

PROBLEM	EXPLANATION	SOLUTION
Chamfer too small	<ul style="list-style-type: none"> Selected blade is too small Blade force is too small Feed rate is too high 	<ul style="list-style-type: none"> Choose larger blade (if possible) Increase blade force Reduce feed rate
No chamfer at all	<ul style="list-style-type: none"> Tool is incorrectly programmed Blade force is too small Blade is dull Too heavy of a burr 	<ul style="list-style-type: none"> Check programming depths Increase blade force Replace the blade Replace the drill tool
Chamfer is too large	<ul style="list-style-type: none"> Selected blade is too large Feed rate too small Blade force too high 	<ul style="list-style-type: none"> Choose a smaller blade Increase the feed rate Reduce the blade force Use DF geometry
Chamfer differs from front to back	<ul style="list-style-type: none"> Feed varies between forward and reverse feed Variation of burr between front and back 	<ul style="list-style-type: none"> Select a constant feed rate Reduce the feed rate when too small or increase feed rate when too large Increase blade tension
Poor surface finish	<ul style="list-style-type: none"> Tool or part not held properly Tool is unstable Speed rate is too high 	<ul style="list-style-type: none"> Ensure tool and part are secured Reduce Speed Check workpiece and holder
Inconsistent chamfer	<ul style="list-style-type: none"> Varying feed rate Incorrect programming position Tool is unstable 	<ul style="list-style-type: none"> Ensure constant feed rate Check workpiece and holder Check programming Reduce Speed
Poor blade life (chipping) (excessive wear)	<ul style="list-style-type: none"> Workpiece or tool not secured Insufficient machine stability Poor cutting conditions 	<ul style="list-style-type: none"> Ensure tool or part is secured Recondition or rectify machine faults Check speed and feed and coolant supply



Grinding may produce hazardous dust. To avoid adverse effects, use adequate ventilation and read MSDS. Cutting tools may break during use. To avoid injury, use proper safety precautions and protective equipment. Use the machine tool with sufficient rigidity and horsepower. Use a cover on a machine tool and protector, such as glasses, against shattering chips and broken tools due to misuse. Do not use insoluble oil because there is a danger of causing fire.

VEX-S



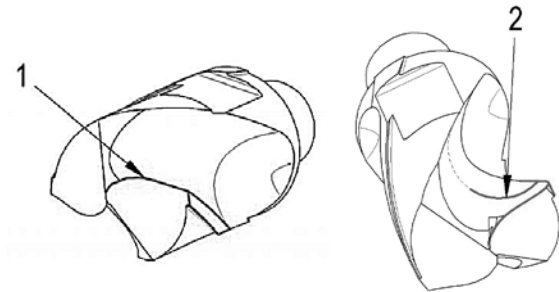
Combination Drill with Front & Back Chamfering of Through Holes

- High performance solid carbide drill tip combined with patented SNAP chamfering system
- VEX drill geometry for better chip control
- Quick and easy drill tip and chamfer blade replacement
- No presetting between drill changes

The VEX-S Tool combines a new high performance solid carbide drill with Heule's patented SNAP chamfering system to drill and chamfer through holes in a single operation. Combining common operations increases the user's productivity and efficiency while maintaining quality. The specially developed connecting system ensures a robust and accurate connection with the tool body and facilitates good transmission of power and also allows quick and easy replacement of the VEX-S twist drill. The replaceable VEX drill tip can be reground and recoated for optimum cost effectiveness and is available in sizes 5-12.0 mm.

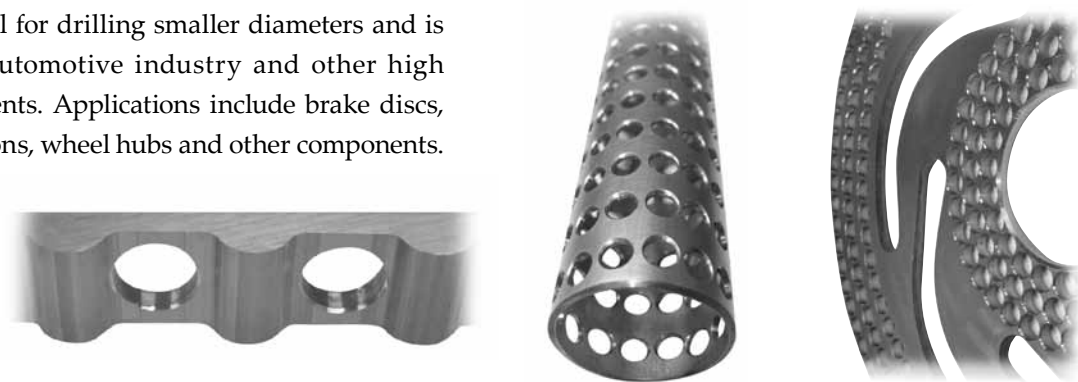
New VEX Drill Geometry

With the new patented VEX self centering cutting geometry, HEULE is setting new benchmarks in the field of drilling technology. The new VEX cutting geometry guarantees high drilling performance with short chips. Due to the convex cutting edge (1) which merges into a concave chip angle (2) short chips are guaranteed even when machining a long chipping material. A large chip channel also optimizes swarf evacuation.



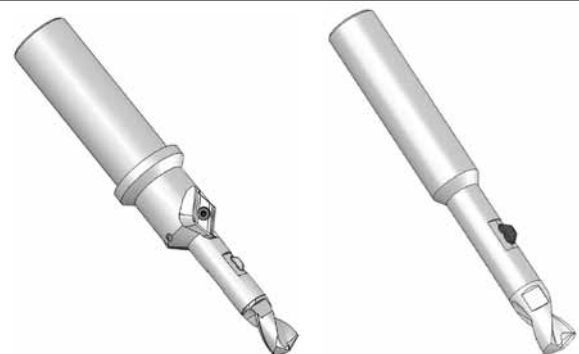
Typical Applications

The VEX-S tool is ideal for drilling smaller diameters and is well suited for the automotive industry and other high production environments. Applications include brake discs, various tube applications, wheel hubs and other components.



Standard and Special Tooling

The VEX-S tool is available from stock in sizes 5-12 mm in the 1xd tooling; other options are available upon request. VEX-S is also available for special design and build custom tooling to suit many special application needs. Contact Heule Tool Corporation for further information if you need a customized tool.



How to Select a VEX-S Tool

1. Determine the drill hole size.
2. Select the appropriate Drill Tip and the coordinating Tool holder.
3. Choose the SNAP chamfer blade according to the needed chamfer size.

Sample Order: Ø3/8" Drill Hole: 1pc P-S-E2-0953-1A VEX-S DRILL Ø3/8", TiAlN, Series E, 1:1
 1pc VEXS-9.5-1d VEX-S Tool Holder Ø9.5 Series E, 1:1, without inserts
 1pc GH-Q-M-30214 SNAP5 Chamfer Blade Ø10.5mm, Carb- TiAlN

1 Series

Bore Range	Series
5.00-5.99	B
6.00-6.99	C
7.00-8.49	D
8.50-10.49	E
10.50-11.49	F

2 Bore-depth T

.5xd	1
1xd	2
1.5xd	3
2xd	4

3 Bore Diameter Ød

Indicate the bore diameter here. For example: Ø9.50 = 0950
 Standard size as shown.

4 Cutting Material

Carbide K20-K30	1
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5 Coating

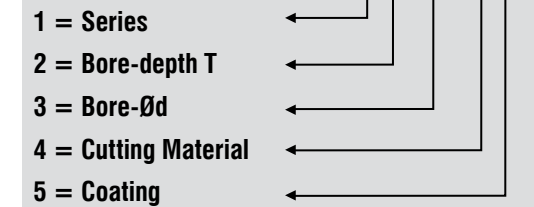
Uncoated	U
TiN	T
TiAlN	A
DLC	D
Helica*	H*

*Will soon be discontinued - replaced with TiAlN

Drill Blade Dimensions

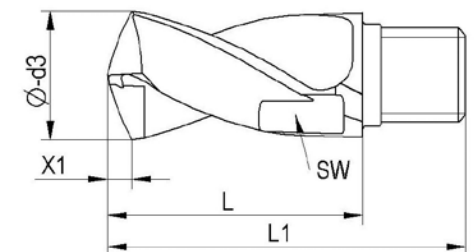
Bore Range	Series	X1	Bore Depth			Bore Depth			Wrench Size	Torque Setting	Flat Wrench
			T	L	L1	T	L	L1			
Ød3											
5.0-5.49	B	1.00	5.0	10.2	14.7				4	170	2301
5.5-5.99		1.10	5.5	11.1	15.6				4	170	2301
6.0-6.49	C	1.20	6.0	11.7	16.2	12	18.4	22.9	5	250	2301
6.5-6.99		1.30	6.5	12.7	17.2	13	20.0	24.5	5	250	2301
7.0-7.49	D	1.35	7.0	13.6	19.1	14	21.4	26.9	6	400	2302
7.5-7.99		1.45	7.5	14.4	19.9	15	22.7	28.2	6	400	2302
8.0-8.49		1.55	8.0	15.2	20.7	16	24.0	29.5	7	400	2302
8.5-8.99	E	1.65	8.5	16.1	21.6	17	25.4	30.9	7	600	2302
9.0-9.49		1.75	9.0	16.9	22.4	18	26.7	32.2	8	600	2303
9.5-9.99		1.85	9.5	17.8	23.3	19	28.1	33.6	8	600	2303
10.0-10.49		1.90	10.0	18.6	24.1	20	29.4	34.9	9	600	2303
10.5-10.99	F	2.10	10.5	19.1	24.6	21	30.2	35.7	9	600	2303
11.0-11.49		2.22	11.0	19.9	25.4	22	31.5	37.0	9	600	2303

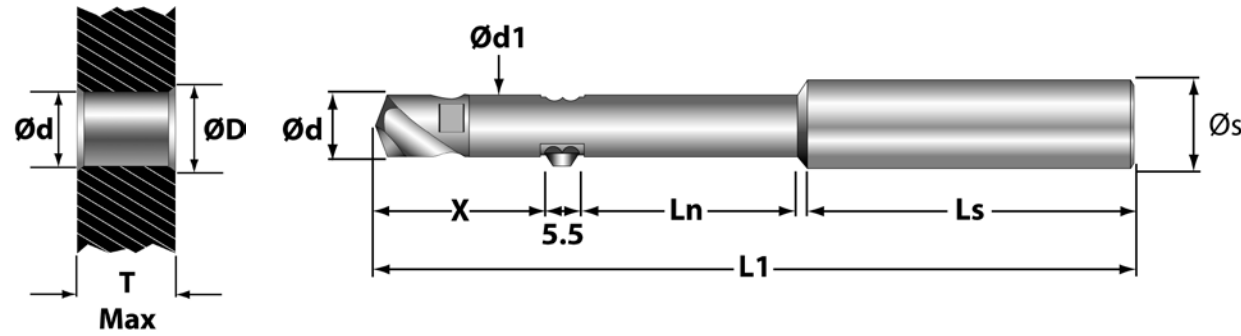
Order Number Example: P-S-E 2-0950-1 A



Order Example:

Bore-Ød	= 9.50mm
Carbide Quality	= K20-K30
Coating	= TiAlN= 9.50mm
Bore-depth T	1xd
Order Number:	P-S-E2-0950-1A





VEX-S Series B, C and D - 1xd Tools

Tool Holder Order Number	Ød Range mm	T Max	Ød1	X	L1	Ln	Ls	Øs
GH-Q-O-4000	5.0 - 5.4	5.0 (.197")	4.9 (.193")	18.9 (.744")	70.5 (2.776")	7.5 (.295")	36.0 (1.417")	8.0 (.315")
GH-Q-O-4001	5.5 - 5.9	5.5 (.217")	5.4 (.213")	19.8 (.780")	71.6 (2.776")	8.0 (.315")	36.0 (1.417")	8.0 (.315")
GH-Q-O-4052	6.0 - 6.4	6.0 (.236")	5.9 (.232")	20.6 (.811")	84.1 (3.311")	15.0 (.591")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4053	6.5 - 6.9	6.5 (.256")	6.4 (.252")	21.6 (.850")	86.1 (3.390")	16.0 (.630")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4054	7.0 - 7.4	7.0 (.276")	6.9 (.272")	23.8 (.937")	89.3 (3.518")	17.0 (.669")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4055	7.5 - 7.9	7.5 (.295")	7.4 (.291")	24.6 (.969")	91.1 (3.587")	18.0 (.709")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4056	8.0 - 8.4	8.0 (.315")	7.9 (.311")	25.4 (1.000")	92.9 (3.658")	19.0 (.748")	45.0 (1.772")	12.0 (.472")

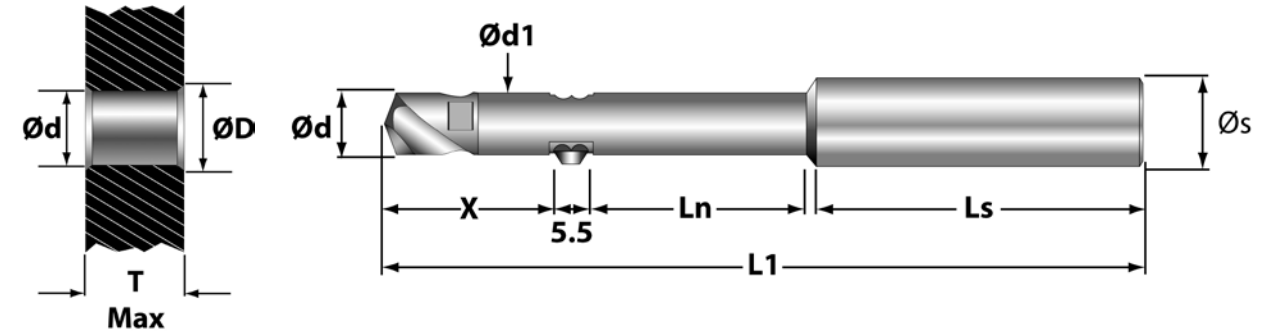
VEX-S Series B, C and D - 1xd Drills and Blades

Series	Ød Drill* mm inches	Tool Holder Order Number	Drill Tip Order #	Cmf. Series	Chamfer Blade Order Number (fab)**			
					(0.25mm x 45°) GH-Q-M-	(0.5mm x 45°) GH-Q-M-	(0.75mm x 45°) GH-Q-M-	(1.0mm x 45°) GH-Q-M-
B	5.0mm (.197)	GH-Q-O-4000	P-S-B2-0500-1A	5	-30204 (5.5)	-30205 (6.0)	-30206 (6.5)	-30207 (7.0)
	5.1mm (.201)	GH-Q-O-4000	P-S-B2-0510-1A		-30204 (5.5)	-30205 (6.0)	-30206 (6.5)	-30207 (7.0)
	5.5mm (.217)	GH-Q-O-4001	P-S-B2-0550-1A		-30205 (6.0)	-30206 (6.5)	-30207 (7.0)	-30208 (7.5)
C	6.0mm (.236)	GH-Q-O-4052	P-S-C2-0600-1A		-30206 (6.5)	-30207 (7.0)	-30208 (7.5)	-30209 (8.0)
	6.35mm (1/4")	GH-Q-O-4052	P-S-C2-0635-1A		-30206 (6.5)	-30207 (7.0)	-30208 (7.5)	-30209 (8.0)
	6.5mm (.256)	GH-Q-O-4053	P-S-C2-0650-1A		-30207 (7.0)	-30208 (7.5)	-30209 (8.0)	-30210 (8.5)
	6.8mm (.268)	GH-Q-O-4053	P-S-C2-0680-1A		-30207 (7.0)	-30208 (7.5)	-30209 (8.0)	-30210 (8.5)
D	7.0mm (.276)	GH-Q-O-4054	P-S-D2-0700-1A		-30208 (7.5)	-30209 (8.0)	-30210 (8.5)	-30211 (9.0)
	7.14mm (9/32")	GH-Q-O-4054	P-S-D2-0714-1A		-30208 (7.5)	-30209 (8.0)	-30210 (8.5)	-30211 (9.0)
	7.5mm (.295)	GH-Q-O-4055	P-S-D2-0750-1A	-30209 (8.0)	-30210 (8.5)	-30211 (9.0)	-30212 (9.5)	
	7.94mm (5/16")	GH-Q-O-4055	P-S-D2-0794-1A	-30210 (8.5)	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	
	8.0mm (.315)	GH-Q-O-4056	P-S-D2-0800-1A	-30210 (8.5)	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	
8.4mm (.331)	GH-Q-O-4056	P-S-D2-0840-1A	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	-30214 (10.5)		

*Other drill sizes available on request. Example: Ød = 8.33mm (.328") - P-S-D4-0833-1A

** Chamfer blades are interchangeable; maximum chamfer diameter ØD = hole Ød + 2mm

BLADE OPTIONS PG. 73
SPARE PARTS PG. 100



VEX-S Series E and F - 1xd Tools

Tool Holder Order Number	Ød Range mm	T Max	Ød1	X	L1	Ln	Ls	Øs
GH-Q-O-4057	8.5 - 8.9	8.5 (.335")	8.4 (.331")	26.6 (1.047")	100.1 (3.941")	20.0 (.787")	45.0 (1.772")	12.0 (.472")
GH-Q-O-4058	9.0 - 9.4	9.0 (.354")	8.9 (.350")	27.4 (1.079")	101.9 (4.012")	21.0 (.827")	45.0 (1.772")	12.0 (.472")
GH-Q-O-4059	9.5 - 9.9	9.5 (.374")	9.4 (.370")	28.3 (1.114")	103.8 (4.087")	22.0 (.866")	45.0 (1.772")	12.0 (.472")
GH-Q-O-4060	10.0 - 10.4	10.0 (.394")	9.9 (.390")	29.5 (1.161")	106.0 (4.173")	23.0 (.906")	45.0 (1.772")	14.0 (.551")
GH-Q-O-4061	10.5 - 11.0	10.5 (.413")	10.4 (.409")	30.1 (1.185")	107.4 (4.228")	24.0 (.945")	45.0 (1.772")	14.0 (.551")
GH-Q-O-4062	11.0 - 11.4	11.0 (.433")	10.9 (.429")	30.9 (1.217")	108.9 (4.287")	24.0 (.945")	45.0 (1.772")	14.0 (.551")

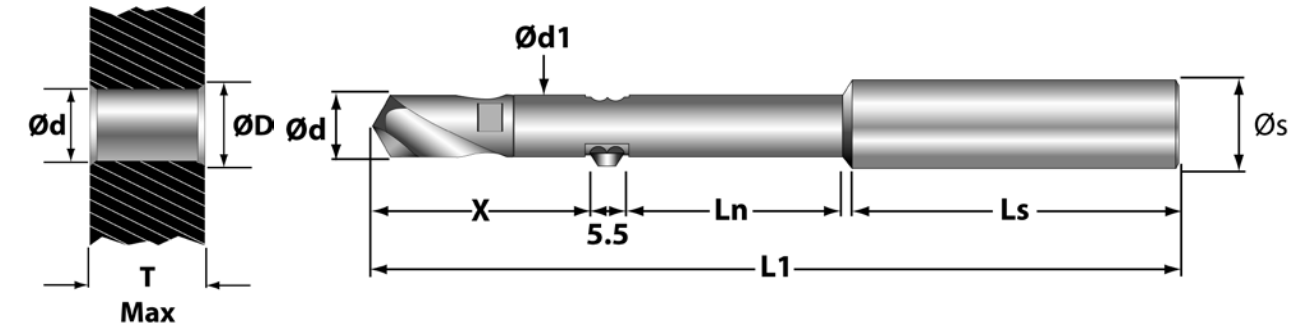
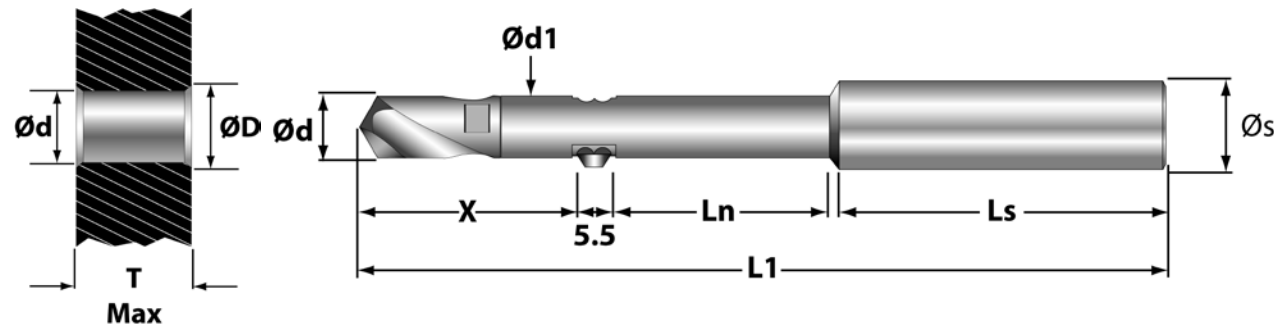
VEX-S Series E and F - 1xd Drills and Blades

Series	Ød Drill* mm inches	Tool Holder Order Number	Drill Tip Order #	Cmf. Series	Chamfer Blade Order Number (fab)**			
					(0.25mm x 45°) GH-Q-M-	(0.5mm x 45°) GH-Q-M-	(0.75mm x 45°) GH-Q-M-	(1.0mm x 45°) GH-Q-M-
E	8.5mm (.335)	GH-Q-O-4057	P-S-E2-0850-1A	5	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	-30214 (10.5)
	8.73mm (11/32")	GH-Q-O-4057	P-S-E2-0873-1A		-30212 (9.5)	-30213 (10.0)	-30214 (10.5)	-30215 (11.0)
	9.0mm (.354)	GH-Q-O-4058	P-S-E2-0900-1A		-30212 (9.5)	-30213 (10.0)	-30214 (10.5)	-30215 (11.0)
	9.35mm (.368)	GH-Q-O-4058	P-S-E2-0935-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	9.5mm (.374)	GH-Q-O-4059	P-S-E2-0950-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	9.53mm (3/8")	GH-Q-O-4059	P-S-E2-0953-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	10.0mm (.394)	GH-Q-O-4060	P-S-E2-1000-1A		-30214 (10.5)	-30215 (11.0)	-30216 (11.5)	-30217 (12.0)
	10.3mm (.406)	GH-Q-O-4060	P-S-E2-1030-1A		-30215 (11.0)	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)
F	10.5mm (.413)	GH-Q-O-4061	P-S-F2-1050-1A	-30215 (11.0)	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)	
	11.0mm (.433)	GH-Q-O-4062	P-S-F2-1100-1A	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)	-30219 (13.0)	
	11.1mm (.437)	GH-Q-O-4062	P-S-F2-1110-1A	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)	-30219 (13.0)	

*Other drill sizes available on request. Example: Ød = 8.33mm (.328") - P-S-D4-0833-1A

** Chamfer blades are interchangeable; maximum chamfer diameter ØD = hole Ød + 2mm

BLADE OPTIONS PG. 73
PROGRAMMING PG. 98-99



VEX-S Series C and D - 2xd Tools

Tool Holder Order Number	Ød Range mm	T Max	Ød1	X	L1	Ln	Ls	Øs
GH-Q-O-4052	6.0 - 6.4	12.0 (.472")	5.9 (.232")	27.3 (1.075")	90.8 (3.575")	15.0 (.591")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4053	6.5 - 6.9	13.0 (.512")	6.4 (.252")	28.9 (1.138")	93.3 (3.673")	16.0 (.630")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4054	7.0 - 7.4	14.0 (.551")	6.9 (.272")	31.6 (1.244")	96.7 (3.807")	17.0 (.669")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4055	7.5 - 7.9	15.0 (.591")	7.4 (.291")	32.9 (1.295")	98.7 (3.886")	18.0 (.709")	40.0 (1.575")	10.0 (.394")
GH-Q-O-4056	8.0 - 8.4	16.0 (.630")	7.9 (.311")	33.3 (1.311")	106.8 (4.205")	19.0 (.748")	40.0 (1.575")	12.0 (.472")

VEX-S Series E and F - 2xd Tools

Tool Holder Order Number	Ød Range mm	T Max	Ød1	X	L1	Ln	Ls	Øs
GH-Q-O-4057	8.5 - 8.9	17.0 (.669")	8.4 (.331")	35.8 (1.409")	109.1 (4.295")	20.0 (.787")	40.0 (1.575")	12.0 (.472")
GH-Q-O-4058	9.0 - 9.4	18.0 (.709")	8.9 (.350")	37.2 (1.465")	111.2 (4.378")	21.0 (.827")	45.0 (1.772")	12.0 (.472")
GH-Q-O-4059	9.5 - 9.9	19.0 (.748")	9.4 (.370")	38.6 (1.520")	113.3 (4.461")	22.0 (.866")	45.0 (1.772")	12.0 (.472")
GH-Q-O-4060	10.0 - 10.4	20.0 (.787")	9.9 (.390")	39.9 (1.571")	116.4 (4.583")	23.0 (.906")	45.0 (1.772")	14.0 (.551")
GH-Q-O-4061	10.5 - 10.9	21.0 (.827")	10.4 (.409")	41.2 (1.622")	118.5 (4.665")	24.0 (.945")	45.0 (1.772")	14.0 (.551")
GH-Q-O-4062	11.0 - 11.4	22.0 (.866")	10.9 (.429")	42.5 (1.673")	120.5 (4.744")	25.0 (.984")	45.0 (1.772")	14.0 (.551")

VEX-S Series C and D - 2xd Drills and Blades

Series	Ød Drill* mm inches	Tool Holder Order Number	Drill Tip Order #	Cmf. Series	Chamfer Blade Order Number (fab)**			
					(0.25mm x 45°) GH-Q-M-	(0.5mm x 45°) GH-Q-M-	(0.75mm x 45°) GH-Q-M-	(1.0mm x 45°) GH-Q-M-
C	6.0mm (.236)	GH-Q-O-4052	P-S-C4-0600-1A	5	-30206 (6.5)	-30207 (7.0)	-30208 (7.5)	-30209 (8.0)
	6.35mm (1/4")	GH-Q-O-4052	P-S-C4-0635-1A		-30206 (6.5)	-30207 (7.0)	-30208 (7.5)	-30209 (8.0)
	6.5mm (.256)	GH-Q-O-4053	P-S-C4-0650-1A		-30207 (7.0)	-30208 (7.5)	-30209 (8.0)	-30210 (8.5)
	6.8mm (.268)	GH-Q-O-4053	P-S-C4-0680-1A		-30207 (7.0)	-30208 (7.5)	-30209 (8.0)	-30210 (8.5)
D	7.0mm (.276)	GH-Q-O-4054	P-S-D4-0700-1A	5	-30208 (7.5)	-30209 (8.0)	-30210 (8.5)	-30211 (9.0)
	7.14mm (9/32")	GH-Q-O-4054	P-S-D4-0714-1A		-30208 (7.5)	-30209 (8.0)	-30210 (8.5)	-30211 (9.0)
	7.5mm (.295)	GH-Q-O-4055	P-S-D4-0750-1A		-30209 (8.0)	-30210 (8.5)	-30211 (9.0)	-30212 (9.5)
	7.94mm (5/16")	GH-Q-O-4055	P-S-D4-0794-1A		-30210 (8.5)	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)
	8.0mm (.315)	GH-Q-O-4056	P-S-D4-0800-1A		-30210 (8.5)	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)
	8.4mm (.331)	GH-Q-O-4056	P-S-D4-0840-1A		-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	-30214 (10.5)

*Other drill sizes available on request. Example: Ød = 8.33mm (.328") - P-S-D2-0833-1A

** Chamfer blades are interchangeable; maximum chamfer diameter ØD = hole Ød + 2mm

BLADE OPTIONS PG. 75
SPARE PARTS PG. 100

VEX-S Series E and F - 2xd Drills and Blades

Series	Ød Drill* mm inches	Tool Holder Order Number	Drill Tip Order #	Cmf. Series	Chamfer Blade Order Number (fab)**			
					(0.25mm x 45°) GH-Q-M-	(0.5mm x 45°) GH-Q-M-	(0.75mm x 45°) GH-Q-M-	(1.0mm x 45°) GH-Q-M-
E	8.5mm (.335)	GH-Q-O-4057	P-S-E4-0850-1A	5	-30211 (9.0)	-30212 (9.5)	-30213 (10.0)	-30214 (10.5)
	8.73mm (11/32")	GH-Q-O-4057	P-S-E4-0873-1A		-30212 (9.5)	-30213 (10.0)	-30214 (10.5)	-30215 (11.0)
	9.0mm (.354)	GH-Q-O-4058	P-S-E4-0900-1A		-30212 (9.5)	-30213 (10.0)	-30214 (10.5)	-30215 (11.0)
	9.35mm (.368)	GH-Q-O-4058	P-S-E4-0935-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	9.5mm (.374)	GH-Q-O-4059	P-S-E4-0950-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	9.53mm (3/8")	GH-Q-O-4059	P-S-E4-0953-1A		-30213 (10.0)	-30214 (10.5)	-30215 (11.0)	-30216 (11.5)
	10.0mm (.394)	GH-Q-O-4060	P-S-E4-1000-1A		-30214 (10.5)	-30215 (11.0)	-30216 (11.5)	-30217 (12.0)
	10.3mm (.406)	GH-Q-O-4060	P-S-E4-1030-1A		-30215 (11.0)	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)
F	10.5mm (.413)	GH-Q-O-4061	P-S-F4-1050-1A	5	-30215 (11.0)	-30216 (11.5)	-30217 (12.0)	-30218 (12.5)
	11.0mm (.433)	GH-Q-O-4062	P-S-F4-1100-1A		-30216 (11.5)	-30217 (12.0)	-30218 (12.5)	-30219 (13.0)
	11.1mm (.437)	GH-Q-O-4062	P-S-F4-1110-1A		-30216 (11.5)	-30217 (12.0)	-30218 (12.5)	-30219 (13.0)

*Other drill sizes available on request. Example: Ød = 8.33mm (.328") - P-S-D2-0833-1A

** Chamfer blades are interchangeable; maximum chamfer diameter ØD = hole Ød + 2mm

BLADE OPTIONS PG. 77
PROGRAMMING PG. 98-99

VEX-S Speeds and Feeds

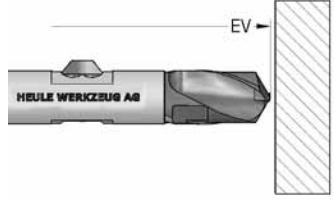
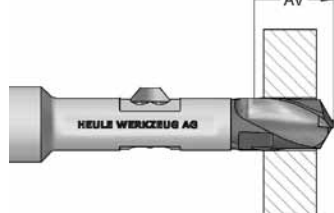
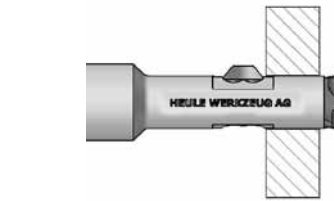
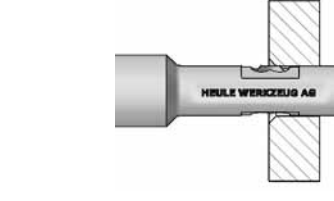
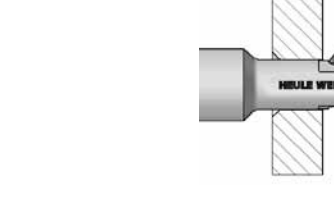
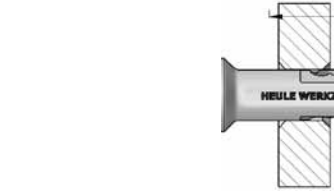
IMPORTANT: Tool holder must be modified with blade locking mechanism for spindle speeds above 6,000 rpm. Please contact Heule Tool Corporation Engineering Department.

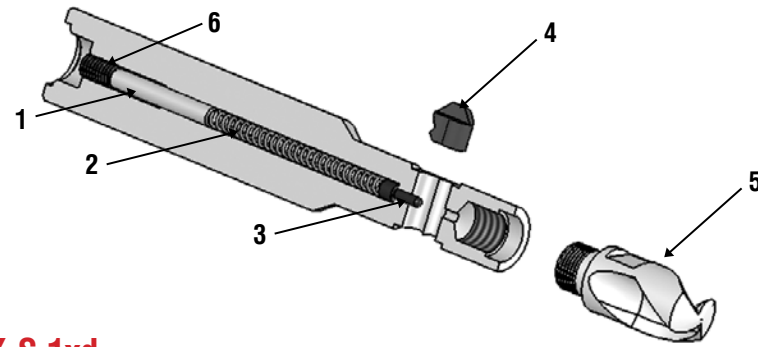
Material	SFM	IPR		
		Ø5-6.5	Ø6.5-8	Ø8-11.5
Unalloyed steel	300-400	.003-.005	.004-.008	.006-.010
Cast steel	150-250	.003-.005	.004-.008	.006-.010
Low-alloy steel	250-400	.003-.005	.004-.008	.006-.010
Free machining steel	220-350	.003-.005	.004-.008	.006-.010
High-alloy steel	130-220	.002-.004	.003-.006	.004-.008
Stainless steel	100-160	.001-.002	.002-.003	.003-.004
Grey cast iron	275-500	.004-.007	.006-.010	.008-.013
Nodular cast iron	275-450	.003-.006	.004-.009	.006-.012
Aluminium-forging alloys	380-600	.005-.007	.007-.010	.010-.013
Aluminium-casting alloys	300-600	.005-.007	.007-.010	.010-.013
Brass	300-500	.005-.007	.007-.010	.010-.013
Bronze-short chipping	200-300	.004-.006	.006-.009	.008-.012
Bronze-long chipping	130-200	.003-.005	.004-.008	.006-.010

VEX-S Programming Sequence

It is not necessary to change the direction of rotation or stop the spindle

AV: Working feed, forward **AR:** Working feed, backward
EV: Rapid feed, forward **ER:** Rapid feed, backward

	<p>Step 1: Rapid Feed the tool to within clearance of the workpiece.</p>
	<p>Step 2: With forward Working Feed (WF), feed the tool through the workpiece until the hole is drilled and the drill tip is clear of the bore.</p>
	<p>Step 3: Rapid feed the tool so the SNAP blade is within clearance of the workpiece top surface or burr.</p>
	<p>Step 4: With working feed, cut the top chamfer. Continue feeding until the SNAP blade is completely retracted into the tool body.</p>
	<p>Step 5: Use rapid feed to position the SNAP blade on the far side of the part. Position the tool so the SNAP blade is completely extended and clear of the part or burr.</p>
	<p>Step 6: With back working feed, cut the back chamfer. When the SNAP blade is completely within the tool and clear of the back surface, the tool can be extracted with rapid feed.</p>



Spare Parts – VEX-S 1xd

Tool Holder	1	2	3	4	5	6
GH-Q-0-	Distance Pin	Spring	Control Bolt	Blade	Drill Tip	Screw Set
4000 4001	GH-Q-E-0052	GH-H-F-0019	GH-Q-E-0008	See Below	See Pages 94-95	GH-H-S-0127

Spare Parts – VEX-S 2xd

Tool Holder	1	2	3	4	5	6
GH-Q-0-	Distance Pin	Spring	Control Bolt	Blade	Drill Tip	Screw Set
4052 4053 4054 4055	GH-Q-E-0048	GH-H-F-0019	GH-Q-E-0008	See Below	See Pages 96-97	GH-H-S-0127
4056 4057 4058 4059 4060 4061 4062	GH-Q-E-0039	GH-H-F-0019	GH-Q-E-0008	See Below	See Pages 96-97	GH-H-S-0127

Bore Range	Tool Holder	SNAP 5 Blade, Carbide TiAlN 90°, front and back cutting Order Number and (Chamfer ØD mm)			
5.0-5.49	GH-Q-0-4000	GH-Q-M-30205 (6.0)	GH-Q-M-30206 (6.5)	GH-Q-M-30207 (7.0)	
5.5-5.99	GH-Q-0-4001	GH-Q-M-30206 (6.5)	GH-Q-M-30207 (7.0)	GH-Q-M-30208 (7.5)	
6.0-6.49	GH-Q-0-4052	GH-Q-M-30207 (7.0)	GH-Q-M-30208 (7.5)	GH-Q-M-30209 (8.0)	
6.5-6.99	GH-Q-0-4053	GH-Q-M-30208 (7.5)	GH-Q-M-30209 (8.0)	GH-Q-M-30210 (8.5)	
7.0-7.49	GH-Q-0-4054	GH-Q-M-30209 (8.0)	GH-Q-M-30210 (8.5)	GH-Q-M-30211 (9.0)	
7.5-7.99	GH-Q-0-4055	GH-Q-M-30210 (8.5)	GH-Q-M-30211 (9.0)	GH-Q-M-30212 (9.5)	
8.0-8.49	GH-Q-0-4056	GH-Q-M-30211 (9.0)	GH-Q-M-30212 (9.5)	GH-Q-M-30213 (10.0)	
8.5-8.99	GH-Q-0-4057	GH-Q-M-30212 (9.5)	GH-Q-M-30213 (10.0)	GH-Q-M-30214 (10.5)	
9.0-9.49	GH-Q-0-4058	GH-Q-M-30213 (10.0)	GH-Q-M-30214 (10.5)	GH-Q-M-30215 (11.0)	
9.5-9.99	GH-Q-0-4059	GH-Q-M-30214 (10.5)	GH-Q-M-30215 (11.0)	GH-Q-M-30216 (11.5)	
10.0-10.49	GH-Q-0-4060	GH-Q-M-30215 (11.0)	GH-Q-M-30216 (11.5)	GH-Q-M-30217 (12.0)	
10.5-10.99	GH-Q-0-4061	GH-Q-M-30216 (11.5)	GH-Q-M-30217 (12.0)	GH-Q-M-30218 (12.5)	
10.0-11.49	GH-Q-0-4062	GH-Q-M-30217 (12.0)	GH-Q-M-30218 (12.5)	GH-Q-M-30219 (13.0)	

Note: For blade dimensions, see page 73. For wrench and drill tip dimensions, see page 93.

How to Change the VEX Drill Tip

Assembly:

Step 1:
Clean the surfaces between the VEX-S twist drill and the tool body.

Step 2:
Screw the VEX-S drill insert tightly with a flat wrench to the tool body.

Step 3:
Check to make sure there is a seamless connection between the drill insert and tool body after tightening the drill insert. There should not be any gaps.

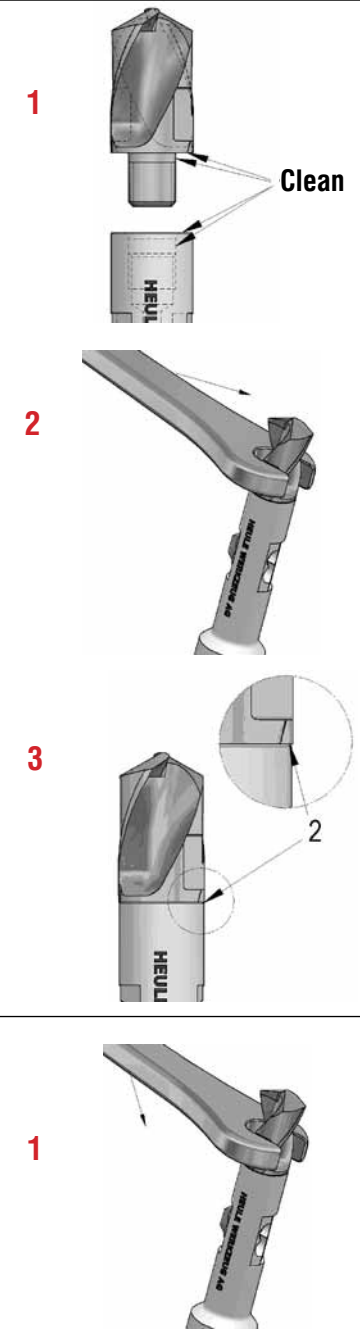
- NOTE:** There are a few situations that could cause gaps;
- Dirt between drill and tool body.
To fix: remove the VEX-S twist drill and clean.
 - VEX-S twist drill is not tight enough.
To fix: tighten the VEX-S twist drill.
 - Adaption areas are damaged.
To fix: exchange the VEX-S twist drill and/or VEX-S tool body.

Disassembly:



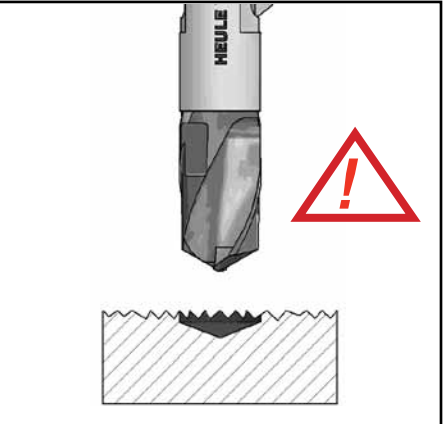
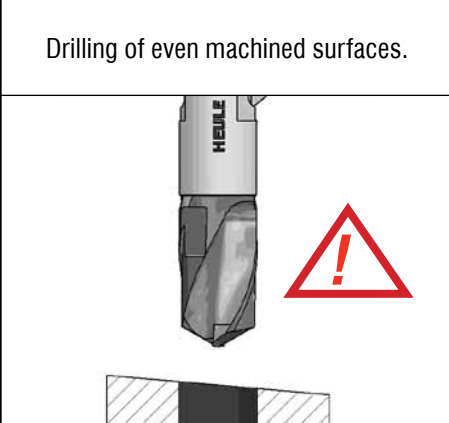
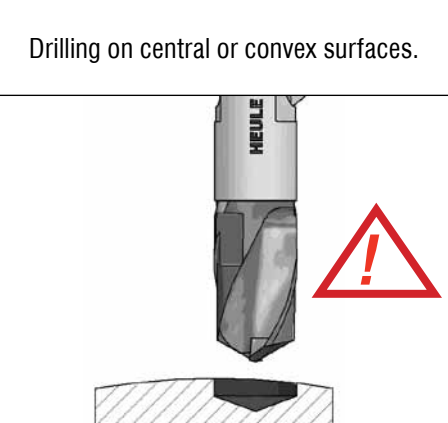

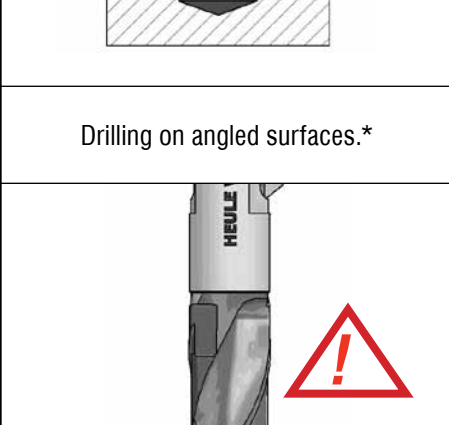
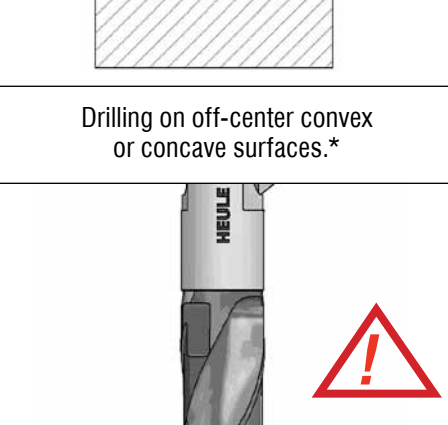
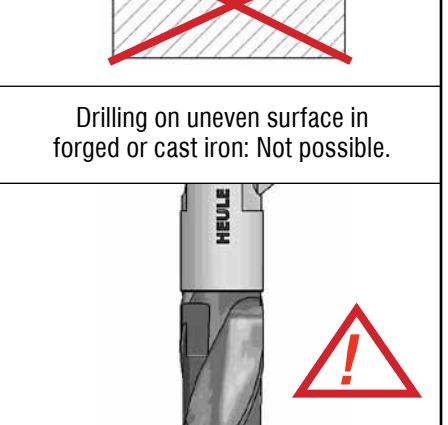
Step 1:
Unscrew the VEX-S twist drill with a flat wrench in counter-clockwise direction from the tool body and remove the twist drill.

Wrenches:
Be sure to use the wrenches available from HEULE to assemble the VEX-S tools. This chart explains which wrench goes with which series.

Wrenches	Description	Distance Across Flats
GH-H-S-2301	Wrench; Series B&C, 5.0-6.99	4 or 5mm
GH-H-S-2302	Wrench; Series D&E 7.0-8.99	6 or 7mm
GH-H-S-2303	Wrench; Series E&F, 9.0-11.5	8 or 9mm



Problem	Explanation	Solution
Built-up material on cutting edge	<ul style="list-style-type: none"> • Cutting Speed is too slow • Feed Rate is too slow • Coating is incorrect for this material • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting Speed • Increase Feed Rate • Change Drill Tip Coating • Adjust coolant flow or position
Chips Jamming in the Chip Gullet	<ul style="list-style-type: none"> • Feed rate is too high for chip evacuation • Drill tip is too short for material thickness • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce feed rate • Use a Peck Drill cycle • Adjust coolant flow or position • Use longer drill
Burr Formation on the Exit of the Bore (see SNAP troubleshooting on page 56 for burr removal issues)	<ul style="list-style-type: none"> • Feed and Speed Rate is too high • Drill Tip worn • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Reduce exit feed 50% • Exchange worn drill tip • Adjust coolant flow or position
Hole size is inconsistent or not symmetrical	<ul style="list-style-type: none"> • Feed is too heavy • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce feed rate • Check stability of set up • Check rotation • Adjust coolant flow or position
Poor Surface finish Quality	<ul style="list-style-type: none"> • Drill Tip worn • Incorrect feeds and speeds • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Exchange worn drill tip • Change feed and speed • Check stability of set up • Adjust coolant flow or position
Chatter during drilling (this must be corrected to avoid tool breakage)	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally insignificant feed rate) • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Increase feed rate • Check stability of set up • Adjust coolant flow or position
Excessive Cutting Edge Wear	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally lacking cutting speed) • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting speed • Decrease feed rate • Check stability of set up • Adjust coolant flow or position
Chipping of Cutting Edge	<ul style="list-style-type: none"> • Material building up on Cutting edge (chipping off) • Incorrect feeds and speeds (normally lacking cutting speed) • Spindle, fixture or set-up is not stable • Entering / Exiting on incline, or irregular surface • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting speed • Reduce feed rate. • Enter / Exit irregularities at 50% of feed rate • Check stability of set up • Adjust coolant flow or position
Excessive Margin Wear (Corner wear or discoloration on Margins O.D.)	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally excessive cutting speed) • Tool is running out of round • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Check run out • Check stability of set up • Adjust coolant flow or position
Chipping of the Top of the Drill-bit	<ul style="list-style-type: none"> • Drill is deflecting during drilling 	<ul style="list-style-type: none"> • Reduce feed rate • Check stability of set up

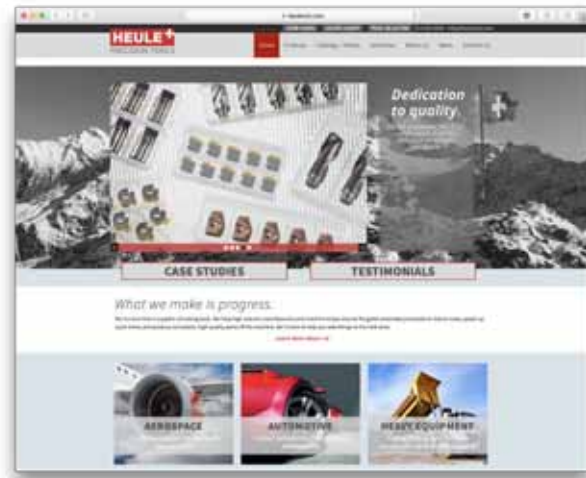
		
Drilling of even machined surfaces.	Drilling on central or convex surfaces.	Drilling on uneven surfaces. If necessary reduce feed-rate.*
		
Drilling on angled surfaces.*	Drilling on off-center convex or concave surfaces.*	Drilling on uneven surface in forged or cast iron: Not possible.
		
Drilling through a cross-hole. \varnothing cross-hole max. $0.5x \varnothing$ bore. If necessary reduce feed rate.**	Drilling with angle on back side. Reduce feed rate to about 50-60%*	Drilling through several layers. Seamless fitting of the different workpieces is necessary.

*Chamfer won't be clean.

**Tool can break! Chamfer blade can get stuck in the cross-hole (drive through the bore with no rotation of the tool!)



Grinding may produce hazardous dust. To avoid adverse effects, use adequate ventilation and read MSDS. Cutting tools may break during use. To avoid injury, use proper safety precautions and protective equipment. Use the machine tool with sufficient rigidity and horsepower. Use a cover on a machine tool and protector, such as glasses, against shattering chips and broken tools due to misuse. Do not use insoluble oil because there is a danger of causing fire.



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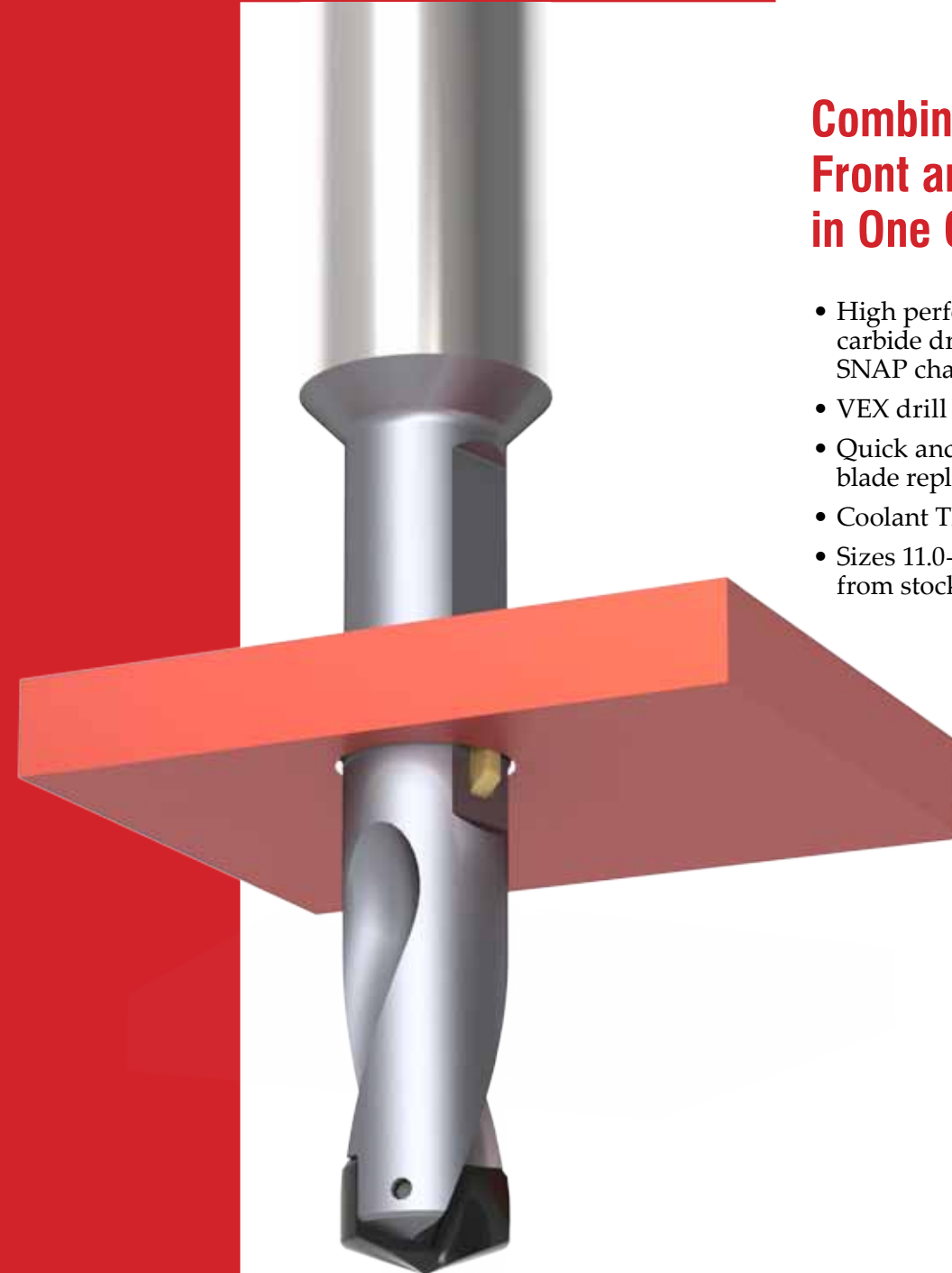
We provide online tool selectors for the
COFA, SNAP, DEFA and **BSF** product groups.

Simply enter your application information and the correct tool will
be provided complete with order number and sample drawing.

We are also available on:



VEX-P



**Combination of Drilling and
Front and Back Chamfering
in One Operation.**

- High performance replaceable carbide drill tip combined with patented SNAP chamfering system
- VEX drill geometry for better chip control
- Quick and easy drill tip and chamfer blade replacement
- Coolant Through
- Sizes 11.0-17.0mm (.433-.669") available from stock