

NACHI

SG Drill Series

High Performance PM-HSS Drills



SG Drill Series



High performance PM-HSS Drills

- The combination of Powder Metal HSS and SG Coating provides the longest tool life in HSS coated drills.
- Ideal point and flute geometry with high accuracy will realize stable drilling and excellent hole position.
- High efficient machining by high speed and high feed drilling.



SG-ESS 3D



Smooth entering with excellent hole positioning.
New Sizes: 0.5~0.99 mm in 1/100 each.
From 0.5~20.0 mm 635 sizes as standard stock.

SG-ESR 5D **NEW!**



Improved chip dividing and chip evacuation.
Applicable to wide range of material in 1 drill.
From 2.0~32.0 mm 149 sizes as standard stock.

SG-coating



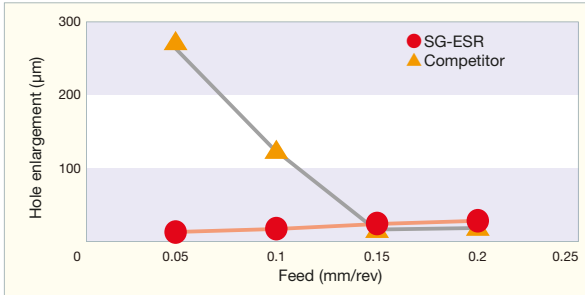
Drilling performance of SG-ESS micro sizes

Dia.	C50	SUS304(1.4301)
0.5 mm	<p>Speed: 25 m/min Feed: 360 mm (0.02 mm/rev) Cutting Depth: 1.5 mm Blind Hole Cutting Fluid: Water Soluble</p>	<p>Speed: 8 m/min Feed: 51 mm (0.01 mm/rev) Cutting Depth: 1.5 mm Blind Hole, 0.25 mm step Cutting Fluid: Water Soluble</p>
0.99 mm	<p>Speed: 25 m/min Feed: 360 mm (0.02 mm/rev) Cutting Depth: 1.5 mm Blind Hole Cutting Fluid: Water Soluble</p>	<p>Speed: 10 m/min Feed: 64 mm (0.02 mm/rev) Cutting Depth: 3 mm Blind Hole, 0.25 mm step Cutting Fluid: Water Soluble</p>

Because of high rigidity design concept, wide ranges of work material are applicable.

SG-ESS 0.5 mm
SUS304(1.4301)

Stable drilling in various feed rate



Hole enlargement under 30 µm

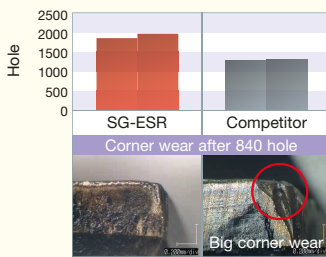
Cutting conditions

Dia.: 6 mm
 Speed: 40 m/min
 Work Material: C50(180HB)
 Cutting Depth: 19 mm Through Hole
 Cutting Fluid: Water Soluble



SG-ESR applicable to wide work material

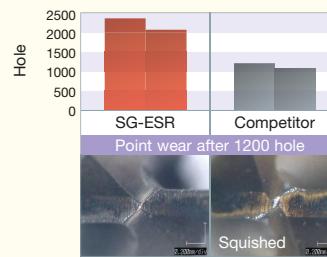
C50 Carbon Steel Drilling



Cutting conditions

Dia.: 6 mm
 Speed: 40 m/min
 Feed: 420 mm (0.2 mm/rev)
 Work Material: C50
 Cutting Depth: 19 mm Through Hole
 Cutting Fluid: Water Soluble

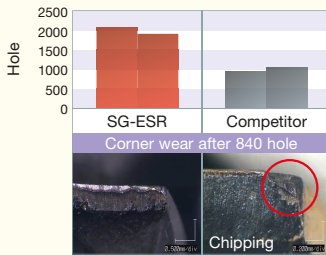
Alloy Steel 42CrMo4(SCM440H) Drilling



Cutting conditions

Dia.: 2 mm
 Speed: 28 m/min
 Feed: 400 mm (0.09 mm/rev)
 Work Material: 42CrMo4(32HRC)
 Cutting Depth: 6 mm Blind Hole
 Cutting Fluid: Water Soluble

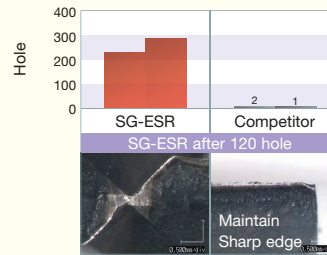
Structure Steel ST37-2(SS400) Drilling



Cutting conditions

Dia.: 6 mm
 Speed: 40 m/min
 Feed: 400 mm (0.19 mm/rev)
 Work Material: ST-37-2
 Cutting Depth: 19 mm Through Hole
 Cutting Fluid: Water Soluble

Stainless Steel SUS304(1.4301) Drilling

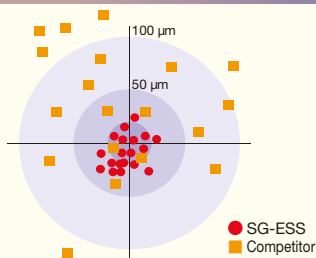


Cutting conditions

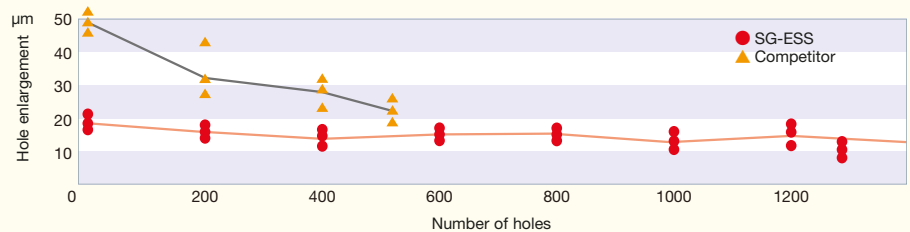
Dia.: 12 mm
 Speed: 12 m/min
 Feed: 80 mm (0.25 mm/rev)
 Work Material: SUS304(1.4301)
 Cutting Depth: 28 mm Through Hole
 Cutting Fluid: Water Soluble

High-accuracy drilling

Hole positioning accuracy



Hole enlargement



Applicable work materials

Product	Structural Steels	Carbon Steels	Pre-Hardened Steels Alloy Steels	Hardened Steels Mold Steels	Hardened Steels		Stainless Steels		Titanium Alloys Nickel Alloys	Cast Irons	Aluminum Alloys	Copper Alloys
	ST-37-2	C45/C50	SCR/NAK	30~40HRC	40~50HRC	50~65HRC	Austenitic SUS304/316	Martensitic SUS420		GG/GGG	Al/ADC	Cu
SGESS	○	○	○	○	×	×	○	○	○	○	○	○
SGESR	○	○	○	○	×	×	○	○	○	○	○	○

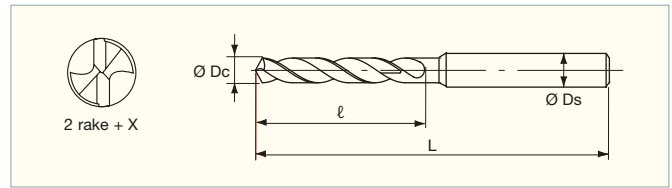
SGESR 5D



List 7574

Code	Dc	ℓ	L	Ds	Stock
SGESR2.0	2.0	24	56	3	●
SGESR2.1	2.1	24	56	3	●
SGESR2.2	2.2	25	56	3	●
SGESR2.3	2.3	25	56	3	●
SGESR2.4	2.4	30	61	3	●
SGESR2.5	2.5	30	61	3	●
SGESR2.6	2.6	30	61	3	●
SGESR2.7	2.7	33	64	3	●
SGESR2.8	2.8	33	64	3	●
SGESR2.9	2.9	33	64	3	●
SGESR3.0	3.0	33	64	3	●
SGESR3.1	3.1	36	68	4	●
SGESR3.2	3.2	36	68	4	●
SGESR3.3	3.3	36	68	4	●
SGESR3.4	3.4	39	71	4	●
SGESR3.5	3.5	39	71	4	●
SGESR3.6	3.6	39	71	4	●
SGESR3.7	3.7	39	71	4	●
SGESR3.8	3.8	43	75	4	●
SGESR3.9	3.9	43	75	4	●
SGESR4.0	4.0	43	75	4	●
SGESR4.1	4.1	43	85	6	●
SGESR4.2	4.2	43	85	6	●
SGESR4.3	4.3	47	89	6	●
SGESR4.4	4.4	47	89	6	●
SGESR4.5	4.5	47	89	6	●
SGESR4.6	4.6	47	89	6	●
SGESR4.7	4.7	47	89	6	●
SGESR4.8	4.8	52	94	6	●
SGESR4.9	4.9	52	94	6	●
SGESR5.0	5.0	52	94	6	●
SGESR5.1	5.1	52	94	6	●
SGESR5.2	5.2	52	94	6	●
SGESR5.3	5.3	52	94	6	●
SGESR5.4	5.4	57	99	6	●
SGESR5.5	5.5	57	99	6	●
SGESR5.6	5.6	57	99	6	●
SGESR5.7	5.7	57	99	6	●
SGESR5.8	5.8	57	99	6	●
SGESR5.9	5.9	57	99	6	●
SGESR6.0	6.0	57	99	6	●
SGESR6.1	6.1	63	107	8	●
SGESR6.2	6.2	63	107	8	●
SGESR6.3	6.3	63	107	8	●
SGESR6.4	6.4	63	107	8	●
SGESR6.5	6.5	63	107	8	●
SGESR6.6	6.6	63	107	8	●
SGESR6.7	6.7	63	107	8	●
SGESR6.8	6.8	69	113	8	●
SGESR6.9	6.9	69	113	8	●
SGESR7.0	7.0	69	113	8	●

Code	Dc	ℓ	L	Ds	Stock
SGESR7.1	7.1	69	113	8	●
SGESR7.2	7.2	69	113	8	●
SGESR7.3	7.3	69	113	8	●
SGESR7.4	7.4	69	113	8	●
SGESR7.5	7.5	69	113	8	●
SGESR7.6	7.6	75	119	8	●
SGESR7.7	7.7	75	119	8	●
SGESR7.8	7.8	75	119	8	●
SGESR7.9	7.9	75	119	8	●
SGESR8.0	8.0	75	119	8	●
SGESR8.1	8.1	75	125	10	●
SGESR8.2	8.2	75	125	10	●
SGESR8.3	8.3	75	125	10	●
SGESR8.4	8.4	75	125	10	●
SGESR8.5	8.5	75	125	10	●
SGESR8.6	8.6	81	131	10	●
SGESR8.7	8.7	81	131	10	●
SGESR8.8	8.8	81	131	10	●
SGESR8.9	8.9	81	131	10	●
SGESR9.0	9.0	81	131	10	●
SGESR9.1	9.1	81	131	10	●
SGESR9.2	9.2	81	131	10	●
SGESR9.3	9.3	81	131	10	●
SGESR9.4	9.4	81	131	10	●
SGESR9.5	9.5	81	131	10	●
SGESR9.6	9.6	87	137	10	●
SGESR9.7	9.7	87	137	10	●
SGESR9.8	9.8	87	137	10	●
SGESR9.9	9.9	87	137	10	●
SGESR10.0	10.0	87	137	10	●
SGESR10.1	10.1	87	144	12	●
SGESR10.2	10.2	87	144	12	●
SGESR10.3	10.3	87	144	12	●
SGESR10.4	10.4	87	144	12	●
SGESR10.5	10.5	87	144	12	●
SGESR10.6	10.6	87	144	12	●
SGESR10.7	10.7	94	151	12	●
SGESR10.8	10.8	94	151	12	●
SGESR10.9	10.9	94	151	12	●
SGESR11.0	11.0	94	151	12	●
SGESR11.1	11.1	94	151	12	●
SGESR11.2	11.2	94	151	12	●
SGESR11.3	11.3	94	151	12	●
SGESR11.4	11.4	94	151	12	●
SGESR11.5	11.5	94	151	12	●
SGESR11.6	11.6	94	151	12	●
SGESR11.7	11.7	94	151	12	●
SGESR11.8	11.8	94	151	12	●
SGESR11.9	11.9	101	158	12	●
SGESR12.0	12.0	101	158	12	●
SGESR12.1	12.1	101	158	12	●



List 7574

Code	Dc	ℓ	L	Ds	Stock
SGESR12.2	12.2	101	158	12	●
SGESR12.3	12.3	101	158	12	●
SGESR12.4	12.4	101	158	12	●
SGESR12.5	12.5	101	158	12	●
SGESR12.6	12.6	101	158	12	●
SGESR12.7	12.7	101	158	12	●
SGESR12.8	12.8	101	158	12	●
SGESR12.9	12.9	101	158	12	●
SGESR13.0	13.0	101	158	12	●
SGESR13.5	13.5	108	168	16	●
SGESR14.0	14.0	108	168	16	●
SGESR14.5	14.5	114	173	16	●
SGESR15.0	15.0	114	180	20	●
SGESR15.5	15.5	120	185	20	●
SGESR16.0	16.0	120	185	20	●
SGESR16.5	16.5	125	189	20	●
SGESR17.0	17.0	125	189	20	●
SGESR17.5	17.5	130	194	20	●
SGESR18.0	18.0	130	194	20	●
SGESR18.5	18.5	135	198	20	●
SGESR19.0	19.0	135	206	25	●
SGESR19.5	19.5	140	210	25	●
SGESR20.0	20.0	140	210	25	●
SGESR20.5	20.5	145	214	25	●

Code	Dc	ℓ	L	Ds	Stock
SGESR21.0	21.0	145	214	25	●
SGESR21.5	21.5	150	218	25	●
SGESR22.0	22.0	150	218	25	●
SGESR22.5	22.5	155	223	25	●
SGESR23.0	23.0	155	223	25	●
SGESR23.5	23.5	155	223	25	●
SGESR24.0	24.0	160	237	32	●
SGESR24.5	24.5	160	237	32	●
SGESR25.0	25.0	165	241	32	●
SGESR25.5	25.5	165	241	32	●
SGESR26.0	26.0	165	241	32	●
SGESR26.5	26.5	165	241	32	●
SGESR27.0	27.0	170	245	32	●
SGESR27.5	27.5	170	245	32	●
SGESR28.0	28.0	170	245	32	●
SGESR28.5	28.5	175	248	32	●
SGESR29.0	29.0	175	248	32	●
SGESR29.5	29.5	175	248	32	●
SGESR30.0	30.0	175	248	32	●
SGESR30.5	30.5	180	252	32	●
SGESR31.0	31.0	180	252	32	●
SGESR31.5	31.5	180	252	32	●
SGESR32.0	32.0	185	255	32	●

Standard Drilling Conditions

Work material	Structural Steels Carbon Steels		Alloy Steels Pre-Hardened Steels		Mold Steels Hardened Steels		Stainless Steels		Cast Iron		Aluminum Alloys Copper Alloys		Nickel Alloys Titanium Alloys	
	ST-37-2, C50		42CrMo4, NAK, HPM		X40MoV51, NAK, HPM		SUS304, SUS316 1.4301, 1.4401		GG/GGG		Al5052, C1100		30-40HRC	
mm	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min
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

- Adjust the drilling condition according to the rigidity of the machine, work clamping situation and shape of the work piece.
- The table values are for drilling with water soluble cutting fluid.
- Provide suffice amount cutting fluid to the cutting point and in the flute.
- Reduce 20 % of the RPM and Feed, when drilling over 3D depth.
- When drilling over 3D depth, add step feed. However, up to the work material and drilling condition, the chip evacuation may be worse. In this case, even the cutting depth is under 3D, add step feed.
- Add step feeding for stainless steel.
- When step feeding, return to the entrance of the hole each step.
- Step feed interval is around 0.5-1D. Small diameters are around 0.2-0.5D.
- Use collet chuck or milling chuck.

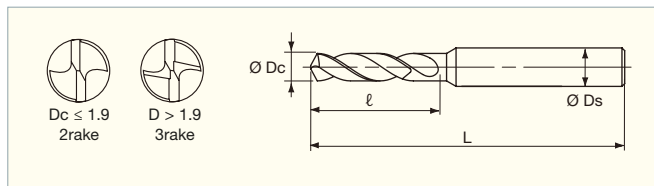
SGESS 3D



List 7572P

Code	Dc	ℓ	L	Ds	Stock
SGESS0.5	0.5	3	38	3	●
SGESS0.51	0.51	3	38	3	●
SGESS0.52	0.52	3	38	3	●
SGESS0.53	0.53	3	38	3	●
SGESS0.54	0.54	3	38	3	●
SGESS0.55	0.55	3	38	3	●
SGESS0.56	0.56	3	38	3	●
SGESS0.57	0.57	3	38	3	●
SGESS0.58	0.58	3	38	3	●
SGESS0.59	0.59	3	38	3	●
SGESS0.6	0.6	3.5	38	3	●
SGESS0.61	0.61	3.5	38	3	●
SGESS0.62	0.62	3.5	38	3	●
SGESS0.63	0.63	3.5	38	3	●
SGESS0.64	0.64	3.5	38	3	●
SGESS0.65	0.65	3.5	38	3	●
SGESS0.66	0.66	3.5	38	3	●
SGESS0.67	0.67	3.5	38	3	●
SGESS0.68	0.68	3.5	38	3	●
SGESS0.69	0.69	3.5	38	3	●
SGESS0.7	0.7	4.5	38	3	●
SGESS0.71	0.71	4.5	38	3	●
SGESS0.72	0.72	4.5	38	3	●
SGESS0.73	0.73	4.5	38	3	●
SGESS0.74	0.74	4.5	38	3	●
SGESS0.75	0.75	4.5	38	3	●
SGESS0.76	0.76	4.5	38	3	●
SGESS0.77	0.77	4.5	38	3	●
SGESS0.78	0.78	4.5	38	3	●
SGESS0.79	0.79	4.5	38	3	●
SGESS0.8	0.8	5	38	3	●
SGESS0.81	0.81	5	38	3	●
SGESS0.82	0.82	5	38	3	●
SGESS0.83	0.83	5	38	3	●
SGESS0.84	0.84	5	38	3	●
SGESS0.85	0.85	5	38	3	●
SGESS0.86	0.86	5	38	3	●
SGESS0.87	0.87	5	38	3	●
SGESS0.88	0.88	5	38	3	●
SGESS0.89	0.89	5	38	3	●
SGESS0.9	0.9	5.5	38	3	●
SGESS0.91	0.91	5.5	38	3	●
SGESS0.92	0.92	5.5	38	3	●
SGESS0.93	0.93	5.5	38	3	●
SGESS0.94	0.94	5.5	38	3	●
SGESS0.95	0.95	5.5	38	3	●
SGESS0.96	0.96	5.5	38	3	●
SGESS0.97	0.97	5.5	38	3	●
SGESS0.98	0.98	5.5	38	3	●
SGESS0.99	0.99	5.5	38	3	●
SGESS1.0	1.0	6	38	3	●
SGESS1.01	1.01	6	38	3	●
SGESS1.02	1.02	6	38	3	●
SGESS1.03	1.03	6	38	3	●
SGESS1.04	1.04	6	38	3	●
SGESS1.05	1.05	6	38	3	●
SGESS1.06	1.06	6	38	3	●
SGESS1.07	1.07	7	39	3	●
SGESS1.08	1.08	7	39	3	●
SGESS1.09	1.09	7	39	3	●
SGESS1.1	1.1	7	39	3	●
SGESS1.11	1.11	7	39	3	●
SGESS1.12	1.12	7	39	3	●
SGESS1.13	1.13	7	39	3	●
SGESS1.14	1.14	7	39	3	●
SGESS1.15	1.15	7	39	3	●
SGESS1.16	1.16	7	39	3	●
SGESS1.17	1.17	7	39	3	●

Code	Dc	ℓ	L	Ds	Stock
SGESS1.18	1.18	7	39	3	●
SGESS1.19	1.19	8	40	3	●
SGESS1.2	1.2	8	40	3	●
SGESS1.21	1.21	8	40	3	●
SGESS1.22	1.22	8	40	3	●
SGESS1.23	1.23	8	40	3	●
SGESS1.24	1.24	8	40	3	●
SGESS1.25	1.25	8	40	3	●
SGESS1.26	1.26	8	40	3	●
SGESS1.27	1.27	8	40	3	●
SGESS1.28	1.28	8	40	3	●
SGESS1.29	1.29	8	40	3	●
SGESS1.3	1.3	8	40	3	●
SGESS1.31	1.31	8	40	3	●
SGESS1.32	1.32	8	40	3	●
SGESS1.33	1.33	9	41	3	●
SGESS1.34	1.34	9	41	3	●
SGESS1.35	1.35	9	41	3	●
SGESS1.36	1.36	9	41	3	●
SGESS1.37	1.37	9	41	3	●
SGESS1.38	1.38	9	41	3	●
SGESS1.39	1.39	9	41	3	●
SGESS1.4	1.4	9	41	3	●
SGESS1.41	1.41	9	41	3	●
SGESS1.42	1.42	9	41	3	●
SGESS1.43	1.43	9	41	3	●
SGESS1.44	1.44	9	41	3	●
SGESS1.45	1.45	9	41	3	●
SGESS1.46	1.46	9	41	3	●
SGESS1.47	1.47	9	41	3	●
SGESS1.48	1.48	9	41	3	●
SGESS1.49	1.49	9	41	3	●
SGESS1.5	1.5	9	41	3	●
SGESS1.51	1.51	10	42	3	●
SGESS1.52	1.52	10	42	3	●
SGESS1.53	1.53	10	42	3	●
SGESS1.54	1.54	10	42	3	●
SGESS1.55	1.55	10	42	3	●
SGESS1.56	1.56	10	42	3	●
SGESS1.57	1.57	10	42	3	●
SGESS1.58	1.58	10	42	3	●
SGESS1.59	1.59	10	42	3	●
SGESS1.6	1.6	10	42	3	●
SGESS1.61	1.61	10	42	3	●
SGESS1.62	1.62	10	42	3	●
SGESS1.63	1.63	10	42	3	●
SGESS1.64	1.64	10	42	3	●
SGESS1.65	1.65	10	42	3	●
SGESS1.66	1.66	10	42	3	●
SGESS1.67	1.67	10	42	3	●
SGESS1.68	1.68	10	42	3	●
SGESS1.69	1.69	10	42	3	●
SGESS1.7	1.7	10	42	3	●
SGESS1.71	1.71	11	43	3	●
SGESS1.72	1.72	11	43	3	●
SGESS1.73	1.73	11	43	3	●
SGESS1.74	1.74	11	43	3	●
SGESS1.75	1.75	11	43	3	●
SGESS1.76	1.76	11	43	3	●
SGESS1.77	1.77	11	43	3	●
SGESS1.78	1.78	11	43	3	●
SGESS1.79	1.79	11	43	3	●
SGESS1.8	1.8	11	43	3	●
SGESS1.81	1.81	11	43	3	●
SGESS1.82	1.82	11	43	3	●
SGESS1.83	1.83	11	43	3	●
SGESS1.84	1.84	11	43	3	●
SGESS1.85	1.85	11	43	3	●



List 7572P

Code	Dc	ℓ	L	Ds	Stock
SGESS1.86	1.86	11	43	3	●
SGESS1.87	1.87	11	43	3	●
SGESS1.88	1.88	11	43	3	●
SGESS1.89	1.89	11	43	3	●
SGESS1.9	1.9	11	43	3	●
SGESS1.91	1.91	12	44	3	●
SGESS1.92	1.92	12	44	3	●
SGESS1.93	1.93	12	44	3	●
SGESS1.94	1.94	12	44	3	●
SGESS1.95	1.95	12	44	3	●
SGESS1.96	1.96	12	44	3	●
SGESS1.97	1.97	12	44	3	●
SGESS1.98	1.98	12	44	3	●
SGESS1.99	1.99	12	44	3	●
SGESS2.0	2.0	12	44	3	●
SGESS2.01	2.01	12	44	3	●
SGESS2.02	2.02	12	44	3	●
SGESS2.03	2.03	12	44	3	●
SGESS2.04	2.04	12	44	3	●
SGESS2.05	2.05	12	44	3	●
SGESS2.06	2.06	12	44	3	●
SGESS2.07	2.07	12	44	3	●
SGESS2.08	2.08	12	44	3	●
SGESS2.09	2.09	12	44	3	●
SGESS2.1	2.1	12	44	3	●
SGESS2.11	2.11	12	44	3	●
SGESS2.12	2.12	12	44	3	●
SGESS2.13	2.13	13	45	3	●
SGESS2.14	2.14	13	45	3	●
SGESS2.15	2.15	13	45	3	●
SGESS2.16	2.16	13	45	3	●
SGESS2.17	2.17	13	45	3	●
SGESS2.18	2.18	13	45	3	●
SGESS2.19	2.19	13	45	3	●
SGESS2.2	2.2	13	45	3	●
SGESS2.21	2.21	13	45	3	●
SGESS2.22	2.22	13	45	3	●
SGESS2.23	2.23	13	45	3	●
SGESS2.24	2.24	13	45	3	●
SGESS2.25	2.25	13	45	3	●
SGESS2.26	2.26	13	45	3	●
SGESS2.27	2.27	13	45	3	●
SGESS2.28	2.28	13	45	3	●
SGESS2.29	2.29	13	45	3	●
SGESS2.3	2.3	13	45	3	●
SGESS2.31	2.31	13	45	3	●
SGESS2.32	2.32	13	45	3	●
SGESS2.33	2.33	13	45	3	●
SGESS2.34	2.34	13	45	3	●
SGESS2.35	2.35	13	45	3	●
SGESS2.36	2.36	13	45	3	●
SGESS2.37	2.37	14	46	3	●
SGESS2.38	2.38	14	46	3	●
SGESS2.39	2.39	14	46	3	●
SGESS2.4	2.4	14	46	3	●
SGESS2.41	2.41	14	46	3	●
SGESS2.42	2.42	14	46	3	●
SGESS2.43	2.43	14	46	3	●
SGESS2.44	2.44	14	46	3	●
SGESS2.45	2.45	14	46	3	●
SGESS2.46	2.46	14	46	3	●
SGESS2.47	2.47	14	46	3	●
SGESS2.48	2.48	14	46	3	●
SGESS2.49	2.49	14	46	3	●
SGESS2.5	2.5	14	46	3	●
SGESS2.51	2.51	14	46	3	●
SGESS2.52	2.52	14	46	3	●
SGESS2.53	2.53	14	46	3	●

Code	Dc	ℓ	L	Ds	Stock
SGESS2.54	2.54	14	46	3	●
SGESS2.55	2.55	14	46	3	●
SGESS2.56	2.56	14	46	3	●
SGESS2.57	2.57	14	46	3	●
SGESS2.58	2.58	14	46	3	●
SGESS2.59	2.59	14	46	3	●
SGESS2.6	2.6	14	46	3	●
SGESS2.61	2.61	14	46	3	●
SGESS2.62	2.62	14	46	3	●
SGESS2.63	2.63	14	46	3	●
SGESS2.64	2.64	14	46	3	●
SGESS2.65	2.65	14	46	3	●
SGESS2.66	2.66	16	48	3	●
SGESS2.67	2.67	16	48	3	●
SGESS2.68	2.68	16	48	3	●
SGESS2.69	2.69	16	48	3	●
SGESS2.7	2.7	16	48	3	●
SGESS2.71	2.71	16	48	3	●
SGESS2.72	2.72	16	48	3	●
SGESS2.73	2.73	16	48	3	●
SGESS2.74	2.74	16	48	3	●
SGESS2.75	2.75	16	48	3	●
SGESS2.76	2.76	16	48	3	●
SGESS2.77	2.77	16	48	3	●
SGESS2.78	2.78	16	48	3	●
SGESS2.79	2.79	16	48	3	●
SGESS2.8	2.8	16	48	3	●
SGESS2.81	2.81	16	48	3	●
SGESS2.82	2.82	16	48	3	●
SGESS2.83	2.83	16	48	3	●
SGESS2.84	2.84	16	48	3	●
SGESS2.85	2.85	16	48	3	●
SGESS2.86	2.86	16	48	3	●
SGESS2.87	2.87	16	48	3	●
SGESS2.88	2.88	16	48	3	●
SGESS2.89	2.89	16	48	3	●
SGESS2.9	2.9	16	48	3	●
SGESS2.91	2.91	16	48	3	●
SGESS2.92	2.92	16	48	3	●
SGESS2.93	2.93	16	48	3	●
SGESS2.94	2.94	16	48	3	●
SGESS2.95	2.95	16	48	3	●
SGESS2.96	2.96	16	48	3	●
SGESS2.97	2.97	16	48	3	●
SGESS2.98	2.98	16	48	3	●
SGESS2.99	2.99	16	48	3	●
SGESS3.0	3.0	16	48	3	●
SGESS3.01	3.01	18	50	4	●
SGESS3.02	3.02	18	50	4	●
SGESS3.03	3.03	18	50	4	●
SGESS3.04	3.04	18	50	4	●
SGESS3.05	3.05	18	50	4	●
SGESS3.06	3.06	18	50	4	●
SGESS3.07	3.07	18	50	4	●
SGESS3.08	3.08	18	50	4	●
SGESS3.09	3.09	18	50	4	●
SGESS3.1	3.1	18	50	4	●
SGESS3.11	3.11	18	50	4	●
SGESS3.12	3.12	18	50	4	●
SGESS3.13	3.13	18	50	4	●
SGESS3.14	3.14	18	50	4	●
SGESS3.15	3.15	18	50	4	●
SGESS3.16	3.16	18	50	4	●
SGESS3.17	3.17	18	50	4	●
SGESS3.18	3.18	18	50	4	●
SGESS3.19	3.19	18	50	4	●
SGESS3.2	3.2	18	50	4	●
SGESS3.21	3.21	18	50	4	●

SGESS 3D

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Code	Dc	ℓ	L	Ds	Stock
SGESS3.22	3.22	18	50	4	●
SGESS3.23	3.23	18	50	4	●
SGESS3.24	3.24	18	50	4	●
SGESS3.25	3.25	18	50	4	●
SGESS3.26	3.26	18	50	4	●
SGESS3.27	3.27	18	50	4	●
SGESS3.28	3.28	18	50	4	●
SGESS3.29	3.29	18	50	4	●
SGESS3.3	3.3	18	50	4	●
SGESS3.31	3.31	18	50	4	●
SGESS3.32	3.32	18	50	4	●
SGESS3.33	3.33	18	50	4	●
SGESS3.34	3.34	18	50	4	●
SGESS3.35	3.35	18	50	4	●
SGESS3.36	3.36	20	52	4	●
SGESS3.37	3.37	20	52	4	●
SGESS3.38	3.38	20	52	4	●
SGESS3.39	3.39	20	52	4	●
SGESS3.4	3.4	20	52	4	●
SGESS3.41	3.41	20	52	4	●
SGESS3.42	3.42	20	52	4	●
SGESS3.43	3.43	20	52	4	●
SGESS3.44	3.44	20	52	4	●
SGESS3.45	3.45	20	52	4	●
SGESS3.46	3.46	20	52	4	●
SGESS3.47	3.47	20	52	4	●
SGESS3.48	3.48	20	52	4	●
SGESS3.49	3.49	20	52	4	●
SGESS3.5	3.5	20	52	4	●
SGESS3.51	3.51	20	52	4	●
SGESS3.52	3.52	20	52	4	●
SGESS3.53	3.53	20	52	4	●
SGESS3.54	3.54	20	52	4	●
SGESS3.55	3.55	20	52	4	●
SGESS3.56	3.56	20	52	4	●
SGESS3.57	3.57	20	52	4	●
SGESS3.58	3.58	20	52	4	●
SGESS3.59	3.59	20	52	4	●
SGESS3.6	3.6	20	52	4	●
SGESS3.61	3.61	20	52	4	●
SGESS3.62	3.62	20	52	4	●
SGESS3.63	3.63	20	52	4	●
SGESS3.64	3.64	20	52	4	●
SGESS3.65	3.65	20	52	4	●
SGESS3.66	3.66	20	52	4	●
SGESS3.67	3.67	20	52	4	●
SGESS3.68	3.68	20	52	4	●
SGESS3.69	3.69	20	52	4	●
SGESS3.7	3.7	20	52	4	●
SGESS3.71	3.71	20	52	4	●
SGESS3.72	3.72	20	52	4	●
SGESS3.73	3.73	20	52	4	●
SGESS3.74	3.74	20	52	4	●
SGESS3.75	3.75	20	52	4	●
SGESS3.76	3.76	22	54	4	●
SGESS3.77	3.77	22	54	4	●
SGESS3.78	3.78	22	54	4	●
SGESS3.79	3.79	22	54	4	●
SGESS3.8	3.8	22	54	4	●
SGESS3.81	3.81	22	54	4	●
SGESS3.82	3.82	22	54	4	●
SGESS3.83	3.83	22	54	4	●
SGESS3.84	3.84	22	54	4	●
SGESS3.85	3.85	22	54	4	●
SGESS3.86	3.86	22	54	4	●
SGESS3.87	3.87	22	54	4	●
SGESS3.88	3.88	22	54	4	●
SGESS3.89	3.89	22	54	4	●
SGESS3.9	3.9	22	54	4	●
SGESS3.91	3.91	22	54	4	●
SGESS3.92	3.92	22	54	4	●
SGESS3.93	3.93	22	54	4	●
SGESS3.94	3.94	22	54	4	●
SGESS3.95	3.95	22	54	4	●

Code	Dc	ℓ	L	Ds	Stock
SGESS3.96	3.96	22	54	4	●
SGESS3.97	3.97	22	54	4	●
SGESS3.98	3.98	22	54	4	●
SGESS3.99	3.99	22	54	4	●
SGESS4.0	4.0	22	54	4	●
SGESS4.01	4.01	22	66	6	●
SGESS4.02	4.02	22	66	6	●
SGESS4.03	4.03	22	66	6	●
SGESS4.04	4.04	22	66	6	●
SGESS4.05	4.05	22	66	6	●
SGESS4.06	4.06	22	66	6	●
SGESS4.07	4.07	22	66	6	●
SGESS4.08	4.08	22	66	6	●
SGESS4.09	4.09	22	66	6	●
SGESS4.1	4.1	22	66	6	●
SGESS4.11	4.11	22	66	6	●
SGESS4.12	4.12	22	66	6	●
SGESS4.13	4.13	22	66	6	●
SGESS4.14	4.14	22	66	6	●
SGESS4.15	4.15	22	66	6	●
SGESS4.16	4.16	22	66	6	●
SGESS4.17	4.17	22	66	6	●
SGESS4.18	4.18	22	66	6	●
SGESS4.19	4.19	22	66	6	●
SGESS4.2	4.2	22	66	6	●
SGESS4.21	4.21	22	66	6	●
SGESS4.22	4.22	22	66	6	●
SGESS4.23	4.23	22	66	6	●
SGESS4.24	4.24	22	66	6	●
SGESS4.25	4.25	22	66	6	●
SGESS4.26	4.26	24	68	6	●
SGESS4.27	4.27	24	68	6	●
SGESS4.28	4.28	24	68	6	●
SGESS4.29	4.29	24	68	6	●
SGESS4.3	4.3	24	68	6	●
SGESS4.31	4.31	24	68	6	●
SGESS4.32	4.32	24	68	6	●
SGESS4.33	4.33	24	68	6	●
SGESS4.34	4.34	24	68	6	●
SGESS4.35	4.35	24	68	6	●
SGESS4.36	4.36	24	68	6	●
SGESS4.37	4.37	24	68	6	●
SGESS4.38	4.38	24	68	6	●
SGESS4.39	4.39	24	68	6	●
SGESS4.4	4.4	24	68	6	●
SGESS4.41	4.41	24	68	6	●
SGESS4.42	4.42	24	68	6	●
SGESS4.43	4.43	24	68	6	●
SGESS4.44	4.44	24	68	6	●
SGESS4.45	4.45	24	68	6	●
SGESS4.46	4.46	24	68	6	●
SGESS4.47	4.47	24	68	6	●
SGESS4.48	4.48	24	68	6	●
SGESS4.49	4.49	24	68	6	●
SGESS4.5	4.5	24	68	6	●
SGESS4.51	4.51	24	68	6	●
SGESS4.52	4.52	24	68	6	●
SGESS4.53	4.53	24	68	6	●
SGESS4.54	4.54	24	68	6	●
SGESS4.55	4.55	24	68	6	●
SGESS4.56	4.56	24	68	6	●
SGESS4.57	4.57	24	68	6	●
SGESS4.58	4.58	24	68	6	●
SGESS4.59	4.59	24	68	6	●
SGESS4.6	4.6	24	68	6	●
SGESS4.61	4.61	24	68	6	●
SGESS4.62	4.62	24	68	6	●
SGESS4.63	4.63	24	68	6	●
SGESS4.64	4.64	24	68	6	●
SGESS4.65	4.65	24	68	6	●
SGESS4.66	4.66	24	68	6	●
SGESS4.67	4.67	24	68	6	●
SGESS4.68	4.68	24	68	6	●
SGESS4.69	4.69	24	68	6	●

List 7572P

Code	Dc	ℓ	L	Ds	Stock
SGESS4.7	4.7	24	68	6	●
SGESS4.71	4.71	24	68	6	●
SGESS4.72	4.72	24	68	6	●
SGESS4.73	4.73	24	68	6	●
SGESS4.74	4.74	24	68	6	●
SGESS4.75	4.75	24	68	6	●
SGESS4.76	4.76	26	70	6	●
SGESS4.77	4.77	26	70	6	●
SGESS4.78	4.78	26	70	6	●
SGESS4.79	4.79	26	70	6	●
SGESS4.8	4.8	26	70	6	●
SGESS4.81	4.81	26	70	6	●
SGESS4.82	4.82	26	70	6	●
SGESS4.83	4.83	26	70	6	●
SGESS4.84	4.84	26	70	6	●
SGESS4.85	4.85	26	70	6	●
SGESS4.86	4.86	26	70	6	●
SGESS4.87	4.87	26	70	6	●
SGESS4.88	4.88	26	70	6	●
SGESS4.89	4.89	26	70	6	●
SGESS4.9	4.9	26	70	6	●
SGESS4.91	4.91	26	70	6	●
SGESS4.92	4.92	26	70	6	●
SGESS4.93	4.93	26	70	6	●
SGESS4.94	4.94	26	70	6	●
SGESS4.95	4.95	26	70	6	●
SGESS4.96	4.96	26	70	6	●
SGESS4.97	4.97	26	70	6	●
SGESS4.98	4.98	26	70	6	●
SGESS4.99	4.99	26	70	6	●
SGESS5.0	5.0	26	70	6	●
SGESS5.01	5.01	26	70	6	●
SGESS5.02	5.02	26	70	6	●
SGESS5.03	5.03	26	70	6	●
SGESS5.04	5.04	26	70	6	●
SGESS5.05	5.05	26	70	6	●
SGESS5.06	5.06	26	70	6	●
SGESS5.07	5.07	26	70	6	●
SGESS5.08	5.08	26	70	6	●
SGESS5.09	5.09	26	70	6	●
SGESS5.1	5.1	26	70	6	●
SGESS5.11	5.11	26	70	6	●
SGESS5.12	5.12	26	70	6	●
SGESS5.13	5.13	26	70	6	●
SGESS5.14	5.14	26	70	6	●
SGESS5.15	5.15	26	70	6	●
SGESS5.16	5.16	26	70	6	●
SGESS5.17	5.17	26	70	6	●
SGESS5.18	5.18	26	70	6	●
SGESS5.19	5.19	26	70	6	●
SGESS5.2	5.2	26	70	6	●
SGESS5.21	5.21	26	70	6	●
SGESS5.22	5.22	26	70	6	●
SGESS5.23	5.23	26	70	6	●
SGESS5.24	5.24	26	70	6	●
SGESS5.25	5.25	26	70	6	●
SGESS5.26	5.26	26	70	6	●
SGESS5.27	5.27	26	70	6	●
SGESS5.28	5.28	26	70	6	●
SGESS5.29	5.29	26	70	6	●
SGESS5.3	5.3	26	70	6	●
SGESS5.31	5.31	28	72	6	●
SGESS5.32	5.32	28	72	6	●
SGESS5.33	5.33	28	72	6	●
SGESS5.34	5.34	28	72	6	●
SGESS5.35	5.35	28	72	6	●
SGESS5.36	5.36	28	72	6	●
SGESS5.37	5.37	28	72	6	●
SGESS5.38	5.38	28	72	6	●
SGESS5.39	5.39	28	72	6	●
SGESS5.4	5.4	28	72	6	●
SGESS5.41	5.41	28	72	6	●
SGESS5.42	5.42	28	72	6	●
SGESS5.43	5.43	28	72	6	●

Code	Dc	ℓ	L	Ds	Stock
SGESS5.44	5.44	28	72	6	●
SGESS5.45	5.45	28	72	6	●
SGESS5.46	5.46	28	72	6	●
SGESS5.47	5.47	28	72	6	●
SGESS5.48	5.48	28	72	6	●
SGESS5.49	5.49	28	72	6	●
SGESS5.5	5.5	28	72	6	●
SGESS5.51	5.51	28	72	6	●
SGESS5.52	5.52	28	72	6	●
SGESS5.53	5.53	28	72	6	●
SGESS5.54	5.54	28	72	6	●
SGESS5.55	5.55	28	72	6	●
SGESS5.56	5.56	28	72	6	●
SGESS5.57	5.57	28	72	6	●
SGESS5.58	5.58	28	72	6	●
SGESS5.59	5.59	28	72	6	●
SGESS5.6	5.6	28	72	6	●
SGESS5.61	5.61	28	72	6	●
SGESS5.62	5.62	28	72	6	●
SGESS5.63	5.63	28	72	6	●
SGESS5.64	5.64	28	72	6	●
SGESS5.65	5.65	28	72	6	●
SGESS5.66	5.66	28	72	6	●
SGESS5.67	5.67	28	72	6	●
SGESS5.68	5.68	28	72	6	●
SGESS5.69	5.69	28	72	6	●
SGESS5.7	5.7	28	72	6	●
SGESS5.71	5.71	28	72	6	●
SGESS5.72	5.72	28	72	6	●
SGESS5.73	5.73	28	72	6	●
SGESS5.74	5.74	28	72	6	●
SGESS5.75	5.75	28	72	6	●
SGESS5.76	5.76	28	72	6	●
SGESS5.77	5.77	28	72	6	●
SGESS5.78	5.78	28	72	6	●
SGESS5.79	5.79	28	72	6	●
SGESS5.8	5.8	28	72	6	●
SGESS5.81	5.81	28	72	6	●
SGESS5.82	5.82	28	72	6	●
SGESS5.83	5.83	28	72	6	●
SGESS5.84	5.84	28	72	6	●
SGESS5.85	5.85	28	72	6	●
SGESS5.86	5.86	28	72	6	●
SGESS5.87	5.87	28	72	6	●
SGESS5.88	5.88	28	72	6	●
SGESS5.89	5.89	28	72	6	●
SGESS5.9	5.9	28	72	6	●
SGESS5.91	5.91	28	72	6	●
SGESS5.92	5.92	28	72	6	●
SGESS5.93	5.93	28	72	6	●
SGESS5.94	5.94	28	72	6	●
SGESS5.95	5.95	28	72	6	●
SGESS5.96	5.96	28	72	6	●
SGESS5.97	5.97	28	72	6	●
SGESS5.98	5.98	28	72	6	●
SGESS5.99	5.99	28	72	6	●
SGESS6.0	6.0	28	72	6	●
SGESS6.1	6.1	31	75	8	●
SGESS6.2	6.2	31	75	8	●
SGESS6.3	6.3	31	75	8	●
SGESS6.4	6.4	31	75	8	●
SGESS6.5	6.5	31	75	8	●
SGESS6.6	6.6	31	75	8	●
SGESS6.7	6.7	31	75	8	●
SGESS6.8	6.8	34	78	8	●
SGESS6.9	6.9	34	78	8	●
SGESS7.0	7.0	34	78	8	●
SGESS7.1	7.1	34	78	8	●
SGESS7.2	7.2	34	78	8	●
SGESS7.3	7.3	34	78	8	●
SGESS7.4	7.4	34	78	8	●
SGESS7.5	7.5	34	78	8	●
SGESS7.6	7.6	37	81	8	●
SGESS7.7	7.7	37	81	8	●

SGESS 3D

List 7572P

Code	Dc	ℓ	L	Ds	Stock
SGESS7.8	7.8	37	81	8	●
SGESS7.9	7.9	37	81	8	●
SGESS8.0	8.0	37	81	8	●
SGESS8.1	8.1	37	87	10	●
SGESS8.2	8.2	37	87	10	●
SGESS8.3	8.3	37	87	10	●
SGESS8.4	8.4	37	87	10	●
SGESS8.5	8.5	37	87	10	●
SGESS8.6	8.6	40	90	10	●
SGESS8.7	8.7	40	90	10	●
SGESS8.8	8.8	40	90	10	●
SGESS8.9	8.9	40	90	10	●
SGESS9.0	9.0	40	90	10	●
SGESS9.1	9.1	40	90	10	●
SGESS9.2	9.2	40	90	10	●
SGESS9.3	9.3	40	90	10	●
SGESS9.4	9.4	40	90	10	●
SGESS9.5	9.5	40	90	10	●
SGESS9.6	9.6	43	93	10	●
SGESS9.7	9.7	43	93	10	●
SGESS9.8	9.8	43	93	10	●
SGESS9.9	9.9	43	93	10	●
SGESS10.0	10.0	43	93	10	●
SGESS10.1	10.1	43	100	12	●
SGESS10.2	10.2	43	100	12	●
SGESS10.3	10.3	43	100	12	●
SGESS10.4	10.4	43	100	12	●
SGESS10.5	10.5	43	100	12	●
SGESS10.6	10.6	43	100	12	●
SGESS10.7	10.7	47	104	12	●
SGESS10.8	10.8	47	104	12	●
SGESS10.9	10.9	47	104	12	●
SGESS11.0	11.0	47	104	12	●
SGESS11.1	11.1	47	104	12	●

Code	Dc	ℓ	L	Ds	Stock
SGESS11.2	11.2	47	104	12	●
SGESS11.3	11.3	47	104	12	●
SGESS11.4	11.4	47	104	12	●
SGESS11.5	11.5	47	104	12	●
SGESS11.6	11.6	47	104	12	●
SGESS11.7	11.7	47	104	12	●
SGESS11.8	11.8	47	104	12	●
SGESS11.9	11.9	51	108	12	●
SGESS12.0	12.0	51	108	12	●
SGESS12.1	12.1	51	108	12	●
SGESS12.2	12.2	51	108	12	●
SGESS12.3	12.3	51	108	12	●
SGESS12.4	12.4	51	108	12	●
SGESS12.5	12.5	51	108	12	●
SGESS12.6	12.6	51	108	12	●
SGESS12.7	12.7	51	108	12	●
SGESS12.8	12.8	51	108	12	●
SGESS12.9	12.9	51	108	12	●
SGESS13.0	13.0	51	108	12	●
SGESS13.5	13.5	72	132	16	●
SGESS14.0	14.0	72	132	16	●
SGESS14.5	14.5	76	136	16	●
SGESS15.0	15.0	76	142	20	●
SGESS15.5	15.5	80	146	20	●
SGESS16.0	16.0	80	146	20	●
SGESS16.5	16.5	84	150	20	●
SGESS17.0	17.0	84	150	20	●
SGESS17.5	17.5	87	153	20	●
SGESS18.0	18.0	87	153	20	●
SGESS18.5	18.5	90	156	20	●
SGESS19.0	19.0	90	164	25	●
SGESS19.5	19.5	94	168	25	●
SGESS20.0	20.0	94	168	25	●

Standard Drilling Conditions

Work material	Structural Steels Carbon Steels		Alloy Steels Pre-Hardened Steels		Mold Steels Hardened Steels		Stainless Steels		Cast Irons		Aluminum Alloys Copper Alloys		Nickel Alloys Titanium Alloys	
	ST-37-2, C50		42CrMo4, NAK, HPM		X40MoV51, NAK, HPM		SUS304,SUS316 1.4301, 1.4401		GG/GGG		Al5052, C1100		30-40HRC	
	-200HB		20-30HRC		30-40HRC									
mm	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min	min ⁻¹	mm/min
0.5	16000	240	13000	150	950	80	5100	50	20000	300	23000	300	2500	18
1	9500	280	8000	190	6400	140	3500	65	12000	400	15000	500	1600	25
2	5700	360	4600	240	3200	160	1900	80	6300	490	9700	760	800	27
3	4200	430	3400	290	2100	165	1300	85	4700	600	7200	900	530	28
5	2500	430	2000	290	1250	165	760	80	2800	600	4300	920	320	29
8	1600	370	1300	250	800	150	480	75	1800	530	2700	790	200	26
10	1300	340	1000	230	650	140	380	73	1400	460	2200	730	160	26
12	1100	310	850	210	530	130	320	70	1200	430	1800	670	130	25
16	800	290	640	200	400	120	240	63	880	390	1400	610	100	23
20	640	260	510	180	320	110	190	57	700	350	1100	550	80	21
25	510	240	410	160	250	95	150	50	560	330	870	510	64	19
32	400	180	320	120	200	70	120	40	440	250	680	380	50	16

Warnings on using the drilling condition tables

- Adjust the drilling condition according to the rigidity of the machine, work clamping situation and shape of the work piece.
- The table values are for drilling with water soluble cutting fluid.
- Provide suffice amount cutting fluid to the cutting point and in the flute.
- Add step feeding for stainless steel.
- Up to the work material and drilling condition, the chip evacuation may be worse. In this case, add step feed.
- When step feeding, return to the entrance of the hole each step.
- Step feed interval is around 0.5-1D. Small diameters are around 0.2-0.5D.
- Use collet chuck or milling chuck.

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