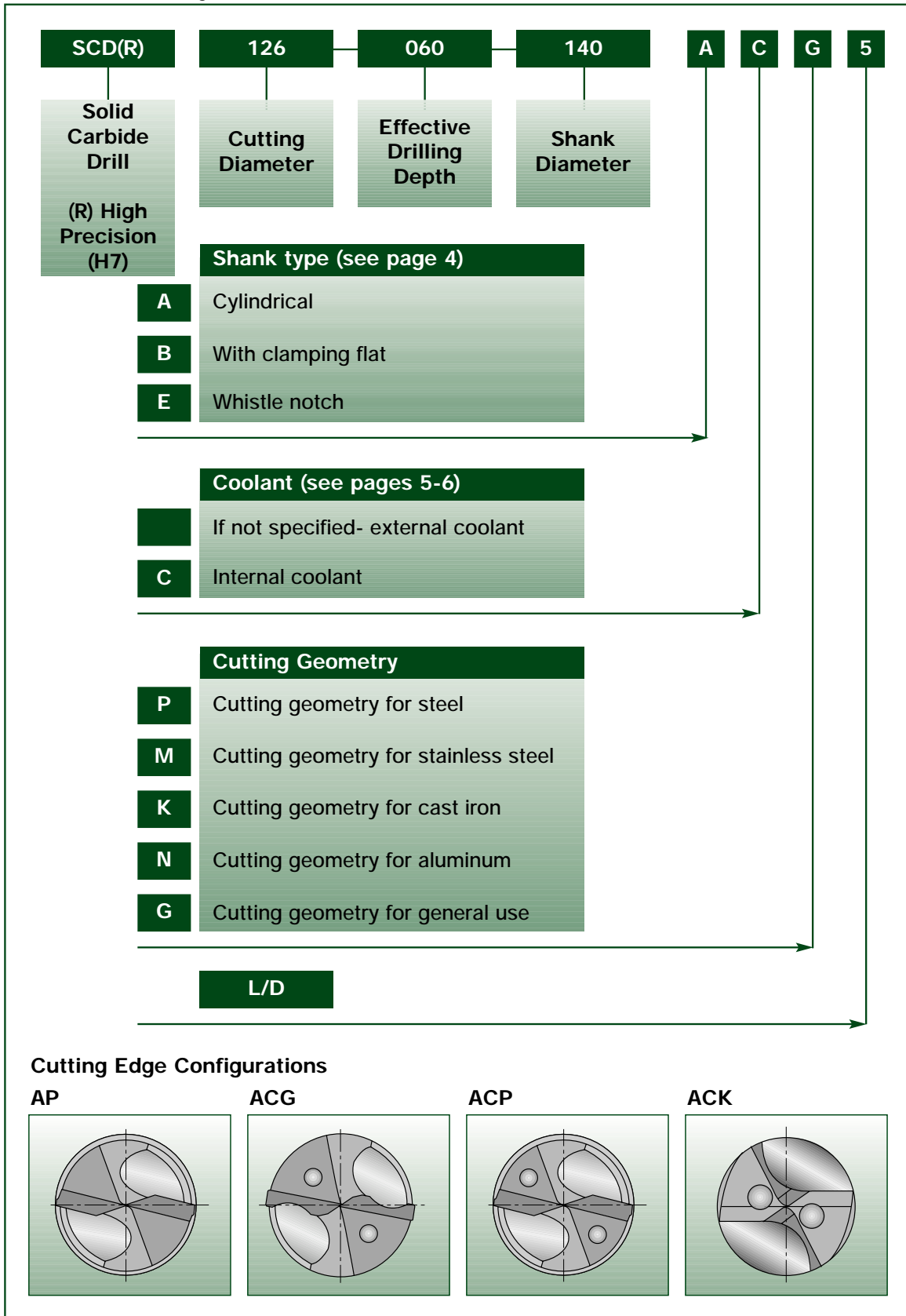


# SOLIDDRILL

## Identification System



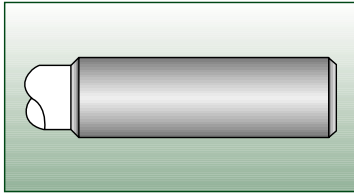
## User Guide:

- Use of internal and external coolant during drilling is recommended for achieving prolonged edge life. In case of non-coolant drill type, external cooling jets are necessary.
- Semi-synthetic or emulsion lubricants are recommended in order to extend tool life. Minimal lubrication or an emulsion spray may be applied for ISO K and ISO N materials.
- Drilling stainless steel or high temperature alloys requires a high oil pressure of 7-15% mineral or vegetable-based oil emulsion for prolonged edge life.
- Dry machining will affect hole quality and drill tool life.
- We recommend using our solid carbide drills in rotating or stationary applications with a maximum of 0.02 mm outer cutting points or chisel runout for optimal performance. Larger runout will influence drill performance and hole quality ([see page 5](#)).
- In case of stationary application we recommend clamping the drill in an orientation which directs both outer cutting points parallel to machine "X" axis.
- On stationary (lathe) applications, if there are misalignment problems it is recommended to use alignment devices such as the ISCAR/ETM GYRO device ([see page 4](#)).
- Difficult to machine materials may require pecking cycle for improved chip evacuation.
- The new solid carbide drills can be clamped in ISCAR tooling systems such as:
  - Collet chucks
  - Shrink system
  - Power chucks
- We recommend:
  - JET 2 collet chucks for internal and external coolant jets.
  - "SCD" drills in SHORTIN adaptation with "AA" super precision collets for a high level of hole quality and prolonged drill life.
  - Using shrink system for SCDR drills for maximum accuracy and best performance.
  - Drilling stacked plates with internal coolant drills only. Both options of stacked plate applications - with and without gap. (A minimum gap of 2 mm between plates is recommended)
  - Drilling sloped surfaces of a maximum 6°. Sloped surfaces of more than 6° require spot or pre-hole centering to avoid drill deviation or poor drill performance.
- Interrupted cut has direct influence on hole accuracy, quality and drill tool life.
- Solid carbide drills can not be used on FITBORE or any other radial adjustment adaptation devices.
- Regrinding instructions can be found on [pages 23-24](#).
- Troubleshooting instructions can be found on [pages 25-26](#).

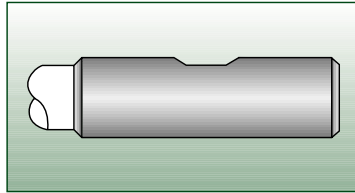
# SOLIDDRILL USER GUIDE

Shank Standard (Based on DIN 6535)

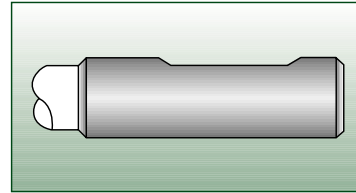
Form A (HA)



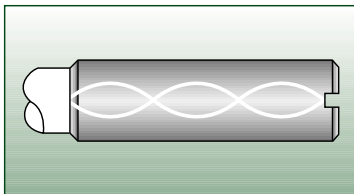
Form B (HB)



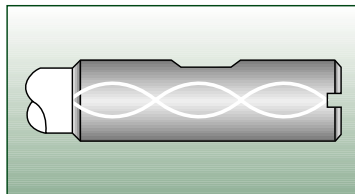
Form E (HE)



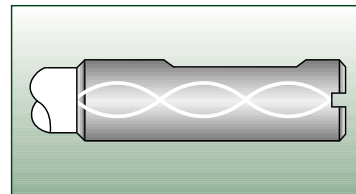
Form AC (HAK)



Form BC (HBK)



Form EC (HEK)

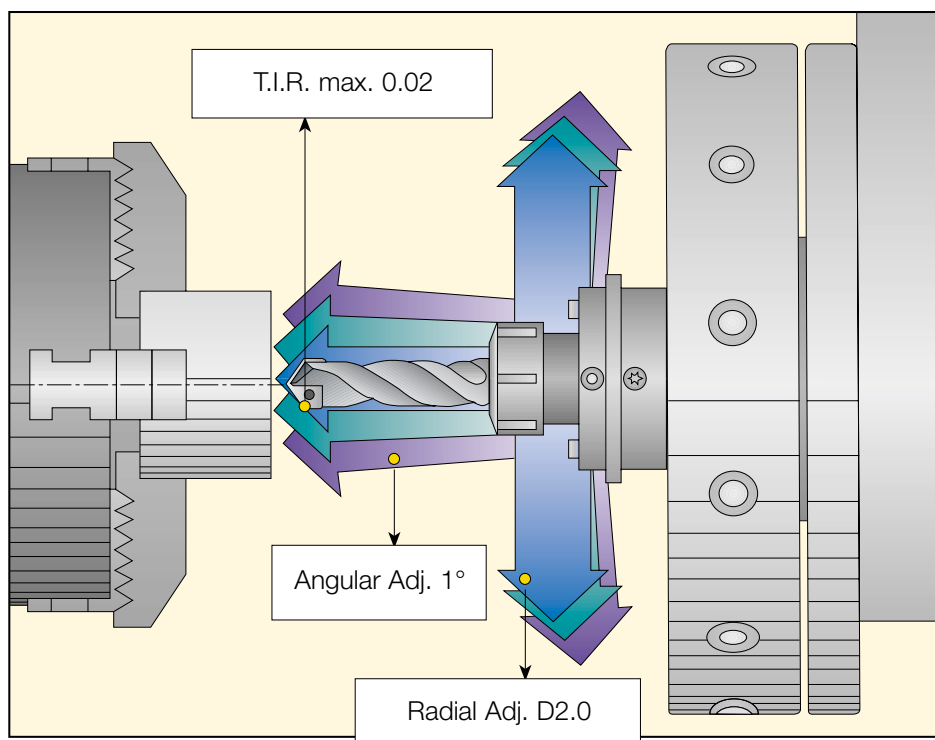


## Stationary Application User Guide

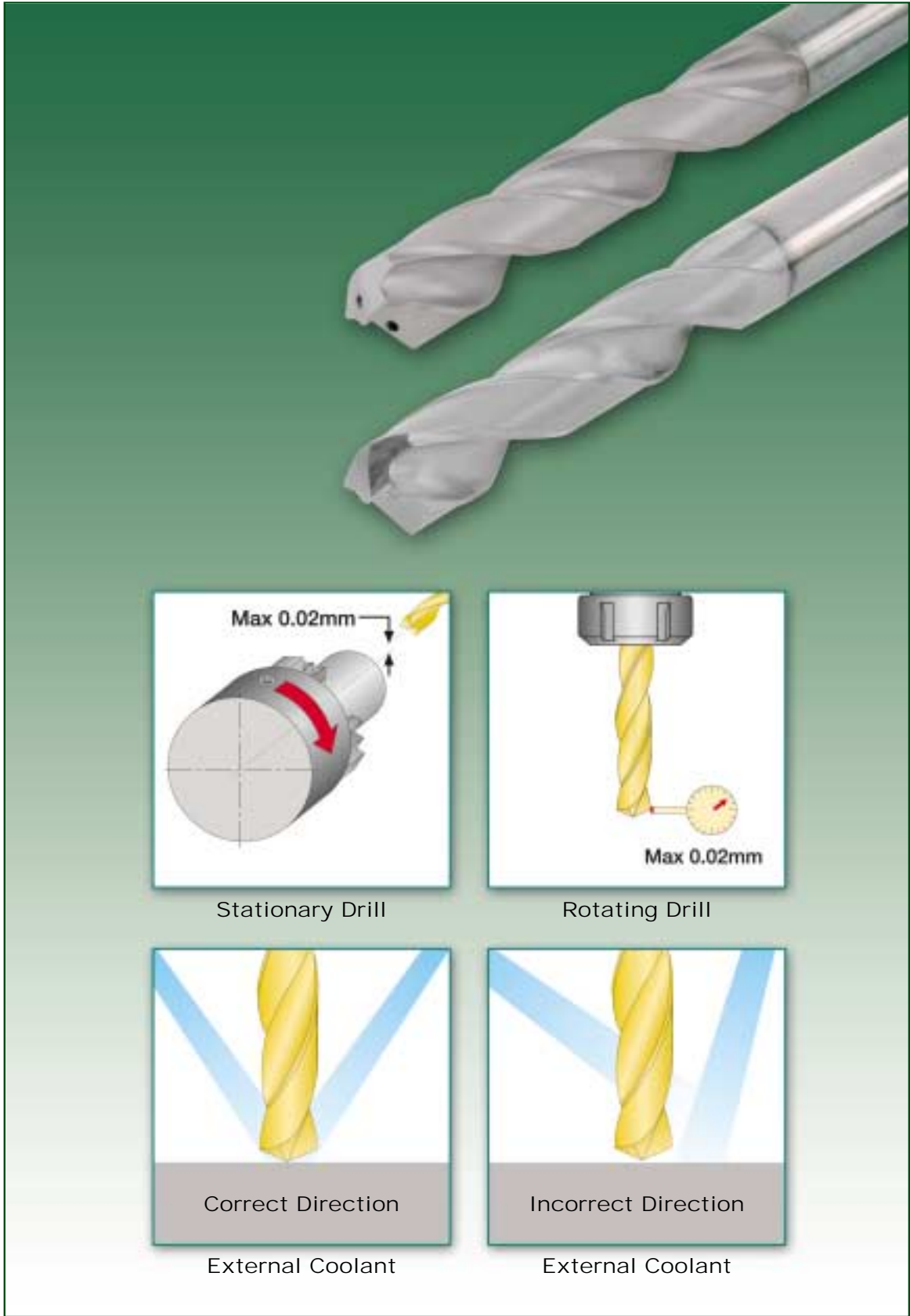
### GYRO

Misalignment Correcting Device for Stationary Operations

Misalignment will cause poor performance of the solid carbide drill or even tool breakage!

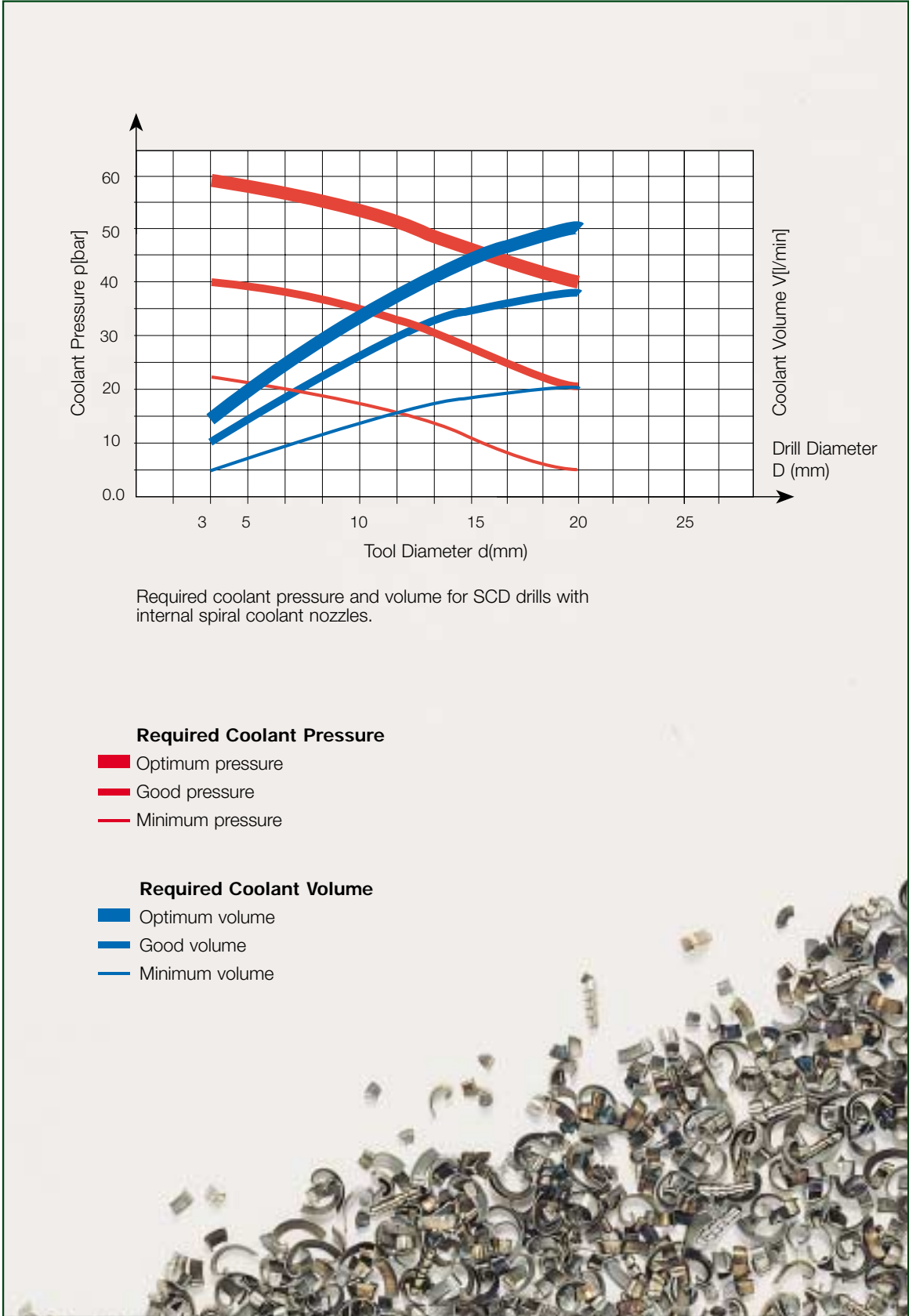


**SOLIDDRILL** USER GUIDE



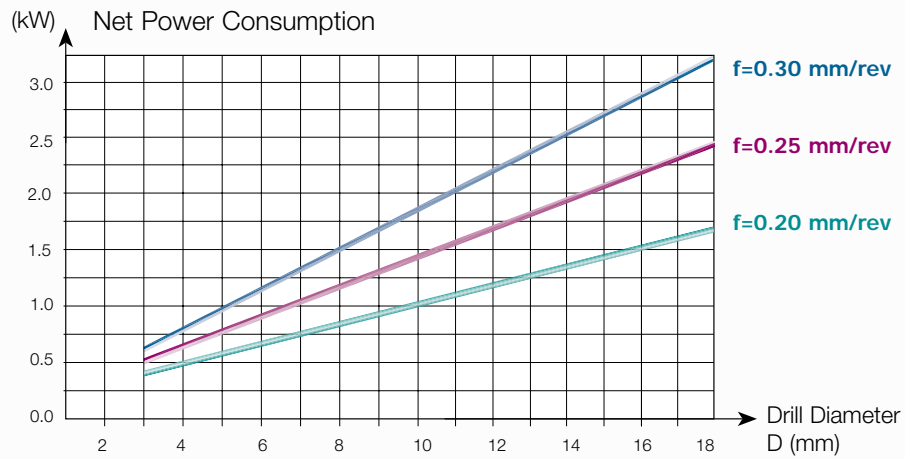
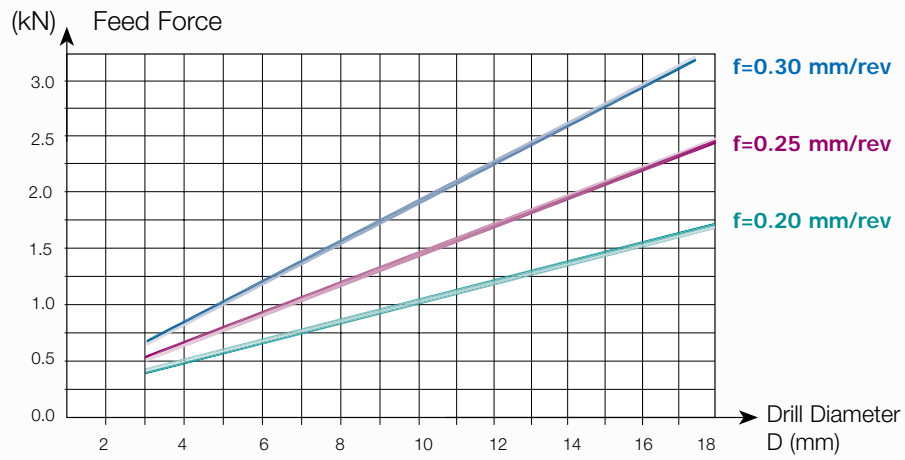
# SOLIDDRILL USER GUIDE

## Coolant Pressure and Volume Recommendations



# SOLIDDRILL USER GUIDE

## Machining Conditions



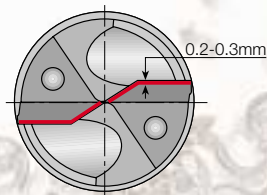
**Material:** SAE 4340  
**Speed:** 100 m/min  
Values may change for different materials and drilling conditions.

### Stability

The stability of the volume 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 breakage.

### Tool Life

Drills should not be used with flank wear exceeding 0.2-0.3 mm.



### Advantages:

- High quality TiAlN coating with a special edge preparation provides a smooth cut and prolonged edge life as compared to any high quality solid carbide drill available in the market.
- Sub-micron substrate provides a high level of rigidity and accuracy.
- Semi-standard/special drills can be supplied upon request.

Solid Carbide Drills  
 Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø3.0 to Ø6.1**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

SCD-AP3

Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
SCD 030-014-060 AP3	3.0	6	14	20	62	M3.5
SCD 031-014-060 AP3	3.1	6	14	20	62	
SCD 032-014-060 AP3	3.2	6	14	20	62	
SCD 033-014-060 AP3	3.3	6	14	20	62	
SCD 034-014-060 AP3	3.4	6	14	20	62	M4
SCD 035-014-060 AP3	3.5	6	14	20	62	
SCD 036-014-060 AP3	3.6	6	14	20	62	
SCD 037-014-060 AP3	3.7	6	14	20	62	
SCD 038-017-060 AP3	3.8	6	17	24	66	
SCD 039-017-060 AP3	3.9	6	17	24	66	
SCD 040-017-060 AP3	4.0	6	17	24	66	
SCD 041-017-060 AP3 <sup>(1)</sup>	4.1	6	17	24	66	
SCD 042-017-060 AP3	4.2	6	17	24	66	
SCD 043-017-060 AP3	4.3	6	17	24	66	M5
SCD 044-017-060 AP3	4.4	6	17	24	66	
SCD 045-017-060 AP3	4.5	6	17	24	66	
SCD 046 -017-060 AP3	4.6	6	17	24	66	
SCD 047-017-060 AP3	4.7	6	17	24	66	
SCD 048-020-060 AP3	4.8	6	20	28	66	
SCD 049-020-060 AP3	4.9	6	20	28	66	
SCD 050-020-060 AP3	5.0	6	20	28	66	
SCD 051-020-060 AP3	5.1	6	20	28	66	M6
SCD 052-020-060 AP3	5.2	6	20	28	66	
SCD 053-020-060 AP3	5.3	6	20	28	66	
SCD 054-020-060 AP3 <sup>(1)</sup>	5.4	6	20	28	66	
SCD 055-020-060 AP3	5.5	6	20	28	66	
SCD 056-020-060 AP3 <sup>(1)</sup>	5.6	6	20	28	66	
SCD 057-020-060 AP3 <sup>(1)</sup>	5.7	6	20	28	66	
SCD 058-020-060 AP3	5.8	6	20	28	66	
SCD 059-020-060 AP3 <sup>(1)</sup>	5.9	6	20	28	66	
SCD 060-020-060 AP3	6.0	6	20	28	66	
SCD 061-024-080 AP3	6.1	8	24	34	79	

<sup>(1)</sup> Available upon request only.  
 Available grade IC908.  
 Shank according to DIN 6535-Form HA.

Solid Carbide Drills  
Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø6.2 to Ø9.3**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a side view of a double-flute solid carbide drill bit. The cutting edge diameter is labeled as  $\text{Ø}D_{m7}$ . The total length of the drill is labeled as  $L$ . The length of the cutting edge is labeled as  $L_1$ . The length of the cutting edge plus the length of the flute is labeled as  $L_2$ . The diameter of the shank is labeled as  $\text{Ø}d_{h6}$ .

SCD-AP3

Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
SCD 062-024-080 AP3	6.2	8	24	34	79	M7
SCD 063-024-080 AP3	6.3	8	24	34	79	
SCD 064-024-080 AP3	6.4	8	24	34	79	
SCD 065-024-080 AP3	6.5	8	24	34	79	
SCD 066-024-080 AP3	6.6	8	24	34	79	
SCD 067-024-080 AP3	6.7	8	24	34	79	
SCD 068-024-080 AP3	6.8	8	24	34	79	M8
SCD 069-024-080 AP3 <sup>(1)</sup>	6.9	8	24	34	79	
SCD 070-024-080 AP3	7.0	8	24	34	79	
SCD 071-029-080 AP3	7.1	8	29	41	79	
SCD 072-029-080 AP3	7.2	8	29	41	79	
SCD 073-029-080 AP3 <sup>(1)</sup>	7.3	8	29	41	79	
SCD 074-029-080 AP3 <sup>(1)</sup>	7.4	8	29	41	79	
SCD 075-029-080 AP3	7.5	8	29	41	79	
SCD 076-029-080 AP3 <sup>(1)</sup>	7.6	8	29	41	79	
SCD 077-029-080 AP3 <sup>(1)</sup>	7.7	8	29	41	79	
SCD 078-029-080 AP3	7.8	8	29	41	79	
SCD 079-029-080 AP3 <sup>(1)</sup>	7.9	8	29	41	79	
SCD 080-029-080 AP3	8.0	8	29	41	79	
SCD 081-035-100 AP3	8.1	10	35	47	89	
SCD 082-035-100 AP3	8.2	10	35	47	89	
SCD 083-035-100 AP3	8.3	10	35	47	89	
SCD 084-035-100 AP3 <sup>(1)</sup>	8.4	10	35	47	89	
SCD 085-035-100 AP3	8.5	10	35	47	89	
SCD 086-035-100 AP3	8.6	10	35	47	89	
SCD 087-035-100 AP3	8.7	10	35	47	89	
SCD 088-035-100 AP3	8.8	10	35	47	89	M10
SCD 089-035-100 AP3 <sup>(1)</sup>	8.9	10	35	47	89	
SCD 090-035-100 AP3	9.0	10	35	47	89	
SCD 091-035-100 AP3 <sup>(1)</sup>	9.1	10	35	47	89	
SCD 092-035-100 AP3	9.2	10	35	47	89	
SCD 093-035-100 AP3	9.3	10	35	47	89	

<sup>(1)</sup> Available upon request only.  
Available grade IC908.  
Shank according to DIN 6535-Form HA.

Solid Carbide Drills  
Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø9.4 to Ø12.5**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

SCD-AP3

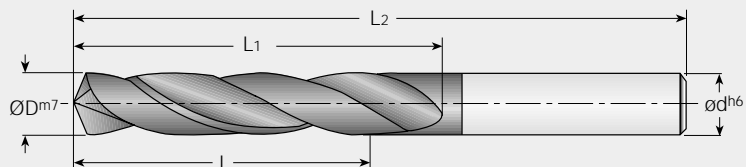
Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
SCD 094-035-100 AP3	9.4	10	35	47	89	
SCD 095-035-100 AP3	9.5	10	35	47	89	
SCD 096-035-100 AP3 <sup>(1)</sup>	9.6	10	35	47	89	
SCD 097-035-100 AP3 <sup>(1)</sup>	9.7	10	35	47	89	
SCD 098-035-100 AP3	9.8	10	35	47	89	
SCD 099-035-100 AP3 <sup>(1)</sup>	9.9	10	35	47	89	
SCD 100-035-100 AP3	10.0	10	35	47	89	
SCD 101-040-120 AP3 <sup>(1)</sup>	10.1	12	40	55	102	
SCD 102-040-120 AP3	10.2	12	40	55	102	M12
SCD 103-040-120 AP3	10.3	12	40	55	102	
SCD 104-040-120 AP3	10.4	12	40	55	102	
SCD 105-040-120 AP3	10.5	12	40	55	102	
SCD 106-040-120 AP3 <sup>(1)</sup>	10.6	12	40	55	102	
SCD 107-040-120 AP3 <sup>(1)</sup>	10.7	12	40	55	102	
SCD 108-040-120 AP3	10.8	12	40	55	102	
SCD 109-040-120 AP3 <sup>(1)</sup>	10.9	12	40	55	102	
SCD 110-040-120 AP3	11.0	12	40	55	102	
SCD 111-040-120 AP3 <sup>(1)</sup>	11.1	12	40	55	102	
SCD 112-040-120 AP3	11.2	12	40	55	102	
SCD 113-040-120 AP3 <sup>(1)</sup>	11.3	12	40	55	102	
SCD 114-040-120 AP3 <sup>(1)</sup>	11.4	12	40	55	102	
SCD 115-040-120 AP3	11.5	12	40	55	102	
SCD 116-040-120 AP3 <sup>(1)</sup>	11.6	12	40	55	102	
SCD 117-040-120 AP3 <sup>(1)</sup>	11.7	12	40	55	102	
SCD 118-040-120 AP3	11.8	12	40	55	102	
SCD 119-040-120 AP3 <sup>(1)</sup>	11.9	12	40	55	102	
SCD 120-040-120 AP3	12.0	12	40	55	102	
SCD 121-043-140 AP3 <sup>(1)</sup>	12.1	14	43	60	107	
SCD 122-043-140 AP3	12.2	14	43	60	107	M14
SCD 123-043-140 AP3	12.3	14	43	60	107	
SCD 124-043-140 AP3 <sup>(1)</sup>	12.4	14	43	60	107	
SCD 125-043-140 AP3	12.5	14	43	60	107	

<sup>(1)</sup> Available upon request only.  
Available grade IC908.  
Shank according to DIN 6535-Form HA.

Solid Carbide Drills  
 Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø12.6 to Ø15.7**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029



SCD-AP3

Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
SCD 126-043-140 AP3	12.6	14	43	60	107	
SCD 127-043-140 AP3	12.7	14	43	60	107	
SCD 128-043-140 AP3	12.8	14	43	60	107	
SCD 129-043-140 AP3 <sup>(1)</sup>	12.9	14	43	60	107	
SCD 130-043-140 AP3	13.0	14	43	60	107	
SCD 131-043-140 AP3	13.1	14	43	60	107	
SCD 132-043-140 AP3 <sup>(1)</sup>	13.2	14	43	60	107	
SCD 133-043-140 AP3 <sup>(1)</sup>	13.3	14	43	60	107	
SCD 134-043-140 AP3 <sup>(1)</sup>	13.4	14	43	60	107	
SCD 135-043-140 AP3	13.5	14	43	60	107	
SCD 136-043-140 AP3 <sup>(1)</sup>	13.6	14	43	60	107	
SCD 137-043-140 AP3 <sup>(1)</sup>	13.7	14	43	60	107	
SCD 138-043-140 AP3	13.8	14	43	60	107	
SCD 139-043-140 AP3 <sup>(1)</sup>	13.9	14	43	60	107	
SCD 140-043-140 AP3	14.0	14	43	60	107	
SCD 141-045-160 AP3 <sup>(1)</sup>	14.1	16	45	65	115	
SCD 142-045-160 AP3	14.2	16	45	65	115	M16
SCD 143-045-160 AP3 <sup>(1)</sup>	14.3	16	45	65	115	
SCD 144-045-160 AP3 <sup>(1)</sup>	14.4	16	45	65	115	
SCD 145-045-160 AP3	14.5	16	45	65	115	
SCD 146-045-160 AP3 <sup>(1)</sup>	14.6	16	45	65	115	
SCD 147-045-160 AP3 <sup>(1)</sup>	14.7	16	45	65	115	
SCD 148-045-160 AP3	14.8	16	45	65	115	
SCD 149-045-160 AP3 <sup>(1)</sup>	14.9	16	45	65	115	
SCD 150-045-160 AP3	15.0	16	45	65	115	
SCD 151-045-160 AP3	15.1	16	45	65	115	
SCD 152-045-160 AP3 <sup>(1)</sup>	15.2	16	45	65	115	
SCD 153-045-160 AP3 <sup>(1)</sup>	15.3	16	45	65	115	
SCD 154-045-160 AP3 <sup>(1)</sup>	15.4	16	45	65	115	
SCD 155-045-160 AP3	15.5	16	45	65	115	
SCD 156-045-160 AP3 <sup>(1)</sup>	15.6	16	45	65	115	
SCD 157-045-160 AP3 <sup>(1)</sup>	15.7	16	45	65	115	

<sup>(1)</sup> Available upon request only.  
 Available grade IC908.  
 Shank according to DIN 6535-Form HA.

Solid Carbide Drills  
 Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø15.8 to Ø18.9**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

SCD-AP3

Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
SCD 158-045-160 AP3	15.8	16	45	65	115	M18
SCD 159-045-160 AP3 <sup>(1)</sup>	15.9	16	45	65	115	
SCD 160-045-160 AP3	16.0	16	45	65	115	
SCD 161-051-180 AP3 <sup>(1)</sup>	16.1	18	51	73	123	
SCD 162-051-180 AP3 <sup>(1)</sup>	16.2	18	51	73	123	
SCD 163-051-180 AP3 <sup>(1)</sup>	16.3	18	51	73	123	
SCD 164-051-180 AP3 <sup>(1)</sup>	16.4	18	51	73	123	
SCD 165-051-180 AP3	16.5	18	51	73	123	
SCD 166-051-180 AP3 <sup>(1)</sup>	16.6	18	51	73	123	
SCD 167-051-180 AP3 <sup>(1)</sup>	16.7	18	51	73	123	
SCD 168-051-180 AP3	16.8	18	51	73	123	
SCD 169-051-180 AP3 <sup>(1)</sup>	16.9	18	51	73	123	
SCD 170-051-180 AP3	17.0	18	51	73	123	
SCD 171-051-180 AP3 <sup>(1)</sup>	17.1	18	51	73	123	
SCD 172-051-180 AP3 <sup>(1)</sup>	17.2	18	51	73	123	
SCD 173-051-180 AP3 <sup>(1)</sup>	17.3	18	51	73	123	
SCD 174-051-180 AP3 <sup>(1)</sup>	17.4	18	51	73	123	
SCD 175-051-180 AP3	17.5	18	51	73	123	
SCD 176-051-180 AP3 <sup>(1)</sup>	17.6	18	51	73	123	
SCD 177-051-180 AP3 <sup>(1)</sup>	17.7	18	51	73	123	
SCD 178-051-180 AP3	17.8	18	51	73	123	M20
SCD 179-051-180 AP3 <sup>(1)</sup>	17.9	18	51	73	123	
SCD 180-051-180 AP3	18.0	18	51	73	123	
SCD 181-055-200 AP3 <sup>(1)</sup>	18.1	20	55	79	131	
SCD 182-055-200 AP3 <sup>(1)</sup>	18.2	20	55	79	131	
SCD 183-055-200 AP3 <sup>(1)</sup>	18.3	20	55	79	131	
SCD 184-055-200 AP3 <sup>(1)</sup>	18.4	20	55	79	131	
SCD 185-055-200 AP3	18.5	20	55	79	131	
SCD 186-055-200 AP3 <sup>(1)</sup>	18.6	20	55	79	131	
SCD 187-055-200 AP3 <sup>(1)</sup>	18.7	20	55	79	131	
SCD 188-055-200 AP3	18.8	20	55	79	131	
SCD 189-055-200 AP3 <sup>(1)</sup>	18.9	20	55	79	131	

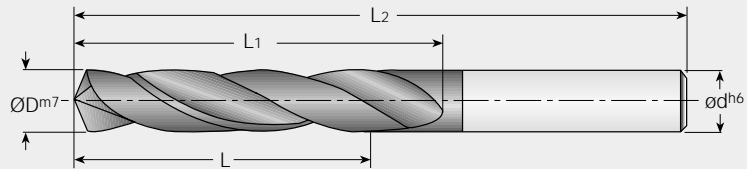
<sup>(1)</sup> Available upon request only.  
 Available grade IC908.  
 Shank according to DIN 6535-Form HA.

## Solid Carbide Drills

Drilling Depth **3xD** (without coolant holes) DIN 6537

Range **Ø19.0 to Ø20.0**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029



## SCD-AP3

Designation	D	d	L	L <sub>1</sub>	L <sub>2</sub>	For Standard Thread Size
<b>SCD 190-055-200 AP3</b>	19.0	20	55	79	131	
<b>SCD 191-055-200 AP3<sup>(1)</sup></b>	19.1	20	55	79	131	
<b>SCD 192-055-200 AP3<sup>(1)</sup></b>	19.2	20	55	79	131	
<b>SCD 193-055-200 AP3<sup>(1)</sup></b>	19.3	20	55	79	131	
<b>SCD 194-055-200 AP3<sup>(1)</sup></b>	19.4	20	55	79	131	
<b>SCD 195-055-200 AP3</b>	19.5	20	55	79	131	
<b>SCD 196-055-200 AP3<sup>(1)</sup></b>	19.6	20	55	79	131	
<b>SCD 197-055-200 AP3<sup>(1)</sup></b>	19.7	20	55	79	131	
<b>SCD 198-055-200 AP3</b>	19.8	20	55	79	131	M22
<b>SCD 199-055-200 AP3<sup>(1)</sup></b>	19.9	20	55	79	131	
<b>SCD 200-055-200 AP3</b>	20.0	20	55	79	131	

<sup>(1)</sup> Available upon request only.  
Available grade IC908.  
Shank according to DIN 6535-Form HA.

## Solid Carbide Drills

Drilling Depth **5xD** (with coolant holes) DIN 6537

Range **Ø3.0 to Ø6.1**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a side view of a double-flute solid carbide drill bit. The cutting edge diameter is labeled as  $\text{Ø}D^{m7}$ . The length of the cutting edge is  $L_1$ , the length of the flute is  $L$ , and the total length of the drill is  $L_2$ . The diameter of the shank is labeled as  $\text{Ø}d^{h6}$ . The drill is shown with blue dashed lines representing coolant holes.

## SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 030-023-060 ACG5	3.0	6	28	23	66	M3.5
SCD 031-023-060 ACG5	3.1	6	28	23	66	
SCD 032-023-060 ACG5	3.2	6	28	23	66	
SCD 033-023-060 ACG5	3.3	6	28	23	66	
SCD 034-023-060 ACG5	3.4	6	28	23	66	M4
SCD 035-023-060 ACG5	3.5	6	28	23	66	
SCD 036-023-060 ACG5	3.6	6	28	23	66	
SCD 037-023-060 ACG5	3.7	6	28	23	66	
SCD 038-029-060 ACG5	3.8	6	36	29	74	
SCD 039-029-060 ACG5	3.9	6	36	29	74	
SCD 040-029-060 ACG5 <sup>(2)</sup>	4.0	6	36	29	74	
SCD 041-029-060 ACG5	4.1	6	36	29	74	
SCD 042-029-060 ACG5 <sup>(2)</sup>	4.2	6	36	29	74	
SCD 043-029-060 ACG5 <sup>(2)</sup>	4.3	6	36	29	74	M5
SCD 044-029-060 ACG5	4.4	6	36	29	74	
SCD 045-029-060 ACG5	4.5	6	36	29	74	
SCD 046-029-060 ACG5	4.6	6	36	29	74	
SCD 047-029-060 ACG5	4.7	6	36	29	74	
SCD 048-035-060 ACG5 <sup>(2)</sup>	4.8	6	44	35	82	
SCD 049-035-060 ACG5 <sup>(1)</sup>	4.9	6	44	35	82	
SCD 050-035-060 ACG5 <sup>(2)</sup>	5.0	6	44	35	82	
SCD 051-035-060 ACG5 <sup>(2)</sup>	5.1	6	44	35	82	M6
SCD 052-035-060 ACG5	5.2	6	44	35	82	
SCD 053-035-060 ACG5	5.3	6	44	35	82	
SCD 054-035-060 ACG5	5.4	6	44	35	82	
SCD 055-035-060 ACG5 <sup>(2)</sup>	5.5	6	44	35	82	
SCD 056-035-060 ACG5	5.6	6	44	35	82	
SCD 057-035-060 ACG5	5.7	6	44	35	82	
SCD 058-035-060 ACG5	5.8	6	44	35	82	
SCD 059-035-060 ACG5 <sup>(1)</sup>	5.9	6	44	35	82	
SCD 060-035-060 ACG5 <sup>(2)</sup>	6.0	6	44	35	82	
SCD 061-043-080 ACG5	6.1	8	53	43	91	

<sup>(1)</sup> Available upon request.

<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).  
Available grade IC908.  
Shank according to DIN 6535-Form HAK.

Solid Carbide Drills  
 Drilling Depth **5xD** (with coolant holes) DIN 6537

Range **Ø6.2 to Ø9.3**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a side view of a double-flute solid carbide drill. The cutting edge diameter is labeled as  $\varnothing D_{m7}$ . The length of the cutting edge is  $L_1$ , the length of the flute is  $L_2$ , and the total length is  $L$ . The shank diameter is  $\varnothing d_{h6}$ . Dashed lines indicate the internal coolant holes.

SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 062-043-080 ACG5 <sup>(2)</sup>	6.2	8	53	43	91	M7
SCD 063-043-080 ACG5	6.3	8	53	43	91	
SCD 064-043-080 ACG5	6.4	8	53	43	91	
SCD 065-043-080 ACG5 <sup>(2)</sup>	6.5	8	53	43	91	
SCD 066-043-080 ACG5	6.6	8	53	43	91	
SCD 067-043-080 ACG5	6.7	8	53	43	91	
SCD 068-043-080 ACG5 <sup>(2)</sup>	6.8	8	53	43	91	
SCD 069-043-080 ACG5 <sup>(2)</sup>	6.9	8	53	43	91	M8
SCD 070-043-080 ACG5 <sup>(2)</sup>	7.0	8	53	43	91	
SCD 071-043-080 ACG5	7.1	8	53	43	91	
SCD 072-043-080 ACG5	7.2	8	53	43	91	
SCD 073-043-080 ACG5	7.3	8	53	43	91	
SCD 074-043-080 ACG5	7.4	8	53	43	91	
SCD 075-043-080 ACG5 <sup>(2)</sup>	7.5	8	53	43	91	
SCD 076-043-080 ACG5	7.6	8	53	43	91	
SCD 077-043-080 ACG5 <sup>(1)</sup>	7.7	8	53	43	91	
SCD 078-043-080 ACG5	7.8	8	53	43	91	
SCD 079-043-080 ACG5 <sup>(1)</sup>	7.9	8	53	43	91	
SCD 080-043-080 ACG5 <sup>(2)</sup>	8.0	8	53	43	91	
SCD 081-049-100 ACG5	8.1	10	61	49	103	
SCD 082-049-100 ACG5	8.2	10	61	49	103	
SCD 083-049-100 ACG5 <sup>(1)</sup>	8.3	10	61	49	103	
SCD 084-049-100 ACG5	8.4	10	61	49	103	
SCD 085-049-100 ACG5 <sup>(2)</sup>	8.5	10	61	49	103	
SCD 086-049-100 ACG5	8.6	10	61	49	103	
SCD 087-049-100 ACG5	8.7	10	61	49	103	
SCD 088-049-100 ACG5	8.8	10	61	49	103	M10
SCD 089-049-100-ACG5 <sup>(1)</sup>	8.9	10	61	49	103	
SCD 090-049-100 ACG5 <sup>(2)</sup>	9.0	10	61	49	103	
SCD 091-049-100 ACG5 <sup>(1)</sup>	9.1	10	61	49	103	
SCD 092-049-100 ACG5 <sup>(2)</sup>	9.2	10	61	49	103	
SCD 093-049-100 ACG5 <sup>(2)</sup>	9.3	10	61	49	103	

<sup>(1)</sup> Available upon request.

<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).  
 Available grade IC908.  
 Shank according to DIN 6535-Form HAK.

Solid Carbide Drills  
Drilling Depth **5xD** (with coolant holes) DIN 6537

Range **Ø9.4 to Ø12.5**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a side view of a double-flute solid carbide drill. The cutting edge diameter is labeled as  $\text{ØD}^{m7}$ . The length of the cutting edge is  $L_1$ , the length of the flute is  $L_2$ , and the total length is  $L$ . The shank diameter is labeled as  $\text{ødh}^6$ . Dashed lines indicate the internal coolant holes.

SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 094-049-100 ACG5 <sup>(1)</sup>	9.4	10	61	49	103	
SCD 095-049-100 ACG5 <sup>(2)</sup>	9.5	10	61	49	103	
SCD 096-049-100 ACG5	9.6	10	61	49	103	
SCD 097-049-100 ACG5	9.7	10	61	49	103	
SCD 098-049-100 ACG5	9.8	10	61	49	103	
SCD 099-049-100 ACG5 <sup>(1)</sup>	9.9	10	61	49	103	
SCD 100-049-100 ACG5 <sup>(2)</sup>	10.0	10	61	49	103	
SCD 101-056-120 ACG5 <sup>(1)</sup>	10.1	12	71	56	118	
SCD 102-056-120 ACG5	10.2	12	71	56	118	M12
SCD 103-056-120 ACG5	10.3	12	71	56	118	
SCD 104-056-120 ACG5	10.4	12	71	56	118	
SCD 105-056-120 ACG5 <sup>(2)</sup>	10.5	12	71	56	118	
SCD 106-056-120 ACG5	10.6	12	71	56	118	
SCD 107-056-120 ACG5	10.7	12	71	56	118	
SCD 108-056-120 ACG5 <sup>(2)</sup>	10.8	12	71	56	118	
SCD 109-056-120 ACG5 <sup>(1)</sup>	10.9	12	71	56	118	
SCD 110-056-120 ACG5	11.0	12	71	56	118	
SCD 111-056-120 ACG5 <sup>(1)</sup>	11.1	12	71	56	118	
SCD 112-056-120 ACG5	11.2	12	71	56	118	
SCD 113-056-120 ACG5	11.3	12	71	56	118	
SCD 114-056-120 ACG5 <sup>(1)</sup>	11.4	12	71	56	118	
SCD 115-056-120 ACG5 <sup>(2)</sup>	11.5	12	71	56	118	
SCD 116-056-120 ACG5 <sup>(1)</sup>	11.6	12	71	56	118	
SCD 117-056-120 ACG5 <sup>(1)</sup>	11.7	12	71	56	118	
SCD 118-056-120 ACG5 <sup>(2)</sup>	11.8	12	71	56	118	
SCD 119-056-120 ACG5 <sup>(1)</sup>	11.9	12	71	56	118	
SCD 120-056-120 ACG5	12.0	12	71	56	118	
SCD 121-060-140 ACG5 <sup>(1)</sup>	12.1	14	77	60	124	
SCD 122-060-140 ACG5	12.2	14	77	60	124	M14
SCD 123-060-140 ACG5 <sup>(1)</sup>	12.3	14	77	60	124	
SCD 124-060-140 ACG5 <sup>(1)</sup>	12.4	14	77	60	124	
SCD 125-060-140 ACG5	12.5	14	77	60	124	

<sup>(1)</sup> Available upon request.

<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).

Available grade IC908.

Shank according to DIN 6535-Form HAK.

## Solid Carbide Drills

Drilling Depth **5xD** (with coolant holes) DIN 6537

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a solid carbide drill with a double-flute design. The overall length is labeled as L. The length of the cutting edge is labeled as L1. The length of the flute section is labeled as L2. The outer diameter is labeled as ØDm7. The inner diameter of the coolant holes is labeled as ødh6. The drill is shown with a perspective view and a cross-sectional view.

## SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 126-060-140 ACG5 <sup>(1)</sup>	12.6	14	77	60	124	
SCD 127-060-140 ACG5	12.7	14	77	60	124	
SCD 128-060-140 ACG5	12.8	14	77	60	124	
SCD 129-060-140 ACG5 <sup>(1)</sup>	12.9	14	77	60	124	
SCD 130-060-140 ACG5	13.0	14	77	60	124	
SCD 131-060-140 ACG5	13.1	14	77	60	124	
SCD 132-060-140 ACG5 <sup>(1)</sup>	13.2	14	77	60	124	
SCD 133-060-140 ACG5 <sup>(1)</sup>	13.3	14	77	60	124	
SCD 134-060-140 ACG5 <sup>(1)</sup>	13.4	14	77	60	124	
SCD 135-060-140 ACG5	13.5	14	77	60	124	
SCD 136-060-140 ACG5 <sup>(1)</sup>	13.6	14	77	60	124	
SCD 137-060-140 ACG5 <sup>(1)</sup>	13.7	14	77	60	124	
SCD 138-060-140 ACG5	13.8	14	77	60	124	
SCD 139-060-140 ACG5 <sup>(1)</sup>	13.9	14	77	60	124	
SCD 140-060-140 ACG5	14.0	14	77	60	124	
SCD 141-063-160 ACG5 <sup>(1)</sup>	14.1	16	83	63	133	
SCD 142-063-160 ACG5 <sup>(2)</sup>	14.2	16	83	63	133	M16
SCD 143-063-160 ACG5 <sup>(1)</sup>	14.3	16	83	63	133	
SCD 144-063-160 ACG5 <sup>(1)</sup>	14.4	16	83	63	133	
SCD 145-063-160 ACG5 <sup>(2)</sup>	14.5	16	83	63	133	
SCD 146-063-160 ACG5 <sup>(1)</sup>	14.6	16	83	63	133	
SCD 147-063-160 ACG5 <sup>(1)</sup>	14.7	16	83	63	133	
SCD 148-063-160 ACG5 <sup>(2)</sup>	14.8	16	83	63	133	
SCD 149-063-160 ACG5 <sup>(1)</sup>	14.9	16	83	63	133	
SCD 150-063-160 ACG5 <sup>(2)</sup>	15.0	16	83	63	133	
SCD 151-063-160 ACG5	15.1	16	83	63	133	
SCD 152-063-160 ACG5 <sup>(1)</sup>	15.2	16	83	63	133	
SCD 153-063-160 ACG5 <sup>(1)</sup>	15.3	16	83	63	133	
SCD 154-063-160 ACG5 <sup>(1)</sup>	15.4	16	83	63	133	
SCD 155-063-160 ACG5 <sup>(2)</sup>	15.5	16	83	63	133	
SCD 156-063-160 ACG5 <sup>(1)</sup>	15.6	16	83	63	133	
SCD 157-063-160 ACG5 <sup>(1)</sup>	15.7	16	83	63	133	

<sup>(1)</sup> Available upon request.

<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).

Available grade IC908.

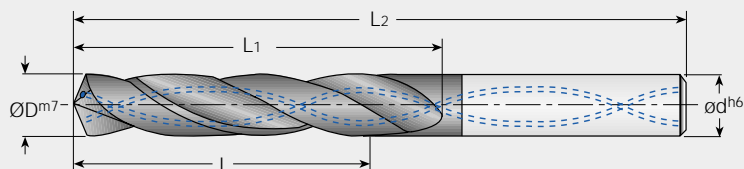
Shank according to DIN 6535-Form HAK.

# SOLIDDRILL

Solid Carbide Drills  
Drilling Depth **5xD** (with coolant holes) DIN 6537

Range **Ø15.8 to Ø18.9**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029



## SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 158-063-160 ACG5 <sup>(2)</sup>	15.8	16	83	63	133	M18
SCD 159-063-160 ACG5 <sup>(1)</sup>	15.9	16	83	63	133	
SCD 160-063-160 ACG5 <sup>(2)</sup>	16.0	16	83	63	133	
SCD 161-071-180 ACG5 <sup>(1)</sup>	16.1	18	93	71	143	
SCD 162-071-180 ACG5 <sup>(1)</sup>	16.2	18	93	71	143	
SCD 163-071-180 ACG5 <sup>(1)</sup>	16.3	18	93	71	143	
SCD 164-071-180 ACG5 <sup>(1)</sup>	16.4	18	93	71	143	
SCD 165-071-180 ACG5	16.5	18	93	71	143	
SCD 166-071-180 ACG5 <sup>(1)</sup>	16.6	18	93	71	143	
SCD 167-071-180 ACG5 <sup>(1)</sup>	16.7	18	93	71	143	
SCD 168-071-180 ACG5	16.8	18	93	71	143	
SCD 169-071-180 ACG5 <sup>(1)</sup>	16.9	18	93	71	143	
SCD 170-071-180 ACG5	17.0	18	93	71	143	
SCD 171-071-180 ACG5 <sup>(1)</sup>	17.1	18	93	71	143	
SCD 172-071-180 ACG5 <sup>(1)</sup>	17.2	18	93	71	143	
SCD 173-071-180 ACG5 <sup>(1)</sup>	17.3	18	93	71	143	
SCD 174-071-180 ACG5 <sup>(1)</sup>	17.4	18	93	71	143	
SCD 175-071-180 ACG5	17.5	18	93	71	143	
SCD 176-071-180 ACG5 <sup>(1)</sup>	17.6	18	93	71	143	
SCD 177-071-180 ACG5 <sup>(1)</sup>	17.7	18	93	71	143	
SCD 178-071-180 ACG5	17.8	18	93	71	143	M20
SCD 179-071-180 ACG5 <sup>(1)</sup>	17.9	18	93	71	143	
SCD 180-071-180 ACG5 <sup>(2)</sup>	18.0	18	93	71	143	
SCD 181-077-200 ACG5 <sup>(1)</sup>	18.1	20	101	77	153	
SCD 182-077-200 ACG5 <sup>(1)</sup>	18.2	20	101	77	153	
SCD 183-077-200 ACG5 <sup>(1)</sup>	18.3	20	101	77	153	
SCD 184-077-200 ACG5 <sup>(1)</sup>	18.4	20	101	77	153	
SCD 185-077-200 ACG5 <sup>(2)</sup>	18.5	20	101	77	153	
SCD 186-077-200 ACG5 <sup>(1)</sup>	18.6	20	101	77	153	
SCD 187-077-200 ACG5 <sup>(1)</sup>	18.7	20	101	77	153	
SCD 188-077-200 ACG5 <sup>(2)</sup>	18.8	20	101	77	153	
SCD 189-077-200 ACG5 <sup>(1)</sup>	18.9	20	101	77	153	

<sup>(1)</sup> Available upon request.

<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).  
Available grade IC908.  
Shank according to DIN 6535-Form HAK.

## Solid Carbide Drills

Drilling Depth **5xD** (with coolant holes) DIN 6537

Range **Ø19.0 to Ø20.0**

D	Tolerance m7
3.00 to 6	0.004-0.016
6.01 to 10	0.006-0.021
10.01 to 18	0.007-0.025
18.01 to 21	0.008-0.029

The diagram shows a side view of a double-flute solid carbide drill bit. The cutting edge diameter is labeled as  $\text{ØD}^{\text{m7}}$ . The length of the cutting edge is  $L_1$ , the length of the flute is  $L$ , and the total length of the drill is  $L_2$ . The shank diameter is labeled as  $\text{Ød}^{\text{h6}}$ . The drill is shown with blue dashed lines representing coolant holes.

## SCD-ACG5

Designation	D	d	L <sub>1</sub>	L	L <sub>2</sub>	For Standard Thread Size
SCD 190-077-200 ACG5 <sup>(2)</sup>	19.0	20	101	77	153	
SCD 191-077-200 ACG5 <sup>(1)</sup>	19.1	20	101	77	153	
SCD 192-077-200 ACG5 <sup>(1)</sup>	19.2	20	101	77	153	
SCD 193-077-200 ACG5 <sup>(1)</sup>	19.3	20	101	77	153	
SCD 194-077-200 ACG5 <sup>(1)</sup>	19.4	20	101	77	153	
SCD 195-077-200 ACG5 <sup>(2)</sup>	19.5	20	101	77	153	
SCD 196-077-200 ACG5 <sup>(1)</sup>	19.6	20	101	77	153	
SCD 197-077-200 ACG5 <sup>(1)</sup>	19.7	20	101	77	153	
SCD 198-077-200 ACG5 <sup>(2)</sup>	19.8	20	101	77	153	M22
SCD 199-077-200 ACG5 <sup>(1)</sup>	19.9	20	101	77	153	
SCD 200-077-200 ACG5 <sup>(2)</sup>	20.0	20	101	77	153	

<sup>(1)</sup> Available upon request.

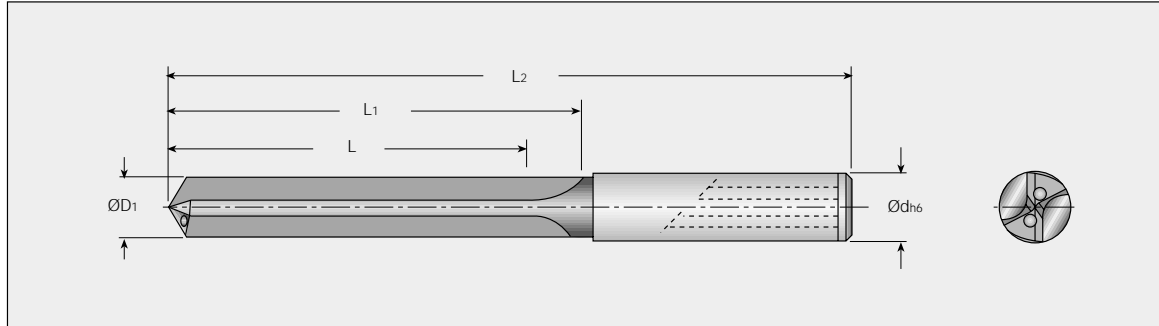
<sup>(2)</sup> Available also with "ECG5" shank type (whistle notch).

Available grade IC908.

Shank according to DIN 6535-Form HAK.

# SOLIDDRILL REAMER

Solid Carbide Drilling Reamers  
Straight Flute - **3xD** (for drilling/reaming of ferritic materials only) DIN 6537



## SCDR-ACK3

Description	$D_1$	$d$	$L_1$	$L$	$L_2$
SCDR 030-014-060 ACK3	3.0	6	20	14	62
SCDR 032-014-060 ACK3	3.2	6	20	14	62
SCDR 033-014-060 ACK3	3.3	6	20	14	62
SCDR 038-017-060 ACK3	3.8	6	24	17	66
SCDR 040-017-060 ACK3	4.0	6	24	17	66
SCDR 042-017-060 ACK3	4.2	6	24	17	66
SCDR 048-020-060 ACK3	4.8	6	28	20	66
SCDR 050-020-060 ACK3	5.0	6	28	20	66
SCDR 060-020-060 ACK3	6.0	6	28	20	66
SCDR 068-024-080 ACK3	6.8	8	34	24	79
SCDR 070-024-080 ACK3	7.0	8	34	24	79
SCDR 080-029-080 ACK3	8.0	8	41	29	79
SCDR 085-035-100 ACK3	8.5	10	47	35	89
SCDR 090-035-100 ACK3	9.0	10	47	35	89
SCDR 100-035-100 ACK3	10.0	10	47	35	89
SCDR 102-040-120 ACK3	10.2	12	55	40	102
SCDR 105-040-120 ACK3	10.5	12	55	40	102
SCDR 110-040-120 ACK3	11.0	12	55	40	102
SCDR 120-040-120 ACK3	12.0	12	55	40	102
SCDR 130-043-140 ACK3	13.0	14	60	43	107
SCDR 140-043-140 ACK3	14.0	14	60	43	107
SCDR 150-045-160 ACK3	15.0	16	65	45	115
SCDR 160-045-160 ACK3	16.0	16	65	45	115
SCDR 170-051-180 ACK3	17.0	18	73	51	123
SCDR 180-051-180 ACK3	18.0	18	73	51	123
SCDR 190-055-200 ACK3	19.0	20	79	55	131
SCDR 200-055-200 ACK3	20.0	20	79	55	131

H7 hole tolerance according to DIN 1420.

Available grades: IC908

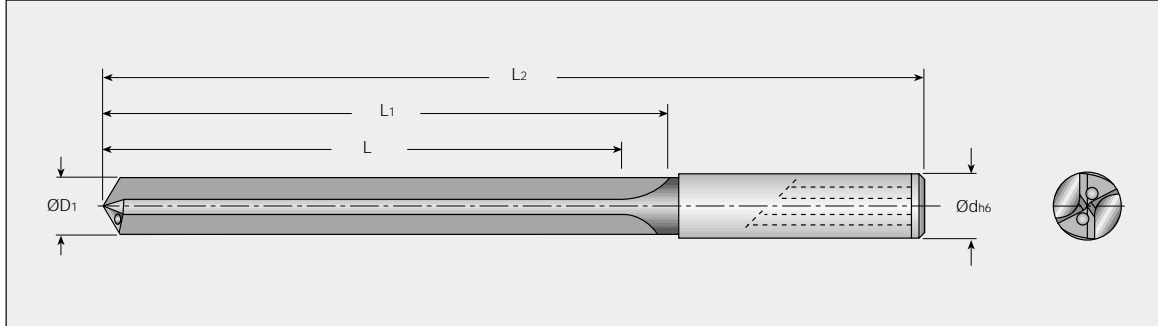
In order to obtain the most accurate drilled hole, a rigid and precise clamping adaptation must be used.

Note: Special diameters are available on request.

# SOLIDDRILL REAMER

## Solid Carbide Drilling Reamers

Straight Flute - **5xD** (for drilling/reaming of ferritic materials only) DIN 6537



### SCDR-ACK5

Description	$D_1$	$d$	$L_1$	$L$	$L_2$
SCDR 030-023-060 ACK5	3.0	6	28	23	66
SCDR 032-023-060 ACK5	3.2	6	28	23	66
SCDR 033-023-060 ACK5	3.3	6	28	23	66
SCDR 038-029-060 ACK5	3.8	6	36	29	74
SCDR 040-029-060 ACK5	4.0	6	36	29	74
SCDR 042-029-060 ACK5	4.2	6	36	29	74
SCDR 048-035-060 ACK5	4.8	6	44	35	82
SCDR 050-035-060 ACK5	5.0	6	44	35	82
SCDR 060-035-060 ACK5	6.0	6	44	35	82
SCDR 068-043-080 ACK5	6.8	8	53	43	91
SCDR 070-043-080 ACK5	7.0	8	53	43	91
SCDR 080-043-080 ACK5	8.0	8	53	43	91
SCDR 085-049-100 ACK5	8.5	10	61	49	103
SCDR 090-049-100 ACK5	9.0	10	61	49	103
SCDR 100-049-100 ACK5	10.0	10	61	49	103
SCDR 102-056-120 ACK5	10.2	12	71	56	118
SCDR 105-056-120 ACK5	10.5	12	71	56	118
SCDR 110-056-120 ACK5	11.0	12	71	56	118
SCDR 120-056-120 ACK5	12.0	12	71	56	118
SCDR 130-060-140 ACK5	13.0	14	77	60	124
SCDR 140-060-140 ACK5	14.0	14	77	60	124
SCDR 150-063-160 ACK5	15.0	16	83	63	133
SCDR 160-063-160 ACK5	16.0	16	83	63	133
SCDR 170-071-180 ACK5	17.0	18	93	71	143
SCDR 180-071-180 ACK5	18.0	18	93	71	143
SCDR 190-077-200 ACK5	19.0	20	101	77	153
SCDR 200-077-200 ACK5	20.0	20	101	77	153

H7 hole tolerance according to DIN 1420.

Available grades: IC908

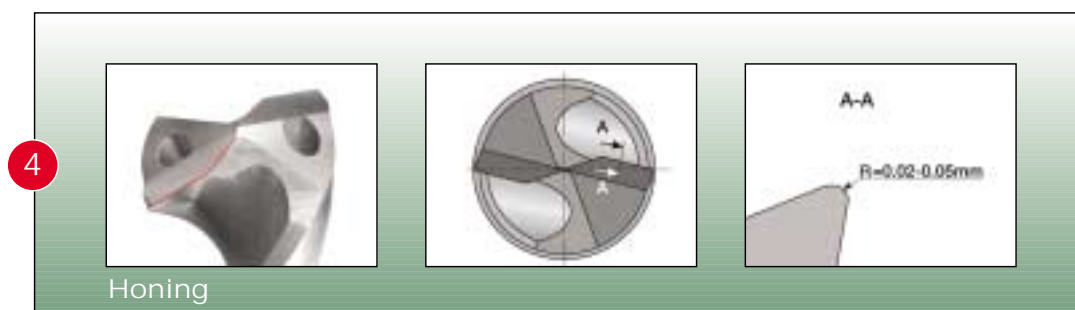
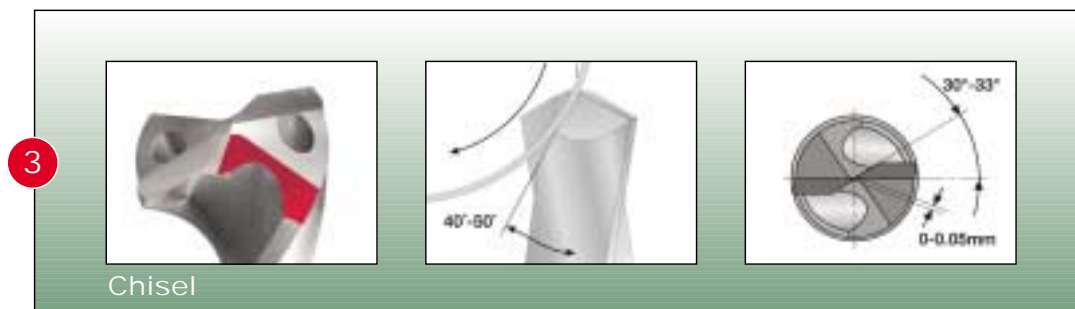
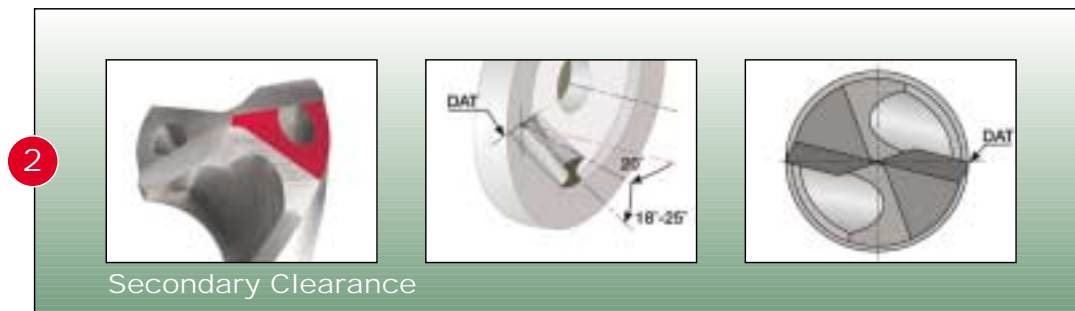
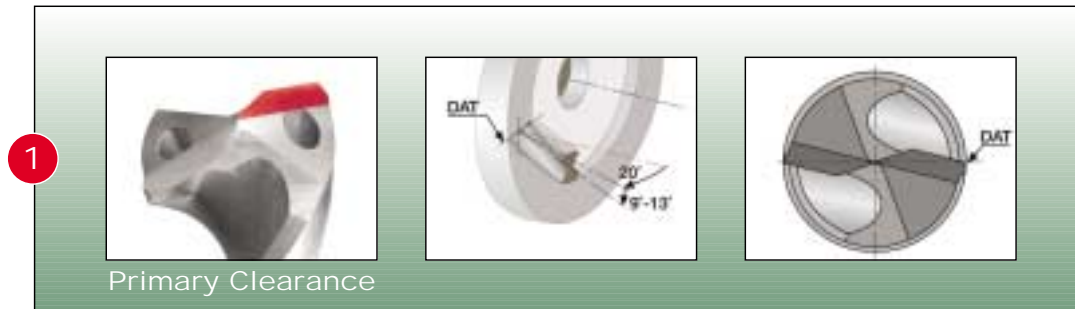
In order to obtain the most accurate drilled hole, a rigid and precise clamping adaptation must be used.

Note: Special diameters are available on request.

# SOLIDDRILL USER GUIDE

## Regrinding Instructions for AP3 and ACP5 Geometries

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure



### Grinding Wheel Recommended Specifications:

1. Diamond grinding wheel: GA2
2. Grinding wheel bond: Synthetic resin
3. Grit size: 325/400 mesh (45/38 μm)
4. Diamond concentration: C-75 (3.3 carats/cm<sup>3</sup>)
5. Cutting fluid emulsion 3%.

# SOLIDDRILL USER GUIDE

## Regrinding Instructions for ACG5 Geometry

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1



Primary Clearance

The first row illustrates the primary clearance grinding process. It consists of three images: a 3D perspective view of the drill tip with a red highlight on the primary clearance area; a side view showing the grinding angle of 20° and a secondary angle of 9°-13°; and a top-down view of the drill bit with a DAT (Datum A Tangent) line indicating the grinding location.


2



Secondary Clearance

The second row illustrates the secondary clearance grinding process. It consists of three images: a 3D perspective view of the drill tip with a red highlight on the secondary clearance area; a side view showing the grinding angle of 20° and a secondary angle of 20°-30°; and a top-down view of the drill bit with a DAT line indicating the grinding location.

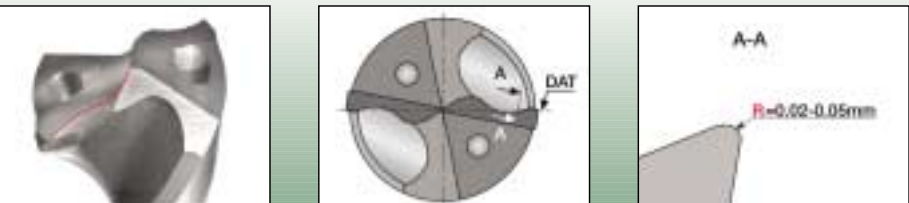
3



Chisel

The third row illustrates the chisel grinding process. It consists of three images: a 3D perspective view of the drill tip with a red highlight on the chisel edge; a side view showing the grinding angle of 40°-50°; and a top-down view of the drill bit with grinding angles of 30°-45° and a grinding width of 0.1-0.3mm.

4



Honing

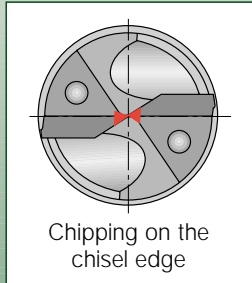
The fourth row illustrates the honing process. It consists of three images: a 3D perspective view of the drill tip with a red highlight on the honing area; a top-down view of the drill bit with a DAT line and a section line A-A; and a magnified view of the honed edge showing a surface roughness of  $R_a = 0.02-0.05\text{mm}$ .

### Grinding Wheel Recommended Specifications:

1. Diamond grinding wheel: GA2
2. Grinding wheel bond: Synthetic resin
3. Grit size: 325/400 mesh (45/38  $\mu\text{m}$ )
4. Diamond concentration: C-75 (3.3 carats/cm<sup>3</sup>)
5. Cutting fluid emulsion 3%.

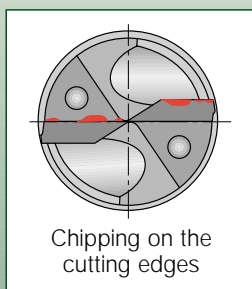
# SOLIDDRILL USER GUIDE

## Troubleshooting Problem



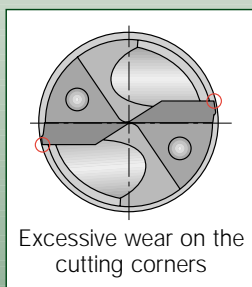
- Poor clamping of the chuck
- Unsuitable cutting conditions
- Chisel runout
- Workpiece movement

- Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
- Decrease feed.
- Check or replace the clamping adaptation.
- Increase workpiece chucking force.



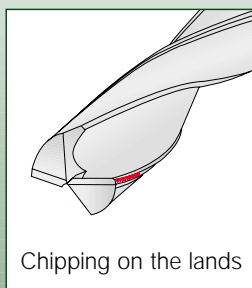
- Poor clamping of the chuck
- Unsuitable cutting conditions
- Insufficient coolant

- Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
- Increase cutting speed.
- Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.



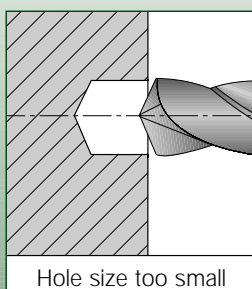
- Insufficient coolant
- Unsuitable cutting conditions
- Poor clamping of the chuck

- Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
- Reduce cutting speed, increase feed.
- Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.



- Workpiece movement
- Insufficient coolant
- Wrong drill
- Unsuitable cutting conditions

- Increase workpiece chucking force.
- Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
- Check drill type, drilling depth, cooling system and workpiece material.
- Increase feed. When spot drilling, reduce feed.

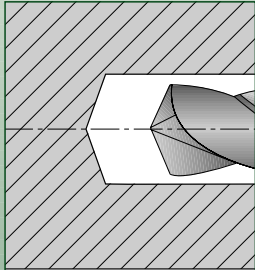
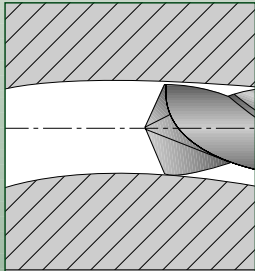
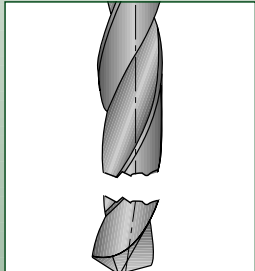
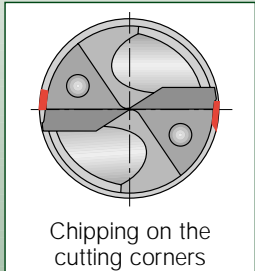


- Insufficient coolant
- Unsuitable cutting conditions
- Worn out drill

- Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
- Reduce cutting speed, increase feed.
- Check cutting edge diameter.
- Regrind cutting edge.

# SOLIDDRILL USER GUIDE

## Troubleshooting Problem

Problem	Cause	Solution
 <p>Hole size too large</p>	<ul style="list-style-type: none"> <li>• Unsuitable cutting conditions</li> <li>• Poor clamping of the chuck</li> <li>• Worn out center point (chisel)</li> </ul>	<ul style="list-style-type: none"> <li>• Increase cutting speed or reduce feed.</li> <li>• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.</li> <li>• Regrind cutting edge.</li> </ul>
 <p>Hole not straight</p>	<ul style="list-style-type: none"> <li>• Insufficient chip evacuation</li> <li>• Poor clamping of the chuck</li> <li>• Workpiece rigidity</li> <li>• Worn out drill center point (chisel)</li> <li>• Unsuitable cutting conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Use pecking cycle.</li> <li>• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.</li> <li>• Increase workpiece chucking force.</li> <li>• Regrind cutting edge.</li> <li>• Increase feed. When spot drilling, reduce feed.</li> </ul>
 <p>Drill breakage</p>	<ul style="list-style-type: none"> <li>• Poor clamping of the chuck</li> <li>• Workpiece movement</li> <li>• Wrong drill</li> <li>• Insufficient coolant</li> <li>• Unsuitable cutting conditions</li> <li>• Worn out drill center point (chisel)</li> <li>• Insufficient chip evacuation</li> </ul>	<ul style="list-style-type: none"> <li>• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.</li> <li>• Increase workpiece chucking force.</li> <li>• Check drill type and drilling depth, cooling system and workpiece material.</li> <li>• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.</li> <li>• Reduce feed.</li> <li>• Regrind cutting edge.</li> <li>• Use pecking cycle.</li> </ul>
 <p>Chipping on the cutting corners</p>	<ul style="list-style-type: none"> <li>• Poor clamping of the chuck</li> <li>• Workpiece movement</li> <li>• Wrong drill</li> <li>• Insufficient coolant</li> <li>• Unsuitable cutting conditions</li> <li>• Worn out or broken cutting corner</li> </ul>	<ul style="list-style-type: none"> <li>• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.</li> <li>• Increase workpiece chucking force and check stability of machine tool.</li> <li>• Check drill type and drilling depth, cooling system and workpiece material. Possibly use longer drill.</li> <li>• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.</li> <li>• Check cutting parameters, and possibly reduce feed.</li> <li>• Replace drill or regrind cutting edge.</li> </ul>

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## Machining Data for Solid Carbide Drills - IC908

ISO	Material	Condition	Tensile Strength [N/mm <sup>2</sup> ]	Hardness HB	Material No.	
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)	Annealed		600	200	6
				930	275	7
		Quenched and tempered		1000	300	8
				1200	350	9
	High alloyed steel, cast steel, and tool steel	Annealed	680	200	10	
Quenched and tempered		1100	325	11		
M	Stainless steel and cast steel	ferritic/martens.	680	200	12	
		martensitic	820	240	13	
		austenitic	600	180	14	
K	Cast iron nodular (GGG)	Ferritic/pearlitic		180	15	
		Pearlitic		260	16	
	Grey cast iron (GG)	Ferritic		160	17	
		Pearlitic		250	18	
	Malleable cast iron	Ferritic		130	19	
		Pearlitic		230	20	
N	Aluminum-wrought alloy	Not cureable		60	21	
		Cured		100	22	
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolytic copper		100	28
	Non metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
	Super alloys	Ni or Co based	Annealed		250	33
			Cured		350	34
		Cast		320	35	
	Titanium Ti alloys			RM 400		36
		Alpha+beta alloys cured		RM 1050		37
H	Hardened steel	Hardened		55 HRC	38	
		Hardened		60 HRC	39	
	Chilled cast iron	Cast		400	40	
	Cast iron	Hardened		55 HRC	41	

Edge geometry should be selected based on our geometry recommendations, (Page 2).

When using coolant supply only, reduce cutting speed by 10%.

Use internal coolant supply when machining austenitic stainless steel.

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Cutting Speed Vc m/min	Drill Diameter				
	Ø3-5	Ø5-8	Ø8-12	Ø12-16	Ø16-20
80-120	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
80-110	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
70-100	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
70-90	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
60-80	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
50-70	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
60-80	0.10-0.20	0.15-0.28	0.18-0.35	0.20-0.38	0.25-0.42
50-70	0.10-0.15	0.12-0.20	0.14-0.25	0.16-0.30	0.18-0.32
25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
85-105	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
75-90	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
65-80	0.12-0.20	0.15-0.25	0.20-0.35	0.25-0.40	0.30-0.45
83-300	0.10-0.25	0.15-0.35	0.25-0.45	0.30-0.50	0.35-0.55
70-200					
70-300	0.07-0.18	0.12-0.25	0.20-0.35	0.25-0.45	0.30-0.50
15-35	0.02-0.07	0.04-0.10	0.06-0.12	0.08-0.15	0.08-0.18
40-70	0.06-0.10	0.08-0.12	0.10-0.14	0.12-0.16	0.14-0.18