

## Cutting Conditions

### • SG-ESR Drills L7574P



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Work Material Drilling Condition	Structural Steels Carbon Steels SS400, S50C (~200HB)		Alloy Steels SCM Pre-Hardened Steels SCM440 NAK HPM (20-30HRC)		Mold Steels Hardened Steels SKD61 NAK HPM (30-40HRC)		Stainless Steels SUS304 SUS316		Cast Irons FC250 FCD400		Aluminium Alloys Copper Alloys A5052 C1100		Nickel Alloys Titanium Alloys (30-40HRC)	
	Drill Dia. (mm)	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>
2	5700	300	4600	200	3200	120	1600	55	6300	410	9700	630	800	23
3	4200	380	3400	260	2100	120	1100	60	4700	530	7200	820	530	25
5	2500	360	2000	240	1250	120	760	75	2800	500	4300	770	320	23
8	1600	310	1300	210	800	115	480	80	1800	440	2700	660	200	22
10	1300	280	1000	190	650	110	380	80	1400	390	2200	610	160	22
12	1100	260	850	180	530	105	320	80	1200	360	1800	560	130	21
16	800	240	640	160	400	100	240	70	880	330	1400	500	100	20
20	640	220	510	150	320	90	190	60	700	300	1100	460	80	19
25	510	200	410	140	250	80	150	50	560	270	870	420	64	18
32	400	150	320	110	200	65	120	45	440	210	680	330	50	15

#### Warnings on using the drilling condition tables

- 1) Adjust drilling condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water soluble cutting fluid.
- 3) Provide suffice amount cutting fluid to the cutting point and in the flute.
- 4) Reduce RPM and feed speeds by 20% for holes deeper than 3D.
- 5) When for hole depth more then 3xD deep, add step feed. However, a work material and drilling condition to chip removal may be worse. In that case, add A even if drilling depth 3xD is as follows.
- 6) When for stainless drilling, add step feeding.
- 7) In step feed, return to the entrance hole.
- 8) Step feed interval is about 0.5-1xD. In small diameter, about 0.2-0.5xD.
- 9) Use a collet chuck, milling chuck.

## Cutting Conditions

### Standard Drilling Condition for Coated HSS Drills

#### • AG-SUS Drill Regular L6594P



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Work Material Drilling Condition	Austenitic Stainless Steels SUS304, SUS316		Austenitic Stainless Steels SUS304N		Martensitic Stainless Steels SUS420, SUS440		Ferritic Stainless Steels SUS405, SUS430		Structural Steels Low Carbon Steels SS400, S15C	
	Drill Dia. (mm)	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>
1	4800	100	3800	70	5700	110	6400	130	11000	220
2	2400	110	1900	80	2900	130	3200	140	5600	250
3	1600	120	1300	90	1900	140	2100	160	3700	280
5	960	120	760	80	1100	140	1300	160	2200	280
8	600	120	480	80	720	140	800	160	1400	280
10	480	120	380	80	570	140	640	160	1100	280
12	400	120	320	80	480	140	530	160	930	280
16	300	110	240	80	360	130	400	140	700	250
20	240	100	190	70	290	120	320	130	560	220

- 1) The table values are for drilling with water soluble cutting fluid.
- 2) In horizontal machine or in drilling of deep hole which depth is over 3 times of drill diamter, use step feed.
- 3) Reduce rotation and feed by 20% of table values in drilling rolled surface or surface as forged.
- 4) Adjust drilling condition when unusual vibration, different sound occur by cutting.

#### • G Non-Step Straight Shank Long Drills L6550P

Work Material Drilling Condition	Structural Steels Carbon Steels		Alloy Steels Pre-Hardened Steels		Mold Steels Stainless Steels Hardened Steels (~40HRC)		Cast Irons FC, FCD		Aluminium Alloys Nonferrous Metals	
	Drill Dia. (mm)	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>
1	3600	70	2100	30	1400	20	3600	72	12000	280
2	2100	80	1300	40	860	25	2100	100	7300	330
3	1800	110	1070	50	720	30	1800	130	5400	430
5	1300	130	770	60	520	40	1300	160	3200	400
8	900	150	540	65	360	40	900	180	2000	340
10	720	150	430	65	290	40	720	180	1600	310
13	550	140	330	65	220	40	550	170	1200	260

#### Attention on using drilling condition tables

- 1) Utilize the standard drilling condition shown in the catalogs just as the general guide, when starting operation.
- 2) Adjust drilling condition when unusual vibration, different sound occur by cutting.
- 3) When using low speed machines, use the maximum speed and adjust the feed rate.