3/4
P	1	230	–	460	IPR	.002–.004	.002–.005	.003–.006	.003–.006	.004–.009	.005–.010	.006–.012	.007–.014	.009–.017	.011–.021
	2, 3, 4, 6, 7	200	–	330	IPR	.002–.004	.002–.005	.003–.006	.004–.007	.005–.009	.006–.011	.007–.013	.009–.015	.010–.018	.013–.023
	5, 9, 10, 11	160	–	330	IPR	.002–.004	.002–.005	.003–.006	.003–.007	.005–.009	.006–.011	.007–.013	.007–.015	.009–.018	.011–.023
	12, 13	130	–	230	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.006	.004–.007	.005–.009	.005–.010	.007–.012	.009–.016
M	14.1	100	–	160	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.004–.005	.004–.006	.005–.006	.006–.007	.006–.008
	14.3	130	–	200	IPR	.001–.002	.001–.003	.002–.003	.002–.004	.003–.005	.004–.006	.004–.006	.005–.007	.006–.008	.006–.009
	14.2, 14.4	100	–	160	IPR	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.004–.005	.004–.006	.005–.006	.006–.007	.006–.008
K	15, 16	260	–	520	IPR	.003–.006	.003–.006	.004–.008	.004–.009	.006–.011	.007–.013	.008–.016	.009–.017	.011–.021	.013–.026
	17, 18, 19	290	–	460	IPR	.004–.005	.004–.005	.004–.006	.005–.007	.006–.009	.007–.011	.008–.013	.009–.014	.011–.017	.013–.021
	20	260	–	430	IPR	.002–.005	.002–.005	.003–.006	.003–.007	.004–.009	.005–.011	.006–.012	.007–.014	.009–.017	.011–.021
N	21	290	–	1030	IPR	.002–.005	.003–.005	.003–.006	.004–.006	.005–.008	.006–.009	.008–.011	.009–.013	.011–.016	.013–.019
	22, 23, 24	290	–	890	IPR	.002–.003	.003–.005	.003–.006	.004–.008	.005–.009	.006–.011	.008–.013	.009–.014	.011–.017	.013–.020
	25	290	–	890	IPR	.004–.005	.004–.005	.005–.006	.005–.006	.006–.008	.006–.009	.008–.011	.009–.013	.011–.016	.013–.017
	26, 27, 28	290	–	890	IPR	.002–.003	.003–.005	.003–.006	.004–.008	.005–.009	.006–.011	.008–.013	.009–.014	.011–.016	.013–.019
S	31, 32	70	–	100	IPR	.001–.002	.001–.002	.001–.002	.002–.003	.002–.004	.003–.005	.004–.005	.004–.006	.005–.006	.006–.007
	33, 34, 35	30	–	100	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.003–.004	.003–.004	.004–.005	.004–.006	.004–.006
	36	30	–	130	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.002–.004	.003–.004	.003–.004	.004–.005	.004–.006
	37	30	–	130	IPR	.001	.001	.001–.002	.001–.002	.002–.003	.003–.004	.003–.004	.004–.005	.004–.006	.004–.006

Solid Carbide Drills

	Inch tolerance	
nominal size range	D1 tolerance	D tolerance h6
.0394–.1181	.0000/-.0006 (h8)	.0000/-.0002
>.1181–.2362	.0000/-.0005 (h7)	.0000/-.0003
>.2362–.3937	.0000/-.0006 (h7)	.0000/-.0004
>.3937–.7087	.0000/-.0007 (h7)	.0000/-.0004
>.7087–.7874	.0000/-.0008 (h7)	.0000/-.0005

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Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate (f) by Diameter									
		min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	60	–	100	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2, 3, 4, 6, 7	50	–	90	mm/r	0,05–0,10	0,06–0,13	0,08–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	5, 9, 10, 11	50	–	100	mm/r	0,05–0,10	0,06–0,13	0,07–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	12, 13	30	–	60	mm/r	0,03–0,05	0,04–0,06	0,05–0,08	0,06–0,10	0,08–0,14	0,10–0,18	0,13–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	14.1	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	14.3	40	–	60	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	14.2, 14.4	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	15, 16	70	–	150	mm/r	0,06–0,13	0,07–0,14	0,09–0,18	0,10–0,19	0,13–0,25	0,16–0,30	0,18–0,35	0,20–0,39	0,25–0,48	0,30–0,59
	17, 18, 19	90	–	120	mm/r	0,08–0,11	0,09–0,12	0,10–0,13	0,10–0,15	0,13–0,20	0,16–0,25	0,18–0,29	0,20–0,32	0,25–0,38	0,30–0,48
	20	80	–	120	mm/r	0,04–0,10	0,06–0,12	0,06–0,14	0,07–0,15	0,10–0,20	0,11–0,24	0,14–0,28	0,15–0,32	0,19–0,38	0,24–0,48
N	21	90	–	270	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	22, 23, 24	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	25	90	–	225	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	26, 27, 28	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	31, 32	20	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	33, 34, 35	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	36	20	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	37	20	–	50	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

Metric tolerance

nominal size range	D1 tolerance	D tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013

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Material Group		Cutting Speed — vc Range — m/min			Recommended Feed Rate (f) by Diameter									
		min	–	max	Tool Diameter (mm)	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	70	–	140	mm/r	0,04–0,09	0,05–0,12	0,07–0,14	0,08–0,16	0,11–0,22	0,13–0,26	0,15–0,31	0,18–0,35	0,22–0,42	0,28–0,54
	2, 3, 4, 6, 7	60	–	100	mm/r	0,05–0,10	0,06–0,13	0,08–0,15	0,09–0,17	0,13–0,23	0,15–0,28	0,19–0,33	0,22–0,38	0,26–0,47	0,34–0,59
	5, 9, 10, 11	50	–	100	mm/r	0,05–0,10	0,06–0,13	0,07–0,15	0,08–0,17	0,12–0,23	0,14–0,28	0,17–0,33	0,19–0,38	0,23–0,47	0,29–0,59
	12, 13	40	–	70	mm/r	0,03–0,05	0,04–0,06	0,05–0,08	0,06–0,10	0,08–0,14	0,10–0,18	0,13–0,22	0,14–0,24	0,18–0,32	0,23–0,41
M	14.1	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,05–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
	14.3	40	–	60	mm/r	0,02–0,06	0,03–0,07	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,14	0,10–0,16	0,12–0,18	0,14–0,20	0,16–0,22
	14.2, 14.4	30	–	50	mm/r	0,02–0,05	0,03–0,06	0,04–0,07	0,06–0,09	0,08–0,11	0,09–0,12	0,10–0,14	0,12–0,16	0,14–0,18	0,16–0,20
K	15, 16	80	–	160	mm/r	0,07–0,14	0,08–0,15	0,10–0,20	0,11–0,22	0,14–0,28	0,18–0,34	0,21–0,40	0,23–0,44	0,28–0,54	0,34–0,67
	17, 18, 19	90	–	140	mm/r	0,09–0,13	0,10–0,14	0,11–0,14	0,12–0,17	0,14–0,23	0,18–0,28	0,21–0,32	0,23–0,36	0,28–0,43	0,34–0,54
	20	80	–	130	mm/r	0,05–0,12	0,06–0,14	0,07–0,15	0,08–0,17	0,11–0,23	0,13–0,27	0,15–0,32	0,17–0,36	0,22–0,43	0,27–0,54
N	21	90	–	315	mm/r	0,05–0,12	0,06–0,13	0,08–0,14	0,10–0,16	0,12–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,48
	22, 23, 24	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,44	0,32–0,52
	25	90	–	270	mm/r	0,10–0,13	0,11–0,14	0,12–0,14	0,13–0,16	0,14–0,20	0,16–0,24	0,20–0,28	0,24–0,32	0,28–0,40	0,32–0,44
	26, 27, 28	90	–	270	mm/r	0,04–0,08	0,06–0,12	0,08–0,16	0,10–0,20	0,12–0,24	0,16–0,28	0,20–0,32	0,24–0,36	0,28–0,40	0,32–0,48
S	31, 32	20	–	30	mm/r	0,01–0,04	0,02–0,05	0,03–0,06	0,04–0,08	0,06–0,10	0,08–0,12	0,09–0,13	0,10–0,14	0,12–0,16	0,14–0,18
	33, 34, 35	10	–	30	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16
	36	10	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,02–0,05	0,04–0,07	0,06–0,09	0,07–0,10	0,08–0,11	0,09–0,13	0,10–0,15
	37	10	–	40	mm/r	0,01–0,03	0,02–0,03	0,02–0,04	0,03–0,06	0,05–0,08	0,07–0,10	0,08–0,11	0,09–0,12	0,10–0,14	0,11–0,16

	Metric tolerance	
nominal size range	D1 tolerance	D tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013