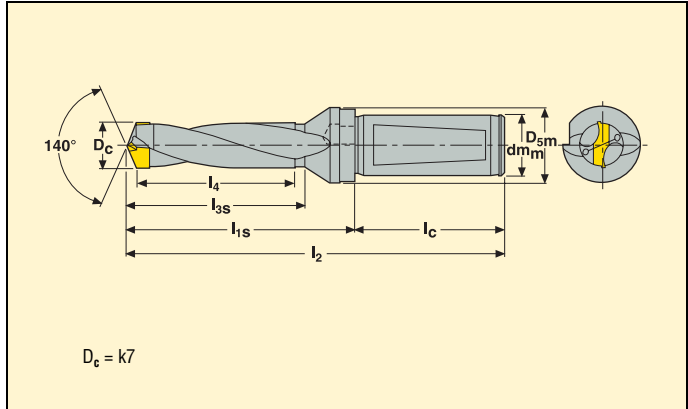


Brazed carbide tipped drills SD30

Drilling depth ~ 3 x D - Metric diameter



- Whistle Notch shank.
- Internal coolant.
- Intermediate diameters are available upon request.



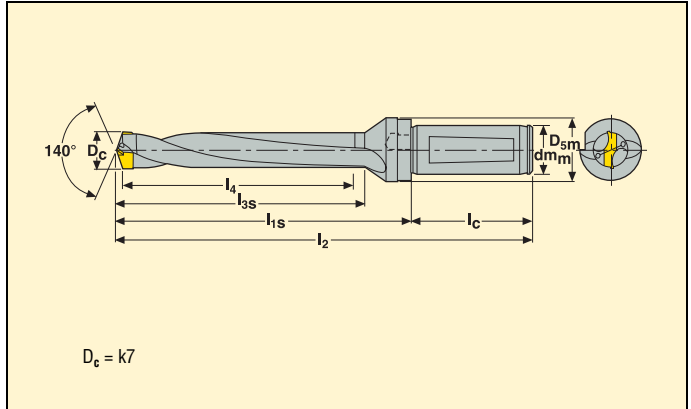
Drill dia. D_c (mm)	Max drilling depth I_4 (inch)	Part No.	Dimensions in Inch					
			I_2	I_{1s}	I_c	I_{3s}	dm_m	D_{sm}
10.0	1.18	SD30-10.00-30-16R5	4.173	2.283	1.890	1.654	0.630	0.827
10.2	1.18	SD30-10.20-30-16R5	4.173	2.283	1.890	1.654	0.630	0.827
10.5	1.18	SD30-10.50-30-16R5	4.173	2.283	1.890	1.654	0.630	0.827
11.0	1.30	SD30-11.00-33-16R5	4.331	2.441	1.890	1.811	0.630	0.827
11.5	1.30	SD30-11.50-33-16R5	4.331	2.441	1.890	1.811	0.630	0.827
12.0	1.46	SD30-12.00-37-16R5	4.291	2.401	1.890	1.850	0.630	0.827
12.2	1.46	SD30-12.20-37-16R5	4.291	2.401	1.890	1.850	0.630	0.827
12.3	1.46	SD30-12.30-37-16R5	4.291	2.402	1.890	1.772	0.630	0.827
12.5	1.46	SD30-12.50-37-16R5	4.291	2.401	1.890	1.850	0.630	0.827
12.7	1.57	SD30-12.70-40-16R5	4.409	2.520	1.890	1.968	0.630	0.827
12.75	1.57	SD30-12.75-40-16R5	4.409	2.520	1.890	1.890	0.630	0.827
12.8	1.57	SD30-12.80-40-16R5	4.409	2.520	1.890	1.890	0.630	0.827
13.0	1.57	SD30-13.00-40-16R5	4.409	2.520	1.890	1.968	0.630	0.827
13.5	1.57	SD30-13.50-40-16R5	4.409	2.520	1.890	1.968	0.630	0.827
14.0	1.65	SD30-14.00-42-16R5	4.567	2.756	1.890	2.126	0.630	0.827
14.5	1.81	SD30-14.50-46-20R5	4.724	2.874	1.890	2.244	0.787	0.984
14.75	1.81	SD30-14.75-46-20R5	4.764	2.874	1.890	2.244	0.787	0.984
15.0	1.81	SD30-15.00-46-20R5	4.724	2.874	1.890	2.244	0.787	0.984
15.25	1.81	SD30-15.25-46-20R5	4.764	2.874	1.890	2.244	0.787	0.984
15.5	1.81	SD30-15.50-46-20R5	4.724	2.874	1.890	2.244	0.787	0.984
16.0	1.93	SD30-16.00-49-20R5	4.921	3.031	1.890	2.402	0.787	0.984
16.3	1.93	SD30-16.30-49-20R5	4.921	3.031	1.890	2.402	0.787	0.984
16.5	1.93	SD30-16.50-49-20R5	4.921	3.031	1.890	2.402	0.787	0.984
17.0	2.01	SD30-17.00-51-20R5	5.039	3.150	1.890	2.560	0.787	0.984
17.5	2.17	SD30-17.50-55-25R5	5.511	3.386	2.126	2.716	0.984	1.260
18.0	2.17	SD30-18.00-55-25R5	5.511	3.386	2.126	2.716	0.984	1.260
18.5	2.17	SD30-18.50-55-25R5	5.511	3.386	2.126	2.716	0.984	1.260
19.0	2.28	SD30-19.00-58-25R5	5.630	3.543	2.126	2.835	0.984	1.260
19.06	2.28	SD30-19.06-58-25R5	5.630	3.504	2.126	2.913	0.984	1.260
19.40	2.28	SD30-19.40-58-25R5	5.630	3.504	2.126	2.913	0.984	1.260
19.5	2.28	SD30-19.50-58-25R5	5.630	3.543	2.126	2.835	0.984	1.260
20.0	2.40	SD30-20.00-61-25R5	5.787	3.700	2.126	2.992	0.984	1.260
20.5	2.40	SD30-20.50-61-25R5	5.787	3.700	2.126	2.992	0.984	1.260
21.0	2.52	SD30-21.00-64-25R5	5.905	3.819	2.126	3.110	0.984	1.260
21.20	2.52	SD30-21.20-64-25R5	5.945	3.819	2.126	3.189	0.984	1.260
21.5	2.52	SD30-21.50-64-25R5	5.905	3.819	2.126	3.110	0.984	1.260
22.0	2.64	SD30-22.00-67-25R5	6.102	3.976	2.126	3.307	0.984	1.260
22.5	2.64	SD30-22.50-67-25R5	6.102	3.976	2.126	3.307	0.984	1.260
23.0	2.76	SD30-23.00-70-25R5	6.220	4.094	2.126	3.425	0.984	1.260
23.25	2.76	SD30-23.25-70-25R5	6.220	4.094	2.126	3.425	0.984	1.260
23.5	2.76	SD30-23.50-70-25R5	6.220	4.094	2.126	3.425	0.984	1.260
24.0	2.87	SD30-24.00-73-32R5	6.535	4.250	2.283	3.583	1.260	1.575
24.5	2.87	SD30-24.50-73-32R5	6.535	4.252	2.283	3.583	1.260	1.575
25.0	2.95	SD30-25.00-75-32R5	6.614	4.370	2.283	3.661	1.260	1.575

Brazed carbide tipped drills SD35

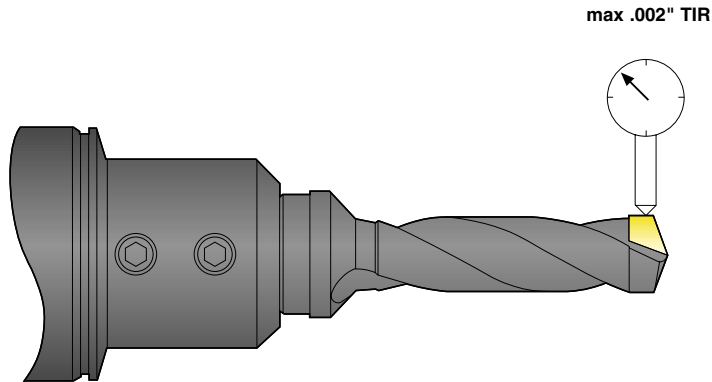
Drilling depth ~ 5 x D - Metric diameter



- Whistle Notch shank.
- Internal coolant.
- Intermediate diameters are available upon request.



Drill dia. D_c (mm)	Max drilling depth l_4 (inch)	Part No.	Dimensions in Inch					
			l_2	l_{1s}	l_c	l_{3s}	dm_m	D_{5m}
10.0	1.97	SD35-10.00-50-16R5	4.961	3.071	1.890	2.362	0.630	0.827
10.2	1.97	SD35-10.20-50-16R5	4.961	3.071	1.890	2.362	0.630	0.827
10.5	1.97	SD35-10.50-50-16R5	4.961	3.071	1.890	2.362	0.630	0.827
11.0	2.17	SD35-11.00-55-16R5	5.197	3.307	1.890	2.677	0.630	0.827
11.5	2.17	SD35-11.50-55-16R5	5.197	3.307	1.890	2.677	0.630	0.827
12.0	2.44	SD35-12.00-62-16R5	5.276	3.386	1.890	2.835	0.630	0.827
12.1	2.44	SD35-12.10-62-16R5	5.276	3.386	1.890	2.756	0.630	0.827
12.2	2.44	SD35-12.20-62-16R5	5.276	3.386	1.890	2.756	0.630	0.827
12.5	2.44	SD35-12.50-62-16R5	5.276	3.386	1.890	2.835	0.630	0.827
12.7	2.64	SD35-12.70-67-16R5	5.472	3.583	1.890	2.953	0.630	0.827
13.0	2.64	SD35-13.00-67-16R5	5.472	3.583	1.890	3.031	0.630	0.827
13.5	2.64	SD35-13.50-67-16R5	5.472	3.583	1.890	3.031	0.630	0.827
14.0	2.76	SD35-14.00-70-16R5	5.709	3.858	1.890	3.268	0.630	0.827
14.5	3.03	SD35-14.50-77-20R5	5.945	4.094	1.890	3.465	0.787	0.984
15.0	3.03	SD35-15.00-77-20R5	5.945	4.094	1.890	3.465	0.787	0.984
15.25	3.03	SD35-15.25-77-20R5	5.984	4.094	1.890	3.465	0.787	0.984
15.5	3.03	SD35-15.50-77-20R5	5.945	4.094	1.890	3.465	0.787	0.984
16.0	3.23	SD35-16.00-82-20R5	6.181	4.331	1.890	3.700	0.787	0.984
16.1	3.23	SD35-16.10-82-20R5	6.220	4.331	1.890	3.701	0.787	0.984
16.2	3.23	SD35-16.20-82-20R5	6.220	4.331	1.890	3.701	0.787	0.984
16.5	3.23	SD35-16.50-82-20R5	6.181	4.331	1.890	3.700	0.787	0.984
16.9	3.39	SD35-16.90-86-20R5	6.417	4.528	1.890	3.898	0.787	0.984
17.0	3.35	SD35-17.00-85-20R5	6.417	4.528	1.890	3.937	0.787	0.984
17.5	3.62	SD35-17.50-92-25R5	6.968	4.843	2.126	4.173	0.984	1.260
18.0	3.62	SD35-18.00-92-25R5	6.968	4.843	2.126	4.173	0.984	1.260
18.5	3.62	SD35-18.50-92-25R5	6.968	4.843	2.126	4.173	0.984	1.260
19.0	3.82	SD35-19.00-97-25R5	7.165	5.078	2.126	4.370	0.984	1.260
19.25	3.82	SD35-19.25-97-25R5	7.165	5.039	2.126	4.409	0.984	1.260
19.5	3.82	SD35-19.50-97-25R5	7.165	5.078	2.126	4.370	0.984	1.260
20.0	4.02	SD35-20.00-102-25R5	7.402	5.315	2.126	4.606	0.984	1.260
20.1	4.02	SD35-20.10-102-25R5	7.441	5.315	2.126	4.685	0.984	1.260
20.5	4.02	SD35-20.50-102-25R5	7.402	5.315	2.126	4.606	0.984	1.260
21.0	4.21	SD35-21.00-107-25R5	7.598	5.512	2.126	4.803	0.984	1.260
21.5	4.21	SD35-21.50-107-25R5	7.598	5.512	2.126	4.803	0.984	1.260
22.0	4.41	SD35-22.00-112-25R5	7.874	5.748	2.126	5.079	0.984	1.260
22.5	4.41	SD35-22.50-112-25R5	7.874	5.748	2.126	5.079	0.984	1.260
23.0	4.61	SD35-23.00-117-25R5	8.071	5.945	2.126	5.276	0.984	1.260
23.5	4.61	SD35-23.50-117-25R5	8.071	5.945	2.126	5.276	0.984	1.260
24.0	4.80	SD35-24.00-122-32R5	8.465	6.181	2.283	5.512	1.260	1.575
24.5	4.80	SD35-24.50-122-32R5	8.465	6.181	2.283	5.512	1.260	1.575
25.0	4.92	SD35-25.00-125-32R5	8.661	6.417	2.283	5.709	1.260	1.575



Run-out

Use a Whistle Notch type holder (DIN 1835E) or similar. If using other types of holders make sure that the clamping screws in the holder completely align with the flat on the shank. Do not tighten the screws on the cylindrical part of the shank. Keep the total indicated run-out of the drill within .002" when used as a rotating tool or keep the distance between the drill point and workpiece center line within .0008" when used as a stationary tool.

Stability

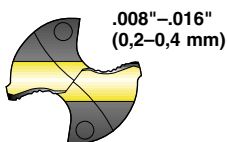
The stability of the application is important to obtain the best tool life and hole accuracy. Check the condition of the machine spindle, fixture and fixturing of the component to secure maximum stability and rigidity. Unstable conditions can cause tool breakages.

Method

- No center drilling necessary, if it has been precentered or if the surface of the workpiece is angled or rough decrease feed by 50% during entrance.
- Adjust feed up or down to obtain as good chip formation as possible. Increased feed/rev. gives shorter chips.
- Reduce the feed during entrance when drilling with SD35 drills.

Tool life

Drills should not be used with flank wear exceeding .008–.016 inch measured at the largest point.



Cutting data

The recommended start values for general applications are marked **bold**.

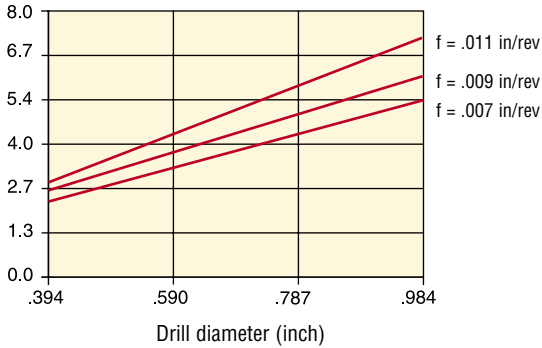
Reduce the values in case of poor stability in the application, high hardness of the workpiece or poor coolant pressure in combination with drilling deep holes (>3 x D).

SD30 and SD35

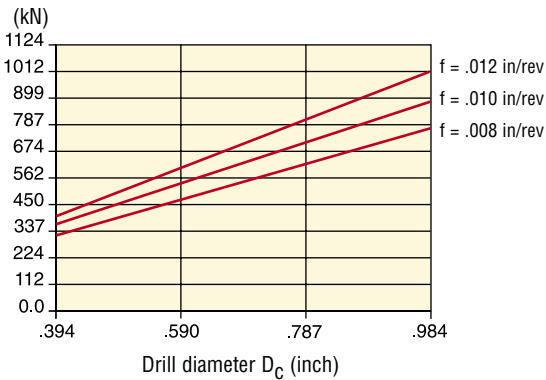
Drilling deep holes, >3 x D, in stainless steels with SD35 is not recommended.

Seco/Carboloy Material group No.	Recommended cutting speed, v_c (ft/min)	Recommended feed, f (inch/rev) for drill diameter			
		.388–.472	.473–.688	.689–.984	.985–1.26
1	260- 360 -460	.0051- .0059 -.0078	.0059- .0078 -.011	.0059- .0078 -.011	.0078- .0098 -.011
2–3	230- 280 -360	.0059- .0078 -.0098	.0078- .0098 -.0157	.0078- .011 -.0157	.0098- .011 -.0157
4–5	160- 230 -295	.0059- .0078 -.0098	.0059- .0078 -.011	.0078- .0098 -.0137	.0098- .011 -.0137
6	130- 160 -200	.0059- .0078 -.0098	.0059- .0078 -.011	.0078- .0098 -.011	.0078- .0098 -.011
7	100- 130 -160	.0039- .0059 -.0098	.0039- .0059 -.0078	.0059- .0078 -.0098	.0078- .0098 -.011
8–9	130- 160 -200	.0039- .0047 -.0059	.0047- .0059 -.0098	.0059- .007 -.011	.0059- .0078 -.011
10	115- 150 -180	.0039- .0047 -.0059	.0047- .0059 -.0078	.0059- .007 -.009	.0059- .007 -.009
11	–	–	–	–	–
12	260- 330 -395	.007- .0098 -.0118	.0078- .011 -.0157	.0098- .0137 -.0177	.011- .0157 -.0196
13–14	200- 260 -330	.0059- .0078 -.0098	.0078- .0098 -.0137	.0078- .0137 -.0157	.0098- .0137 -.0177
15	160- 200 -230	.0047- .0062 -.0078	.0059- .0078 -.011	.0078- .0098 -.0137	.0098- .011 -.0137
16–17	330- 495 -820	.0059- .0078 -.0098	.0078- .0098 -.0137	.0078- .011 -.0157	.0098- .0137 -.0177

Net power consumption



Feed force



The values showing feed force and net power consumption above are basic values and vary with type of cutting data, material and tool wear. Formulae for calculation are on page 148.

Coolant

Hole depth	Recommended pressure (psi)	Volume gal/min. for drill diameter	
		Ø .472	Ø .984
< 3 x D	min. 140	1.2	2.64
> 3 x D	min. 280	1.6	4.5

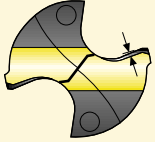
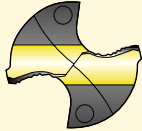
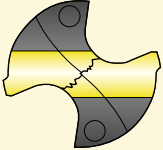
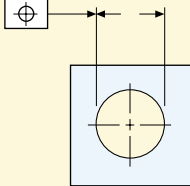
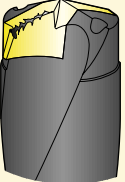
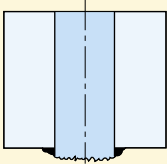
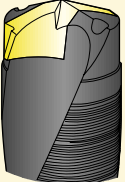
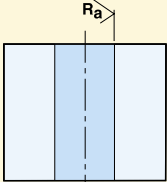
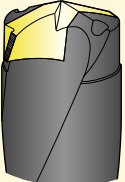
Coolant supply through the drill will improve chip evacuation, lubrication of the carbide and cooling.

Recommended emulsion mix is 6–8%.
When drilling in high alloy- and stainless steel an emulsion mix of >10% is recommended.
Drilling with external coolant supply can be done with hole depths less than 2 x D and with reduced cutting data.

Hole tolerances/surface finish

SD30		SD35	
IT9/ ≈ Ra 2 μm (80 μ inch)		IT10/ ≈ Ra 2 μm (80 μ inch)	
Drill dia D (inch)	Tolerance range	Drill dia D (inch)	Tolerance range
>.236–.394	.0014	>.236–.394	.0023
>.394–.708	.0017	>.394–.708	.0027
>.708–1.18	.0020	>.708–1.18	.0033

*Deterioration of finish can occur when drilling in low carbon and stainless steel.

<p>Rapid flank wear</p> 	<ul style="list-style-type: none"> • Reduce the cutting speed. 	<p>Pick up/Wear Built up edge</p> 	<ul style="list-style-type: none"> • Increase coolant concentration. • Increase the cutting speed or, if the drill is worn, regrind it.
<p>Chipping/Center</p> 	<ul style="list-style-type: none"> • Check for run-out and make sure it is less than .002 inch TIR. • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Increase coolant pressure and adjust the feed to optimize the chip formation. • Reduce the cutting speed. 	<p>Poor tolerance/positioning</p> 	<ul style="list-style-type: none"> • Check for run-out and make sure it is less than .002 inch TIR. • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Reduce the feed. • Increase coolant pressure and adjust the feed to optimize the chip formation.
<p>Chipping/Outer corner, cutting edge</p> 	<ul style="list-style-type: none"> • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Increase coolant concentration. 	<p>Burrs on exit</p> 	<ul style="list-style-type: none"> • Reduce the width of edge preparation (W).
<p>Pick up/Wear Drill body</p> 	<ul style="list-style-type: none"> • Check for run-out and make sure it is less than .002 inch TIR. • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Increase coolant pressure and adjust the feed to optimize the chip formation. 	<p>Poor surface finish</p> 	<ul style="list-style-type: none"> • Check for run-out and make sure it is less than .002 inch TIR. • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Reduce the feed. • Increase coolant pressure and adjust the feed to optimize the chip formation. • Increase coolant concentration. • Reduce the cutting speed.
<p>Pick up/Wear Periphery land</p> 	<ul style="list-style-type: none"> • Check the machine spindle, fixture and clamping of the component. • Reduce feed during entrance. • Increase coolant pressure and adjust the feed to optimize the chip formation. • Increase coolant concentration. • Reduce the cutting speed. 		