

NEW!
Sizes and
lengths in
both Solid and
Coolant-Thru
options

NACHI

High Performance Micro Drills



NACHI AMERICA, INC.
www.nachiamerica.com

AQUA REVO DRILL MICRO

AQRVDM 5D/10D



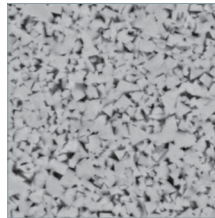
Product Info
Video

REVOLUTIONIZING THE WORLD OF MANUFACTURING

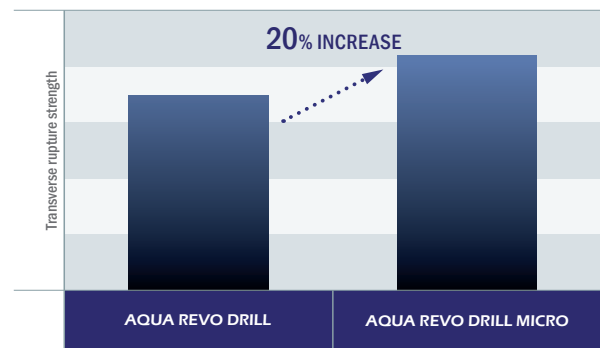
- New lineup of small diameter sizes for the AquaREVO Drill series
- Achieves "long tool life that is hard to break" and "stable cutting with little dispersion" required for small-diameter drills

MATERIAL

Newly developed carbide material for micro drill that is hard to break. Both hardness and toughness are improved by using ultra-fine particles carbide and original component design.



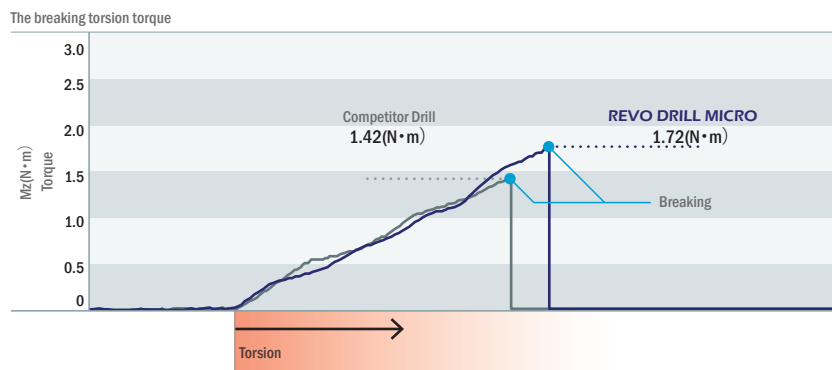
Microstructure
Material with ultra-fine particle type for micro drill



GEOMETRY

Achieves a drill that is hard to break with a flute shape that emphasizes rigidity and chip evacuation.

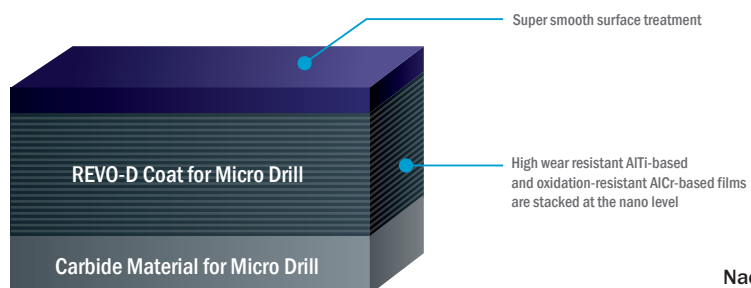
AquaREVO Drills Micro has 1.2 times the breaking torque of competitor's drill.



SHAPE

Stable tool life with accurate film thickness control - even with small diameter drills.

Super smooth surface treatment reduces resistance during cutting and improves smooth chip evacuation.



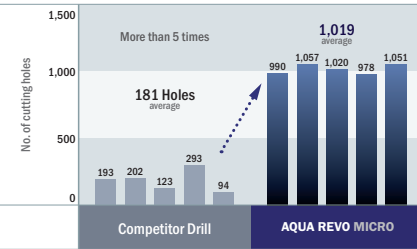
Cross-sectional structure of coating film for micro drill

TECHNICAL INFORMATION - REVO DRILL MICRO

LONG TOOL LIFE

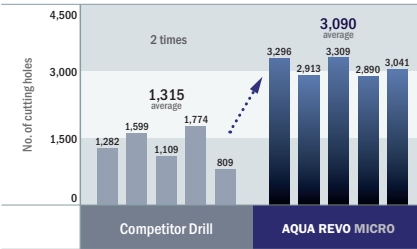
Hard to break even when drilling small diameter holes

S50C

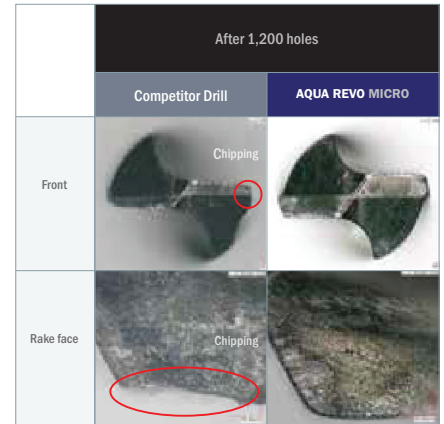


φ 0.5
 Diameter
S50C (180HB)
 Work Material
40m/min
 Cutting Speed
0.03mm/rev
 Feed Rate
5mm (10DC)
 Depth of Cutting: Blind hole
0.1mm (0.2DC)
 Step feed
 Cutting Fluid: Water-soluble
 M/C
 Machine: Vertical M/C

SUS304



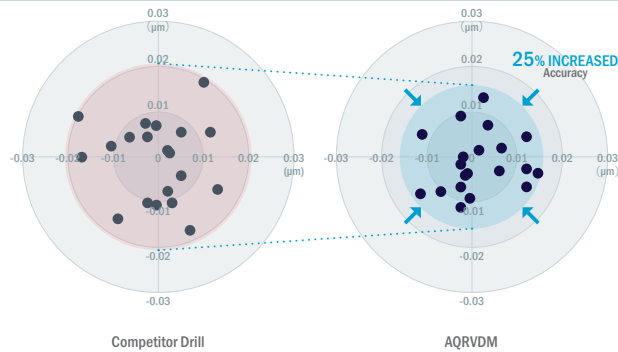
0.5
 Diameter
SUS304
 Work Material
9m/min
 Cutting Speed
0.02mm/rev
 Feed Rate
5mm (10DC)
 Depth of Cutting: Blind hole
0.1mm (0.2DC)
 Step feed
 Cutting Fluid: Water-soluble
 M/C
 Machine: Vertical M/C



HIGH-PRECISION

Exceptional Hole Position Accuracy

AquaREVO Drill Micro is designed with optimized centripetal properties and tool rigidity to achieve hole position accuracy within 15 μm .

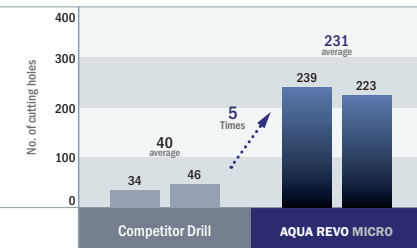


0.5
 Diameter
SUS304
 Work Material
9m/min
 Cutting Speed
0.02mm/rev
 Feed Rate
5mm (10DC)
 Depth of Cutting: Blind hole
0.1mm (0.2DC)
 Step feed
 Cutting Fluid: Water-soluble
 M/C
 Machine: Vertical M/C

MULTI-PURPOSE

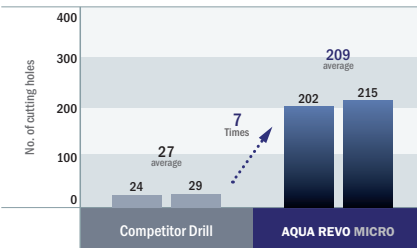
Compatible with a wide range of work materials

SCM440H (32HRC)



0.5
 Diameter
SCM440H (32HRC)
 Work Material
30m/min
 Cutting Speed
0.02mm/rev
 Feed Rate
5mm (10DC)
 Depth of Cutting: Blind hole
0.1mm (0.2DC)
 Step feed
 Cutting Fluid: Water-soluble
 M/C
 Machine: Vertical M/C

SKD61 (53HRC)



φ0.5
 Diameter
SKD61 (53HRC)
 Work Material
20m/min
 Cutting Speed
0.02mm/rev
 Feed Rate
5mm (10DC)
 Depth of Cutting: Blind hole
0.1mm (0.2DC)
 Step feed
 Cutting Fluid: Water-soluble
 M/C
 Machine: Vertical M/C

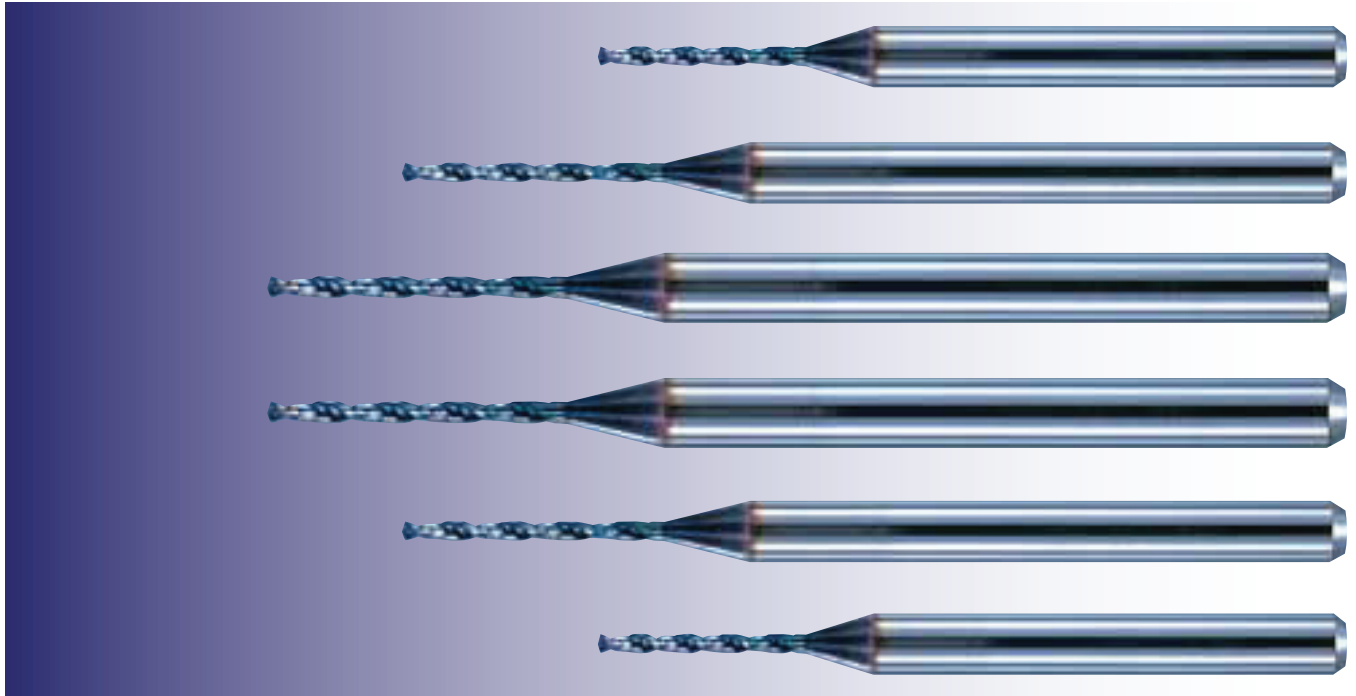


Applicable work Materials

Work Material	Structural Steel	Carbon Steel	Alloy Steel Heat treated Steel	Mold Steel Pre-Hardened Steel	Hardened Steel		Cast Iron	Stainless Steel			Aluminum Alloy
	SS400	S45C S50C	SCM SCr	30~40HRC	40~50HRC	50~55HRC	FC FCD	SUS304 SUS316	SUS420	SUS630	AC ADC
AQRVDM	◎	◎	◎	◎	◎	○	○	◎	◎	◎	○

◎: Excellent ○: Good

AQUA Micro Drills



Features

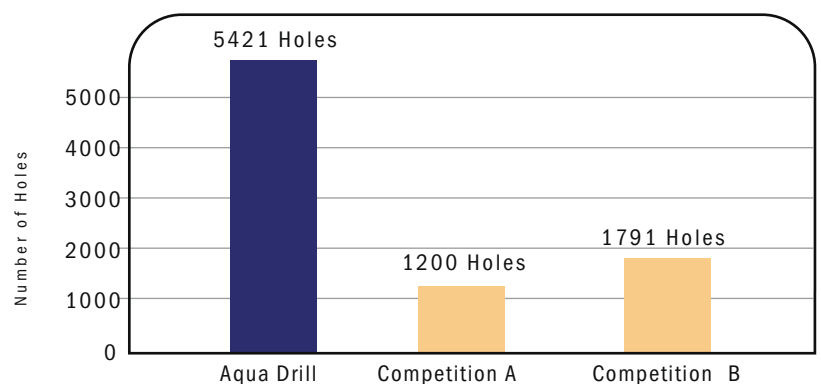
- Made from Ultra micro grain carbide with Nachi's patented Aqua Coating (Composite Multi layered TiALN + original lubrication film)
- Self-lubricating properties of Aqua Coating offers superior heat & wear resistance
- End mill type shank for highly precise and accurate drilling
- Diameter Range (0.2~1.99mm)

Applications

- Suitable for Structural Steels, Carbon Steels, Pre-hardened Steels, Mold Steels, Cast Irons, Hardened Steels (under 55 HRC), Stainless Steels & Hi-temp alloys.

Performance

- Material: 300 Series Stainless
- Drill Diameter: 0.5mm
- RPM: 9600
- IPR / IPM : .0002 / 1.9
- Peck:.005"
- Drill Depth: .080"



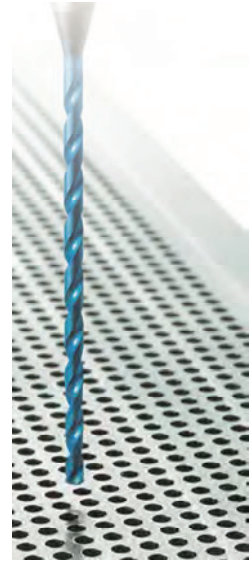
Features

- Oil-Hole Drills for high efficiency drilling of small diameter deep holes
- Stable drilling of small diameter holes with new cutting edge geometry and large oil holes for efficient chip evacuation
- Suitable for wide work materials like Carbon Steels, Alloy Steels and Stainless Steels
- Multi-layered Aqua Ex Coating (TiAlN+TiAlCr) plus anti-adhesive coating film for added lubrication

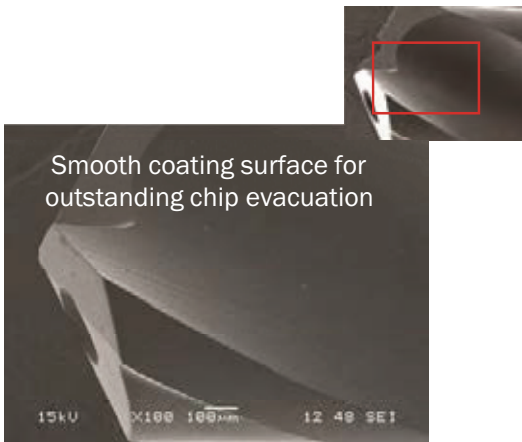
Performance



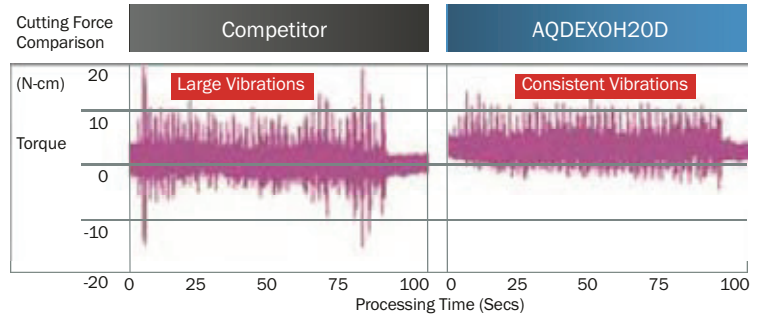
- New Oil Hole Design delivers coolant directly to the cutting edges
- New Cutting-Edge geometry breaks chips effectively
- Extremely smooth Aqua EX coating evacuates chips smoothly



Smooth Drill Flute Surface



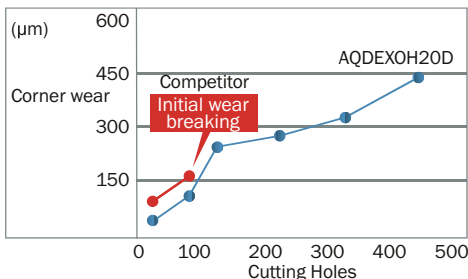
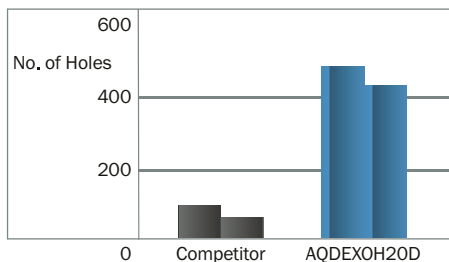
Stable Drilling of Deep Holes



Cutting Condition

Tool Ø	Ø1.8	Coolant Type	Water Soluble - Coolant Thru
Cutting Speed	150 SFM (45m/min)	Hole Depth	38.1 mm (1.5") (20D) Blind Hole
Feed	0.003 IPR (310mm/min)	Step Feed Interval	0.17" (0.45 mm) / 0.25D
Work Material	Carbon Steel (S50C)	Guide Hole	AQDEXOHPLT01815 for 1.8 mm Hole

Long Tool Life



Cutting Condition

Tool Ø	Ø2.0
Cutting Speed	150 SFM (45m/min)
Feed/Speed	0.003 IPR (310mm/min)
Hole Depth	38.1 mm (1.5") (20D) Blind Hole
Step Feed Interval	0.17" (0.45 mm) / 0.25D
Coolant Type	Water Soluble - Coolant Thru
Guide Hole	AQDEXOHPLT02015 for 2.0 mm Hole

AQUA DRILL EX FLAT

- One Drill does it all – Eliminates the need to use a “center drill” or “end mill” on inclined or curved surfaces
- True 180° flat cutting edges creates minimal exit burr in Tubing & Thin Plates
- Double Margin for stable and precision Drilling



ELIMINATE END MILL DISH ANGLE

180° TRUE FLAT FACE

One cut to produce accurate counter bore surface

AQUA DRILL EX FLAT



Completely Flat Point

Endmill 2-Flute



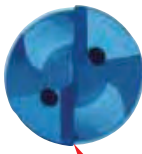
Not a Flat Point

DURABLE AND STABLE DESIGN

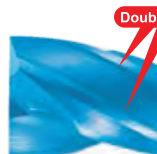
AQUA DRILL EX OH FLAT

Features on 3D & 5D:

- 1) Double Margin
- 2) Corner Chamfer
- 3) Added Stability & Tool Life



Corner Chamfer

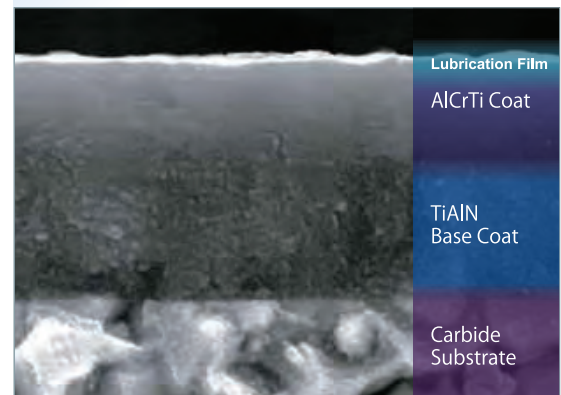


Double Margin

IMPROVED HEAT & WEAR RESISTANCE

AQUA EX COATING

TiAlN + AlCrTi Nano Layer Coating

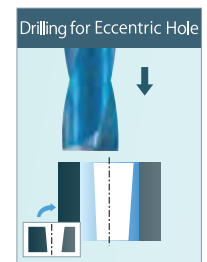
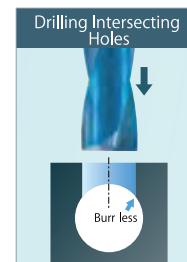
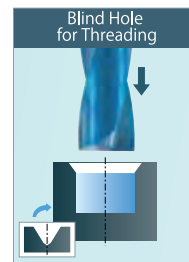
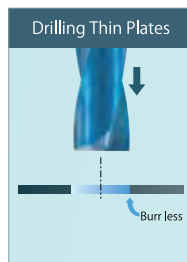
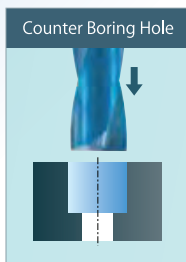
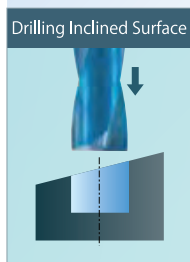


AQUA DRILL EX FLAT

Unique and Versatile High Performance Carbide Drill

One Step Drilling with Minimal Burr

Eliminate the need for “Center Drill” & “End mill”



● Not recommended for milling

SG-ESS Drill Micro

Features

- Premium PM-Cobalt Substrate with composite SG Coating (Tin+Ticn)
- Equals Solid Carbide Drill in performance due to tough PM Cobalt Substrate

Work Materials

- Structural Steels
- Alloy Steels
- Cast Irons
- Carbon Steels
- Stainless Steels
- Aluminum Alloys

Performance

- 30 - 40% more tool life than conventional HSS/HSCO micro drills.
- Self centering point design with excellent positional accuracy.
- Precision ground end mill style shank for accurate and precision drilling.



Drilling Performance of SG-ESS Micro Drill

Diameter	Carbon Steel	304 Stainless Steel
0.5 mm		
	SFM (RPM) 80 (15,500) Feed 0.0006 ipr / 9.3 ipm Hole Depth 1.5mm (Blind Hole) Cutting Fluid Water soluble	SFM (RPM) 26 (5000) Feed 0.0004 ipr / 2.0 ipm Hole Depth 1.5mm (Blind Hole) Cutting Fluid Water Soluble
0.99 mm		
	SFM (RPM) 80 (8,000) Feed 0.0015 ipr / 12 ipm Hole Depth 1.5mm (Blind Hole) Cutting Fluid Water Soluble	SFM (RPM) 30 (3,200) Feed 0.001 ipr / 2.5 ipm Hole Depth 3mm (Blind Hole) Cutting Fluid Water Soluble

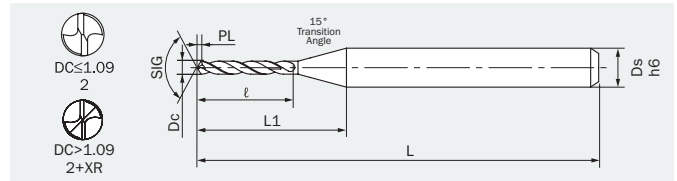
Applicable Work Materials

Drill Name	Structural Steels	Carbon Steels	Alloy Steels Pre-hardened Steels	Hardened Steels Mold Steels	Hardened Steels		Stainless Steels		Titanium Alloys Nickel Alloys	Cast Irons	Aluminum Alloys	Copper Alloys
	SS400	S45C/S50C	SCR/NAK	30~40HRC	40~50HRC	50~65HRC	304SS/316SS	400-Series		FCD/FC	AC/ADC	Cu
SGESS Drill	○	○	○	○	X	X	○	○	●	○	○	○

○ : Great ● : Good X : Not Suitable

HIGH PERFORMANCE MICRO DRILLS

Aqua REVO Drill Micro 5D



LIST 9878 Metric sizes

Unit: mm

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0786515	0.50	0.0197	3.5	8.7	38	3
0786521	0.51	0.0201	3.8	8.9		
0786538	0.52	0.0205				
0786544	0.53	0.0209				
0786550	0.54	0.0213				
0786567	0.55	0.0217				
0786573	0.56	0.0220	4.2	9.2		
0786580	0.57	0.0224				
0786596	0.58	0.0228				
0786601	0.59	0.0232				
0786618	0.60	0.0236				
0786624	0.61	0.0240	4.5	9.4		
0786630	0.62	0.0244				
0786647	0.63	0.0248				
0786653	0.64	0.0252				
0786660	0.65	0.0256				
0786676	0.66	0.0260	4.9	9.7		
0786682	0.67	0.0264				
0786699	0.68	0.0268				
0786704	0.69	0.0272				
0786710	0.70	0.0276				
0786727	0.71	0.0280	5.2	9.9		
0786733	0.72	0.0283				
0786740	0.73	0.0287				
0786756	0.74	0.0291				
0786762	0.75	0.0295				
0786779	0.76	0.0299	5.6	10.2		
0786785	0.77	0.0303				
0786791	0.78	0.0307				
0786807	0.79	0.0311				
0786813	0.80	0.0315				
0786820	0.81	0.0319	5.9	10.4		
0786836	0.82	0.0323				
0786842	0.83	0.0327				
0786859	0.84	0.0331				
0786865	0.85	0.0335				
0786871	0.86	0.0339	6.3	10.7		
0786888	0.87	0.0343				
0786894	0.88	0.0346				
0786900	0.89	0.0350				
0786916	0.90	0.0354				

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0786922	0.91	0.0358	6.6	10.9	38	3
0786939	0.92	0.0362				
0786945	0.93	0.0366				
0786951	0.94	0.0370				
0786968	0.95	0.0374				
0786974	0.96	0.0378	7.0	11.3		
0786980	0.97	0.0382				
0786997	0.98	0.0386				
0787001	0.99	0.0390		11.7		
0787018	1.00	0.0394	7.4	12		
0787024	1.01	0.0398				
0787030	1.02	0.0402				
0787047	1.03	0.0406				
0787053	1.04	0.0409				
0787060	1.05	0.0413	7.7	12.3		
0787076	1.06	0.0417				
0787082	1.07	0.0421				
0787099	1.08	0.0425		12.2		
0787104	1.09	0.0429				
0787110	1.10	0.0433	8.1	12.6		
0787127	1.11	0.0437				
0787133	1.12	0.0441				
0787140	1.13	0.0445				
0787156	1.14	0.0449				
0787162	1.15	0.0453	8.4	12.8		
0787179	1.16	0.0457				
0787185	1.17	0.0461				
0787191	1.18	0.0465				
0787207	1.19	0.0469				
0787213	1.20	0.0472	8.8	13.1		
0787220	1.21	0.0476				
0787236	1.22	0.0480				
0787242	1.23	0.0484				
0787259	1.24	0.0488				
0787265	1.25	0.0492	9.1	13.3		
0787271	1.26	0.0496				
0787288	1.27	0.0500				
0787294	1.28	0.0504				
0787300	1.29	0.0508				
0787316	1.30	0.0512				

HIGH PERFORMANCE MICRO DRILLS

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0787322	1.31	0.0516	9.5	13.6	38	3
0787339	1.32	0.0520				
0787345	1.33	0.0524				
0787351	1.34	0.0528				
0787368	1.35	0.0531	9.8	13.8		
0787374	1.36	0.0535				
0787380	1.37	0.0539				
0787397	1.38	0.0543				
0787402	1.39	0.0547	10.2	14.1		
0787419	1.40	0.0551				
0787425	1.41	0.0555				
0787431	1.42	0.0559				
0787448	1.43	0.0563	10.5	14.3		
0787454	1.44	0.0567				
0787460	1.45	0.0571				
0787477	1.46	0.0575				
0787483	1.47	0.0579	10.9	14.6		
0787490	1.48	0.0583				
0787505	1.49	0.0587				
0787511	1.50	0.0591				
0787528	1.51	0.0594	11.3	14.9		
0787534	1.52	0.0598				
0787540	1.53	0.0602				
0787557	1.54	0.0606				
0787563	1.55	0.0610	11.6	15.1	45	
0787570	1.56	0.0614				
0787586	1.57	0.0618				
0787592	1.58	0.0622				
0787608	1.59	0.0626	11.6	15.1		
0787614	1.60	0.0630				
0787620	1.61	0.0634				
0787637	1.62	0.0638				
0787643	1.63	0.0642	11.6	15.1		
0787650	1.64	0.0646				
0787666	1.65	0.0650				

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0787672	1.66	0.0654	12.0	15.4	45	3
0787689	1.67	0.0657				
0787695	1.68	0.0661				
0787700	1.69	0.0665				
0787717	1.70	0.0669	12.3	15.6		
0787723	1.71	0.0673				
0787730	1.72	0.0677				
0787746	1.73	0.0681				
0787752	1.74	0.0685	12.7	15.9		
0787769	1.75	0.0689				
0787775	1.76	0.0693				
0787781	1.77	0.0697				
0787798	1.78	0.0701	13.0	16.1		
0787803	1.79	0.0705				
0787810	1.80	0.0709				
0787826	1.81	0.0713				
0787832	1.82	0.0717	13.3	16.4		
0787849	1.83	0.0720				
0787855	1.84	0.0724				
0787861	1.85	0.0728				
0787878	1.86	0.0732	13.7	16.7		
0787884	1.87	0.0736				
0787890	1.88	0.0740				
0787906	1.89	0.0744				
0787912	1.90	0.0748	14.0	16.9		
0787929	1.91	0.0752				
0787935	1.92	0.0756				
0787941	1.93	0.0760				
0787958	1.94	0.0764	14.0	16.9		
0787964	1.95	0.0768				
0787970	1.96	0.0772				
0787987	1.97	0.0776				
0787993	1.98	0.0780	14.0	16.9		
0788008	1.99	0.0783				

*Tolerance of diameter is 0 to -0.009mm.

**Point angle is 120° for diameters 0.50 to 1.09mm or less and 135° for diameters over 1.09 to 1.99mm.

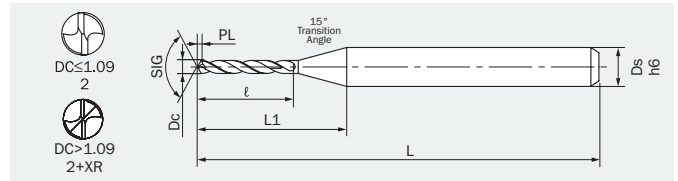
LIST 9878 Standard Wet Cutting Conditions

Work Material	Carbon Steel, Cast Iron (200 HB)		Alloy Steel (20 - 30 HRC)		Mold Steel (30 - 40 HRC)		Hardened Steel (40 - 55 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Aluminum Alloy	
Drill Diam. mm	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
0.5	25500	0.0012	19100	0.0008	15900	0.0008	12750	0.0008	12600	0.0008	5600	0.0007	5600	0.0007	30000	0.0012
1	15000	0.0024	9900	0.0016	8500	0.0016	7500	0.0016	9900	0.0016	4200	0.0011	4200	0.0009	25000	0.0024
1.1	15000	0.0026	9900	0.0017	8500	0.0017	7500	0.0017	9900	0.0017	4100	0.0012	4100	0.0010	25000	0.0026
1.6	11940	0.0038	7900	0.0025	7000	0.0025	6000	0.0025	7900	0.0025	4000	0.0013	3200	0.0012	20000	0.0038
1.9	10050	0.0045	6700	0.0030	5900	0.0030	5030	0.0030	6700	0.0030	3350	0.0015	2700	0.0015	16760	0.0045

1. Adjust cutting condition according to the rigidity of the machine and work holding
2. If the machine you are using has rotation limitations, reduce the rotation and feed rate by the same ratio.
3. Wet condition refers to drilling with water soluble content.
4. In non-water soluble coolant, reduce the rotation and feed rate by 20%.
5. Please use pecking regardless of the hole depth.
6. Retract plane for pecking should return to the top of the hole.
7. Recommended peck increment is 0.2-0.5 x Dc.
8. Direct flood coolant along the work piece and not directly at the drill.

HIGH PERFORMANCE MICRO DRILLS

Aqua REVO Drill Micro 10D



LIST 9880 Metric sizes

Unit: mm

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0788014	0.50	0.0197	6.0	11.2	38	3
0788020	0.51	0.0201	6.6	11.7		
0788037	0.52	0.0205				
0788043	0.53	0.0209				
0788050	0.54	0.0213				
0788066	0.55	0.0217				
0788072	0.56	0.0220	7.2	12.2		
0788089	0.57	0.0224				
0788095	0.58	0.0228				
0788100	0.59	0.0232				
0788117	0.60	0.0236				
0788123	0.61	0.0240	7.8	12.7		
0788130	0.62	0.0244				
0788146	0.63	0.0248				
0788152	0.64	0.0252				
0788169	0.65	0.0256				
0788175	0.66	0.0260	8.4	13.2		
0788181	0.67	0.0264				
0788198	0.68	0.0268				
0788203	0.69	0.0272				
0788210	0.70	0.0276				
0788226	0.71	0.0280	9.0	13.7		
0788232	0.72	0.0283				
0788249	0.73	0.0287				
0788255	0.74	0.0291				
0788261	0.75	0.0295				
0788278	0.76	0.0299	9.6	14.2		
0788284	0.77	0.0303				
0788290	0.78	0.0307				
0788306	0.79	0.0311				
0788312	0.80	0.0315				
0788329	0.81	0.0319	10.2	14.7	45	
0788335	0.82	0.0323				
0788341	0.83	0.0327				
0788358	0.84	0.0331				
0788364	0.85	0.0335				
0788370	0.86	0.0339	10.8	15.2		
0788387	0.87	0.0343				
0788393	0.88	0.0346				
0788409	0.89	0.0350				
0788415	0.90	0.0354				

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0788421	0.91	0.0358	11.4	15.7	45	3
0788438	0.92	0.0362				
0788444	0.93	0.0366				
0788450	0.94	0.0370				
0788467	0.95	0.0374				
0788473	0.96	0.0378	12.0	16.3		
0788480	0.97	0.0382				
0788496	0.98	0.0386				
0788501	0.99	0.0390				
0788518	1.00	0.0394		16.7		
0788524	1.01	0.0398	12.6	17.2		
0788530	1.02	0.0402				
0788547	1.03	0.0406				
0788553	1.04	0.0409				
0788560	1.05	0.0413				
0788576	1.06	0.0417	13.2	17.8		
0788582	1.07	0.0421				
0788599	1.08	0.0425				
0788604	1.09	0.0429				
0788610	1.10	0.0433		17.7		
0788627	1.11	0.0437	13.8	18.3		
0788633	1.12	0.0441				
0788640	1.13	0.0445				
0788656	1.14	0.0449				
0788662	1.15	0.0453				
0788679	1.16	0.0457	14.4	18.8		
0788685	1.17	0.0461				
0788691	1.18	0.0465				
0788707	1.19	0.0469				
0788713	1.20	0.0472				
0788720	1.21	0.0476	15.0	19.3		
0788736	1.22	0.0480				
0788742	1.23	0.0484				
0788759	1.24	0.0488				
0788765	1.25	0.0492				
0788771	1.26	0.0496	15.6	19.8		
0788788	1.27	0.0500				
0788794	1.28	0.0504				
0788800	1.29	0.0508				
0788816	1.30	0.0512				

HIGH PERFORMANCE MICRO DRILLS

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0788822	1.31	0.0516	16.2	20.3	45	3
0788839	1.32	0.0520				
0788845	1.33	0.0524				
0788851	1.34	0.0528				
0788868	1.35	0.0531				
0788874	1.36	0.0535	16.8	20.8		
0788880	1.37	0.0539				
0788897	1.38	0.0543				
0788902	1.39	0.0547				
0788919	1.40	0.0551				
0788925	1.41	0.0555	17.4	21.3		
0788931	1.42	0.0559				
0788948	1.43	0.0563				
0788954	1.44	0.0567				
0788960	1.45	0.0571				
0788977	1.46	0.0575	18.0	21.8		
0788983	1.47	0.0579				
0788990	1.48	0.0583				
0789004	1.49	0.0587				
0789010	1.50	0.0591				
0789027	1.51	0.0594	18.6	22.3	50	
0789033	1.52	0.0598				
0789040	1.53	0.0602				
0789056	1.54	0.0606				
0789062	1.55	0.0610				
0789079	1.56	0.0614	19.2	22.8		
0789085	1.57	0.0618				
0789091	1.58	0.0622				
0789107	1.59	0.0626				
0789113	1.60	0.0630				
0789120	1.61	0.0634	19.8	23.3		
0789136	1.62	0.0638				
0789142	1.63	0.0642				
0789159	1.64	0.0646				
0789165	1.65	0.0650				

EDP #	Size mm	Decimal Equivalent	Flute Length	Neck Length	Overall Length	Shank Diameter
		Dc	ℓ	L1	L	Ds
0789171	1.66	0.0654	20.4	23.8	50	3
0789188	1.67	0.0657				
0789194	1.68	0.0661				
0789200	1.69	0.0665				
0789216	1.70	0.0669				
0789222	1.71	0.0673	21.0	24.3		
0789239	1.72	0.0677				
0789245	1.73	0.0681				
0789251	1.74	0.0685				
0789268	1.75	0.0689				
0789274	1.76	0.0693	21.6	24.8		
0789280	1.77	0.0697				
0789297	1.78	0.0701				
0789302	1.79	0.0705				
0789319	1.80	0.0709				
0789325	1.81	0.0713	22.2	25.3		
0789331	1.82	0.0717				
0789348	1.83	0.0720				
0789354	1.84	0.0724				
0789360	1.85	0.0728				
0789377	1.86	0.0732	22.8	25.9		
0789383	1.87	0.0736				
0789390	1.88	0.0740				
0789405	1.89	0.0744				
0789411	1.90	0.0748				
0789428	1.91	0.0752	23.4	26.4		
0789434	1.92	0.0756				
0789440	1.93	0.0760				
0789457	1.94	0.0764				
0789463	1.95	0.0768				
0789470	1.96	0.0772	23.9	26.8		
0789486	1.97	0.0776				
0789492	1.98	0.0780				
0789508	1.99	0.0783				

*Tolerance of diameter is 0 to -0.009mm.

**Point angle is 120° for diameters 0.50 to 1.09mm or less and 135° for diameters over 1.09 to 1.99mm.

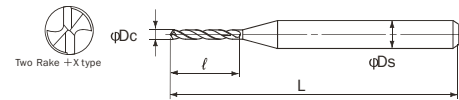
LIST 9880 Standard Wet Cutting Conditions

Work Material	Carbon Steel, Cast Iron (200 HB)		Alloy Steel (20 - 30 HRC)		Mold Steel (30 - 40 HRC)		Hardened Steel (40 - 55 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Aluminum Alloy	
Drill Diam. mm	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
0.5	25500	0.0012	19100	0.0008	15900	0.0008	12750	0.0008	12600	0.0008	5600	0.0007	5600	0.0007	30000	0.0012
1	15000	0.0024	9900	0.0016	8500	0.0016	7500	0.0016	9900	0.0016	4200	0.0011	4200	0.0009	25000	0.0024
1.1	15000	0.0026	9900	0.0017	8500	0.0017	7500	0.0017	9900	0.0017	4100	0.0012	4100	0.0010	25000	0.0026
1.6	11940	0.0038	7900	0.0025	7000	0.0025	6000	0.0025	7900	0.0025	4000	0.0013	3200	0.0012	20000	0.0038
1.9	10050	0.0045	6700	0.0030	5900	0.0030	5030	0.0030	6700	0.0030	3350	0.0015	2700	0.0015	16760	0.0045

1. Adjust cutting condition according to the rigidity of the machine and work holding
2. If the machine you are using has rotation limitations, reduce the rotation and feed rate by the same ratio.
3. Wet condition refers to drilling with water soluble content.
4. In non-water coluble coolant, reduce the rotation and feed rate by 20%.
5. Please use pecking regardless of the hole depth.
6. Retract plane for pecking should return to the top of the hole.
7. Recommended peck increment is 0.2-0.5 x Dc.
8. Direct flood coolant along the work piece and not directly at the drill.

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill Micro Solid Carbide



LIST 9544 Metric Range 0.20 to 1.99

■ U.S. Stock Item ■ Special Order

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0634002	0.20	0.0079	2.5	38	3
0634019	0.21	0.0083			
0634025	0.22	0.0087			
0634031	0.23	0.0091			
0634048	0.24	0.0094			
0634054	0.25	0.0098			
0634060	0.26	0.0102			
0634077	0.27	0.0106			
0634083	0.28	0.0110			
0634090	0.29	0.0114			
0634105	0.30	0.0118	3		
0634111	0.31	0.0122			
0634128	0.32	0.0126			
0634134	0.33	0.0130			
0634140	0.34	0.0134	4		
0634157	0.35	0.0138			
0634163	0.36	0.0142			
0634170	0.37	0.0146			
0634186	0.38	0.0150	5		
0634192	0.39	0.0154			
0634208	0.40	0.0157			
0634214	0.41	0.0161			
0634220	0.42	0.0165	6		
0634237	0.43	0.0169			
0634243	0.44	0.0173			
0634250	0.45	0.0177			
0634266	0.46	0.0181			
0634272	0.47	0.0185			
0634289	0.48	0.0189			
0634295	0.49	0.0193			
0634300	0.50	0.0197			
0634317	0.51	0.0201			
0634323	0.52	0.0205	7		
0634330	0.53	0.0209			
0634346	0.54	0.0213			
0634352	0.55	0.0217			
0634369	0.56	0.0220			
0634375	0.57	0.0224			
0634381	0.58	0.0228			
0634398	0.59	0.0232			
0634403	0.60	0.0236			
0634410	0.61	0.0240			

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0634426	0.62	0.0244	7	38	3
0634432	0.63	0.0248			
0634449	0.64	0.0252			
0634455	0.65	0.0256			
0634461	0.66	0.0260			
0634478	0.67	0.0264			
0634484	0.68	0.0268			
0634490	0.69	0.0272	9		
0634506	0.70	0.0276			
0634512	0.71	0.0280			
0634529	0.72	0.0283			
0634535	0.73	0.0287			
0634541	0.74	0.0291			
0634558	0.75	0.0295			
0634564	0.76	0.0299	10		
0634570	0.77	0.0303			
0634587	0.78	0.0307			
0634593	0.79	0.0311			
0634609	0.80	0.0315			
0634615	0.81	0.0319			
0634621	0.82	0.0323			
0634638	0.83	0.0327	11		
0634644	0.84	0.0331			
0634650	0.85	0.0335			
0634667	0.86	0.0339			
0634673	0.87	0.0343			
0634680	0.88	0.0346			
0634696	0.89	0.0350			
0634701	0.90	0.0354	12		
0634718	0.91	0.0358			
0634724	0.92	0.0362			
0634730	0.93	0.0366			
0634747	0.94	0.0370			
0634753	0.95	0.0374			
0634760	0.96	0.0378			
0634776	0.97	0.0382	13		
0634782	0.98	0.0386			
0634799	0.99	0.0390			
0634804	1.00	0.0394			
0634810	1.01	0.0398			
0634827	1.02	0.0402			
0634833	1.03	0.0406			

HIGH PERFORMANCE MICRO DRILLS

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0634840	1.04	0.0409	12	38	3
0634856	1.05	0.0413			
0634862	1.06	0.0417			
0634879	1.07	0.0421			
0634885	1.08	0.0425			
0634891	1.09	0.0429			
0634907	1.10	0.0433	14	47	
0634913	1.11	0.0437			
0634920	1.12	0.0441			
0634936	1.13	0.0445			
0634942	1.14	0.0449			
0634959	1.15	0.0453			
0634965	1.16	0.0457	15		
0634971	1.17	0.0461			
0634988	1.18	0.0465			
0634994	1.19	0.0469			
0635009	1.20	0.0472			
0635015	1.21	0.0476			
0635021	1.22	0.0480			
0635038	1.23	0.0484			
0635044	1.24	0.0488			
0635050	1.25	0.0492			
0635067	1.26	0.0496			
0635073	1.27	0.0500			
0635080	1.28	0.0504			
0635096	1.29	0.0508			
0635101	1.30	0.0512			
0635118	1.31	0.0516			
0635124	1.32	0.0520			
0635130	1.33	0.0524			
0635147	1.34	0.0528			
0635153	1.35	0.0531			
0635160	1.36	0.0535			
0635176	1.37	0.0539			
0635182	1.38	0.0543			
0635199	1.39	0.0547			
0635204	1.40	0.0551			
0635210	1.41	0.0555			
0635227	1.42	0.0559			
0635233	1.43	0.0563			
0635240	1.44	0.0567			
0635256	1.45	0.0571			
0635262	1.46	0.0575			
0635279	1.47	0.0579			
0635285	1.48	0.0583			
0635291	1.49	0.0587			
0635307	1.50	0.0591			
0635313	1.51	0.0594			
0635320	1.52	0.0598			

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0635336	1.53	0.0602	15	47	3
0635342	1.54	0.0606			
0635359	1.55	0.0610			
0635365	1.56	0.0614			
0635371	1.57	0.0618			
0635388	1.58	0.0622			
0635394	1.59	0.0626			
0635400	1.60	0.0630			
0635416	1.61	0.0634			
0635422	1.62	0.0638			
0635439	1.63	0.0642			
0635445	1.64	0.0646			
0635451	1.65	0.0650			
0635468	1.66	0.0654			
0635474	1.67	0.0657			
0635480	1.68	0.0661			
0635497	1.69	0.0665			
0635502	1.70	0.0669			
0635519	1.71	0.0673			
0635525	1.72	0.0677			
0635531	1.73	0.0681			
0635548	1.74	0.0685			
0635554	1.75	0.0689			
0635560	1.76	0.0693			
0635577	1.77	0.0697			
0635583	1.78	0.0701			
0635590	1.79	0.0705			
0635605	1.80	0.0709			
0635611	1.81	0.0713			
0635628	1.82	0.0717			
0635634	1.83	0.0720			
0635640	1.84	0.0724			
0635657	1.85	0.0728			
0635663	1.86	0.0732			
0635670	1.87	0.0736			
0635686	1.88	0.0740			
0635692	1.89	0.0744			
0635708	1.90	0.0748			
0635714	1.91	0.0752			
0635720	1.92	0.0756			
0635737	1.93	0.0760			
0635743	1.94	0.0764			
0635750	1.95	0.0768			
0635766	1.96	0.0772			
0635772	1.97	0.0776			
0635789	1.98	0.0780			
0635795	1.99	0.0783			

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Standard Cutting Conditions

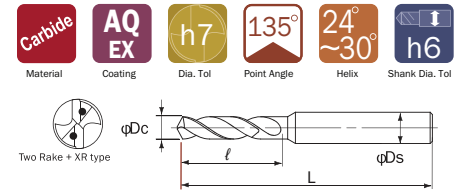
LIST 9544 AQMD

Work Material	"Carbon Steel, Cast Iron (200 HB)"			"Alloy Steel (20 - 30 HRC)"			"Mold Steel (30 - 40 HRC)"			"Hardened Steel (40 - 50 HRC)"			"Hardened Steel (50 - 55 HRC)"			Ductile Cast Iron			Stainless Steels		
Drill Diameter (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)	RPM	Feed (IPR)	Peck Increment (mm)
0.2	31800	0.0001	0.1D	26500	0.0001	0.1D	21200	0.0001	0.1D	12700	0.0001	0.1D	10600	0.0001	0.1D	31800	0.0001	0.1D	10600	0.0001	0.1D
0.3	31800	0.0001		26500	0.0001		21200	0.0001		12700	0.0001		10600	0.0001		31800	0.0001		10600	0.0001	
0.4	31800	0.0002		25900	0.0002		19900	0.0002		12700	0.0002		9900	0.0002		31800	0.0002		9500	0.0002	
0.5	31800	0.0002		25900	0.0002		19100	0.0002		12700	0.0002		9200	0.0002		31800	0.0002		9500	0.0002	
1	23900	0.0006	0.2D	15900	0.0006	0.2D	12700	0.0006	0.2D	8000	0.0005	0.1D	5600	0.0004	0.1D	19100	0.0006	0.2D	5600	0.0006	0.1D
1.5	21200	0.0011		13800	0.0011		9500	0.0011		6400	0.0009		4200	0.0006		17000	0.0011		4200	0.0012	
1.99	19200	0.0019		12800	0.0020		8000	0.0020		5600	0.0015		3600	0.0008		16000	0.0014		3600	0.0015	

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of the machine and work holding.
- 2) If the machine you are using has rotation limitations, reduce the rotation and feed rate by the same ratio.
- 3) Wet condition refers to drilling with water soluble coolant.
- 4) In non-water soluble coolant, reduce the rotation and feed rate by 20%.
- 5) Please use pecking regardless of the hole depth.
- 6) Retract plane for pecking should return to the top of the hole.
- 7) Drill runout should be 0.005mm or less.
- 8) Direct flood coolant along the work piece and not directly at the drill.

HIGH PERFORMANCE MICRO DRILLS



Aqua Drill EX Oil Hole Micro 3D



LIST 9604 Metric sizes

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0754470	1.0	0.0394	6	54	3
0754492	1.1	0.0433	7	55	
0754514	1.2	0.0472	8		
0754537	1.3	0.0512	8		
0754550	1.4	0.0551	9		
0754572	1.5	0.0591	10		
0754595	1.6	0.0630	11	58	
0754617	1.7	0.0669			
0754630	1.8	0.0709	12		
0754652	1.9	0.0748			
0754675	2.0	0.0787	13	63	
0754698	2.1	0.0827			
0754710	2.2	0.0866			
0754732	2.3	0.0906	14		
0754755	2.4	0.0945			
0754778	2.5	0.0984	15	68	
0754790	2.6	0.1024	16		
0754812	2.7	0.1063	17.5		
0754835	2.8	0.1102			
0754858	2.9	0.1142			

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Aqua Drill EX Oil Hole Micro 5D



LIST 9606 Metric sizes

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0737203	1.0	0.0394	8	56	3
0737210	1.1	0.0433	9	58	
0737226	1.2	0.0472	10		
0737232	1.3	0.0512	11		
0737249	1.4	0.0551	12		
0737255	1.5	0.0591	13		
0737261	1.6	0.0630	14	62	
0737278	1.7	0.0669			
0737284	1.8	0.0709	15		
0737290	1.9	0.0748			
0737306	2.0	0.0787	16		
0737312	2.1	0.0827	17	68	
0737329	2.2	0.0866	18		
0737335	2.3	0.0906	18		
0737341	2.4	0.0945	19		
0737358	2.5	0.0984	20		
0737364	2.6	0.1024	21	78	
0737370	2.7	0.1063	22		
0737387	2.8	0.1102			
0737393	2.9	0.1142			

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9604, 9606

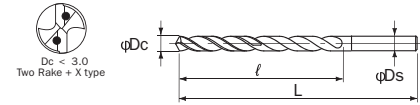
Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mild Steel Hardened Steel (30 - 40 HRC)		Hardened Steels (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)	160-200 SFM		140-180 SFM		130-165 SFM		95-115 SFM		130-165 SFM		90-115 SFM		30-50 SFM		255 - 310 SFM	
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
1.0	15500	0.0009	13600	0.0008	12600	0.0006	9700	0.0005	12600	0.0008	9700	0.0005	3900	0.0004	24250	0.0005
1.5	10350	0.0013	9100	0.0012	8400	0.0009	6450	0.0007	8400	0.0012	6450	0.0007	2600	0.0006	16200	0.0008
2.0	7750	0.0017	6800	0.0016	6300	0.0012	4850	0.0009	6300	0.0016	4850	0.0010	1950	0.0008	12100	0.0012
2.5	6200	0.0024	5450	0.0021	5050	0.0013	3900	0.0012	5050	0.0021	3900	0.0015	1550	0.0012	9700	0.0022

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 30% for non-water soluble coolant.

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole 10D



LIST 9612 Metric sizes

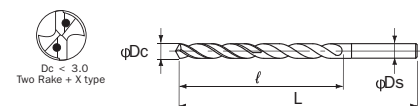
Unit _ mm

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0733673	1.000	0.0394	13	61	3
0733680	1.100	0.0433	14	63	
0733696	1.200	0.0472	16		
0733701	1.300	0.0512	17		
0733718	1.400	0.0551	18		
0733724	1.500	0.0591	20		
0733730	1.600	0.0630	21	70	
0733747	1.700	0.0669	22		
0733753	1.800	0.0709	23		
0733760	1.900	0.0748	25		
0733776	2.000	0.0787	26		
0733782	2.100	0.0827	27	80	
0733799	2.200	0.0866	29		
0733804	2.300	0.0906	30		
0733810	2.400	0.0945	31		
0733827	2.500	0.0984	33		
0733833	2.600	0.1024	34	89	
0733840	2.700	0.1063	35		
0733856	2.800	0.1102	36		
0733862	2.900	0.1142	38		
0726519	3.000	0.1181	39		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Aqua Drill EX Oil Hole 15D



LIST 9614 Metric sizes

Unit _ mm

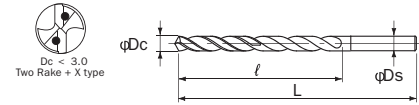
EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0733879	1.000	0.0394	18	66	3
0733885	1.100	0.0433	20	71	
0733891	1.200	0.0472	22		
0733907	1.300	0.0512	23		
0733913	1.400	0.0551	25		
0733920	1.500	0.0591	27	80	
0733936	1.600	0.0630	29		
0733942	1.700	0.0669	31		
0733959	1.800	0.0709	32		
0733965	1.900	0.0748	34		
0733971	2.000	0.0787	36	93	
0733988	2.100	0.0827	38		
0733994	2.200	0.0866	40		
0734009	2.300	0.0906	41		
0734015	2.400	0.0945	43	104	
0734021	2.500	0.0984	45		
0734038	2.600	0.1024	47		
0734044	2.700	0.1063	49		
0734050	2.800	0.1102	50		
0734067	2.900	0.1142	52		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole 20D



LIST 9616 Metric sizes

Unit _ mm

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0734073	1.000	0.0394	23	71	3
0734080	1.100	0.0433	25	78	
0734096	1.200	0.0472	28		
0734101	1.300	0.0512	30		
0734118	1.400	0.0551	32		
0734124	1.500	0.0591	35		
0734130	1.600	0.0630	37	90	
0734147	1.700	0.0669	39		
0734153	1.800	0.0709	41		
0734160	1.900	0.0748	44		
0734176	2.000	0.0787	46		
0734182	2.100	0.0827	48	105	
0734199	2.200	0.0866	51		
0734204	2.300	0.0906	53		
0734210	2.400	0.0945	55		
0734227	2.500	0.0984	58		
0734233	2.600	0.1024	60	119	
0734240	2.700	0.1063	62		
0734256	2.800	0.1102	64		
0734262	2.900	0.1142	67		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9612, 9614, 9616

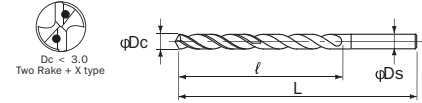
Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)	145-180 SFM		130-165 SFM		115-150 SFM		115-150 SFM		80-100 SFM		70-90 SFM			
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
1.0	15500	0.0009	14000	0.0008	12100	0.0008	12100	0.0011	7750	0.0005	6800	0.0004	Contact Engineering	
1.5	10350	0.0013	9400	0.0012	8100	0.0012	8100	0.0016	5200	0.0007	4500	0.0006		
2.0	7800	0.0020	7000	0.0016	6050	0.0016	6050	0.0021	3900	0.0009	3400	0.0008		
2.5	6200	0.0030	5600	0.0020	4850	0.0020	4850	0.0027	3100	0.0015	2700	0.0013		

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 30% for non-water soluble coolant.
- 4) Straight shot drilling is possible. However, when experiencing poor chip evacuation please add a peck or review drilling parameters.
- 5) When pecking, set retract slightly below hole entrance.
- 6) Peck increment starting size should be 0.5-1XD.
- 7) Recommended pilot hole depth is 1.5-2XD.
- 8) Recommend the AQDEXOHLT for pilot hole drilling.

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole 25D



LIST 9618 Metric sizes

Unit _ mm

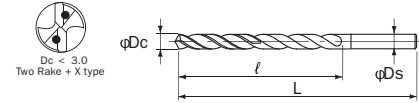
EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Dia.
	Dc		<i>ℓ</i>	L	Ds
1574446	1.000	0.0394	28	76	3
1574452	1.100	0.0433	31	86	
1574469	1.200	0.0472	34		
1574475	1.300	0.0512	36		
1574481	1.400	0.0551	39		
1574498	1.500	0.0591	42		
1574503	1.600	0.0630	45	100	
1574510	1.700	0.0669	48		
1574526	1.800	0.0709	50		
1574532	1.900	0.0748	53		
1574549	2.000	0.0787	56		
1574555	2.100	0.0827	59	115	
1574584	2.200	0.0866	62		
1574590	2.300	0.0906	64		
1574606	2.400	0.0945	67		
1574612	2.500	0.0984	70		
1574629	2.600	0.1024	73	126	
1574635	2.700	0.1063	76		
1574641	2.800	0.1102	78		
1574561	2.900	0.1142	81		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole 30D



LIST 9620 Metric sizes

Unit _ mm

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Dia.
	Dc		ℓ	L	Ds
1574578	1.000	0.0394	33	78	3
1574658	1.100	0.0433	36	93	
1574664	1.200	0.0472	40		
1574670	1.300	0.0512	43		
1574687	1.400	0.0551	46		
1574693	1.500	0.0591	50		
1574709	1.600	0.0630	53		
1574715	1.700	0.0669	56		
1574721	1.800	0.0709	59		
1574738	1.900	0.0748	63		
1574744	2.000	0.0787	66		
1574750	2.100	0.0827	69	127	
1574767	2.200	0.0866	73		
1574773	2.300	0.0906	76		
1574780	2.400	0.0945	79		
1574796	2.500	0.0984	83		
1574801	2.600	0.1024	86		
1574818	2.700	0.1063	89		
1574824	2.800	0.1102	92		
1574830	2.900	0.1142	96		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9618, 9620

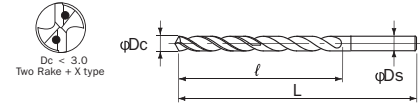
Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)	145-180 SFM		130-165 SFM		115-150 SFM		115-150 SFM		80-100 SFM		70-90 SFM			
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
1.0	15500	0.0008	14000	0.0007	12100	0.0007	12100	0.0010	7750	0.0004	6800	0.0004	Contact Engineering	
1.5	10350	0.0012	9400	0.0011	8100	0.0011	8100	0.0015	5200	0.0006	4500	0.0006		
2.0	7800	0.0018	7000	0.0014	6050	0.0014	6050	0.0020	3900	0.0008	3400	0.0008		
2.5	6200	0.0028	5600	0.0017	4850	0.0017	4850	0.0026	3100	0.0014	2700	0.0012		

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 30% for non-water soluble coolant.
- 4) Straight shot drilling is possible. However, when experiencing poor chip evacuation please add a peck or review drilling parameters.
- 5) When pecking, set retract slightly below hole entrance.
- 6) Peck increment starting size should be 0.5-1XD.
- 7) Recommended pilot hole depth is 1.5-2XD.
- 8) Recommend the AQDEXOHLPT for pilot hole drilling.

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole 40D



LIST 9626 Metric sizes

Unit _ mm

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
1575058	1.000	0.0394	43	88	3
1575064	1.100	0.0433	47	108	
1575070	1.200	0.0472	52		
1575087	1.300	0.0512	56		
1575093	1.400	0.0551	60		
1575109	1.500	0.0591	65		
1575115	1.600	0.0630	69	130	
1575121	1.700	0.0669	73		
1575138	1.800	0.0709	77		
1575144	1.900	0.0748	82		
1575150	2.000	0.0787	76		
1575167	2.100	0.0827	90	152	
1575173	2.200	0.0866	95		
1575180	2.300	0.0906	99		
1575196	2.400	0.0945	103		
1575201	2.500	0.0984	108		
1575218	2.600	0.1024	112	170	
1575224	2.700	0.1063	116		
1575230	2.800	0.1102	120		
1575247	2.900	0.1142	125		

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9626

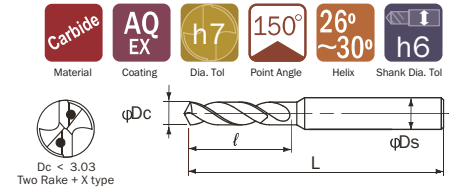
Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)	145-180 SFM		130-165 SFM		115-150 SFM		115-150 SFM		80-100 SFM		70-90 SFM			
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
1.0	15500	0.0006	14000	0.0006	12100	0.0006	12100	0.0008	7750	0.0004	6800	0.0004	Contact Engineering	
1.5	10350	0.0009	9400	0.0008	8100	0.0008	8100	0.0012	5200	0.0006	4500	0.0006		
2.0	7800	0.0015	7000	0.0011	6050	0.0011	6050	0.0016	3900	0.0008	3400	0.0008		
2.5	6200	0.0024	5600	0.0014	4850	0.0014	4850	0.0022	3100	0.0012	2700	0.0011		

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 30% for non-water soluble coolant.
- 4) Straight shot drilling is possible. However, when experiencing poor chip evacuation please add a peck or review drilling parameters.
- 5) When pecking, set retract slightly below hole entrance.
- 6) Peck increment starting size should be 0.5-1XD.
- 7) Recommended pilot hole depth is 1.5-2XD.
- 8) Recommend the AQDEXOHPLT for pilot hole drilling.

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Oil Hole Pilot



LIST 9622 Metric sizes

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	Shank Diameter
	Dc		ℓ	L	Ds
0734279	1.015	0.0400	3.3	54	3
0734285	1.115	0.0439	3.6	56	
0734291	1.215	0.0478	3.9		
0734307	1.315	0.0518	4.2		
0734313	1.415	0.0557	4.6		
0734320	1.515	0.0596	4.9	60	
0734336	1.615	0.0636	5.2		
0734342	1.715	0.0675	5.5		
0734359	1.815	0.0715	5.8		
0734365	1.915	0.0754	6.2		
0734371	2.015	0.0793	9	63	
0734388	2.115	0.0833	11		
0734394	2.215	0.0872			
0734400	2.315	0.0911			
0734416	2.415	0.0951	12		
0734422	2.515	0.0990			
0734439	2.615	0.1030	14		
0734445	2.715	0.1069			
0734451	2.815	0.1108			
0734468	2.915	0.1148			

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9622

Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)	145-180 SFM		130-165 SFM		115-150 SFM		115-150 SFM		80-100 SFM		70-90 SFM		280-300 SFM	
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
1.015	15500	0.0011	14000	0.0010	12100	0.0008	12100	0.0014	7750	0.0005	6800	0.0004	27200	0.0010
1.515	10350	0.0016	9400	0.0015	8100	0.0012	8100	0.0018	5200	0.0007	4500	0.0006	18100	0.0015
2.015	7800	0.0025	7000	0.0020	6050	0.0016	6050	0.0024	3900	0.0010	3400	0.0008	13600	0.0020
2.515	6200	0.0032	5600	0.0025	4850	0.0020	4850	0.0030	3100	0.0015	2700	0.0013	10900	0.0025

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 20% for non-water soluble coolant.
- 4) Use internal coolant.

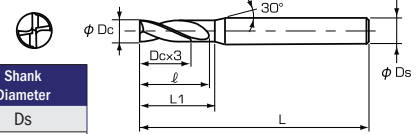
HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Flat Stub



LIST 9610 Metric sizes

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	L1	Shank Diameter
	Dc		ℓ	L	L1	Ds
0751974	0.200	0.0079	0.66	47	0.98	3
0751951	0.300	0.0118	0.99		1.36	
0751968	0.400	0.0157	1.32		1.65	
0737198	0.500	0.0197	1.65		2.03	
0737181	0.600	0.0236	1.98		2.32	
0737175	0.700	0.0276	2.31		2.71	
0737169	0.800	0.0315	2.64		2.99	
0737152	0.900	0.0354	2.97		3.28	
0715148	1.000	0.0394	3.3		3.6	
0715154	1.100	0.0433	3.5		3.9	
0715160	1.200	0.0472	3.9		4.2	
0715177	1.300	0.0512	4.2		4.5	
0715183	1.400	0.0551	4.6		4.9	
0715190	1.500	0.0591	4.9		5.2	
0715205	1.600	0.0630	5.2		5.5	
0715211	1.700	0.0669	5.5		5.8	
0715228	1.800	0.0709	5.8		6.1	
0715234	1.900	0.0748	6.2		6.5	
0711354	2.000	0.0787	9	50	9.5	4
0713180	2.100	0.0827	11		11.0	
0711360	2.200	0.0866			11.0	
0713197	2.300	0.0906			11.0	
0713202	2.400	0.0945			12.0	
0711377	2.500	0.0984	12		12.0	
0713219	2.600	0.1024			12.0	
0713225	2.700	0.1063			14.0	
0713231	2.800	0.1102			14.0	
0713248	2.900	0.1142	14		14.0	



1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9610

Work Material	Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy		Aluminum Casting	
Speed (SFM)	65 - 85 SFM		60 - 80 SFM		40 - 60 SFM		60 - 80 SFM		55 - 75 SFM		50 - 70 SFM		80 - 100 SFM		70 - 90 SFM	
Drill Diameter	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
Metric																
0.2	31000	0.00008	28650	0.00006	19100	0.00004	28650	0.00005	26300	0.00006	24000	0.00006	38200	0.00016	33500	0.00008
0.5	16200	0.0002	15200	0.00015	11400	0.0001	15200	0.00012	14300	0.00015	12400	0.00015	19100	0.00040	17100	0.00020
Speed (SFM)	130 - 150 SFM		120 - 140 SFM		90 - 110 SFM		120 - 140 SFM		65 - 85 SFM		55 - 75 SFM		170 - 190 SFM		155 - 175 SFM	
1.0	13600	0.0004	12600	0.0003	9700	0.0002	12600	0.0002	7300	0.0003	6300	0.0003	17450	0.0008	16000	0.0004
1.5	9100	0.0006	8400	0.0005	6500	0.0004	8400	0.0004	4850	0.0005	4200	0.0005	11650	0.0012	10700	0.0007
2.0	6800	0.0009	6300	0.0008	4850	0.0007	6300	0.0007	3650	0.0008	3150	0.0008	8750	0.0014	8000	0.0009
2.5	5450	0.0020	5050	0.0017	3900	0.0014	5050	0.0013	2900	0.0014	2550	0.0014	7000	0.0028	6400	0.0020

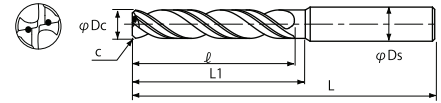
Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 20% for non-water soluble coolant.

9610 Drilling Conditions for Angled Surfaces				
Reduction % to above table values				
Degree of Angle	Reduction %		Reduction % (Multiplier)	
	RPM	Feed	RPM	Feed
0° - 5°	100%	100%	Table Value	Table Value
6° - 20°	50%	50%	(Table Value)x0.5	(Table Value)x0.5
21 - 35°	70%	40%	(Table Value)x0.3	(Table Value)x0.6
36° - 60°	70%	40%	(Table Value)x0.3	(Table Value)x0.6
61° and above	70%	30%	(Table Value)x0.3	(Table Value)x0.7

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Flat Oil Hole 3D



LIST 9812 Metric sizes

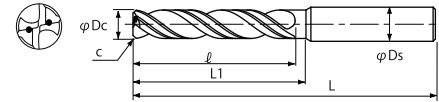
EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	L1	Shank Diameter
	Dc		<i>ℓ</i>	L	L1	Ds
0760322	1.000	0.0394	4.3	55	4.6	3
0760339	1.100	0.0433	4.7	58	5.0	
0760345	1.200	0.0472	5.2		5.5	
0760351	1.300	0.0512	5.6		5.9	
0760368	1.400	0.0551	6.0		6.3	
0760374	1.500	0.0591	6.5		6.8	
0760380	1.600	0.0630	6.9		7.2	
0760397	1.700	0.0669	7.3		7.6	
0760402	1.800	0.0709	7.7		8.0	
0760419	1.900	0.0748	8.2	62	8.5	
0760425	2.000	0.0787	8.6		8.9	
0760431	2.100	0.0827	9.0		9.3	
0760448	2.200	0.0866	9.5		9.8	
0760454	2.300	0.0906	9.9	68	10.2	
0760460	2.400	0.0945	10.3		10.6	
0760477	2.500	0.0984	10.8		11.1	
0760483	2.600	0.1024	11.2		11.5	
0760490	2.700	0.1063	11.6		11.9	
0760505	2.800	0.1102	12.0		12.3	
0760511	2.900	0.1142	12.5		12.9	

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

HIGH PERFORMANCE MICRO DRILLS

Aqua Drill EX Flat Oil Hole 5D



LIST 9814 Metric sizes

EDP#	Size	Decimal Equiv.	Flute Length	Overall Length	L1	Shank Diameter
	Dc		ℓ	L	L1	Ds
0760528	1.000	0.0394	6.3	57	6.6	3
0760534	1.100	0.0433	6.9	60	7.2	
0760540	1.200	0.0472	7.6		7.9	
0760557	1.300	0.0512	8.2		8.5	
0760563	1.400	0.0551	8.8		9.1	
0760570	1.500	0.0591	9.5		9.8	
0760586	1.600	0.0630	10.1		10.4	
0760592	1.700	0.0669	10.7		11.0	
0760608	1.800	0.0709	11.3		11.6	
0760614	1.900	0.0748	12.0		12.3	
0760620	2.000	0.0787	12.6		12.9	
0760637	2.100	0.0827	13.2	64	13.5	
0760643	2.200	0.0866	13.9		14.2	
0760650	2.300	0.0906	14.5		14.8	
0760666	2.400	0.0945	15.1		15.4	
0760672	2.500	0.0984	15.8	74	16.1	
0760689	2.600	0.1024	16.4		16.7	
0760695	2.700	0.1063	17.0		17.3	
0760700	2.800	0.1102	17.6		17.9	
0760717	2.900	0.1142	18.3		18.6	

• For entry on flat surfaces, Center Drill Hole is recommended



• Center Hole Diameter should be 0.5mm larger than Flat drill Diameter

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 9812, 9814

Work Material	Structural Steel Carbon Steel		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steels (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys PH Stainless		Aluminum Alloy		Aluminum Casting	
Speed (SFM)	160-200 SFM		130 - 170 SFM		100 - 140 SFM		80 - 100 SFM		130-165 SFM		90-115 SFM		70 - 80 SFM		180 - 200 SFM		160 - 185 SFM	
Drill Diameter	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
Metric																		
1.0	15500	0.0004	13600	0.0003	10700	0.0002	8700	0.0002	12600	0.0002	9700	0.0003	6800	0.0003	18300	0.0008	15500	0.0004
1.5	10350	0.0006	9100	0.0005	7100	0.0004	5800	0.0004	8400	0.0004	6450	0.0005	4500	0.0005	12300	0.0012	10350	0.0007
2.0	7750	0.0009	6800	0.0008	5350	0.0007	4350	0.0007	6300	0.0007	4850	0.0008	3400	0.0008	9200	0.0014	7750	0.0009
2.5	6200	0.0020	5450	0.0017	4300	0.0014	3500	0.0013	5050	0.0013	3900	0.0014	2700	0.0014	7400	0.0028	6200	0.0020

Cutting Condition Table Recommendations

- 1) Adjust cutting condition according to the rigidity of machine or work clamp state.
- 2) The table values are for drilling with water-soluble cutting fluid.
- 3) Reduce RPM and feed rate by 20% for non-water soluble coolant.
- 4) Use 9812 3xD for angled and irregular entries. See chart below.
- 5) If entering on a flat surface with a 9814 5xD drill, please use a spot drill on entry.

9812 Drilling Conditions for Angled Surfaces				
Reduction % to above table values				
Degree of Angle	Reduction %		Reduction % (Multiplier)	
	RPM	Feed	RPM	Feed
0° - 5°	100%	100%	Table Value	Table Value
6° - 20°	50%	50%	(Table Value)x0.5	(Table Value)x0.5
21 - 35°	70%	40%	(Table Value)x0.3	(Table Value)x0.6
36° - 60°	70%	40%	(Table Value)x0.3	(Table Value)x0.6
61° and above	70%	30%	(Table Value)x0.3	(Table Value)x0.7

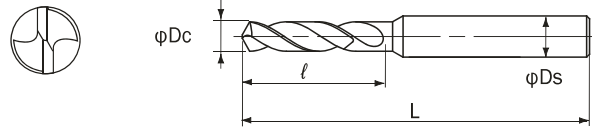
HIGH PERFORMANCE MICRO DRILLS

SG-ESS Drill Micro

High Performance (3xD)

LIST 7572P Metric sizes

LIST 7573P Fractional, Wire & Letter



EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0716602	0.50	0.0197		3	38	3
0716705	0.51	0.0201	#76			
0716711	0.52	0.0205				
0716728	0.53	0.0209				
0716734	0.54	0.0213				
0716619	0.55	0.0217				
0716740	0.56	0.0220				
0716757	0.57	0.0224				
0716763	0.58	0.0228				
0716770	0.59	0.0232				
0716625	0.60	0.0236		3.5		
0716786	0.61	0.0240	#73			
0716792	0.62	0.0244				
0716808	0.63	0.0248				
0716814	0.64	0.0252				
0716631	0.65	0.0256				
0716820	0.66	0.0260	#71			
0716837	0.67	0.0264				
0716843	0.68	0.0268				
0716850	0.69	0.0272				
0716648	0.70	0.0276		4.5		
0716866	0.71	0.0280	#70			
0716872	0.72	0.0283				
0716889	0.73	0.0287				
0716895	0.74	0.0291				
0716654	0.75	0.0295				
0716900	0.76	0.0299				
0716917	0.77	0.0303				
0716923	0.78	0.0307	#68			
0716930	0.79	0.0311				
0716660	0.80	0.0315		5		
0716946	0.81	0.0319				
0716952	0.82	0.0323	#67			
0716969	0.83	0.0327				
0716975	0.84	0.0331	#66			
0716677	0.85	0.0335				
0716981	0.86	0.0339				
0716998	0.87	0.0343				
0717002	0.88	0.0346				
0717019	0.89	0.0350	#65			
0716683	0.90	0.0354		5.5		
0717025	0.91	0.0358				
0717031	0.92	0.0362				
0717048	0.93	0.0366				
0717054	0.94	0.0370	#63			
0716690	0.95	0.0374				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0717060	0.96	0.0378		5.5	38	3
0717077	0.97	0.0382				
0717083	0.98	0.0386				
0717090	0.99	0.0390	#61			
0573780	1.00	0.0394		6		
0693862	1.01	0.0398				
0693879	1.02	0.0402	#60			
0693885	1.03	0.0406				
0693891	1.04	0.0409	#59			
0575347	1.05	0.0413				
0693907	1.06	0.0417				
0693913	1.07	0.0421	#58	7	39	
0693920	1.08	0.0425				
0693936	1.09	0.0429	#57			
0573797	1.10	0.0433				
0693942	1.11	0.0437				
0693959	1.12	0.0441				
0693965	1.13	0.0445				
0693971	1.14	0.0449				
0575353	1.15	0.0453				
0693988	1.16	0.0457				
0693994	1.17	0.0461		8	40	
0694009	1.18	0.0465	#56			
0694015	1.19	0.0469	3/64			
0573802	1.20	0.0472				
0694021	1.21	0.0476				
0694038	1.22	0.0480				
0694044	1.23	0.0484				
0694050	1.24	0.0488				
0575360	1.25	0.0492				
0694067	1.26	0.0496				
0694073	1.27	0.0500		9	41	
0694080	1.28	0.0504				
0694096	1.29	0.0508				
0573819	1.30	0.0512				
0694101	1.31	0.0516				
0694118	1.32	0.0520	#55			
0694124	1.33	0.0524				
0694130	1.34	0.0528				
0575376	1.35	0.0531				
0694147	1.36	0.0535				
0694153	1.37	0.0539				
0694160	1.38	0.0543				
0694176	1.39	0.0547				
0573825	1.40	0.0551				
0694182	1.41	0.0555				

HIGH PERFORMANCE MICRO DRILLS

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0694199	1.42	0.0559		9	41	
0694204	1.43	0.0563				
0694210	1.44	0.0567				
0575382	1.45	0.0571				
0694227	1.46	0.0575				
0694233	1.47	0.0579				
0694240	1.48	0.0583				
0694256	1.49	0.0587				
0573831	1.50	0.0591				
0694262	1.51	0.0594	#53	10	42	
0694279	1.52	0.0598				
0694285	1.53	0.0602				
0694291	1.54	0.0606				
0575399	1.55	0.0610				
0694307	1.56	0.0614				
0694313	1.57	0.0618				
0694320	1.58	0.0622				
0694336	1.59	0.0626	1/16			
0573848	1.60	0.0630				
0694342	1.61	0.0634	#52			
0694359	1.62	0.0638				
0694365	1.63	0.0642				
0694371	1.64	0.0646				
0575404	1.65	0.0650				
0694388	1.66	0.0654				
0694394	1.67	0.0657				
0694400	1.68	0.0661				
0694416	1.69	0.0665				
0573854	1.70	0.0669				
0694422	1.71	0.0673		11	43	3
0694439	1.72	0.0677				
0694445	1.73	0.0681				
0694451	1.74	0.0685				
0575410	1.75	0.0689				
0694468	1.76	0.0693				
0694474	1.77	0.0697				
0694480	1.78	0.0701	#50			
0694497	1.79	0.0705				
0573860	1.80	0.0709				
0694502	1.81	0.0713				
0694519	1.82	0.0717				
0694525	1.83	0.0720	#49	11	43	
0694531	1.84	0.0724				
0575427	1.85	0.0728				
0694548	1.86	0.0732				
0694554	1.87	0.0736				
0694560	1.88	0.0740				
0694577	1.89	0.0744				
0573877	1.90	0.0748				
0694583	1.91	0.0752				
0694590	1.92	0.0756		12	44	
0694605	1.93	0.0760	#48			
0694611	1.94	0.0764				
0575433	1.95	0.0768				
0694628	1.96	0.0772				
0694634	1.97	0.0776				
0694640	1.98	0.0780	5/64			

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter	
	Dc			ℓ	L	Ds	
0694657	1.99	0.0783	#47	12	44	3	
0572514	2.00	0.0787					
0694663	2.01	0.0791					
0694670	2.02	0.0795					
0694686	2.03	0.0799					
0694692	2.04	0.0803					
0575440	2.05	0.0807					
0694708	2.06	0.0811	#46				
0694714	2.07	0.0815					
0694720	2.08	0.0819					
1363043	2.08	0.0820	#45	3/4	2	1/8	
0694737	2.09	0.0823		12	44	3	
0572520	2.10	0.0827					
0694743	2.11	0.0831		13	45		
0694750	2.12	0.0835					
0694766	2.13	0.0839					
0694772	2.14	0.0843					
0575456	2.15	0.0846					
0694789	2.16	0.0850					
0694795	2.17	0.0854					
0694800	2.18	0.0858					
1363050	2.18	0.0860	#44	3/4	2	1/8	
0694817	2.19	0.0862		13	45	3	
0572537	2.20	0.0866					
0694823	2.21	0.0870					
0694830	2.22	0.0874					
0694846	2.23	0.0878					
0694852	2.24	0.0882					
0575462	2.25	0.0886					
0694869	2.26	0.0890					
1363066	2.26	0.0890	#43	3/4	2	1/8	
0694875	2.27	0.0894		13	45	3	
0694881	2.28	0.0898					
0694898	2.29	0.0902					
0572543	2.30	0.0906					
0694903	2.31	0.0909					
0694910	2.32	0.0913					
0694926	2.33	0.0917					
0694932	2.34	0.0921					
0575479	2.35	0.0925					
0694949	2.36	0.0929					
0694955	2.37	0.0933		14	46		
1363072	2.37	0.0935	#42	3/4	2	1/8	
0694961	2.38	0.0937		14	46	3	
1245365	2.38	0.0938	3/32	1/2	1-3/4	1/8	
0694978	2.39	0.0941		14	46	3	
0572550	2.40	0.0945					
0694984	2.41	0.0949					
0694990	2.42	0.0953					
0695005	2.43	0.0957					
1363089	2.44	0.0960	#41	13/16	2-1/16	1/8	
0695011	2.44	0.0961		14	46	3	
0575485	2.45	0.0965					
0695028	2.46	0.0969					
0695034	2.47	0.0972					
0695040	2.48	0.0976					
1280931	2.49	0.0980	#40	13/16	2-1/16	1/8	

HIGH PERFORMANCE MICRO DRILLS

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0695057	2.49	0.0980		14	46	3
0572566	2.50	0.0984				
0695063	2.51	0.0988				
0695070	2.52	0.0992				
1363095	2.53	0.0995	#39	13/16	2-1/4	1/8
0695086	2.53	0.0996		14	46	3
0695092	2.54	0.1000				
0575491	2.55	0.1004				
0695108	2.56	0.1008				
0695114	2.57	0.1012		13/16	2-1/4	1/8
1363100	2.58	0.1015	#38			
0695120	2.58	0.1016				
0695137	2.59	0.1020				
0572572	2.60	0.1024		14	46	3
0695143	2.61	0.1028				
0695150	2.62	0.1031				
0695166	2.63	0.1035				
0695172	2.64	0.1039		14	46	3
1363117	2.64	0.1040	#37	13/16	2-1/4	1/8
0575507	2.65	0.1043		14	46	3
0695189	2.66	0.1047		16	48	
0695195	2.67	0.1051				
0695200	2.68	0.1055				
0695217	2.69	0.1059				
0572589	2.70	0.1063		13/16	2-1/4	1/8
1245823	2.71	0.1065	#36			
0695223	2.71	0.1067				
0695230	2.72	0.1071				
0695246	2.73	0.1075		16	48	3

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0695252	2.74	0.1079		16	48	3
0575513	2.75	0.1083				
0695269	2.76	0.1087				
0695275	2.77	0.1091				
1245371	2.78	0.1094	7/64	5/8	1-7/8	1/8
0695281	2.78	0.1094		16	48	3
0695298	2.79	0.1098				
0572595	2.80	0.1102				
0695303	2.81	0.1106				
1363130	2.82	0.1110	#34	7/8	2-5/16	1/8
0695310	2.82	0.1110		16	48	3
0695326	2.83	0.1114				
0695332	2.84	0.1118				
0575520	2.85	0.1122				
0695349	2.86	0.1126		7/8	2-5/16	1/8
0695355	2.87	0.1130				
1363146	2.87	0.1130	#33			
0695361	2.88	0.1134				
0695378	2.89	0.1138		16	48	3
0572600	2.90	0.1142				
0695384	2.91	0.1146				
0695390	2.92	0.1150				
0695406	2.93	0.1154				
0695412	2.94	0.1157				
0575536	2.95	0.1161				
0695429	2.96	0.1165				
0695435	2.97	0.1169				
0695441	2.98	0.1173				
0695458	2.99	0.1177				

1 per tube

⚠ WARNING: Cancer - www.P65Warnings.ca.gov

Drilling Conditions - Wet

LIST 7572P, 7573P

Work Material	Structural Steel Carbon Steel		Alloy Steel (20-30 HRC)		Die Steels Hardened Steels		Stainless Steel 300 Series		Nickel Alloys Titanium Alloys PH Stainless		Cast Irons		Aluminum Alloys Copper Alloy	
Speed (SFM)	80 - 90 SFM		65 - 85 SFM		35 - 45 SFM		20 - 30 SFM		10 - 20 SFM		100 - 110 SFM		110 - 120 SFM	
Drill Diameter Metric	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)
0.5	16000	0.0005	13000	0.0004	7750	0.0004	5250	0.0004	2500	0.0003	20000	0.0005	23000	0.0006
0.75	10500	0.0008	8550	0.0007	5100	0.0006	3800	0.0006	2150	0.0005	13100	0.0008	15150	0.0009
Speed (SFM)	115 - 135 SFM		95 - 105 SFM		40 - 50 SFM		30 - 50 SFM		20 - 30 SFM		115 - 135 SFM		120 - 140 SFM	
1.0	11200	0.0010	9200	0.0009	3900	0.0008	3600	0.0008	1950	0.0006	11200	0.0010	13100	0.0012
1.5	7450	0.0015	6150	0.0013	2600	0.0012	1950	0.0012	1300	0.0009	7450	0.0015	8750	0.0018
2.0	5600	0.0020	4600	0.0018	1950	0.0016	1450	0.0016	970	0.0012	5600	0.0020	6550	0.0024
2.5	4450	0.0025	3700	0.0022	1550	0.0020	1150	0.0020	780	0.0015	4450	0.0025	5250	0.0029

Cutting Condition Table Recommendations

- 1) Adjust drilling condition according to the rigidity of the machine or workholding.
- 2) The table values are for drilling with water-soluble cutting fluid in vertical and horizontal machines.
- 3) When drilling stainless or other tough to machine materials, use peck drilling.
- 4) When pecking, set retract to the hole entrance.
- 5) Peck increment should be 0.5xD - 1xD. For small diameters, use 0.2xD - 0.5xD.
- 6) Recommended feeds and speeds are starting points only and may require adjustment based on specific material, condition of equipment, and coolant condition.



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 WARNING: This product can expose you to chemicals including cobalt, which is known to the State of California to cause cancer.
For more information go to www.P65Warnings.ca.gov