

INCH SHANK

ORION 3xD HIGH PERFORMANCE DRILLS

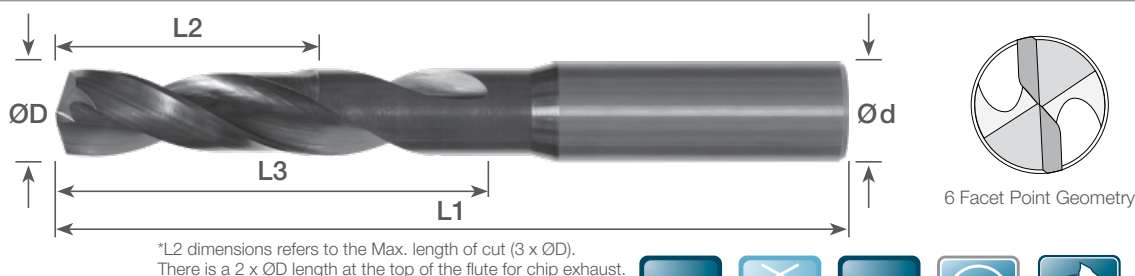
0.0469" - 0.5000" DIAMETER

Increased Positional Accuracy

Less Heat Build Up

Excellent Pilot Hole Drill

External Coolant



ORION 3xD High Performance



AITIN Nano		Dimensions (in)					Point Angle
Part Number	Stock	ØD	Ød	L1	*L2	L3	
NEW 160-0469AG234	●	0.0469 (3/64)	1/8	2	0.141	0.234	142°
NEW 160-0625AG313	●	0.0625 (1/16)	1/8	2	0.188	0.313	142°
NEW 160-0781AG391	●	0.0781 (5/64)	1/8	2	0.234	0.391	142°
NEW 160-0938AG469	●	0.0938 (3/32)	1/8	2	0.281	0.469	142°
NEW 160-1094AG547	●	0.1094 (7/64)	1/8	2	0.328	0.547	142°
160-1250AG625	●	0.1250 (1/8)	3/16	2 1/2	0.375	0.625	142°
160-1406AG703	●	0.1406 (9/64)	3/16	2 1/2	0.422	0.703	142°
160-1563AG781	●	0.1563 (5/32)	3/16	2 1/2	0.468	0.781	142°
160-1719AG859	●	0.1719 (11/64)	3/16	2 1/2	0.515	0.859	142°
160-1875AG938	●	0.1875 (3/16)	1/4	2 1/2	0.563	0.938	142°
160-2031AG1016	●	0.2031 (13/64)	1/4	2 1/2	0.610	1.016	142°
160-2188AG1094	●	0.2188 (7/32)	1/4	2 1/2	0.656	1.094	142°
160-2344AG1172	●	0.2344 (15/64)	1/4	2 1/2	0.703	1.172	142°
160-2500AG1250	●	0.2500 (1/4)	5/16	3	0.750	1.250	142°
160-2570AG1285	●	0.2570 (F)	5/16	3	0.771	1.285	142°
160-2656AG1328	●	0.2656 (17/64)	5/16	3	0.797	1.328	142°
160-2813AG1406	●	0.2813 (9/32)	5/16	3	0.843	1.406	142°
160-3125AG1563	●	0.3125 (5/16)	3/8	4	0.938	1.563	142°
160-3320AG1660	●	0.3320 (Q)	3/8	4	0.996	1.660	142°
160-3438AG1719	●	0.3438 (11/32)	3/8	4	1.031	1.719	142°
160-3750AG1875	●	0.3750 (3/8)	7/16	4 1/2	1.125	1.875	142°
160-4219AG2109	●	0.4219 (27/64)	7/16	4 1/2	1.265	2.109	142°
160-4375AG2188	●	0.4375 (7/16)	1/2	5	1.313	2.188	142°
160-4531AG2266	●	0.4531 (29/64)	1/2	5	1.360	2.266	142°
160-5000AG2500	●	0.5000 (1/2)	5/8	5	1.500	2.500	142°

Diameter Tolerance

Cutting Dia. (ØD)	0.1250" - 0.2344"	0.2500" - 0.3750"	0.4219" - 0.5000"
Tolerance + / +	+0.00016"/+0.00063"	+0.00024"/+0.00083"	+0.00028"/+0.00098"

Shank Tolerance

Shank Dia. (Ød)	0.1250" - 0.2344"	0.2500" - 0.3750"	0.4219" - 0.5000"
Tolerance + / -	+0.00000"/-0.00032"	+0.00000"/-0.00035"	+0.00000"/-0.00043"

ORION SERIES 160 WORKPIECE MATERIAL

Coating	Material Coating															
	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions • Page L216

Symbol Descriptions • Page L3

INCH SHANK NEW

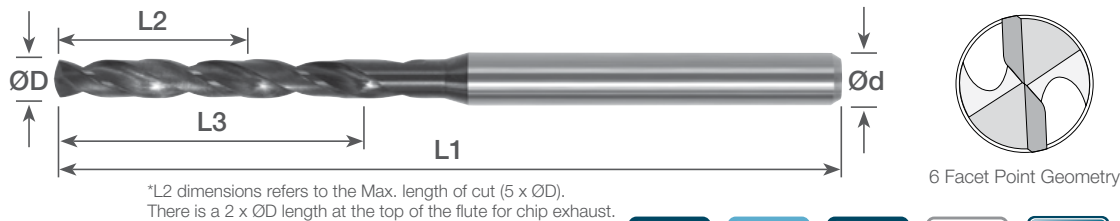
ORION 5XD HIGH PERFORMANCE DRILLS

0.0469" - 0.5000" DIAMETER

Increased Positional Accuracy

Less Heat Build Up

External Coolant



ORION 5xD High Performance



AlTiN Nano		Dimensions (in)					Point Angle
Part Number	Stock	ØD	Ød	L1	*L2	L3	
160-0469AG328	●	0.0469 (3/64)	1/8	2 1/2	0.235	0.328	142°
160-0625AG438	●	0.0625 (1/16)	1/8	2 1/2	0.313	0.438	142°
160-0781AG547	●	0.0781 (5/64)	1/8	2 1/2	0.391	0.547	142°
160-0938AG656	●	0.0938 (3/32)	1/8	2 1/2	0.469	0.656	142°
160-1094AG766	●	0.1094 (7/64)	1/8	2 1/2	0.547	0.766	142°
160-1250AG875	●	0.1250 (1/8)	3/16	3	0.625	0.875	142°
160-1406AG984	●	0.1406 (9/64)	3/16	3	0.703	0.984	142°
160-1563AG1094	●	0.1563 (5/32)	3/16	3	0.781	1.094	142°
160-1719AG1203	●	0.1719 (11/64)	3/16	3	0.859	1.203	142°
160-1875AG1313	●	0.1875 (3/16)	1/4	3 1/2	0.938	1.313	142°
160-2031AG1422	●	0.2031 (13/64)	1/4	3 1/2	1.016	1.422	142°
160-2188AG1531	●	0.2188 (7/32)	1/4	3 1/2	1.094	1.531	142°
160-2344AG1641	●	0.2344 (15/64)	1/4	3 1/2	1.172	1.641	142°
160-2500AG1750	●	0.2500 (1/4)	5/16	4	1.250	1.750	142°
160-2570AG1799	●	0.2570 (F)	5/16	4	1.285	1.799	142°
160-2656AG1859	●	0.2656 (17/64)	5/16	4	1.328	1.859	142°
160-2813AG1969	●	0.2813 (9/32)	5/16	4	1.406	1.969	142°
160-3125AG2188	●	0.3125 (5/16)	3/8	4 1/2	1.563	2.188	142°
160-3320AG2324	●	0.3320 (Q)	3/8	4 1/2	1.660	2.324	142°
160-3438AG2406	●	0.3438 (11/32)	3/8	4 1/2	1.719	2.406	142°
160-3750AG2625	●	0.3750 (3/8)	7/16	5	1.875	2.625	142°
160-4219AG2953	●	0.4219 (27/64)	7/16	5	2.109	2.953	142°
160-4375AG3063	●	0.4375 (7/16)	1/2	6	2.188	3.063	142°
160-4531AG3172	●	0.4531 (29/64)	1/2	6	2.266	3.172	142°
160-5000AG3500	●	0.5000 (1/2)	5/8	6	2.500	3.500	142°

Diameter Tolerance

Cutting Dia. (ØD)	0.1250" - 0.2344"	0.2500" - 0.3750"	0.4219" - 0.5000"
Tolerance + / +	+0.00016"/+0.00063"	+0.00024"/+0.00083"	+0.00028"/+0.00098"

Shank Tolerance

Shank Dia. (Ød)	0.1250" - 0.2344"	0.2500" - 0.3750"	0.4219" - 0.5000"
Tolerance + / -	+0.00000"/-0.00032"	+0.00000"/-0.00035"	+0.00000"/-0.00043"

ORION SERIES 160 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions [Page L216](#)Symbol Descriptions [Page L3](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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METRIC SHANK

ORION 3xD HIGH PERFORMANCE DRILLS

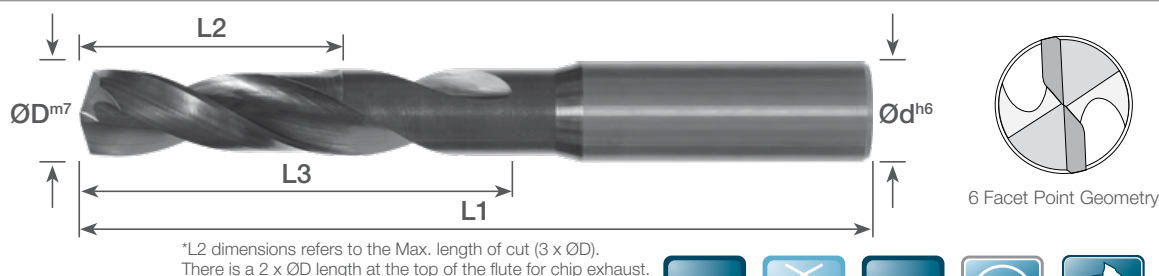
1.00mm - 3.70mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

Excellent Pilot Hole Drill

External Coolant



ORION 3xD High Performance



AITiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
NEW 165-0394AG197	●	1.00	3.00	50.00	3.00	5.00	142°
NEW 165-0433AG217	●	1.10	3.00	50.00	3.30	5.50	142°
NEW 165-0472AG236	●	1.20	3.00	50.00	3.60	6.00	142°
NEW 165-0512AG256	●	1.30	3.00	50.00	3.90	6.50	142°
NEW 165-0551AG276	●	1.40	3.00	50.00	4.20	7.00	142°
NEW 165-0591AG295	●	1.50	3.00	50.00	4.50	7.50	142°
NEW 165-0630AG315	●	1.60	3.00	50.00	4.80	8.00	142°
NEW 165-0669AG335	●	1.70	3.00	50.00	5.10	8.50	142°
NEW 165-0709AG354	●	1.80	3.00	50.00	5.40	9.00	142°
NEW 165-0748AG374	●	1.90	3.00	50.00	5.70	9.50	142°
NEW 165-0787AG394	●	2.00	3.00	50.00	6.00	10.00	142°
NEW 165-0827AG413	●	2.10	3.00	50.00	6.30	10.50	142°
NEW 165-0866AG433	●	2.20	3.00	50.00	6.60	11.00	142°
NEW 165-0906AG453	●	2.30	3.00	50.00	6.90	11.50	142°
NEW 165-0945AG472	●	2.40	3.00	50.00	7.20	12.00	142°
NEW 165-0984AG492	●	2.50	3.00	50.00	7.50	12.50	142°
NEW 165-1024AG512	●	2.60	3.00	50.00	7.80	13.00	142°
NEW 165-1063AG531	●	2.70	3.00	50.00	8.10	13.50	142°
NEW 165-1102AG551	●	2.80	3.00	50.00	8.40	14.00	142°
NEW 165-1142AG571	●	2.90	3.00	50.00	8.70	14.50	142°
165-1181AG591	●	3.00	4.00	60.00	9.00	15.00	142°
165-1220AG610	●	3.10	4.00	60.00	9.30	15.50	142°
165-1260AG630	●	3.20	4.00	60.00	9.60	16.00	142°
165-1299AG650	●	3.30	4.00	60.00	9.90	16.50	142°
165-1339AG669	●	3.40	4.00	60.00	10.20	17.00	142°
165-1378AG689	●	3.50	4.00	60.00	10.50	17.50	142°
165-1417AG709	●	3.60	4.00	60.00	10.80	18.00	142°
165-1457AG728	●	3.70	4.00	60.00	11.10	18.50	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AITiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions [Page L216](#)

Symbol Descriptions [Page L3](#)

METRIC SHANK

ORION 3xD HIGH PERFORMANCE DRILLS

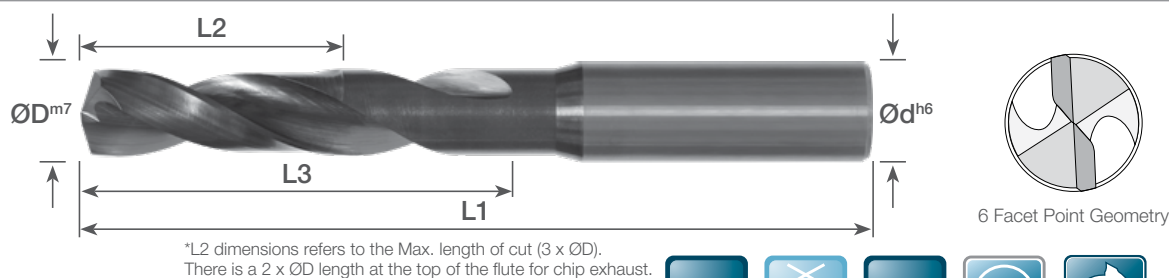
3.80mm - 6.50mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

Excellent Pilot Hole Drill

External Coolant



ORION 3xD High Performance



AlTiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-1496AG748	●	3.80	4.00	60.00	11.40	19.00	142°
165-1535AG768	●	3.90	4.00	60.00	11.70	19.50	142°
165-1575AG787	●	4.00	6.00	70.00	12.00	20.00	142°
165-1614AG807	●	4.10	6.00	70.00	12.30	20.50	142°
165-1654AG827	●	4.20	6.00	70.00	12.60	21.00	142°
165-1693AG846	●	4.30	6.00	70.00	12.90	21.50	142°
165-1732AG866	●	4.40	6.00	70.00	13.20	22.00	142°
165-1772AG886	●	4.50	6.00	70.00	13.50	22.50	142°
165-1811AG906	●	4.60	6.00	70.00	13.80	23.00	142°
165-1850AG925	●	4.70	6.00	70.00	14.10	23.50	142°
165-1890AG945	●	4.80	6.00	70.00	14.40	24.00	142°
165-1929AG965	●	4.90	6.00	70.00	14.70	24.50	142°
165-1969AG984	●	5.00	6.00	70.00	15.00	25.00	142°
165-2008AG1004	●	5.10	6.00	70.00	15.30	25.50	142°
165-2047AG1024	●	5.20	6.00	70.00	15.60	26.00	142°
165-2087AG1043	●	5.30	6.00	70.00	15.90	26.50	142°
165-2126AG1063	●	5.40	6.00	70.00	16.20	27.00	142°
165-2165AG1083	●	5.50	6.00	70.00	16.50	27.50	142°
165-2205AG1102	●	5.60	6.00	70.00	16.80	28.00	142°
165-2244AG1122	●	5.70	6.00	70.00	17.10	28.50	142°
165-2283AG1142	●	5.80	6.00	70.00	17.40	29.00	142°
165-2323AG1161	●	5.90	6.00	70.00	17.70	29.50	142°
165-2362AG1181	●	6.00	8.00	80.00	18.00	30.00	142°
165-2402AG1201	●	6.10	8.00	80.00	18.30	30.50	142°
165-2441AG1220	●	6.20	8.00	80.00	18.60	31.00	142°
165-2480AG1240	●	6.30	8.00	80.00	18.90	31.50	142°
165-2520AG1260	●	6.40	8.00	80.00	19.20	32.00	142°
165-2559AG1280	●	6.50	8.00	80.00	19.50	32.50	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions Page L216

Symbol Descriptions Page L3

● : U.S. Stock Standard
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ORION 3xD HIGH PERFORMANCE DRILLS

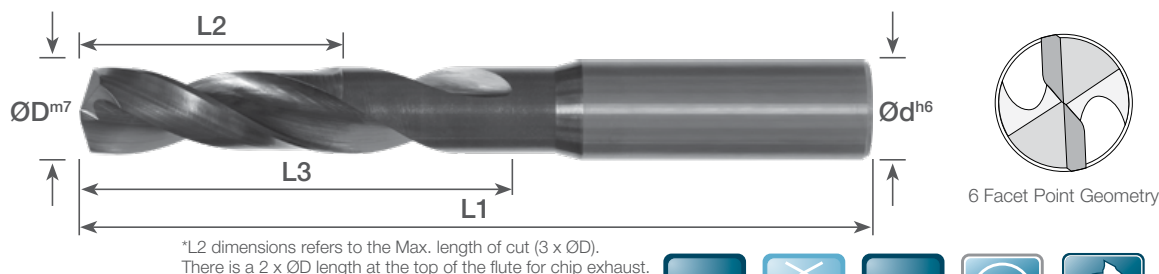
6.60mm - 9.30mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

Excellent Pilot Hole Drill

External Coolant



ORION 3xD High Performance

AlTiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-2598AG1299	●	6.60	8.00	80.00	19.80	33.00	142°
165-2638AG1319	●	6.70	8.00	80.00	20.10	33.50	142°
165-2677AG1339	●	6.80	8.00	80.00	20.40	34.00	142°
165-2717AG1358	●	6.90	8.00	80.00	20.70	34.50	142°
165-2756AG1378	●	7.00	8.00	80.00	21.00	35.00	142°
165-2795AG1398	●	7.10	8.00	80.00	21.30	35.50	142°
165-2835AG1417	●	7.20	8.00	80.00	21.60	36.00	142°
165-2874AG1437	●	7.30	8.00	80.00	21.90	36.50	142°
165-2913AG1457	●	7.40	8.00	80.00	22.20	37.00	142°
165-2953AG1476	●	7.50	8.00	80.00	22.50	37.50	142°
165-2992AG1496	●	7.60	8.00	80.00	22.80	38.00	142°
165-3031AG1516	●	7.70	8.00	80.00	23.10	38.50	142°
165-3071AG1535	●	7.80	8.00	80.00	23.40	39.00	142°
165-3110AG1555	●	7.90	8.00	80.00	23.70	39.50	142°
165-3150AG1575	●	8.00	10.00	100.00	24.00	40.00	142°
165-3189AG1594	●	8.10	10.00	100.00	24.30	40.50	142°
165-3228AG1614	●	8.20	10.00	100.00	24.60	41.00	142°
165-3268AG1634	●	8.30	10.00	100.00	24.90	41.50	142°
165-3307AG1654	●	8.40	10.00	100.00	25.20	42.00	142°
165-3346AG1673	●	8.50	10.00	100.00	25.50	42.50	142°
165-3386AG1693	●	8.60	10.00	100.00	25.80	43.00	142°
165-3425AG1713	●	8.70	10.00	100.00	26.10	43.50	142°
165-3465AG1732	●	8.80	10.00	100.00	26.40	44.00	142°
165-3504AG1752	●	8.90	10.00	100.00	26.70	44.50	142°
165-3543AG1772	●	9.00	10.00	100.00	27.00	45.00	142°
165-3583AG1791	●	9.10	10.00	100.00	27.30	45.50	142°
165-3622AG1811	●	9.20	10.00	100.00	27.60	46.00	142°
165-3661AG1831	●	9.30	10.00	100.00	27.90	46.50	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions Page L216

Symbol Descriptions Page L3

METRIC SHANK

ORION 3xD HIGH PERFORMANCE DRILLS

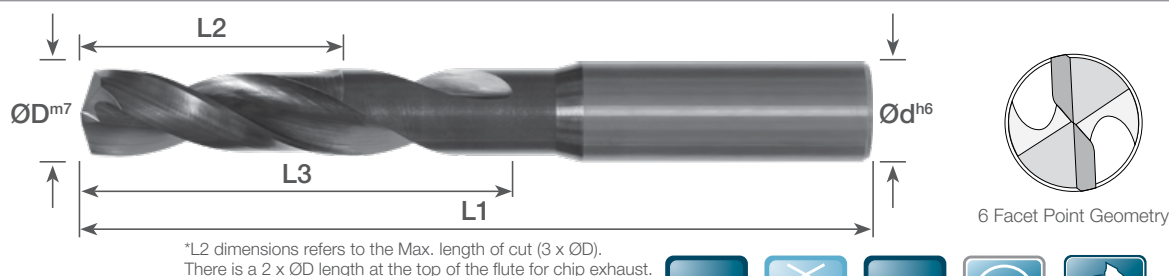
9.40mm - 12.00mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

Excellent Pilot Hole Drill

External Coolant



ORION 3xD High Performance



AITIN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-3701AG1850	●	9.40	10.00	100.00	28.20	47.00	142°
165-3740AG1870	●	9.50	10.00	100.00	28.50	47.50	142°
165-3780AG1890	●	9.60	10.00	100.00	28.80	48.00	142°
165-3819AG1909	●	9.70	10.00	100.00	29.10	48.50	142°
165-3858AG1929	●	9.80	10.00	100.00	29.40	49.00	142°
165-3898AG1949	●	9.90	10.00	100.00	29.70	49.50	142°
165-3937AG1969	●	10.00	12.00	110.00	30.00	50.00	142°
165-3976AG1988	●	10.10	12.00	110.00	30.30	50.50	142°
165-4016AG2008	●	10.20	12.00	110.00	30.60	51.00	142°
165-4055AG2028	●	10.30	12.00	110.00	30.90	51.50	142°
165-4094AG2047	●	10.40	12.00	110.00	31.20	52.00	142°
165-4134AG2067	●	10.50	12.00	110.00	31.50	52.50	142°
165-4173AG2087	●	10.60	12.00	110.00	31.80	53.00	142°
165-4213AG2106	●	10.70	12.00	110.00	32.10	53.50	142°
165-4252AG2126	●	10.80	12.00	110.00	32.40	54.00	142°
165-4291AG2146	●	10.90	12.00	110.00	32.70	54.50	142°
165-4331AG2165	●	11.00	12.00	110.00	33.00	55.00	142°
165-4370AG2185	●	11.10	12.00	110.00	33.30	55.50	142°
165-4409AG2205	●	11.20	12.00	110.00	33.60	56.00	142°
165-4449AG2224	●	11.30	12.00	110.00	33.90	56.50	142°
165-4488AG2244	●	11.40	12.00	110.00	34.20	57.00	142°
165-4528AG2264	●	11.50	12.00	110.00	34.50	57.50	142°
165-4567AG2283	●	11.60	12.00	110.00	34.80	58.00	142°
165-4606AG2303	●	11.70	12.00	110.00	35.10	58.50	142°
165-4646AG2323	●	11.80	12.00	110.00	35.40	59.00	142°
165-4685AG2343	●	11.90	12.00	110.00	35.70	59.50	142°
165-4724AG2362	●	12.00	14.00	110.00	36.00	60.00	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	Material															
	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions Page L216

Symbol Descriptions Page L3

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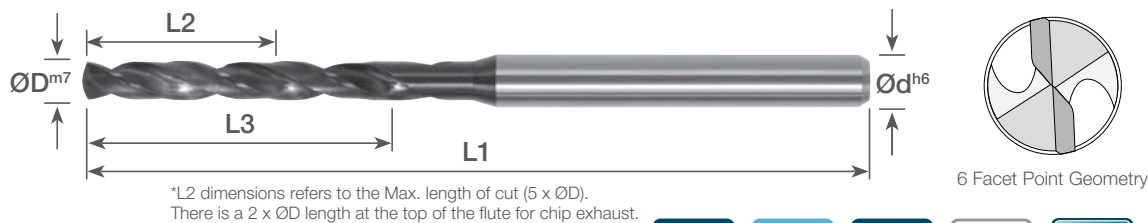
ORION 5xD HIGH PERFORMANCE DRILLS

1.00mm - 3.70mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

External Coolant



ORION 5xD High Performance



AITiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-0394AG276	●	1.00	3.00	60.00	5.00	0.276	142°
165-0433AG303	●	1.10	3.00	60.00	5.50	0.303	142°
165-0472AG331	●	1.20	3.00	60.00	6.00	0.331	142°
165-0512AG358	●	1.30	3.00	60.00	6.50	0.358	142°
165-0551AG386	●	1.40	3.00	60.00	7.00	0.386	142°
165-0591AG413	●	1.50	3.00	60.00	7.50	10.50	142°
165-0630AG441	●	1.60	3.00	60.00	8.00	11.20	142°
165-0669AG469	●	1.70	3.00	60.00	8.50	11.90	142°
165-0709AG496	●	1.80	3.00	60.00	9.00	12.60	142°
165-0748AG524	●	1.90	3.00	60.00	9.50	13.30	142°
165-0787AG551	●	2.00	3.00	60.00	10.00	14.00	142°
165-0827AG579	●	2.10	3.00	60.00	10.50	14.70	142°
165-0866AG606	●	2.20	3.00	60.00	11.00	15.40	142°
165-0906AG634	●	2.30	3.00	60.00	11.50	16.10	142°
165-0945AG661	●	2.40	3.00	60.00	12.00	16.80	142°
165-0984AG689	●	2.50	3.00	60.00	12.50	17.50	142°
165-1024AG717	●	2.60	3.00	60.00	13.00	18.20	142°
165-1063AG744	●	2.70	3.00	60.00	13.50	18.90	142°
165-1102AG772	●	2.80	3.00	60.00	14.00	19.60	142°
165-1142AG799	●	2.90	3.00	60.00	14.50	20.30	142°
165-1181AG827	●	3.00	4.00	70.00	15.00	21.00	142°
165-1220AG854	●	3.10	4.00	70.00	15.50	21.70	142°
165-1260AG882	●	3.20	4.00	70.00	16.00	22.40	142°
165-1299AG909	●	3.30	4.00	70.00	16.50	23.10	142°
165-1339AG937	●	3.40	4.00	70.00	17.00	23.80	142°
165-1378AG965	●	3.50	4.00	70.00	17.50	24.50	142°
165-1417AG992	●	3.60	4.00	70.00	18.00	25.20	142°
165-1457AG1020	●	3.70	4.00	70.00	18.50	25.90	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AITiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions [Page L216](#)Symbol Descriptions [Page L3](#)

METRIC SHANK NEW

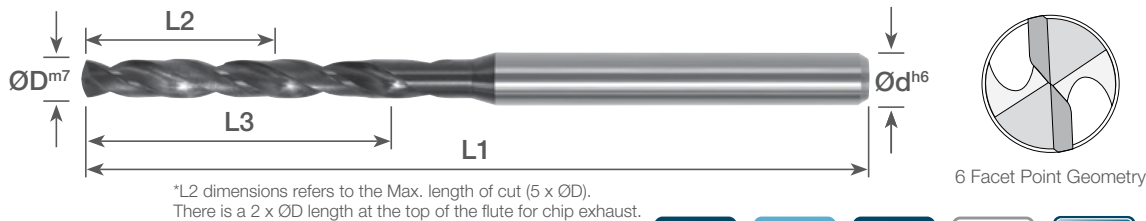
ORION 5XD HIGH PERFORMANCE DRILLS

3.80mm - 6.50mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

External Coolant



ORION 5xD High Performance



AITIN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{H6}	L1	*L2	L3	
165-1496AG1047	●	3.80	4.00	70.00	19.00	26.60	142°
165-1535AG1075	●	3.90	4.00	70.00	19.50	27.30	142°
165-1575AG1102	●	4.00	6.00	90.00	20.00	28.00	142°
165-1614AG1130	●	4.10	6.00	90.00	20.50	28.70	142°
165-1654AG1157	●	4.20	6.00	90.00	21.00	29.40	142°
165-1693AG1185	●	4.30	6.00	90.00	21.50	30.10	142°
165-1732AG1213	●	4.40	6.00	90.00	22.00	30.80	142°
165-1772AG1240	●	4.50	6.00	90.00	22.50	31.50	142°
165-1811AG1268	●	4.60	6.00	90.00	23.00	32.20	142°
165-1850AG1295	●	4.70	6.00	90.00	23.50	32.90	142°
165-1890AG1323	●	4.80	6.00	90.00	24.00	33.60	142°
165-1929AG1350	●	4.90	6.00	90.00	24.50	34.30	142°
165-1969AG1378	●	5.00	6.00	90.00	25.00	35.00	142°
165-2008AG1406	●	5.10	6.00	90.00	25.50	35.70	142°
165-2047AG1433	●	5.20	6.00	90.00	26.00	36.40	142°
165-2087AG1461	●	5.30	6.00	90.00	26.50	37.10	142°
165-2126AG1488	●	5.40	6.00	90.00	27.00	37.80	142°
165-2165AG1516	●	5.50	6.00	90.00	27.50	38.50	142°
165-2205AG1543	●	5.60	6.00	90.00	28.00	39.20	142°
165-2244AG1571	●	5.70	6.00	90.00	28.50	39.90	142°
165-2283AG1598	●	5.80	6.00	90.00	29.00	40.60	142°
165-2323AG1626	●	5.90	6.00	90.00	29.50	41.30	142°
165-2362AG1654	●	6.00	8.00	100.00	30.00	42.00	142°
165-2402AG1681	●	6.10	8.00	100.00	30.50	42.70	142°
165-2441AG1709	●	6.20	8.00	100.00	31.00	43.40	142°
165-2480AG1736	●	6.30	8.00	100.00	31.50	44.10	142°
165-2520AG1764	●	6.40	8.00	100.00	32.00	44.80	142°
165-2559AG1791	●	6.50	8.00	100.00	32.50	45.50	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AITiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions Page L216

Symbol Descriptions Page L3

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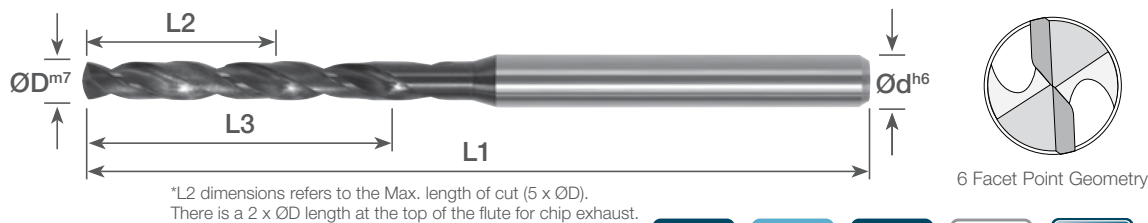
ORION 5xD HIGH PERFORMANCE DRILLS

6.60mm - 9.30mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

External Coolant



ORION 5xD High Performance



AlTiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-2598AG1819	●	6.60	8.00	100.00	33.00	46.20	142°
165-2638AG1846	●	6.70	8.00	100.00	33.50	46.90	142°
165-2677AG1874	●	6.80	8.00	100.00	34.00	47.60	142°
165-2717AG1902	●	6.90	8.00	100.00	34.50	48.30	142°
165-2756AG1929	●	7.00	8.00	100.00	35.00	49.00	142°
165-2795AG1957	●	7.10	8.00	100.00	35.50	49.70	142°
165-2835AG1984	●	7.20	8.00	100.00	36.00	50.40	142°
165-2874AG2012	●	7.30	8.00	100.00	36.50	51.10	142°
165-2913AG2039	●	7.40	8.00	100.00	37.00	51.80	142°
165-2953AG2067	●	7.50	8.00	100.00	37.50	52.50	142°
165-2992AG2094	●	7.60	8.00	100.00	38.00	53.20	142°
165-3031AG2122	●	7.70	8.00	100.00	38.50	53.90	142°
165-3071AG2150	●	7.80	8.00	100.00	39.00	54.60	142°
165-3110AG2177	●	7.90	8.00	100.00	39.50	55.30	142°
165-3150AG2205	●	8.00	10.00	120.00	40.00	56.00	142°
165-3189AG2232	●	8.10	10.00	120.00	40.50	56.70	142°
165-3228AG2260	●	8.20	10.00	120.00	41.00	57.40	142°
165-3268AG2287	●	8.30	10.00	120.00	41.50	58.10	142°
165-3307AG2315	●	8.40	10.00	120.00	42.00	58.80	142°
165-3346AG2343	●	8.50	10.00	120.00	42.50	59.50	142°
165-3386AG2370	●	8.60	10.00	120.00	43.00	60.20	142°
165-3425AG2398	●	8.70	10.00	120.00	43.50	60.90	142°
165-3465AG2425	●	8.80	10.00	120.00	44.00	61.60	142°
165-3504AG2453	●	8.90	10.00	120.00	44.50	62.30	142°
165-3543AG2480	●	9.00	10.00	120.00	45.00	63.00	142°
165-3583AG2508	●	9.10	10.00	120.00	45.50	63.70	142°
165-3622AG2535	●	9.20	10.00	120.00	46.00	64.40	142°
165-3661AG2563	●	9.30	10.00	120.00	46.50	65.10	142°

L
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TOOLS

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

TECHNICAL

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions [Page L216](#)Symbol Descriptions [Page L3](#)

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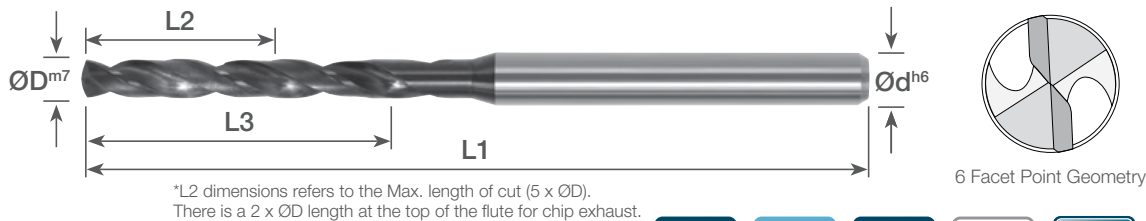
ORION 5xD HIGH PERFORMANCE DRILLS

9.40mm - 12.00mm DIAMETER

Increased Positional Accuracy

Less Heat Build Up

External Coolant



ORION 5xD High Performance



AlTiN Nano		Dimensions (mm)					Point Angle
Part Number	Stock	ØD ^{m7}	Ød ^{h6}	L1	*L2	L3	
165-3701AG2591	●	9.40	10.00	120.00	47.00	65.80	142°
165-3740AG2618	●	9.50	10.00	120.00	47.50	66.50	142°
165-3780AG2646	●	9.60	10.00	120.00	48.00	67.20	142°
165-3819AG2673	●	9.70	10.00	120.00	48.50	67.90	142°
165-3858AG2701	●	9.80	10.00	120.00	49.00	68.60	142°
165-3898AG2728	●	9.90	10.00	120.00	49.50	69.30	142°
165-3937AG2756	●	10.00	12.00	140.00	50.00	70.00	142°
165-3976AG2783	●	10.10	12.00	140.00	50.50	70.70	142°
165-4016AG2811	●	10.20	12.00	140.00	51.00	71.40	142°
165-4055AG2839	●	10.30	12.00	140.00	51.50	72.10	142°
165-4094AG2866	●	10.40	12.00	140.00	52.00	72.80	142°
165-4134AG2894	●	10.50	12.00	140.00	52.50	73.50	142°
165-4173AG2921	●	10.60	12.00	140.00	53.00	74.20	142°
165-4213AG2949	●	10.70	12.00	140.00	53.50	74.90	142°
165-4252AG2976	●	10.80	12.00	140.00	54.00	75.60	142°
165-4291AG3004	●	10.90	12.00	140.00	54.50	76.30	142°
165-4331AG3031	●	11.00	12.00	140.00	55.00	77.00	142°
165-4370AG3059	●	11.10	12.00	140.00	55.50	77.70	142°
165-4409AG3087	●	11.20	12.00	140.00	56.00	78.40	142°
165-4449AG3114	●	11.30	12.00	140.00	56.50	79.10	142°
165-4488AG3142	●	11.40	12.00	140.00	57.00	79.80	142°
165-4528AG3169	●	11.50	12.00	140.00	57.50	80.50	142°
165-4567AG3197	●	11.60	12.00	140.00	58.00	81.20	142°
165-4606AG3224	●	11.70	12.00	140.00	58.50	81.90	142°
165-4646AG3252	●	11.80	12.00	140.00	59.00	82.60	142°
165-4685AG3280	●	11.90	12.00	140.00	59.50	83.30	142°
165-4724AG3307	●	12.00	14.00	140.00	60.00	84.00	142°

ORION SERIES 165 WORKPIECE MATERIAL

Coating	P Steel ~30HRC	P Steel 30~40HRC	H Hardened Steel ~55HRC	H Hardened Steel ~68HRC	M Stainless Steel	K Cast Iron	N Aluminum	N Graphite	N Copper Alloy	N Brass	N CFRP	N Plastic	N Thermoset Plastic	N High Density Plastic	S Nickel / Cobalt	S Titanium Alloy
AlTiN Nano	★	★	★	★	★	☆		☆	☆	☆		☆	☆	☆	★	★

★ : Priority ☆ : Applicable Materials

Recommended Cutting Conditions • Page L216

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