NACHI

NACHI EUROPE GmbH

OUR SYNERGY
YOUR PERFORMANCE

AquaREVO DRILLS

HIGHLY EFFICIENT AND MULTI-PURPOSE

CELEBRATE THE POLE POSITION

NEW

TOP
QUALITY
LEADER

Doubled tool life
due to improved
substrate, coating
and cutting geometry

REVOlutionize your processing time

NEW

- NACHI Carbide Drills have been continuously improved: From the first generation AQUA to the second AQUA EX and now AquaREVO.
- AquaREVO drills profit from over 90 years of experience from a technology leader.
- Substrate, design and coating have been completely renewed.
- The newly developed features dramatically improve all drilling functions.

Doubled tool life

AquaREVO's durability and stability outperform that of other drills by far.

High efficiency

High performance even at increased speed and feed, significantly shorting the processing time.

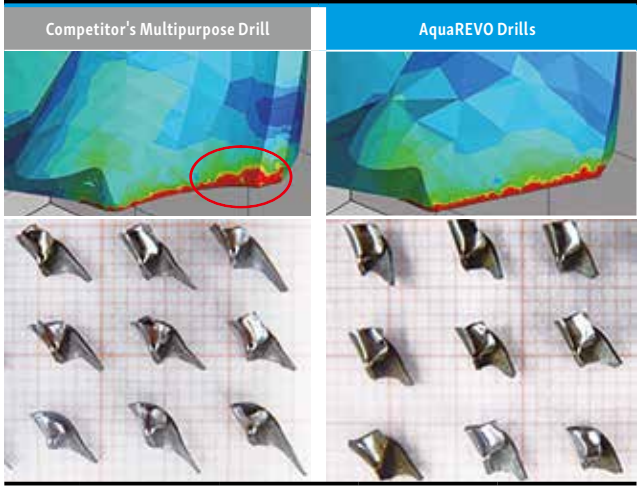
Multi-purpose

Even with high-hardness- and difficult-to-cut-materials, high-quality processing is possible without lowering efficiency.

Design of Geometry

- A straight cutting edge has been adopted as well as a disperse inflexion point where cutting stress concentrates to evenly distribute wear.
- By implementing the straight cutting edge and thinning shape, chips are ejected finely even during high-speed cutting and high feed processing.

PERFORMANCE COMPARISON

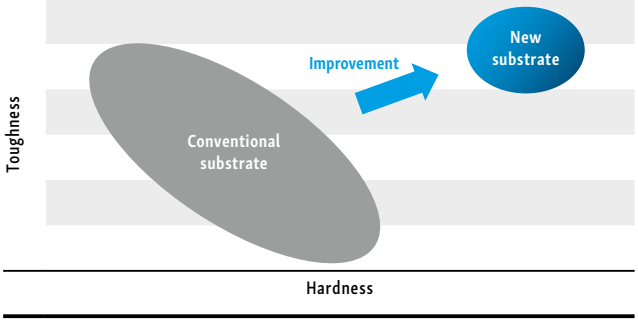


Cutting conditions				
	Diameter	Ø6mm	Cutting speed	150m/min
	Material	C50E	Feed rate	0.24mm/rev

Improved Substrate

- A newly developed carbide substrate with enhanced hardness and toughness constitutes to a considerable improvement in wear- and chipping-resistance.

SUBSTRATE PROPERTY



Newly developed Coating

- Newly developed REVO-D coating – suitable for drilling.
- AlCr-based and AlTi-based films are stacked at the nano level ensuring high oxidation resistance and wear resistance.
- Low friction and smooth chip evacuation by super smooth surface treatment.

REVO-D COATING

APPLICABLE WORK MATERIALS

Tool	Structural Steels	Carbon Steels	Alloy Steels, Heat-treated Steels	Mold Steels, Hardened Steels	Hardened Steels			Stainless Steels		Titanium Alloys	Nickel Alloys	Cast Irons	Aluminium Alloys	Copper Alloys
	St37-2	C45E	42CrMo4	30~40HRC	40~50HRC	50~57HRC	58~65HRC	1.4301/ 1.4401	1.4021			GG/GGG	AC/ADC	Cu
AquaREVO Drills Stub (3D)	◉	◉	◉	◉	◉	○		○	○		◉	◉		
AquaREVO Drills Regular (5D)	◉	◉	◉	◉	◉	○		○	○		◉	◉		

◉ Excellent | ○ Good

AquaREVO Drills Oil-Hole

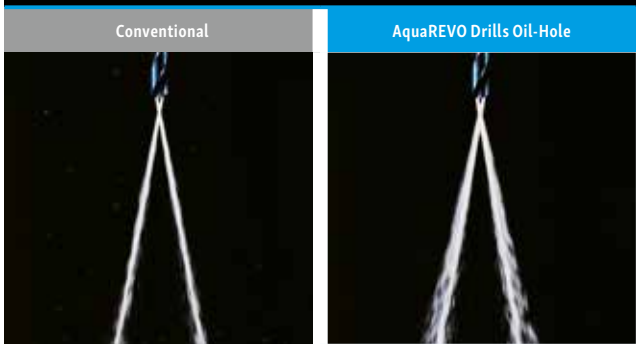
NEW

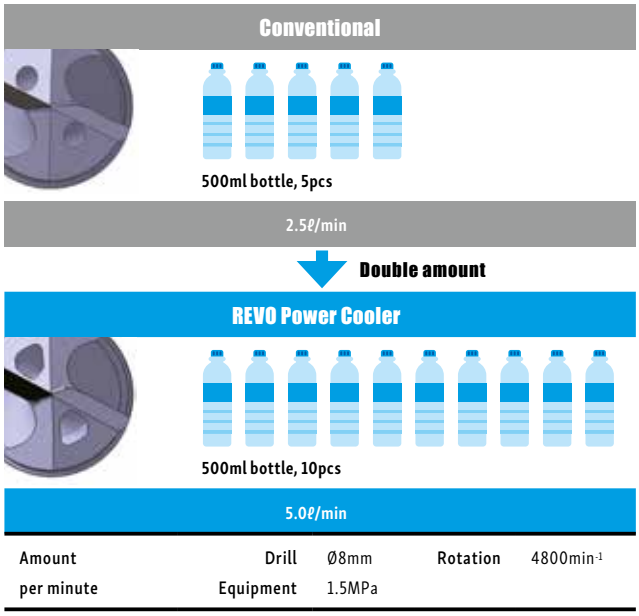
- The new Oil-Hole concept was born within the AquaREVO series, where material, design and coating have been completely renewed.
- In addition to REVO-D coat and super smooth surface treatment, the use of fluid analysis further improves cooling, lubrication and smooth chip evacuation.

REVO Power Cooler

New Oil-Hole design with overwhelming flow rate. Cross-sectional area and coolant amount of the oil hole are more than twice that of conventional.

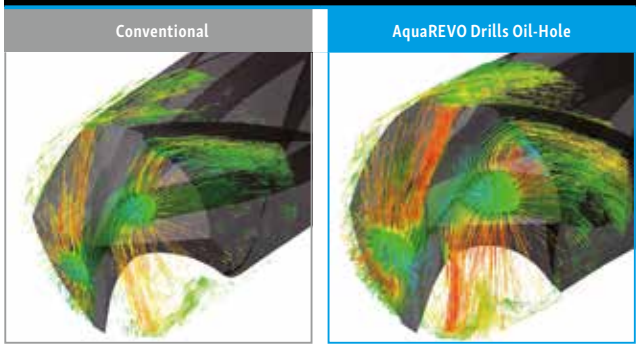
OVERWHELMING FLOW RATE





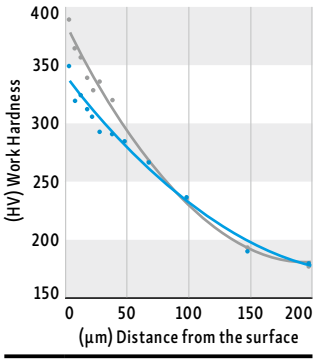
Amount per minute	Drill Equipment	Ø8mm 1.5MPa	Rotation	4800min⁻¹

IMPROVED COOLING



Increased flow rate and flow velocity of corners and thinning.

SUPPRESSES WORK HARDENING

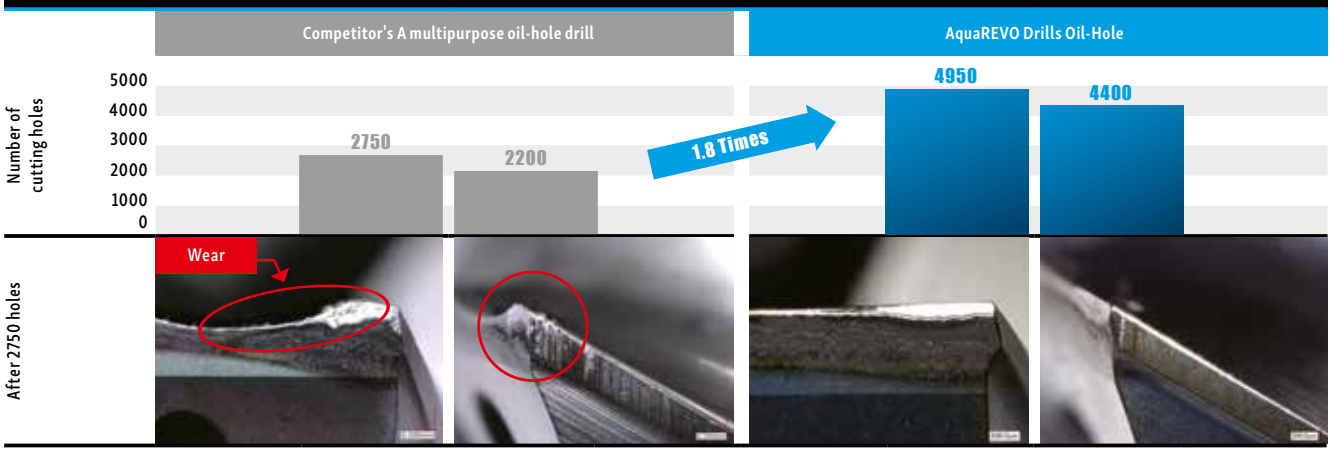


Tool life and accuracy will improve after drilling process. Comparison of work hardening and internal hardness.
Work material: 1.4301

Excellent service life due to wear suppression

Durability and stability surpass other drills.

PERFORMANCE COMPARISON

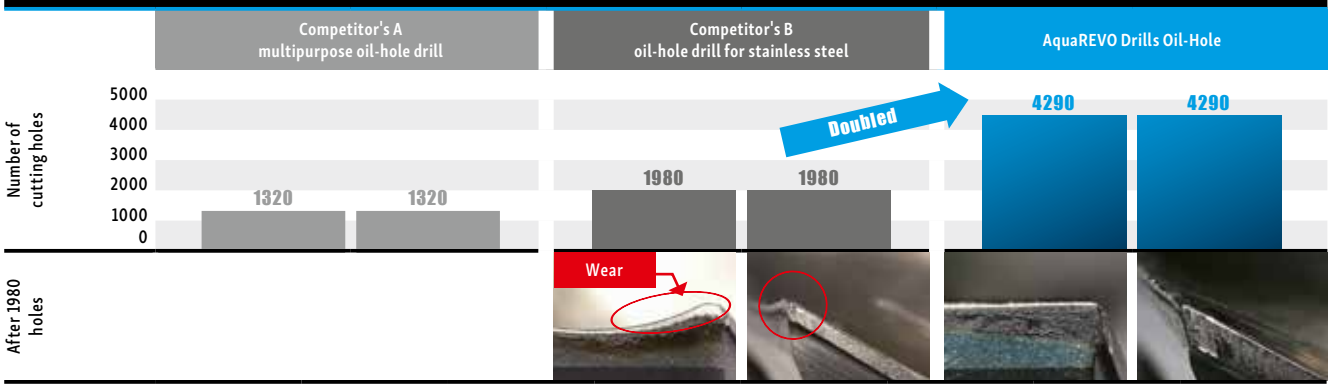


Cutting conditions							
Diameter	Ø8mm	Cutting speed	120m/min	Depth of cutting	40mm (5xD)	Emulsion	Water-soluble
Material	C50E	Feed rate	0.254mm/rev	Machine	Vertical M/C		

Incredible tool life even in stainless steel drilling

Although it is a multi-purpose drill, even compared to the drill for Stainless steel, more than twice as much drilling.

PERFORMANCE COMPARISON



Cutting conditions							
Diameter	Ø8mm	Cutting speed	80m/min	Depth of cutting	40mm (5xD)	Emulsion	Water-soluble
Material	1.4301	Feed rate	0.20mm/rev	Machine	Vertical M/C		

Compatible with a wide range of materials

APPLICABLE WORK MATERIALS

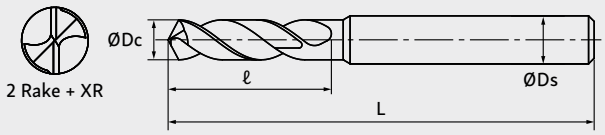
Tool	Structural Steels	Carbon Steels	Alloy Steels, Heat-treated Steels	Mold Steels, Hardened Steels	Hardened Steels			Stainless Steels			Titanium Alloys	Nickel Alloys	Cast Irons	Aluminium Alloys
	St37-2	C45E/ C50E	42CrMo4	30~40 HRC	40~50 HRC	50~57 HRC	58~65 HRC	1.4301/ 1.4401	1.4021	1.4542	Ti-6Al-4V		GG/GGG	AC/ADC
AquaREVO Drills Oil-Hole (3D)	◉	◉	◉	◉	◉	○		◉	◉	◉	○	○	◉	○
AquaREVO Drills Oil-Hole (5D)	◉	◉	◉	◉	◉	○		◉	◉	◉	○	○	◉	○
AquaREVO Drills Oil-Hole (8D)	◉	◉	◉	◉	◉	○		◉	◉	◉	○	○	◉	○

◉ Excellent | ○ Good

AQRVDS

AquaREVO Drills

Stub (3D)



TOOL MATERIAL | POINT ANGLE | HELIX ANGLE

List: 9860

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198600200	2.00	9	45	3	●
9198600205	2.05	10	45	3	●
9198600210	2.10	11	45	3	●
9198600215	2.15	11	45	3	●
9198600220	2.20	11	45	3	●
9198600225	2.25	11	45	3	●
9198600230	2.30	11	45	3	●
9198600235	2.35	11	45	3	●
9198600240	2.40	11	45	3	●
9198600245	2.45	11	45	3	●
9198600250	2.50	11	45	3	●
9198600255	2.55	14	45	3	●
9198600260	2.60	14	45	3	●
9198600265	2.65	14	45	3	●
9198600270	2.70	14	45	3	●
9198600275	2.75	14	45	3	●
9198600280	2.80	14	45	3	●
9198600285	2.85	14	45	3	●
9198600290	2.90	14	45	3	●
9198600295	2.95	14	45	3	●
9198600300	3.00	14	45	3	●
9198600305	3.05	20	55	4	●
9198600310	3.10	20	55	4	●
9198600315	3.15	20	55	4	●
9198600320	3.20	20	55	4	●
9198600325	3.25	20	55	4	●
9198600330	3.30	20	55	4	●
9198600335	3.35	20	55	4	●
9198600340	3.40	20	55	4	●
9198600345	3.45	20	55	4	●
9198600350	3.50	20	55	4	●
9198600355	3.55	22	55	4	●
9198600360	3.60	22	55	4	●

Article number	Dc	ℓ	L	Ds	Stock
9198600365	3.65	22	55	4	●
9198600370	3.70	22	55	4	●
9198600375	3.75	22	55	4	●
9198600380	3.80	22	55	4	●
9198600385	3.85	22	55	4	●
9198600390	3.90	22	55	4	●
9198600395	3.95	22	55	4	●
9198600400	4.00	22	55	4	●
9198600405	4.05	24	62	5	●
9198600410	4.10	24	62	5	●
9198600410-D	4.10	24	62	6	●
9198600415	4.15	24	62	5	●
9198600420	4.20	24	62	5	●
9198600420-D	4.20	24	62	6	●
9198600425	4.25	24	62	5	●
9198600430	4.30	24	62	5	●
9198600430-D	4.30	24	62	6	●
9198600435	4.35	24	62	5	●
9198600440	4.40	24	62	5	●
9198600440-D	4.40	24	62	6	●
9198600445	4.45	24	62	5	●
9198600450	4.50	24	62	5	●
9198600450-D	4.50	24	62	6	●
9198600455	4.55	26	62	5	●
9198600460	4.60	26	62	5	●
9198600460-D	4.60	26	62	6	●
9198600465	4.65	26	62	5	●
9198600470	4.70	26	62	5	●
9198600470-D	4.70	26	62	6	●
9198600475	4.75	26	62	5	●
9198600480	4.80	26	62	5	●
9198600480-D	4.80	26	62	6	●
9198600485	4.85	26	62	5	●

List: 9860

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198600490	4.90	26	62	5	●
9198600490-D	4.90	26	62	6	●
9198600495	4.95	26	62	5	●
9198600500	5.00	26	62	5	●
9198600500-D	5.00	26	62	6	●
9198600505	5.05	26	66	6	●
9198600510	5.10	26	66	6	●
9198600515	5.15	26	66	6	●
9198600520	5.20	26	66	6	●
9198600525	5.25	26	66	6	●
9198600530	5.30	26	66	6	●
9198600535	5.35	26	66	6	●
9198600540	5.40	26	66	6	●
9198600545	5.45	26	66	6	●
9198600550	5.50	26	66	6	●
9198600555	5.55	28	66	6	●
9198600560	5.60	28	66	6	●
9198600565	5.65	28	66	6	●
9198600570	5.70	28	66	6	●
9198600575	5.75	28	66	6	●
9198600580	5.80	28	66	6	●
9198600585	5.85	28	66	6	●
9198600590	5.90	28	66	6	●
9198600595	5.95	28	66	6	●
9198600600	6.00	28	66	6	●
9198600610	6.10	32	74	7	●
9198600610-D	6.10	32	74	8	●
9198600620	6.20	32	74	7	●
9198600620-D	6.20	32	74	8	●
9198600630	6.30	32	74	7	●
9198600630-D	6.30	32	74	8	●
9198600640	6.40	32	74	7	●
9198600640-D	6.40	32	74	8	●
9198600650	6.50	32	74	7	●
9198600650-D	6.50	32	74	8	●
9198600660	6.60	35	74	7	●
9198600660-D	6.60	35	74	8	●
9198600670	6.70	35	74	7	●
9198600670-D	6.70	35	74	8	●
9198600680	6.80	35	74	7	●
9198600680-D	6.80	35	74	8	●
9198600690	6.90	35	74	7	●
9198600690-D	6.90	35	74	8	●
9198600700	7.00	35	74	7	●
9198600700-D	7.00	35	74	8	●
9198600710	7.10	35	79	8	●
9198600720	7.20	35	79	8	●
9198600730	7.30	35	79	8	●
9198600740	7.40	35	79	8	●
9198600750	7.50	35	79	8	●
9198600760	7.60	38	79	8	●
9198600770	7.70	38	79	8	●
9198600780	7.80	38	79	8	●
9198600790	7.90	38	79	8	●
9198600800	8.00	38	79	8	●
9198600810	8.10	38	83	9	●
9198600810-D	8.10	38	83	10	●
9198600820	8.20	38	83	9	●
9198600820-D	8.20	38	83	10	●
9198600830	8.30	38	83	9	●
9198600830-D	8.30	38	83	10	●
9198600840	8.40	38	83	9	●
9198600840-D	8.40	38	83	10	●
9198600850	8.50	38	83	9	●
9198600850-D	8.50	38	83	10	●
9198600860	8.60	40	83	9	●
9198600860-D	8.60	40	83	10	●
9198600870	8.70	40	83	9	●
9198600870-D	8.70	40	83	10	●
9198600880	8.80	40	83	9	●
9198600880-D	8.80	40	83	10	●
9198600890	8.90	40	83	9	●
9198600890-D	8.90	40	83	10	●
9198600900	9.00	40	83	9	●
9198600900-D	9.00	40	83	10	●
9198600910	9.10	40	89	10	●
9198600920	9.20	40	89	10	●
9198600930	9.30	40	89	10	●
9198600940	9.40	40	89	10	●
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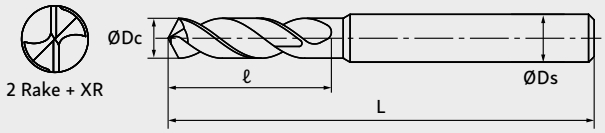
AQRVDS

AquaREVO Drills
Stub (3D)



TOOL MATERIAL — POINT ANGLE — HELIX ANGLE

List: 9860

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198600960	9.60	43	89	10	●
9198600970	9.70	43	89	10	●
9198600980	9.80	43	89	10	●
9198600990	9.90	43	89	10	●
9198601000	10.00	43	89	10	●
9198601010	10.10	43	95	11	●
9198601010-D	10.10	43	95	12	●
9198601020	10.20	43	95	11	●
9198601020-D	10.20	43	95	12	●
9198601030	10.30	43	95	11	●
9198601030-D	10.30	43	95	12	●
9198601040	10.40	43	95	11	●
9198601040-D	10.40	43	95	12	●
9198601050	10.50	43	95	11	●
9198601050-D	10.50	43	95	12	●
9198601060	10.60	47	95	11	●
9198601060-D	10.60	47	95	12	●
9198601070	10.70	47	95	11	●
9198601070-D	10.70	47	95	12	●
9198601080	10.80	47	95	11	●
9198601080-D	10.80	47	95	12	●
9198601090	10.90	47	95	11	●
9198601090-D	10.90	47	95	12	●
9198601100	11.00	47	95	11	●
9198601100-D	11.00	47	95	12	●
9198601110	11.10	47	102	12	●
9198601120	11.20	47	102	12	●
9198601130	11.30	47	102	12	●
9198601140	11.40	47	102	12	●
9198601150	11.50	47	102	12	●
9198601160	11.60	50	102	12	●
9198601170	11.70	50	102	12	●
9198601180	11.80	50	102	12	●

Article number	Dc	ℓ	L	Ds	Stock
9198601190	11.90	50	102	12	●
9198601200	12.00	50	102	12	●
9198601210	12.10	50	102	13	●
9198601210-D	12.10	50	102	14	●
9198601220	12.20	50	102	13	●
9198601220-D	12.20	50	102	14	●
9198601230	12.30	50	102	13	●
9198601230-D	12.30	50	102	14	●
9198601240	12.40	50	102	13	●
9198601240-D	12.40	50	102	14	●
9198601250	12.50	50	102	13	●
9198601250-D	12.50	50	102	14	●
9198601260	12.60	52	102	13	●
9198601260-D	12.60	52	102	14	●
9198601270	12.70	52	102	13	●
9198601270-D	12.70	52	102	14	●
9198601280	12.80	52	102	13	●
9198601280-D	12.80	52	102	14	●
9198601290	12.90	52	102	13	●
9198601290-D	12.90	52	102	14	●
9198601300	13.00	52	102	13	●
9198601300-D	13.00	52	102	14	●
9198601310	13.10	53	107	14	●
9198601320	13.20	53	107	14	●
9198601330	13.30	53	107	14	●
9198601340	13.40	53	107	14	●
9198601350	13.50	53	107	14	●
9198601360	13.60	55	107	14	●
9198601370	13.70	55	107	14	●
9198601380	13.80	55	107	14	●
9198601390	13.90	55	107	14	●
9198601400	14.00	55	107	14	●
9198601410	14.10	55	110	15	●

List: 9860

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198601410-D	14.10	55	110	16	●
9198601420	14.20	55	110	15	●
9198601420-D	14.20	55	110	16	●
9198601430	14.30	55	110	15	●
9198601430-D	14.30	55	110	16	●
9198601440	14.40	55	110	15	●
9198601440-D	14.40	55	110	16	●
9198601450	14.50	55	110	15	●
9198601450-D	14.50	55	110	16	●
9198601460	14.60	56	110	15	●
9198601460-D	14.60	56	110	16	●
9198601470	14.70	56	110	15	●
9198601470-D	14.70	56	110	16	●
9198601480	14.80	56	110	15	●
9198601480-D	14.80	56	110	16	●
9198601490	14.90	56	110	15	●
9198601490-D	14.90	56	110	16	●
9198601500	15.00	56	110	15	●
9198601500-D	15.00	56	110	16	●
9198601510	15.10	56	114	16	●
9198601520	15.20	56	114	16	●
9198601530	15.30	56	114	16	●
9198601540	15.40	56	114	16	●
9198601550	15.50	56	114	16	●
9198601560	15.60	58	114	16	●
9198601570	15.70	58	114	16	●
9198601580	15.80	58	114	16	●
9198601590	15.90	58	114	16	●
9198601600	16.00	58	114	16	●

●: German Stock | : DIN sizes

STANDARD CUTTING CONDITIONS

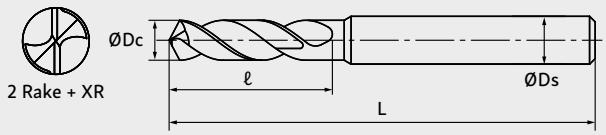
Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG		Stainless Steels 1.4301 1.4401	
	~200HB		20~30HRC		30~40HRC		40~50HRC					
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
2.0	16000	1000	12700	800	7200	350	4800	190	12000	750	3200	140
3.0	10600	1100	8500	890	4800	390	3200	210	8000	830	2120	150
5.0	6400	1100	5100	890	2900	390	1900	210	4800	830	1280	150
8.0	4000	1100	3200	890	1800	390	1200	210	3000	830	800	150
10.0	3200	1050	2500	840	1400	380	1000	200	2400	800	640	150
12.0	2650	1000	2100	800	1200	350	800	190	2000	750	530	140
16.0	2000	890	1600	700	900	320	600	170	1500	660	400	120

Attention on using the cutting condition tables

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) Wet conditions are for drilling with water-soluble cutting fluid.
3) In non-water-soluble cutting fluid, reduce the rotation and feed rate by 20%.
4) Drilling the step feed in Stainless Steel when hole depth more than 2×Dc deep, step feed interval is about 0.5×Dc.
5) Use air blow for cooling and the chip exclusion in dry process.
6) By sparks during cutting, or heat by breakage, or hot chip, there is danger of fire.
7) Retraction of the step feed is to be returned to the top of the hole.
8) 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.
9) 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.

AQRVDR

AquaREVO Drills
Regular (5D)



TOOL MATERIAL | POINT ANGLE | HELIX ANGLE

List: 9862

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198620200	2.00	15	49	3	●
9198620205	2.05	18	49	3	●
9198620210	2.10	18	49	3	●
9198620215	2.15	18	49	3	●
9198620220	2.20	18	49	3	●
9198620225	2.25	18	49	3	●
9198620230	2.30	18	49	3	●
9198620235	2.35	18	49	3	●
9198620240	2.40	18	49	3	●
9198620245	2.45	18	49	3	●
9198620250	2.50	18	49	3	●
9198620255	2.55	20	49	3	●
9198620260	2.60	20	49	3	●
9198620265	2.65	20	49	3	●
9198620270	2.70	20	49	3	●
9198620275	2.75	20	49	3	●
9198620280	2.80	20	49	3	●
9198620285	2.85	20	49	3	●
9198620290	2.90	20	49	3	●
9198620295	2.95	20	49	3	●
9198620300	3.00	20	49	3	●
9198620305	3.05	25	60	4	●
9198620310	3.10	25	60	4	●
9198620315	3.15	25	60	4	●
9198620320	3.20	25	60	4	●
9198620325	3.25	25	60	4	●
9198620330	3.30	25	60	4	●
9198620335	3.35	25	60	4	●
9198620340	3.40	25	60	4	●
9198620345	3.45	25	60	4	●
9198620350	3.50	25	60	4	●
9198620355	3.55	28	60	4	●
9198620360	3.60	28	60	4	●

Article number	Dc	ℓ	L	Ds	Stock
9198620365	3.65	28	60	4	●
9198620370	3.70	28	60	4	●
9198620375	3.75	28	60	4	●
9198620380	3.80	28	60	4	●
9198620385	3.85	28	60	4	●
9198620390	3.90	28	60	4	●
9198620395	3.95	28	60	4	●
9198620400	4.00	28	60	4	●
9198620405	4.05	32	77	5	●
9198620410	4.10	32	77	5	●
9198620410-D	4.10	32	77	6	●
9198620415	4.15	32	77	5	●
9198620420	4.20	32	77	5	●
9198620420-D	4.20	32	77	6	●
9198620425	4.25	32	77	5	●
9198620430	4.30	32	77	5	●
9198620430-D	4.30	32	77	6	●
9198620435	4.35	32	77	5	●
9198620440	4.40	32	77	5	●
9198620440-D	4.40	32	77	6	●
9198620445	4.45	32	77	5	●
9198620450	4.50	32	77	5	●
9198620450-D	4.50	32	77	6	●
9198620455	4.55	39	77	5	●
9198620460	4.60	39	77	5	●
9198620460-D	4.60	39	77	6	●
9198620465	4.65	39	77	5	●
9198620470	4.70	39	77	5	●
9198620470-D	4.70	39	77	6	●
9198620475	4.75	39	77	5	●
9198620480	4.80	39	77	5	●
9198620480-D	4.80	39	77	6	●
9198620485	4.85	39	77	5	●

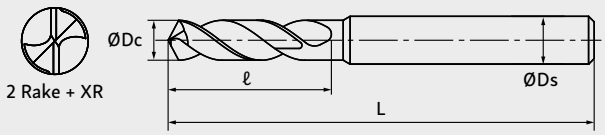
List: 9862

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198620490	4.90	39	77	5	●
9198620490-D	4.90	39	77	6	●
9198620495	4.95	39	77	5	●
9198620500	5.00	40	77	5	●
9198620500-D	5.00	40	77	6	●
9198620505	5.05	40	82	6	●
9198620510	5.10	40	82	6	●
9198620515	5.15	40	82	6	●
9198620520	5.20	40	82	6	●
9198620525	5.25	40	82	6	●
9198620530	5.30	40	82	6	●
9198620535	5.35	40	82	6	●
9198620540	5.40	40	82	6	●
9198620545	5.45	40	82	6	●
9198620550	5.50	40	82	6	●
9198620555	5.55	42	82	6	●
9198620560	5.60	42	82	6	●
9198620565	5.65	42	82	6	●
9198620570	5.70	42	82	6	●
9198620575	5.75	42	82	6	●
9198620580	5.80	42	82	6	●
9198620585	5.85	42	82	6	●
9198620590	5.90	42	82	6	●
9198620595	5.95	42	82	6	●
9198620600	6.00	42	82	6	●
9198620610	6.10	43	84	7	●
9198620610-D	6.10	43	84	8	●
9198620620	6.20	43	84	7	●
9198620620-D	6.20	43	84	8	●
9198620630	6.30	43	84	7	●
9198620630-D	6.30	43	84	8	●
9198620640	6.40	43	84	7	●
9198620640-D	6.40	43	84	8	●
9198620650	6.50	43	84	7	●
9198620650-D	6.50	43	84	8	●
9198620660	6.60	44	84	7	●
9198620660-D	6.60	44	84	8	●
9198620670	6.70	44	84	7	●
9198620670-D	6.70	44	84	8	●
9198620680	6.80	44	84	7	●
9198620680-D	6.80	44	84	8	●
9198620690	6.90	44	84	7	●
9198620690-D	6.90	44	84	8	●
9198620700	7.00	44	84	7	●
9198620700-D	7.00	44	84	8	●
9198620710	7.10	46	91	8	●
9198620720	7.20	46	91	8	●
9198620730	7.30	46	91	8	●
9198620740	7.40	46	91	8	●
9198620750	7.50	46	91	8	●
9198620760	7.60	47	91	8	●
9198620770	7.70	47	91	8	●
9198620780	7.80	47	91	8	●
9198620790	7.90	47	91	8	●
9198620800	8.00	47	91	8	●
9198620810	8.10	55	99	9	●
9198620810-D	8.10	55	99	10	●
9198620820	8.20	55	99	9	●
9198620820-D	8.20	55	99	10	●
9198620830	8.30	55	99	9	●
9198620830-D	8.30	55	99	10	●
9198620840	8.40	55	99	9	●
9198620840-D	8.40	55	99	10	●
9198620850	8.50	55	99	9	●
9198620850-D	8.50	55	99	10	●
9198620860	8.60	57	99	9	●
9198620860-D	8.60	57	99	10	●
9198620870	8.70	57	99	9	●
9198620870-D	8.70	57	99	10	●
9198620880	8.80	57	99	9	●
9198620880-D	8.80	57	99	10	●
9198620890	8.90	57	99	9	●
9198620890-D	8.90	57	99	10	●
9198620900	9.00	57	99	9	●
9198620900-D	9.00	57	99	10	●
9198620910	9.10	60	107	10	●
9198620920	9.20	60	107	10	●
9198620930	9.30	60	107	10	●
9198620940	9.40	60	107	10	●
9198620950	9.50	60	107	10	●

AQRVDR

AquaREVO Drills
Regular (5D)



TOOL MATERIAL — POINT ANGLE — HELIX ANGLE

List: 9862

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198620960	9.60	62	107	10	●
9198620970	9.70	62	107	10	●
9198620980	9.80	62	107	10	●
9198620990	9.90	62	107	10	●
9198621000	10.00	62	107	10	●
9198621010	10.10	68	116	11	●
9198621010-D	10.10	68	116	12	●
9198621020	10.20	68	116	11	●
9198621020-D	10.20	68	116	12	●
9198621030	10.30	68	116	11	●
9198621030-D	10.30	68	116	12	●
9198621040	10.40	68	116	11	●
9198621040-D	10.40	68	116	12	●
9198621050	10.50	68	116	11	●
9198621050-D	10.50	68	116	12	●
9198621060	10.60	70	116	11	●
9198621060-D	10.60	70	116	12	●
9198621070	10.70	70	116	11	●
9198621070-D	10.70	70	116	12	●
9198621080	10.80	70	116	11	●
9198621080-D	10.80	70	116	12	●
9198621090	10.90	70	116	11	●
9198621090-D	10.90	70	116	12	●
9198621100	11.00	70	116	11	●
9198621100-D	11.00	70	116	12	●
9198621110	11.10	73	123	12	●
9198621120	11.20	73	123	12	●
9198621130	11.30	73	123	12	●
9198621140	11.40	73	123	12	●
9198621150	11.50	73	123	12	●
9198621160	11.60	76	123	12	●
9198621170	11.70	76	123	12	●
9198621180	11.80	76	123	12	●

Article number	Dc	ℓ	L	Ds	Stock
9198621190	11.90	76	123	12	●
9198621200	12.00	76	123	12	●
9198621210	12.10	79	138	13	●
9198621210-D	12.10	79	138	14	●
9198621220	12.20	79	138	13	●
9198621220-D	12.20	79	138	14	●
9198621230	12.30	79	138	13	●
9198621230-D	12.30	79	138	14	●
9198621240	12.40	79	138	13	●
9198621240-D	12.40	79	138	14	●
9198621250	12.50	79	138	13	●
9198621250-D	12.50	79	138	14	●
9198621260	12.60	81	138	13	●
9198621260-D	12.60	81	138	14	●
9198621270	12.70	81	138	13	●
9198621270-D	12.70	81	138	14	●
9198621280	12.80	81	138	13	●
9198621280-D	12.80	81	138	14	●
9198621290	12.90	81	138	13	●
9198621290-D	12.90	81	138	14	●
9198621300	13.00	81	138	13	●
9198621300-D	13.00	81	138	14	●
9198621310	13.10	87	148	14	●
9198621320	13.20	87	148	14	●
9198621330	13.30	87	148	14	●
9198621340	13.40	87	148	14	●
9198621350	13.50	87	148	14	●
9198621360	13.60	90	148	14	●
9198621370	13.70	90	148	14	●
9198621380	13.80	90	148	14	●
9198621390	13.90	90	148	14	●
9198621400	14.00	90	148	14	●
9198621410	14.10	92	154	15	●

List: 9862

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198621410-D	14.10	92	154	16	●
9198621420	14.20	92	154	15	●
9198621420-D	14.20	92	154	16	●
9198621430	14.30	92	154	15	●
9198621430-D	14.30	92	154	16	●
9198621440	14.40	92	154	15	●
9198621440-D	14.40	92	154	16	●
9198621450	14.50	92	154	15	●
9198621450-D	14.50	92	154	16	●
9198621460	14.60	94	154	15	●
9198621460-D	14.60	94	154	16	●
9198621470	14.70	94	154	15	●
9198621470-D	14.70	94	154	16	●
9198621480	14.80	94	154	15	●
9198621480-D	14.80	94	154	16	●

Article number	Dc	ℓ	L	Ds	Stock
9198621490	14.90	94	154	15	●
9198621490-D	14.90	94	154	16	●
9198621500	15.00	94	154	15	●
9198621500-D	15.00	94	154	16	●
9198621510	15.10	97	162	16	●
9198621520	15.20	97	162	16	●
9198621530	15.30	97	162	16	●
9198621540	15.40	97	162	16	●
9198621550	15.50	97	162	16	●
9198621560	15.60	99	162	16	●
9198621570	15.70	99	162	16	●
9198621580	15.80	99	162	16	●
9198621590	15.90	99	162	16	●
9198621600	16.00	99	162	16	●

●: German Stock | : DIN sizes

STANDARD CUTTING CONDITIONS

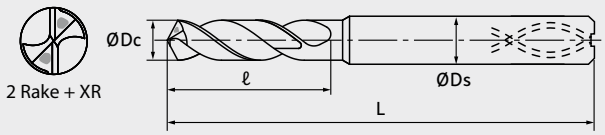
Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG		Stainless Steels 1.4301 1.4401	
	~200HB		20~30HRC		30~40HRC		40~50HRC					
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
2.0	16000	900	12700	720	7200	320	4800	170	12000	680	3200	130
3.0	10600	1000	8500	810	4800	360	3200	190	8000	760	2120	140
5.0	6400	1000	5100	810	2900	360	1900	190	4800	760	1280	140
8.0	4000	1000	3200	810	1800	350	1200	190	3000	760	800	140
10.0	3200	960	2500	760	1400	340	1000	180	2400	720	640	130
12.0	2650	900	2100	720	1200	310	800	170	2000	680	530	130
16.0	2000	810	1600	650	900	290	600	150	1500	600	400	110

Attention on using the cutting condition tables

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) Wet conditions are for drilling with water-soluble cutting fluid.
3) In non-water-soluble cutting fluid, reduce the rotation and feed rate by 20%.
4) Drilling the step feed in Stainless Steel when hole depth more than 2×Dc deep, step feed interval is about 0.5×Dc.
5) Use air blow for cooling and the chip exclusion in dry process.
6) By sparks during cutting, or heat by breakage or hot chip, there is danger of fire.
7) Retraction of the step feed is to be returned to the top of the hole.
8) 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.
9) 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.

AQRVDOH3D

AquaREVO Drills
Oil-Hole (3D)



TOOL MATERIAL — POINT ANGLE — HELIX ANGLE

List: 9872

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198720300	3.0	20	62	6	●
9198720310	3.1	20	62	6	●
9198720320	3.2	20	62	6	●
9198720330	3.3	20	62	6	●
9198720340	3.4	20	62	6	●
9198720350	3.5	20	62	6	●
9198720360	3.6	20	62	6	●
9198720370	3.7	20	62	6	●
9198720380	3.8	24	66	6	●
9198720390	3.9	24	66	6	●
9198720400	4.0	24	66	6	●
9198720410	4.1	24	66	6	●
9198720420	4.2	24	66	6	●
9198720430	4.3	24	66	6	●
9198720440	4.4	24	66	6	●
9198720450	4.5	24	66	6	●
9198720460	4.6	24	66	6	●
9198720470	4.7	24	66	6	●
9198720480	4.8	28	66	6	●
9198720490	4.9	28	66	6	●
9198720500	5.0	28	66	6	●
9198720510	5.1	28	66	6	●
9198720520	5.2	28	66	6	●
9198720530	5.3	28	66	6	●
9198720540	5.4	28	66	6	●
9198720550	5.5	28	66	6	●
9198720560	5.6	28	66	6	●
9198720570	5.7	28	66	6	●
9198720580	5.8	28	66	6	●
9198720590	5.9	28	66	6	●
9198720600	6.0	28	66	6	●
9198720610	6.1	34	79	8	●
9198720620	6.2	34	79	8	●

Article number	Dc	ℓ	L	Ds	Stock
9198720630	6.3	34	79	8	●
9198720640	6.4	34	79	8	●
9198720650	6.5	34	79	8	●
9198720660	6.6	34	79	8	●
9198720670	6.7	34	79	8	●
9198720680	6.8	34	79	8	●
9198720690	6.9	34	79	8	●
9198720700	7.0	34	79	8	●
9198720710	7.1	41	79	8	●
9198720720	7.2	41	79	8	●
9198720730	7.3	41	79	8	●
9198720740	7.4	41	79	8	●
9198720750	7.5	41	79	8	●
9198720760	7.6	41	79	8	●
9198720770	7.7	41	79	8	●
9198720780	7.8	41	79	8	●
9198720790	7.9	41	79	8	●
9198720800	8.0	41	79	8	●
9198720810	8.1	47	89	10	●
9198720820	8.2	47	89	10	●
9198720830	8.3	47	89	10	●
9198720840	8.4	47	89	10	●
9198720850	8.5	47	89	10	●
9198720860	8.6	47	89	10	●
9198720870	8.7	47	89	10	●
9198720880	8.8	47	89	10	●
9198720890	8.9	47	89	10	●
9198720900	9.0	47	89	10	●
9198720910	9.1	47	89	10	●
9198720920	9.2	47	89	10	●
9198720930	9.3	47	89	10	●
9198720940	9.4	47	89	10	●
9198720950	9.5	47	89	10	●

List: 9872

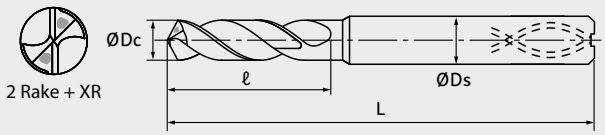
unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198720960	9.6	47	89	10	●
9198720970	9.7	47	89	10	●
9198720980	9.8	47	89	10	●
9198720990	9.9	47	89	10	●
9198721000	10.0	47	89	10	●
9198721010	10.1	55	102	12	●
9198721020	10.2	55	102	12	●
9198721030	10.3	55	102	12	●
9198721040	10.4	55	102	12	●
9198721050	10.5	55	102	12	●
9198721060	10.6	55	102	12	●
9198721070	10.7	55	102	12	●
9198721080	10.8	55	102	12	●
9198721090	10.9	55	102	12	●
9198721100	11.0	55	102	12	●
9198721110	11.1	55	102	12	●
9198721120	11.2	55	102	12	●
9198721130	11.3	55	102	12	●
9198721140	11.4	55	102	12	●
9198721150	11.5	55	102	12	●
9198721160	11.6	55	102	12	●
9198721170	11.7	55	102	12	●
9198721180	11.8	55	102	12	●
9198721190	11.9	55	102	12	●
9198721200	12.0	55	102	12	●
9198721210	12.1	60	107	14	●
9198721220	12.2	60	107	14	●
9198721230	12.3	60	107	14	●
9198721240	12.4	60	107	14	●
9198721250	12.5	60	107	14	●
9198721260	12.6	60	107	14	●
9198721270	12.7	60	107	14	●
9198721280	12.8	60	107	14	●
9198721290	12.9	60	107	14	●
9198721300	13.0	60	107	14	●
9198721310	13.1	60	107	14	●
9198721320	13.2	60	107	14	●
9198721330	13.3	60	107	14	●
9198721340	13.4	60	107	14	●
9198721350	13.5	60	107	14	●
9198721360	13.6	60	107	14	●
9198721370	13.7	60	107	14	●
9198721380	13.8	60	107	14	●
9198721390	13.9	60	107	14	●
9198721400	14.0	60	107	14	●
9198721410	14.1	65	115	16	●
9198721420	14.2	65	115	16	●
9198721430	14.3	65	115	16	●
9198721440	14.4	65	115	16	●
9198721450	14.5	65	115	16	●
9198721460	14.6	65	115	16	●
9198721470	14.7	65	115	16	●
9198721480	14.8	65	115	16	●
9198721490	14.9	65	115	16	●
9198721500	15.0	65	115	16	●
9198721510	15.1	65	115	16	●
9198721520	15.2	65	115	16	●
9198721530	15.3	65	115	16	●
9198721540	15.4	65	115	16	●
9198721550	15.5	65	115	16	●
9198721560	15.6	65	115	16	●
9198721570	15.7	65	115	16	●
9198721580	15.8	65	115	16	●
9198721590	15.9	65	115	16	●
9198721600	16.0	65	115	16	●

●: German Stock

AQRVDOH5D

AquaREVO Drills
Oil-Hole (5D)



TOOL MATERIAL — POINT ANGLE — HELIX ANGLE

List: 9874

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198740300	3.0	28	66	6	●
9198740310	3.1	28	66	6	●
9198740320	3.2	28	66	6	●
9198740330	3.3	28	66	6	●
9198740340	3.4	28	66	6	●
9198740350	3.5	28	66	6	●
9198740360	3.6	28	66	6	●
9198740370	3.7	28	66	6	●
9198740380	3.8	36	74	6	●
9198740390	3.9	36	74	6	●
9198740400	4.0	36	74	6	●
9198740410	4.1	36	74	6	●
9198740420	4.2	36	74	6	●
9198740430	4.3	36	74	6	●
9198740440	4.4	36	74	6	●
9198740450	4.5	36	74	6	●
9198740460	4.6	36	74	6	●
9198740470	4.7	36	74	6	●
9198740480	4.8	44	82	6	●
9198740490	4.9	44	82	6	●
9198740500	5.0	44	82	6	●
9198740510	5.1	44	82	6	●
9198740520	5.2	44	82	6	●
9198740530	5.3	44	82	6	●
9198740540	5.4	44	82	6	●
9198740550	5.5	44	82	6	●
9198740560	5.6	44	82	6	●
9198740570	5.7	44	82	6	●
9198740580	5.8	44	82	6	●
9198740590	5.9	44	82	6	●
9198740600	6.0	44	82	6	●
9198740610	6.1	53	91	8	●
9198740620	6.2	53	91	8	●

Article number	Dc	ℓ	L	Ds	Stock
9198740630	6.3	53	91	8	●
9198740640	6.4	53	91	8	●
9198740650	6.5	53	91	8	●
9198740660	6.6	53	91	8	●
9198740670	6.7	53	91	8	●
9198740680	6.8	53	91	8	●
9198740690	6.9	53	91	8	●
9198740700	7.0	53	91	8	●
9198740710	7.1	53	91	8	●
9198740720	7.2	53	91	8	●
9198740730	7.3	53	91	8	●
9198740740	7.4	53	91	8	●
9198740750	7.5	53	91	8	●
9198740760	7.6	53	91	8	●
9198740770	7.7	53	91	8	●
9198740780	7.8	53	91	8	●
9198740790	7.9	53	91	8	●
9198740800	8.0	53	91	8	●
9198740810	8.1	61	103	10	●
9198740820	8.2	61	103	10	●
9198740830	8.3	61	103	10	●
9198740840	8.4	61	103	10	●
9198740850	8.5	61	103	10	●
9198740860	8.6	61	103	10	●
9198740870	8.7	61	103	10	●
9198740880	8.8	61	103	10	●
9198740890	8.9	61	103	10	●
9198740900	9.0	61	103	10	●
9198740910	9.1	61	103	10	●
9198740920	9.2	61	103	10	●
9198740930	9.3	61	103	10	●
9198740940	9.4	61	103	10	●
9198740950	9.5	61	103	10	●

List: 9874

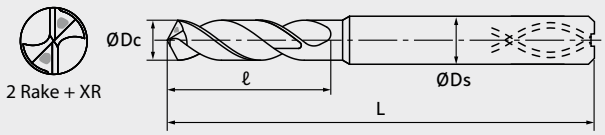
unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198740960	9.6	61	103	10	●
9198740970	9.7	61	103	10	●
9198740980	9.8	61	103	10	●
9198740990	9.9	61	103	10	●
9198741000	10.0	61	103	10	●
9198741010	10.1	71	118	12	●
9198741020	10.2	71	118	12	●
9198741030	10.3	71	118	12	●
9198741040	10.4	71	118	12	●
9198741050	10.5	71	118	12	●
9198741060	10.6	71	118	12	●
9198741070	10.7	71	118	12	●
9198741080	10.8	71	118	12	●
9198741090	10.9	71	118	12	●
9198741100	11.0	71	118	12	●
9198741110	11.1	71	118	12	●
9198741120	11.2	71	118	12	●
9198741130	11.3	71	118	12	●
9198741140	11.4	71	118	12	●
9198741150	11.5	71	118	12	●
9198741160	11.6	71	118	12	●
9198741170	11.7	71	118	12	●
9198741180	11.8	71	118	12	●
9198741190	11.9	71	118	12	●
9198741200	12.0	71	118	12	●
9198741210	12.1	77	124	14	●
9198741220	12.2	77	124	14	●
9198741230	12.3	77	124	14	●
9198741240	12.4	77	124	14	●
9198741250	12.5	77	124	14	●
9198741260	12.6	77	124	14	●
9198741270	12.7	77	124	14	●
9198741280	12.8	77	124	14	●
9198741290	12.9	77	124	14	●
9198741300	13.0	77	124	14	●
9198741310	13.1	77	124	14	●
9198741320	13.2	77	124	14	●
9198741330	13.3	77	124	14	●
9198741340	13.4	77	124	14	●
9198741350	13.5	77	124	14	●
9198741360	13.6	77	124	14	●
9198741370	13.7	77	124	14	●
9198741380	13.8	77	124	14	●
9198741390	13.9	77	124	14	●
9198741400	14.0	77	124	14	●
9198741410	14.1	83	133	16	●
9198741420	14.2	83	133	16	●
9198741430	14.3	83	133	16	●
9198741440	14.4	83	133	16	●
9198741450	14.5	83	133	16	●
9198741460	14.6	83	133	16	●
9198741470	14.7	83	133	16	●
9198741480	14.8	83	133	16	●
9198741490	14.9	83	133	16	●
9198741500	15.0	83	133	16	●
9198741510	15.1	83	133	16	●
9198741520	15.2	83	133	16	●
9198741530	15.3	83	133	16	●
9198741540	15.4	83	133	16	●
9198741550	15.5	83	133	16	●
9198741560	15.6	83	133	16	●
9198741570	15.7	83	133	16	●
9198741580	15.8	83	133	16	●
9198741590	15.9	83	133	16	●
9198741600	16.0	83	133	16	●

●: German Stock

AQRVDOH8D

AquaREVO Drills
Oil-Hole (8D)



TOOL MATERIAL — POINT ANGLE — HELIX ANGLE

List: 9868 / 9868D

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
9198680300	3.0	34	81	3	●
9198680310	3.1	39	92	4	●
9198680320	3.2	39	92	4	●
9198680330	3.3	39	92	4	●
9198680340	3.4	39	92	4	●
9198680350	3.5	39	92	4	●
9198680360	3.6	45	92	4	●
9198680370	3.7	45	92	4	●
9198680380	3.8	45	92	4	●
9198680390	3.9	45	92	4	●
9198680400	4.0	45	92	4	●
9198680410	4.1	50	105	5	○
919868D0410	4.1	50	105	6	●*
9198680420	4.2	50	105	5	○
919868D0420	4.2	50	105	6	●*
9198680430	4.3	50	105	5	○
919868D0430	4.3	50	105	6	●*
9198680440	4.4	50	105	5	○
919868D0440	4.4	50	105	6	●*
9198680450	4.5	50	105	5	○
919868D0450	4.5	50	105	6	●*
9198680460	4.6	56	105	5	○
919868D0460	4.6	56	105	6	●*
9198680470	4.7	56	105	5	○
919868D0470	4.7	56	105	6	●*
9198680480	4.8	56	105	5	○
919868D0480	4.8	56	105	6	●*
9198680490	4.9	56	105	5	○
919868D0490	4.9	56	105	6	●*
9198680500	5.0	56	105	5	○
919868D0500	5.0	56	105	6	●*
9198680510	5.1	62	118	6	●
9198680520	5.2	62	118	6	●
9198680530	5.3	62	118	6	●
9198680540	5.4	62	118	6	●
9198680550	5.5	62	118	6	●
9198680560	5.6	68	118	6	●
9198680570	5.7	68	118	6	●
9198680580	5.8	68	118	6	●
9198680590	5.9	68	118	6	●
9198680600	6.0	68	118	6	●
9198680610	6.1	73	130	7	○
919868D0610	6.1	73	130	8	●*
9198680620	6.2	73	130	7	○

Article number	Dc	ℓ	L	Ds	Stock
919868D0620	6.2	73	130	8	●*
9198680630	6.3	73	130	7	○
919868D0630	6.3	73	130	8	●*
9198680640	6.4	73	130	7	○
919868D0640	6.4	73	130	8	●*
9198680650	6.5	73	130	7	○
919868D0650	6.5	73	130	8	●*
9198680660	6.6	79	130	7	○
919868D0660	6.6	79	130	8	●*
9198680670	6.7	79	130	7	○
919868D0670	6.7	79	130	8	●*
9198680680	6.8	79	130	7	○
919868D0680	6.8	79	130	8	●*
9198680690	6.9	79	130	7	○
919868D0690	6.9	79	130	8	●*
9198680700	7.0	79	130	7	○
919868D0700	7.0	79	130	8	●*
9198680710	7.1	84	142	8	●
9198680720	7.2	84	142	8	●
9198680730	7.3	84	142	8	●
9198680740	7.4	84	142	8	●
9198680750	7.5	84	142	8	●
9198680760	7.6	90	142	8	●
9198680770	7.7	90	142	8	●
9198680780	7.8	90	142	8	●
9198680790	7.9	90	142	8	●
9198680800	8.0	90	142	8	●
9198680810	8.1	95	154	9	○
919868D0810	8.1	95	154	10	●*
9198680820	8.2	95	154	9	○
919868D0820	8.2	95	154	10	●*
9198680830	8.3	95	154	9	○
919868D0830	8.3	95	154	10	●*
9198680840	8.4	95	154	9	○
919868D0840	8.4	95	154	10	●*
9198680850	8.5	95	154	9	○
919868D0850	8.5	95	154	10	●*
9198680860	8.6	101	154	9	○
919868D0860	8.6	101	154	10	●*
9198680870	8.7	101	154	9	○
919868D0870	8.7	101	154	10	●*
9198680880	8.8	101	154	9	○
919868D0880	8.8	101	154	10	●*
9198680890	8.9	101	154	9	○

List: 9868 / 9868D

unit: mm

Article number	Dc	ℓ	L	Ds	Stock
919868D0890	8.9	101	154	10	●*
9198680900	9.0	101	154	9	○
919868D0900	9.0	101	154	10	●*
9198680910	9.1	106	166	10	●
9198680920	9.2	106	166	10	●
9198680930	9.3	106	166	10	●
9198680940	9.4	106	166	10	●
9198680950	9.5	106	166	10	●
9198680960	9.6	112	166	10	●
9198680970	9.7	112	166	10	●
9198680980	9.8	112	166	10	●
9198680990	9.9	112	166	10	●
9198681000	10.0	112	166	10	●
9198681010	10.1	118	182	11	○
919868D1010	10.1	118	182	12	●*
9198681020	10.2	118	182	11	○
919868D1020	10.2	118	182	12	●*
9198681030	10.3	118	182	11	○
919868D1030	10.3	118	182	12	●*
9198681040	10.4	118	182	11	○
919868D1040	10.4	118	182	12	●*
9198681050	10.5	118	182	11	○
919868D1050	10.5	118	182	12	●*
9198681060	10.6	124	182	11	○
919868D1060	10.6	124	182	12	●*
9198681070	10.7	124	182	11	○
919868D1070	10.7	124	182	12	●*
9198681080	10.8	124	182	11	○
919868D1080	10.8	124	182	12	●*
9198681090	10.9	124	182	11	○
919868D1090	10.9	124	182	12	●*
9198681100	11.0	124	182	11	○
919868D1100	11.0	124	182	12	●*
9198681110	11.1	129	194	12	●
9198681120	11.2	129	194	12	●
9198681130	11.3	129	194	12	●
9198681140	11.4	129	194	12	●
9198681150	11.5	129	194	12	●
9198681160	11.6	135	194	12	●
9198681170	11.7	135	194	12	●
9198681180	11.8	135	194	12	●
9198681190	11.9	135	194	12	●
9198681200	12.0	135	194	12	●
9198681210	12.1	140	206	13	○
919868D1210	12.1	140	206	14	●*
9198681220	12.2	140	206	13	○
919868D1220	12.2	140	206	14	●*
9198681230	12.3	140	206	13	○
919868D1230	12.3	140	206	14	●*
9198681240	12.4	140	206	13	○
919868D1240	12.4	140	206	14	●*
9198681250	12.5	140	206	13	○
919868D1250	12.5	140	206	14	●*
9198681260	12.6	146	206	13	○
919868D1260	12.6	146	206	14	●*
9198681270	12.7	146	206	13	○
919868D1270	12.7	146	206	14	●*
9198681280	12.8	146	206	13	○
919868D1280	12.8	146	206	14	●*
9198681290	12.9	146	206	13	○
919868D1290	12.9	146	206	14	●*
9198681300	13.0	146	206	13	○
919868D1300	13.0	146	206	14	●*
9198681310	13.1	151	218	14	●
9198681320	13.2	151	218	14	●
9198681330	13.3	151	218	14	●
9198681340	13.4	151	218	14	●
9198681350	13.5	151	218	14	●
9198681360	13.6	157	218	14	●
9198681370	13.7	157	218	14	●
9198681380	13.8	157	218	14	●
9198681390	13.9	157	218	14	●
9198681400	14.0	157	218	14	●
9198681410	14.1	163	230	15	○
919868D1410	14.1	163	230	16	●*
9198681420	14.2	163	230	15	○
919868D1420	14.2	163	230	16	●*
9198681430	14.3	163	230	15	○
919868D1430	14.3	163	230	16	●*
9198681440	14.4	163	230	15	○
919868D1440	14.4	163	230	16	●*
9198681450	14.5	163	230	15	○
919868D1450	14.5	163	230	16	●*
9198681460	14.6	169	230	15	○
919868D1460	14.6	169	230	16	●*
9198681470	14.7	169	230	15	○
919868D1470	14.7	169	230	16	●*
9198681480	14.8	169	230	15	○
919868D1480	14.8	169	230	16	●*
9198681490	14.9	169	230	15	○
919868D1490	14.9	169	230	16	●*
9198681500	15.0	169	230	15	○
919868D1500	15.0	169	230	16	●*
9198681510	15.1	174	242	16	●
9198681520	15.2	174	242	16	●
9198681530	15.3	174	242	16	●
9198681540	15.4	174	242	16	●
9198681550	15.5	174	242	16	●
9198681560	15.6	180	242	16	●
9198681570	15.7	180	242	16	●
9198681580	15.8	180	242	16	●
9198681590	15.9	180	242	16	●
9198681600	16.0	180	242	16	●

●: German Stock
*Comming soon

AQRVDOH3D/5D

AquaREVO Drills Oil-Hole (3D/5D)

STANDARD CUTTING WET CONDITIONS

Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG		Stainless Steels 1.4301 1.4000 1.4016		Stainless Steels 1.4542		Titanium Alloys TI-6Al-4V		Nickel Alloys Inconel 718	
	~200HB		20~30HRC		30~40HRC		40~50HRC											
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
3.0	12700	1220	10600	1020	8500	760	4250	260	10600	950	8500	680	5300	400	4200	320	4200	190
4.0	9600	1220	8000	1020	6400	760	3200	260	8000	950	6400	680	4000	400	3200	320	3200	190
6.0	6400	1220	5300	1020	4200	710	2100	240	5300	950	4200	660	2600	400	2100	320	2100	190
8.0	4800	1220	4000	1020	3200	710	1600	240	4000	880	3200	640	2000	400	1600	320	1600	190
10.0	3800	1140	3200	960	2500	640	1300	230	3200	790	2500	590	1600	370	1300	300	1300	180
12.0	3200	1070	2700	920	2100	540	1050	220	2700	670	2100	560	1300	350	1050	280	1050	180
16.0	2400	960	2000	890	1600	480	800	210	2000	620	1600	510	1000	320	800	260	800	150

STANDARD MQL CONDITIONS

Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG	
	~200HB		20~30HRC		30~40HRC		40~50HRC			
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
3.0	8500	770	7400	570	6400	540	2550	140	7400	620
4.0	6400	770	5600	570	4800	540	1900	140	5600	620
6.0	4200	770	3700	570	3200	540	1300	130	3700	620
8.0	3200	770	2800	570	2400	500	1000	130	2800	580
10.0	2500	720	2200	540	1900	440	800	120	2200	500
12.0	2100	670	1900	500	1600	380	650	120	1900	460
16.0	1600	600	1400	500	1200	340	480	100	1400	400

AQRVDOH8D

AquaREVO Drills Oil-Hole (8D)

STANDARD CUTTING WET CONDITIONS

Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG		Stainless Steels 1.4301 1.4000 1.4016		Stainless Steels 1.4542		Titanium Alloys TI-6Al-4V		Nickel Alloys Inconel 718	
	~200HB		20~30HRC		30~40HRC		40~50HRC											
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
3.0	12700	1020	10600	920	8500	630	4250	230	10600	800	8500	630	5300	360	4200	290	4200	170
4.0	9600	1020	8000	920	6400	630	3200	230	8000	800	6400	630	4000	360	3200	290	3200	170
6.0	6400	1020	5300	920	4200	600	2100	220	5300	740	4200	600	2600	360	2100	290	2100	170
8.0	4800	1020	4000	920	3200	590	1600	220	4000	740	3200	570	2000	360	1600	290	1600	170
10.0	3800	950	3200	860	2500	530	1300	210	3200	680	2500	530	1600	330	1300	260	1300	160
12.0	3200	890	2700	820	2100	480	1050	200	2700	630	2100	500	1300	320	1050	250	1050	150
16.0	2400	800	2000	800	1600	440	800	190	2000	550	1600	470	1000	290	800	230	800	140

STANDARD MQL CONDITIONS

Work Material	Structural Steels, Carbon Steels, Cast Irons St37-2, C50E		Alloy Steels, Heat-treated Steels 42CrMo4		Mold Steels, Hardened Steels 1.2344		Hardened Steels		Ductile Cast Irons GG/GGG	
	~200HB		20~30HRC		30~40HRC		40~50HRC			
Drill Dia. mm	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min	Rotation min^{-1}	Feed mm/min
3.0	8500	640	7400	510	6400	400	2550	120	7400	500
4.0	6400	640	5600	510	4800	400	1900	120	5600	500
6.0	4200	640	3700	510	3200	370	1300	120	3700	470
8.0	3200	640	2800	510	2400	370	1000	120	2800	470
10.0	2500	600	2200	480	1900	340	800	100	2200	440
12.0	2100	560	1900	450	1600	340	650	100	1900	430
16.0	1600	500	1400	450	1200	330	480	90	1400	360

Attention on using the cutting condition tables

1) Adjust cutting condition according to the rigidity of machine or work clamp state.
2) Wet conditions are for drilling with water-soluble cutting fluid.
3) In non-water-soluble cutting fluid, reduce the rotation and feed rate by 20%.
4) Use on internal coolant.
5) Non-step drilling is possible. 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. In step feed, return to the entrance hole. Step feed interval is about 0.2~1×Dc.

Pictogram overview

NACHI – high-quality solid carbide substrate

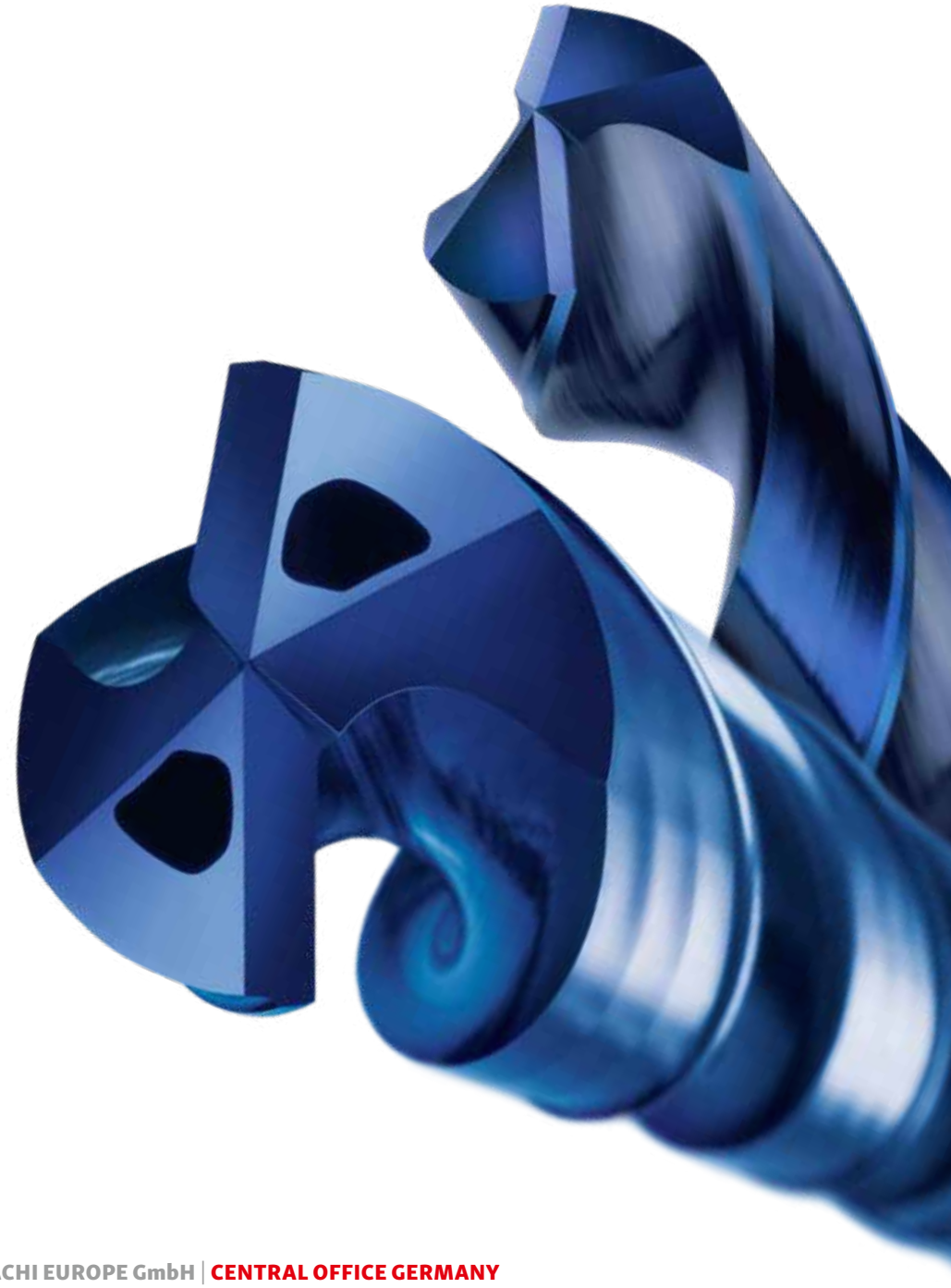
Point angle

Helix angle

Revo-D coating AlTiCrXN Nanolayers

Grinding tolerance

Shank tolerance



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