GOLD RUSH GRADES FOR HOLEMAKING

The ingenious solution that takes cutting tool materials to another level

Features

- Improved adhesion and insert chipping resistance
- Stable and extended tool life in continuous and interrupted cutting operations
- Reduced cutting friction and minimized built-up edge on exotic materials
- High quality surface finish on the work pieces

GOLD RUSH GRADES FOR HOLEMAKING APPLICATIONS

IN1030 (PVD) **CAST IRON, STAINLESS, TITANIUM**

Great for tough, slower speed applications. A good option when machine rigidity is an issue.

IN2505 (PVD) **GENERAL PURPOSE**

An improvement over the current IN2005 grade, IN2505 has a multi-layered PVD coating for a wide variety of materials.

IN6505 (CVD) **STEEL APPLICATIONS**

A 10µm thick layer has been added to the CVD coating that enhances toughness and wear resistance. It makes this grade suitable for high speed steel machining.

GOLD TWIST™

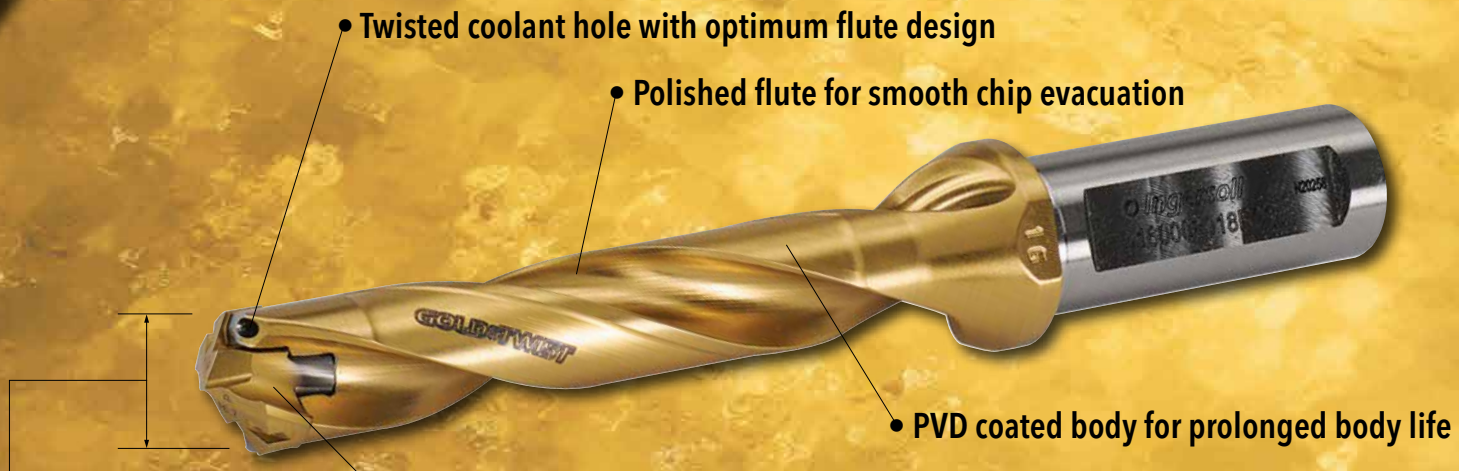
REPLACEABLE TIP DRILLS

Ingersoll Cutting Tool Company is proud to announce the expansion of GOLD TWIST™: The Next Generation of Replaceable Tip Drills. This new design is a standard product line with tip diameters ranging from .2756" – 1.0197" (7mm ~ 25.9mm) in 0.004" (.1mm) increments and drill bodies available in 1.5xD, 3xD, 5xD and 8xD length to diameter ratios.

The precision bodies have an improved pocket design and innovative clamping system that provide stable performance after multiple tip indexes. These drill bodies also feature twisted coolant holes, polished flutes, and a PVD-coating that allows smooth chip evacuation and prolonged body life. Each body accepts a range of tips that covers .040" (1mm).

The drill tips are offered in grade IN2505 which features a multi-layered PVD coating that provides excellent performance, improved wear resistance and increased tool life in a wide range of applications. With three cutting geometries, the "P" for Steel and General Purpose, the "M" geometry for Stainless Steels and Exotics and the "K" geometry for Irons, we can better meet our customers' needs.

Ingersoll's GOLD TWIST™ Drilling Line is excellent in higher speed applications, providing guaranteed performance and excellent results in a unique, rigid and fast-indexing clamping system. The result is a product that combines cost efficiency and higher productivity in all your drilling applications.



GOLD TWIST™

DRILL BODY COMPARISON:
GOLD TWIST VS. QWIK TWIST

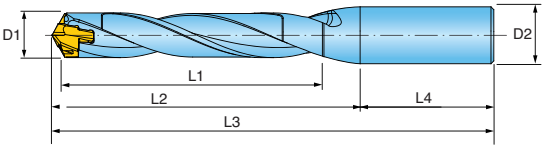
The new Gold Twist pocket design's contact/clamping area is three times deeper than our current Qwik Twist drill.

The accuracy of the added cylinder to the clamping area improves rigidity and helps reduce internal stresses.
The two precision ground positive stop locations improve the drilling tips' position and support.

CYLINDRICAL SHANKS

1.5XD

Drilling | Coolant



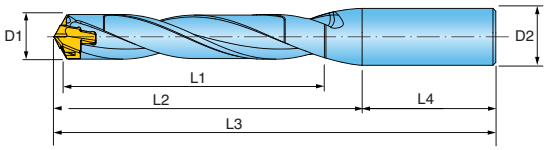
1.5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700010S4R01	0.2756	0.2913	0.43	0.500	N/A	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750011S4R01	0.2953	0.3110	0.44	0.500	N/A	1.02	1.77	2.790	7.5	KTD6.0-D9.9
TD0800012S4R01	0.3150	0.3504	0.47	0.500	N/A	1.10	1.77	2.870	8	KTD6.0-D9.9
TD0900013S4R01	0.3543	0.3898	0.55	0.500	N/A	1.15	1.77	2.920	9	KTD6.0-D9.9
TD1000015S6R01	0.3937	0.4291	0.59	0.625	N/A	1.23	1.89	3.120	10	KTD10.0-19.9
TD1100016S6R01	0.4331	0.4685	0.67	0.625	N/A	1.30	1.89	3.190	11	KTD10.0-19.9
TD1200018S6R01	0.4724	0.5079	0.71	0.625	N/A	1.38	1.89	3.270	12	KTD10.0-19.9
TD1300019S6R01	0.5118	0.5472	0.79	0.625	N/A	1.46	1.89	3.350	13	KTD10.0-19.9
TD1400021S6R01	0.5512	0.5866	0.83	0.625	N/A	1.62	1.89	3.510	14	KTD10.0-19.9
TD1500022S7R01	0.5906	0.6260	0.91	0.750	N/A	1.82	1.97	3.790	15	KTD10.0-19.9
TD1600024S7R01	0.6299	0.6654	0.94	0.750	N/A	1.94	1.97	3.910	16	KTD10.0-19.9
TD1700025S7R01	0.6693	0.7047	1.02	0.750	N/A	2.06	1.97	4.030	17	KTD10.0-19.9
TD1800027S1R01	0.7087	0.7441	1.06	1.000	N/A	2.19	2.20	4.390	18	KTD10.0-19.9
TD1900028S1R01	0.7480	0.7835	1.14	1.000	N/A	2.30	2.20	4.500	19	KTD10.0-19.9
TD2000030S1R01	0.7874	0.8228	1.18	1.000	N/A	2.43	2.20	4.630	20	KTD20.0-D26.9
TD2100031S1R01	0.8268	0.8622	1.26	1.000	N/A	2.55	2.20	4.750	21	KTD20.0-D26.9
TD2200033S1R01	0.8661	0.9016	1.30	1.000	N/A	2.67	2.20	4.870	22	KTD20.0-D26.9
TD2300034S9R01	0.9055	0.9409	1.38	1.250	N/A	2.79	2.36	5.150	23	KTD20.0-D26.9
TD2400036S9R01	0.9449	0.9803	1.42	1.250	N/A	2.91	2.36	5.270	24	KTD20.0-D26.9
TD2500037S9R01	0.9843	1.0197	1.50	1.250	N/A	3.03	2.36	5.390	25	KTD20.0-D26.9

CYLINDRICAL SHANKS

3XD

Drilling

Coolant



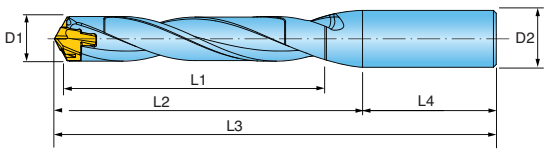
3xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700021S4R01	0.2756	0.2913	0.83	0.500	N/A	1.40	1.77	3.170	7	KTD6.0-D9.9
TD0750022S4R01	0.2953	0.3110	0.89	0.500	N/A	1.46	1.77	3.230	7.5	KTD6.0-D9.9
TD0800024S4R01	0.3150	0.3307	0.94	0.500	N/A	1.55	1.77	3.320	8	KTD6.0-D9.9
TD0850025S4R01	0.3346	0.3504	1.00	0.500	N/A	1.61	1.77	3.380	8.5	KTD6.0-D9.9
TD0900027S4R01	0.3543	0.3701	1.06	0.500	N/A	1.69	1.77	3.460	9	KTD6.0-D9.9
TD0950028S4R01	0.3740	0.3898	1.12	0.500	N/A	1.74	1.77	3.510	9.5	KTD6.0-D9.9
TD1000030S6R01	0.3937	0.4094	1.18	0.625	N/A	1.82	1.89	3.710	10	KTD10.0-19.9
TD1050031S6R01	0.4134	0.4291	1.26	0.625	N/A	1.88	1.89	3.770	10.5	KTD10.0-19.9
TD1100033S6R01	0.4331	0.4488	1.30	0.625	N/A	1.95	1.89	3.840	11	KTD10.0-19.9
TD1150034S6R01	0.4528	0.4685	1.38	0.625	N/A	2.01	1.89	3.900	11.5	KTD10.0-19.9
TD1200036S6R01	0.4724	0.4882	1.42	0.625	N/A	2.09	1.89	3.980	12	KTD10.0-19.9
TD1250037S6R01	0.4921	0.5079	1.46	0.625	N/A	2.15	1.89	4.040	12.5	KTD10.0-19.9
TD1300039S6R01	0.5118	0.5276	1.54	0.625	N/A	2.23	1.89	4.120	13	KTD10.0-19.9
TD1350040S6R01	0.5315	0.5472	1.61	0.625	N/A	2.29	1.89	4.180	13.5	KTD10.0-19.9
TD1400042S6R01	0.5512	0.5669	1.65	0.625	N/A	2.44	1.89	4.330	14	KTD10.0-19.9
TD1450043S6R01	0.5709	0.5866	1.73	0.625	N/A	2.50	1.89	4.390	14.5	KTD10.0-19.9
TD1500045S7R01	0.5906	0.6260	1.77	0.750	N/A	2.70	1.97	4.670	15	KTD10.0-19.9
TD1600048S7R01	0.6299	0.6654	1.89	0.750	N/A	2.89	1.97	4.860	16	KTD10.0-19.9
TD1700051S7R01	0.6693	0.7047	2.01	0.750	N/A	3.07	1.97	5.040	17	KTD10.0-19.9
TD1800054S1R01	0.7087	0.7441	2.13	1.000	N/A	3.25	2.20	5.450	18	KTD10.0-19.9
TD1900057S1R01	0.7480	0.7835	2.24	1.000	N/A	3.43	2.20	5.630	19	KTD10.0-19.9
TD2000060S1R01	0.7874	0.8228	2.36	1.000	N/A	3.61	2.20	5.810	20	KTD20.0-D26.9
TD2100063S1R01	0.8268	0.8622	2.48	1.000	N/A	3.79	2.20	5.990	21	KTD20.0-D26.9
TD2200066S1R01	0.8661	0.9016	2.60	1.000	N/A	3.97	2.20	6.170	22	KTD20.0-D26.9
TD2300069S9R01	0.9055	0.9409	2.72	1.250	N/A	4.15	2.36	6.510	23	KTD20.0-D26.9
TD2400072S9R01	0.9449	0.9803	2.83	1.250	N/A	4.33	2.36	6.690	24	KTD20.0-D26.9
TD2500075S9R01	0.9843	1.0197	2.95	1.250	N/A	4.51	2.36	6.870	25	KTD20.0-D26.9

CYLINDRICAL SHANKS

5XD

Drilling

Coolant



5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700035S4R01	0.2756	0.2913	1.38	0.500	N/A	1.95	1.77	3.720	7	KTD6.0-D9.9
TD0750037S4R01	0.2953	0.3110	1.48	0.500	N/A	2.05	1.77	3.820	7.5	KTD6.0-D9.9
TD0800040S4R01	0.3150	0.3307	1.57	0.500	N/A	2.18	1.77	3.950	8	KTD6.0-D9.9
TD0850042S4R01	0.3346	0.3504	1.67	0.500	N/A	2.28	1.77	4.050	8.5	KTD6.0-D9.9
TD0900045S4R01	0.3543	0.3701	1.77	0.500	N/A	2.39	1.77	4.160	9	KTD6.0-D9.9
TD0950047S4R01	0.3740	0.3898	1.87	0.500	N/A	2.49	1.77	4.260	9.5	KTD6.0-D9.9
TD1000050S6R01	0.3937	0.4094	1.97	0.625	N/A	2.61	1.89	4.500	10	KTD10.0-19.9
TD1050052S6R01	0.4134	0.4291	2.09	0.625	N/A	2.70	1.89	4.590	10.5	KTD10.0-19.9
TD1100055S6R01	0.4331	0.4488	2.17	0.625	N/A	2.82	1.89	4.710	11	KTD10.0-19.9
TD1150057S6R01	0.4528	0.4685	2.28	0.625	N/A	2.92	1.89	4.810	11.5	KTD10.0-19.9
TD1200060S6R01	0.4724	0.4882	2.36	0.625	N/A	3.03	1.89	4.920	12	KTD10.0-19.9
TD1250062S6R01	0.4921	0.5079	2.44	0.625	N/A	3.13	1.89	5.020	12.5	KTD10.0-19.9
TD1300065S6R01	0.5118	0.5276	2.56	0.625	N/A	3.25	1.89	5.140	13	KTD10.0-19.9
TD1350067S6R01	0.5315	0.5472	2.68	0.625	N/A	3.35	1.89	5.240	13.5	KTD10.0-19.9
TD1400070S6R01	0.5512	0.5669	2.76	0.625	N/A	3.55	1.89	5.440	14	KTD10.0-19.9
TD1450072S6R01	0.5709	0.5866	2.87	0.625	N/A	3.65	1.89	5.540	14.5	KTD10.0-19.9
TD1500075S7R01	0.5906	0.6260	2.95	0.750	N/A	3.89	1.97	5.860	15	KTD10.0-19.9
TD1600080S7R01	0.6299	0.6654	3.15	0.750	N/A	4.15	1.97	6.120	16	KTD10.0-19.9
TD1700085S7R01	0.6693	0.7047	3.35	0.750	N/A	4.41	1.97	6.380	17	KTD10.0-19.9
TD1800090S1R01	0.7087	0.7441	3.54	1.000	N/A	4.67	2.20	6.870	18	KTD10.0-19.9
TD1900095S1R01	0.7480	0.7835	3.74	1.000	N/A	4.92	2.20	7.120	19	KTD10.0-19.9
TD2000100S1R01	0.7874	0.8228	3.94	1.000	N/A	5.18	2.20	7.380	20	KTD20.0-D26.9
TD2100105S1R01	0.8268	0.8622	4.13	1.000	N/A	5.44	2.20	7.640	21	KTD20.0-D26.9
TD2200110S1R01	0.8661	0.9016	4.33	1.000	N/A	5.70	2.20	7.900	22	KTD20.0-D26.9
TD2300115S9R01	0.9055	0.9409	4.53	1.250	N/A	5.96	2.36	8.320	23	KTD20.0-D26.9
TD2400120S9R01	0.9449	0.9803	4.72	1.250	N/A	6.22	2.36	8.580	24	KTD20.0-D26.9
TD2500125S9R01	0.9843	1.0197	4.92	1.250	N/A	6.48	2.36	8.840	25	KTD20.0-D26.9

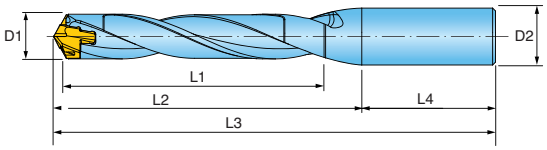
CYLINDRICAL SHANKS

8XD

Drilling

Coolant

NOTE: We strongly recommend the use of a 1.5:1 or 3:1 Gold•Twist drill of the same diameter to drill a centering starter hole. The use of a centering starter hole improves hole location, accuracy, roundness, straightness and surface finish.



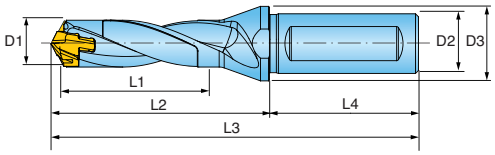
8xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700056S4R01	0.2756	0.2913	2.20	0.500	N/A	2.78	1.77	4.550	7	KTD6.0-D9.9
TD0750060S4R01	0.2953	0.3110	2.28	0.500	N/A	2.94	1.77	4.710	7.5	KTD6.0-D9.9
TD0800064S4R01	0.3150	0.3307	2.52	0.500	N/A	3.13	1.77	4.900	8	KTD6.0-D9.9
TD0850068S4R01	0.3346	0.3504	2.68	0.500	N/A	3.32	1.77	5.090	8.5	KTD6.0-D9.9
TD0900072S4R01	0.3543	0.3701	2.83	0.500	N/A	3.46	1.77	5.230	9	KTD6.0-D9.9
TD0950076S4R01	0.3740	0.3898	2.99	0.500	N/A	3.65	1.77	5.420	9.5	KTD6.0-D9.9
TD1000080S6R01	0.3937	0.4094	3.15	0.625	N/A	3.79	1.89	5.680	10	KTD10.0-19.9
TD1050084S6R01	0.4134	0.4291	3.31	0.625	N/A	3.94	1.89	5.830	10.5	KTD10.0-19.9
TD1100088S6R01	0.4331	0.4488	3.46	0.625	N/A	4.12	1.89	6.010	11	KTD10.0-19.9
TD1150092S6R01	0.4528	0.4685	3.62	0.625	N/A	4.28	1.89	6.170	11.5	KTD10.0-19.9
TD1200096S6R01	0.4724	0.4882	3.78	0.625	N/A	4.45	1.89	6.340	12	KTD10.0-19.9
TD1250100S6R01	0.4921	0.5079	3.94	0.625	N/A	4.61	1.89	6.500	12.5	KTD10.0-19.9
TD1300104S6R01	0.5118	0.5276	4.09	0.625	N/A	4.79	1.89	6.680	13	KTD10.0-19.9
TD1350108S6R01	0.5315	0.5472	4.25	0.625	N/A	4.94	1.89	6.830	13.5	KTD10.0-19.9
TD1400112S6R01	0.5512	0.5669	4.41	0.625	N/A	5.20	1.89	7.090	14	KTD10.0-19.9
TD1450116S6R01	0.5709	0.5866	4.57	0.625	N/A	5.36	1.89	7.250	14.5	KTD10.0-19.9
TD1500120S7R01	0.5906	0.6260	4.72	0.750	N/A	5.66	1.97	7.630	15	KTD10.0-19.9
TD1600128S7R01	0.6299	0.6654	5.04	0.750	N/A	6.04	1.97	8.010	16	KTD10.0-19.9
TD1700136S7R01	0.6693	0.7047	5.35	0.750	N/A	6.41	1.97	8.380	17	KTD10.0-19.9
TD1800144S1R01	0.7087	0.7441	5.67	1.000	N/A	6.79	2.20	8.990	18	KTD10.0-19.9
TD1900152S1R01	0.7480	0.7835	5.98	1.000	N/A	7.17	2.20	9.370	19	KTD10.0-19.9
TD2000160S1R01	0.7874	0.8228	6.30	1.000	N/A	7.54	2.20	9.740	20	KTD20.0-D26.9
TD2100168S1R01	0.8268	0.8622	6.61	1.000	N/A	7.92	2.20	10.120	21	KTD20.0-D26.9
TD2200176S1R01	0.8661	0.9016	6.93	1.000	N/A	8.30	2.20	10.500	22	KTD20.0-D26.9
TD2300184S9R01	0.9055	0.9409	7.24	1.250	N/A	8.68	2.36	11.040	23	KTD20.0-D26.9
TD2400192S9R01	0.9449	0.9803	7.56	1.250	N/A	9.06	2.36	11.420	24	KTD20.0-D26.9
TD2500200S9R01	0.9843	1.0197	7.87	1.250	N/A	9.43	2.36	11.790	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

1.5XD

Drilling

Coolant



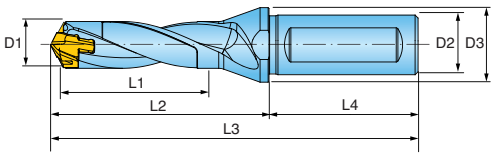
1.5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700010B9R01	0.2756	0.2913	0.43	0.500	0.63	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750011B9R01	0.2953	0.3110	0.44	0.500	0.63	1.02	1.77	2.790	7.5	KTD6.0-D9.9
TD0800012B9R01	0.3150	0.3504	0.47	0.500	0.63	1.10	1.77	2.870	8	KTD6.0-D9.9
TD0900013B9R01	0.3543	0.3898	0.55	0.500	0.63	1.15	1.77	2.920	9	KTD6.0-D9.9
TD1000015C0R01	0.3937	0.4291	0.59	0.625	0.79	1.23	1.89	3.120	10	KTD10.0-19.9
TD1100016C0R01	0.4331	0.4685	0.67	0.625	0.79	1.30	1.89	3.190	11	KTD10.0-19.9
TD1200018C0R01	0.4724	0.5079	0.71	0.625	0.79	1.38	1.89	3.270	12	KTD10.0-19.9
TD1300019C0R01	0.5118	0.5472	0.79	0.625	0.79	1.46	1.89	3.350	13	KTD10.0-19.9
TD1400021C0R01	0.5512	0.5866	0.83	0.625	0.79	1.62	1.89	3.510	14	KTD10.0-19.9
TD150002218R01	0.5906	0.6260	0.91	0.750	0.98	1.82	1.97	3.790	15	KTD10.0-19.9
TD160002418R01	0.6299	0.6654	0.94	0.750	0.98	1.94	1.97	3.910	16	KTD10.0-19.9
TD170002518R01	0.6693	0.7047	1.02	0.750	0.98	2.06	1.97	4.030	17	KTD10.0-19.9
TD1800027C8R01	0.7087	0.7441	1.06	1.000	1.26	2.19	2.20	4.390	18	KTD10.0-19.9
TD1900028C8R01	0.7480	0.7835	1.14	1.000	1.26	2.30	2.20	4.500	19	KTD10.0-19.9
TD2000030C8R01	0.7874	0.8228	1.18	1.000	1.26	2.43	2.20	4.630	20	KTD20.0-D26.9
TD2100031C8R01	0.8268	0.8622	1.26	1.000	1.26	2.55	2.20	4.750	21	KTD20.0-D26.9
TD2200033C8R01	0.8661	0.9016	1.30	1.000	1.26	2.67	2.20	4.870	22	KTD20.0-D26.9
TD2300034B7R01	0.9055	0.9409	1.38	1.250	1.65	2.79	2.36	5.150	23	KTD20.0-D26.9
TD2400036B7R01	0.9449	0.9803	1.42	1.250	1.65	2.91	2.36	5.270	24	KTD20.0-D26.9
TD2500037B7R01	0.9843	1.0197	1.50	1.250	1.65	3.03	2.36	5.390	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

3XD

Drilling

Coolant

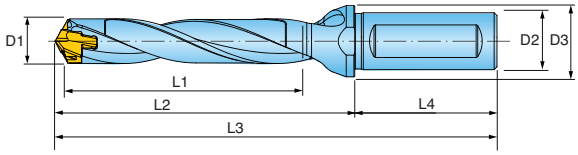


3xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700021B9R01	0.2756	0.2913	0.83	0.500	0.63	1.40	1.77	3.170	7	KTD6.0-D9.9
TD0750022B9R01	0.2953	0.3110	0.89	0.500	0.63	1.46	1.77	3.230	7.5	KTD6.0-D9.9
TD0800024B9R01	0.3150	0.3307	0.94	0.500	0.63	1.55	1.77	3.320	8	KTD6.0-D9.9
TD0850025B9R01	0.3346	0.3504	1.00	0.500	0.63	1.61	1.77	3.380	8.5	KTD6.0-D9.9
TD0900027B9R01	0.3543	0.3701	1.06	0.500	0.63	1.69	1.77	3.460	9	KTD6.0-D9.9
TD0950028B9R01	0.3740	0.3898	1.12	0.500	0.63	1.74	1.77	3.510	9.5	KTD6.0-D9.9
TD1000030C0R01	0.3937	0.4094	1.18	0.625	0.79	1.82	1.89	3.710	10	KTD10.0-19.9
TD1050031C0R01	0.4134	0.4291	1.26	0.625	0.79	1.88	1.89	3.770	10.5	KTD10.0-19.9
TD1100033C0R01	0.4331	0.4488	1.30	0.625	0.79	1.95	1.89	3.840	11	KTD10.0-19.9
TD1150034C0R01	0.4528	0.4685	1.38	0.625	0.79	2.01	1.89	3.900	11.5	KTD10.0-19.9
TD1200036C0R01	0.4724	0.4882	1.42	0.625	0.79	2.09	1.89	3.980	12	KTD10.0-19.9
TD1250037C0R01	0.4921	0.5079	1.46	0.625	0.79	2.15	1.89	4.040	12.5	KTD10.0-19.9
TD1300039C0R01	0.5118	0.5276	1.54	0.625	0.79	2.23	1.89	4.120	13	KTD10.0-19.9
TD1350040C0R01	0.5315	0.5472	1.61	0.625	0.79	2.29	1.89	4.180	13.5	KTD10.0-19.9
TD1400042C0R01	0.5512	0.5669	1.65	0.625	0.79	2.44	1.89	4.330	14	KTD10.0-19.9
TD1450043C0R01	0.5709	0.5866	1.73	0.625	0.79	2.50	1.89	4.390	14.5	KTD10.0-19.9
TD150004518R01	0.5906	0.6260	1.77	0.750	0.98	2.70	1.97	4.670	15	KTD10.0-19.9
TD160004818R01	0.6299	0.6654	1.89	0.750	0.98	2.89	1.97	4.860	16	KTD10.0-19.9
TD170005118R01	0.6693	0.7047	2.01	0.750	0.98	3.07	1.97	5.040	17	KTD10.0-19.9
TD1800054C8R01	0.7087	0.7441	2.13	1.000	1.26	3.25	2.20	5.450	18	KTD10.0-19.9
TD1900057C8R01	0.7480	0.7835	2.24	1.000	1.26	3.43	2.20	5.630	19	KTD10.0-19.9
TD2000060C8R01	0.7874	0.8228	2.36	1.000	1.26	3.61	2.20	5.810	20	KTD20.0-D26.9
TD2100063C8R01	0.8268	0.8622	2.48	1.000	1.26	3.79	2.20	5.990	21	KTD20.0-D26.9
TD2200066C8R01	0.8661	0.9016	2.60	1.000	1.26	3.97	2.20	6.170	22	KTD20.0-D26.9
TD2300069B7R01	0.9055	0.9409	2.72	1.250	1.65	4.15	2.36	6.510	23	KTD20.0-D26.9
TD2400072B7R01	0.9449	0.9803	2.83	1.250	1.65	4.33	2.36	6.690	24	KTD20.0-D26.9
TD2500075B7R01	0.9843	1.0197	2.95	1.250	1.65	4.51	2.36	6.870	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

5XD

Coolant



5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700035B9R01	0.2756	0.2913	1.38	0.500	0.63	1.95	1.77	3.720	7	KTD6.0-D9.9
TD0750037B9R01	0.2953	0.3110	1.48	0.500	0.63	2.05	1.77	3.820	7.5	KTD6.0-D9.9
TD0800040B9R01	0.3150	0.3307	1.57	0.500	0.63	2.18	1.77	3.950	8	KTD6.0-D9.9
TD0850042B9R01	0.3346	0.3504	1.67	0.500	0.63	2.28	1.77	4.050	8.5	KTD6.0-D9.9
TD0900045B9R01	0.3543	0.3701	1.77	0.500	0.63	2.39	1.77	4.160	9	KTD6.0-D9.9
TD0950047B9R01	0.3740	0.3898	1.87	0.500	0.63	2.49	1.77	4.260	9.5	KTD6.0-D9.9
TD1000050C0R01	0.3937	0.4094	1.97	0.625	0.79	2.61	1.89	4.500	10	KTD10.0-19.9
TD1050052C0R01	0.4134	0.4291	2.09	0.625	0.79	2.70	1.89	4.590	10.5	KTD10.0-19.9
TD1100055C0R01	0.4331	0.4488	2.17	0.625	0.79	2.82	1.89	4.710	11	KTD10.0-19.9
TD1150057C0R01	0.4528	0.4685	2.28	0.625	0.79	2.92	1.89	4.810	11.5	KTD10.0-19.9
TD1200060C0R01	0.4724	0.4882	2.36	0.625	0.79	3.03	1.89	4.920	12	KTD10.0-19.9
TD1250062C0R01	0.4921	0.5079	2.44	0.625	0.79	3.13	1.89	5.020	12.5	KTD10.0-19.9
TD1300065C0R01	0.5118	0.5276	2.56	0.625	0.79	3.25	1.89	5.140	13	KTD10.0-19.9
TD1350067C0R01	0.5315	0.5472	2.68	0.625	0.79	3.35	1.89	5.240	13.5	KTD10.0-19.9
TD1400070C0R01	0.5512	0.5669	2.76	0.625	0.79	3.55	1.89	5.440	14	KTD10.0-19.9
TD1450072C0R01	0.5709	0.5866	2.87	0.625	0.79	3.65	1.89	5.540	14.5	KTD10.0-19.9
TD150007518R01	0.5906	0.6260	2.95	0.750	0.98	3.89	1.97	5.860	15	KTD10.0-19.9
TD160008018R01	0.6299	0.6654	3.15	0.750	0.98	4.15	1.97	6.120	16	KTD10.0-19.9
TD170008518R01	0.6693	0.7047	3.35	0.750	0.98	4.41	1.97	6.380	17	KTD10.0-19.9
TD1800090C8R01	0.7087	0.7441	3.54	1.000	1.26	4.67	2.20	6.870	18	KTD10.0-19.9
TD1900095C8R01	0.7480	0.7835	3.74	1.000	1.26	4.92	2.20	7.120	19	KTD10.0-19.9
TD2000100C8R01	0.7874	0.8228	3.94	1.000	1.26	5.18	2.20	7.380	20	KTD20.0-D26.9
TD2100105C8R01	0.8268	0.8622	4.13	1.000	1.26	5.44	2.20	7.640	21	KTD20.0-D26.9
TD2200110C8R01	0.8661	0.9016	4.33	1.000	1.26	5.70	2.20	7.900	22	KTD20.0-D26.9
TD2300115B7R01	0.9055	0.9409	4.53	1.250	1.65	5.96	2.36	8.320	23	KTD20.0-D26.9
TD2400120B7R01	0.9449	0.9803	4.72	1.250	1.65	6.22	2.36	8.580	24	KTD20.0-D26.9
TD2500125B7R01	0.9843	1.0197	4.92	1.250	1.65	6.48	2.36	8.840	25	KTD20.0-D26.9

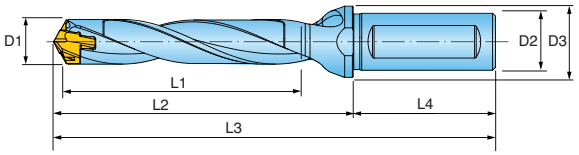
WELDON & ISO9766 SHANKS

8XD

Drilling

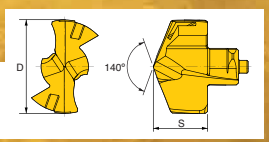
Coolant

NOTE: We strongly recommend the use of a 1.5:1 or 3:1 Gold•Twist drill of the same diameter to drill a centering starter hole. The use of a centering starter hole improves hole location, accuracy, roundness, straightness and surface finish.



8xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700056B9R01	0.2756	0.2913	0.43	0.500	0.63	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750060B9R01	0.2953	0.3110	2.28	0.500	0.63	2.94	1.77	4.710	7.5	KTD6.0-D9.9
TD0800064B9R01	0.3150	0.3307	2.52	0.500	0.63	3.13	1.77	4.900	8	KTD6.0-D9.9
TD0850068B9R01	0.3346	0.3504	2.68	0.500	0.63	3.32	1.77	5.090	8.5	KTD6.0-D9.9
TD0900072B9R01	0.3543	0.3701	2.83	0.500	0.63	3.46	1.77	5.230	9	KTD6.0-D9.9
TD0950076B9R01	0.3740	0.3898	2.99	0.500	0.63	3.65	1.77	5.420	9.5	KTD6.0-D9.9
TD1000080C0R01	0.3937	0.4094	3.15	0.625	0.79	3.79	1.89	5.680	10	KTD10.0-19.9
TD1050084C0R01	0.4134	0.4291	3.31	0.625	0.79	3.94	1.89	5.830	10.5	KTD10.0-19.9
TD1100088C0R01	0.4331	0.4488	3.46	0.625	0.79	4.12	1.89	6.010	11	KTD10.0-19.9
TD1150092C0R01	0.4528	0.4685	3.62	0.625	0.79	4.28	1.89	6.170	11.5	KTD10.0-19.9
TD1200096C0R01	0.4724	0.4882	3.78	0.625	0.79	4.45	1.89	6.340	12	KTD10.0-19.9
TD1250100C0R01	0.4921	0.5079	3.94	0.625	0.79	4.61	1.89	6.500	12.5	KTD10.0-19.9
TD1300104C0R01	0.5118	0.5276	4.09	0.625	0.79	4.79	1.89	6.680	13	KTD10.0-19.9
TD1350108C0R01	0.5315	0.5472	4.25	0.625	0.79	4.94	1.89	6.830	13.5	KTD10.0-19.9
TD1400112C0R01	0.5512	0.5669	4.41	0.625	0.79	5.20	1.89	7.090	14	KTD10.0-19.9
TD1450116C0R01	0.5709	0.5866	4.57	0.625	0.79	5.36	1.89	7.250	14.5	KTD10.0-19.9
TD150012018R01	0.5906	0.6260	4.72	0.750	0.98	5.66	1.97	7.630	15	KTD10.0-19.9
TD160012818R01	0.6299	0.6654	5.04	0.750	0.98	6.04	1.97	8.010	16	KTD10.0-19.9
TD170013618R01	0.6693	0.7047	5.35	0.750	0.98	6.41	1.97	8.380	17	KTD10.0-19.9
TD1800144C8R01	0.7087	0.7441	5.67	1.000	1.26	6.79	2.20	8.990	18	KTD10.0-19.9
TD1900152C8R01	0.7480	0.7835	5.98	1.000	1.26	7.17	2.20	9.370	19	KTD10.0-19.9
TD2000160C8R01	0.7874	0.8228	6.30	1.000	1.26	7.54	2.20	9.740	20	KTD20.0-D26.9
TD2100168C8R01	0.8268	0.8622	6.61	1.000	1.26	7.92	2.20	10.120	21	KTD20.0-D26.9
TD2200176C8R01	0.8661	0.9016	6.93	1.000	1.26	8.30	2.20	10.500	22	KTD20.0-D26.9
TD2300184B7R01	0.9055	0.9409	7.24	1.250	1.65	8.68	2.36	11.040	23	KTD20.0-D26.9
TD2400192B7R01	0.9449	0.9803	7.56	1.250	1.65	9.06	2.36	11.420	24	KTD20.0-D26.9
TD2500200B7R01	0.9843	1.0197	7.87	1.250	1.65	9.43	2.36	11.790	25	KTD20.0-D26.9

TIPS



"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter (mm)	(D) Diameter (inch)	S Dim (inch)	Pocket Size	Grade
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TPA0710R01	TMA0710R01	TKA0710R01	7.1	0.2795	0.181	7	IN2505
TPA0720R01	TMA0720R01	TKA0720R01	7.2	0.2835	0.181	7	IN2505
TPA0730R01	TMA0730R01	TKA0730R01	7.3	0.2874	0.181	7	IN2505
TPA0740R01	TMA0740R01	TKA0740R01	7.4	0.2913	0.181	7	IN2505
TPA0750R01	TMA0750R01	TKA0750R01	7.5	0.2953	0.181	7.5	IN2505
TPA0760R01	TMA0760R01	TKA0760R01	7.6	0.2992	0.181	7.5	IN2505
TPA0770R01	TMA0770R01	TKA0770R01	7.7	0.3031	0.181	7.5	IN2505
TPA0780R01	TMA0780R01	TKA0780R01	7.8	0.3071	0.181	7.5	IN2505
TPA0790R01	TMA0790R01	TKA0790R01	7.9	0.3110	0.181	7.5	IN2505
TPA0800R01	TMA0800R01	TKA0800R01	8.0	0.3150	0.213	8	IN2505
TPA0810R01	TMA0810R01	TKA0810R01	8.1	0.3189	0.213	8	IN2505
TPA0820R01	TMA0820R01	TKA0820R01	8.2	0.3228	0.213	8	IN2505
TPA0830R01	TMA0830R01	TKA0830R01	8.3	0.3268	0.213	8	IN2505
TPA0840R01	TMA0840R01	TKA0840R01	8.4	0.3307	0.213	8	IN2505
TPA0850R01	TMA0850R01	TKA0850R01	8.5	0.3346	0.213	8.5	IN2505
TPA0860R01	TMA0860R01	TKA0860R01	8.6	0.3386	0.213	8.5	IN2505
TPA0870R01	TMA0870R01	TKA0870R01	8.7	0.3425	0.213	8.5	IN2505
TPA0880R01	TMA0880R01	TKA0880R01	8.8	0.3465	0.213	8.5	IN2505
TPA0890R01	TMA0890R01	TKA0890R01	8.9	0.3504	0.213	8.5	IN2505
TPA0900R01	TMA0900R01	TKA0900R01	9.0	0.3543	0.228	9	IN2505
TPA0910R01	TMA0910R01	TKA0910R01	9.1	0.3583	0.228	9	IN2505
TPA0920R01	TMA0920R01	TKA0920R01	9.2	0.3622	0.228	9	IN2505
TPA0930R01	TMA0930R01	TKA0930R01	9.3	0.3661	0.228	9	IN2505
TPA0940R01	TMA0940R01	TKA0940R01	9.4	0.3701	0.228	9	IN2505
TPA0950R01	TMA0950R01	TKA0950R01	9.5	0.3740	0.228	9.5	IN2505
TPA0960R01	TMA0960R01	TKA0960R01	9.6	0.3780	0.228	9.5	IN2505
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TPA0990R01	TMA0990R01	TKA0990R01	9.9	0.3898	0.228	9.5	IN2505
TPA1000R01	TMA1000R01	TKA1000R01	10.0	0.3937	0.244	10	IN2505
TPA1010R01	TMA1010R01	TKA1010R01	10.1	0.3976	0.244	10	IN2505
TPA1020R01	TMA1020R01	TKA1020R01	10.2	0.4016	0.244	10	IN2505
TPA1030R01	TMA1030R01	TKA1030R01	10.3	0.4055	0.244	10	IN2505
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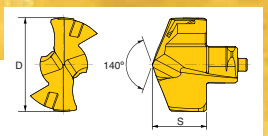
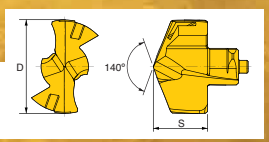
TPA1080R01	TMA1080R01	TKA1080R01	10.8	0.4252	0.244	10.5	IN2505
TPA1090R01	TMA1090R01	TKA1090R01	10.9	0.4291	0.244	10.5	IN2505
TPA1100R01	TMA1100R01	TKA1100R01	11.0	0.4331	0.260	11	IN2505
TPA1110R01	TMA1110R01	TKA1110R01	11.1	0.4370	0.260	11	IN2505
TPA1120R01	TMA1120R01	TKA1120R01	11.2	0.4409	0.260	11	IN2505
TPA1130R01	TMA1130R01	TKA1130R01	11.3	0.4449	0.260	11	IN2505
TPA1140R01	TMA1140R01	TKA1140R01	11.4	0.4488	0.260	11	IN2505
TPA1150R01	TMA1150R01	TKA1150R01	11.5	0.4528	0.260	11.5	IN2505
TPA1160R01	TMA1160R01	TKA1160R01	11.6	0.4567	0.260	11.5	IN2505
TPA1170R01	TMA1170R01	TKA1170R01	11.7	0.4606	0.260	11.5	IN2505
TPA1180R01	TMA1180R01	TKA1180R01	11.8	0.4646	0.260	11.5	IN2505
TPA1190R01	TMA1190R01	TKA1190R01	11.9	0.4685	0.260	11.5	IN2505
TPA1200R01	TMA1200R01	TKA1200R01	12.0	0.4724	0.275	12	IN2505
TPA1210R01	TMA1210R01	TKA1210R01	12.1	0.4764	0.275	12	IN2505
TPA1220R01	TMA1220R01	TKA1220R01	12.2	0.4803	0.275	12	IN2505

TIPS



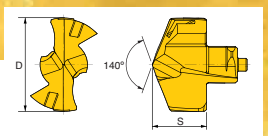
"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter (mm)	(D) Diameter (inch)	S Dim (inch)	Pocket Size	Grade
TPA1230R01	TMA1230R01	TKA1230R01	12.3	0.4843	0.275	12	IN2505
TPA1240R01	TMA1240R01	TKA1240R01	12.4	0.4882	0.275	12	IN2505
TPA1250R01	TMA1250R01	TKA1250R01	12.5	0.4921	0.275	12.5	IN2505
TPA1260R01	TMA1260R01	TKA1260R01	12.6	0.4961	0.275	12.5	IN2505
TPA1270R01	TMA1270R01	TKA1270R01	12.7	0.5000	0.275	12.5	IN2505
TPA1280R01	TMA1280R01	TKA1280R01	12.8	0.5039	0.275	12.5	IN2505
TPA1290R01	TMA1290R01	TKA1290R01	12.9	0.5079	0.275	12.5	IN2505
TPA1300R01	TMA1300R01	TKA1300R01	13.0	0.5118	0.299	13	IN2505
TPA1310R01	TMA1310R01	TKA1310R01	13.1	0.5157	0.299	13	IN2505
TPA1320R01	TMA1320R01	TKA1320R01	13.2	0.5197	0.299	13	IN2505
TPA1330R01	TMA1330R01	TKA1330R01	13.3	0.5236	0.299	13	IN2505
TPA1340R01	TMA1340R01	TKA1340R01	13.4	0.5276	0.299	13	IN2505
TPA1350R01	TMA1350R01	TKA1350R01	13.5	0.5315	0.299	13.5	IN2505
TPA1360R01	TMA1360R01	TKA1360R01	13.6	0.5354	0.299	13.5	IN2505
TPA1370R01	TMA1370R01	TKA1370R01	13.7	0.5394	0.299	13.5	IN2505
TPA1380R01	TMA1380R01	TKA1380R01	13.8	0.5433	0.299	13.5	IN2505
TPA1390R01	TMA1390R01	TKA1390R01	13.9	0.5472	0.299	13.5	IN2505
TPA1400R01	TMA1400R01	TKA1400R01	14.0	0.5512	0.321	14	IN2505
TPA1410R01	TMA1410R01	TKA1410R01	14.1	0.5551	0.321	14	IN2505
TPA1420R01	TMA1420R01	TKA1420R01	14.2	0.5591	0.321	14	IN2505
TPA1430R01	TMA1430R01	TKA1430R01	14.3	0.5630	0.321	14	IN2505
TPA1440R01	TMA1440R01	TKA1440R01	14.4	0.5669	0.321	14	IN2505
TPA1450R01	TMA1450R01	TKA1450R01	14.5	0.5709	0.321	14.5	IN2505
TPA1460R01	TMA1460R01	TKA1460R01	14.6	0.5748	0.321	14.5	IN2505
TPA1470R01	TMA1470R01	TKA1470R01	14.7	0.5787	0.321	14.5	IN2505
TPA1480R01	TMA1480R01	TKA1480R01	14.8	0.5827	0.321	14.5	IN2505
TPA1490R01	TMA1490R01	TKA1490R01	14.9	0.5866	0.321	14.5	IN2505
TPA1500R01	TMA1500R01	TKA1500R01	15.0	0.5906	0.344	15	IN2505
TPA1510R01	TMA1510R01	TKA1510R01	15.1	0.5945	0.344	15	IN2505
TPA1520R01	TMA1520R01	TKA1520R01	15.2	0.5984	0.344	15	IN2505
TPA1530R01	TMA1530R01	TKA1530R01	15.3	0.6024	0.344	15	IN2505
TPA1540R01	TMA1540R01	TKA1540R01	15.4	0.6063	0.344	15	IN2505
TPA1550R01	TMA1550R01	TKA1550R01	15.5	0.6102	0.344	15	IN2505
TPA1560R01	TMA1560R01	TKA1560R01	15.6	0.6142	0.344	15	IN2505
TPA1570R01	TMA1570R01	TKA1570R01	15.7	0.6181	0.344	15	IN2505
TPA1580R01	TMA1580R01	TKA1580R01	15.8	0.6220	0.344	15	IN2505
TPA1590R01	TMA1590R01	TKA1590R01	15.9	0.6260	0.344	15	IN2505
TPA1600R01	TMA1600R01	TKA1600R01	16.0	0.6299	0.366	16	IN2505
TPA1610R01	TMA1610R01	TKA1610R01	16.1	0.6339	0.366	16	IN2505
TPA1620R01	TMA1620R01	TKA1620R01	16.2	0.6378	0.366	16	IN2505
TPA1630R01	TMA1630R01	TKA1630R01	16.3	0.6417	0.366	16	IN2505
TPA1640R01	TMA1640R01	TKA1640R01	16.4	0.6457	0.366	16	IN2505
TPA1650R01	TMA1650R01	TKA1650R01	16.5	0.6496	0.366	16	IN2505
TPA1660R01	TMA1660R01	TKA1660R01	16.6	0.6535	0.366	16	IN2505
TPA1670R01	TMA1670R01	TKA1670R01	16.7	0.6575	0.366	16	IN2505
TPA1680R01	TMA1680R01	TKA1680R01	16.8	0.6614	0.366	16	IN2505
TPA1690R01	TMA1690R01	TKA1690R01	16.9	0.6654	0.366	16	IN2505
TPA1700R01	TMA1700R01	TKA1700R01	17.0	0.6693	0.390	17	IN2505
TPA1710R01	TMA1710R01	TKA1710R01	17.1	0.6732	0.390	17	IN2505
TPA1720R01	TMA1720R01	TKA1720R01	17.2	0.6772	0.390	17	IN2505
TPA1730R01	TMA1730R01	TKA1730R01	17.3	0.6811	0.390	17	IN2505
TPA1740R01	TMA1740R01	TKA1740R01	17.4	0.6850	0.390	17	IN2505
TPA1750R01	TMA1750R01	TKA1750R01	17.5	0.6890	0.390	17	IN2505

TIPS



"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter (mm)	(D) Diameter (inch)	S Dim (inch)	Pocket Size	Grade
TPA1760R01	TMA1760R01	TKA1760R01	17.6	0.6929	0.390	17	IN2505
TPA1770R01	TMA1770R01	TKA1770R01	17.7	0.6968	0.390	17	IN2505
TPA1780R01	TMA1780R01	TKA1780R01	17.8	0.7008	0.390	17	IN2505
TPA1790R01	TMA1790R01	TKA1790R01	17.9	0.7047	0.390	17	IN2505
TPA1800R01	TMA1800R01	TKA1800R01	18.0	0.7087	0.413	18	IN2505
TPA1810R01	TMA1810R01	TKA1810R01	18.1	0.7126	0.413	18	IN2505
TPA1820R01	TMA1820R01	TKA1820R01	18.2	0.7165	0.413	18	IN2505
TPA1830R01	TMA1830R01	TKA1830R01	18.3	0.7205	0.413	18	IN2505
TPA1840R01	TMA1840R01	TKA1840R01	18.4	0.7244	0.413	18	IN2505
TPA1850R01	TMA1850R01	TKA1850R01	18.5	0.7283	0.413	18	IN2505
TPA1860R01	TMA1860R01	TKA1860R01	18.6	0.7323	0.413	18	IN2505
TPA1870R01	TMA1870R01	TKA1870R01	18.7	0.7362	0.413	18	IN2505
TPA1880R01	TMA1880R01	TKA1880R01	18.8	0.7402	0.413	18	IN2505
TPA1890R01	TMA1890R01	TKA1890R01	18.9	0.7441	0.413	18	IN2505
TPA1900R01	TMA1900R01	TKA1900R01	19.0	0.7480	0.433	19	IN2505
TPA1905R01	TMA1905R01	TKA1905R01	19.05	0.7500	0.433	19	IN2505
TPA1910R01	TMA1910R01	TKA1910R01	19.1	0.7520	0.433	19	IN2505
TPA1920R01	TMA1920R01	TKA1920R01	19.2	0.7559	0.433	19	IN2505
TPA1930R01	TMA1930R01	TKA1930R01	19.3	0.7598	0.433	19	IN2505
TPA1940R01	TMA1940R01	TKA1940R01	19.4	0.7638	0.433	19	IN2505
TPA1950R01	TMA1950R01	TKA1950R01	19.5	0.7677	0.433	19	IN2505
TPA1960R01	TMA1960R01	TKA1960R01	19.6	0.7717	0.433	19	IN2505
TPA1970R01	TMA1970R01	TKA1970R01	19.7	0.7756	0.433	19	IN2505
TPA1980R01	TMA1980R01	TKA1980R01	19.8	0.7795	0.433	19	IN2505
TPA1990R01	TMA1990R01	TKA1990R01	19.9	0.7835	0.433	19	IN2505
TPA2000R01	TMA2000R01	TKA2000R01	20.0	0.7874	0.344	20	IN2505
TPA2010R01	TMA2010R01	TKA2010R01	20.1	0.7913	0.344	20	IN2505
TPA2020R01	TMA2020R01	TKA2020R01	20.2	0.7953	0.344	20	IN2505
TPA2030R01	TMA2030R01	TKA2030R01	20.3	0.7992	0.344	20	IN2505
TPA2040R01	TMA2040R01	TKA2040R01	20.4	0.8031	0.344	20	IN2505
TPA2050R01	TMA2050R01	TKA2050R01	20.5	0.8071	0.344	20	IN2505
TPA2060R01	TMA2060R01	TKA2060R01	20.6	0.8110	0.344	20	IN2505
TPA2070R01	TMA2070R01	TKA2070R01	20.7	0.8150	0.344	20	IN2505
TPA2080R01	TMA2080R01	TKA2080R01	20.8	0.8189	0.344	20	IN2505
TPA2090R01	TMA2090R01	TKA2090R01	20.9	0.8228	0.344	20	IN2505
TPA2100R01	TMA2100R01	TKA2100R01	21.0	0.8268	0.366	21	IN2505
TPA2110R01	TMA2110R01	TKA2110R01	21.1	0.8307	0.366	21	IN2505
TPA2120R01	TMA2120R01	TKA2120R01	21.2	0.8346	0.366	21	IN2505
TPA2130R01	TMA2130R01	TKA2130R01	21.3	0.8386	0.366	21	IN2505
TPA2140R01	TMA2140R01	TKA2140R01	21.4	0.8425	0.366	21	IN2505
TPA2150R01	TMA2150R01	TKA2150R01	21.5	0.8465	0.366	21	IN2505
TPA2160R01	TMA2160R01	TKA2160R01	21.6	0.8504	0.366	21	IN2505
TPA2170R01	TMA2170R01	TKA2170R01	21.7	0.8543	0.366	21	IN2505
TPA2180R01	TMA2180R01	TKA2180R01	21.8	0.8583	0.366	21	IN2505
TPA2190R01	TMA2190R01	TKA2190R01	21.9	0.8622	0.366	21	IN2505
TPA2200R01	TMA2200R01	TKA2200R01	22.0	0.8661	0.390	22	IN2505
TPA2210R01	TMA2210R01	TKA2210R01	22.1	0.8701	0.390	22	IN2505
TPA2220R01	TMA2220R01	TKA2220R01	22.2	0.8740	0.390	22	IN2505
TPA2222R01	TMA2222R01	TKA2222R01	22.22	0.8750	0.390	22	IN2505
TPA2230R01	TMA2230R01	TKA2230R01	22.3	0.8780	0.390	22	IN2505
TPA2240R01	TMA2240R01	TKA2240R01	22.4	0.8819	0.390	22	IN2505

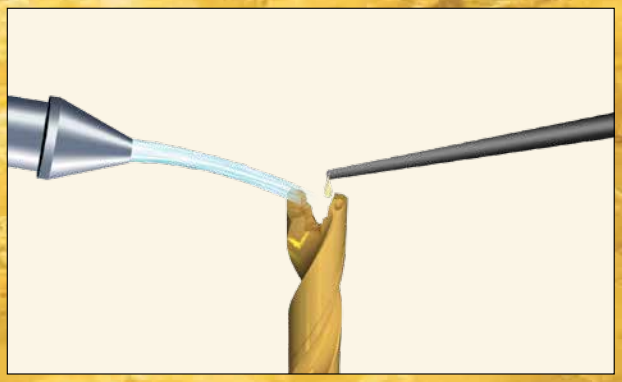
TIPS



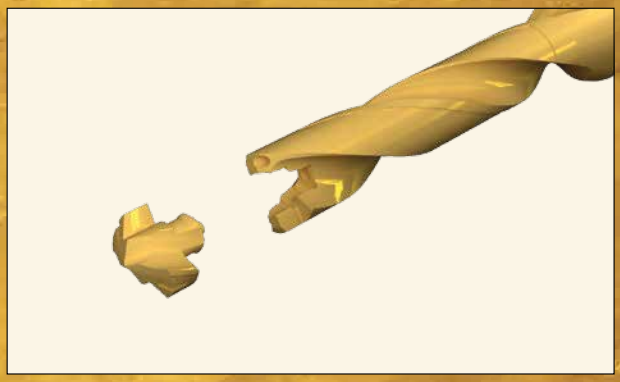
"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter (mm)	(D) Diameter (inch)	S Dim (inch)	Pocket Size	Grade
TPA2250R01	TMA2250R01	TKA2250R01	22.5	0.8858	0.390	22	IN2505
TPA2260R01	TMA2260R01	TKA2260R01	22.6	0.8898	0.390	22	IN2505
TPA2270R01	TMA2270R01	TKA2270R01	22.7	0.8937	0.390	22	IN2505
TPA2280R01	TMA2280R01	TKA2280R01	22.8	0.8976	0.390	22	IN2505
TPA2290R01	TMA2290R01	TKA2290R01	22.9	0.9016	0.390	22	IN2505
TPA2300R01	TMA2300R01	TKA2300R01	23.0	0.9055	0.413	23	IN2505
TPA2310R01	TMA2310R01	TKA2310R01	23.1	0.9094	0.413	23	IN2505
TPA2320R01	TMA2320R01	TKA2320R01	23.2	0.9134	0.413	23	IN2505
TPA2330R01	TMA2330R01	TKA2330R01	23.3	0.9173	0.413	23	IN2505
TPA2340R01	TMA2340R01	TKA2340R01	23.4	0.9213	0.413	23	IN2505
TPA2350R01	TMA2350R01	TKA2350R01	23.5	0.9252	0.413	23	IN2505
TPA2360R01	TMA2360R01	TKA2360R01	23.6	0.9291	0.413	23	IN2505
TPA2370R01	TMA2370R01	TKA2370R01	23.7	0.9331	0.413	23	IN2505
TPA2380R01	TMA2380R01	TKA2380R01	23.8	0.9370	0.413	23	IN2505
TPA2390R01	TMA2390R01	TKA2390R01	23.9	0.9409	0.413	23	IN2505
TPA2400R01	TMA2400R01	TKA2400R01	24.0	0.9449	0.433	24	IN2505
TPA2410R01	TMA2410R01	TKA2410R01	24.1	0.9488	0.433	24	IN2505
TPA2420R01	TMA2420R01	TKA2420R01	24.2	0.9528	0.433	24	IN2505
TPA2430R01	TMA2430R01	TKA2430R01	24.3	0.9567	0.433	24	IN2505
TPA2440R01	TMA2440R01	TKA2440R01	24.4	0.9606	0.433	24	IN2505
TPA2450R01	TMA2450R01	TKA2450R01	24.5	0.9646	0.433	24	IN2505
TPA2460R01	TMA2460R01	TKA2460R01	24.6	3.9685	0.433	24	IN2505
TPA2470R01	TMA2470R01	TKA2470R01	24.7	0.9724	0.433	24	IN2505
TPA2480R01	TMA2480R01	TKA2480R01	24.8	0.9764	0.433	24	IN2505
TPA2490R01	TMA2490R01	TKA2490R01	24.9	0.9803	0.433	24	IN2505
TPA2500R01	TMA2500R01	TKA2500R01	25.0	0.9843	0.433	25	IN2505
TPA2510R01	TMA2510R01	TKA2510R01	25.1	0.9882	0.433	25	IN2505
TPA2520R01	TMA2520R01	TKA2520R01	25.2	0.9921	0.433	25	IN2505
TPA2530R01	TMA2530R01	TKA2530R01	25.3	0.9961	0.433	25	IN2505
TPA2540R01	TMA2540R01	TKA2540R01	25.4	1.0000	0.433	25	IN2505
TPA2550R01	TMA2550R01	TKA2550R01	25.5	1.0039	0.433	25	IN2505
TPA2560R01	TMA2560R01	TKA2560R01	25.6	1.0079	0.433	25	IN2505
TPA2570R01	TMA2570R01	TKA2570R01	25.7	1.0118	0.433	25	IN2505
TPA2580R01	TMA2580R01	TKA2580R01	25.8	1.0157	0.433	25	IN2505
TPA2590R01	TMA2590R01	TKA2590R01	25.9	1.0197	0.433	25	IN2505

* Aluminum geometry available as a special: TNA designation

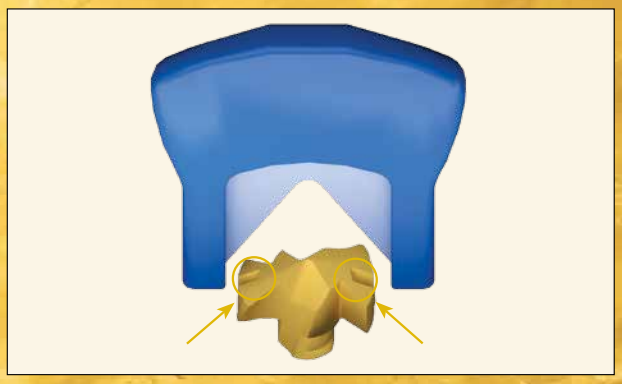
SET UP (DRILLING TIP MOUNTING PROCEDURE)



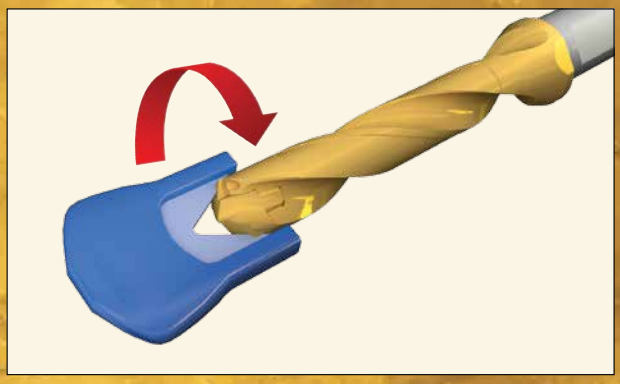
1. Clean the pocket and put oil



2. Mount the drill tip on the pocket



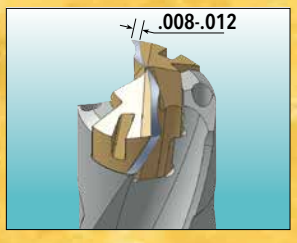
3. Insert key into the slots on tip



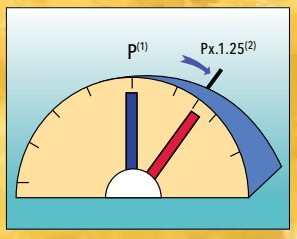
4. Tighten the tip by rotating the key CW

INDICATION OF HEAD WEAR

Wear Limit

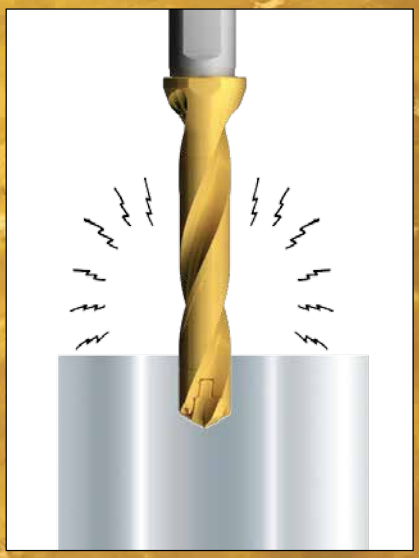


Power Restriction

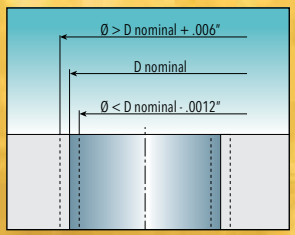


(1) New drilling head
(2) Worn-out drilling head

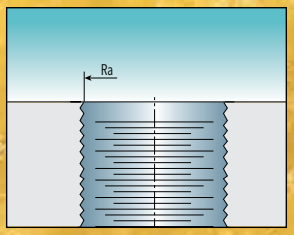
Vibration Noise Drastically Increases



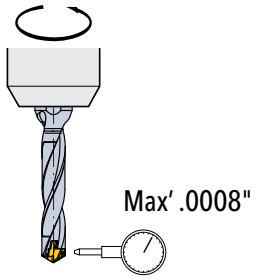
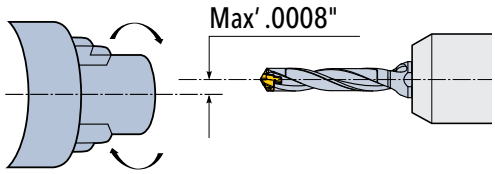
Diameter Change



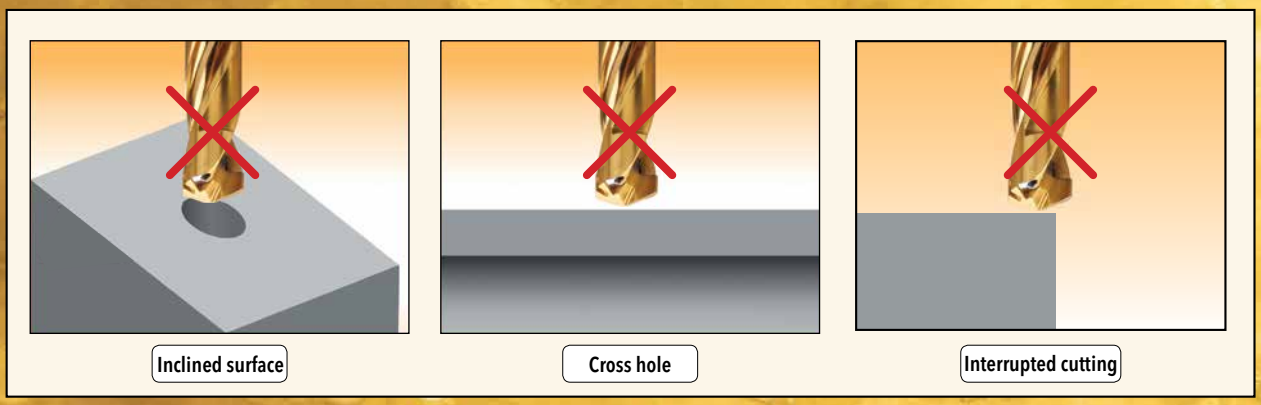
Surface Finish Declines



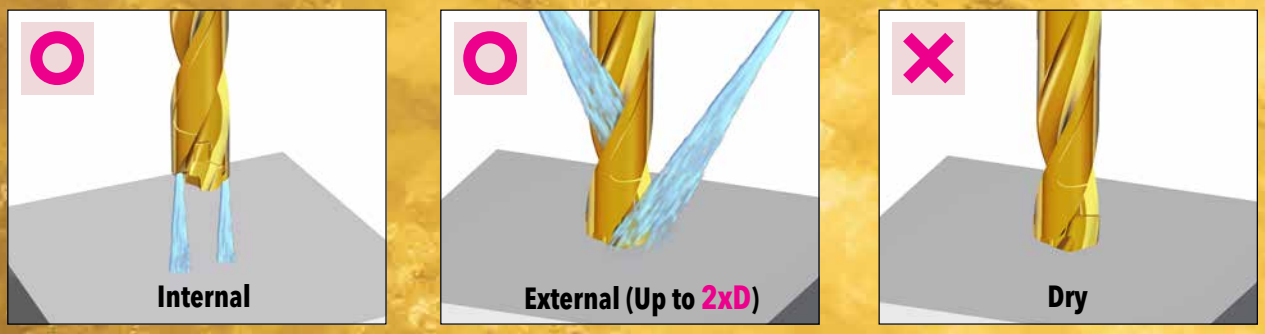
MAXIMUM RUNOUT

Rotational runout	Stationary runout
	

DRILLING LIMITATION



COOLANT RECOMMENDATIONS



RECOMMENDED PILOTING PROCEDURE FOR 8XD OR 12XD

1. Prior to using 8xD or 12xD drills, it is recommended to drill pilot holes from 0.5xD~1.5xD using a short drill (GOLDTWIST 1.5xD holder is recommended).
2. Approach the pre-hole at reduced speed and feed until 2~5mm from it's bottom depth.
3. Increase up to recommended speed and maintain feed rate for 2~3 seconds applying coolant.
4. Start drilling at the recommended feed rate.

GOLDTWIST™

ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed vs Drill Diameter					
							D= 7-9.9mm (.275-.390")	D= 10-11.9mm (.394-.469")	D= 12-13.9mm (.472-.547")	D= 14-15.9mm (.551-.626")	D= 16-19.9mm (.630-.783")	D= 20-25.9mm (.787-1.019")
							IPR (inches/rev)					
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting steel <0.55% C > = 0.55% C	Annealed	420	125	1	260-360-460	.005 .007 .009	.006 .008 .011	.007 .009 .012	.008 .011 .014	.010 .014 .018	.010 .014 .018
		Annealed	650	190	2	260-345-430						
		Quenched & Tempered	850	250	3	260-330-400						
		Annealed	750	220	4	230-295-360						
		Quenched & Tempered	1000	300	5	165-230-300						
	Low alloy steel & cast steek (less than 5% alloying elements)	Annealed	600	200	6	230-315-400	.005 .007 .010	.006 .008 .011	.006 .009 .013	.007 .010 .014	.009 .012 .016	.010 .014 .018
		Quenched & Tempered	930	275	7	230-295-360						
			1000	300	8	165-230-300						
			1200	350	9	135-180-230						
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	165-230-300	.005 .006 .008	.005 .006 .007	.006 .008 .010	.007 .009 .011	.008 .010 .012	.009 .011 .013
		Quenched & Tempered	1100	325	11	130-200-265						
M	Stainless steel & cast stainless steel	Ferritic/martensitic	680	200	12	130-180-230	.004 .005 .006	.005 .006 .007	.006 .007 .008	.006 .008 .009	.006 .008 .010	.007 .009 .012
		Martensitic	820	240	13	130-180-230						
		Austenitic	600	180	14	100-165-230						
K	GreyCast Iron (GG)	Ferritic		160	15	300-410-525	.006 .009 .012	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .018 .022	.014 .018 .024
		Pearlitic		250	16	265-360-460						
	Cast Iron Nodular (GGG)	Ferritic		180	17	300-450-600						
		Pearlitic		260	18	265-360-460						
	Malleable Cast Iron	Ferritic		130	19	300-410-525						
		Pearlitic		230	20	265-360-460						
N	Aluminum - wrought alloy	Not cureable		60	21	300-510-725	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .017 .020	.016 .020 .024	.018 .022 .028
		Cured		100	22	300-510-725						
	Aluminum - cast, alloyed <=12% Si / >12% Si	Not cureable		75	23	300-510-725						
		Cured		90	24	300-510-725						
		High temperature		130	25	265-400-525						
	Copper alloys > 1% Pb	Free cutting		110	26	300-510-725						
		Brass		90	27	300-510-725						
		Electrolitic copper		100	28	300-510-725						
	Non-metallic	Duro & fiber plastics			29	-	- -	- -	- -	- -	- -	
		Hard rubber			30	-						
S	High temp alloys Fe based / Ni or Co based	Annealed		200	31	100-150-200	.002 .003 .004	.003 .004 .005	.004 .005 .006	.005 .006 .007	.005 .006 .008	.006 .007 .009
		Cured		280	32	70-115-165						
		Annealed		250	33	70-115-165						
		Cured		350	34	70-115-165						
		Cast		320	35	70-115-165						
	Titanium, Ti alloys		Rm 400		36	70-115-165	.002 .004 .005	.003 .004 .006	.004 .006 .007	.005 .007 .008	.006 .007 .009	.006 .008 .010
		Alpha+beta alloys cured	Rm 1050		37	70-115-165						
H	Hardened steel	Hardened		55 HRC	38	70-115-165	.002 .004 .005	.003 .004 .006	.004 .006 .007	.005 .007 .008	.006 .007 .009	.006 .008 .010
		Hardened		60 HRC	39	70-115-165						
	Chilled cast iron	Cast		400	40	-	-	-	-	-	-	
	Cast iron nodular	Hardened		55 HRC	41	-	-	-	-	-	-	

*** Feed Rates are based on Two Effective - DO NOT DOUBLE.**

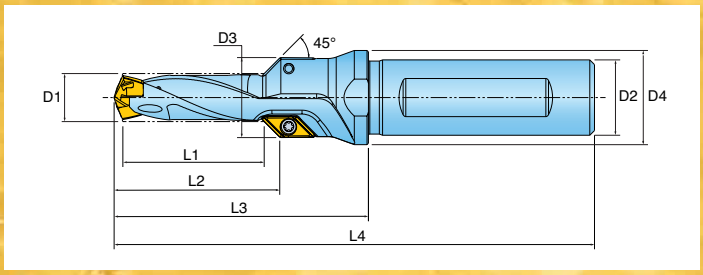
GOLD TWIST
DRILL LINE

AN ECONOMICAL DRILL/CHAMFER COMBO SOLUTION FOR INCH AND METRIC TAP SIZES

Drill Body Features
- Cost effective solution that replaces the high cost of special solid carbide step drills
- A twisted through coolant channel for smooth chip evacuation & high penetration rates
- Two symmetrically designed standard chamfering inserts firmly seated for optimal performance via balanced cutting
- Eliminates the need for solid carbide drill regrinding

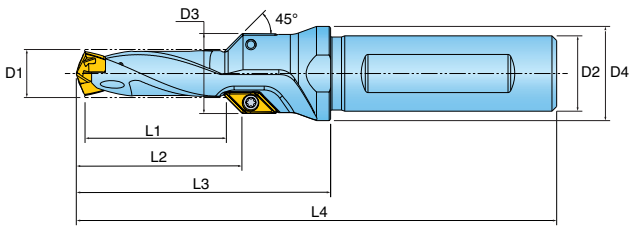
Insert Features
- Widely capable KOMT insert is designed for both chamfering and countersinking
- Indexable inserts include two cutting edges for optimum chip control
- Capable of machining a wide range of workpiece materials
- Indexable inserts mean economy and flexibility over a wide range of applications

METRIC BODIES



BODY	Thread	Dimensions (inch) D1	D3	L1	L2	L3	D2	D4	L4	Pocket Size
TC0850026JCR01	M10	.335 (8.5mm)	.610	1.024	1.20	1.96	.472 (12.0mm)	.630	3.73	8.5
TC1020030JDR01	M12	.402 (10.2mm)	.669	1.181	1.36	2.13	.630 (16.0mm)	.787	4.02	10
TC1200035JDR01	M14	.472 (12.0mm)	.748	1.378	1.56	2.40	.630 (16.0mm)	.787	4.29	12
TC1400039JER01	M16	.551 (14.0mm)	.827	1.535	1.71	2.72	.787 (20.0mm)	.984	4.69	14
TC1750042JER01	M20	.689 (17.5mm)	.965	1.653	1.83	2.83	.787 (20.0mm)	1.062	4.80	17
TC2100048JFR01	M24	.827 (21.0mm)	1.102	1.890	2.07	3.15	.984 (25.0mm)	1.259	5.35	21

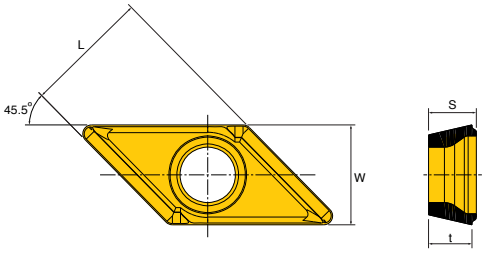
INCH BODIES



BODY	Thread	Dimensions (inch) D1	D3	L1	L2	L3	D2	D4	L4	Pocket Size
TC0790025B9R01	3/8 UNC	.311 (7.9mm)	.590	1.000	1.18	1.97	.500 (12.7mm)	.630	3.74	7.5
TC0850025B9R01	3/8 UNF	.335 (8.5mm)	.610	1.000	1.18	2.01	.500 (12.7mm)	.630	3.78	8.5
TC0940026B9R01	7/16 UNC	.370 (9.4mm)	.650	1.059	1.24	2.13	.500 (12.7mm)	.709	3.90	9, 9.5
TC0990026B9R01	7/16 UNF	.390 (9.9mm)	.669	1.059	1.24	2.13	.500 (12.7mm)	.709	3.90	9
TC1080026C0R01	1/2 UNC	.425 (10.8mm)	.709	1.059	1.24	2.17	.625 (15.88mm)	.787	4.06	10.5
TC1150026C0R01	1/2 UNF	.453 (11.5mm)	.728	1.059	1.24	2.20	.625 (15.88mm)	.787	4.09	11.5
TC1230026C0R01	9/16 UNC	.484 (12.3mm)	.768	1.059	1.24	2.24	.625 (15.88mm)	.866	4.13	12
TC1300026C0R01	9/16 UNF	.512 (13.0mm)	.787	1.059	1.24	2.28	.625 (15.88mm)	.866	4.17	13
TC137003018R01	5/8 UNC	.539 (13.7mm)	.807	1.201	1.38	2.40	.750 (19.05mm)	.984	4.37	13.5
TC146003018R01	5/8 UNF	.575 (14.6mm)	.827	1.201	1.38	2.44	.750 (19.05mm)	.984	4.41	14.5
TC167003518R01	3/4 UNC	.658 (16.7mm)	.925	1.402	1.58	2.76	.750 (19.05mm)	.984	4.73	16
TC175003518R01	3/4 UNF	.689 (17.5mm)	.965	1.402	1.58	2.83	.750 (19.05mm)	.984	4.80	17
TC1950041C8R01	7/8 UNC	.768 (19.5mm)	1.043	1.650	1.83	3.15	1.000 (25.4mm)	1.260	5.35	19
TC2050041C8R01	7/8 UNF	.807 (20.5mm)	1.083	1.650	1.83	3.23	1.000 (25.4mm)	1.260	5.43	20

INSERT

IN2005, IN2505



DESIGNATION	Dimensions (inch) W	L	S	t	Screw	Wrench
KOMT050104R	.177	.223	.085	.077	TS220461	TD7P

QUADTWIST™ DRILL

NEW GENERATION OF INDEXABLE DRILL

- 4 cornered economical insert design.
- Grade IN2505 can be used for both inboard and outboard pockets.
- Improved machinability due to ideally configured cutting edge.
- Applicable to most materials including low carbon and mild steel.
- Twisted coolant design provides for excellent chip evacuation and better hole quality.
- Enhanced insert durability with new grade (IN2505).
- New extended length shank (R02).
  - Allows two set screw contact for lathe applications.
  - Cut-off notch added for ease of shortening in rotating applications, if necessary.

IN2505 (PVD) - GENERAL PURPOSE

- Sub-micron grade with high hardness and toughness
- New Multi-layered coating for higher chipping resistance
- Post-coat surface treatment improves chipping resistance and reduces cutting forces
- First choice for general applications

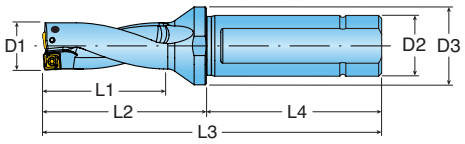
IN6505 (CVD) - STEEL APPLICATION

- Multi-layered CVD coating along with post coat surface treatment provides excellent wear resistance and improves chipping resistance
- Peripheral (Outboard) pocket only

IN1030 (PVD) - CAST IRON, STAINLESS, TITANIUM

- Tough, slower speed applications
- More forgiving when machine rigidity is an issue.

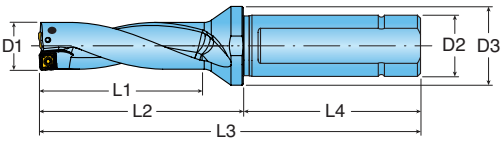
QR SERIES INDEXABLE DRILL



2xD Bodies	Dimensions (inch)											
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth	Insert	Screw	Torx	Plug
* QR0143029N5R02	14.3	0.563			1.13	2.13	5.28	3.16				
* QR0150030N5R02	15.0	0.591			1.19	2.24	5.39	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
* QR0159032N5R02	15.9	0.626			1.25	2.36	5.51	3.16				
* QR0167033N5R02	16.7	0.658			1.31	2.44	5.59	3.16				
* QR0175035N5R02	17.5	0.689			1.38	2.56	5.71	3.16	SOMT060204SK	TS 22052I/HG-P	TD 7P	PF-0012
* QR0183037N5R02	18.3	0.721	1.00	1.26	1.44	2.56	5.71	3.16				
* QR0191038N5R02	19.1	0.750			1.50	2.64	5.79	3.16				
* QR0198040N5R02	19.8	0.781			1.56	2.80	5.94	3.16				
* QR0206041N5R02	20.6	0.813			1.63	2.87	6.02	3.16	SOMT070306SK	TS 22052I/HG-P	TD 7P	PF-0012
* QR0214042N5R02	21.4	0.843			1.69	2.95	6.10	3.16				
* QR0222044N5R02	22.2	0.875			1.75	2.95	6.10	3.16				
* QR0230046N6R02	23.0	0.906			1.81	3.19	6.34	3.16				
* QR0238048N6R02	23.8	0.938			1.88	3.31	6.46	3.16				
* QR0246049N6R02	24.6	0.969	1.25	1.77	1.94	3.43	6.57	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
* QR0250050N5R02	25.0	0.984			1.97	3.43	6.58	3.16				
* QR0254051N6R02	25.4	1.000			2.00	3.50	6.65	3.16				
* QR0262052N6R02	26.2	1.031			2.06	3.50	6.65	3.16				
QR0270054N6R02	27.0	1.063			2.13	3.58	6.73	3.16				
QR0278056N6R02	27.8	1.094			2.19	3.70	6.85	3.16				
QR0286058N6R02	28.6	1.125	1.25	1.77	2.25	3.78	6.93	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0294058N6R02	29.4	1.156			2.31	3.98	7.13	3.16				
QR0302060N6R02	30.2	1.187			2.37	3.98	7.13	3.16				
QR0310062N6R02	31.0	1.219			2.44	4.09	7.24	3.16				
QR0318063N6R02	31.8	1.250			2.50	4.17	7.32	3.16				
QR0325065N6R02	32.5	1.281			2.56	4.29	7.44	3.16				
QR0333067N6R02	33.3	1.312	1.25	1.77	2.62	4.29	7.44	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0341068N6R02	34.1	1.343			2.69	4.37	7.52	3.16				
QR0349070N6R02	34.9	1.375			2.75	4.49	7.64	3.16				
QR0357071N6R02	35.7	1.406			2.81	4.61	7.76	3.16				
QR0365073N6R02	36.5	1.437			2.87	4.72	7.87	3.16				
QR0373075N6R02	37.3	1.468			2.94	4.72	7.87	3.16				
QR0381076N6R02	38.1	1.500			3.00	4.84	7.99	3.16				
QR0389078N6R02	38.9	1.531	1.25	2.16	3.06	4.92	8.07	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0397079N6R02	39.7	1.562			3.12	5.04	8.19	3.16				
QR0405081N6R02	40.5	1.594			3.12	5.16	8.31	3.16				
QR0413083N6R02	41.3	1.625			3.25	5.16	8.31	3.16				
QR0428086N7R02	42.8	1.687			3.37	5.35	8.50	3.16				
QR0437087N7R02	43.7	1.719			3.44	5.43	8.58	3.16				
QR0445089N7R02	44.5	1.750			3.50	5.59	8.74	3.16				
QR0452090N7R02	45.2	1.781			3.56	5.59	8.74	3.16				
QR0460092N7R02	46.0	1.813	1.50	2.36	3.63	5.71	8.86	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0476095N7R02	47.6	1.875			3.75	5.91	9.06	3.16				
QR0492098N7R02	49.2	1.937			3.87	5.98	9.13	3.16				
QR0500100N7R02	50.0	1.969			3.94	6.10	9.25	3.16				
QR0508102N7R02	50.8	2.000			4.00	6.22	9.37	3.16				

* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

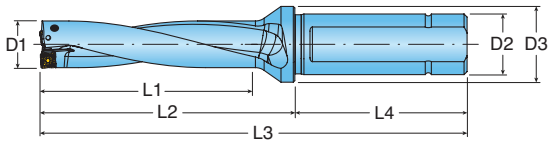
QR SERIES INDEXABLE DRILL



3xD Bodies	Dimensions (inch)											
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth	Insert	Screw	Torx	Plug
*QR0143043N5R02	14.3	0.563			1.69	2.68	5.83	3.16				
*QR0150045N5R02	15.0	0.591			1.78	2.83	5.98	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
*QR0159048N5R02	15.9	0.626			1.87	2.99	6.14	3.16				
*QR0167050N5R02	16.7	0.658			1.97	3.11	6.26	3.16				
*QR0175053N5R02	17.5	0.689			2.06	3.27	6.42	3.16				
*QR0183055N5R02	18.3	0.721	1.00	1.26	2.16	3.27	6.42	3.16	SOMT060204SK	TS 22052I/HG-P	TD 7P	PF-0012
*QR0191057N5R02	19.1	0.750			2.25	3.39	6.54	3.16				
*QR0198059N5R02	19.8	0.781			2.34	3.58	6.73	3.16				
*QR0206062N5R02	20.6	0.813			2.44	3.70	6.85	3.16				
*QR0214064N5R02	21.4	0.843			2.53	3.82	6.97	3.16	SOMT070306SK	TS 22052I/HG-P	TP 7P	PF-0012
*QR0222067N5R02	22.2	0.875			2.63	3.82	6.97	3.16				
*QR0230069N6R02	23.0	0.906			2.72	4.09	7.24	3.16				
*QR0238071N6R02	23.8	0.938			2.81	4.25	7.40	3.16				
*QR0246074N6R02	24.6	0.969			2.91	4.41	7.56	3.16				
*QR0250075N5R02	25.0	0.984	1.25	1.77	2.95	4.41	7.56	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
*QR0254076N6R02	25.4	1.000			3.00	4.53	7.68	3.16				
*QR0262079N6R02	26.2	1.031			3.09	4.53	7.68	3.16				
QR0270081N6R02	27.0	1.063			3.19	4.65	7.80	3.16				
QR0278083N6R02	27.8	1.094			3.28	4.80	7.95	3.16				
QR0286086N6R02	28.6	1.125			3.38	4.92	8.07	3.16				
QR0294088N6R02	29.4	1.156	1.25	1.77	3.47	5.16	8.30	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0302090N6R02	30.2	1.187			3.56	5.16	8.30	3.16				
QR0310093N6R02	31.0	1.219			3.66	5.31	8.46	3.16				
QR0318095N6R02	31.8	1.250			3.75	5.43	8.58	3.16				
QR0325098N6R02	32.5	1.281			3.84	5.59	8.74	3.16				
QR0333100N6R02	33.3	1.312			3.94	5.59	8.74	3.16				
QR0341102N6R02	34.1	1.343	1.25	1.77	4.03	5.71	8.86	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0349105N6R02	34.9	1.375			4.13	5.87	9.02	3.16				
QR0357107N6R02	35.7	1.406			4.22	6.02	9.17	3.16				
QR0365110N6R02	36.5	1.437			4.31	6.18	9.33	3.16				
QR0373112N6R02	37.3	1.468			4.41	6.18	9.33	3.16				
QR0381114N6R02	38.1	1.500			4.50	6.34	9.49	3.16				
QR0389117N6R02	38.9	1.531	1.25	2.16	4.59	6.46	9.61	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0397119N6R02	39.7	1.562			4.69	6.61	9.76	3.16				
QR0405122N6R02	40.5	1.594			4.69	6.77	9.92	3.16				
QR0413124N6R02	41.3	1.625			4.87	6.77	9.92	3.16				
QR0428128N7R02	42.8	1.687			5.06	7.05	10.20	3.16				
QR0437131N7R02	43.7	1.719			1.50	2.36	5.16	7.17				
QR0445134N7R02	44.5	1.750			5.25	7.36	10.51	3.16				
QR0452136N7R02	45.2	1.781			5.34	7.36	10.51	3.16				
QR0460138N7R02	46.0	1.813	1.50	2.36	5.44	7.52	10.67	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0476143N7R02	47.6	1.875			5.63	7.80	10.94	3.16				
QR0492148N7R02	49.2	1.937			5.81	7.91	11.06	3.16				
QR0500150N7R02	50.0	1.969			5.91	8.07	11.22	3.16				
QR0508152N7R02	50.8	2.000			6.00	8.23	11.38	3.16				

* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

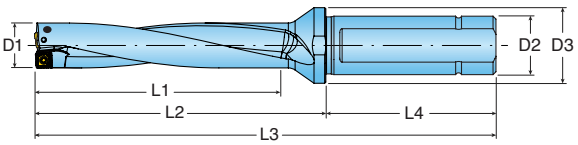
QR SERIES INDEXABLE DRILL



4xD Bodies	Dimensions (inch)											
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth	Insert	Screw	Torx	Plug
* QR0143057N5R02	14.3	0.563			2.25	3.23	6.38	3.16				
* QR0150060N5R02	15.0	0.591			2.37	3.43	6.57	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
* QR0159064N5R02	15.9	0.626			2.50	3.62	6.77	3.16				
* QR0167067N5R02	16.7	0.658			2.63	3.78	6.93	3.16				
* QR0175070N5R02	17.5	0.689			2.75	3.98	7.13	3.16				
* QR0183073N5R02	18.3	0.721	1.00	1.26	2.87	3.98	7.13	3.16	SOMT060204SK	TS 22052I/HG-P	TD 7P	PF-0012
* QR0191076N5R02	19.1	0.750			3.00	4.13	7.28	3.16				
* QR0198079N5R02	19.8	0.781			3.13	4.37	7.52	3.16				
* QR0206082N5R02	20.6	0.813			3.25	4.53	7.68	3.16				
* QR0214086N5R02	21.4	0.843			3.37	4.69	7.83	3.16	SOMT070306SK	TS 22052I/HG-P	TP 7P	PF-0012
* QR0222089N5R02	22.2	0.875			3.50	4.69	7.83	3.16				
* QR0230092N6R02	23.0	0.906			3.62	5.00	8.15	3.16				
* QR0238095N6R02	23.8	0.938			3.75	5.20	8.35	3.16				
* QR0246098N6R02	24.6	0.969	1.25	1.77	3.87	5.39	8.54	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
* QR0250100N5R02	25.0	0.984			3.94	5.39	8.54	3.16				
* QR0254102N6R02	25.4	1.000			4.00	5.55	8.70	3.16				
* QR0262105N6R02	26.2	1.031			4.13	5.55	8.70	3.16				
QR0270108N6R02	27.0	1.063			4.25	5.71	8.86	3.16				
QR0278111N6R02	27.8	1.094			4.38	5.91	9.06	3.16				
QR0286114N6R02	28.6	1.125	1.25	1.77	4.50	6.06	9.21	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0294118N6R02	29.4	1.156			4.62	6.34	9.49	3.16				
QR0302120N6R02	30.2	1.187			4.75	6.34	9.49	3.16				
QR0310124N6R02	31.0	1.219			4.87	6.54	9.69	3.16				
QR0318127N6R02	31.8	1.250			5.00	6.69	9.84	3.16				
QR0325130N6R02	32.5	1.281			5.13	6.89	10.04	3.16				
QR0333133N6R02	33.3	1.312	1.25	1.77	5.25	6.89	10.04	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0341136N6R02	34.1	1.343			5.37	7.05	10.20	3.16				
QR0349140N6R02	34.9	1.375			5.50	7.24	10.39	3.16				
QR0357143N6R02	35.7	1.406			5.62	7.44	10.59	3.16				
QR0365146N6R02	36.5	1.437			5.75	7.64	10.79	3.16				
QR0373149N6R02	37.3	1.468			5.87	7.64	10.79	3.16				
QR0381152N6R02	38.1	1.500			6.00	7.83	10.98	3.16				
QR0389156N6R02	38.9	1.531	1.25	2.16	6.13	7.99	11.14	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0397159N6R02	39.7	1.562			6.25	8.19	11.34	3.16				
QR0405162N6R02	40.5	1.594			6.25	8.39	11.54	3.16				
QR0413165N6R02	41.3	1.625			6.50	8.39	11.54	3.16				
QR0428171N7R02	42.8	1.687			6.75	8.74	11.89	3.16				
QR0437175N7R02	43.7	1.719			1.50	2.36	6.87	8.90				
QR0445178N7R02	44.5	1.750			7.00	9.13	12.28	3.16				
QR0452181N7R02	45.2	1.781			7.13	9.13	12.28	3.16				
QR0460184N7R02	46.0	1.813	1.50	2.36	7.25	9.33	12.48	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0476190N7R02	47.6	1.875			7.50	9.69	12.83	3.16				
QR0492197N7R02	49.2	1.937			7.75	9.84	12.99	3.16				
QR0500200N7R02	50.0	1.969			7.87	10.04	13.19	3.16				
QR0508203N7R02	50.8	2.000			8.00	10.24	13.39	3.16				

* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

QR SERIES INDEXABLE DRILL

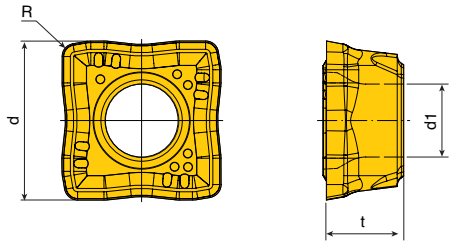


5xD Bodies	Dimensions (inch)											
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth	Insert	Screw	Torx	Plug
*QR0143072N5R02	14.3	0.563			2.81	3.78	6.94	3.16				
*QR0150075N5R02	15.0	0.591			2.96	4.02	7.17	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
*QR0159080N5R02	15.9	0.626			3.13	4.25	7.40	3.16				
*QR0167083N5R02	16.7	0.658			3.29	4.45	7.60	3.16				
*QR0175087N5R02	17.5	0.689			3.44	4.69	7.84	3.16				
*QR0183091N5R02	18.3	0.721	1.00	1.26	3.59	4.69	7.84	3.16	SOMT060204SK	TS 22052I/HG-P	TD 7P	PF-0012
*QR0191095N5R02	19.1	0.750			3.75	4.88	8.03	3.16				
*QR0198099N5R02	19.8	0.781			3.91	5.16	8.31	3.16				
*QR0206103N5R02	20.6	0.813			4.07	5.35	8.50	3.16				
*QR0214107N5R02	21.4	0.843			4.22	5.55	8.70	3.16	SOMT070306SK	TS 22052I/HG-P	TP 7P	PF-0012
*QR0222111N5R02	22.2	0.875			4.38	5.55	8.70	3.16				
*QR0230115N6R02	23.0	0.906			4.53	5.91	9.06	3.16				
*QR0238119N6R02	23.8	0.938			4.69	6.14	9.29	3.16				
*QR0246123N6R02	24.6	0.969			4.85	6.38	9.53	3.16				
*QR0250125N5R02	25.0	0.984	1.25	1.77	4.85	6.38	9.53	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
*QR0254127N6R02	25.4	1.000			5.00	6.57	9.72	3.16				
*QR0262131N6R02	26.2	1.031			5.16	6.57	9.72	3.16				
QR0270135N6R02	27.0	1.063			5.31	6.77	9.92	3.16				
QR0278139N6R02	27.8	1.094			5.47	7.01	10.15	3.16				
QR0286143N6R02	28.6	1.125			5.63	7.20	10.34	3.16				
QR0294147N6R02	29.4	1.156	1.25	1.77	5.78	7.52	10.64	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0302151N6R02	30.2	1.187			5.94	7.52	10.68	3.16				
QR0310155N6R02	31.0	1.219			6.09	7.76	10.90	3.16				
QR0318159N6R02	31.8	1.250			6.25	7.95	11.09	3.16				
QR0325163N6R02	32.5	1.281			6.41	8.19	11.32	3.16				
QR0333167N6R02	33.3	1.312			6.56	8.19	11.35	3.16				
QR0341171N6R02	34.1	1.343	1.25	1.77	6.72	8.39	11.54	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0349175N6R02	34.9	1.375			6.88	8.62	11.77	3.16				
QR0357179N6R02	35.7	1.406			7.03	8.86	12.00	3.16				
QR0365182N6R02	36.5	1.437			7.19	9.09	12.24	3.16				
QR0373186N6R02	37.3	1.468			7.34	9.09	12.24	3.16				
QR0381191N6R02	38.1	1.500			7.50	9.33	12.26	3.16				
QR0389194N6R02	38.9	1.531	1.25	2.16	7.66	9.53	12.67	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0397198N6R02	39.7	1.562			7.81	9.76	12.91	3.16				
QR0405202N6R02	40.5	1.594			7.81	10.00	13.15	3.16				
QR0413206N6R02	41.3	1.625			8.13	10.00	13.15	3.16				

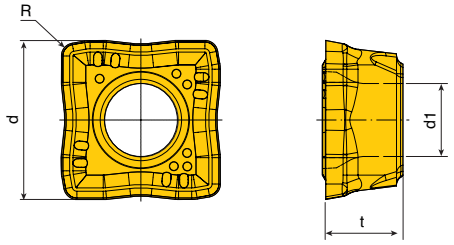
* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

SOMT SK

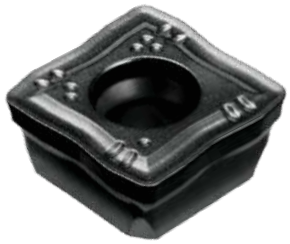
GRADE: IN2505
For General Purpose

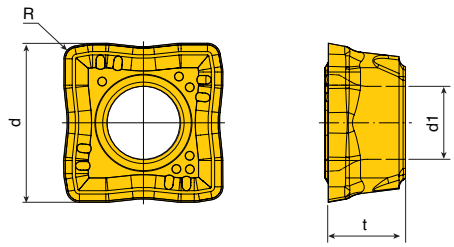


GRADE: IN6505
For Steel Applications
For Peripheral Pockets Only



GRADE: IN1030
For Cast Iron, Stainless
and Titanium Applications





Designation	Dimension (inch) d	t	R	d1	Tool Diameter Range
SOMT 050204 SK	0.193	0.094	0.016	0.089	14.00mm(.5512") - 16.49mm(.6492")
SOMT 060204 SK	0.224	0.094	0.016	0.102	16.50mm(.6496") - 19.49mm(.7673")
SOMT 070306 SK	0.268	0.110	0.024	0.102	19.50mm(.7677") - 22.49mm(.8854")
SOMT 08T306 SK	0.311	0.156	0.024	0.112	22.50mm(.8858") - 26.49mm(1.0429")
SOMT 09T308 SK	0.362	0.156	0.031	0.149	26.50mm(1.0433") - 31.49mm(1.2397")
SOMT 11T308 SK	0.433	0.156	0.031	0.149	31.50mm(1.2401") - 36.99mm(1.4563")
SOMT 130408 SK	0.504	0.173	0.031	0.173	37.00mm(1.4567") - 43.49mm(1.7122")
SOMT 150510 SK	0.590	0.189	0.039	0.212	43.50mm(1.7126") - 50.00mm(1.9685")

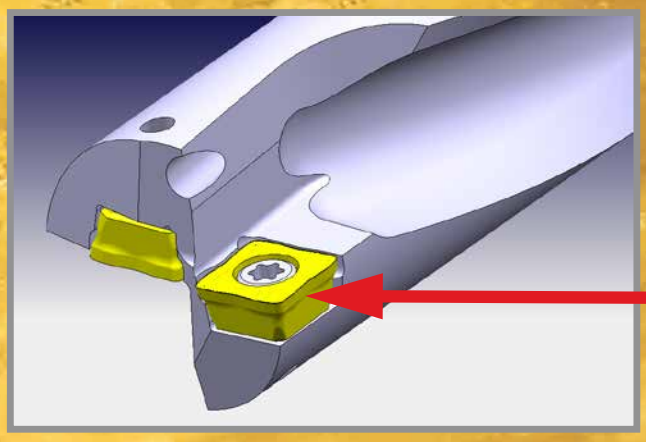
All QuadTwist inserts available in Grades IN1030, IN2505 and IN6505.

RADIAL ADJUSTMENT

Drill Diameter	Insert	Max. Radial (X)	Max. Dia
0.563" (14.3mm)	SOMT 050204 SK	0.015	0.593
0.594" (15.0mm)		0.013	0.620
0.626" (15.9mm)		0.011	0.648
0.657" (16.7mm)	SOMT 060204 SK	0.018	0.693
0.688" (17.5mm)		0.013	0.714
0.719" (18.3mm)		0.011	0.741
0.750" (19.1mm)		0.010	0.770
0.781" (19.8mm)	SOMT 070306 SK	0.020	0.821
0.813" (20.6mm)		0.015	0.843
0.843" (21.4mm)		0.011	0.865
0.875" (22.2mm)		0.008	0.891
0.906" (23.0mm)	SOMT 08T306 SK	0.025	0.956
0.938" (23.8mm)		0.022	0.982
0.969" (24.6mm)		0.018	1.005
0.984" (25.0mm)		0.015	1.014
1.000" (25.4mm)		0.015	1.030
1.031" (26.2mm)		0.011	1.053
1.063" (27.0mm)	SOMT 09T308 SK	0.028	1.119
1.094" (27.8mm)		0.024	1.142
1.125" (28.6mm)		0.015	1.155
1.156" (29.4mm)		0.015	1.186
1.187" (30.2mm)		0.011	1.209
1.219" (31.0mm)		0.008	1.235
1.250" (31.8mm)	SOMT 11T308 DP	0.035	1.320
1.281" (32.5mm)		0.031	1.343
1.312" (33.3mm)		0.031	1.374
1.343" (34.1mm)		0.028	1.399
1.375" (34.9mm)		0.024	1.423
1.406" (35.7mm)		0.015	1.436

Drill Diameter	Insert	Max. Radial (X)	Max. Dia
1.437" (36.5mm)	SOMT 130408 DP	0.047	1.531
1.468" (37.3mm)		0.047	1.562
1.500" (38.1mm)		0.039	1.578
1.531" (38.9mm)		0.035	1.601
1.562" (39.7mm)		0.028	1.618
1.594" (40.5mm)		0.024	1.642
1.625" (41.3mm)		0.024	1.673
1.687" (42.8mm)		0.012	1.711
1.719" (43.7mm)	SOMT 150510 DP	0.047	1.813
1.750" (44.5mm)		0.043	1.836
1.781" (45.2mm)		0.043	1.867
1.813" (46.0mm)		0.039	1.891
1.875" (47.6mm)		0.028	1.931
1.937" (49.2mm)		0.024	1.985
1.969" (50.0mm)		0.020	2.009
2.000" (50.8mm)		0.015	2.030

4 CORNERED INSERT DESIGN



2XD, 3XD AND 4XD RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed v.s. Drill Diameter In/Rev Drill Length 2, 3, 4xD							
							SOMT 05 Ø.551-.645 (inch)	SOMT 06 Ø.649-.763 (inch)	SOMT 07 Ø.767-.882 (inch)	SOMT 08 Ø.886-1.039 (inch)	SOMT 09 Ø 1.063-1.220 (inch)	SOMT 11 Ø 1.250-1.460 (inch)	SOMT 13 Ø 1.437-1.687 (inch)	SOMT 15 Ø 1.719-2.000 (inch)
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting steel <0.55% C > = 0.55% C	Annealed	420	125	1	700 -1200	.002-.003	.002-.003	.002-.004	.002-.004	.003-.004	.003-.005	.003-.005	.003-.005
		Annealed	650	190	2	600 - 950	.003-.004	.003-.004	.003-.005	.003-.005	.003-.006	.003-.006	.003-.0065	.003-.0065
		Quenched & Tempered	850	250	3	450 - 800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.006	.004-.006	.004-.007	.004-.007
		Annealed	750	220	4	450 - 800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.007	.004-.007	.004-.007	.004-.007
		Quenched & Tempered	1000	300	5	450 - 800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.007	.004-.007	.004-.007	.004-.007
	Low alloy steel & cast steek (less than 5% alloying elements)	Annealed	600	200	6	450 - 800	.003-.006	.003-.006	.003-.007	.003-.007	.004-.007	.004-.009	.004-.009	.004-.0095
		Quenched & Tempered	930	275	7	325 - 600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
			1000	300	8	325 - 600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
			1200	350	9	325 - 600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	450 - 675	.002-.005	.0025-.005	.0025-.005	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
		Quenched & Tempered	1100	325	11	325 - 525	.0025-.005	.0025-.005	.003-.006	.003-.006	.0035-.007	.0035-.008	.004-.008	.004-.008
M	Stainless steel & cast stainless steel	Ferritic/ martensitic	680	200	12	500 - 800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
		Martensitic	820	240	13	500 - 800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
		Austenitic	600	180	14	500 - 800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
K	GreyCast Iron (GG)	Ferritic		160	15	525 - 850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
		Pearlitic		250	16	525 - 850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
	Cast Iron Nodular (GGG)	Ferritic		180	17	525 - 850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
		Pearlitic		260	18	525 - 850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
	Malleable Cast Iron	Ferritic		130	19	400 - 725	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.007	.004-.007	.004-.007
		Pearlitic		230	20	400 - 725	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.007	.004-.007	.004-.007
N	Aluminum - wrought alloy	Not cureable		60	21	650 - 1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		Cured		100	22	650 - 1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
	Aluminum - <=12% Si cast, alloyed >12% Si	Not cureable		75	23	650 - 1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		Cured		90	24	650 - 1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		High temperature		130	25	650 - 1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
	> 1% Pb Copper alloys	Free cutting		110	26	490 - 825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Brass		90	27	490 - 825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Electrolitic copper		100	28	490 - 825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
	Non-metallic	Duro & fiber plastics			29	490 - 825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Hard rubber			30	490 - 825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
S	Fe based High temp alloys Ni or Co based	Annealed		200	31	100 - 200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cured		280	32	100 - 200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Annealed		250	33	100 - 200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cured		350	34	100 - 200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cast		320	35	100 - 200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
	Titanium, Ti alloys		Rm 400		36	165 - 265	.0025-.0035	.0025-.0035	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004
		Alpha+beta alloys cured	Rm 1050		37	165 - 265	.0025-.0035	.0025-.0035	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004
H	Hardened steel	Hardened		55 HRC	38	100 - 200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
		Hardened		60 HRC	39	100 - 200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
	Chilled cast iron	Cast		400	40	100 - 200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
	Cast iron nodular	Hardened		55 HRC	41	100 - 200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045

5XD RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed v.s. Drill Diameter In/Rev Drill Length 5xD							
							SOMT 05 Ø.551-.645 (inch)	SOMT 06 Ø.649-.763 (inch)	SOMT 07 Ø.767-.882 (inch)	SOMT 08 Ø.886-1.039 (inch)	SOMT 09 Ø 1.063-1.220 (inch)	SOMT 11 Ø 1.250-1.460 (inch)	SOMT 13 Ø 1.437-1.687 (inch)	SOMT 15 Ø 1.719-2.000 (inch)
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting <0.55% C steel > = 0.55% C	Annealed	420	125	1	700 -1200	.0015-.002	.0015-.002	.0015-.002	.0015-.002	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
		Annealed	650	190	2	600 - 950	.002-.003	.002-.003	.002-.004	.002-.004	.003-.005	.003-.005	.003-.0055	.003-.0055
		Quenched & Tempered	850	250	3	450 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.007	.003-.006	.004-.007	.004-.007
		Annealed	750	220	4	450 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.007	.003-.006	.004-.007	.004-.007
		Quenched & Tempered	1000	300	5	450 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.007	.003-.006	.004-.007	.004-.007
	Low alloy steel & cast steek (less than 5% alloying elements)	Annealed	600	200	6	450 - 800	.002-.005	.002-.005	.003-.006	.003-.006	.003-.007	.003-.008	.003-.008	.004-.0085
		Quenched & Tempered	930	275	7	325 - 600	.002-.005	.002-.005	.003-.006	.003-.006	.003-.007	.003-.008	.003-.008	.004-.0085
			1000	300	8	325 - 600	.002-.005	.002-.005	.003-.006	.003-.006	.003-.007	.003-.008	.003-.008	.004-.0085
			1200	350	9	325 - 600	.002-.005	.002-.005	.003-.006	.003-.006	.003-.007	.003-.008	.003-.008	.004-.0085
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	450 - 675	.002-.004	.002-.004	.003-.005	.003-.005	.003-.006	.003-.007	.003-.007	.004-.008
		Quenched & Tempered	1100	325	11	325 - 525	.002-.004	.002-.004	.003-.005	.003-.005	.003-.006	.003-.007	.004-.007	.004-.008
M	Stainless steel & cast stainless steel	Ferritic/ martensitic	680	200	12	500 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.006	.003-.007	.004-.007	.004-.008
		Martensitic	820	240	13	500 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.006	.003-.007	.004-.007	.004-.008
		Austenitic	600	180	14	500 - 800	.002-.004	.002-.004	.003-.005	.003-.005	.003-.006	.003-.007	.004-.007	.004-.008
K	GreyCast Iron (GG)	Ferritic		160	15	525 - 850	.003-.0055	.003-.0055	.003-.006	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
		Pearlitic		250	16	525 - 850	.003-.0055	.003-.0055	.003-.006	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
	Cast Iron Nodular (GGG)	Ferritic		180	17	525 - 850	.003-.0055	.003-.0055	.003-.006	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
		Pearlitic		260	18	525 - 850	.003-.0055	.003-.0055	.003-.006	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
	Malleable Cast Iron	Ferritic		130	19	400 - 725	.0025-.0045	.0025-.0045	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.0065
		Pearlitic		230	20	400 - 725	.0025-.0045	.0025-.0045	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.0065
N	Aluminum - wrought alloy	Not cureable		60	21	650 - 1150	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.003-.006	.0035-.007	.0035-.007
		Cured		100	22	650 - 1150	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.003-.006	.0035-.007	.0035-.007
	Aluminum - <=12% Si cast, alloyed >12% Si	Not cureable		75	23	650 - 1150	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.003-.006	.0035-.007	.0035-.007
		Cured		90	24	650 - 1150	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.003-.006	.0035-.007	.0035-.007
		High temperature		130	25	650 - 1150	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.003-.006	.0035-.007	.0035-.007
	> 1% Pb Copper alloys	Free cutting		110	26	490 - 825	.002-.0055	.002-.0055	.003-.006	.003-.006	.003-.0065	.003-.0065	.0035-.0075	.0035-.0075
		Brass		90	27	490 - 825	.002-.0055	.002-.0055	.003-.006	.003-.006	.003-.0065	.003-.0065	.0035-.0075	.0035-.0075
		Electrolitic copper		100	28	490 - 825	.002-.0055	.002-.0055	.003-.006	.003-.006	.003-.0065	.003-.0065	.0035-.0075	.0035-.0075
	Non-metallic	Duro & fiber plastics			29	490 - 825	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.0035-.006	.0035-.0075	.0035-.0075
		Hard rubber			30	490 - 825	.002-.0055	.002-.0055	.0025-.006	.0025-.006	.003-.006	.0035-.006	.0035-.0075	.0035-.0075
S	Fe based High temp alloys Ni or Co based	Annealed		200	31	100 - 200	.0015-.0025	.0015-.0025	.0015-.0025	.0015-.0025	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
		Cured		280	32	100 - 200	.0015-.0025	.0015-.0025	.0015-.0025	.0015-.0025	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
		Annealed		250	33	100 - 200	.0015-.0025	.0015-.0025	.0015-.0025	.0015-.0025	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
		Cured		350	34	100 - 200	.0015-.0025	.0015-.0025	.0015-.0025	.0015-.0025	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
		Cast		320	35	100 - 200	.0015-.0025	.0015-.0025	.0015-.0025	.0015-.0025	.0025-.0035	.0025-.0035	.0025-.004	.0025-.004
	Titanium, Ti alloys		Rm 400		36	165 - 265	.002-.003	.002-.003	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035
		Alpha+beta alloys cured	Rm 1050		37	165 - 265	.002-.003	.002-.003	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035	.0025-.0035
H	Hardened steel	Hardened		55 HRC	38	100 - 200	.0015-.003	.0015-.003	.0015-.0035	.0015-.0035	.0015-.004	.0015-.004	.0015-.004	.0015-.004
		Hardened		60 HRC	39	100 - 200	.0015-.003	.0015-.003	.0015-.0035	.0015-.0035	.0015-.004	.0015-.004	.0015-.004	.0015-.004
	Chilled cast iron	Cast		400	40	100 - 200	.0015-.003	.0015-.003	.0015-.0035	.0015-.0035	.0015-.004	.0015-.004	.0015-.004	.0015-.004
	Cast iron nodular	Hardened		55 HRC	41	100 - 200	.0015-.003	.0015-.003	.0015-.0035	.0015-.0035	.0015-.004	.0015-.004	.0015-.004	.0015-.004

CHAMFERING RINGS

FOR

GOLD•TWIST DRILL LINE

QUAD•TWIST DRILL

QUAD•DRILL+

- Available for 3xD, 5xD & 8xD GOLD•TWIST and 3xD & 4xD QUAD•TWIST & QUAD•DRILL+
- Adjustable step length
- Reduces cycle time by combining two operations into one

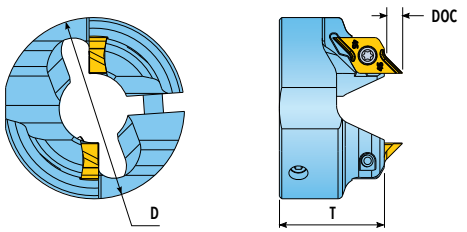
Ingersoll, the supplier of cost competitive, high productivity indexable drill lines, now introduces chamfering rings to promote machining convenience for end-users in hole making applications.

Ingersoll chamfering rings can be used to drill and chamfer in a single operation to minimize cycle time as well as reduce inventory of special combination tools.

All chamfering rings are compatible with GOLD•TWIST, QUAD•TWIST and QUAD•DRILL+ bodies to control drilling depth. The specially treated, multi-layered PVD coated CRNG inserts enable stable machining and long tool life.

CHAMFERING RINGS

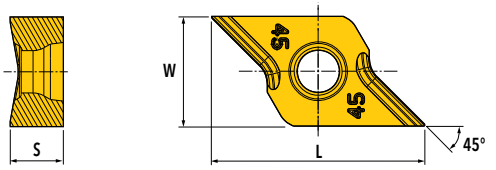
45° CHAMFERING RING – 2 EFFECTIVE INSERTS



Description	D (inch)	T (inch)	Fits Gold Twist Series	Fits Quad Twist Series	Fits Quad Drill+ Series	Maximum Chamfer Size
			Dia. Range (mm)	Dia. Range (mm)	Dia. Range (mm)	
CB140R02	1.50	.866	13.5 – 14.4	13.5 – 14.4	13.5 – 14.4	.118 x 45°
CB150R02	1.50	.866	14.5 – 15.9	14.5 – 15.4	14.5 – 15.4	.118 x 45°
CB160R02	1.65	.906	16.0 – 16.9	15.5 – 16.4	15.5 – 16.4	.118 x 45°
CB170R02	1.65	.906	17.0 – 17.9	16.5 – 17.4	16.5 – 17.4	.118 x 45°
CB180R02	1.65	.906	18.0 – 18.9	17.5 – 18.4	17.5 – 18.4	.118 x 45°
CB190R02	1.65	.945	19.0 – 19.9	18.5 – 19.4	18.5 – 19.4	.118 x 45°
CB200R02	1.65	.945	20.0 – 20.9	19.5 – 20.4	19.5 – 20.4	.118 x 45°

NOTE: For use with GOLD•TWIST 3, 5 & 8xD and QUAD•TWIST & QUAD•DRILL+ 3 & 4xD.

INSERTS



Desigation	L	W	S	Grade
CRNG-0802-45CD	.583	.295	.144	IN2505

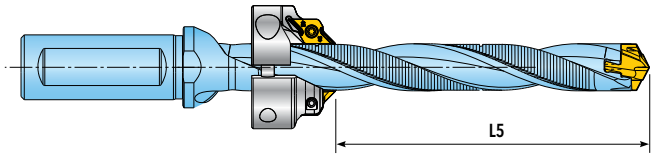
HARDWARE

Description	Insert Screw	Torx	Clamping Screw	Wrench
CB140R02	SO 25065I	DS-T07S	SHM4x0.7x12[1]	L-W3
CB150R02	SO 25065I	DS-T07S	SHM4x0.7x12[1]	L-W3
CB160R02	SO 25065I	DS-T07S	SHM5x0.8x16[2]	L-W4
CB170R02	SO 25065I	DS-T07S	SHM5x0.8x16[2]	L-W4
CB180R02	SO 25065I	DS-T07S	SHM5x0.8x16[2]	L-W4
CB190R02	SO 25065I	DS-T07S	SHM5x0.8x16[2]	L-W4
CB200R02	SO 25065I	DS-T07S	SHM5x0.8x16[2]	L-W4

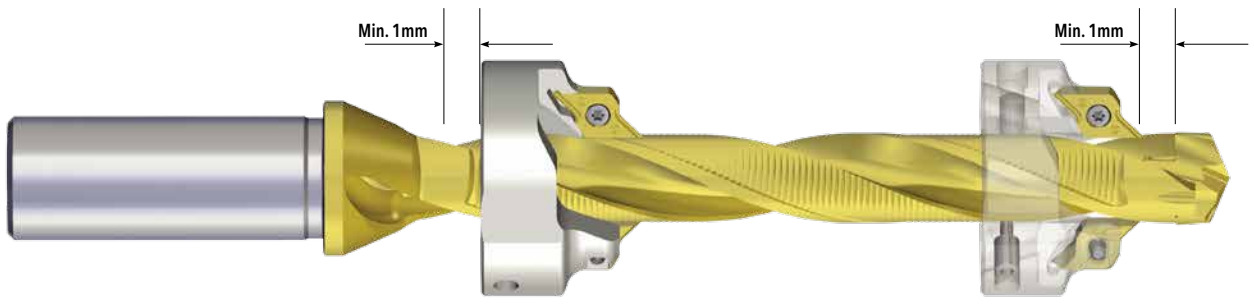
[1] Clamping torque: 4 [N•m] 36 [lbf-in]
[2] Clamping torque: 7-8 [N•m] 84-96 [lbf-in]

CHAMFERING RINGS

FOR GOLD TWIST DRILL LINE

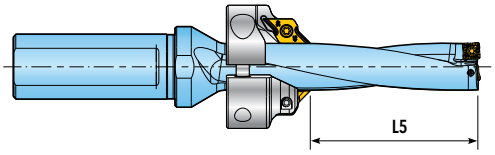


L:D	Body Designation		Ring Designation	L5 (min) inch	L5 (max) inch
	Cylindrical Shank	Shank with Flat			
3	TD1400042S6R01	TD1400042C0R01	CB140R02	0.630	0.866
	TD1450043S6R01	TD1450043C0R01	CB140R02	0.630	0.866
	TD1500045S7R01	TD150004518R01	CB150R02	0.670	0.984
	TD1600048S7R01	TD160004818R01	CB160R02	0.709	1.102
	TD1700051S7R01	TD170005118R01	CB170R02	0.748	1.22
	TD1800054S1R01	TD1800054C8R01	CB180R02	0.787	1.339
	TD1900057S1R01	TD1900057C8R01	CB190R02	0.827	1.457
	TD2000060S1R01	TD2000060C8R01	CB200R02	0.866	1.575
5	TD1400070S6R01	TD1400070C0R01	CB140R02	0.787	1.969
	TD1450072S6R01	TD1450072C0R01	CB140R02	0.787	1.969
	TD1500075S7R01	TD150007518R01	CB150R02	0.906	2.165
	TD1600080S7R01	TD160008018R01	CB160R02	1.024	2.362
	TD1700085S7R01	TD170008518R01	CB170R02	1.142	2.559
	TD1800090S1R01	TD1800090C8R01	CB180R02	1.260	2.756
	TD1900095S1R01	TD1900095C8R01	CB190R02	1.378	2.953
	TD2000100S1R01	TD2000100C8R01	CB200R02	1.496	3.15
8	TD1400112S6R01	TD1400112C0R01	CB140R02	1.890	3.622
	TD1450116S6R01	TD1450116C0R01	CB140R02	1.890	3.622
	TD1500120S7R01	TD150012018R01	CB150R02	2.087	3.937
	TD1600128S7R01	TD160012818R01	CB160R02	2.283	4.252
	TD1700136S7R01	TD170013618R01	CB170R02	2.480	4.567
	TD1800144S1R01	TD1800144C8R01	CB180R02	2.677	4.882
	TD1900152S1R01	TD1900152C8R01	CB190R02	2.874	5.197
	TD2000160S1R01	TD2000160C8R01	CB200R02	3.071	5.512

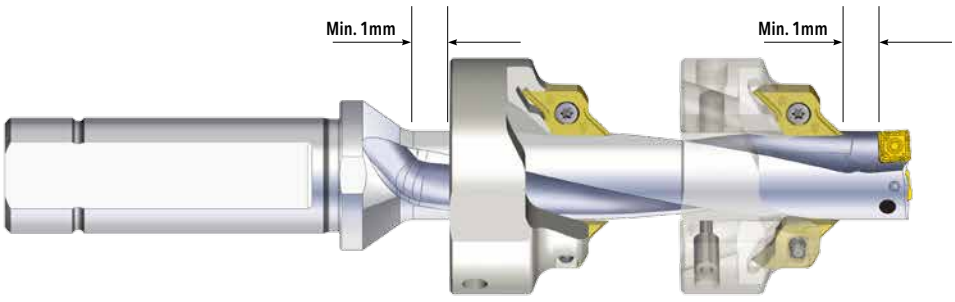


CHAMFERING RINGS

FOR QUAD•TWIST™ QUAD•DRILL+™



L:D	Body Designation		Ring Designation	L5 (min) inch	L5 (max) inch
	QUAD•TWIST	QUAD•DRILL+			
3	QR0143043N5R01/R02	Q0143043N5R01/R02	CB140R02	0.551	0.709
	QR0150045N5R01/R02	Q0150045N5R01/R02	CB150R02	0.591	0.827
	QR0159048N5R01/R02	Q0159048N5R01/R02	CB160R02	0.630	0.945
	QR0167050N5R01/R02	Q0167050N5R01/R02	CB170R02	0.670	1.062
	QR0175053N5R01/R02	Q0175053N5R01/R02	CB180R02	0.709	1.181
	QR0183055N5R01/R02	Q0183055N5R01/R02	CB180R02	0.709	1.181
	QR0191057N5R01/R02	Q0191057N5R01/R02	CB190R02	0.748	1.299
	QR0198059N5R01/R02	Q0198059N5R01/R02	CB200R02	0.787	1.417
4	QR0143057N5R01/R02	Q0143057N5R01/R02	CB140R02	0.630	1.260
	QR0150060N5R01/R02	Q0150060N5R01/R02	CB150R02	0.748	1.417
	QR0159064N5R01/R02	Q0159064N5R01/R02	CB160R02	0.866	1.575
	QR0167067N5R01/R02	Q0167067N5R01/R02	CB170R02	0.984	1.732
	QR0175070N5R01/R02	Q0175070N5R01/R02	CB180R02	1.102	1.890
	QR0183073N5R01/R02	Q0183073N5R01/R02	CB180R02	1.102	1.890
	QR0191076N5R01/R02	Q0191076N5R01/R02	CB190R02	1.220	2.047
	QR0198079N5R01/R02	Q0198079N5R01/R02	CB200R02	1.339	2.204

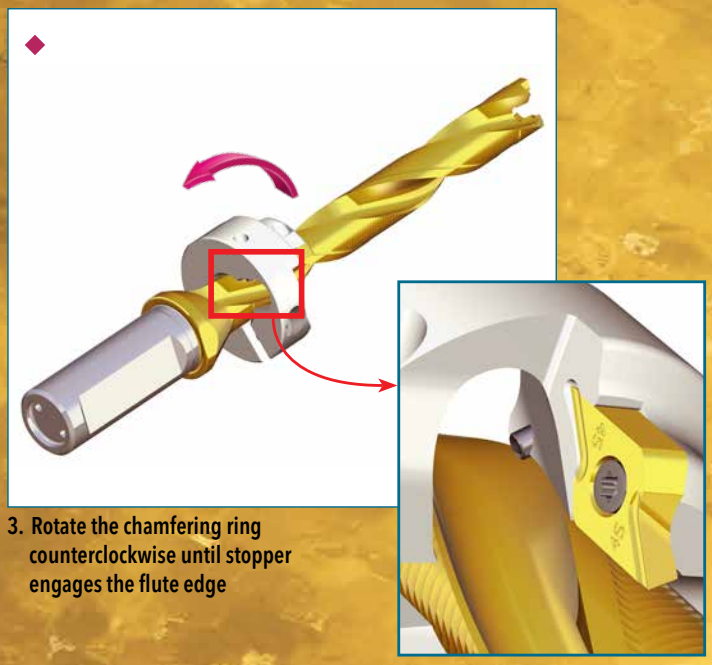


CHAMFERING RINGS

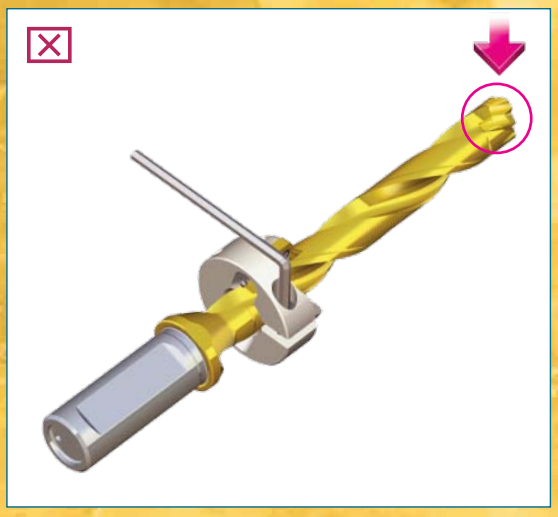
ASSEMBLY OF CHAMFERING RING

1. Insert the chamfering ring on to the drill body. The stopper must be inside the flute.

2. Slide the chamfering ring to the desired position.

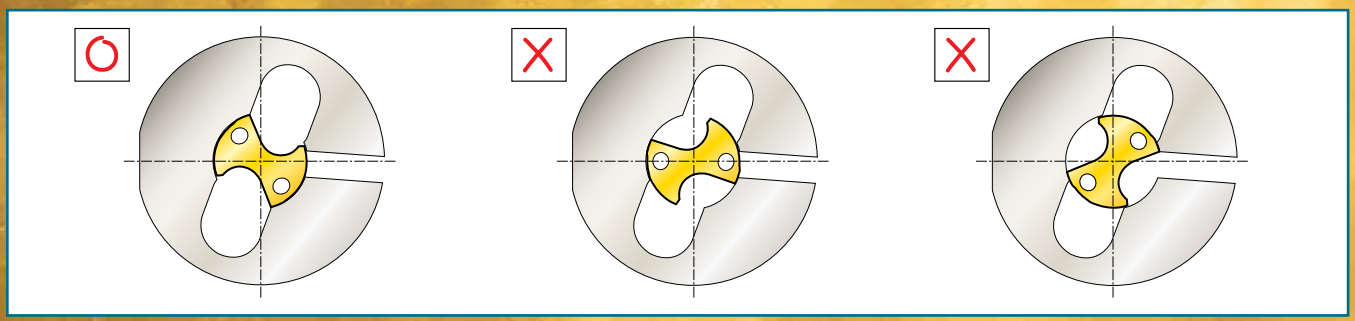


3. Rotate the chamfering ring counterclockwise until stopper engages the flute edge



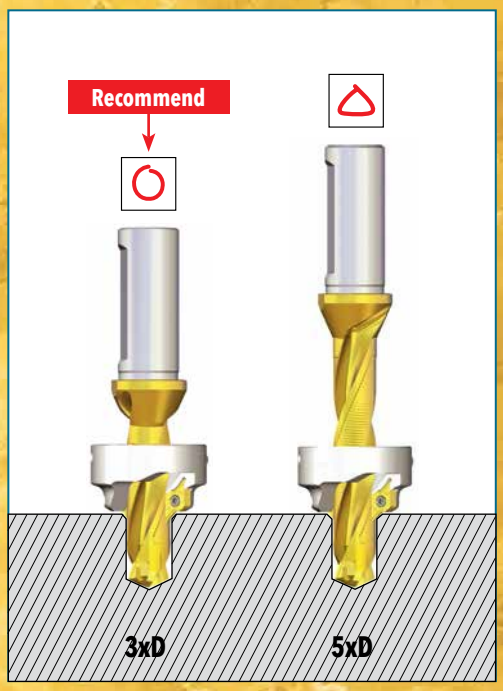
4. Tighten the chamfering ring and clamp the drill head.

When the chamfering ring is clamped correctly, the drill flute will be aligned with the chamfering ring flute.



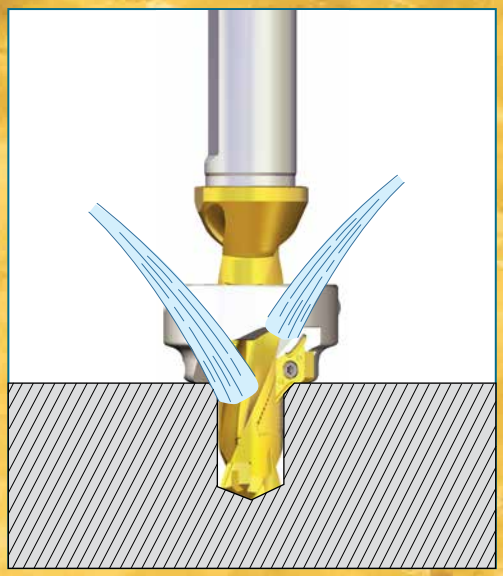
CHAMFERING RINGS

RECOMMENDATIONS FOR STABLE MACHINING



1. If possible, always use a short holder.
   If not, reduce the cutting speed to minimize vibration.

2. Mount the chamfering ring as close as possible to the drilling shank.



3. For better insert life, apply external coolant to the insert and internal coolant to the drill tip.

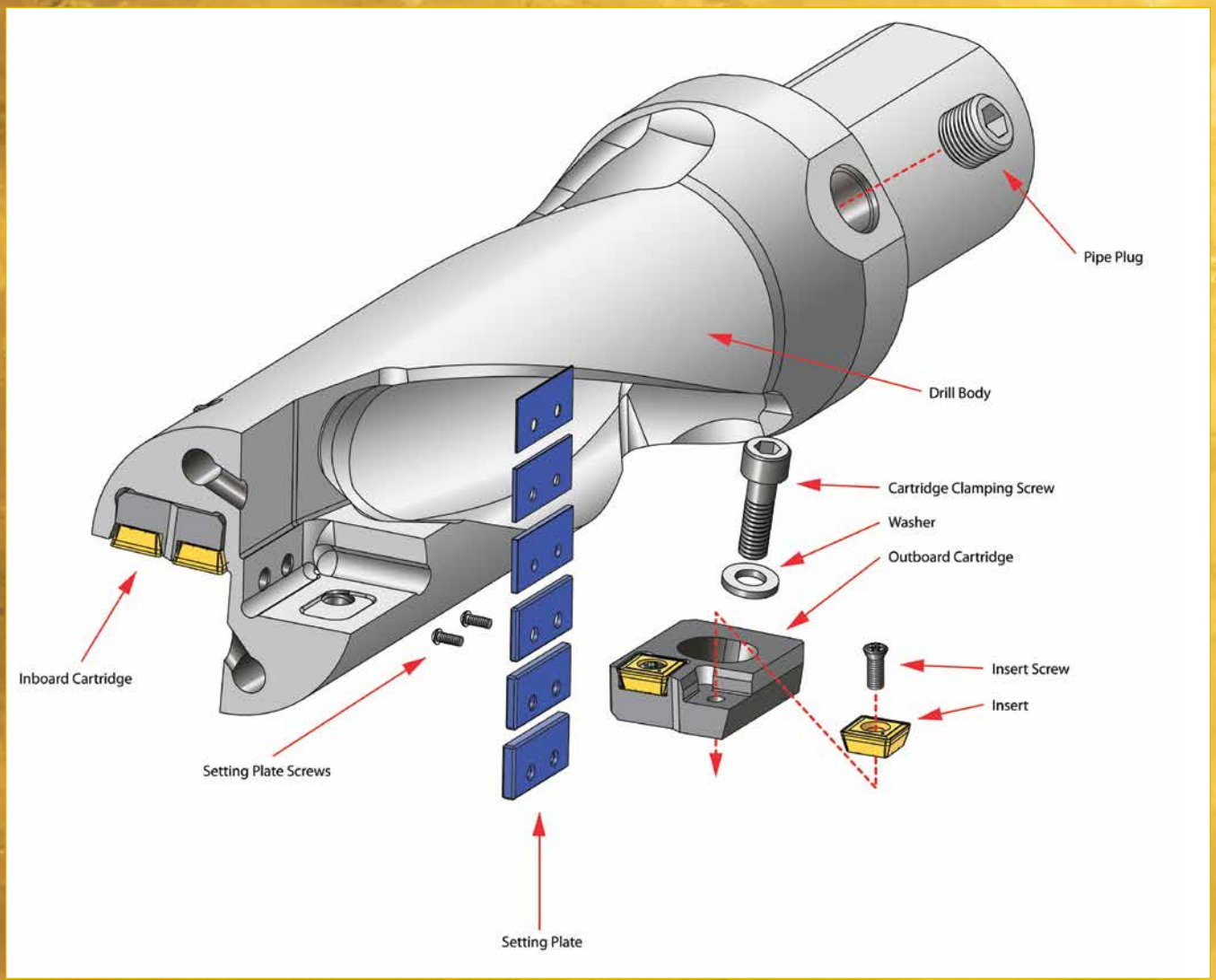
QUADDRILL+™

QA ADJUSTABLE DRILLS

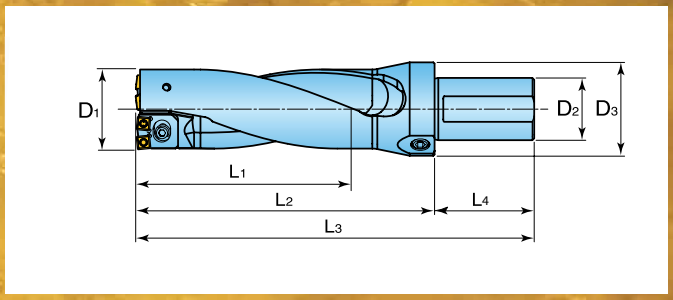
NEW GENERATION OF INDEXABLE DRILL

- Adjustability enables multiple diameters with the same body.
- Five drill bodies cover (17) standard sizes.
- Minimum Drill inventory for Cost savings.
- Two coolant access ports, side port specifically for non-rotational lathe drilling applications.
- Cartridge design protects the drill body - a significant feature on larger size expensive drill bodies.
- 4 inserts per body: 2 cartridges per body, 2 inserts per cartridges.

• QUADDRILL+ SERIES QA DRILL ASSEMBLY



2XD ADJUSTABLE CARTRIDGE DRILL SERIES QA



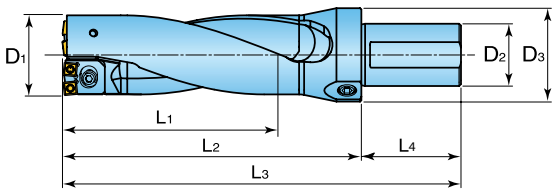
Drill Number	Dimensions (inch) D1	L1	L2	L3	L4	D2	D3	# of inserts	Setting Plates Part Number	Setting Plates Plate Thickness	Cartridge Outboard	Cartridge Inboard
QA0540111N8R01	2.125	4.41	5.98	9.23	3.25	2.000 Universal	2.365	4	-	-	55E223R01	55E213R01
	2.188								DS07-080-01	.031		
QA0572121N8R01	2.250	4.82	6.69	9.94	3.25	2.000 Universal	2.365	4	-	-	55F243R02	55F233R01
	2.313								DS09-080-01	.031		
	2.375								DS09-159-01	.063		
QA0619130N8R01	2.438	5.13	7.17	10.42	3.25	2.000 Universal	2.365	4	-	-	55F263R01	55F243R03
	2.500								DS09-080-01	.031		
	2.563								DS09-159-01	.063		
QA0667143N8R01	2.625	5.67	7.99	11.24	3.25	2.000 Universal	2.365	4	-	-	55G294R01	55G264R01
	2.688								DS11-080-01	.031		
	2.750								DS11-159-01	.063		
	2.813								DS11-238-01	.094		
QA0730159N8R01	2.875	6.25	8.27	11.52	3.25	2.000 Universal	2.365	4	-	-	55H314R00	55H294R00
	2.938								DS11-080-01	.031		
	3.000								DS11-159-01	.063		
	3.063								DS11-238-01	.094		
	3.125								DS11-320-01	.125		

*Each drill includes all hardware. Order inserts separately.

HARDWARE

Drill Diameter Size Range	Outboard Cartridge	Inboard Cartridge	Cartridge Mounting Screw	Cartridge Mounting Screw Washer	Allen Wrench	Insert Screw	Insert Screw Wrench	Setting Plate Screws	Setting Plate Screw Wrench
2.125-2.188	55E223R01	55E213R01	SD040-16 (M4 X 0.7 X 16MM SHCS)	WA004-01 (4.3MM X 8MM)	L-W3 (3MM)	SM25-064-00	DS-T08W (Tx-08)	SM20-043-00	DS-TP06S (TxP-06)
2.250-2.375	55F243R02	55F233R01	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.437-2.563	55F263R01	55F243R03	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.625-2.813	55G294R01	55G264R01	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)
2.875-3.125	55H314R00	55H294R00	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)

3XD ADJUSTABLE CARTRIDGE DRILL SERIES QA



Drill Number	Dimensions (inch) D1	L1	L2	L3	L4	D2	D3	# of inserts	Setting Plates Part Number	Setting Plates Plate Thickness	Cartridge Outboard	Cartridge Inboard
QA0540167N8R01	2.125 2.188	6.61	8.19	11.44	3.25	2.000 Universal	2.365	4	- DS07-080-01	- .031	55E223R01	55E213R01
QA0572181N8R01	2.250 2.313 2.375	7.23	9.13	12.38	3.25	2.000 Universal	2.365	4	- DS09-080-01 DS09-159-01	- .031 .063	55F243R02	55F233R01
QA0619195N8R01	2.438 2.500 2.563	7.69	9.76	13.01	3.25	2.000 Universal	2.365	4	- DS09-080-01 DS09-159-01	- .031 .063	55F263R01	55F243R03
QA0667214N8R01	2.625 2.688 2.750 2.813	8.50	10.87	14.12	3.25	2.000 Universal	2.365	4	- DS11-080-01 DS11-159-01 DS11-238-01	- .031 .063 .094	55G294R01	55G264R01
QA0730238N8R01	2.875 2.938 3.000 3.063 3.125	9.38	11.42	14.67	3.25	2.000 Universal	2.365	4	- DS11-080-01 DS11-159-01 DS11-238-01 DS11-320-01	- .031 .063 .094 .125	55H314R00	55H294R00

*Each drill includes all hardware. Order inserts separately.

HARDWARE

Drill Diameter Size Range	Outboard Cartridge	Inboard Cartridge	Cartridge Mounting Screw	Cartridge Mounting Screw Washer	Allen Wrench	Insert Screw	Insert Screw Wrench	Setting Plate Screws	Setting Plate Screw Wrench
2.125-2.188	55E223R01	55E213R01	SD040-16 (M4 X 0.7 X 16MM SHCS)	WA004-01 (4.3MM X 8MM)	L-W3 (3MM)	SM25-064-00	DS-T08W (Tx-08)	SM20-043-00	DS-TP06S (TxP-06)
2.250-2.375	55F243R02	55F233R01	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.437-2.563	55F263R01	55F243R03	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.625-2.813	55G294R01	55G264R01	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)
2.875-3.125	55H314R00	55H294R00	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)

INSERTS

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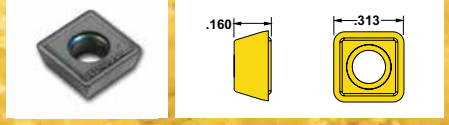

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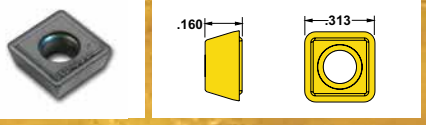

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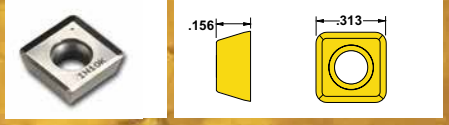

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SHLT090408N

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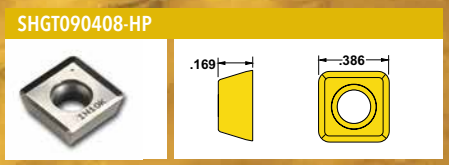

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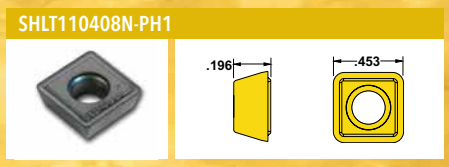

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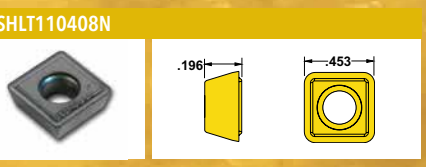

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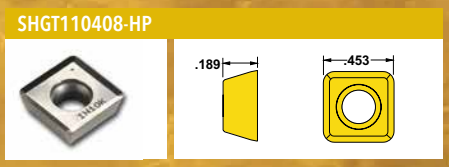

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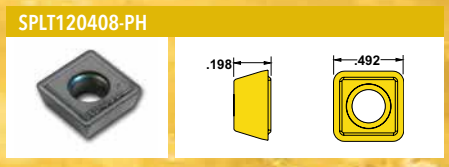


Drill Diameter Range	Insert Number (n)	Cast Iron Inserts Grade IN2010 only (s)	Aluminum Inserts Grade IN10K only (l)	Corner	Grades 1030	2005	2010	6520	10K
2.125-2.188	SPLT07T308N-PH	SPLT07T308N	SDGT07T308-HP	.030R	•	•	•	•	•
2.250-2.563	SHLT090408N-PH1	SHLT090408N	SHGT090408-HP	.030R	•	•	•	•	•
2.625-2.813	SHLT110408N-PH1	SHLT110408N	SHGT110408-HP	.030R	•	•	•	•	•
2.875-3.125	SPLT120408N-PH	-	-	.030R		•			

Grade	Application
IN2005	General Purpose
IN1030	For use in unstable conditions, low SFM
IN6520	Peripheral pocket only, more wear resistance
IN2010	Cast iron applications
IN10K	Aluminum, non-ferrous materials

CARTRIDGE-STYLE (DIA. OVER 2.125") RECOMMENDED CUTTING CONDITIONS

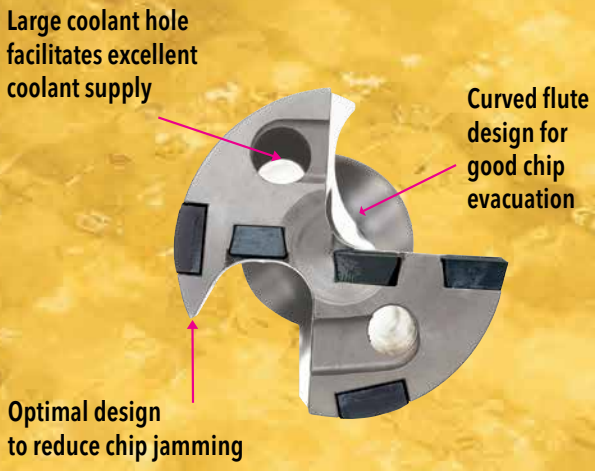
ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed vs. Drill Diameter Inch/Rev Drill Length 2xD, 3xD			
							Ø 2.125 (inch)	Ø 2.250-2.750 (inch)	Ø 2.875-3.000 (inch)	Ø 3.250 (inch)
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting <0.55% C steel > = 0.55% C	Annealed	420	125	1	800 -1000	.002-.003	.002-.003	.002-.004	.002-.004
		Annealed	650	190	2	800 -1000	.003-.004	.003-.004	.003-.005	.003-.005
		Quenched & Tempered	850	250	3	500 - 800	.003-.005	.003-.005	.003-.006	.003-.006
		Annealed	750	220	4	800 -1000	.003-.005	.003-.005	.003-.006	.003-.006
		Quenched & Tempered	1000	300	5	600 - 800	.003-.005	.003-.005	.003-.006	.003-.006
	Low alloy steel & cast steek (less than 5% alloying elements)	Annealed	600	200	6	500 - 800	.003-.006	.003-.006	.003-.007	.003-.007
		Quenched & Tempered	930	275	7	400 - 700	.003-.006	.003-.006	.003-.008	.003-.008
			1000	300	8	400 - 600	.003-.006	.003-.006	.003-.008	.003-.008
			1200	350	9	300 - 550	.003-.006	.003-.006	.003-.008	.003-.008
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	400 - 600	.002-.005	.0025-.005	.0025-.005	.003-.006
		Quenched & Tempered	1100	325	11	400 - 550	.0025-.005	.0025-.005	.003-.006	.003-.006
M	Stainless steel & cast stainless steel	Ferritic/Martensitic	680	200	12	550 - 800	.0035-.007	.004-.008	.005-.085	.003-.006
		Martensitic	820	240	13	500 - 700	.0035-.007	.004-.008	.005-.085	.003-.006
		Austenitic	600	180	14	500 - 700	.0035-.007	.004-.008	.005-.085	.003-.006
K	GreyCast Iron (GG)	Ferritic		160	15	500 - 800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		250	16	500 - 800	.006-.0095	.007-.012	.007-.013	.0085-.014
	Cast Iron Nodular (GGG)	Ferritic		180	17	600 - 800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		260	18	600 - 800	.006-.0095	.007-.012	.007-.013	.0085-.014
	Malleable Cast Iron	Ferritic		130	19	600 - 800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		230	20	500 - 700	.006-.0095	.007-.012	.007-.013	.0085-.014
N	Aluminum - wrought alloy	Not cureable		60	21	1300 - 2000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Cured		100	22	1000 - 1300	.005-.0095	.006-.011	.0065-.011	.007-.012
	Aluminum - cast, alloyed <=12% Si / >12% Si	Not cureable		75	23	1300 - 2000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Cured		90	24	1000 - 1300	.005-.0095	.006-.011	.0065-.011	.007-.012
		High temperature		130	25	1000 - 1300	.005-.0095	.006-.011	.0065-.011	.007-.012
	Copper alloys > 1% Pb	Free cutting		110	26	800-1000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Brass		90	27	750-900	.005-.0095	.006-.011	.0065-.011	.007-.012
		Electrolitic copper		100	28	800-1000	.005-.0095	.006-.011	.0065-.011	.007-.012
	Non-metallic	Duro & fiber plastics			29					
		Hard rubber			30					
S	High temp alloys Fe based / Ni or Co based	Annealed		200	31	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cured		280	32	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Annealed		250	33	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cured		350	34	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cast		320	35	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
	Titanium, Ti alloys		Rm 400		36	100 - 250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Alpha+beta alloys cured	Rm 1050		37	100 - 200	.0035-.0085	.005-.010	.006-.011	.007-.0115
H	Hardened steel	Hardened		55 HRC	38	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
		Hardened		60 HRC	39	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
	Chilled cast iron	Cast		400	40	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
	Cast iron nodular	Hardened		55 HRC	41	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045

DEEP TWIST™
DEEP DRILL

HF SERIES DEEP DRILL

INSERT GRADE APPLICATIONS

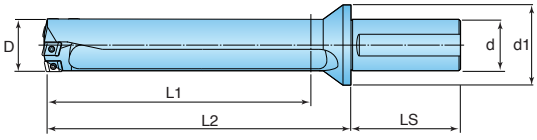
IN6542	P25	P20-30	CVD 3-Layered	Steel Alloyed Steel Steel Coating
IN1510	M30	K15-25 M35-40 P30-40 S15-25	PVD-TiCN	Stainless HRSA Cast iron
IN2005	P30	M10-30 P15-35	PVD-TiAlN	Multipurpose



INSERTS

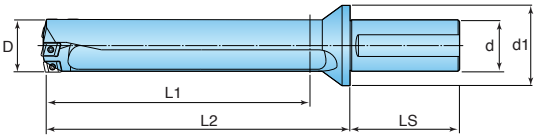
D	Insert Outer	Inner	Center	Guide Pad
30 - 33	NPMT06504R2	NPMT06504R2	NPMT06504L2	PAD-GO-07CD
33.01 - 36	NPMT06504R2	NPMT06504R2	NPMT0804L2	PAD-GO-07CD
36.01 - 39	NPMT0804R2	NPMT06504R2	NPMT0804L2	PAD-GO-07CD
39.01 - 42	NPMT0804R2	NPMT0804R2	NPMT0804L2	PAD-GO-08CD
42.01 - 45	NPMT0804R2	NPMT0804R2	NPMT09504L2	PAD-GO-08CD
45.01 - 48	NPMT09504R2	NPMT0804R2	NPMT09504L2	PAD-GO-10CD
48.01 - 51	NPMT09504R2	NPMT09504R2	NPMT09504L2	PAD-GO-10CD
51.01 - 57	NPMT09504R2	NPMT09504R2	NPMT12504L2	PAD-GO-10CD
57.01 - 63	NPMT12504R2	NPMT09504R2	NPMT12504L2	PAD-GO-12CD
63.01- 69	NPMT12504R2	NPMT12504R2	NPMT12504L2	PAD-GO-12CD

HF SERIES DEEP DRILL



Description	Dimensions (inch)							
	D"	D mm	L1	L2	LS	d	d1	L/D
HF0300420N6R01	1.181	30	16.54	17.68	2.36	1.25	1.77	14
HF0310420N6R01	1.220	31	16.54	17.68	2.36	1.25	1.77	13
HF0318420N7R01	1.250	31.8	16.54	17.68	2.76	1.50	2.17	13
HF0320420N7R01	1.260	32	16.54	17.68	2.76	1.50	2.17	13
HF0330420N7R01	1.299	33	16.54	17.68	2.76	1.50	2.17	12
HF0340420N7R01	1.339	34	16.54	17.72	2.76	1.50	2.17	12
HF0350420N7R01	1.378	35	16.54	17.72	2.76	1.50	2.17	12
HF0360420N7R01	1.417	36	16.54	17.72	2.76	1.50	2.17	12
HF0370420N7R01	1.457	37	16.54	17.83	2.76	1.50	2.17	11
HF0380420N7R01	1.496	38	16.54	17.83	2.76	1.50	2.17	11
HF0381420N7R01	1.500	38.1	16.54	17.83	2.76	1.50	2.17	11
HF0390420N7R01	1.535	39	16.54	17.83	2.76	1.50	2.17	10
HF0400420N7R01	1.575	40	16.54	17.87	2.76	1.50	2.17	10
HF0410420N7R01	1.614	41	16.54	17.87	2.76	1.50	2.17	10
HF0420420N7R01	1.654	42	16.54	17.87	2.76	1.50	2.17	10
HF0430420N7R01	1.693	43	16.54	17.95	2.76	1.50	2.17	9
HF0440420N7R01	1.732	44	16.54	17.95	2.76	1.50	2.17	9
HF0445420N7R01	1.750	44.5	16.54	17.95	2.76	1.50	2.17	9
HF0450420N7R01	1.772	45	16.54	17.95	2.76	1.50	2.17	9
HF0460420N7R01	1.811	46	16.54	18.07	2.76	1.50	2.17	9
HF0470420N7R01	1.850	47	16.54	18.07	2.76	1.50	2.17	8
HF0480420N7R01	1.890	48	16.54	18.07	2.76	1.50	2.17	8
HF0490420N7R01	1.929	49	16.54	18.15	2.76	1.50	2.17	8

HF SERIES DEEP DRILL



Description	Dimensions (inch)							
	D"	D mm	L1	L2	LS	d	d1	L/D
HF0500420N7R01	1.969	50	16.54	18.15	2.76	1.50	2.17	8
HF0508420N7R01	2.000	50.8	16.54	18.15	2.76	1.50	2.17	8
HF0510420N7R01	2.008	51	16.54	18.15	2.76	1.50	2.17	8
HF0520420N7R01	2.047	52	16.54	18.27	2.76	1.50	-	8
HF0530420N7R01	2.087	53	16.54	18.27	2.76	1.50	-	7
HF0540420N7R01	2.126	54	16.54	18.27	2.76	1.50	-	7
HF0550420N7R01	2.165	55	16.54	18.27	2.76	1.50	-	7
HF0560420N7R01	2.205	56	16.54	18.27	2.76	1.50	-	7
HF0570420N7R01	2.244	57	16.54	18.27	2.76	1.50	-	7
HF0571420N7R01	2.248	57.1	16.54	18.27	2.76	1.50	-	7
HF0580420N7R01	2.283	58	16.54	18.50	2.76	1.50	-	7
HF0590420N7R01	2.323	59	16.54	18.50	2.76	1.50	-	7
HF0600420N7R01	2.362	60	16.54	18.50	2.76	1.50	-	7
HF0610420N7R01	2.402	61	16.54	18.50	2.76	1.50	-	6
HF0620420N7R01	2.441	62	16.54	18.50	2.76	1.50	-	6
HF0630420N7R01	2.48	63	16.54	18.50	2.76	1.50	-	6
HF0635420N7R01	2.500	63.5	16.54	18.50	2.76	1.50	-	6
HF0640420N7R01	2.520	64	16.54	18.62	2.76	1.50	-	6
HF0650420N7R01	2.559	65	16.54	18.62	2.76	1.50	-	6
HF0660420N7R01	2.598	66	16.54	18.62	2.76	1.50	-	6
HF0670420N7R01	2.638	67	16.54	18.62	2.76	1.50	-	6
HF0680420N7R01	2.677	68	16.54	18.62	2.76	1.50	-	6
HF0690420N7R01	2.716	69	16.54	18.62	2.76	1.50	-	6