NEW!

NACHI

AQUA REVO DRILLS

REVOlutionizing the World of Product Manufacturing

Aqua REVO Drill Stub
LIST 9860, 9861

Aqua REVO Drill Regular
LIST 9862, 9863

Aqua REVO Drill Oil Hole 3D, 5D, 8D
LIST 9864, 9866, 9868, 9869, 9872, 9873, 9874, 9875

Aqua REVO Drill Micro 5D, 10D
LIST 9878, 9880

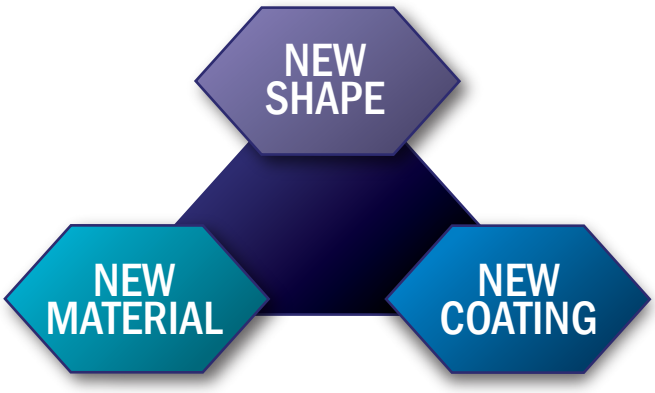
REVOlutionizing the World of Product Manufacturing

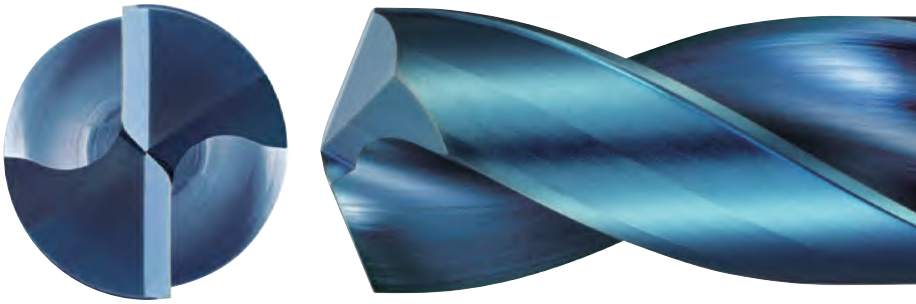
AQUA REVO DRILLS

LIST 9860, 9861 / LIST 9862, 9863

AQUA REVO Drills Stub/Regular

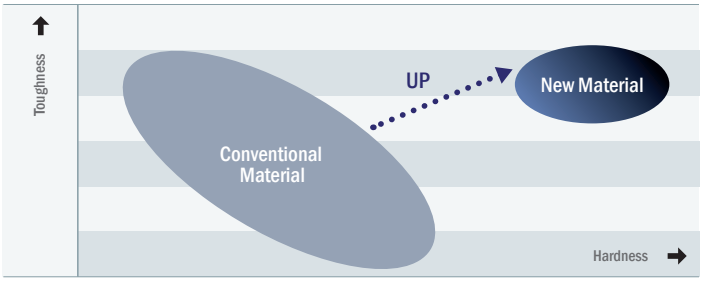
All New Material, Design and Coating Dramatically improves all functions of drilling





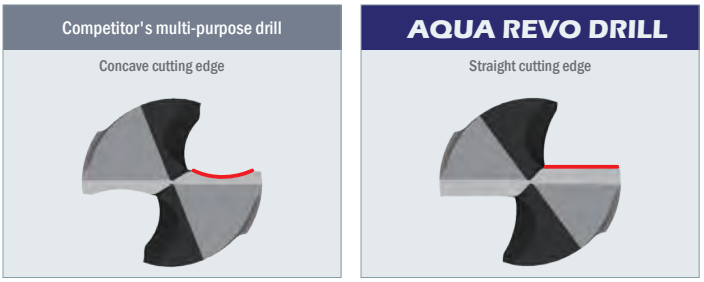
NEW MATERIAL

- Development of a carbide material adds both hardness and toughness
- Improves wear resistance and chipping resistance



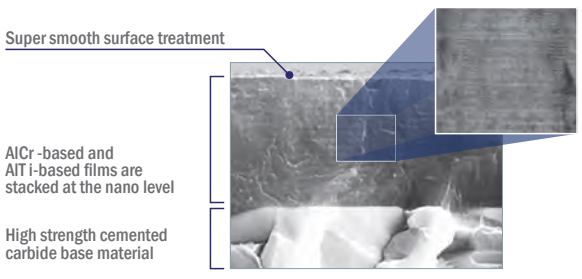
NEW SHAPE

- New straight cutting edge breaks up cutting stress
- Improved strength against corner chipping



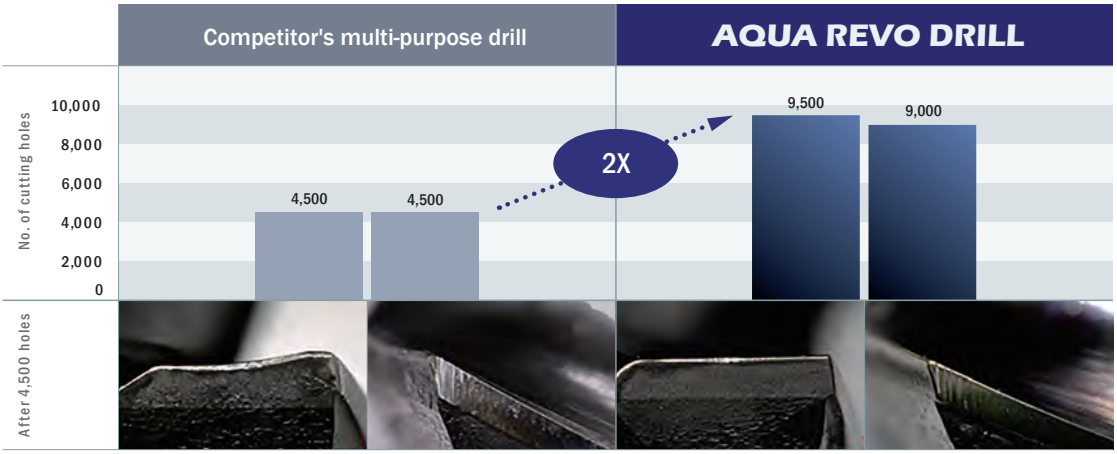
NEW COATING

- Newly developed REVO-D coating suitable for drilling multiple materials
- High oxidation resistance and wear resistance
- Low friction and smooth chip evacuation from super smooth surface treatment



LONG TOOL LIFE

Durability and stability to exceed other drills



φ 6.0
Diameter

S50C
Work Material

100m/min
Cutting speed

0.19mm/rev
Feed Rate

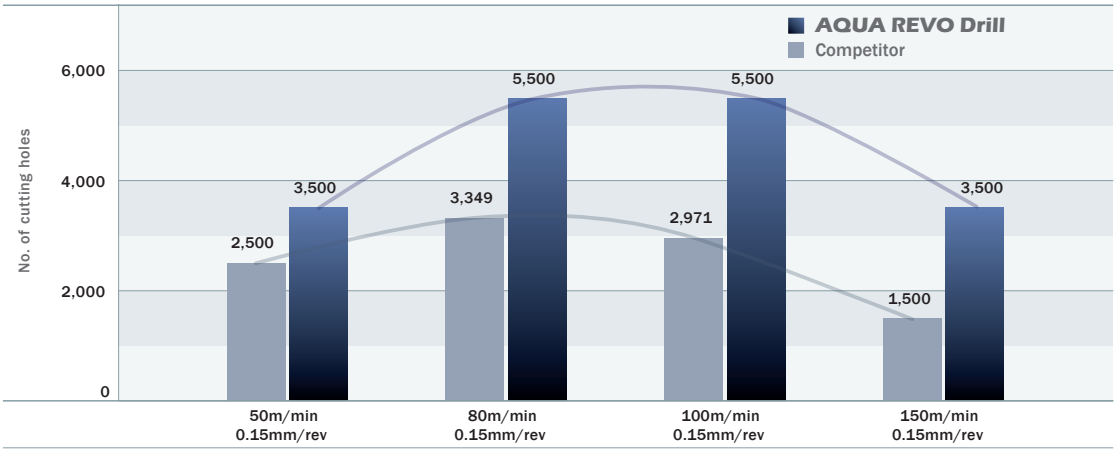
30m m (5Dc)
Depth of Cutting

Machine: Vertical M/C

Cutting Fluid: Water-soluble

HIGH EFFICIENCY

High performance even with increased speed and feed, extending tool life and shortening processing time



φ 6.0
Diameter

S50C
Work Material

30m m (5Dc)
Depth of Cutting

Machine: Vertical M/C

Cutting Fluid: Water-soluble

MULTI-PURPOSE

Able to cut high hardness materials and difficult-to-cut materials,
while maintaining high quality processing and increasing efficiency

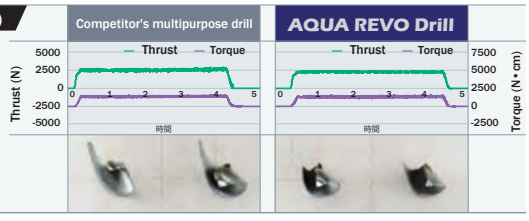
φ 6.0
Diameter
Machine: Vertical M/C
Cutting Fluid: Water-soluble

S50C (180HB)

Cutting speed
100m/min

Feed Rate
0.34mm/rev

Depth of Cutting
30mm

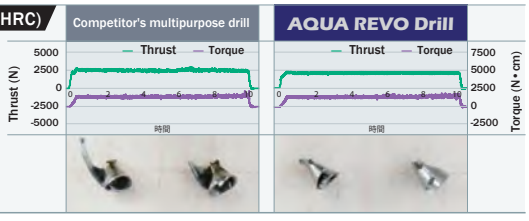


SCM440H (32HRC)

Cutting speed
45m/min

Feed Rate
0.29mm/rev

Depth of Cutting
30mm

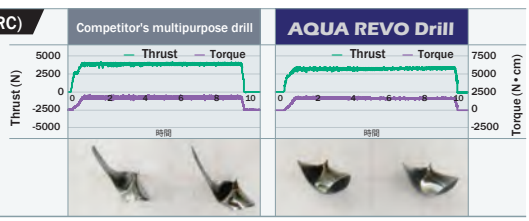


SKD61 (53HRC)

Cutting speed
30m/min

Feed Rate
0.27mm/rev

Depth of Cutting
18mm

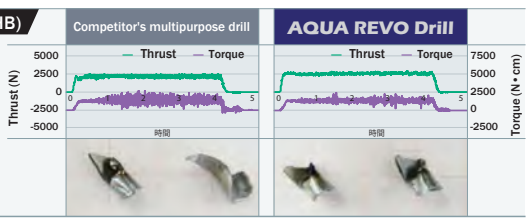


SS400 (124HB)

Cutting speed
100m/min

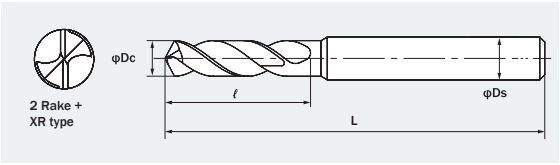
Feed Rate
0.34mm/rev

Depth of Cutting
30mm



AQUA REVO DRILL STUB

Carbide Material | REVO D Coating | h7 Dia. Tolerance | 135° Point Angle | 30° Helix | h6 Shank Dia. Tol. | 2.0-16.0 Size Range



LIST 9860 Metric Sizes
LIST 9861 Wire, Fractional & Letter Sizes

Unit: mm

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0769955	2.00	0.0787		9	45	3
0769978	2.100	0.0827		11		
0769990	2.200	0.0866				
0770010	2.300	0.0906				
1547745	2.381	0.0938	3/32			
0770033	2.400	0.0945				
0770056	2.500	0.0984				
0770079	2.600	0.1024		14		
0770091	2.700	0.1063				
1547751	2.778	0.1094	7/64			
0770113	2.800	0.1102				
0770136	2.900	0.1142				
0770159	3.000	0.1181				
0770171	3.100	0.1220		20	55	4
1547768	3.175	0.1250	1/8			
0770194	3.200	0.1260				
0770216	3.300	0.1299				
0770239	3.400	0.1339				
0770251	3.500	0.1378				
1547774	3.572	0.1406	9/64	22		
0770274	3.600	0.1417				
0770297	3.700	0.1457				
0770319	3.800	0.1496				
0770331	3.900	0.1535				
1547780	3.969	0.1563	5/32			
0770354	4.000	0.1575				
1548094	4.039	0.1590	#21	24	62	6
1548100	4.089	0.1610	#20			
0773783	4.100	0.1614				
0773790	4.200	0.1654				
0773805	4.300	0.1693				
1547797	4.366	0.1719	11/64			
0773811	4.400	0.1732				
0773828	4.500	0.1772				
0773834	4.600	0.1811		26	66	
0773840	4.700	0.1850				
1547802	4.762	0.1875	3/16			
0773857	4.800	0.1890				
0773863	4.900	0.1929				
0773870	5.000	0.1969				
0770572	5.100	0.2008				
1548116	5.105	0.2010	#7			
1547819	5.159	0.2031	13/64			
0770595	5.200	0.2047				
0770617	5.300	0.2087				
0770630	5.400	0.2126				
1548122	5.410	0.2130	#3			
0770652	5.500	0.2165				
1547825	5.556	0.2187	7/32	28		
0770675	5.600	0.2205				
1548139	5.613	0.2210	#2			
0770698	5.700	0.2244				
0770710	5.800	0.2283				
0770732	5.900	0.2323				
1547831	5.953	0.2344	15/64			
0770755	6.000	0.2362				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0773886	6.100	0.2402		32	74	8
0773892	6.200	0.2441				
0773908	6.300	0.2480				
1547848	6.350	0.2500	1/4			
0773914	6.400	0.2520				
0773920	6.500	0.2559				
1548185	6.528	0.2570	F	35	79	
0773937	6.600	0.2598				
0773943	6.700	0.2638				
1547854	6.747	0.2656	17/64			
0773950	6.800	0.2677				
0773966	6.900	0.2717				
1548151	6.909	0.2720	I			
0773972	7.000	0.2756				
1548168	7.036	0.2770	J			
0770864	7.100	0.2795				
1547860	7.144	0.2813	9/32			
0770870	7.200	0.2835				
0770887	7.300	0.2874				
0770893	7.400	0.2913				
0770909	7.500	0.2953				
1547877	7.541	0.2969	19/64	38	83	10
0770915	7.600	0.2992				
0770921	7.700	0.3031				
0770938	7.800	0.3071				
0770944	7.900	0.3110				
1547883	7.937	0.3125	5/16			
0770950	8.000	0.3150				
0773989	8.100	0.3189				
0773995	8.200	0.3228				
1548174	8.204	0.3230	P			
0774000	8.300	0.3268				
1547890	8.334	0.3281	21/64			
0774016	8.400	0.3307				
1548180	8.433	0.3320	Q			
0774022	8.500	0.3346				
0774039	8.600	0.3386		40	89	
0774045	8.700	0.3425				
1547905	8.731	0.3437	11/32			
0774051	8.800	0.3465				
0774068	8.900	0.3504				
0774074	9.000	0.3543				
0771069	9.100	0.3583				
1547911	9.128	0.3594	23/64			
0771075	9.200	0.3622				
0771081	9.300	0.3661				
1548197	9.347	0.3680	U			
0771098	9.400	0.3701				
0771103	9.500	0.3740				
1547928	9.525	0.3750	3/8	43		
0771110	9.600	0.3780				
0771126	9.700	0.3819				
0771132	9.800	0.3858				
0771149	9.900	0.3898				
1547934	9.922	0.3906	25/64			
0771155	10.000	0.3937				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0774080	10.100	0.3976		43	95	12
0774097	10.200	0.4016				
0774102	10.300	0.4055				
1547940	10.319	0.4063	13/32			
0774119	10.400	0.4094				
0774125	10.500	0.4134				
0774131	10.600	0.4173		47	102	
0774148	10.700	0.4213				
1547957	10.716	0.4219	27/64			
0774154	10.800	0.4252				
0774160	10.900	0.4291				
0774177	11.000	0.4331				
0771264	11.100	0.4370				
1547963	11.112	0.4375	7/16			
0771270	11.200	0.4409				
0771287	11.300	0.4449				
0771293	11.400	0.4488				
0771309	11.500	0.4528				
1547970	11.509	0.4531	29/64	50		
0771315	11.600	0.4567				
0771321	11.700	0.4606				
0771338	11.800	0.4646				
0771344	11.900	0.4685				
1547986	11.906	0.4687	15/32			
0771350	12.000	0.4724				
0774183	12.100	0.4764				14
0774190	12.200	0.4803				
0774205	12.300	0.4843				
1547992	12.303	0.4844	31/64			
0774211	12.400	0.4882				
0774228	12.500	0.4921				
0774234	12.600	0.4961		52		
0774240	12.700	0.5000				
1548007	12.700	0.5000	1/2			
0774257	12.800	0.5039				
0774263	12.900	0.5079				
0774270	13.000	0.5118				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
1548013	13.097	0.5156	33/64	53	107	14
0771460	13.100	0.5157				
0771476	13.200	0.5197				
0771482	13.300	0.5236				
0771499	13.400	0.5276				
1548020	13.494	0.5313	17/32			
0771504	13.500	0.5315				
0771510	13.600	0.5354		55	110	16
0771527	13.700	0.5394				
0771533	13.800	0.5433				
1548036	13.891	0.5469	35/64			
0771540	13.900	0.5472				
0771556	14.000	0.5512				
0774286	14.100	0.5551				
0774292	14.200	0.5591				
1548042	14.287	0.5625	9/16			
0774308	14.300	0.5630				
0774314	14.400	0.5669				
0774320	14.500	0.5709				
0774337	14.600	0.5748		56	114	
1548059	14.684	0.5781	37/64			
0774343	14.700	0.5787				
0774350	14.800	0.5827				
0774366	14.900	0.5866				
0774372	15.000	0.5906				
1548065	15.081	0.5937	19/32			
0771665	15.100	0.5945				
0771671	15.200	0.5984				
0771688	15.300	0.6024				
0771694	15.400	0.6063				
1548071	15.478	0.6094	39/64			
0771700	15.500	0.6102				
0771716	15.600	0.6142		58		
0771722	15.700	0.6181				
0771739	15.800	0.6220				
1548088	15.875	0.6250	5/8			
0771745	15.900	0.6260				
0771751	16.000	0.6299				

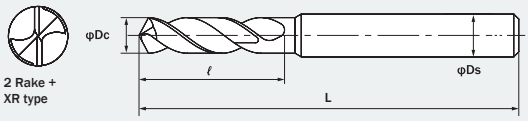
LIST 9860, 9861 Standard Wet Cutting Conditions

Work Material		Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys Titanium Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)		320 - 330 SFM		255 - 265 SFM		140 - 150 SFM		100 - 105 SFM		245 - 255 SFM		100 - 110 SFM		115 - 135 SFM		340 - 360 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	Fractional																
2		16000	0.0023	12700	0.0023	7200	0.0017	4800	0.0014	11900	0.0023	6000	0.0009	4120	0.0010	16750	0.0022
3		10600	0.0035	8500	0.0033	4800	0.0030	3200	0.0023	7950	0.0038	3400	0.0016	2750	0.0017	11200	0.0033
	1/8	10000	0.0038	7950	0.0035	4450	0.0031	2900	0.0025	7500	0.0040	3200	0.0017	2600	0.0017	10500	0.0035
	3/16	6700	0.0056	5300	0.0053	2950	0.0047	1950	0.0037	5000	0.0060	2130	0.0026	1730	0.0026	7000	0.0053
5		6400	0.0059	5050	0.0055	2800	0.0051	1850	0.0040	4750	0.0063	2030	0.0027	1650	0.0028	6700	0.0055
	1/4	5000	0.0075	4000	0.0068	2200	0.0064	1450	0.0051	3750	0.0080	1600	0.0034	1300	0.0035	5300	0.0070
	5/16	4050	0.0094	3200	0.0075	1800	0.0078	1200	0.0064	3000	0.0100	1280	0.0043	1040	0.0044	4250	0.0086
8		4000	0.0095	3150	0.0076	1750	0.0079	1150	0.0065	2950	0.0101	1270	0.0043	1030	0.0044	4200	0.0088
	3/8	3350	0.0113	2650	0.0090	1500	0.0089	1000	0.0071	2500	0.0113	1070	0.0048	870	0.0046	3500	0.0105
10		3200	0.0118	2500	0.0094	1400	0.0094	950	0.0074	2400	0.0119	1020	0.0050	830	0.0048	3350	0.0110
12		2650	0.0132	2100	0.0109	1200	0.0102	800	0.0084	2000	0.0134	850	0.0060	690	0.0058	2800	0.0123
	1/2	2500	0.0140	2000	0.0115	1100	0.0107	750	0.0088	1900	0.0141	800	0.0063	650	0.0061	2600	0.0130
16		2000	0.0157	1600	0.0145	900	0.0127	600	0.0098	1500	0.0157	640	0.0067	510	0.0074	2100	0.0157

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
5) Drilling in stainless steel will require pecking. Recommended peck depth is 0.1 x Dc.
6) Use air blow for cooling and chip evacuation when drilling dry.
7) Use the tables values for drilling depth under 3 x Dc.
8) Where chip jamming is a problem, add pecking.
9) Retract plane for peck drilling should be set to the top of the hole.
10) Recommended peck depth is 0.2 - 1.0 x Dc.

AQUA REVO DRILL REGULAR

Carbide (Material) | REVO D (Coating) | h7 (Dia. Tolerance) | 135° (Point Angle) | 30° (Helix) | h6 (Shank Dia. Tol.) | 2.0-16.0 (Size Range)



LIST 9862 Metric Sizes
LIST 9863 Wire, Fractional & Letter Sizes

Unit: mm

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0771768	2.000	0.0787		15	49	3
0771780	2.100	0.0827		18		
0771802	2.200	0.0866				
0771825	2.300	0.0906				
1548202	2.381	0.0938	3/32			
0771848	2.400	0.0945				
0771860	2.500	0.0984				
0771883	2.600	0.1024		20		
0771905	2.700	0.1063				
1548219	2.778	0.1094	7/64			
0771928	2.800	0.1102				
0771940	2.900	0.1142				
0771963	3.000	0.1181				
0771986	3.100	0.1220		25	60	4
1548225	3.175	0.1250	1/8			
0772007	3.200	0.1260				
0772020	3.300	0.1299				
0772042	3.400	0.1339				
0772065	3.500	0.1378				
1548231	3.572	0.1406	9/64	28		
0772088	3.600	0.1417				
0772100	3.700	0.1457				
0772122	3.800	0.1496				
0772145	3.900	0.1535				
1548248	3.969	0.1563	5/32			
0772168	4.000	0.1575				
1548552	4.039	0.1590	#21	32	77	6
1548569	4.089	0.1610	#20			
0774389	4.100	0.1614				
0774395	4.200	0.1654				
0774400	4.300	0.1693				
1548254	4.366	0.1719	11/64			
0774417	4.400	0.1732				
0774423	4.500	0.1772				
0774430	4.600	0.1811		39		
0774446	4.700	0.1850				
1548260	4.762	0.1875	3/16			
0774452	4.800	0.1890				
0774469	4.900	0.1929				
0774475	5.000	0.1969				
0772386	5.100	0.2008		40	82	
1548575	5.105	0.2010	#7			
1548277	5.159	0.2031	13/64			
0772408	5.200	0.2047				
0772420	5.300	0.2087				
0772443	5.400	0.2126				
1548581	5.410	0.2130	#3			
0772466	5.500	0.2165				
1548283	5.556	0.2187	7/32	42		
0772489	5.600	0.2205				
1548598	5.613	0.2210	#2			
0772500	5.700	0.2244				
0772523	5.800	0.2283				
0772546	5.900	0.2323				
1548290	5.953	0.2344	15/64			
0772569	6.000	0.2362				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0774481	6.100	0.2402		43	84	8
0774498	6.200	0.2441				
0774503	6.300	0.2480				
1548305	6.350	0.2500	1/4			
0774510	6.400	0.2520				
0774526	6.500	0.2559				
1548603	6.528	0.2570	F	44		
0774532	6.600	0.2598				
0774549	6.700	0.2638				
1548311	6.747	0.2656	17/64			
0774555	6.800	0.2677				
0774561	6.900	0.2717				
1548610	6.909	0.2720	I			
0774578	7.000	0.2756				
1548626	7.036	0.2770	J	46	91	
0772678	7.100	0.2795				
1548328	7.144	0.2813	9/32			
0772684	7.200	0.2835				
0772690	7.300	0.2874				
0772706	7.400	0.2913				
0772712	7.500	0.2953				
1548334	7.541	0.2969	19/64	47		
0772729	7.600	0.2992				
0772735	7.700	0.3031				
0772741	7.800	0.3071				
0772758	7.900	0.3110				
1548340	7.937	0.3125	5/16			
0772764	8.000	0.3150				
0774584	8.100	0.3189		55	99	10
0774590	8.200	0.3228				
1548632	8.204	0.3230	P			
0774606	8.300	0.3268				
1548357	8.334	0.3281	21/64			
0774612	8.400	0.3307				
1548649	8.433	0.3320	Q			
0774629	8.500	0.3346				
0774635	8.600	0.3386		57		
0774641	8.700	0.3425				
1548363	8.731	0.3437	11/32			
0774658	8.800	0.3465				
0774664	8.900	0.3504				
0774670	9.000	0.3543				
0772873	9.100	0.3583		60	107	
1548370	9.128	0.3594	23/64			
0772880	9.200	0.3622				
0772896	9.300	0.3661				
1548655	9.347	0.3680	U			
0772901	9.400	0.3701				
0772918	9.500	0.3740				
1548386	9.525	0.3750	3/8	62		
0772924	9.600	0.3780				
0772930	9.700	0.3819				
0772947	9.800	0.3858				
0772953	9.900	0.3898				
1548392	9.922	0.3906	25/64			
0772960	10.000	0.3937				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0774687	10.100	0.3976		68	116	12
0774693	10.200	0.4016				
0774709	10.300	0.4055				
1548408	10.319	0.4063	13/32			
0774715	10.400	0.4094				
0774721	10.500	0.4134				
0774738	10.600	0.4173		70		
0774744	10.700	0.4213				
1548414	10.716	0.4219	27/64			
0774750	10.800	0.4252				
0774767	10.900	0.4291				
0774773	11.000	0.4331				
0773078	11.100	0.4370		73	123	
1548420	11.112	0.4375	7/16			
0773084	11.200	0.4409				
0773090	11.300	0.4449				
0773106	11.400	0.4488				
0773112	11.500	0.4528				
1548437	11.509	0.4531	29/64			
0773129	11.600	0.4567		76		
0773135	11.700	0.4606				
0773141	11.800	0.4646				
0773158	11.900	0.4685				
1548443	11.906	0.4687	15/32			
0773164	12.000	0.4724				
0774780	12.100	0.4764		79	138	14
0774796	12.200	0.4803				
0774801	12.300	0.4843				
1548450	12.303	0.4844	31/64			
0774818	12.400	0.4882				
0774824	12.500	0.4921				
0774830	12.600	0.4961		81		
0774847	12.700	0.5000				
1548466	12.700	0.5000	1/2			
0774853	12.800	0.5039				
0774860	12.900	0.5079				
0774876	13.000	0.5118				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
1548472	13.097	0.5156	33/64	81	148	14
0773273	13.100	0.5157		87		
0773280	13.200	0.5197				
0773296	13.300	0.5236				
0773301	13.400	0.5276				
1548489	13.494	0.5313	17/32			
0773318	13.500	0.5315				
0773324	13.600	0.5354		90		
0773330	13.700	0.5394				
0773347	13.800	0.5433				
1548495	13.891	0.5469	35/64			
0773353	13.900	0.5472				
0773360	14.000	0.5512				
0774882	14.100	0.5551		92	154	16
0774899	14.200	0.5591				
1548500	14.287	0.5625	9/16			
0774904	14.300	0.5630				
0774910	14.400	0.5669				
0774927	14.500	0.5709				
0774933	14.600	0.5748		94		
1548517	14.684	0.5781	37/64			
0774940	14.700	0.5787				
0774956	14.800	0.5827				
0774962	14.900	0.5866				
0774979	15.000	0.5906				
1548523	15.081	0.5937	19/32	97	162	
0773479	15.100	0.5945				
0773485	15.200	0.5984				
0773491	15.300	0.6024				
0773507	15.400	0.6063				
1548530	15.478	0.6094	39/64			
0773513	15.500	0.6102				
0773520	15.600	0.6142		99		
0773536	15.700	0.6181				
0773542	15.800	0.6220				
1548546	15.875	0.6250	5/8			
0773559	15.900	0.6260				
0773565	16.000	0.6299				

LIST 9862, 9863 Standard Cutting Conditions

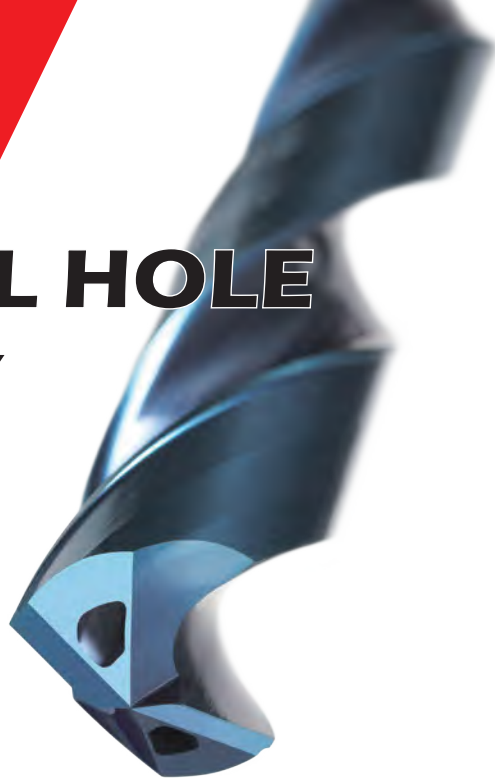
Work Material		Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel (300 Series)		Nickel Alloys Titanium Alloys PH Stainless		Aluminum Alloy	
Speed (SFM)		320 - 330 SFM		255 - 265 SFM		140 - 150 SFM		100 - 105 SFM		245 - 255 SFM		100 - 110 SFM		115 - 135 SFM		340 - 360 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	Fractional																
2		16000	0.0023	12700	0.0023	7200	0.0017	4800	0.0014	11900	0.0023	6000	0.0009	4120	0.0010	16750	0.0022
3		10600	0.0035	8500	0.0033	4800	0.0030	3200	0.0023	7950	0.0038	3400	0.0016	2750	0.0017	11200	0.0033
	1/8	10000	0.0038	7950	0.0035	4450	0.0031	2900	0.0025	7500	0.0040	3200	0.0017	2600	0.0017	10500	0.0035
	3/16	6700	0.0056	5300	0.0053	2950	0.0047	1950	0.0037	5000	0.0060	2130	0.0026	1730	0.0026	7000	0.0053
5		6400	0.0059	5050	0.0055	2800	0.0051	1850	0.0040	4750	0.0063	2030	0.0027	1650	0.0028	6700	0.0055
	1/4	5000	0.0075	4000	0.0068	2200	0.0064	1450	0.0051	3750	0.0080	1600	0.0034	1300	0.0035	5300	0.0070
	5/16	4050	0.0094	3200	0.0075	1800	0.0078	1200	0.0064	3000	0.0100	1280	0.0043	1040	0.0044	4250	0.0086
8		4000	0.0095	3150	0.0076	1750	0.0079	1150	0.0065	2950	0.0101	1270	0.0043	1030	0.0044	4200	0.0088
	3/8	3350	0.0113	2650	0.0090	1500	0.0089	1000	0.0071	2500	0.0113	1070	0.0048	870	0.0046	3500	0.0105
10		3200	0.0118	2500	0.0094	1400	0.0094	950	0.0074	2400	0.0119	1020	0.0050	830	0.0048	3350	0.0110
12		2650	0.0132	2100	0.0109	1200	0.0102	800	0.0084	2000	0.0134	850	0.0060	690	0.0058	2800	0.0123
	1/2	2500	0.0140	2000	0.0115	1100	0.0107	750	0.0088	1900	0.0141	800	0.0063	650	0.0061	2600	0.0130
16		2000	0.0157	1600	0.0145	900	0.0127	600	0.0098	1500	0.0157	640	0.0067	510	0.0074	2100	0.0157

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
5) Drilling in stainless steel will require pecking. Recommended peck interval is 0.1 x Dc.
6) Use air blow for cooling and chip evacuation when drilling dry.
7) Use the tables values for drilling depth under 3 x Dc.
8) Where chip jamming is a problem, add pecking.
9) Retract plane for peck drilling should be set to the top of the hole.
10) Recommended peck depth is 0.2 - 1.0 x Dc.

NEW!

REVOlutionizing the World of Product Manufacturing

AQUA REVO DRILLS OIL HOLE



LIST 9864, 9866, 9868, 9869, 9872, 9873, 9874, 9875

AQUA REVO Drills Oil Hole 3D, 5D, 8D

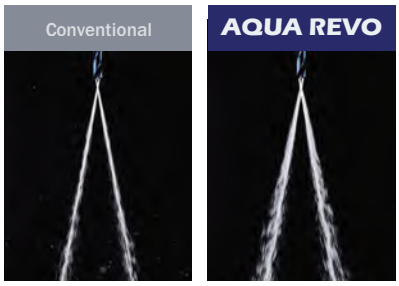
All New Oil Hole Concept in our REVO Material, Design and Coating
The use of Fluid Analysis Greatly Improves Cooling and Lubrication

New Oil Hole Design

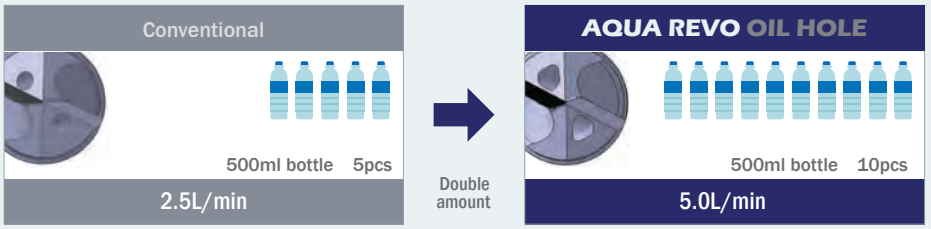
REVO Power Cooler

OVERWHELMING FLOW

Cross-sectional area and coolant amount of the oil hole are more than twice that of conventional.

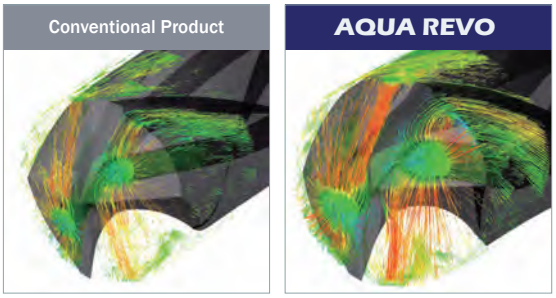


Amount per 1 minute
Drill: φ8.0 Equipment: 1.5MPa
Rotation: 4,800min $^{-1}$



IMPROVED COOLING

Increased flow rate and flow velocity around corners and thinning

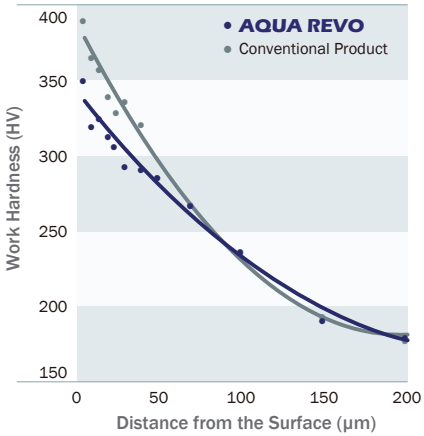


SUPPRESSES WORK

Tool life and accuracy will improve after drilling process

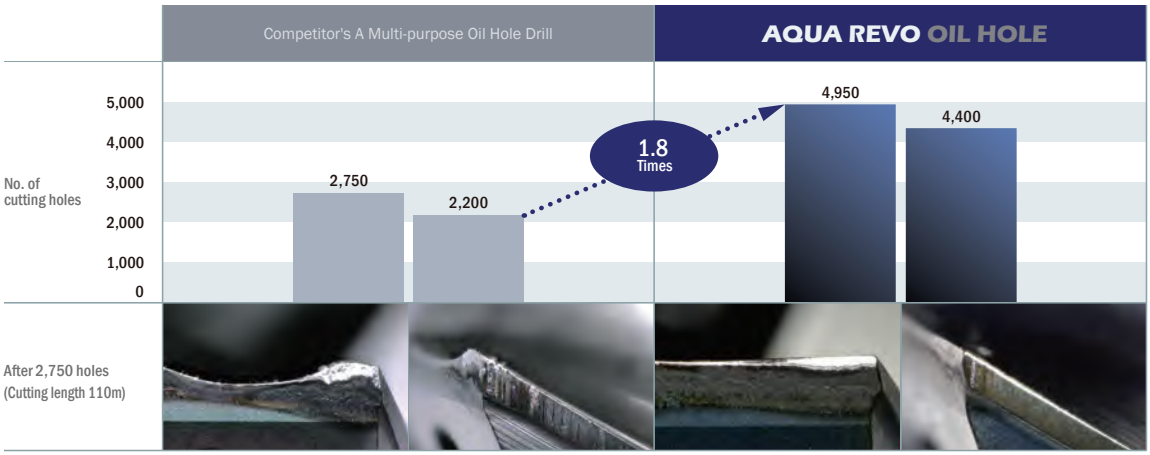
During the drilling process the work material can harden. Because of Nachi's new oil hole design, users can see a decrease in work hardening, prolonging tool life.

Work Material: SUS304



EXCELLENT TOOL LIFE & WEAR SUPPRESSION

Durability and stability surpasses other drills



Diameter: φ8.0

Work Material: S50C(180HB)

Cutting Speed: 120m/min

Feed Amount: 0.254mm/rev

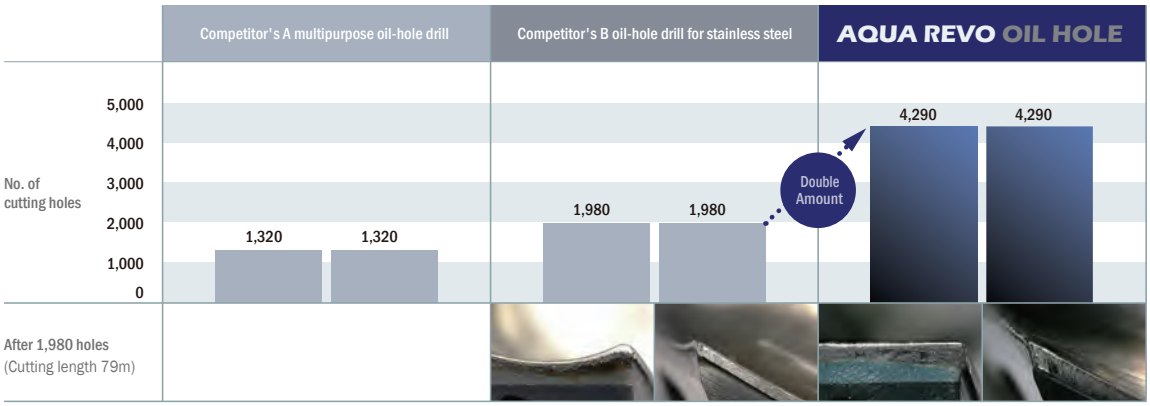
Depth of Hole: 40mm(5Dc)

Machine: Vertical M/C

Cutting Fluid: Water-soluble

INCREDIBLE TOOL LIFE EVEN IN STAINLESS STEEL

Although it is a multi-purpose drill, even compared to drills for Stainless steel, Nachi achieved more than twice as many holes



Diameter: φ8.0

Work Material: SUS304

Cutting Speed: 80m/min

Feed Amount: 0.20mm/rev

Depth of Hole: 40mm(5Dc)

Machine: Vertical M/C

Cutting Fluid: Water-soluble

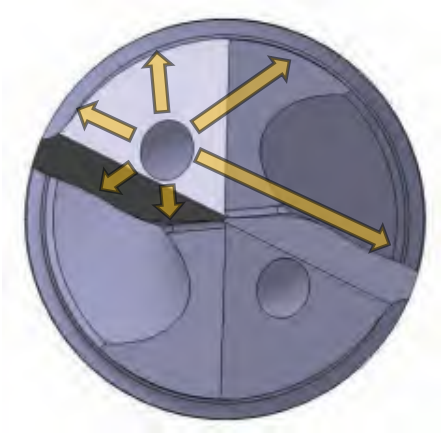
Compatible with a wide range of materials from Structural steel to Stainless steel and Hardened steel

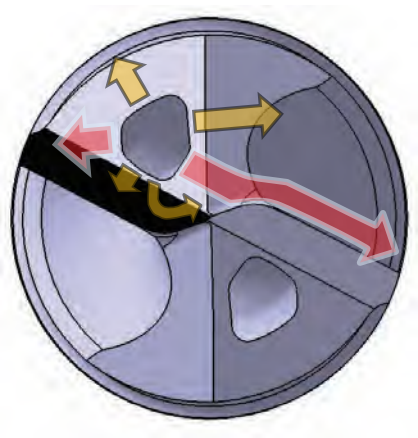
SELECTION BY WORKING MATERIAL

	Structural Steel	Carbon Steel	Alloy Steel Heat-treated Steel	Mold Steel Hardened Steel	Hardened Steel			Stainless Steel			Titanium Alloy	Nickel Based Alloy	Cast Iron	Aluminum Alloy
	SS400	S45C S50C	SCM SCr	30～40 HRC	40～50 HRC	50～57 HRC	58～65 HRC	SUS304 SUS316	SUS420	SUS630	Ti-6Al-4V		FC FCD	AC ADC
AQUA REVO Oil Hole 3D, 5D, 8D	◎	◎	◎	◎	◎	○	–	◎	◎	◎	○	○	◎	○

◎: Excellent ○: Good –: Not recommended

UNIQUE REVO POWER COOLER DESIGN

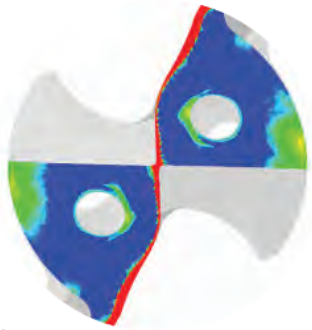




The REVO Power Cooler's unique design directs coolant to the cutting edge. This results in longer tool life by keeping the drill cooler when drilling.

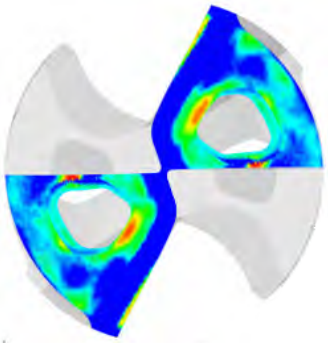
REVO POWER COOLER VS. CONVENTIONAL DESIGN

Conventional



Area with low cooling effect

AQUA REVO POWER COOLER

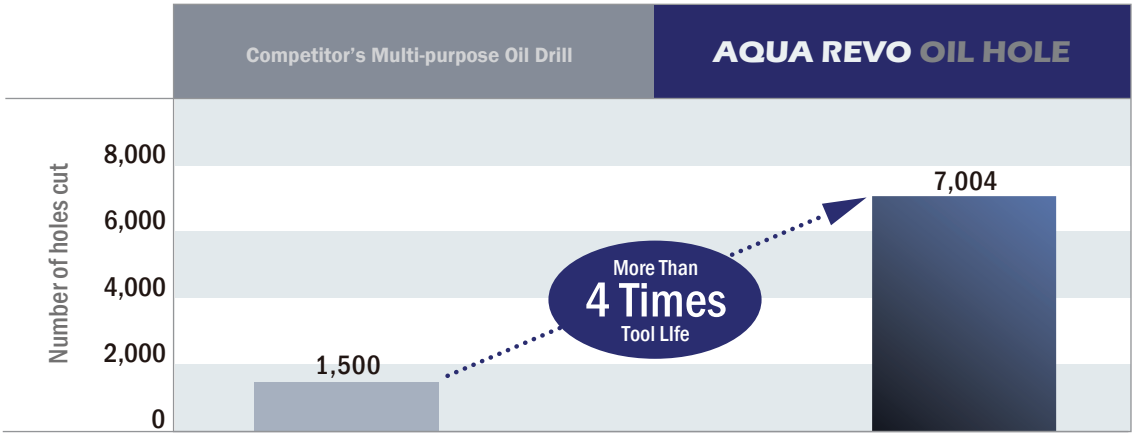


Area with high cooling effect

During a thermal analysis, Nachi's REVO Power Cooler proved to keep the cutting edge cooler than conventional oil hole drills.

SUCCESS CASE #1 - TOOL LIFE

L9874 REVO POWER COOLER 5XD - 316L



Application
Diameter: φ9.7
Work Material: 316L SS
Cutting Speed: 130 SFM
Feed Rate: 0.0027 IPR
Depth of Hole: 30.2 mm
Machine: Vertical M/C
Cutting Fluid: Water-soluble

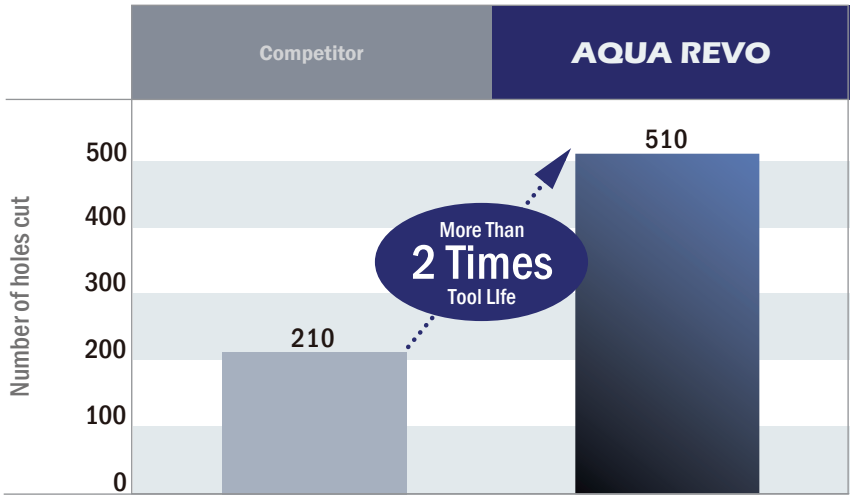
AQUA REVO Wear Results After 7004 Holes

Face | Cutting Edge 1 | Cutting Edge 2

AQUA REVO was able to increase tool life more than 400%

SUCCESS CASE #2 - TOOL LIFE & PART CYCLE TIME

L9872 REVO POWER COOLER 3XD - MONEL K500



Application
Diameter: φ8.5mm
Work Material: Monel K500
Depth of Hole: 12.6mm
Machine: Vertical M/C
Cutting Fluid: Water-soluble

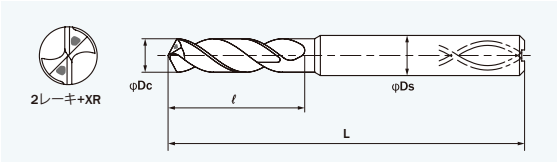
Competitor Parameters	Nachi Parameters
Cutting Speed: 50 SFM	Cutting Speed: 50 SFM
Feed Amount: 0.0024 IPR	Feed Amount: 0.0043 IPR

Chip Formation

AQUA REVO was able to more than double tool life and reduce part cycle time by one minute

AQUA REVO DRILL OIL HOLE 3D

Carbide (Material) | REVO D (Coating) | h7 (Dia. Tolerance) | 140° (Point Angle) | 26° ~30° (Helix) | h6 (Shank Dia. Tol.) | 3.0-16.0 (Size Range)



LIST 9872 Metric Sizes
LIST 9873 Wire, Fractional & Letter Sizes

DIN Standard

Unit: mm

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diame-ter
	Dc			l	L	Ds
0777800	3.000	0.1181		20	62	6
0777817	3.100	0.1220				
1561530	3.175	0.1250	1/8			
0777823	3.200	0.1260				
0777830	3.300	0.1299				
0777846	3.400	0.1339				
0777852	3.500	0.1378				
1561547	3.572	0.1406	9/64			
0777869	3.600	0.1417				
0777875	3.700	0.1457				
0777881	3.800	0.1496		24	66	
0777898	3.900	0.1535				
1561553	3.969	0.1563	5/32			
0777903	4.000	0.1575				
1561560	4.039	0.1590	#21			
1561977	4.089	0.1610	#20			
0777910	4.100	0.1614				
0777926	4.200	0.1654				
0777932	4.300	0.1693				
1561576	4.366	0.1719	11/64			
0777949	4.400	0.1732				
0777955	4.500	0.1772				
0777961	4.600	0.1811				
0777978	4.700	0.1850				
1561582	4.762	0.1875	3/16	28		
0777984	4.800	0.1890				
0777990	4.900	0.1929				
0778005	5.000	0.1969				
0778011	5.100	0.2008				
1561599	5.105	0.2010	#7			
1561983	5.159	0.2031	13/64			
0778028	5.200	0.2047				
0778034	5.300	0.2087				
0778040	5.400	0.2126				
1561604	5.410	0.2130	#3			
0778057	5.500	0.2165				
1561610	5.556	0.2187	7/32			
0778063	5.600	0.2205				
1561627	5.613	0.2210	#2			
0778070	5.700	0.2244				
0778086	5.800	0.2283				
0778092	5.900	0.2323				
1561633	5.953	0.2344	15/64			
0778108	6.000	0.2362				
0778114	6.100	0.2402		34	79	8
0778120	6.200	0.2441				
0778137	6.300	0.2480				
1561640	6.350	0.2500	1/4			
0778143	6.400	0.2520				
0778150	6.500	0.2559				
1561656	6.528	0.2570	F			
0778166	6.600	0.2598				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diame-ter
	Dc			l	L	Ds
0778172	6.700	0.2638		34	79	8
1561662	6.747	0.2656	17/64			
0778189	6.800	0.2677				
0778195	6.900	0.2717				
1561679	6.909	0.2720	I			
0778200	7.000	0.2756				
1561685	7.036	0.2770	J	41		
0778217	7.100	0.2795				
1561691	7.144	0.2813	9/32			
0778223	7.200	0.2835				
0778230	7.300	0.2874				
0778246	7.400	0.2913				
0778252	7.500	0.2953				
1561707	7.541	0.2969	19/64			
0778269	7.600	0.2992				
0778275	7.700	0.3031				
0778281	7.800	0.3071				
0778298	7.900	0.3110				
1561713	7.937	0.3125	5/16			
0778303	8.000	0.3150				
0778310	8.100	0.3189		47	89	10
0778326	8.200	0.3228				
1561720	8.204	0.3230	P			
0778332	8.300	0.3268				
1561736	8.334	0.3281	21/64			
0778349	8.400	0.3307				
1561742	8.433	0.3320	Q			
0778355	8.500	0.3346				
0778361	8.600	0.3386				
0778378	8.700	0.3425				
1561759	8.731	0.3437	11/32			
0778384	8.800	0.3465				
0778390	8.900	0.3504				
0778406	9.000	0.3543				
0778412	9.100	0.3583				
1561765	9.128	0.3594	23/64			
0778429	9.200	0.3622				
0778435	9.300	0.3661				
1561771	9.347	0.3680	U			
0778441	9.400	0.3701				
0778458	9.500	0.3740				
1561788	9.525	0.3750	3/8			
0778464	9.600	0.3780				
0778470	9.700	0.3819				
0778487	9.800	0.3858				
0778493	9.900	0.3898				
1561794	9.922	0.3906	25/64			
0778509	10.000	0.3937				
0778515	10.100	0.3976		55	102	12
0778521	10.200	0.4016				
0778538	10.300	0.4055				
1561800	10.319	0.4063	13/32			

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diame-ter
	Dc			l	L	Ds
0778544	10.400	0.4094				
0778550	10.500	0.4134				
0778567	10.600	0.4173				
0778573	10.700	0.4213				
1561816	10.716	0.4219	27/64			
0778580	10.800	0.4252				
0778596	10.900	0.4291				
0778601	11.000	0.4331				
0778618	11.100	0.4370				
1561822	11.112	0.4375	7/16			
0778624	11.200	0.4409		55	102	12
0778630	11.300	0.4449				
0778647	11.400	0.4488				
0778653	11.500	0.4528				
1561839	11.509	0.4531	29/64			
0778660	11.600	0.4567				
0778676	11.700	0.4606				
0778682	11.800	0.4646				
0778699	11.900	0.4685				
1561845	11.906	0.4687	15/32			
0778704	12.000	0.4724				
0778710	12.100	0.4764				
0778727	12.200	0.4803				
0778733	12.300	0.4843				
1561851	12.303	0.4844	31/64			
0778740	12.400	0.4882				
0778756	12.500	0.4921				
0778762	12.600	0.4961				
0778779	12.700	0.5000		60	107	14
1561868	12.700	0.5000	1/2			
0778785	12.800	0.5039				
0778791	12.900	0.5079				
0778807	13.000	0.5118				
1561874	13.097	0.5156	33/64			
0778813	13.100	0.5157				
0778820	13.200	0.5197				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diame-ter
	Dc			l	L	Ds
0778836	13.300	0.5236				
0778842	13.400	0.5276				
1561880	13.494	0.5313	17/32			
0778859	13.500	0.5315				
0778865	13.600	0.5354		60	107	14
0778871	13.700	0.5394				
0778888	13.800	0.5433				
1561897	13.891	0.5469	35/64			
0778894	13.900	0.5472				
0778900	14.000	0.5512				
0778916	14.100	0.5551				
0778922	14.200	0.5591				
1561902	14.287	0.5625	9/16			
0778939	14.300	0.5630				
0778945	14.400	0.5669				
0778951	14.500	0.5709				
0778968	14.600	0.5748				
1561919	14.684	0.5781	37/64			
0778974	14.700	0.5787				
0778980	14.800	0.5827				
0778997	14.900	0.5866				
0779001	15.000	0.5906				
1561925	15.081	0.5937	19/32	65	115	16
0779018	15.100	0.5945				
0779024	15.200	0.5984				
0779030	15.300	0.6024				
0779047	15.400	0.6063				
1561931	15.478	0.6094	39/64			
0779053	15.500	0.6102				
0779060	15.600	0.6142				
0779076	15.700	0.6181				
0779082	15.800	0.6220				
1561948	15.875	0.6250	5/8			
0779099	15.900	0.6260				
0779104	16.000	0.6299				

LIST 9872, 9873 Standard Cutting Conditions

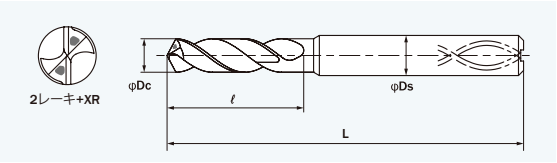
Work Material		Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Titanium Alloys		Nickel Alloys Inconel		Aluminum Alloy	
Speed (SFM)		380 - 400 SFM		310 - 330 SFM		240 - 260 SFM		120 - 140 SFM		320 - 340 SFM		240 - 260 SFM		140 - 160 SFM		115 - 135 SFM		115 - 135 SFM		440 - 460 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)	RPM	Feed (IPR)
Metric	Fractional																				
3		12700	0.0038	10600	0.0038	8250	0.0035	4200	0.0024	10600	0.0035	8000	0.0031	4850	0.0030	4000	0.0030	4000	0.0018	14550	0.0041
	1/8	12000	0.0040	10000	0.0040	7800	0.0037	4000	0.0026	9950	0.0037	7650	0.0033	4600	0.0032	3700	0.0032	3700	0.0019	13750	0.0044
	3/16	7950	0.0060	6650	0.0060	5200	0.0056	2650	0.0038	6650	0.0056	5100	0.0050	3000	0.0047	2450	0.0047	2450	0.0028	9200	0.0066
5		7600	0.0063	6300	0.0063	4950	0.0058	2500	0.0040	6300	0.0059	4850	0.0052	2900	0.0049	2300	0.0049	2300	0.0029	8700	0.0069
	1/4	6000	0.0080	5000	0.0080	3900	0.0071	2000	0.0048	5000	0.0076	3800	0.0066	2300	0.0064	1850	0.0064	1850	0.0038	6700	0.0088
	5/16	4750	0.0099	4000	0.0099	3150	0.0088	1600	0.0059	4000	0.0086	3050	0.0078	1850	0.0076	1500	0.0076	1500	0.0046	5500	0.0109
8		4700	0.0101	3950	0.0101	3100	0.0087	1550	0.0060	3950	0.0087	3000	0.0079	1800	0.0077	1450	0.0077	1450	0.0047	5450	0.0110
	3/8	4000	0.0120	3350	0.0120	2600	0.0098	1350	0.0065	3300	0.0093	2550	0.0089	1550	0.0087	1250	0.0087	1250	0.0056	4600	0.0131
10		3800	0.0126	3200	0.0126	2450	0.0101	1250	0.0070	3200	0.0097	2400	0.0093	1450	0.0091	1150	0.0091	1150	0.0057	4400	0.0138
12		3200	0.0132	2700	0.0132	2050	0.0104	1050	0.0082	2650	0.0098	200	0.0105	1200	0.0103	1000	0.0102	1000	0.0067	3650	0.0151
	1/2	3000	0.0140	2500	0.0140	1950	0.0107	1000	0.0083	2500	0.0104	1900	0.0111	1150	0.0108	950	0.0107	950	0.0072	3450	0.0160
16		2400	0.0157	2000	0.0157	1550	0.0118	800	0.0103	2000	0.0122	1500	0.0125	900	0.0122	750	0.0121	750	0.0074	2750	0.0189

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
5) Use high pressure internal coolant
6) In applications where chip jamming is a problem, use peck drilling.
7) Retract plane for peck drilling should be set to the top of the hole.
8) Recommended peck depth is 0.2 - 1.0 x Dc.

NEW!

AQUA REVO DRILL OIL HOLE 3D

Carbide Material | REVO D Coating | h7 Dia. Tolerance | 140° Point Angle | 26° ~30° Helix | h6 Shank Dia. Tol. | 3.0-16.0 Size Range



LIST 9864 Metric Sizes

JIS Standard

Unit: mm

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0775180	3.0	0.1181	19	68	3
0775196	3.1	0.1220	21	72	4
0775201	3.2	0.1260			
0775218	3.3	0.1299			
0775224	3.4	0.1339			
0775230	3.5	0.1378			
0775247	3.6	0.1417	23		
0775253	3.7	0.1457			
0775260	3.8	0.1496			
0775276	3.9	0.1535			
0775282	4.0	0.1575			
0775299	4.1	0.1614	26	80	5
0775304	4.2	0.1654			
0775310	4.3	0.1693			
0775327	4.4	0.1732			
0775333	4.5	0.1772			
0775340	4.6	0.1811	29		
0775356	4.7	0.1850			
0775362	4.8	0.1890			
0775379	4.9	0.1929			
0775385	5.0	0.1969			
0775391	5.1	0.2008		82	6
0775407	5.2	0.2047			
0775413	5.3	0.2087			
0775420	5.4	0.2126			
0775436	5.5	0.2165			
0775442	5.6	0.2205	32		
0775459	5.7	0.2244			
0775465	5.8	0.2283			
0775471	5.9	0.2323			
0775488	6.0	0.2362			
0775494	6.1	0.2402	34	88	7
0775500	6.2	0.2441			
0775516	6.3	0.2480			
0775522	6.4	0.2520			
0775539	6.5	0.2559			
0775545	6.6	0.2598	37		
0775551	6.7	0.2638			
0775568	6.8	0.2677			
0775574	6.9	0.2717			
0775580	7.0	0.2756			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0775597	7.1	0.2795	39	94	8
0775602	7.2	0.2835			
0775619	7.3	0.2874			
0775625	7.4	0.2913			
0775631	7.5	0.2953			
0775648	7.6	0.2992	42		
0775654	7.7	0.3031			
0775660	7.8	0.3071			
0775677	7.9	0.3110			
0775683	8.0	0.3150			
0775690	8.1	0.3189	44	100	9
0775705	8.2	0.3228			
0775711	8.3	0.3268			
0775728	8.4	0.3307			
0775734	8.5	0.3346			
0775740	8.6	0.3386	47		
0775757	8.7	0.3425			
0775763	8.8	0.3465			
0775770	8.9	0.3504			
0775786	9.0	0.3543			
0775792	9.1	0.3583	49	106	10
0775808	9.2	0.3622			
0775814	9.3	0.3661			
0775820	9.4	0.3701			
0775837	9.5				
0775843	9.6	0.3780	52		
0775850	9.7	0.3819			
0775866	9.8	0.3858			
0775872	9.9	0.3898			
0775889	10.0	0.3937			
0775895	10.1	0.3976	54	116	11
0775900	10.2	0.4016			
0775917	10.3	0.4055			
0775923	10.4	0.4094			
0775930	10.5	0.4134			
0775946	10.6	0.4173	57		
0775952	10.7	0.4213			
0775969	10.8	0.4252			
0775975	10.9	0.4291			
0775981	11.0	0.4331			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0775998	11.1	0.4370	60	122	12
0776002	11.2	0.4409			
0776019	11.3	0.4449			
0776025	11.4	0.4488			
0776031	11.5	0.4528			
0776048	11.6	0.4567	63		
0776054	11.7	0.4606			
0776060	11.8	0.4646			
0776077	11.9	0.4685			
0776083	12.0	0.4724			
0776090	12.1	0.4764	65	128	13
0776105	12.2	0.4803			
0776111	12.3	0.4843			
0776128	12.4	0.4882			
0776134	12.5	0.4921			
0776140	12.6	0.4961	68		
0776157	12.7	0.5000			
0776163	12.8	0.5039			
0776170	12.9	0.5079			
0776186	13.0	0.5118			
0776192	13.1	0.5157	70	134	14
0776208	13.2	0.5197			
0776214	13.3	0.5236			
0776220	13.4	0.5276			
0776237	13.5	0.5315			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0776243	13.6	0.5354	73	134	14
0776250	13.7	0.5394			
0776266	13.8	0.5433			
0776272	13.9	0.5472			
0776289	14.0	0.5512			
0776295	14.1	0.5551	75	140	15
0776300	14.2	0.5591			
0776317	14.3	0.5630			
0776323	14.4	0.5669			
0776330	14.5	0.5709			
0776346	14.6	0.5748	78		
0776352	14.7	0.5787			
0776369	14.8	0.5827			
0776375	14.9	0.5866			
0776381	15.0	0.5906			
0776398	15.1	0.5945	80	146	16
0776403	15.2	0.5984			
0776410	15.3	0.6024			
0776426	15.4	0.6063			
0776432	15.5	0.6102			
0776449	15.6	0.6142	83		
0776455	15.7	0.6181			
0776461	15.8	0.6220			
0776478	15.9	0.6260			
0776484	16.0	0.6299			

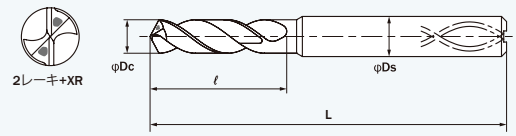
LIST 9864 Standard Cutting Conditions

Work Material	Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Titanium Alloys		Nickel Alloys Inconel		Aluminum Alloy	
Speed (SFM)	380 - 400 SFM		310 - 330 SFM		240 - 260 SFM		120 - 140 SFM		320 - 340 SFM		240 - 260 SFM		140 - 160 SFM		115 - 135 SFM		115 - 135 SFM		440 - 460 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)	RPM	Feed (IPR)	RPM	Feed (IPR)
3	12700	0.0038	10600	0.0038	8250	0.0035	4200	0.0024	10600	0.0035	8000	0.0031	4850	0.0030	4000	0.0030	4000	0.0018	14550	0.0041
5	7600	0.0063	6300	0.0063	4950	0.0058	2500	0.0040	6300	0.0059	4850	0.0052	2900	0.0049	2300	0.0049	2300	0.0029	8700	0.0069
8	4700	0.0101	3950	0.0101	3100	0.0087	1550	0.0060	3950	0.0087	3000	0.0079	1800	0.0077	1450	0.0077	1450	0.0047	5450	0.0110
10	3800	0.0126	3200	0.0126	2450	0.0101	1250	0.0070	3200	0.0097	2400	0.0093	1450	0.0091	1150	0.0091	1150	0.0057	4400	0.0138
12	3200	0.0132	2700	0.0132	2050	0.0104	1050	0.0082	2650	0.0098	200	0.0105	1200	0.0103	1000	0.0102	1000	0.0067	3650	0.0151
16	2400	0.0157	2000	0.0157	1550	0.0118	800	0.0103	2000	0.0122	1500	0.0125	900	0.0122	750	0.0121	750	0.0074	2750	0.0189

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
6) In applications where chip jamming is a problem, use peck drilling.
7) Retract plane for peck drilling should be set to the top of the hole.
8) Recommended peck depth is 0.2 - 1.0 x Dc.

AQUA REVO DRILL OIL HOLE 5D

Carbide Material | REVO D Coating | h7 Dia. Tolerance | 140° Point Angle | 26° ~30° Helix | h6 Shank Dia. Tol. | 3.0-16.0 Size Range



LIST 9874 Metric Sizes
LIST 9875 Wire, Fractional & Letter Sizes

DIN Standard

Unit: mm

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0779110	3.000	0.1181		28	66	6
0779127	3.100	0.1220				
1561990	3.175	0.1250	1/8			
0779133	3.200	0.1260				
0779140	3.300	0.1299				
0779156	3.400	0.1339				
0779162	3.500	0.1378				
1562004	3.572	0.1406	9/64			
0779179	3.600	0.1417				
0779185	3.700	0.1457				
0779191	3.800	0.1496		36	74	
0779207	3.900	0.1535				
1562010	3.969	0.1563	5/32			
0779213	4.000	0.1575				
1562027	4.039	0.1590	#21			
1561954	4.089	0.1610	#20			
0779220	4.100	0.1614				
0779236	4.200	0.1654				
0779242	4.300	0.1693				
1562033	4.366	0.1719	11/64			
0779259	4.400	0.1732				
0779265	4.500	0.1772				
0779271	4.600	0.1811				
0779288	4.700	0.1850				
1562040	4.762	0.1875	3/16	44	82	
0779294	4.800	0.1890				
0779300	4.900	0.1929				
0779316	5.000	0.1969				
0779322	5.100	0.2008				
1562056	5.105	0.2010	#7			
1561960	5.159	0.2031	13/64			
0779339	5.200	0.2047				
0779345	5.300	0.2087				
0779351	5.400	0.2126				
1562062	5.410	0.2130	#3			
0779368	5.500	0.2165				
1562079	5.556	0.2187	7/32			
0779374	5.600	0.2205				
1562085	5.613	0.2210	#2			
0779380	5.700	0.2244				
0779397	5.800	0.2283				
0779402	5.900	0.2323				
1562091	5.953	0.2344	15/64			
0779419	6.000	0.2362				
0779425	6.100	0.2402		53	91	8
0779431	6.200	0.2441				
0779448	6.300	0.2480				
1562107	6.350	0.2500	1/4			
0779454	6.400	0.2520				
0779460	6.500	0.2559				
1562113	6.528	0.2570	F			
0779477	6.600	0.2598				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0779483	6.700	0.2638		53	91	8
1562120	6.747	0.2656	17/64			
0779490	6.800	0.2677				
0779505	6.900	0.2717				
1562136	6.909	0.2720	I			
0779511	7.000	0.2756				
1562142	7.036	0.2770	J			
0779528	7.100	0.2795				
1562159	7.144	0.2813	9/32			
0779534	7.200	0.2835				
0779540	7.300	0.2874				
0779557	7.400	0.2913				
0779563	7.500	0.2953				
1562165	7.541	0.2969	19/64			
0779570	7.600	0.2992				
0779586	7.700	0.3031				
0779592	7.800	0.3071				
0779608	7.900	0.3110				
1562171	7.937	0.3125	5/16			
0779614	8.000	0.3150				
0779620	8.100	0.3189		61	103	10
0779637	8.200	0.3228				
1562188	8.204	0.3230	P			
0779643	8.300	0.3268				
1562194	8.334	0.3281	21/64			
0779650	8.400	0.3307				
1562200	8.433	0.3320	Q			
0779666	8.500	0.3346				
0779672	8.600	0.3386				
0779689	8.700	0.3425				
1562216	8.731	0.3437	11/32			
0779695	8.800	0.3465				
0779700	8.900	0.3504				
0779717	9.000	0.3543				
0779723	9.100	0.3583				
1562222	9.128	0.3594	23/64			
0779730	9.200	0.3622				
0779746	9.300	0.3661				
1562239	9.347	0.3680	U			
0779752	9.400	0.3701				
0779769	9.500	0.3740				
1562245	9.525	0.3750	3/8			
0779775	9.600	0.3780				
0779781	9.700	0.3819				
0779798	9.800	0.3858				
0779803	9.900	0.3898				
1562251	9.922	0.3906	25/64			
0779810	10.000	0.3937				
0779826	10.100	0.3976		71	118	12
0779832	10.200	0.4016				
0779849	10.300	0.4055				
1562268	10.319	0.4063	13/32			

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0779855	10.400	0.4094				
0779861	10.500	0.4134				
0779878	10.600	0.4173				
0779884	10.700	0.4213				
1562274	10.716	0.4219	27/64			
0779890	10.800	0.4252				
0779906	10.900	0.4291				
0779912	11.000	0.4331				
0779929	11.100	0.4370				
1562280	11.112	0.4375	7/16			
0779935	11.200	0.4409		71	118	12
0779941	11.300	0.4449				
0779958	11.400	0.4488				
0779964	11.500	0.4528				
1562297	11.509	0.4531	29/64			
0779970	11.600	0.4567				
0779987	11.700	0.4606				
0779993	11.800	0.4646				
0780007	11.900	0.4685				
1562302	11.906	0.4687	15/32			
0780013	12.000	0.4724				
0780020	12.100	0.4764				
0780036	12.200	0.4803				
0780042	12.300	0.4843				
1562319	12.303	0.4844	31/64			
0780059	12.400	0.4882				
0780065	12.500	0.4921				
0780071	12.600	0.4961				
0780088	12.700	0.5000		77	124	14
1562325	12.700	0.5000	1/2			
0780094	12.800	0.5039				
0780100	12.900	0.5079				
0780116	13.000	0.5118				
1562331	13.097	0.5156	33/64			
0780122	13.100	0.5157				
0780139	13.200	0.5197				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0780145	13.300	0.5236				
0780151	13.400	0.5276				
1562348	13.494	0.5313	17/32			
0780168	13.500	0.5315				
0780174	13.600	0.5354		77	124	14
0780180	13.700	0.5394				
0780197	13.800	0.5433				
1562354	13.891	0.5469	35/64			
0780202	13.900	0.5472				
0780219	14.000	0.5512				
0780225	14.100	0.5551				
0780231	14.200	0.5591				
1562360	14.287	0.5625	9/16			
0780248	14.300	0.5630				
0780254	14.400	0.5669				
0780260	14.500	0.5709				
0780277	14.600	0.5748				
1562377	14.684	0.5781	37/64			
0780283	14.700	0.5787				
0780290	14.800	0.5827				
0780305	14.900	0.5866				
0780311	15.000	0.5906				
1562383	15.081	0.5937	19/32	83	133	16
0780328	15.100	0.5945				
0780334	15.200	0.5984				
0780340	15.300	0.6024				
0780357	15.400	0.6063				
1562390	15.478	0.6094	39/64			
0780363	15.500	0.6102				
0780370	15.600	0.6142				
0780386	15.700	0.6181				
0780392	15.800	0.6220				
1562405	15.875	0.6250	5/8			
0780408	15.900	0.6260				
0780414	16.000	0.6299				

LIST 9874, 9875 Standard Cutting Conditions

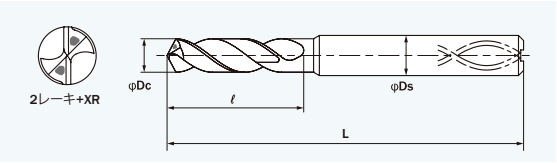
Work Material		Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Titanium Alloys		Nickel Alloys Inconel		Aluminum Alloy	
Speed (SFM)		380 - 400 SFM		310 - 330 SFM		240 - 260 SFM		120 - 140 SFM		320 - 340 SFM		240 - 260 SFM		140 - 160 SFM		115 - 135 SFM		115 - 135 SFM		440 - 460 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)	RPM	Feed (IPR)
Metric	Fractional																				
3		12700	0.0038	10600	0.0038	8250	0.0035	4200	0.0024	10600	0.0035	8000	0.0031	4850	0.0030	4000	0.0030	4000	0.0018	14550	0.0041
	1/8	12000	0.0040	10000	0.0040	7800	0.0037	4000	0.0026	9950	0.0037	7650	0.0033	4600	0.0032	3700	0.0032	3700	0.0019	13750	0.0044
	3/16	7950	0.0060	6650	0.0060	5200	0.0056	2650	0.0038	6650	0.0056	5100	0.0050	3000	0.0047	2450	0.0047	2450	0.0028	9200	0.0066
5		7600	0.0063	6300	0.0063	4950	0.0058	2500	0.0040	6300	0.0059	4850	0.0052	2900	0.0049	2300	0.0049	2300	0.0029	8700	0.0069
	1/4	6000	0.0080	5000	0.0080	3900	0.0071	2000	0.0048	5000	0.0076	3800	0.0066	2300	0.0064	1850	0.0064	1850	0.0038	6700	0.0088
	5/16	4750	0.0099	4000	0.0099	3150	0.0088	1600	0.0059	4000	0.0086	3050	0.0078	1850	0.0076	1500	0.0076	1500	0.0046	5500	0.0109
8		4700	0.0101	3950	0.0101	3100	0.0087	1550	0.0060	3950	0.0087	3000	0.0079	1800	0.0077	1450	0.0077	1450	0.0047	5450	0.0110
	3/8	4000	0.0120	3350	0.0120	2600	0.0098	1350	0.0065	3300	0.0093	2550	0.0089	1550	0.0087	1250	0.0087	1250	0.0056	4600	0.0131
10		3800	0.0126	3200	0.0126	2450	0.0101	1250	0.0070	3200	0.0097	2400	0.0093	1450	0.0091	1150	0.0091	1150	0.0057	4400	0.0138
12		3200	0.0132	2700	0.0132	2050	0.0104	1050	0.0082	2650	0.0098	200	0.0105	1200	0.0103	1000	0.0102	1000	0.0067	3650	0.0151
	1/2	3000	0.0140	2500	0.0140	1950	0.0107	1000	0.0083	2500	0.0104	1900	0.0111	1150	0.0108	950	0.0107	950	0.0072	3450	0.0160
16		2400	0.0157	2000	0.0157	1550	0.0118	800	0.0103	2000	0.0122	1500	0.0125	900	0.0122	750	0.0121	750	0.0074	2750	0.0189

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
6) In applications where chip jamming is a problem, use peck drilling.
7) Retract plane for peck drilling should be set to the top of the hole.
8) Recommended peck depth is 0.2 - 1.0 x Dc.

NEW!

AQUA REVO DRILL OIL HOLE 5D

Carbide Material | REVO D Coating | h7 Dia. Tolerance | 140° Point Angle | 26° ~30° Helix | h6 Shank Dia. Tol. | 3.0-16.0 Size Range



LIST 9866 Metric Sizes

JIS Standard

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0776490	3.0	0.1181	29	78	3
0776506	3.1	0.1220	33	86	4
0776512	3.2	0.1260			
0776529	3.3	0.1299			
0776535	3.4	0.1339			
0776541	3.5	0.1378			
0776558	3.6	0.1417	37		
0776564	3.7	0.1457			
0776570	3.8	0.1496			
0776587	3.9	0.1535			
0776593	4.0	0.1575			
0776609	4.1	0.1614	41	98	5
0776615	4.2	0.1654			
0776621	4.3	0.1693			
0776638	4.4	0.1732			
0776644	4.5	0.1772			
0776650	4.6	0.1811	46		
0776667	4.7	0.1850			
0776673	4.8	0.1890			
0776680	4.9	0.1929			
0776696	5.0	0.1969			
0776701	5.1	0.2008		100	6
0776718	5.2	0.2047			
0776724	5.3	0.2087			
0776730	5.4	0.2126			
0776747	5.5	0.2165			
0776753	5.6	0.2205	50		
0776760	5.7	0.2244			
0776776	5.8	0.2283			
0776782	5.9	0.2323			
0776799	6.0	0.2362			
0776804	6.1	0.2402	54	109	7
0776810	6.2	0.2441			
0776827	6.3	0.2480			
0776833	6.4	0.2520			
0776840	6.5	0.2559			
0776856	6.6	0.2598	58		
0776862	6.7	0.2638			
0776879	6.8	0.2677			
0776885	6.9	0.2717			
0776891	7.0	0.2756			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0776907	7.1	0.2795	62	118	8
0776913	7.2	0.2835			
0776920	7.3	0.2874			
0776936	7.4	0.2913			
0776942	7.5	0.2953			
0776959	7.6	0.2992	66		
0776965	7.7	0.3031			
0776971	7.8	0.3071			
0776988	7.9	0.3110			
0776994	8.0	0.3150			
0777009	8.1	0.3189	70	127	9
0777015	8.2	0.3228			
0777021	8.3	0.3268			
0777038	8.4	0.3307			
0777044	8.5	0.3346			
0777050	8.6	0.3386	74		
0777067	8.7	0.3425			
0777073	8.8	0.3465			
0777080	8.9	0.3504			
0777096	9.0	0.3543			
0777101	9.1	0.3583	78	136	10
0777118	9.2	0.3622			
0777124	9.3	0.3661			
0777130	9.4	0.3701			
0777147	9.5	0.3740			
0777153	9.6	0.3780	82		
0777160	9.7	0.3819			
0777176	9.8	0.3858			
0777182	9.9	0.3898			
0777199	10.0	0.3937			
0777204	10.1	0.3976	87	149	11
0777210	10.2	0.4016			
0777227	10.3	0.4055			
0777233	10.4	0.4094			
0777240	10.5	0.4134			
0777256	10.6	0.4173	91		
0777262	10.7	0.4213			
0777279	10.8	0.4252			
0777285	10.9	0.4291			
0777291	11.0	0.4331			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0777307	11.1	0.4370	95	158	12
0777313	11.2	0.4409			
0777320	11.3	0.4449			
0777336	11.4	0.4488			
0777342	11.5	0.4528			
0777359	11.6	0.4567	99		
0777365	11.7	0.4606			
0777371	11.8	0.4646			
0777388	11.9	0.4685			
0777394	12.0	0.4724			
0777400	12.1	0.4764	103	167	13
0777416	12.2	0.4803			
0777422	12.3	0.4843			
0777439	12.4	0.4882			
0777445	12.5	0.4921			
0777451	12.6	0.4961	107		
0777468	12.7	0.5000			
0777474	12.8	0.5039			
0777480	12.9	0.5079			
0777497	13.0	0.5118			
0777502	13.1	0.5157	111	176	14
0777519	13.2	0.5197			
0777525	13.3	0.5236			
0777531	13.4	0.5276			
0777548	13.5	0.5315			

EDP #	Size mm	Decimal Equivalent	Flute Length	Overall Length	Shank Diameter
		Dc	ℓ	L	Ds
0777554	13.6	0.5354	115	176	14
0777560	13.7	0.5394			
0777577	13.8	0.5433			
0777583	13.9	0.5472			
0777590	14.0	0.5512			
0777605	14.1	0.5551	119	185	15
0777611	14.2	0.5591			
0777628	14.3	0.5630			
0777634	14.4	0.5669			
0777640	14.5	0.5709			
0777657	14.6	0.5748	124		
0777663	14.7	0.5787			
0777670	14.8	0.5827			
0777686	14.9	0.5866			
0777692	15.0	0.5906			
0777708	15.1	0.5945	128	194	16
0777714	15.2	0.5984			
0777720	15.3	0.6024			
0777737	15.4	0.6063			
0777743	15.5	0.6102			
0777750	15.6	0.6142	132		
0777766	15.7	0.6181			
0777772	15.8	0.6220			
0777789	15.9	0.6260			
0777795	16.0	0.6299			

LIST 9866 Standard Cutting Conditions

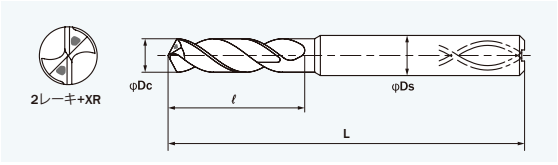
Work Material	Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Titanium Alloys		Nickel Alloys Inconel		Aluminum Alloy	
Speed (SFM)	380 - 400 SFM		310 - 330 SFM		240 - 260 SFM		120 - 140 SFM		320 - 340 SFM		240 - 260 SFM		140 - 160 SFM		115 - 135 SFM		115 - 135 SFM		440 - 460 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)	RPM	Feed (IPR)	RPM	Feed (IPR)
3	12700	0.0038	10600	0.0038	8250	0.0035	4200	0.0024	10600	0.0035	8000	0.0031	4850	0.0030	4000	0.0030	4000	0.0018	14550	0.0041
5	7600	0.0063	6300	0.0063	4950	0.0058	2500	0.0040	6300	0.0059	4850	0.0052	2900	0.0049	2300	0.0049	2300	0.0029	8700	0.0069
8	4700	0.0101	3950	0.0101	3100	0.0087	1550	0.0060	3950	0.0087	3000	0.0079	1800	0.0077	1450	0.0077	1450	0.0047	5450	0.0110
10	3800	0.0126	3200	0.0126	2450	0.0101	1250	0.0070	3200	0.0097	2400	0.0093	1450	0.0091	1150	0.0091	1150	0.0057	4400	0.0138
12	3200	0.0132	2700	0.0132	2050	0.0104	1050	0.0082	2650	0.0098	200	0.0105	1200	0.0103	1000	0.0102	1000	0.0067	3650	0.0151
16	2400	0.0157	2000	0.0157	1550	0.0118	800	0.0103	2000	0.0122	1500	0.0125	900	0.0122	750	0.0121	750	0.0074	2750	0.0189

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
5) Use high pressure internal coolant
6) In applications where chip jamming is a problem, use peck drilling.
7) Retract plane for peck drilling should be set to the top of the hole.
8) Recommended peck depth is 0.2 - 1.0 x Dc.

NEW!

AQUA REVO DRILL OIL HOLE 8D

Carbide Material | REVO D Coating | h7 Dia. Tolerance | 140° Point Angle | 26° ~30° Helix | h6 Shank Dia. Tol. | 3.0-16.0 Size Range



LIST 9868 Metric Sizes
LIST 9869 Wire, Fractional & Letter Sizes

Unit: mm

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0780632	3.000	0.1181		34	81	3
0780649	3.100	0.1220		39	92	4
1571126	3.175	0.1250	1/8			
0780655	3.200	0.1260				
0780661	3.300	0.1299				
0780678	3.400	0.1339				
0780684	3.500	0.1378				
1571132	3.572	0.1406	9/64	45		
0780690	3.600	0.1417				
0780706	3.700	0.1457				
0780712	3.800	0.1496				
0780729	3.900	0.1535				
1571149	3.969	0.1563	5/32			
0780735	4.000	0.1575				
1571155	4.039	0.1590	#21	50	105	5
1571161	4.089	0.1610	#20			
0780741	4.100	0.1614				
0780758	4.200	0.1654				
0780764	4.300	0.1693				
1571178	4.366	0.1719	11/64			
0780770	4.400	0.1732				
0780787	4.500	0.1772				
0780793	4.600	0.1811		56		
0780809	4.700	0.1850				
157184	4.762	0.1875				
0780815	4.800	0.1890				
0780821	4.900	0.1929				
0780838	5.000	0.1969				
0780844	5.100	0.2008		62	118	6
1571190	5.105	0.2010	#7			
1571206	5.159	0.2031	13/64			
0780850	5.200	0.2047				
0780867	5.300	0.2087				
0780873	5.400	0.2126				
1571212	5.410	0.2130	#3			
0780880	5.500	0.2165				
1571229	5.556	0.2187	7/32	68		
0780896	5.600	0.2205				
1571235	5.613	0.2210	#2			
0780901	5.700	0.2244				
0780918	5.800	0.2283				
0780924	5.900	0.2323				
1571241	5.953	0.2344	15/64			
0780930	6.000	0.2362				
1569949	6.100	0.2402		73	130	8
1569955	6.200	0.2441				
1569961	6.300	0.2480				
1571258	6.350	0.2500	1/4			
1569978	6.400	0.2520				
1569984	6.500	0.2559				
1571264	6.528	0.2570	F	79		
1569990	6.600	0.2598				
1570004	6.700	0.2638				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
1571270	6.747	0.2656	17/64	79	130	8
1570010	6.800	0.2677				
1570027	6.900	0.2717				
1571287	6.909	0.2720	I			
1570033	7.000	0.2756				
1571293	7.036	0.2770	J	84	142	
0781049	7.100	0.2795				
1571309	7.144	0.2813	9/32			
0781055	7.200	0.2835				
0781061	7.300	0.2874				
0781078	7.400	0.2913				
0781084	7.500	0.2953				
1571315	7.541	0.2969	19/64	90		
0781090	7.600	0.2992				
0781106	7.700	0.3031				
0781112	7.800	0.3071				
0781129	7.900	0.3110				
1571321	7.937	0.3125	5/16			
0781135	8.000	0.3150				
1570040	8.100	0.3189		95	154	10
1570056	8.200	0.3228				
1571338	8.204	0.3230	P			
1570062	8.300	0.3268				
1571344	8.334	0.3281	21/64			
1570079	8.400	0.3307				
1571350	8.433	0.3320	Q			
1570085	8.500	0.3346				
1570091	8.600	0.3386		101		
1570107	8.700	0.3425				
1571367	8.731	0.3437	11/32			
1570113	8.800	0.3465				
1570120	8.900	0.3504				
1570136	9.000	0.3543				
0781244	9.100	0.3583		106	166	
1571373	9.128	0.3594	23/64			
0781250	9.200	0.3622				
0781267	9.300	0.3661				
1571380	9.347	0.3680	U			
0781273	9.400	0.3701				
0781280	9.500	0.3740				
1571396	9.525	0.3750	3/8	112		
0781296	9.600	0.3780				
0781301	9.700	0.3819				
0781318	9.800	0.3858				
0781324	9.900	0.3898				
1571401	9.922	0.3906	25/64			
0781330	10.000	0.3937				
1570142	10.100	0.3976		118	182	12
1570159	10.200	0.4016				
1570165	10.300	0.4055				
1571418	10.319	0.4063	13/32			
1570171	10.400	0.4094				
1570188	10.500	0.4134				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
1570194	10.600	0.4173		124	182	12
1570200	10.700	0.4213				
1571424	10.716	0.4219	27/64			
1570216	10.800	0.4252				
1570222	10.900	0.4291				
1570239	11.000	0.4331				
0781440	11.100	0.4370		129	194	
1571430	11.112	0.4375	7/16			
0781456	11.200	0.4409				
0781462	11.300	0.4449				
0781479	11.400	0.4488				
0781485	11.500	0.4528				
1571447	11.509	0.4531	29/64	135		
0781491	11.600	0.4567				
0781507	11.700	0.4606				
0781513	11.800	0.4646				
0781520	11.900	0.4685				
1571453	11.906	0.4687	15/63			
0781536	12.000	0.4724				
1570245	12.100	0.4764		140	206	14
1570251	12.200	0.4803				
1570268	12.300	0.4843				
1571460	12.303	0.4844	31/64			
1570274	12.400	0.4882				
1570280	12.500	0.4921				
1570297	12.600	0.4961		146		
1570302	12.700	0.5000				
1570319	12.800	0.5039				
1570325	12.900	0.5079				
1570331	13.000	0.5118				
0781645	13.097	0.5156	33/64	151	218	
0781645	13.100	0.5157				
0781651	13.200	0.5197				
0781668	13.300	0.5236				

EDP#	Size	Decimal Equiv.	Wire, Fractional, Letter	Flute Length	Overall Length	Shank Diameter
	Dc			l	L	Ds
0781674	13.400	0.5276		151	218	14
1571476	13.494	0.5313	17/32			
0781680	13.500	0.5315				
0781697	13.600	0.5354		157		
0781702	13.700	0.5394				
0781719	13.800	0.5433				
1571482	13.891	0.5469	35/64			
0781725	13.900	0.5472				
0781731	14.000	0.5512				
1570348	14.100	0.5551		163	230	16
1570354	14.200	0.5591				
1571499	14.287	0.5625	9/16			
1570360	14.300	0.5630				
1570377	14.400	0.5669				
1570383	14.500	0.5709				
1570390	14.600	0.5748		169		
1571504	14.684	0.5781	37/64			
1570405	14.700	0.5787				
1570411	14.800	0.5827				
1570428	14.900	0.5866				
1570434	15.000	0.5906				
1571510	15.081	0.5937	19/32	174	242	
0781840	15.100	0.5945				
0781857	15.200	0.5984				
0781863	15.300	0.6024				
0781870	15.400	0.6063				
1571527	15.478	0.6094	39/64			
0781886	15.500	0.6102				
0781892	15.600	0.6142		180		
0781908	15.700	0.6181				
0781914	15.800	0.6220				
1571533	15.875	0.6250	5/8			
0781920	15.900	0.6260				
0781937	16.000	0.6299				

LIST 9868, 9869 Standard Cutting Conditions

Work Material		Structural Steel Carbon Steel Cast Iron		Alloy Steel Heat Treated Steel (20 - 30 HRC)		Mold Steel Hardened Steel (30 - 40 HRC)		Hardened Steel (40 - 50 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Titanium Alloys		Nickel Alloys Inconel		Aluminum Alloy	
Speed (SFM)		380 - 400 SFM		310 - 330 SFM		240 - 260 SFM		120 - 140 SFM		320 - 340 SFM		240 - 260 SFM		140 - 160 SFM		115 - 135 SFM		115 - 135 SFM		440 - 460 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)	RPM	Feed (IPR)
Metric	Fractional																				
3		12700	0.0038	10600	0.0038	8250	0.0035	4200	0.0024	10600	0.0035	8000	0.0031	4850	0.0030	4000	0.0030	4000	0.0018	14550	0.0041
	1/8	12000	0.0040	10000	0.0040	7800	0.0037	4000	0.0026	9950	0.0037	7650	0.0033	4600	0.0032	3700	0.0032	3700	0.0019	13750	0.0044
	3/16	7950	0.0060	6650	0.0060	5200	0.0056	2650	0.0038	6650	0.0056	5100	0.0050	3000	0.0047	2450	0.0047	2450	0.0028	9200	0.0066
5		7600	0.0063	6300	0.0063	4950	0.0058	2500	0.0040	6300	0.0059	4850	0.0052	2900	0.0049	2300	0.0049	2300	0.0029	8700	0.0069
	1/4	6000	0.0080	5000	0.0080	3900	0.0071	2000	0.0048	5000	0.0076	3800	0.0066	2300	0.0064	1850	0.0064	1850	0.0038	6700	0.0088
	5/16	4750	0.0099	4000	0.0099	3150	0.0088	1600	0.0059	4000	0.0086	3050	0.0078	1850	0.0076	1500	0.0076	1500	0.0046	5500	0.0109
8		4700	0.0101	3950	0.0101	3100	0.0087	1550	0.0060	3950	0.0087	3000	0.0079	1800	0.0077	1450	0.0077	1450	0.0047	5450	0.0110
	3/8	4000	0.0120	3350	0.0120	2600	0.0098	1350	0.0065	3300	0.0093	2550	0.0089	1550	0.0087	1250	0.0087	1250	0.0056	4600	0.0131
10		3800	0.0126	3200	0.0126	2450	0.0101	1250	0.0070	3200	0.0097	2400	0.0093	1450	0.0091	1150	0.0091	1150	0.0057	4400	0.0138
12		3200	0.0132	2700	0.0132	2050	0.0104	1050	0.0082	2650	0.0098	200	0.0105	1200	0.0103	1000	0.0102	1000	0.0067	3650	0.0151
	1/2	3000	0.0140	2500	0.0140	1950	0.0107	1000	0.0083	2500	0.0104	1900	0.0111	1150	0.0108	950	0.0107	950	0.0072	3450	0.0160
16		2400	0.0157	2000	0.0157	1550	0.0118	800	0.0103	2000	0.0122	1500	0.0125	900	0.0122	750	0.0121	750	0.0074	2750	0.0189

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) When rigidity is low and chattering occurs, reduce the roation and feed rate.
3) Wet conditions are for drilling with water soluble cutting fluid.
4) In non-water soluble cutting fluid, reduce the rotation and feed rate by 20%.
6) In applications where chip jamming is a problem, use peck drilling.
7) Retract plane for peck drilling should be set to the top of the hole.
8) Recommended peck depth is 0.2 - 1.0 x Dc.

NEW!

AQUA REVO DRILL MICRO

AQRVDM 5D/10D

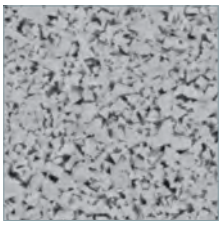
Product Info Video

REVOLUTIONIZING THE WORLD OF MANUFACTURING

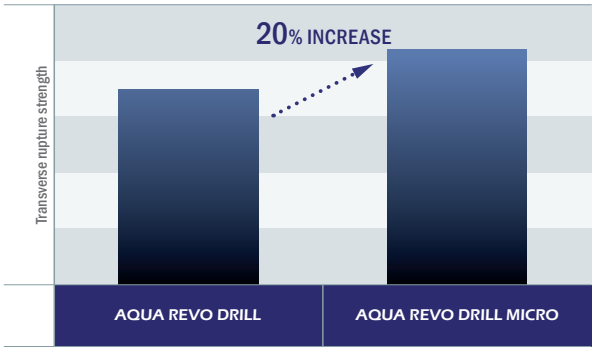
- New lineup of small diameter sizes for the AquaREVO Drill series
- Achieves "long tool life that is hard to break" and "stable cutting with little dispersion" required for small-diameter drills

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

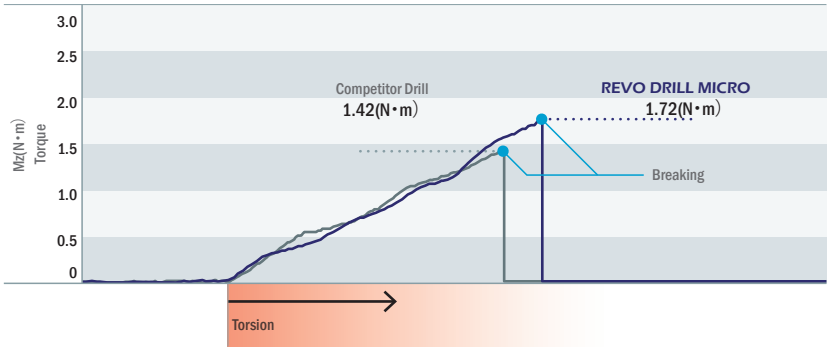


GEOMETRY

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.

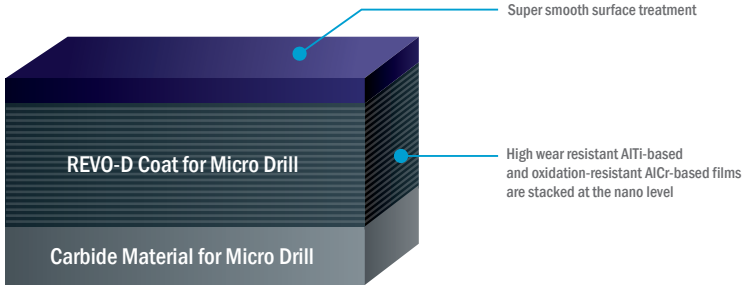
The breaking torsion torque



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.

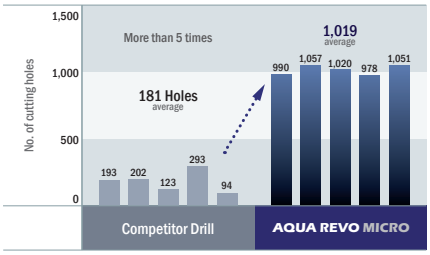


Cross-sectional structure of coating film for micro drill

LONG TOOL LIFE

Hard to break even when drilling small diameter holes

S50C

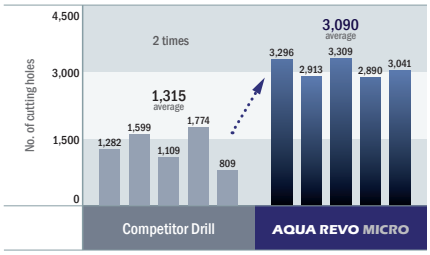


ϕ 0.5
Diameter
S50C (180HB)
Work Material
40m/min
Cutting Speed
0.03mm/rev
Feed Rate

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

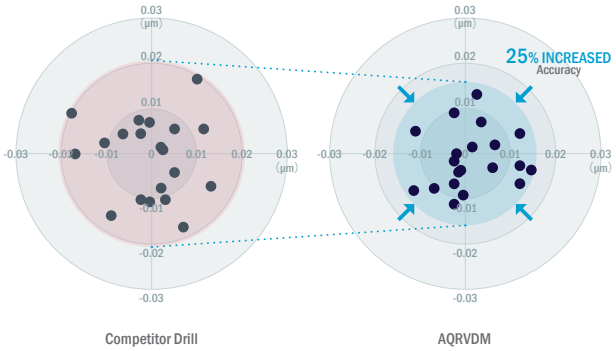
5mm (10DC)
Depth of Cutting: Blind hole
0.1mm (0.2DC)
Step feed

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.



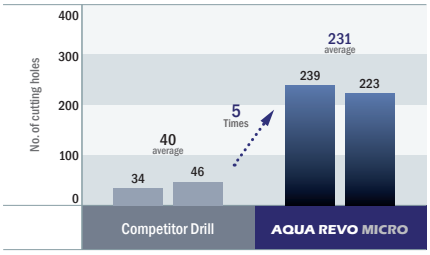
0.5
Diameter
SUS304
Work Material
9m/min
Cutting Speed
0.02mm/rev
Feed Rate
5mm (10DC)
Depth of Cutting: Blind hole
0.1mm (0.2DC)
Step feed

Cutting Fluid: Water-soluble
M/C
Machine: Vertical M/C

MULTI-PURPOSE

Compatible with a wide range of work materials

SCM440H (32HRC)

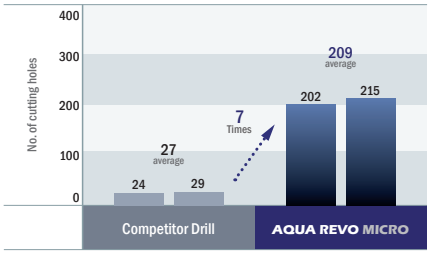


0.5
Diameter
SCM440H (32HRC)
Work Material
30m/min
Cutting Speed
0.02mm/rev
Feed Rate

5mm (10DC)
Depth of Cutting: Blind hole
0.1mm (0.2DC)
Step feed

Cutting Fluid: Water-soluble
M/C
Machine: Vertical M/C

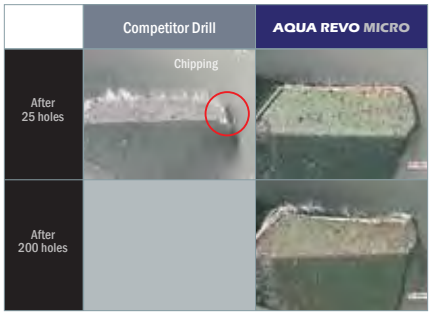
SKD61 (53HRC)



ΦO.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

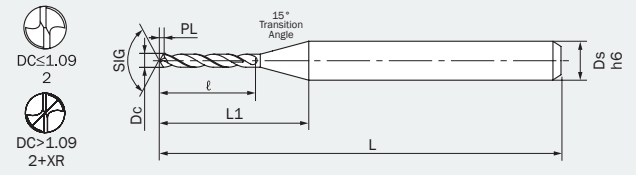
Work Material	Structural Steel	Carbon Steel	Alloy Steel Heat treated Steel	Mold Steel Pre-Hardened Steel	Hardened Steel		Cast Iron	Stainless Steel			Aluminum Alloy
	SS400	S45C S50C	SCM SCr	30~40HRC	40~50HRC	50~55HRC	FC FCD	SUS304 SUS316	SUS420	SUS630	AC ADC
AQRVDM	◎	◎	◎	◎	◎	○	○	◎	◎	◎	○

◎: Excellent ○: Good

NEW!

AQUA REVO DRILL MICRO 5D

Carbide (Material) | REVO D (Coating) | SEE FOOTNOTE AFTER TABLE (*Dia. Tolerance) | 120° (**Point Angle Dc ≤ 1.09) | 135° (**Point Angle Dc > 1.09) | 30° (Helix) | h6 (Shank Dia. Tol.) | 0.50-1.99 (Size Range)



LIST 9878 Decimal 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				
0787018	1.00	0.0394		11.7		
0787024	1.01	0.0398	7.4	12		
0787030	1.02	0.0402				
0787047	1.03	0.0406				
0787053	1.04	0.0409				
0787060	1.05	0.0413				
0787076	1.06	0.0417	7.7	12.3		
0787082	1.07	0.0421				
0787099	1.08	0.0425				
0787104	1.09	0.0429				
0787110	1.10	0.0433		12.2		
0787127	1.11	0.0437	8.1	12.6		
0787133	1.12	0.0441				
0787140	1.13	0.0445				
0787156	1.14	0.0449				
0787162	1.15	0.0453				
0787179	1.16	0.0457	8.4	12.8		
0787185	1.17	0.0461				
0787191	1.18	0.0465				
0787207	1.19	0.0469				
0787213	1.20	0.0472				
0787220	1.21	0.0476	8.8	13.1		
0787236	1.22	0.0480				
0787242	1.23	0.0484				
0787259	1.24	0.0488				
0787265	1.25	0.0492				
0787271	1.26	0.0496	9.1	13.3		
0787288	1.27	0.0500				
0787294	1.28	0.0504				
0787300	1.29	0.0508				
0787316	1.30	0.0512				

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				
0787374	1.36	0.0535	9.8	13.8		
0787380	1.37	0.0539				
0787397	1.38	0.0543				
0787402	1.39	0.0547				
0787419	1.40	0.0551				
0787425	1.41	0.0555	10.2	14.1		
0787431	1.42	0.0559				
0787448	1.43	0.0563				
0787454	1.44	0.0567				
0787460	1.45	0.0571				
0787477	1.46	0.0575	10.5	14.3		
0787483	1.47	0.0579				
0787490	1.48	0.0583				
0787505	1.49	0.0587				
0787511	1.50	0.0591				
0787528	1.51	0.0594	10.9	14.6		
0787534	1.52	0.0598				
0787540	1.53	0.0602				
0787557	1.54	0.0606				
0787563	1.55	0.0610				
0787570	1.56	0.0614	11.3	14.9		
0787586	1.57	0.0618				
0787592	1.58	0.0622				
0787608	1.59	0.0626				
0787614	1.60	0.0630				
0787620	1.61	0.0634	11.6	15.1	45	
0787637	1.62	0.0638				
0787643	1.63	0.0642				
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				
0787723	1.71	0.0673	12.3	15.6		
0787730	1.72	0.0677				
0787746	1.73	0.0681				
0787752	1.74	0.0685				
0787769	1.75	0.0689				
0787775	1.76	0.0693	12.7	15.9		
0787781	1.77	0.0697				
0787798	1.78	0.0701				
0787803	1.79	0.0705				
0787810	1.80	0.0709				
0787826	1.81	0.0713	13.0	16.1		
0787832	1.82	0.0717				
0787849	1.83	0.0720				
0787855	1.84	0.0724				
0787861	1.85	0.0728				
0787878	1.86	0.0732	13.3	16.4		
0787884	1.87	0.0736				
0787890	1.88	0.0740				
0787906	1.89	0.0744				
0787912	1.90	0.0748				
0787929	1.91	0.0752	13.7	16.7		
0787935	1.92	0.0756				
0787941	1.93	0.0760				
0787958	1.94	0.0764				
0787964	1.95	0.0768				
0787970	1.96	0.0772	14.0	16.9		
0787987	1.97	0.0776				
0787993	1.98	0.0780				
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

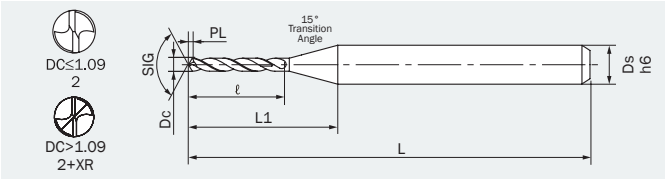
Work Material	Carbon Steel, Cast Iron (200 HB)		Alloy Steel (20 - 30 HRC)		Mold Steel (30 - 40 HRC)		Hardened Steel (40 - 55 HRC)		Ductile Cast Iron		Stainless Steel		PH Stainless		Aluminum Alloy	
Drill Diam. mm	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	RPM	Feed (IPR)	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 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.

NEW!

AQUA REVO DRILL MICRO 10D

Carbide — Material
REVO D — Coating
SEE FOOTNOTE AFTER TABLE — *Dia. Tolerance
120° — **Point Angle Dc ≤ 1.09
135° — **Point Angle Dc > 1.09
30° — Helix
h6 — Shank Dia. Tol.
0.50-1.99 — Size Range



LIST 9880 Decimal 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				

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.

NACHI

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