SECO FEEDMAX™ SOLID CARBIDE DRILLS
16xD

REDUCE YOUR DRILLING COSTS!

SECO

Reduce your drilling costs with Seco Feedmax™

Product feature:

- Optimised cutting geometry
- Chip flutes
  - Unique design
  - Polished
- 4 land margins
- TiAlN PVD coating

Benefits:

- Long tool life
- Good centring capability
- Low cutting forces
- Excellent chip evacuation
- Good hole quality

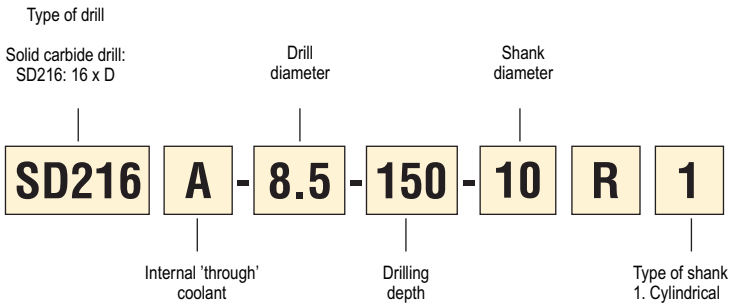
What´s in it for you?

- Lower tool and set up costs
  - Eliminate pre drilling
- Increased out put
- High application security
- Good component quality

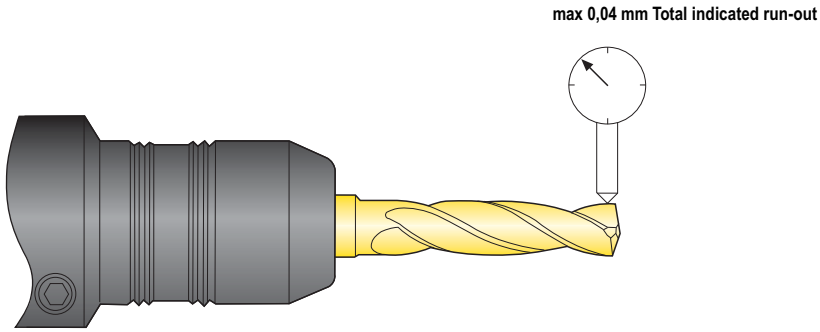
Range 16xD:

- Ø 5-12 mm

Code key Solid carbide drill



Cylindrical shank DIN6537A



Set up

Holding/run-out

Drills with cylindrical shanks should be used with shrink fit holders or hydraulic chucks. For best result keep run-out <0,04 mm.

Recommended tool holders

For best result use holders:
Type 5803 - Shrinkfit holders, DIN type
Type 5834 - Hydraulic chucks
For more information see EPB Tooling systems catalogue.

Stability

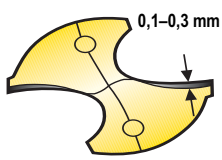
The stability of the application is important to obtain the best tool life and hole accuracy. Check the condition of the machine spindle, fixture and fixturing of the component to secure maximum stability and rigidity.
Unstable conditions can cause tool breakages.

First choice
5803

5834

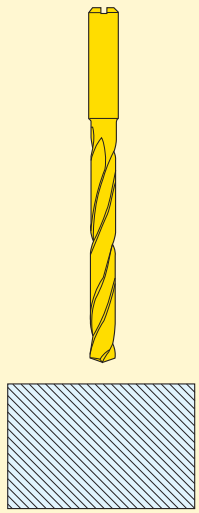
Tool life

Drills should not be used with flank wear exceeding 0,1–0,3 mm measured at the largest point.



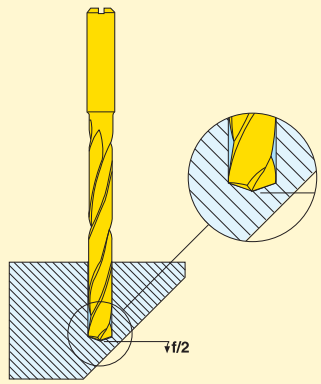
Machined surface

No pre drilling or entrance feed needed.



Angled hole exits

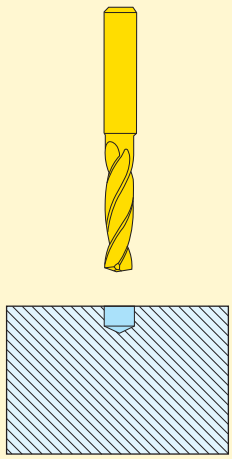
Before hole exit reduce the feed/rev by 50%.



Irregular/Angled hole entrance

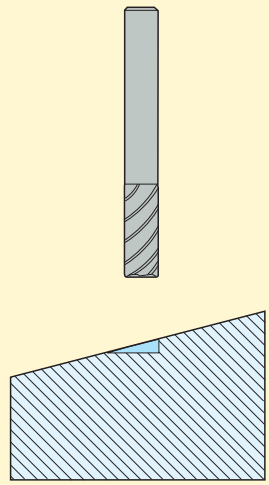
Pre operation alternatives

Pre drill with a short standard Seco Feedmax.



Irregular hole entrance

Machine a flat using an end mill from the Seco range.

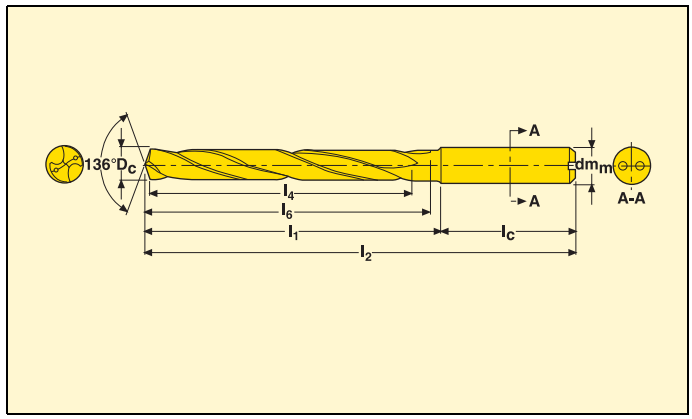


Angled hole entrance

Seco Feedmax™ – SD216A

Drilling depth ~ 16 x D

Cylindrical shank DIN 6537A



- A=Internal 'through' coolant.
- For cutting and machining data see page 10.
- Coating: TiAlN + TiN.
- Hole tolerance: IT 9.

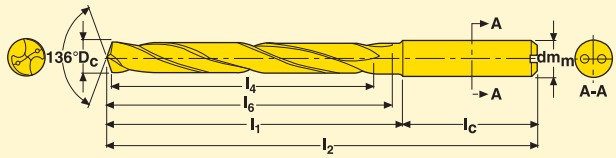
Drill dia. D_c (mm)	Max drilling depth l_4 (mm)	Part No.**	Dimensions in mm				
			l_2	l_1	l_c	l_6	dm_m h6
5	90	**SD216A-5.0-90-6R1**	142	106	36	103	6
5,5	90	**SD216A-5.5-90-6R1**	142	106	36	103	6
6	90	**SD216A-6.0-90-6R1**	142	106	36	103	6
6,35	120	**SD216A-6.35-120-8R1**	177	141	36	137	8
6,5	120	**SD216A-6.5-120-8R1**	177	141	36	137	8
7	120	**SD216A-7.0-120-8R1**	177	141	36	137	8
7,5	120	**SD216A-7.5-120-8R1**	177	141	36	137	8
8	120	**SD216A-8.0-120-8R1**	177	141	36	137	8
8,5	150	**SD216A-8.5-150-10R1**	216	176	40	172	10
9	150	**SD216A-9.0-150-10R1**	216	176	40	172	10
9,5	150	**SD216A-9.5-150-10R1**	216	176	40	172	10
9,52	150	**SD216A-9.52-150-10R1**	216	176	40	172	10
10	150	**SD216A-10.0-150-10R1**	216	176	40	172	10
10,5	180	**SD216A-10.5-180-12R1**	256	211	45	207	12
11	180	**SD216A-11.0-180-12R1**	256	211	45	207	12
11,5	180	**SD216A-11.5-180-12R1**	256	211	45	207	12
12	180	**SD216A-12.0-180-12R1**	256	211	45	207	12

** For intermediate diameters see the Custom Design software.

Seco Feedmax™ – SD216A

Intermediate diameters – drilling depth ~ 16 x D

Cylindrical shank DIN 6537A



- A=Internal 'through' coolant.
- For cutting and machining data see page 10.
- Coating: TiAlN + TiN.
- Hole tolerance: IT 9.

Drill dia. D_c (mm)	Max drilling depth l_4 (mm)	Part No.**	Dimensions in mm				
			l_2	l_1	l_c	l_6	dm_m h6
5,00-6,10	90	**SD216A-x.xx-90-6R1**	142	106	36	103	6
6,00-8,10	120	**SD216A-x.xx-120-R1**	177	141	36	137	8
8,00-10,10	150	**SD216A-x.xx-150-10R1**	216	176	40	172	10
10,00-12,10	180	**SD216A-x.xx-180-12R1**	256	211	45	207	12

The drills are available in ∅ increments of 0,01 mm. Fill in required cutting ∅ instead of -xx.xx- according to the ordering example.
Cutting ∅ tolerance is equal to m7 unless otherwise specified. **Ordering example for** ∅ 11,3 mm: SD216A-11.3-180-12R1.
** Also available for intermediate diameters in the Custom Design software.

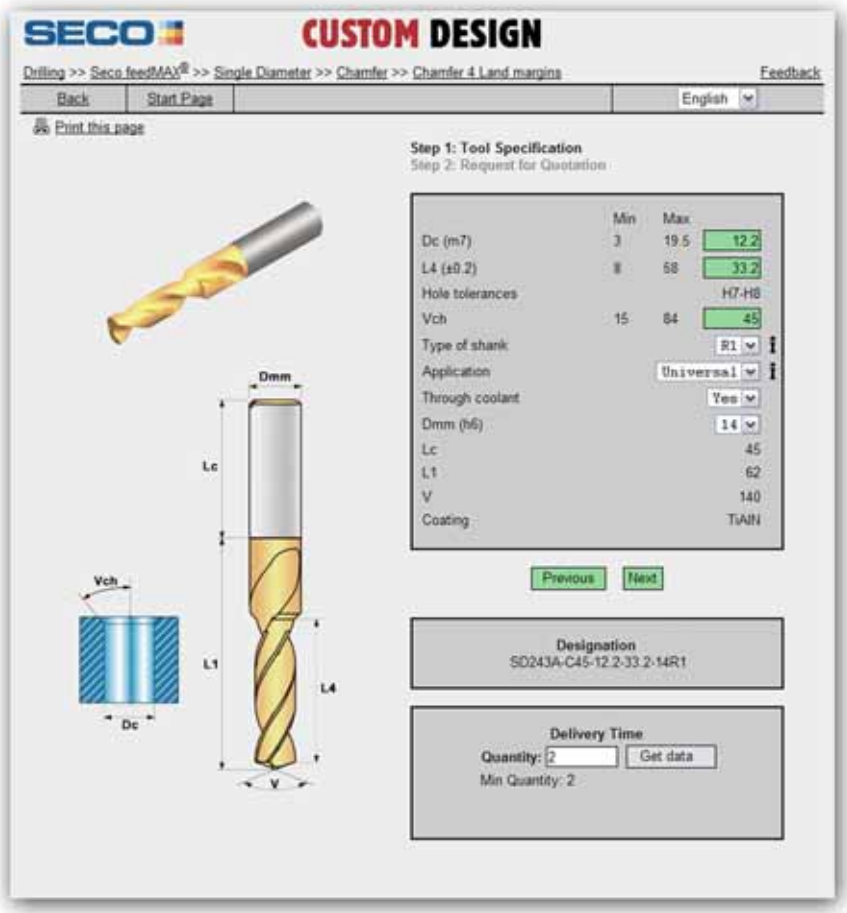
Seco Feedmax™ – Custom Design

No waiting for quotations. Short delivery time.

Custom design is a totally new concept for custom drills.
A well defined strategy has been created for the total process for custom-made drills from quotation to finished drill.
You can now design your own customised Seco Feedmax™ drill using the Custom Design software.

The concept gives you a number of advantages:

- No waiting for quotations! price and delivery time available instantly.
- Directly visualises your needs. No risk of misunderstandings.
- Short delivery time.

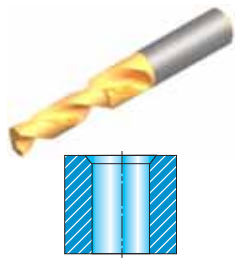


Different types of custom drills – Detailed information can be found in the Custom Design software

A1. Single diameter

A2. Reinforced

A3. Chamfer



Seco Feedmax™ – Cutting data

SD216A

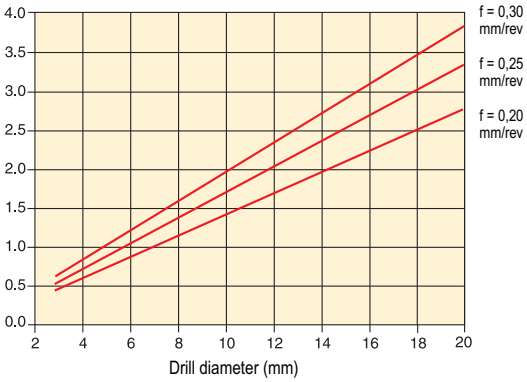
The recommended start values for general applications are marked **bold**.
Reduce the values in case of poor stability in the application, high hardness of the workpiece or low coolant pressure in combination with drilling deep holes (> 16 x D).

Seco Material group No.	Recommended cutting speed v_c (m/min)	Recommended feed f, (mm/rev)			
		∅ 6	∅ 8	∅ 10	∅ 12
1	130-**110**-70	0,16-**0,19**-0,24	0.20-**0.25**-0.30	0.24-**0.30**-0.38	0.28-**0.33**-0.41
2–3	120-**100**-70	0,16-**0,19**-0,24	0.20-**0.25**-0.30	0.24-**0.30**-0.38	0.28-**0.33**-0.41
4–5	110-**90**-70	0.16-**0.18**-0.23	0.19-**0.23**-0.29	0.23-**0.28**-0.35	0.25-**0.30**-0.36
6	80-**70**-60	0,14-**0,16**-0,20	0,16-**0,20**-0,24	0.19-**0.24**-0.30	0.20-**0.26**-0.33
7	70-**60**-50	0,11-**0,12**-0,16	0.13-**0.16**-0.20	0.15-**0.19**-0.24	0.17-**0.21**-0.26
8-9	70-**55**-40	0,08-**0,13**-0,16	0.10-**0.17**-0.20	0.13-**0.21**-0.24	0.14-**0.23**-0.26
10	60-**50**-30	0,07-**0,10**-0,12	0.08-**0.14**-0.17	0.11-**0.16**-0.19	0.12-**0.18**-0.21
11	50-**40**-30	0,05-**0,08**-0,11	0.08-**0.11**-0.13	0.09-**0.13**-0.16	0.09-**0.15**-0.17
12	110-**90**-70	0,22-**0,26**-0,33	0.28-**0.34**-0.43	0.33-**0.41**-0.50	0,37-**0,44**-0,50
13–14	100-**80**-60	0,19-**0,23**-0,28	0,24-**0,30**-0,35	0.28-**0.36**-0.43	0.33-**0.39**-0.46
15	70-**60**-50	0,11-**0,13**-0,17	0,14-**0,16**-0,20	0.17-**0.20**-0.26	0.18-**0.22**-0.28
16-17	180-**140**-100	0,26-**0,29**-0,37	0.27-**0.33**-0.40	0.33-**0.38**-0.46	0,37-**0,41**-0,47

Seco Feedmax™ – Machining data

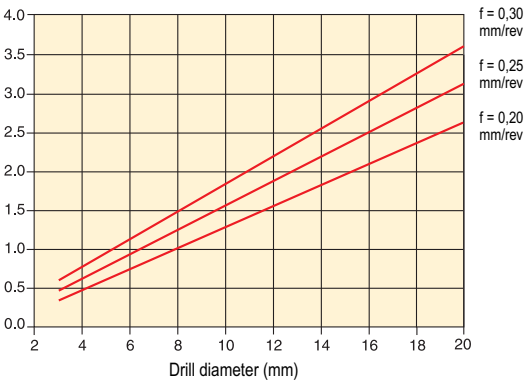
Net power consumption

(kW)



Feed force

(kN)



The values showing net power and feed force consumption above are basic values and vary with type of cutting data, material and tool wear.

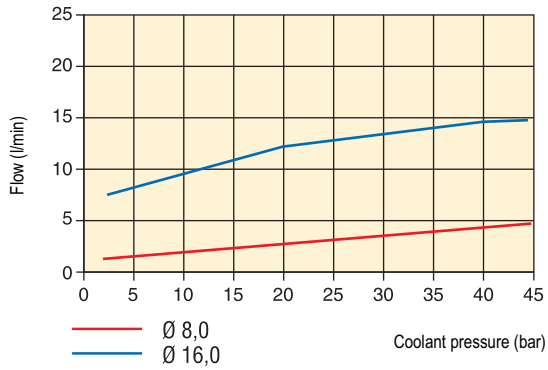
Formulae for calculation are on page 348-349 in Machining Navigator 2008..

Hole tolerances/Surface finish

SD203, SD203A, SD205A, SD207A, SD216A IT8–9/R_a 1–3*		
Drill dia, D_c (mm)	**IT8 tolerance (µm)**	**IT9 tolerance (µm)**
-3	14	25
>3–6	18	30
>6–10	22	36
>10–18	27	43
>18	33	52

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

Coolant flow at different pressures



Minimum recommended coolant pressure 10 bar with < 3 x D.
Minimum recommended coolant pressure 20 bar with > 3 x D.
Minimum recommended coolant pressure 40 bar with > 5 x D.

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.

When using an external coolant supply, direct the jet down the hole and not across it.

External coolant supply is only recommended when the drilling depth is maximum 3 x D. In more difficult stainless steels the recommendation is maximum 1 x D.

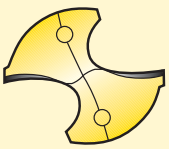
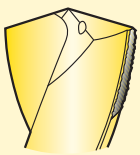
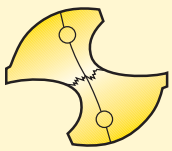
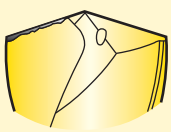
Method

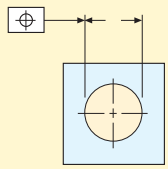
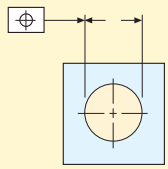
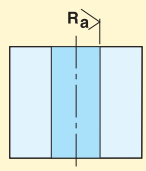
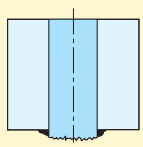
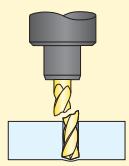
- Adjust feed up or down to obtain as good chip formation as possible. Increased feed/rev. gives shorter chips.

Seco Feedmax™ – Troubleshooting

Initial check points:

- Fixturing stability
- Machine spindle condition
- Tool holder condition
- Clamping of tool:
  - Run-out within 0.02 TIR
  - SD216A run-out within 0.04 TIR
- Chip evacuation:
  - Cutting data
- Coolant:
  - Pressure
  - Flow
  - Concentration

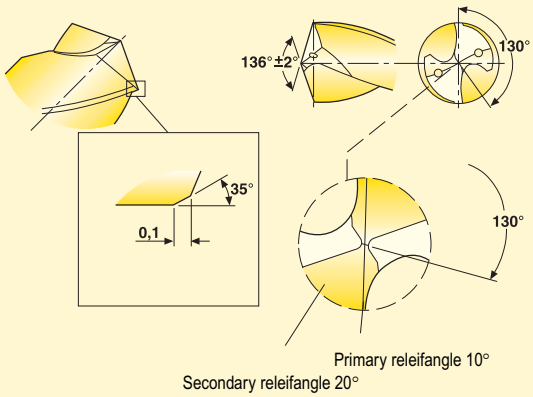
Rapid flank wear 	• Reduce the cutting speed. • Increase coolant concentration.
Wear/Periphery land 	• Reduce the cutting speed. • Increase coolant concentration.
Chipping/Centre 	• Reduce feed during entrance. • Increase coolant pressure and adjust the feed to optimize the chip formation.
Chipping/Outer corner, cutting edge 	• Reduce feed during entrance/exit. • Reduce the cutting speed. • Increase coolant concentration. • Regrind the drill.
Built-up edge 	• If closer to the perifphery increase the cutting speed. • If closer to the centre increase feed/rev. • If the drill is worn, regrind it.

Unsatisfactory diameter tolerance 	• Increase the feed/rev. • Use a reaming operation see page . • Use a boring operation see page 253 in Machining navigator 2008.
Unsatisfactory positioning of the hole 	• Reduce feed/rev. on entrance • Reduce feed/rev. • Use a boring operation see page 253 in Machining navigator 2008 . If drilling through rough, hard and angled surfaces - reduce the feed by 30%–50% during entrance and exit. • Centre drill with a 140° point angle.
Unsatisfactory surface finish 	• Reduce the feed/rev. • Increase the cutting speed. • Use a reaming operation see page 174 in Machining navigator 2008.
Burrs on exit 	• Reduce feed/rev. on exit. • Reduce the width of edge preparation (b_n).
Breakage on contact/ at hole bottom 	• Reduce the feed/rev during entrance/exit. • Adjust cutting data for improved chip evacuation. SD216A • Use a pre operation alternative see page 4

Seco Feedmax™ – Regringing instructions

Regrinding instructions for Solid carbide drills with -SD216A geometry

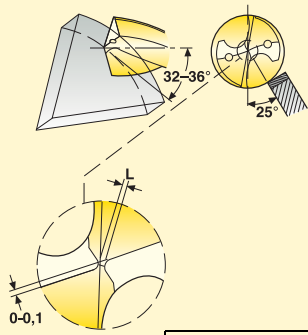
1. Conical flank



Primary releifangle 10°
Secondary releifangle 20°

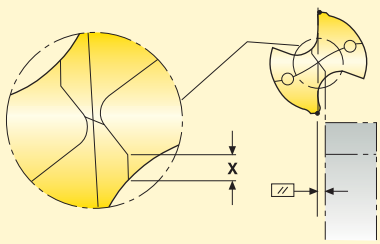
Lip height distance (axial run-out) to be within 0,02 mm

2. Web thinning



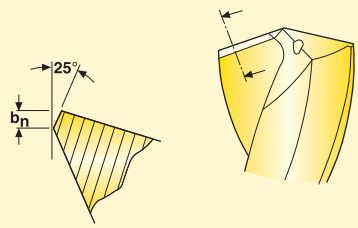
Drill dia. D_c (mm)	L (mm)
<10	0,2
10≤	0,4

3. Grinding of flat X



X = 0,08 x drill diameter D_c

4. Edge preparation



Drill dia. D_c (mm)	b_n (mm)
<10	0,05
10≤	0,1

Max. allowed flank wear before regrinding is 0,1–0,3 mm measured at the largest point.

Specifications

For step 1 use:
Diamond grinding wheel shape:
Grain size:
Concentration:
11V9
D76 (230 mesh)-D46
75-100

For step 2-3 use:
Diamond grinding wheel shape:
Grain size:
Concentration:
1A1 or 1V1 10°
D76 (230 mesh)-D46
75-100

For step 4 use:
Diamond file
Grain size:
or
Silicon carbide brush
D46 (400 mesh)

Important:

- The cutting edges must be uniform and have the same size of edge preparation.
- The edge preparation must be applied on the whole length of the cutting edges.

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