

SG-ESS

SG-ESS Drill

Ideal for High Accurate Drilling. Realize High Efficiency and Long Life.



AG-ES

AG-ES Drill

The new alloy HSS drill approaches the performance of a carbide drill.



Features of SG-ESS Drill

Powder metal and TiCN based multi-layered coating



SG-ESS Drill: Multi-Layered and Composite SG Coating.

Feature & Application:

Ideal for High Accurate Drilling

- high accuracy drill point with milling shank.

Realize High Efficiency and Long Life

- multi-layered and composite SG coating on powder HSS.

Applicable for Carbon Steel, Stainless Steel and Alloyed Steel.

Adoption of End Mill Shank for High Precision Drilling.

Features of AG-ES Drill

Coating & Material:

High Alloyed HSS = FM Alloy
+ AG coating based on AlCrTi

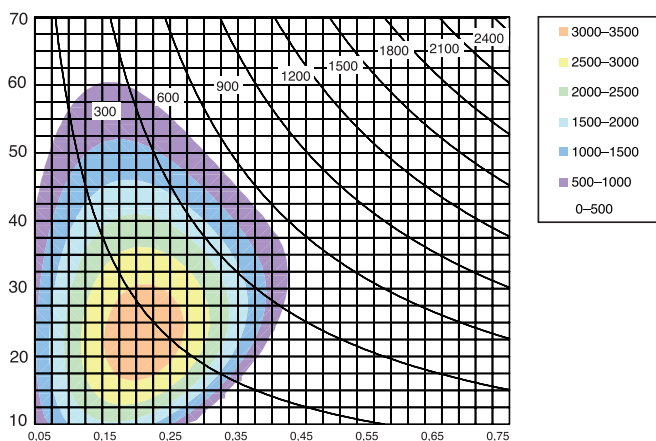
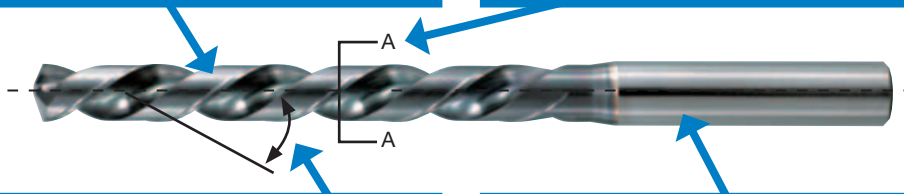
Geometry:

- Newly developed geometry superior in chip evacuation and well-balanced rigidity
- It can apply to wide work material range from carbon steel and SUS to pre-hardened steel

Geometry:

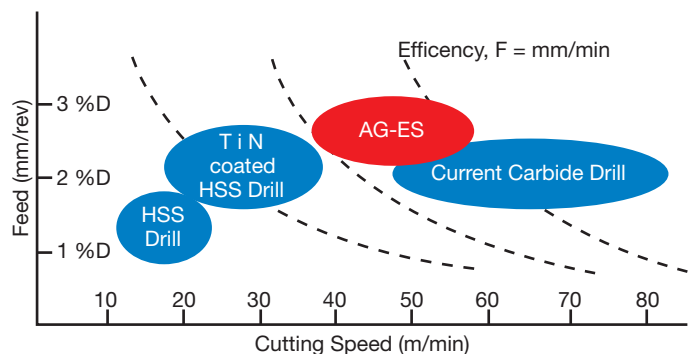
High Helix
= Excellent chip evacuation

High accuracy milling shank



Applicable Cutting Condition of AG Drill

Work Material: Carbon Steel, Structure Steel



High Performance SG-ESS Drills & AG-ES DRILLS

SG-ESS Drills are made of premium metal with the compound, multi-layered SG coating.

End mill style shanks combined with high accuracy shape of relief achieve extremely precise drill positioning and stability within 15 μ .

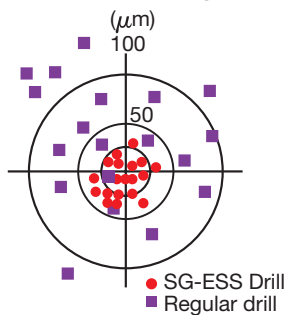
Original material, coating and geometry design, all developed by NACHI's own technology, realize a wide range of application.

Features

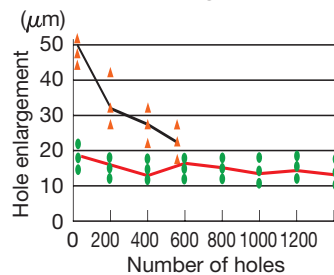
Wide applications from aluminium to heat-resistant alloys

High accuracy drilling

Hole positioning accuracy

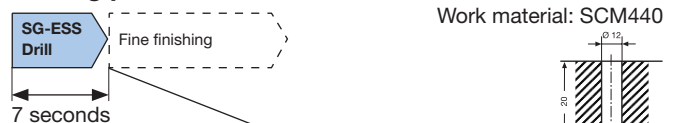


Hole enlargement

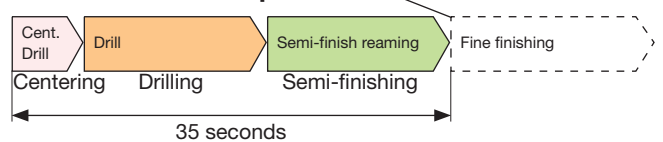


One drill can handle centering → Drilling → Semi-finishing

Drilling process with the SG-ESS Drill

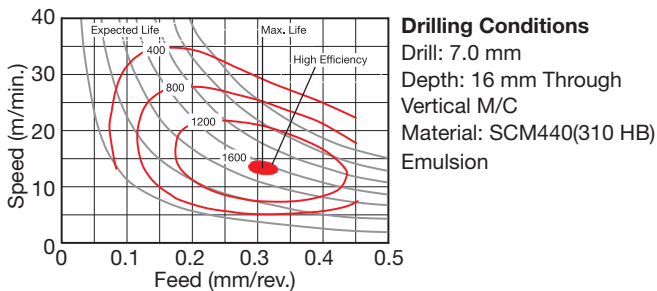


Conventional work process



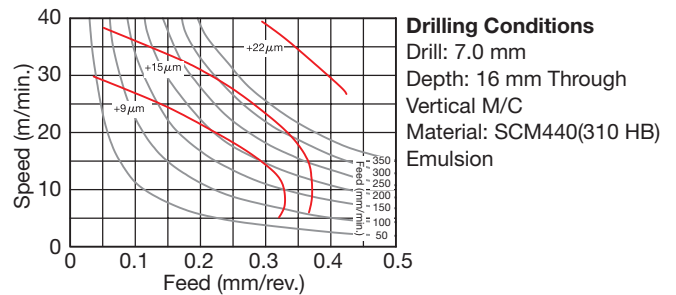
Long tool life with high performance

Longer tool life in various cutting conditions

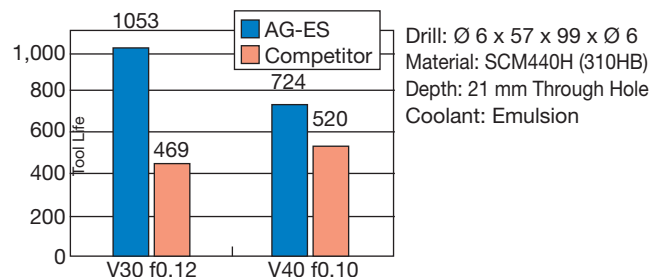
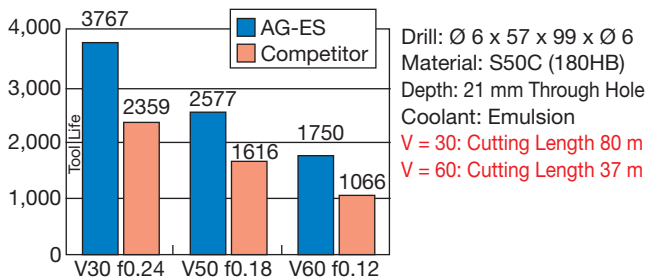


High accurate drilling as well as small oversize of hole is possible!!

High accurate & small enlargement



Performance of AG-ES Drill

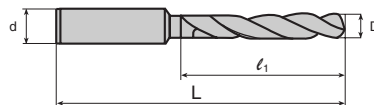


SGESS

Stub length SG drills with end mill shank. Extremely precise positioning, stable drilled hole diameter, reduced cycle via high speed and feed.



D ≤ 1,9 D ≤ 1,9 D ≤ 1,4 D > 1,4



List 7572P

unit: mm

D	L ₁	L	d	STOCK
1,01~1,06	6	38	3	
1,07~1,18	7	39	3	
1,19~1,32	8	40	3	
1,33~1,49	9	41	3	
1,51~1,69	10	42	3	
1,71~1,89	11	43	3	
1,91~2,12	12	44	3	
2,13~2,36	13	45	3	
2,37~2,64	14	46	3	
2,66~2,99	16	48	3	
3,01~3,34	18	50	4	
3,36~3,74	20	52	4	
3,76~3,99	22	54	4	
4,01~4,24	22	66	6	
4,26~4,74	24	68	6	
4,76~5,29	26	70	6	
5,31~5,99	28	72	6	

Tolerance: 0~0,009 mm

New sizes from 0,5 mm ~ 0,99 mm coming soon.

D	L ₁	L	d	STOCK
1,00	6	38	3	●
1,05	6	38	3	●
1,10	7	39	3	●
1,15	7	39	3	●
1,20	8	40	3	●
1,25	8	40	3	●
1,30	8	40	3	●
1,35	9	41	3	●
1,40	9	41	3	●
1,45	9	41	3	●
1,50	9	41	3	●
1,55	10	42	3	●
1,60	10	42	3	●
1,65	10	42	3	●
1,70	10	42	3	●
1,75	11	43	3	●
1,80	11	43	3	●
1,85	11	43	3	●
1,90	11	43	3	●
1,95	12	44	3	●
2,00	12	44	3	●
2,05	12	44	3	●
2,10	12	44	3	●
2,15	13	45	3	●
2,20	13	45	3	●
2,25	13	45	3	●
2,30	13	45	3	●
2,35	13	45	3	●
2,40	14	46	3	●
2,45	14	46	3	●
2,50	14	46	3	●
2,55	14	46	3	●
2,60	14	46	3	●
2,65	14	46	3	●
2,70	16	48	3	●

D	L ₁	L	d	STOCK
2,75	16	48	3	●
2,80	16	48	3	●
2,85	16	48	3	●
2,90	16	48	3	●
2,95	16	48	3	●
3,00	16	48	3	●
3,05	18	50	4	●
3,10	18	50	4	●
3,15	18	50	4	●
3,20	18	50	4	●
3,25	18	50	4	●
3,30	18	50	4	●
3,35	18	50	4	●
3,40	20	52	4	●
3,45	20	52	4	●
3,50	20	52	4	●
3,55	20	52	4	●
3,60	20	52	4	●
3,65	20	52	4	●
3,70	20	52	4	●
3,75	20	52	4	●
3,80	22	54	4	●
3,85	22	54	4	●
3,90	22	54	4	●
3,95	22	54	4	●
4,00	22	54	4	●
4,05	22	66	6	●
4,10	22	66	6	●
4,15	22	66	6	●
4,20	22	66	6	●
4,25	22	66	6	●
4,30	24	68	6	●
4,35	24	68	6	●
4,40	24	68	6	●
4,45	24	68	6	●

Selection Chart

Tool	Work Material											
	Structural Steels	Carbon Steels	Alloy Steels	Pre-Hardend Steels, Mold Steels	Hardend Steels		Stainless Steels		Titanium Alloys/ Nickel Alloys	Cast Irons	Aluminium Alloys	Copper Alloys
	SS400	S45C SCM	SCR NAK	30~40HRC	40~50HRC	50~65HRC	SUS304 SUS316	SUS420	Ti Ni	FC FCD	AC ADC	Cu
SG-ESS	◎	◎	◎	◎		X	○	○	◎	○	○	○

◎: Excellent; ○: Good; X: Not Used; No mark: Not recommended

D	ℓ_1	L	d	STOCK
4,50	24	68	6	●
4,55	24	68	6	●
4,60	24	68	6	●
4,65	24	68	6	●
4,70	24	68	6	●
4,75	24	68	6	●
4,80	26	70	6	●
4,85	26	70	6	●
4,90	26	70	6	●
4,95	26	70	6	●
5,00	26	70	6	●
5,05	26	70	6	●
5,10	26	70	6	●
5,15	26	70	6	●
5,20	26	70	6	●
5,25	26	70	6	●
5,30	26	70	6	●
5,35	28	72	6	●
5,40	28	72	6	●
5,45	28	72	6	●
5,50	28	72	6	●
5,55	28	72	6	●
5,60	28	72	6	●
5,65	28	72	6	●
5,70	28	72	6	●
5,75	28	72	6	●
5,80	28	72	6	●
5,85	28	72	6	●
5,90	28	72	6	●
5,95	28	72	6	●
6,00	28	72	6	●
6,10	31	75	8	●
6,20	31	75	8	●
6,30	31	75	8	●
6,40	31	75	8	●
6,50	31	75	8	●
6,60	31	75	8	●
6,70	31	75	8	●
6,80	34	78	8	●
6,90	34	78	8	●

D	ℓ_1	L	d	STOCK
7,00	34	78	8	●
7,10	34	78	8	●
7,20	34	78	8	●
7,30	34	78	8	●
7,40	34	78	8	●
7,50	34	78	8	●
7,60	37	81	8	●
7,70	37	81	8	●
7,80	37	81	8	●
7,90	37	81	8	●
8,00	37	81	8	●
8,10	37	87	10	●
8,20	37	87	10	●
8,30	37	87	10	●
8,40	37	87	10	●
8,50	37	87	10	●
8,60	40	90	10	●
8,70	40	90	10	●
8,80	40	90	10	●
8,90	40	90	10	●
9,00	40	90	10	●
9,10	40	90	10	●
9,20	40	90	10	●
9,30	40	90	10	●
9,40	40	90	10	●
9,50	40	90	10	●
9,60	43	93	10	●
9,70	43	93	10	●
9,80	43	93	10	●
9,90	43	93	10	●
10,00	43	93	10	●
10,10	43	100	12	●
10,20	43	100	12	●
10,30	43	100	12	●
10,40	43	100	12	●
10,50	43	100	12	●
10,60	43	100	12	●
10,70	47	104	12	●
10,80	47	104	12	●
10,90	47	104	12	●

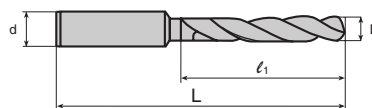
D	ℓ_1	L	d	STOCK
11,00	47	104	12	●
11,10	47	104	12	●
11,20	47	104	12	●
11,30	47	104	12	●
11,40	47	104	12	●
11,50	47	104	12	●
11,60	47	104	12	●
11,70	47	104	12	●
11,80	47	104	12	●
11,90	51	108	12	●
12,00	51	108	12	●
12,10	51	108	12	●
12,20	51	108	12	●
12,30	51	108	12	●
12,40	51	108	12	●
12,50	51	108	12	●
12,60	51	108	12	●
12,70	51	108	12	●
12,80	51	108	12	●
12,90	51	108	12	●
13,00	51	108	12	●
13,50	72	132	16	●
14,00	72	132	16	●
14,50	76	136	16	●
15,00	76	142	20	●
15,50	80	146	20	●
16,00	80	146	20	●
16,50	84	150	20	●
17,00	84	150	20	●
17,50	87	153	20	●
18,00	87	153	20	●
18,50	90	156	20	●
19,00	90	164	25	●
19,50	94	168	25	●
20,00	94	168	25	●

Drilling Condition

Work Material Drilling Condition	Structural Steels Carbon Steels SS, SC		Alloy Steels, Pre-Hardened Steels SCM, NAK, HPM		Mold Steels, Hardened Steels, Stainless Steels SKD, SUS, (30~40HRC)		Cast Irons FC, FCD		Aluminum Alloys Nonferrous Metals	
	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min
2	5700	360	4600	240	2400	135	6300	490	9700	760
3	4200	460	3400	320	1600	145	4700	640	7200	980
5	2500	430	2000	290	960	100	2800	600	4300	920
8	1600	370	1300	250	600	100	1800	530	2700	790
10	1300	340	1000	230	480	100	1400	460	2200	730
12	1100	310	850	210	400	90	1200	430	1800	670
16	800	290	640	200	300	80	880	390	1400	610
20	640	260	510	180	240	75	700	350	1100	550
25	510	240	410	160	200	70	560	330	870	510
32	400	180	320	120	150	60	440	250	680	380

AGES

The new alloy HSS drill is approached to the carbide drill.



List 6546

unit: mm

D	L ₁	L	d	STOCK
2.0	24	56	3	●
2.1	24	56	3	●
2.2	25	56	3	●
2.3	25	56	3	●
2.4	30	64	3	●
2.5	30	64	3	●
2.6	30	64	3	●
2.7	33	64	3	●
2.8	33	64	3	●
2.9	33	64	3	●
3.0	33	64	3	●
3.1	36	71	4	●
3.2	36	71	4	●
3.3	36	71	4	●
3.4	39	71	4	●
3.5	39	71	4	●
3.6	39	71	4	●
3.7	39	71	4	●
3.8	43	75	4	●
3.9	43	75	4	●
4.0	43	75	4	●
4.1	43	89	6	●
4.2	43	89	6	●
4.3	47	89	6	●
4.4	47	89	6	●
4.5	47	89	6	●
4.6	47	89	6	●
4.7	47	89	6	●
4.8	52	94	6	●
4.9	52	94	6	●
5.0	52	94	6	●
5.1	52	94	6	●
5.2	52	94	6	●
5.3	52	94	6	●
5.4	57	99	6	●
5.5	57	99	6	●
5.6	57	99	6	●
5.7	57	99	6	●
5.8	57	99	6	●
5.9	57	99	6	●

D	L ₁	L	d	STOCK
6.0	57	99	6	●
6.1	63	107	8	●
6.2	63	107	8	●
6.3	63	107	8	●
6.4	63	107	8	●
6.5	63	107	8	●
6.6	63	107	8	●
6.7	63	107	8	●
6.8	69	113	8	●
6.9	69	113	8	●
7.0	69	113	8	●
7.1	69	113	8	●
7.2	69	113	8	●
7.3	69	113	8	●
7.4	69	113	8	●
7.5	69	113	8	●
7.6	75	119	8	●
7.7	75	119	8	●
7.8	75	119	8	●
7.9	75	119	8	●
8.0	75	119	8	●
8.1	75	125	10	●
8.2	75	125	10	●
8.3	75	125	10	●
8.4	75	125	10	●
8.5	75	125	10	●
8.6	81	131	10	●
8.7	81	131	10	●
8.8	81	131	10	●
8.9	81	131	10	●
9.0	81	131	10	●
9.1	81	131	10	●
9.2	81	131	10	●
9.3	81	131	10	●
9.4	81	131	10	●
9.5	81	131	10	●
9.6	87	137	10	●
9.7	87	137	10	●
9.8	87	137	10	●
9.9	87	137	10	●

D	L ₁	L	d	STOCK
10.0	87	137	10	●
10.1	87	144	12	●
10.2	87	144	12	●
10.3	87	144	12	●
10.4	87	144	12	●
10.5	87	144	12	●
10.6	87	144	12	●
10.7	94	151	12	●
10.8	94	151	12	●
10.9	94	151	12	●
11.0	94	151	12	●
11.1	94	151	12	●
11.2	94	151	12	●
11.3	94	151	12	●
11.4	94	151	12	●
11.5	94	151	12	●
11.6	94	151	12	●
11.7	94	151	12	●
11.8	94	151	12	●
11.9	101	158	12	●
12.0	101	158	12	●
12.1	101	158	12	●
12.2	101	158	12	●
12.3	101	158	12	●
12.4	101	158	12	●
12.5	101	158	12	●
12.6	101	158	12	●
12.7	101	158	12	●
12.8	101	158	12	●
12.9	101	158	12	●
13.0	101	158	12	●
13.5	108	168	16	●
14.0	108	168	16	●
14.5	114	173	16	●
15.0	114	180	20	●
15.5	120	185	20	●
16.0	120	185	20	●
16.5	125	189	20	●
17.0	125	189	20	●
17.5	130	194	20	●

D	L ₁	L	d	STOCK
18.0	130	194	20	●
18.5	135	198	20	●
19.0	135	206	25	●
19.5	140	210	25	●
20.0	140	210	25	●

Selection Chart

Tool	Work Material											
	Structural Steels	Carbon Steels	Alloy Steels	Pre-Hardend Steels, Mold Steels	Hardend Steels		Stainless Steels		Titanium Alloys/ Nickel Alloys	Cast Irons	Aluminium Alloys	Copper Alloys
	SS400	S45C SCM	SCR NAK	30~40HRC	40~50HRC	50~65HRC	SUS304 SUS316	SUS420	Ti Ni	FC FCD	AC ADC	Cu
AG-ES	◎	◎	◎	◎	X	X	○	○	○	○	○	○

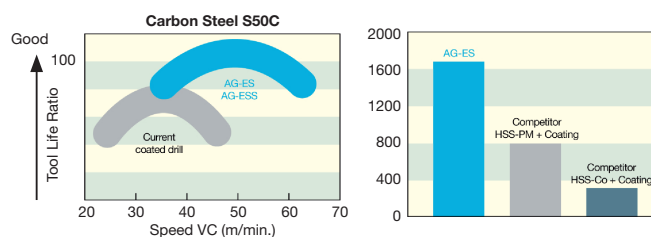
◎: Excellent; ○: Good; X: Not Used; No mark: Not recommended

Drilling Condition

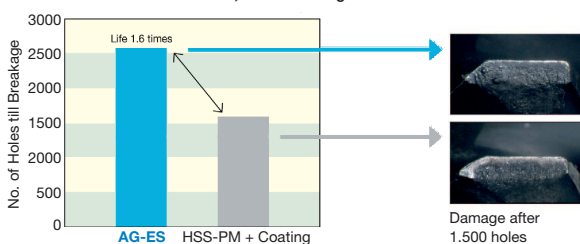
Work Material Drilling Condition Drill Dia. (mm)	Structural Steels, Carbon Steels SS, SC (150~200HB)		Alloy Steels SMC (20~30HRC)		Mold Steels, Pre-Hardened SKD (30~40HRC)		Stainless Steels SUS (~40HRC)		Cast Irons FC, FCD		Aluminum Alloys Nonferrous Metals	
	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min	Rotation min ⁻¹	Feed mm/min
2	7200	390	5600	255	3200	115	1900	60	8000	530	12000	840
3	4800	430	3700	280	2100	130	1300	80	5300	560	8000	840
5	2900	390	2200	280	1300	130	760	65	3200	560	4800	840
8	1800	360	1400	255	800	130	480	65	2000	480	3000	720
10	1400	330	1100	235	640	130	380	60	1600	480	2400	720
12	1200	300	930	210	530	115	320	60	1300	400	2000	600
16	900	270	700	190	400	95	240	50	1000	320	1500	480
20	720	240	560	170	320	95	190	50	800	320	1200	480

Hard wearing and chip resistant.

- The newly developed high alloy HSS drills have chipping and wear resistance, which is consistent even with the larger sizes.
- Higher speeds and longer tool life can be expected even in materials with hardness greater than HRC 32 where stable drilling is normally difficult with HSS.



AG-ES Ø 6.0, Carbon Steel S50C
V50 m/min. x F500 mm/min., 21 mm Through



Works with a wide range of materials.

- Newly designed optimized groove geometry, shape relief and helix angle.
- The superior chip formation and removal properties of these drills are unaffected by the hardness of the material.

Tool: AGES9.0
Feed: 480 mm/min. (0.27 mm/rev)
Workmaterial: Structural Steel 400
Speed: 50 m/min.
Through hole: 19 mm



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