NACHI

NEW

REVOlutionizing the World of Product Manufacturing

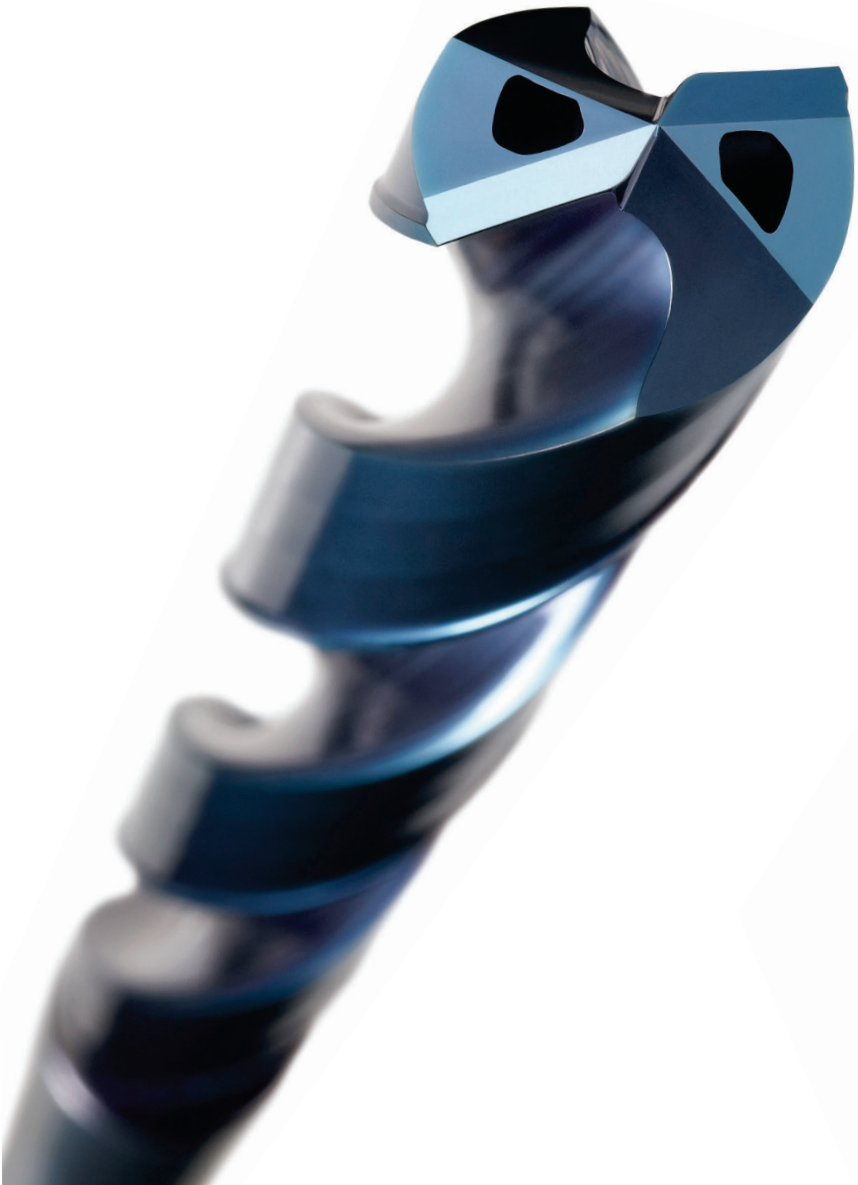
AQUA REVO DRILLS
DRILLS OIL HOLE

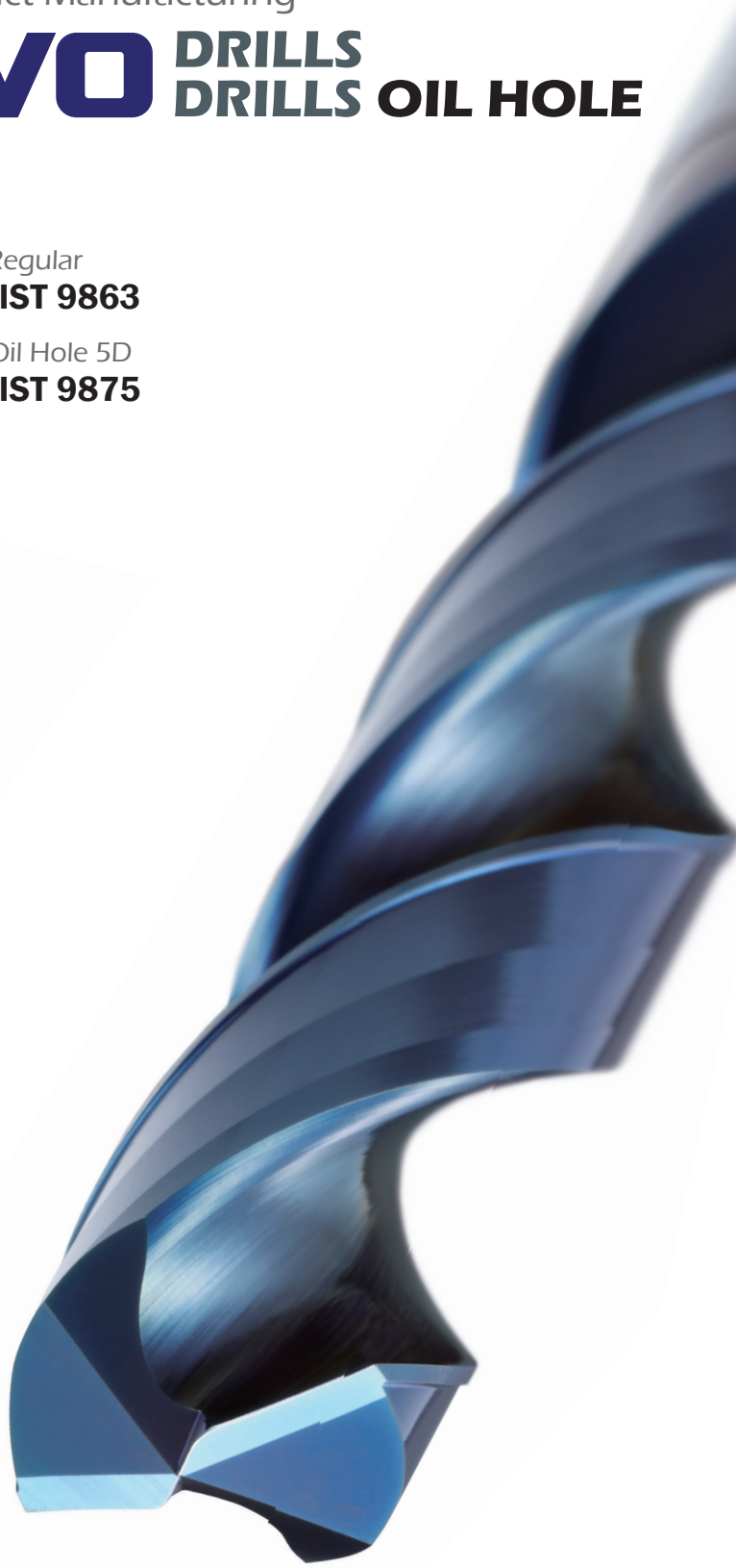
Aqua REVO Drill Stub
LIST 9860 **LIST 9861**

Aqua REVO Drill Regular
LIST 9862 **LIST 9863**

Aqua REVO Drill Oil Hole 3D
LIST 9872 **LIST 9873**

Aqua REVO Drill Oil Hole 5D
LIST 9874 **LIST 9875**



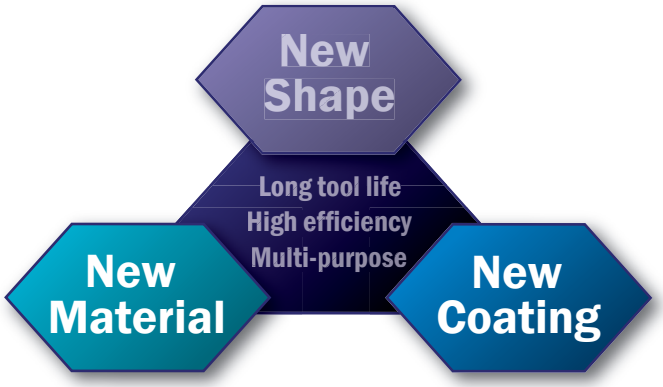


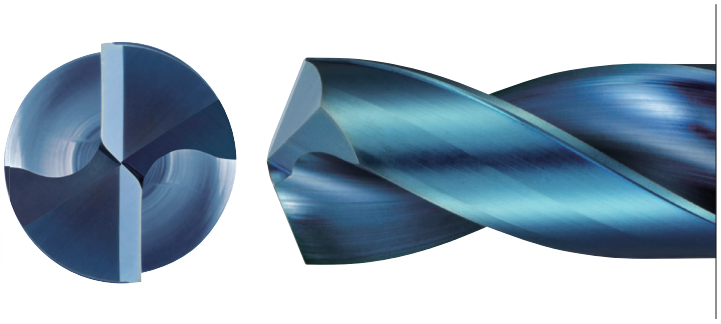
REVOlutionizing the World of Product Manufacturing

AQUA REVO DRILLS

LIST 9860, 9861 / LIST 9862, 9863

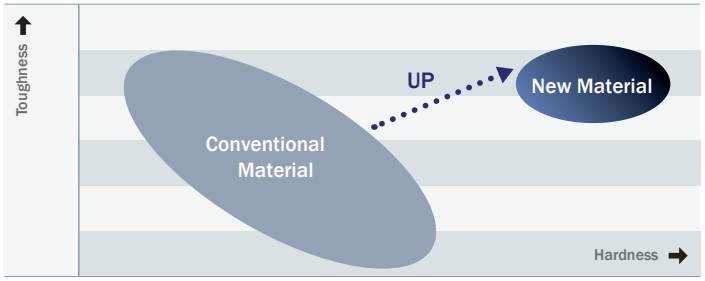
AQUA REVO Drills Stub/Regular
All New Material, Design and Coating
Dramatically improves all functions of drilling





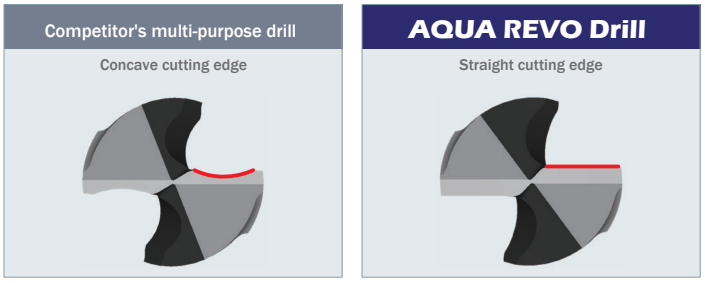
New Material

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



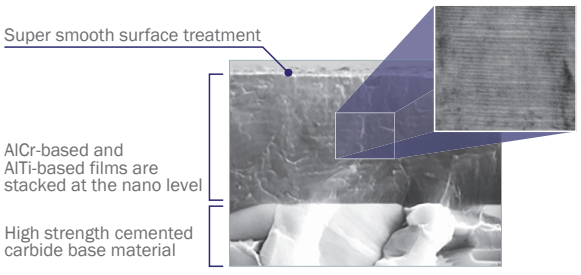
New Shape

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



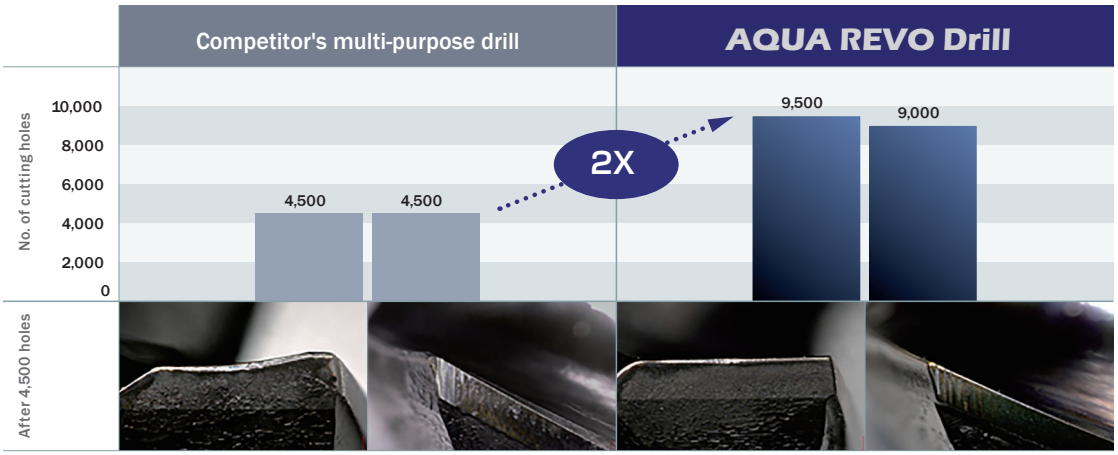
New Coating

- 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



ϕ6.0
Diameter

S50C
Work Material

100m/min
Cutting speed

0.19mm/rev
Feed Rate

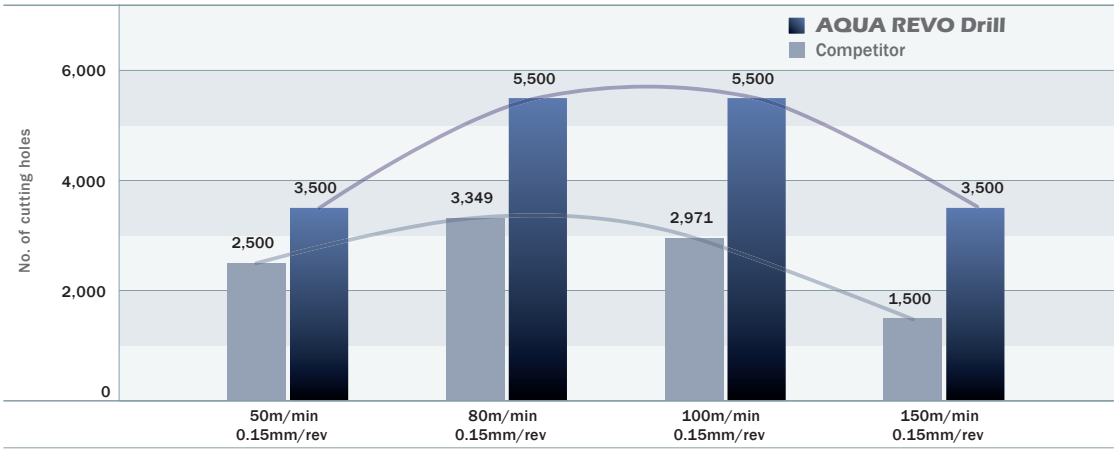
30mm(5Dc)
Depth of Cutting

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



ϕ6.0
Diameter

S50C
Work Material

30mm(5Dc)
Depth of Cutting

Machine: Vertical M/C

Cutting Fluid: Water-soluble

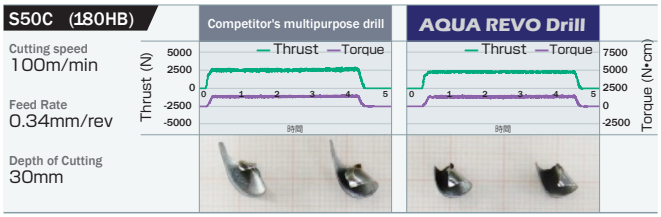
Multi-purpose

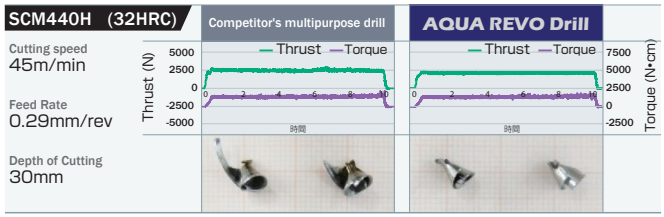
Able to cut high hardness materials and difficult-to-cut materials,
while maintaining high quality processing and increasing efficiency

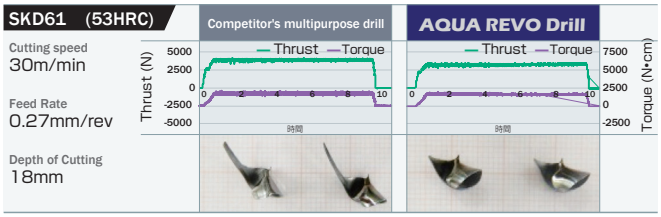
ϕ6.0
Diameter

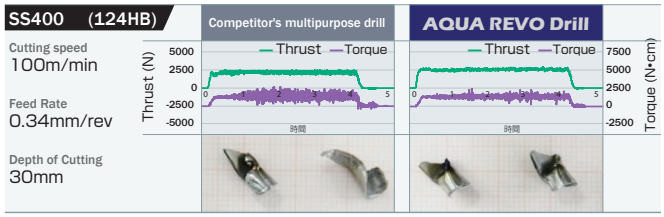
Machine: Vertical M/C

Cutting Fluid: Water-soluble



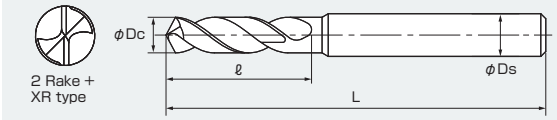






AQUA REVO Drill Stub

Carbide Material | REVO D Coating | h7 Dia. Tol. | 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	2.10	0.0827		11		
0769990	2.20	0.0866				
0770010	2.30	0.0906				
1547745	2.38	0.0938	3/32			
0770033	2.40	0.0945				
0770056	2.50	0.0984				
0770079	2.60	0.1024		14		
0770091	2.70	0.1063				
1547751	2.78	0.1094	7/64			
0770113	2.80	0.1102				
0770136	2.90	0.1142				
0770159	3.00	0.1181				
0770171	3.10	0.1220		20	55	4
1547768	3.18	0.1250	1/8			
0770194	3.20	0.1260				
0770216	3.30	0.1299				
0770239	3.40	0.1339				
0770251	3.50	0.1378				
1547774	3.57	0.1406	9/64	22		
0770274	3.60	0.1417				
0770297	3.70	0.1457				
0770319	3.80	0.1496				
0770331	3.90	0.1535				
1547780	3.97	0.1563	5/32			
0770354	4.00	0.1575				
1548094	4.04	0.1590	#21	24	62	6
1548100	4.09	0.1610	#20			
0773783	4.10	0.1614				
0773790	4.20	0.1654				
0773805	4.30	0.1693				
1547797	4.37	0.1719	11/64			
0773811	4.40	0.1732				
0773828	4.50	0.1772				
0773834	4.60	0.1811		26		
0773840	4.70	0.1850				
1547802	4.76	0.1875	3/16			
0773857	4.80	0.1890				
0773863	4.90	0.1929				
0773870	5.00	0.1969				
0770572	5.10	0.2008			66	
1548116	5.11	0.2010	#7			
1547819	5.16	0.2031	13/64			
0770595	5.20	0.2047				
0770617	5.30	0.2087				
0770630	5.40	0.2126				
1548122	5.41	0.2130	#3			
0770652	5.50	0.2165				
1547825	5.56	0.2188	7/32	28		
0770675	5.60	0.2205				
1548139	5.61	0.2210	#2			
0770698	5.70	0.2244				
0770710	5.80	0.2283				
0770732	5.90	0.2323				
1547831	5.95	0.2344	15/64			

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0770755	6.00	0.2362		28	66	6
0773886	6.10	0.2402		32	74	8
0773892	6.20	0.2441				
0773908	6.30	0.2480				
1547848	6.35	0.2500	1/4			
0773914	6.40	0.2520				
0773920	6.50	0.2559				
1548145	6.53	0.2570	F	35		
0773937	6.60	0.2598				
0773943	6.70	0.2638				
1547854	6.75	0.2656	17/64			
0773950	6.80	0.2677				
0773966	6.90	0.2717				
1548151	6.91	0.2720	I			
0773972	7.00	0.2756				
1548168	7.04	0.2770	J		79	
0770864	7.10	0.2795				
1547860	7.14	0.2813	9/32			
0770870	7.20	0.2835				
0770887	7.30	0.2874				
0770893	7.40	0.2913				
0770909	7.50	0.2953				
1547877	7.54	0.2969	19/64	38		
0770915	7.60	0.2992				
0770921	7.70	0.3031				
0770938	7.80	0.3071				
0770944	7.90	0.3110				
1547883	7.94	0.3125	5/16			
0770950	8.00	0.3150				
0773989	8.10	0.3189			83	10
0773995	8.20	0.3228				
1548174	8.204	0.3230	P			
0774000	8.30	0.3268				
1547890	8.33	0.3281	21/64			
0774016	8.40	0.3307				
1548180	8.43	0.3320	Q			
0774022	8.50	0.3346				
0774039	8.60	0.3386		40		
0774045	8.70	0.3425				
1547905	8.73	0.3438	11/32			
0774051	8.80	0.3465				
0774068	8.90	0.3504				
0774074	9.00	0.3543				
0771069	9.10	0.3583			89	
1547911	9.13	0.3594	23/64			
0771075	9.20	0.3622				
0771081	9.30	0.3661				
1548197	9.35	0.3680	U			
0771098	9.40	0.3701				
0771103	9.50	0.3740				
1547928	9.53	0.3750	3/8	43		
0771110	9.60	0.3780				
0771126	9.70	0.3819				
0771132	9.80	0.3858				
0771149	9.90	0.3898				

Unit: mm

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1547934	9.92	0.3906	25/64	43	89	10
0771155	10.00	0.3937			95	12
0774080	10.10	0.3976				
0774097	10.20	0.4016				
0774102	10.30	0.4055				
1547940	10.32	0.4063	13/32			
0774119	10.40	0.4094				
0774125	10.50	0.4134				
0774131	10.60	0.4173		47		
0774148	10.70	0.4213				
1547957	10.72	0.4219	27/64			
0774154	10.80	0.4252				
0774160	10.90	0.4291				
0774177	11.00	0.4331			102	
0771264	11.10	0.4370				
1547963	11.11	0.4375	7/16			
0771270	11.20	0.4409				
0771287	11.30	0.4449				
0771293	11.40	0.4488				
0771309	11.50	0.4528				
1547970	11.51	0.4531	29/64	50		
0771315	11.60	0.4567				
0771321	11.70	0.4606				
0771338	11.80	0.4646				
0771344	11.90	0.4685				
1547986	11.91	0.4688	15/32			
0771350	12.00	0.4724				
0774183	12.10	0.4764				14
0774190	12.20	0.4803				
0774205	12.30	0.4843				
1547992	12.30	0.4844	31/64			
0774211	12.40	0.4882				
0774228	12.50	0.4921				
0774234	12.60	0.4961		52		
0774240	12.70	0.5000	1/2			
0774257	12.80	0.5039				
0774263	12.90	0.5079				
0774270	13.00	0.5118				

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1548013	13.10	0.5156	33/64	53	107	14
0771460	13.10	0.5157				
0771476	13.20	0.5197				
0771482	13.30	0.5236				
0771499	13.40	0.5276				
1548020	13.49	0.5313	17/32			
0771504	13.50	0.5315				
0771510	13.60	0.5354		55		
0771527	13.70	0.5394				
0771533	13.80	0.5433				
1548036	13.89	0.5469	35/64			
0771540	13.90	0.5472				
0771556	14.00	0.5512				
0774286	14.10	0.5551			110	16
0774292	14.20	0.5591				
1548042	14.29	0.5625	9/16			
0774308	14.30	0.5630				
0774314	14.40	0.5669				
0774320	14.50	0.5709				
0774337	14.60	0.5748		56		
1548059	14.68	0.5781	37/64			
0774343	14.70	0.5787				
0774350	14.80	0.5827				
0774366	14.90	0.5866				
0774372	15.00	0.5906				
1548065	15.08	0.5938	19/32		114	
0771665	15.10	0.5945				
0771671	15.20	0.5984				
0771688	15.30	0.6024				
0771694	15.40	0.6063				
1548071	15.48	0.6094	39/64			
0771700	15.50	0.6102				
0771716	15.60	0.6142		58		
0771722	15.70	0.6181				
0771739	15.80	0.6220				
1548088	15.88	0.6250	5/8			
0771745	15.90	0.6260				
0771751	16.00	0.6299				

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

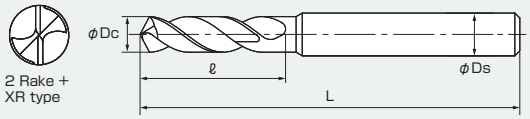
LIST 9860/61 Standard Cutting Conditions

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	
Speed (SFM)	320-330 SFM		255-265 SFM		140-150 SFM		95-105 SFM		245-255 SFM		100-105 SFM		80-90 SFM	
Drill Dia. Metric Fractional	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR
2.0	16000	0.0025	12700	0.0025	7200	0.0019	4800	0.0016	12000	0.0025	4850	0.0014	4120	0.0012
3.0	10600	0.0041	8500	0.0041	4800	0.0032	3200	0.0026	8000	0.0041	3230	0.0020	2750	0.0018
1/8	10000	0.0043	7950	0.0044	4450	0.0034	2900	0.0027	7500	0.0043	3060	0.0021	2600	0.0019
3/16	6700	0.0065	5300	0.0065	2950	0.0051	1950	0.0041	5000	0.0065	2040	0.0030	1730	0.0028
5.0	6400	0.0068	5050	0.0069	2800	0.0055	1850	0.0045	4800	0.0068	1940	0.0031	1650	0.0030
1/4	5000	0.0086	4000	0.0088	2200	0.0070	1450	0.0057	3750	0.0086	1530	0.0037	1300	0.0037
5/16	4050	0.0108	3200	0.0109	1800	0.0087	1200	0.0071	3050	0.0108	1220	0.0047	1040	0.0047
8.0	4000	0.0108	3150	0.0111	1750	0.0088	1150	0.0072	3000	0.0109	1200	0.0047	1030	0.0047
3/8	3350	0.0129	2650	0.0120	1500	0.0105	1000	0.0085	2500	0.0130	1020	0.0052	870	0.0056
10.0	3200	0.0129	2500	0.0126	1400	0.0107	950	0.0083	2400	0.0131	970	0.0055	830	0.0059
12.0	2650	0.0148	2100	0.0150	1200	0.0115	800	0.0094	2000	0.0148	800	0.0066	690	0.0071
1/2	2500	0.0157	2000	0.0158	1100	0.0121	750	0.0099	1900	0.0156	760	0.0070	650	0.0075
16.0	2000	0.0175	1550	0.0178	900	0.0140	600	0.0111	1500	0.0173	600	0.0082	510	0.0094

NOTES:
1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) In machine or installation of machining step, when there is no rigidity of machine or chattering occurs, reduce the rotation and feed rate.
3) Wet condition 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 the step feed in Stainless Steel when hole depth more than 2×Dc deep, step feed interval is about 0.5×Dc.
6) Use air blow for cooling and the chip exclusion in dry process.
7) By sparks during cutting, or heat by breakage, or hot chip, there is danger of fire. Take fire prevention measures.
8) Retraction of the step feed is to be returned to the top of the hole.
9) Step feed is recommended to 0.5～1.0×Dc. In the case of small diameter step feed is recommended to 0.2～0.5×Dc.
10) Please use the fixture to control the amplitude of the drill bit below 0.02mm, for small diameter, high-speed cutting control amplitude of the drill bit 0.01mm or less.

AQUA REVO Drill Regular

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



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	2.00	0.0787		15	49	3
0771780	2.10	0.0827		18		
0771802	2.20	0.0866				
0771825	2.30	0.0906				
1548202	2.38	0.0938	3/32			
0771848	2.40	0.0945				
0771860	2.50	0.0984				
0771883	2.60	0.1024		20		
0771905	2.70	0.1063				
1548219	2.78	0.1094	7/64			
0771928	2.80	0.1102				
0771940	2.90	0.1142				
0771963	3.00	0.1181				
0771986	3.10	0.1220		25	60	4
1548225	3.18	0.1250	1/8			
0772007	3.20	0.1260				
0772020	3.30	0.1299				
0772042	3.40	0.1339				
0772065	3.50	0.1378				
1548231	3.57	0.1406	9/64	28		
0772088	3.60	0.1417				
0772100	3.70	0.1457				
0772122	3.80	0.1496				
0772145	3.90	0.1535				
1548248	3.97	0.1563	5/32			
0772168	4.00	0.1575				
1548552	4.04	0.1590	#21	32	77	6
1548569	4.09	0.1610	#20			
0774389	4.10	0.1614				
0774395	4.20	0.1654				
0774400	4.30	0.1693				
1548254	4.37	0.1719	11/64			
0774417	4.40	0.1732				
0774423	4.50	0.1772				
0774430	4.60	0.1811		39		
0774446	4.70	0.1850				
1548260	4.76	0.1875	3/16			
0774452	4.80	0.1890				
0774469	4.90	0.1929				
0774475	5.00	0.1969				
0772386	5.10	0.2008		40	82	
1548575	5.11	0.2010	#7			
1548277	5.16	0.2031	13/64			
0772408	5.20	0.2047				
0772420	5.30	0.2087				
0772443	5.40	0.2126				
1548581	5.41	0.2130	#3			
0772466	5.50	0.2165				
1548283	5.56	0.2188	7/32	42		
0772489	5.60	0.2205				
1548598	5.61	0.2210	#2			
0772500	5.70	0.2244				
0772523	5.80	0.2283				
0772546	5.90	0.2323				
1548290	5.95	0.2344	15/64			

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0772569	6.00	0.2362		42	82	6
0774481	6.10	0.2402		43	84	8
0774498	6.20	0.2441				
0774503	6.30	0.2480				
1548305	6.35	0.2500	1/4			
0774510	6.40	0.2520				
0774526	6.50	0.2559				
1548603	6.53	0.2570	F	44		
0774532	6.60	0.2598				
0774549	6.70	0.2638				
1548311	6.75	0.2656	17/64			
0774555	6.80	0.2677				
0774561	6.90	0.2717				
1548610	6.91	0.2720	I			
0774578	7.00	0.2756				
1548626	7.04	0.2770	J	46	91	
0772678	7.10	0.2795				
1548328	7.14	0.2813	9/32			
0772684	7.20	0.2835				
0772690	7.30	0.2874				
0772706	7.40	0.2913				
0772712	7.50	0.2953				
1548334	7.54	0.2969	19/64	47		
0772729	7.60	0.2992				
0772735	7.70	0.3031				
0772741	7.80	0.3071				
0772758	7.90	0.3110				
1548340	7.94	0.3125	5/16			
0772764	8.00	0.3150				
0774584	8.10	0.3189		55	99	10
0774590	8.20	0.3228				
1548632	8.204	0.3230	P			
0774606	8.30	0.3268				
1548357	8.33	0.3281	21/64			
0774612	8.40	0.3307				
1548649	8.43	0.3320	Q			
0774629	8.50	0.3346				
0774635	8.60	0.3386		57		
0774641	8.70	0.3425				
1548363	8.73	0.3438	11/32			
0774658	8.80	0.3465				
0774664	8.90	0.3504				
0774670	9.00	0.3543				
0772873	9.10	0.3583		60	107	
1548370	9.13	0.3594	23/64			
0772880	9.20	0.3622				
0772896	9.30	0.3661				
1548655	9.35	0.3680	U			
0772901	9.40	0.3701				
0772918	9.50	0.3740				
1548386	9.53	0.3750	3/8	62		
0772924	9.60	0.3780				
0772930	9.70	0.3819				
0772947	9.80	0.3858				
0772953	9.90	0.3898				

Unit: mm

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1548392	9.92	0.3906	25/64	62	107	10
0772960	10.00	0.3937				
0774687	10.10	0.3976		68	116	12
0774693	10.20	0.4016				
0774709	10.30	0.4055				
1548408	10.32	0.4063	13/32			
0774715	10.40	0.4094				
0774721	10.50	0.4134				
0774738	10.60	0.4173		70		
0774744	10.70	0.4213				
1548414	10.72	0.4219	27/64			
0774750	10.80	0.4252				
0774767	10.90	0.4291				
0774773	11.00	0.4331				
0773078	11.10	0.4370		73	123	
1548420	11.11	0.4375	7/16			
0773084	11.20	0.4409				
0773090	11.30	0.4449				
0773106	11.40	0.4488				
0773112	11.50	0.4528				
1548437	11.51	0.4531	29/64	76		
0773129	11.60	0.4567				
0773135	11.70	0.4606				
0773141	11.80	0.4646				
0773158	11.90	0.4685				
1548443	11.91	0.4688	15/32			
0773164	12.00	0.4724				
0774780	12.10	0.4764		79	138	14
0774796	12.20	0.4803				
0774801	12.30	0.4843				
1548450	12.30	0.4844	31/64			
0774818	12.40	0.4882				
0774824	12.50	0.4921				
0774830	12.60	0.4961		81		
0774847	12.70	0.5000	1/2			
0774853	12.80	0.5039				
0774860	12.90	0.5079				
0774876	13.00	0.5118				

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1548472	13.10	0.5156	33/64	87	148	14
0773273	13.10	0.5157				
0773280	13.20	0.5197				
0773296	13.30	0.5236				
0773301	13.40	0.5276				
1548489	13.49	0.5313	17/32			
0773318	13.50	0.5315				
0773324	13.60	0.5354		90		
0773330	13.70	0.5394				
0773347	13.80	0.5433				
1548495	13.89	0.5469	35/64			
0773353	13.90	0.5472				
0773360	14.00	0.5512				
0774882	14.10	0.5551		92	154	16
0774899	14.20	0.5591				
1548500	14.29	0.5625	9/16			
0774904	14.30	0.5630				
0774910	14.40	0.5669				
0774927	14.50	0.5709				
0774933	14.60	0.5748		94		
1548517	14.68	0.5781	37/64			
0774940	14.70	0.5787				
0774956	14.80	0.5827				
0774962	14.90	0.5866				
0774979	15.00	0.5906				
1548523	15.08	0.5938	19/32	97	162	
0773479	15.10	0.5945				
0773485	15.20	0.5984				
0773491	15.30	0.6024				
0773507	15.40	0.6063				
1548530	15.48	0.6094	39/64			
0773513	15.50	0.6102				
0773520	15.60	0.6142		99		
0773536	15.70	0.6181				
0773542	15.80	0.6220				
1548546	15.88	0.6250	5/8			
0773559	15.90	0.6260				
0773565	16.00	0.6299				

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

LIST 9862/63 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	
Speed (SFM)	320-330 SFM		255-265 SFM		140-150 SFM		95-105 SFM		245-255 SFM		100-110 SFM		80-90 SFM	
Drill Dia. Metric Fractional	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR
2.0	16000	0.0022	12700	0.0022	7200	0.0017	4800	0.0014	11900	0.0023	6000	0.0009	4120	0.0010
3.0	10600	0.0035	8500	0.0038	4800	0.0030	3200	0.0023	7950	0.0038	3400	0.0016	2750	0.0017
1/8	10000	0.0037	7950	0.0040	4450	0.0031	2900	0.0025	7500	0.0040	3200	0.0017	2600	0.0017
3/16	6700	0.0056	5300	0.0060	2950	0.0047	1950	0.0037	5000	0.0060	2130	0.0026	1730	0.0026
5.0	6400	0.0061	5050	0.0063	2800	0.0051	1850	0.0040	4750	0.0063	2030	0.0027	1650	0.0028
1/4	5000	0.0077	4000	0.0080	2200	0.0064	1450	0.0051	3750	0.0080	1600	0.0034	1300	0.0035
5/16	4050	0.0097	3200	0.0100	1800	0.0078	1200	0.0064	3000	0.0100	1280	0.0043	1040	0.0044
8.0	4000	0.0098	3150	0.0101	1750	0.0079	1150	0.0065	2950	0.0101	1270	0.0043	1030	0.0044
3/8	3350	0.0116	2650	0.0113	1500	0.0089	1000	0.0071	2500	0.0113	1070	0.0048	870	0.0046
10.0	3200	0.0118	2500	0.0119	1400	0.0094	950	0.0074	2400	0.0119	1020	0.0050	830	0.0048
12.0	2650	0.0132	2100	0.0135	1200	0.0102	800	0.0084	2000	0.0134	850	0.0060	690	0.0058
1/2	2500	0.0140	2000	0.0143	1100	0.0107	750	0.0088	1900	0.0141	800	0.0063	650	0.0061
16.0	2000	0.0157	1600	0.0160	900	0.0127	600	0.0098	1500	0.0157	640	0.0067	510	0.0074

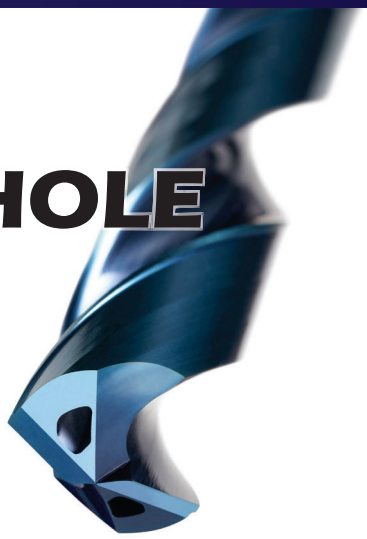
NOTES:

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) In machine or installation of machining step, when there is no rigidity of machine or chattering occurs, reduce the rotation and feed rate.
3) Wet condition 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 the step feed in Stainless Steel when hole depth more than 2×Dc deep, step feed interval is about 0.5×Dc.
6) Use air blow for cooling and the chip exclusion in dry process.
7) By sparks during cutting, or heat by breakage, or hot chip, there is danger of fire. Take fire prevention measures.
8) Use the table values for drilling depth under 3×Dc.
9) When for hole depth more than 3×Dc deep, add step feeding. However, a work material and cutting condition to chip removal may be worse. In that case, even if under predetermined hole depth, please step feed.
10) Retraction of the step feed is to be returned to the top of the hole.
11) Step feed is recommended to 0.5～1.0×Dc. In the case of small diameter step feed is recommended to 0.2 ～0.5×Dc.
12) Please use the fixture to control the amplitude of the drill bit below 0.02mm, for small diameter, high-speed cutting control amplitude of the drill bit 0.01mm or less.

NEW

REVOlutionizing the World of Product Manufacturing

AQUA REVO DRILLS OIL HOLE



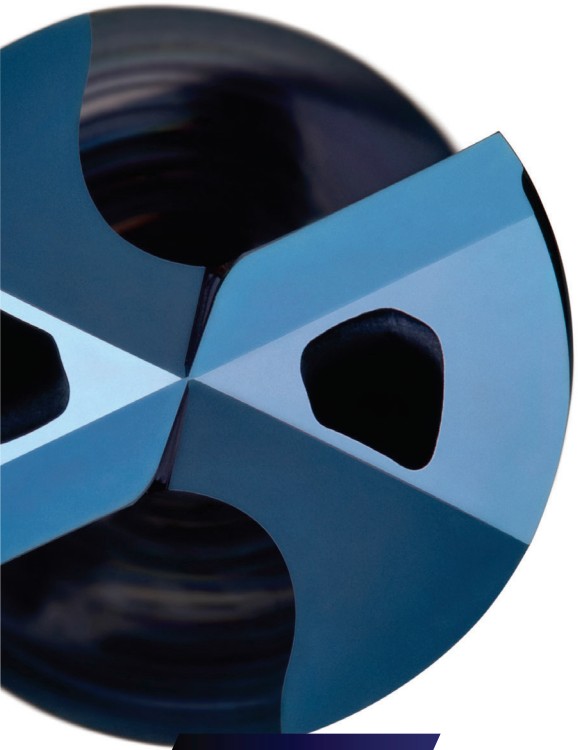
LIST 9872, 9873, 9874, 9875

AQUA REVO Drills Oil Hole 3D, 5D

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

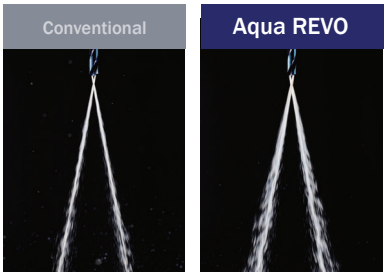
New Oil Hole Design

REVO Power Cooler

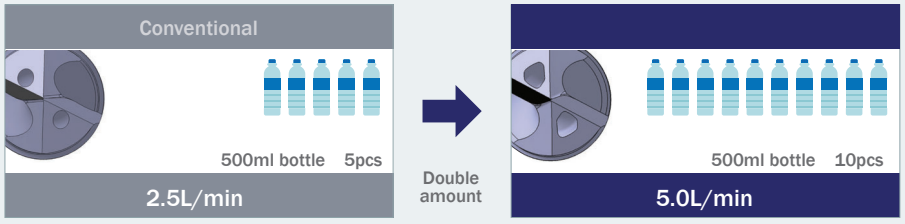


Overwhelming Flow Rate

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

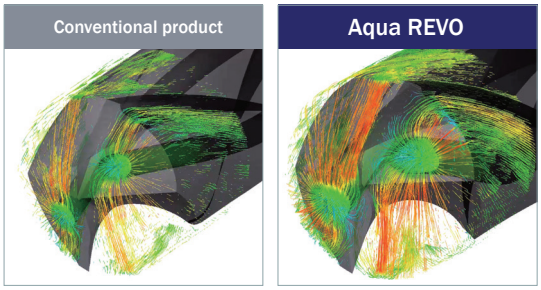


Amount per 1 minute
Drill: φ8.0 Equipment: 1.5MPa
Rotation: 4,800min^{-1}



Improved Cooling

Increased flow rate and flow velocity around corners and thinning

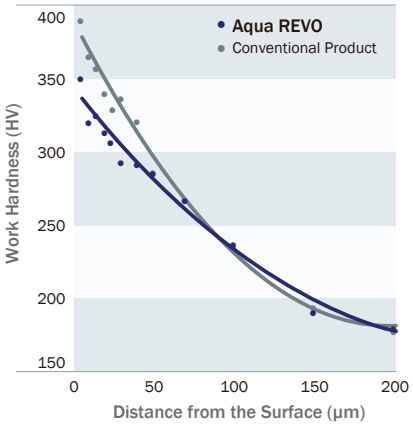


Suppresses Work Hardening

Tool life and accuracy will improve after drilling process

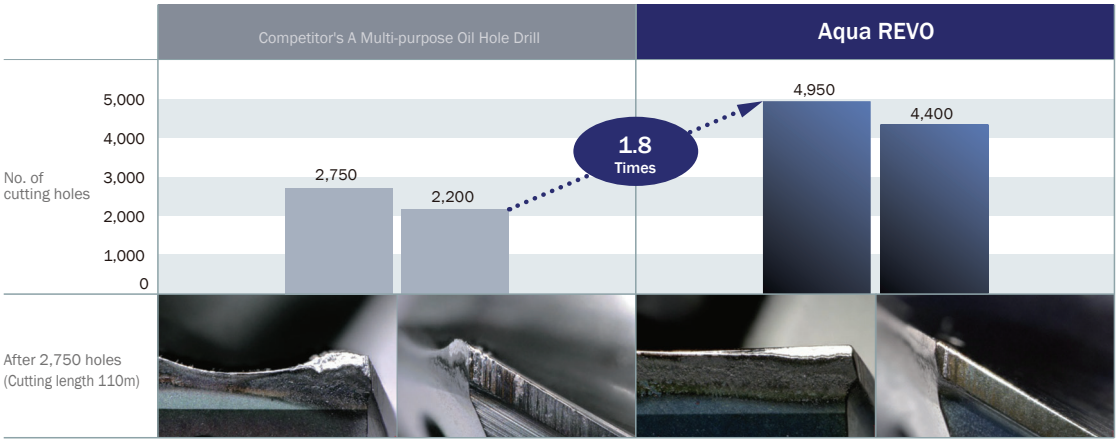
During the drilling process the work material can harden. Because of Nachi's new oil hole design, users can see a decrease in work hardening, prolonging tool life.

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

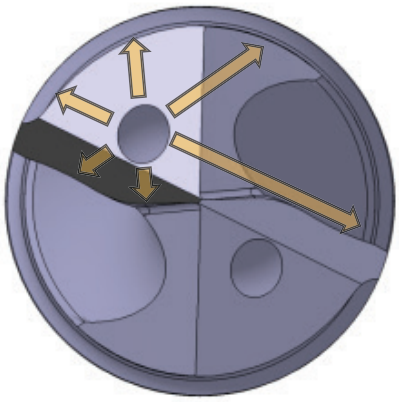
Compatible with a wide range of materials from Structural steel to Stainless steel and Hardened steel

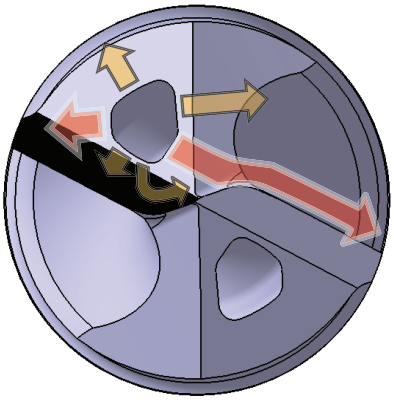
Selection Chart According to Work Materials

	L/D	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	3	◎	◎	◎	◎	◎	○	–	◎	◎	◎	○	○	◎	○
Aqua REVO Oil Hole 5D	5	◎	◎	◎	◎	◎	○	–	◎	◎	◎	○	○	◎	○

◎: Excellent ○: Good –: Not recommended

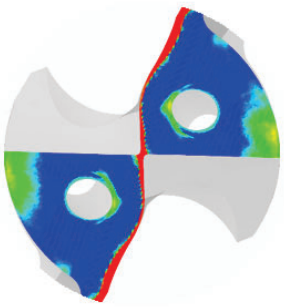
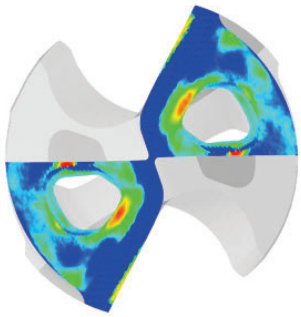
REVO Power Cooler / Unique Design





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 / Cooling Effect Comparison

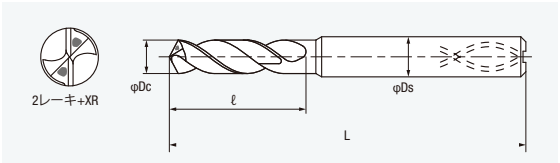
Conventional	Aqua REVO Power Cooler
	
Area with low cooling effect	Area with high cooling effect

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

AQUA REVO Oil Hole 3D

NEW

Carbide Material | REVO D Coating | h7 Dia. Tol. | 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

Unit: mm

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0777800	3.00	0.1181		20	62	6
0777817	3.10	0.1220				
1561530	3.18	0.1250	1/8			
0777823	3.20	0.1260				
0777830	3.30	0.1299				
0777846	3.40	0.1339				
0777852	3.50	0.1378				
1561547	3.57	0.1406	9/64			
0777869	3.60	0.1417				
0777875	3.70	0.1457				
0777881	3.80	0.1496		24	66	
0777898	3.90	0.1535				
1561553	3.97	0.1563	5/32			
0777903	4.00	0.1575				
1561560	4.04	0.1590	#21			
1561977	4.09	0.1610	#20			
0777910	4.10	0.1614				
0777926	4.20	0.1654				
0777932	4.30	0.1693				
1561576	4.37	0.1719	11/64			
0777949	4.40	0.1732				
0777955	4.50	0.1772				
0777961	4.60	0.1811				
0777978	4.70	0.1850				
1561582	4.76	0.1875	3/16	28		
0777984	4.80	0.1890				
0777990	4.90	0.1929				
0778005	5.00	0.1969				
0778011	5.10	0.2008				
1561599	5.11	0.2010	#7			
1561983	5.16	0.2031	13/64			
0778028	5.20	0.2047				
0778034	5.30	0.2087				
0778040	5.40	0.2126				
1561604	5.41	0.2130	#3			
0778057	5.50	0.2165				
1561610	5.56	0.2188	7/32			
0778063	5.60	0.2205				
1561627	5.61	0.2210	#2			
0778070	5.70	0.2244				
0778086	5.80	0.2283				
0778092	5.90	0.2323				
1561633	5.95	0.2344	15/64			
0778108	6.00	0.2362				
0778114	6.10	0.2402		34	79	8
0778120	6.20	0.2441				
0778137	6.30	0.2480				
1561640	6.35	0.2500	1/4			
0778143	6.40	0.2520				
0778150	6.50	0.2559				
1561656	6.53	0.2570	F			
0778166	6.60	0.2598				
0778172	6.70	0.2638				
1561662	6.75	0.2656	17/64			

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0778189	6.80	0.2677		34	79	8
0778195	6.90	0.2717				
1561679	6.91	0.2720	I			
0778200	7.00	0.2756				
1561685	7.04	0.2770	J	41		
0778217	7.10	0.2795				
1561691	7.14	0.2813	9/32			
0778223	7.20	0.2835				
0778230	7.30	0.2874				
0778246	7.40	0.2913				
0778252	7.50	0.2953				
1561707	7.54	0.2969	19/64			
0778269	7.60	0.2992				
0778275	7.70	0.3031				
0778281	7.80	0.3071				
0778298	7.90	0.3110				
1561713	7.94	0.3125	5/16			
0778303	8.00	0.3150				
0778310	8.10	0.3189		47	89	10
0778326	8.20	0.3228				
1561720	8.20	0.3230	P			
0778332	8.30	0.3268				
1561736	8.33	0.3281	21/64			
0778349	8.40	0.3307				
1561742	8.43	0.3320	Q			
0778355	8.50	0.3346				
0778361	8.60	0.3386				
0778378	8.70	0.3425				
1561759	8.73	0.3438	11/32			
0778384	8.80	0.3465				
0778390	8.90	0.3504				
0778406	9.00	0.3543				
0778412	9.10	0.3583				
1561765	9.13	0.3594	23/64			
0778429	9.20	0.3622				
0778435	9.30	0.3661				
1561771	9.35	0.3680	U			
0778441	9.40	0.3701				
0778458	9.50	0.3740				
1561788	9.53	0.3750	3/8			
0778464	9.60	0.3780				
0778470	9.70	0.3819				
0778487	9.80	0.3858				
0778493	9.90	0.3898				
1561794	9.92	0.3906	25/64			
0778509	10.00	0.3937				
0778515	10.10	0.3976		55	102	12
0778521	10.20	0.4016				
0778538	10.30	0.4055				
1561800	10.32	0.4063	13/32			
0778544	10.40	0.4094				
0778550	10.50	0.4134				
0778567	10.60	0.4173				
0778573	10.70	0.4213				

Unit: mm

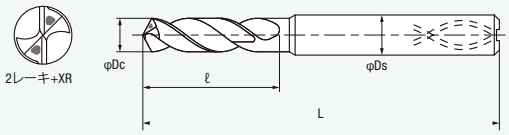
EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1561816	10.72	0.4219	27/64	55	102	12
0778580	10.80	0.4252				
0778596	10.90	0.4291				
0778601	11.00	0.4331				
0778618	11.10	0.4370				
1561822	11.11	0.4375	7/16			
0778624	11.20	0.4409				
0778630	11.30	0.4449				
0778647	11.40	0.4488				
0778653	11.50	0.4528				
1561839	11.51	0.4531	29/64			
0778660	11.60	0.4567				
0778676	11.70	0.4606				
0778682	11.80	0.4646				
0778699	11.90	0.4685				
1561845	11.91	0.4688	15/32			
0778704	12.00	0.4724				
0778710	12.10	0.4764		60	107	14
0778727	12.20	0.4803				
0778733	12.30	0.4843				
1561851	12.30	0.4844	31/64			
0778740	12.40	0.4882				
0778756	12.50	0.4921				
0778762	12.60	0.4961				
1561868	12.70	0.5000	1/2			
0778779	12.70	0.5000				
0778785	12.80	0.5039				
0778791	12.90	0.5079				
0778807	13.00	0.5118				
1561874	13.10	0.5156	33/64			
0778813	13.10	0.5157				
0778820	13.20	0.5197				
0778836	13.30	0.5236				
0778842	13.40	0.5276				

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1561880	13.49	0.5313	17/32	60	107	14
0778859	13.50	0.5315				
0778865	13.60	0.5354				
0778871	13.70	0.5394				
0778888	13.80	0.5433				
1561897	13.89	0.5469	35/64			
0778894	13.90	0.5472				
0778900	14.00	0.5512				
0778916	14.10	0.5551		65	115	16
0778922	14.20	0.5591				
1561902	14.29	0.5625	9/16			
0778939	14.30	0.5630				
0778945	14.40	0.5669				
0778951	14.50	0.5709				
0778968	14.60	0.5748				
1561919	14.68	0.5781	37/64			
0778974	14.70	0.5787				
0778980	14.80	0.5827				
0778997	14.90	0.5866				
0779001	15.00	0.5906				
1561925	15.08	0.5938	19/32			
0779018	15.10	0.5945				
0779024	15.20	0.5984				
0779030	15.30	0.6024				
0779047	15.40	0.6063				
1561931	15.48	0.6094	39/64			
0779053	15.50	0.6102				
0779060	15.60	0.6142				
0779076	15.70	0.6181				
0779082	15.80	0.6220				
1561948	15.88	0.6250	5/8			
0779099	15.90	0.6260				
0779104	16.00	0.6299				

AQUA REVO Oil Hole 5D

NEW

Carbide Material | REVO D Coating | h7 Dia. Tol. | 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

Unit: mm

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0779110	3.00	0.2677		28	66	6
0779127	3.10	0.2717				
1561990	3.18	0.2720	1/8			
0779133	3.20	0.2756				
0779140	3.30	0.2770				
0779156	3.40	0.2795				
0779162	3.50	0.2813				
1562004	3.57	0.2835	9/64			
0779179	3.60	0.2874				
0779185	3.70	0.2913				
0779191	3.80	0.2953		36	74	
0779207	3.90	0.2969				
1562010	3.97	0.2992	5/32			
0779213	4.00	0.3031				
1562027	4.04	0.3071	#21			
1561954	4.09	0.3110	#20			
0779220	4.10	0.3125				
0779236	4.20	0.3150				
0779242	4.30	0.3189				
1562033	4.37	0.3228	11/64			
0779259	4.40	0.3230				
0779265	4.50	0.3268				
0779271	4.60	0.3281				
0779288	4.70	0.3307				
1562040	4.76	0.3320	3/16	44	82	
0779294	4.80	0.3346				
0779300	4.90	0.3386				
0779316	5.00	0.3425				
0779322	5.10	0.3438				
1562056	5.11	0.3465	#7			
1561960	5.16	0.3504	13/64			
0779339	5.20	0.3543				
0779345	5.30	0.3583				
0779351	5.40	0.3594				
1562062	5.41	0.3622	#3			
0779368	5.50	0.3661				
1562079	5.56	0.3680	7/32			
0779374	5.60	0.3701				
1562085	5.61	0.3740	#2			
0779380	5.70	0.3750				
0779397	5.80	0.3780				
0779402	5.90	0.3819				
1562091	5.95	0.3858	15/64			
0779419	6.00	0.3898				
0779425	6.10	0.3906		53	91	8
0779431	6.20	0.3937				
0779448	6.30	0.3976				
1562107	6.35	0.4016	1/4			
0779454	6.40	0.4055				
0779460	6.50	0.4063				
1562113	6.53	0.4094	F			
0779477	6.60	0.4134				
0779483	6.70	0.4173				
1562120	6.75	0.4213	17/64			

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
0779490	6.80	0.2677		53	91	8
0779505	6.90	0.2717				
1562136	6.91	0.2720	I			
0779511	7.00	0.2756				
1562142	7.04	0.2770	J			
0779528	7.10	0.2795				
1562159	7.14	0.2813	9/32			
0779534	7.20	0.2835				
0779540	7.30	0.2874				
0779557	7.40	0.2913				
0779563	7.50	0.2953				
1562165	7.54	0.2969	19/64			
0779570	7.60	0.2992				
0779586	7.70	0.3031				
0779592	7.80	0.3071				
0779608	7.90	0.3110				
1562171	7.94	0.3125	5/16			
0779614	8.00	0.3150				
0779620	8.10	0.3189		61	103	10
0779637	8.20	0.3228				
1562188	8.20	0.3230	P			
0779643	8.30	0.3268				
1562194	8.33	0.3281	21/64			
0779650	8.40	0.3307				
1562200	8.43	0.3320	Q			
0779666	8.50	0.3346				
0779672	8.60	0.3386				
0779689	8.70	0.3425				
1562216	8.73	0.3438	11/32			
0779695	8.80	0.3465				
0779700	8.90	0.3504				
0779717	9.00	0.3543				
0779723	9.10	0.3583				
1562222	9.13	0.3594	23/64			
0779730	9.20	0.3622				
0779746	9.30	0.3661				
1562239	9.35	0.3680	U			
0779752	9.40	0.3701				
0779769	9.50	0.3740				
1562245	9.53	0.3750	3/8			
0779775	9.60	0.3780				
0779781	9.70	0.3819				
0779798	9.80	0.3858				
0779803	9.90	0.3898				
1562251	9.92	0.3906	25/64			
0779810	10.00	0.3937				
0779826	10.10	0.3976		71	118	12
0779832	10.20	0.4016				
0779849	10.30	0.4055				
1562268	10.32	0.4063	13/32			
0779855	10.40	0.4094				
0779861	10.50	0.4134				
0779878	10.60	0.4173				
0779884	10.70	0.4213				

Unit: mm

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1562274	10.72	0.4219	27/64	71	118	12
0779890	10.80	0.4252				
0779906	10.90	0.4291				
0779912	11.00	0.4331				
0779929	11.10	0.4370				
1562280	11.11	0.4375	7/16			
0779935	11.20	0.4409				
0779941	11.30	0.4449				
0779958	11.40	0.4488				
0779964	11.50	0.4528				
1562297	11.51	0.4531	29/64			
0779970	11.60	0.4567				
0779987	11.70	0.4606				
0779993	11.80	0.4646				
0780007	11.90	0.4685				
1562302	11.91	0.4688	15/32			
0780013	12.00	0.4724				
0780020	12.10	0.4764		77	124	14
0780036	12.20	0.4803				
0780042	12.30	0.4843				
1562319	12.30	0.4844	31/64			
0780059	12.40	0.4882				
0780065	12.50	0.4921				
0780071	12.60	0.4961				
1562325	12.70	0.5000	1/2			
0780088	12.70	0.5000				
0780094	12.80	0.5039				
0780100	12.90	0.5079				
0780116	13.00	0.5118				
1562331	13.10	0.5156	33/64			
0780122	13.10	0.5157				
0780139	13.20	0.5197				
0780145	13.30	0.5236				
0780151	13.40	0.5276				

EDP #	Size	Decimal Equiv.	Wire/ Fractional/ Letter	Flute Length	Overall Length	Shank Diameter
	Dc			ℓ	L	Ds
1562348	13.49	0.5313	17/32	77	124	14
0780168	13.50	0.5315				
0780174	13.60	0.5354				
0780180	13.70	0.5394				
0780197	13.80	0.5433				
1562354	13.89	0.5469	35/64			
0780202	13.90	0.5472				
0780219	14.00	0.5512				
0780225	14.10	0.5551		83	133	16
0780231	14.20	0.5591				
1562360	14.29	0.5625	9/16			
0780248	14.30	0.5630				
0780254	14.40	0.5669				
0780260	14.50	0.5709				
0780277	14.60	0.5748				
1562377	14.68	0.5781	37/64			
0780283	14.70	0.5787				
0780290	14.80	0.5827				
0780305	14.90	0.5866				
0780311	15.00	0.5906				
1562383	15.08	0.5938	19/32			
0780328	15.10	0.5945				
0780334	15.20	0.5984				
0780340	15.30	0.6024				
0780357	15.40	0.6063				
1562390	15.48	0.6094	39/64			
0780363	15.50	0.6102				
0780370	15.60	0.6142				
0780386	15.70	0.6181				
0780392	15.80	0.6220				
1562405	15.88	0.6250	5/8			
0780408	15.90	0.6260				
0780414	16.00	0.6299				

Dimensions for 3D and 5D are held to DIN Standard.
For JIS standard please ask your local sales rep.

LIST 9872/9873/9874/9875 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 & 400 Series)		PH Stainless		Titanium Alloys		Nickel Alloys Inconel	
Speed (SFM)	390-400 SFM		325-335 SFM		255-265 SFM		130-140 SFM		325-340 SFM		255-265 SFM		155-165 SFM		125-135 SFM		125-135 SFM	
Drill Dia. Metric Fractional	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR
3.0	12700	0.0038	10600	0.0038	8500	0.0035	4250	0.0024	10600	0.0035	8500	0.0031	5300	0.0030	4200	0.0030	4200	0.0018
1/8	12000	0.0040	10000	0.0040	7950	0.0037	4000	0.0026	9950	0.0037	8000	0.0033	4900	0.0032	3850	0.0032	4000	0.0019
3/16	7950	0.0060	6650	0.0060	5300	0.0056	2650	0.0038	6650	0.0056	5300	0.0050	3250	0.0047	2600	0.0047	2650	0.0028
5.0	7600	0.0063	6300	0.0063	5050	0.0058	2550	0.0040	6300	0.0059	5050	0.0052	3104	0.0049	2450	0.0049	2500	0.0029
1/4	6000	0.0080	5000	0.0080	4000	0.0071	2000	0.0048	5000	0.0076	4000	0.0066	2450	0.0064	1910	0.0064	2000	0.0038
5/16	4750	0.0099	3970	0.0100	3170	0.0088	1580	0.0059	3970	0.0086	3170	0.0078	1950	0.0080	1550	0.0079	1550	0.0047
8.0	4800	0.0100	4000	0.0100	3200	0.0087	1600	0.0059	4000	0.0087	3200	0.0079	2000	0.0079	1600	0.0079	1600	0.0047
3/8	4000	0.0113	3350	0.0113	2650	0.0104	1350	0.0059	3300	0.0093	2650	0.0089	1630	0.0094	1270	0.0094	1350	0.0056
10.0	3800	0.0118	3200	0.0118	2500	0.0101	1300	0.0070	3200	0.0097	2500	0.0093	1600	0.0091	1300	0.0091	1300	0.0055
12.0	3200	0.0132	2700	0.0134	2100	0.0101	1050	0.0082	2700	0.0098	2100	0.0105	1300	0.0106	1050	0.0105	1050	0.0067
1/2	3000	0.0140	2500	0.0142	1980	0.0107	1000	0.0083	2500	0.0104	2000	0.0111	1200	0.0112	960	0.0111	990	0.0072
16.0	2400	0.0157	2000	0.0175	1600	0.0118	800	0.0103	2000	0.0122	1600	0.0125	1000	0.0126	800	0.0128	800	0.0074

NOTES:

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) In machine or installation of machining step, when there is no rigidity of machine or chattering occurs, reduce the rotation and feed rate.
3) Wet condition 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 an internal coolant.
6) When for hole depth more than 3×Dc deep, add step feeding. However, a work material and cutting condition to chip removal may be worse. In that case, even if under predetermined hole depth, please step feed.
7) Retraction of the step feed is to be returned to the top of the hole.
8) Step feed is recommended to 0.2～1.0×Dc.

LIST 9872/9873/9874/9875 MQL 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	
Speed (SFM)	390-400 SFM		325-335 SFM		255-265 SFM		130-140 SFM		325-340 SFM	
Drill Dia. Metric Fractional	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR	RPM	IPR
3.0	8500	0.0036	7400	0.0030	6400	0.0033	2550	0.0022	7400	0.0033
1/8	7950	0.0038	6900	0.0032	6000	0.0035	2300	0.0023	6900	0.0035
3/16	5300	0.0056	4600	0.0048	4000	0.0053	1550	0.0035	4600	0.0052
5.0	5050	0.0059	4400	0.0050	3800	0.0055	1450	0.0036	4350	0.0055
1/4	4000	0.0077	3450	0.0064	3000	0.0070	1150	0.0042	3450	0.0070
5/16	3150	0.0094	2750	0.0080	2350	0.0081	920	0.0052	2750	0.0081
8.0	3200	0.0095	2800	0.0080	2400	0.0082	1000	0.0051	2800	0.0082
3/8	2650	0.0111	2300	0.0095	2000	0.0087	760	0.0056	2300	0.0086
10.0	2500	0.0113	2200	0.0097	1900	0.0091	800	0.0059	2200	0.0089
12.0	2100	0.0126	1900	0.0104	1600	0.0094	650	0.0073	1900	0.0095
1/2	2000	0.0133	1700	0.0110	1500	0.0099	570	0.0077	1700	0.0101
16.0	1600	0.0148	1400	0.0141	1200	0.0112	480	0.0082	1400	0.0112

NOTES:

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) In machine or installation of machining step, when there is no rigidity of machine or chattering occurs, reduce the rotation and feed rate.
3) Wet condition 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 an internal coolant.
6) When for hole depth more than 3×Dc deep, add step feeding. However, a work material and cutting condition to chip removal may be worse. In that case, even if under predetermined hole depth, please step feed.
7) Retraction of the step feed is to be returned to the top of the hole.
8) Step feed is recommended to 0.2～1.0×Dc.

NACHI

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

www.nachiamerica.com

NACHI AMERICA INC.

HEADQUARTERS & MAIN WAREHOUSE

715 Pushville Road, Greenwood, Indiana, 46143, U.S.A.
Phone: 317-530-1003 Toll Free Phone: +1-888-340-8665
Fax: 317-530-1013 Toll Free Fax: +1-888-383-8665
Web Site URL : http://www.nachiamerica.com

WEST COAST BRANCH

12652 E. Alondra Blvd. Cerritos, California, 90703, U.S.A
Phone: 562-802-0055 Toll Free Phone: 1-800-548-3903
Fax: 562-802-2455

NACHI CANADA INC.

TORONTO HEADQUARTERS

89 Courtland Ave., Unit No.2,
Concord, Ontario, L4K 3T4, CANADA
Phone: (905)-660-0088 Toll Free Phone: +1-800-387-9188
Fax: (905)-660-0097

LATIN AMERICA BRANCH

2315 NW 107th Ave., Miami, Florida, 33172
Phone: 305-591-0054
Fax: 305-591-3110

NACHI MEXICANA, S.A. DE C.V.

Calle Tequisquiapan 2, Aerotech Industrial Park, Localidad Galeras,
Municipio de Colon, Queretaro, Mexico C.P. 76295
Phone: +52-442-153-2424
Fax: +52-442-153-2435

2019.10.MT