

DRILLING - ValDRILL

<b>Val-U-Dex</b>	<b>360-363</b>
VWDR/L Drills	361
VWDR Drills	362
WCEM Inserts	363
CD2D Inserts	363
<b>Carbide Tipped Drills</b>	<b>364-366</b>
VSD Drills	365
Application Guidelines	366
<b>Solid Carbide Drills</b>	<b>367-368</b>
VSCD Drills, Inch Series	367
VSCD Drills, Metric Series	367
Application Information	368

1	TURNING - BORING
2	GRINDING
3	ROTARY - CONNECTION   GROOVING - THREADING
4	ROTARY - CONNECTION
5	DRILLING
6	ADVANCED MATERIALS
7	MODCO
8	GAGING SYSTEMS
9	VALCOOL®
10	SPARE PARTS
11	MISCELLANEOUS

## Val-U-Dex INDEXABLE INSERT DRILLS

### Valenite offers faster, more profitable production with three styles of Val-U-Dex indexable insert drills:

Val-U-Dex helical flute indexable insert drills provide faster cutting speeds and efficient chip removal for use on conventional, NC or CNC lathes. Val-U-Dex helical flute drills incorporate a neutral rake geometry and screw down trigon inserts for stability and clean through hole cutting. To maximize production potential, Val-U-Dex helical flute indexable insert drills are offered with an optional coolant collar for use in rotating applications. Val-U-Dex helical flute drills are available in cutting diameters ranging from .750" to 2.500".

Val-U-Dex straight flute indexable insert Weldon shank drills are stub length for short hole drilling with extra stability. The self centering action with minimal overhang makes these drills perfect for lathes or machining centers. Six sizes are available in cutting diameters ranging from .750" to 2.000". Val-U-Dex straight flute weldon shank drills also use indexable screw down trigon inserts for maximum productivity and cost effectiveness.

Val-U-Dex straight flute indexable insert drills are available in three cutting diameters: .625", .750", and .875". Val-U-Dex straight flute drills use a single low cost chip control insert designed to provide flat bottom cutting while splitting chips into two or three segments. Since chip clearing is a characteristic problem with high speed carbide drilling, the chip splitting, together with the flood action of a coolant jet directed near the insert, permits highly productive metal removal rates. These small hole drills can be used for both rotating and non rotating applications.

To boost your parts productivity, select the Val-U-Dex drills that fit you application...contact your Valenite customer service representative.

### Val-U-Dex INDEXABLE INSERT DRILLS (Small Hole)

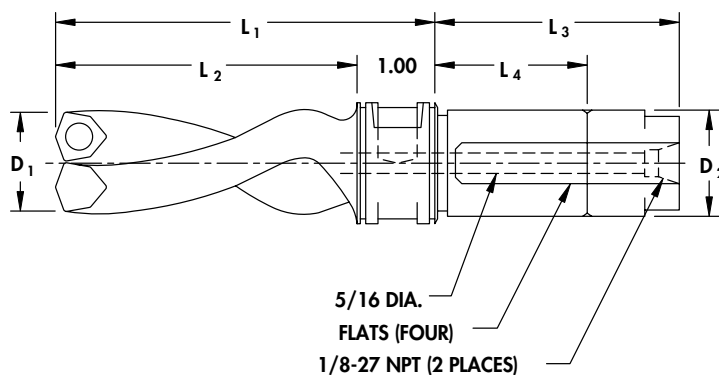
#### Outstanding Economy and Performance!

Val-U-Dex straight flute indexable insert drills for small hole operations are available in three cutting diameters: .625", .750", and .875". The drills can be used for both non rotating and rotating applications.

The small hole drills use a single low cost diamond shaped utility chip control insert which is designed to fragment metal shavings into two or three vertical chips. Since chip clearance is a characteristic problem with high speed carbide drilling, the metal break up, together with the clearing action of a coolant jet directed through holes near the cutting end of the tool, permits highly productive metal removal rates. In addition, downtime and costs associated with sharpening high speed steel or spade drills are eliminated.

- Drilling from solid
- Self-centering action
- High drill through speeds
- Generous flute for easy chip disposal
- Non-rotating or rotating applications

**NOTE: The full line of Val-U-Dex drills can be found in our Rotary Tooling Systems catalog, 27-00-160, published Feb. 2002.**



Use Insert Style:  
WCEM 1PWCEM  
3PWCEMX 3P

Part Number	Insert Size	Dimensions					EDP#
		D1	D2	L1	L2	L3	
VWDR 075 100 318	221	.750	1.00	3.18	1.68	3.50	56823
VWDR 081 100 340	221	.812	1.00	3.40	1.78	3.50	56824
VWDR 088 100 358	221	.875	1.00	3.58	1.95	3.50	56825
VWDR 093 125 438*	2.521	.937	1.25	4.38	2.93	4.00	56826
VWDR 098 125 452*	2.521	.987	1.25	4.52	2.95	4.00	56827
VWDR 100 125 454*	2.521	1.000	1.25	4.54	3.00	4.00	56829
VWDR 106 125 472*	2.521	1.062	1.25	4.72	3.18	4.00	56830
VWDR 112 125 495*	2.521	1.125	1.25	4.95	3.38	4.00	56832
VWDR 118 125 511*	2.521	1.187	1.25	5.11	3.56	4.00	56833
VWDR 122 125 531*	2.521	1.220	1.25	5.31	3.66	4.00	56834
VWDR 125 125 540*	2.521	1.250	1.25	5.40	3.75	4.00	56835
VWDR 138 125 590	321	1.375	1.25	5.90	4.14	4.00	56839
VWDR 143 125 591	321	1.437	1.25	5.91	4.31	4.00	56840
VWDR 150 125 612	321	1.500	1.25	6.12	4.50	4.00	56842
VWDR 162 125 652	321	1.625	1.25	6.52	4.88	4.00	56845
VWDR 175 150 695	421	1.750	1.50	6.95	5.25	4.50	56849
VWDR 188 150 737	421	1.875	1.50	7.37	5.62	4.50	56852
VWDR 200 150 760	421	2.000	1.50	7.60	6.00	4.50	56857
VWDR 250 200 931A	52.51	2.500	2.00	9.52	7.50	5.50	56867

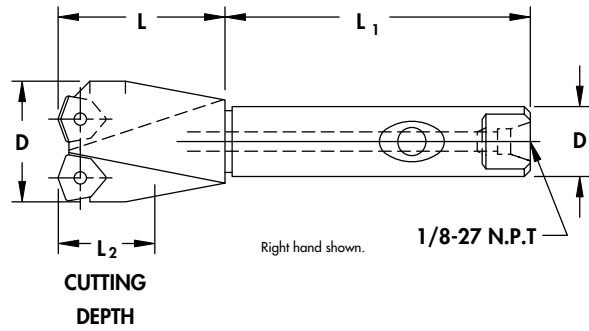
\* Use PT 509 for Coolant Collar  
• Denotes non-stock standard

Spare Parts

Insert Size	Lock Screw		Torx Wrench		Coolant Collar	
	Part #	EDP#	Part #	EDP#	Part #	EDP#
2...	PT 487T	52280	T 7	50101	PT 508	56458
3...	PT 488T	52281	T 10	50083	PT 509	56459
4...	PT 489T	52282	T 20	50091	PT 510	56460
5...	PT 546T	52290	T 20	50091	PT 511	56461

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## Val-U-Dex VWDR DRILLS



Use Insert Style:  
WCEN 1PWCEM  
3PWCEMX 3P

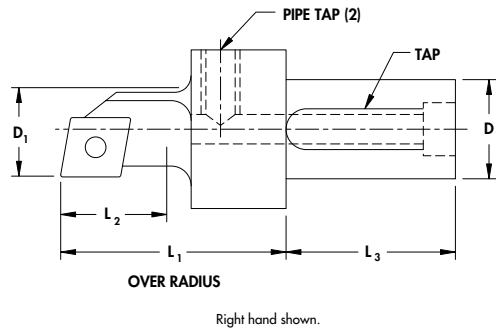
Part Number	Insert Size	Dimensions					EDP#
		D1	D2	L1	L2	L3	
VWDR 100 100W 162	2.521	1.000	1.000	1.62	1.25	3.50	56828
VWDR 150 125W 200	321	1.500	1.250	2.25	1.62	3.25	56843
VWDR 200 125W 200	421	2.000	1.250	2.75	2.12	2.75	56856

### Spare Parts

Insert Size	Lock Screw		Torx Wrench	
	Part #	EDP#	Part #	EDP#
2...	PT 487T	52280	T 7	50101
3...	PT 488T	52281	T 10	50083
4...	PT 489T	52282	T 20	50091

## SMALL DIAMETER STRAIGHT FLUTE DRILLS

## Val-U-Dex VWDR DRILLS



Part Number	Insert Size	Dimensions					EDP#
		D1	D2	L1	L2	L3	
VCDD 062 075 0512(CS)	CD 3222 2D	.625	.750	2.87	1.50	2.50	56888
VCDD 075 100 0644(CS)	CD 422 2D	.750	1.00	2.94	1.50	3.50	56889
VCDD 088 100 0675(CS)	CD 422 2D	.875	1.00	3.25	1.75	3.50	56890

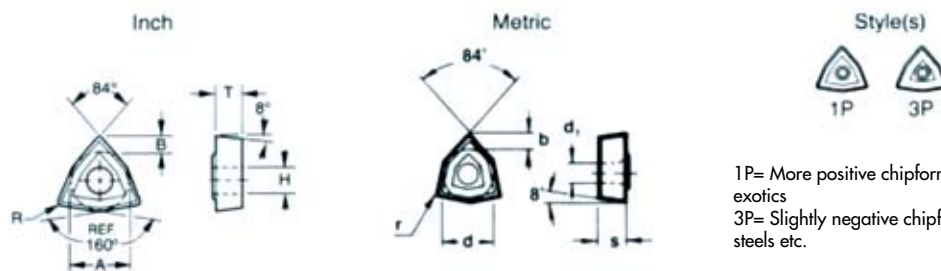
5 digit EDP/Order Number indicates: stock standard

Tool includes body, lock screws, Torx wrench less inserts.

### Spare Parts

Insert Size	Dry Seal Pipe Plug		Insert Lock Screw		Torx Wrench	
	Part #	EDP#	Part #	EDP#	Part #	EDP#
CD 3...	1/8-27 N.P.T	•	PT 317T	52261	T 10	50083
CD 4...	1/8-27 N.P.T	•	PT 317T	52261	T 10	50083

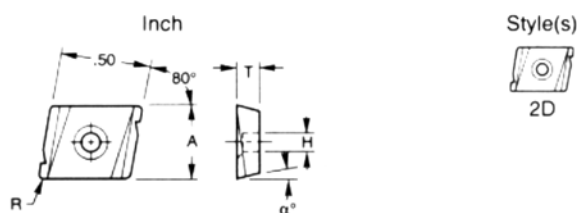
**Val-U-Dex WCEM INSERTS**  
84° TRIGON - 8° RELIEF  
SCREW DOWN  
CHIP CONTROL ONE SIDE



1P= More positive chipform for stainless & exotics  
3P= Slightly negative chipform for carbon steels etc.

Part Number	Dimensions					Available Grades/EDP#						
	A(IC)	T	R	H	B	VC2	VC56	VC111	VN8	V1N	SV230	SV325
WCEM221 1P	1/4	.093	.015	.110	.054	08453	-	08454	03051	03050	-	-
WCEM2.521 1P	5/16	.113	.015	.110	.069	08455	08456	08457	03055	03054	03052	03053
WCEM321 1P	3/8	.125	.015	.160	.085	08458	08459	08460	03059	03058	03056	03057
WCEM421 1P	1/2	.125	.015	.200	.116	08461	08462	08463	03061	03060	-	-
WCEM52.51 3P	5/8	.156	.015	.216	.146	13673	-	13674	-	05805	-	-

**Val-U-Dex CD 2D INSERTS**  
80° DIAMOND - POSITIVE  
SCREW DOWN

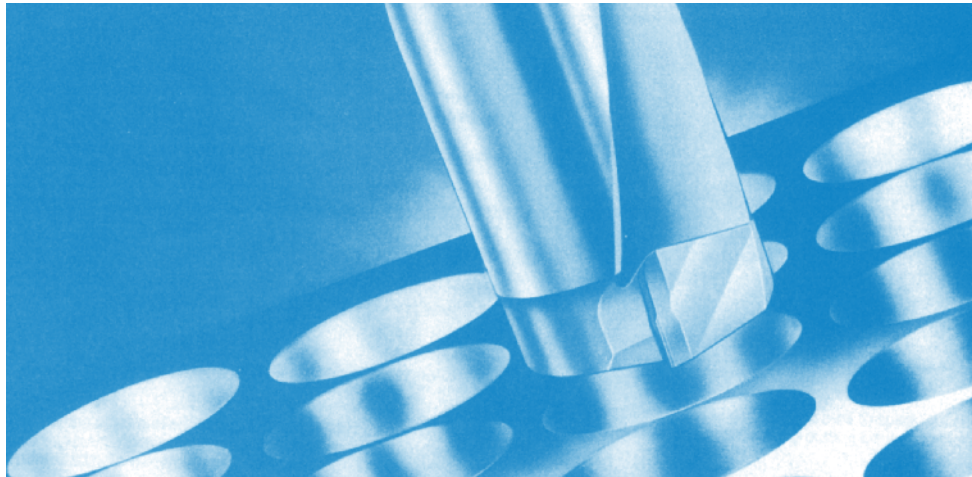


Part Number	Dimensions						Grades/EDP#	
	A(IC)	L	T	R	H	α°	VC2	VC56
CD3222 2D	.375	.500	.125	.031	.158	7°	13576	13632
CD422 2D	.500	.500	.125	.031	.158	11°	13577	10154

## CARBIDE TIPPED DRILLS

### HIGH PRODUCTION DRILLS DESIGNED FOR MAXIMUM PRODUCTIVITY!

- High strength body made from heat treated high nickel alloy steel.
- New design features promote excellent chip control.
- Tough brazed on carbide tip ensures high penetration rates and long tool life.
- Drilling depths up to 4 x diameter.
- Coolant holes allow coolant to be supplied directly to cutting edges.
- Capable of drilling full range of common industrial materials - from Cast Iron to Inconel.
- Easily regrindable - no special fixture or apparatus necessary.
- 26 cutting diameters from 31/64" to 1".



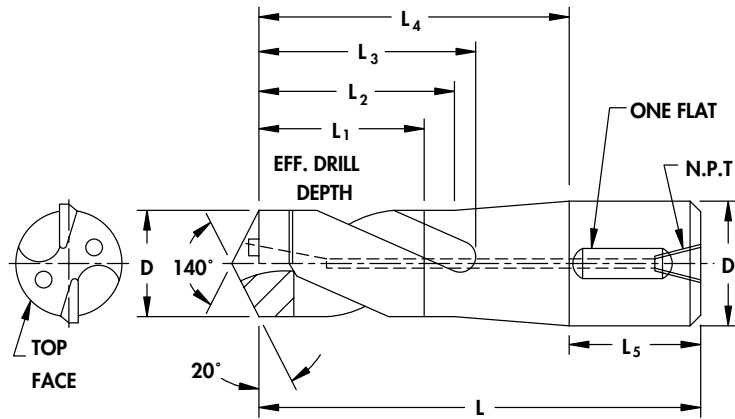
### APPLICATION GUIDELINES

#### Application Guidelines Recommended Cutting Speeds and Feeds

Part Material	Cutting Speed (SFM)	Feed Per Revolution	
		Drill Dia. 31/64-.45/64	Drill Dia. 23/32-1"
Soft Steel	230-328	.007 - .012	.010 - .015
Carbon Alloy Steel	160 - 265	.006 - .010	.007 - .012
Stainless	100 - 200	.006 - .010	.007 - .012
Cast Iron	200 - 300	.007 - .015	.012 - .020
Aluminum	700 - 1000	.007 - .015	.012 - .020

NOTE: When drilling hard materials (250 Brinell or greater), cutting speed and feed rate should be set lower.

**WARNING:** Cutting tools may chip or fragment in use. Always use appropriate machine guards, protective clothing and safety glasses to prevent burns or other injury to body or eyes from flying particles or chips. Wet or dry grinding produces potentially hazardous dusts or mists; to avoid adverse health effects use adequate ventilation and read material safety data sheet before grinding. This product contains cobalt and/or nickel, chemicals which are "known to the state of California to cause cancer and birth defects (or other reproductive harm)."



Part Number	Dimensions								EDP #
	D	D1	L	L1	L2	L3	L4	L5	
VSD-500-062-200	1/2	.625	4.25	2.00	2.15	2.40	2.50	1.75	80411
VSD-53 1-062-2 12	17/32	.625	4.40	2.12	2.28	2.55	2.65	1.75	80413
VSD-547-062-218	35/64	.625	4.48	2.18	2.35	2.62	2.73	1.75	80414
VSD-562-062-225	9/16	.625	4.56	2.25	2.41	2.70	2.81	1.75	80415
VSD-578-062-231	37/64	.625	4.64	2.31	2.48	2.77	2.89	1.75	80416
VSD-656-075-262	21/32	.750	5.28	2.62	2.82	3.15	3.28	2.00	80421
VSD-687-075-275	11/16	.750	5.43	2.75	2.95	3.30	3.43	2.00	80423
VSD-71 9-1 00-288	23/32	1.000	5.71	2.88	3.09	3.45	3.59	2.12	80425
VSD-734- 100-294	47/64	1.000	5.79	2.94	3.15	3.52	3.67	2.12	80426
VSD-781-100-312	25/32	1.000	6.02	3.12	3.36	3.75	3.90	2.12	80429
VSD-8 12- 100-325	13/16	1.000	6.18	3.25	3.49	3.90	4.06	2.12	80430
VSD-906- 100-362	29/32	1.000	6.65	3.62	3.89	4.35	4.53	2.12	80433

5 digit EDP # indicates stock standard  
 Note: Drill N.P.T. is 1/8 - 27

## CARBIDE TIPPED DRILLS APPLICATION GUIDELINES

### Coolant Use For Drills

- Coolant should be supplied through center hole of the drill.
- Existing coolant can be used; but enriched mixture, diluted only 5-10 times, is recommended.
- If coolant oil is used, it should be a gundrilling type containing active sulfur and chlorine.
- Coolant volume should be 1.3 to 2.6 gallons/minute.
- Recommended minimum coolant pressure should be 70 PSI to 140 PSI, depending on application.
- A pressure style coolant inducer is strongly recommended. With this type of inducer, good chip control can be maintained even when drilling hard to machine materials by simply modifying the cutting speed and feed rate.

### Regrinding (See warning note on previous page)

The cutting edge and centerline of tool should be kept parallel with grinding machine table. Set 20 degrees against spindle center, and set spindle centerline at 7 degrees.

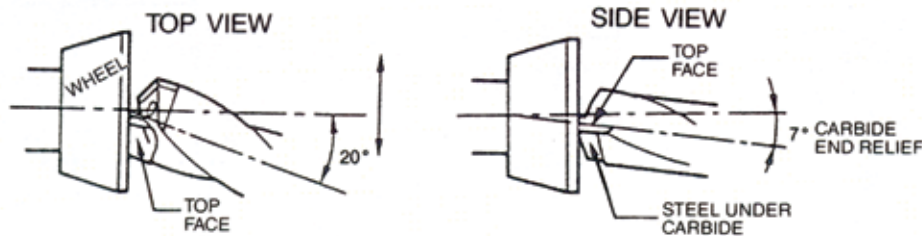
### Relief Grinding

- Fix drill on tool grinding machine as shown in diagram below. Then move table transversely and grind.
- Relief angle should be pre set in fixture before grinding.
- During final stage of grinding, be sure to spark out and maintain the lip height between the two cutting edges to within .001 inch.

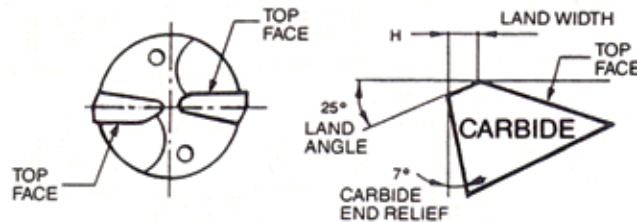
### Honing

- Hone entire edge evenly, as shown in diagram below.
- Amount and angle of honing should be according to table below.
- Rough hone first with a #200 hand lapper. Finish with a #400 lapper.

## SHARPENING OF CARBIDE



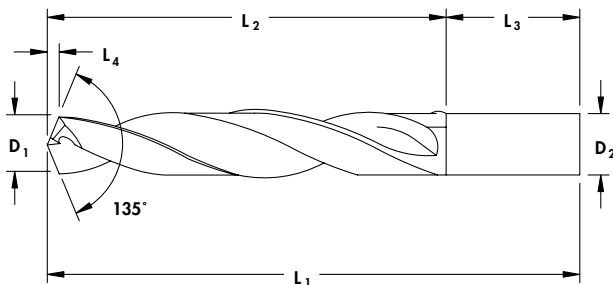
## HONING OF CARBIDE



Material	"H"- Land Width	
	31/64-45/64 Diameter	23/32-1" Diameter
Soft Steel	.006 - .008	.008 - .012
Carbon Alloy Steel	.004 - .006	.006 - .010*
Stainless and Exotics	.004 - .006	.006 - .008
Cast Iron	.001 - .002	.002 - .004
Aluminum	.004 - .006*	.006 - .010*

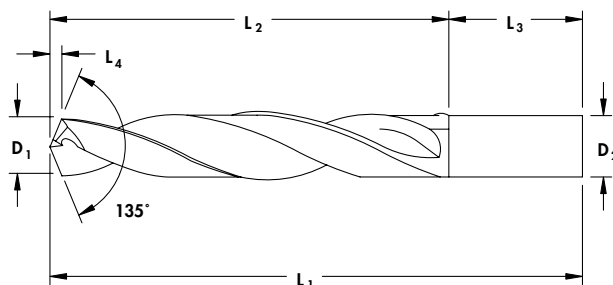
\* Are stock land widths

**SOLID CARBIDE VSCD DRILLS, INCH SERIES**  
10% COBALT MICROGRAIN, TIN COATED  
5 X DIA. DEPTH, 30° HELIX



Part Number	Size							EDP/ Order No.
	D <sub>1</sub>							
VSCDI 320310	13/64	0.2031	0.2031	3.00	1.75	1.21	0.04	80588
VSCDI 329690	19/64	0.2969	0.2969	3.75	2.38	1.31	0.06	80594
VSCDI 331 250	5/16	0.3125	0.3125	3.75	2.38	1.31	0.06	80595
VSCDI 332810	21/64	0.3281	0.3281	4.00	2.50	1.43	0.07	80596
VSCDI 340620	13/32	0.4062	0.4062	4.50	2.88	1.54	0.08	80601
VSCDI 3421 90	27/64	0.4219	0.4219	4.50	2.88	1.54	0.09	80602

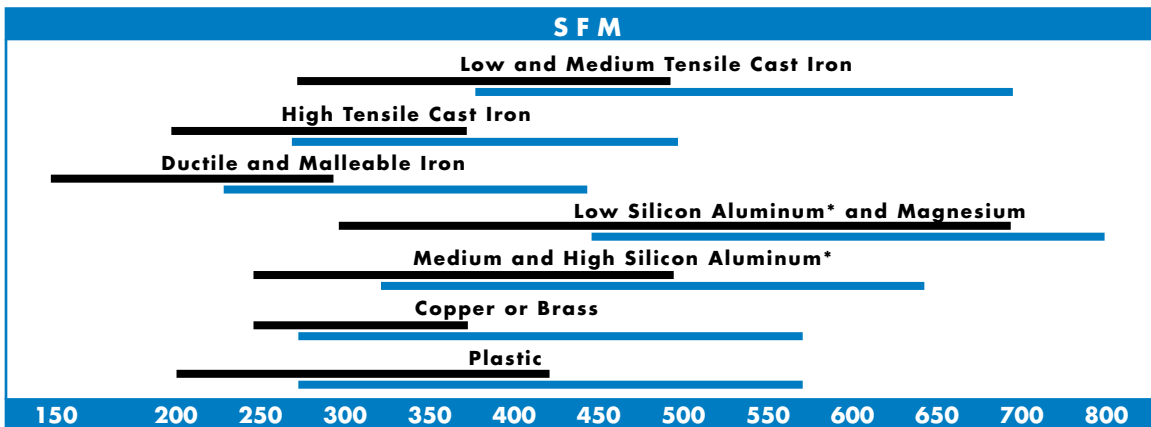
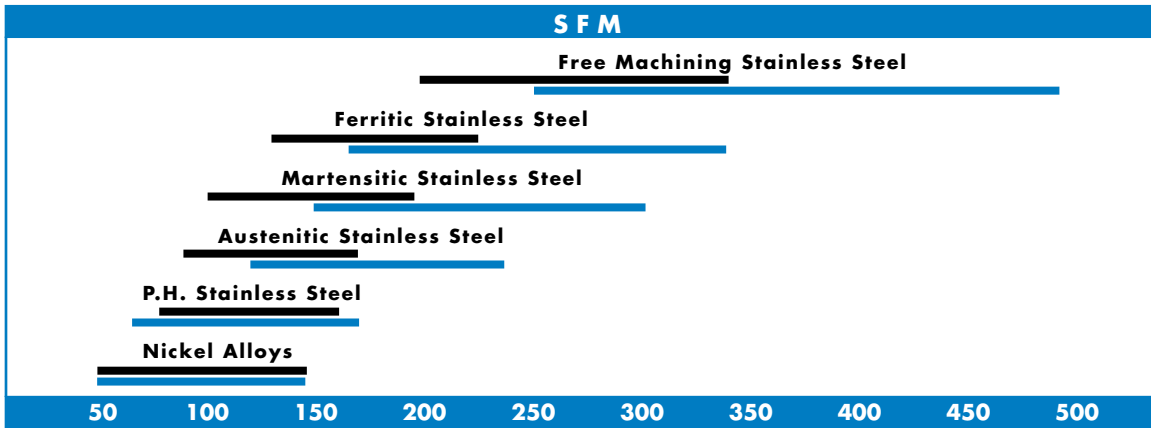
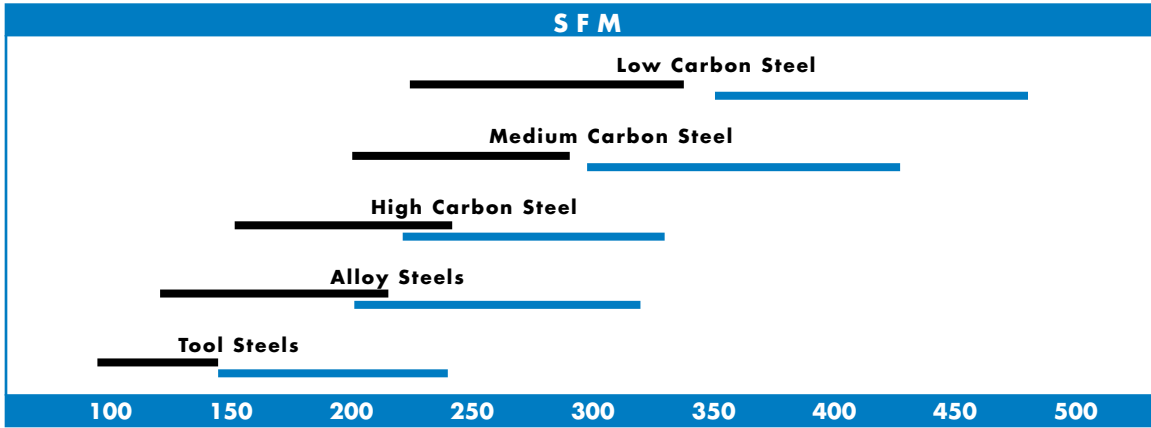
**SOLID CARBIDE VSCD DRILLS, METRIC SERIES**  
10% COBALT MICROGRAIN, TIN COATED  
5 X DIA. DEPTH, 30° HELIX



Part Number	Size (mm) or (i.) D <sub>2</sub> (mm)							EDP/ Order No.
	D <sub>1</sub>							
VSCD08 19680	5	0.1968	6.0000	82.00	44.00	37.00	1.00	80445
VSCD0820470	5.2	0.2047	6.0000	82.00	44.00	37.00	1.10	80447
VSCD0823620	6	0.2362	6.0000	82.00	44.00	37.00	1.20	80450
VSCD0825710	6.53	0.2571	8.0000	91.00	53.00	37.00	1.40	80453
VSCD0826770	6.8	0.2677	8.0000	91.00	53.00	37.00	1.40	80454
VSCD0833860	8.6	0.3386	10.0000	103.00	61.00	40.00	1.80	80462
VSCD0835430	9	0.3543	10.0000	103.00	61.00	40.00	1.90	80464
VSCD0839370	10	0.3937	10.0000	103.00	61.00	40.00	2.10	80469
VSCD0855120	14	0.5512	14.0000	124.00	77.00	44.00	2.90	80483

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————— **Inch Series 12**  
————— **Metric Series 08**



Diameter, in.			
1/8	1/4	1/2	3/4
0.003	0.006	0.010	0.012
Feed, IPR			

Diameter, mm			
4	6	12	18
0.003	0.006	0.010	0.012
Feed, IPR			

\* Feed rates on these materials can be increased 20%