KYOCERA

DRA Magic Drill

High Efficiency Replaceable Tip Drill

Excellent Hole Accuracy with a Low Cutting Force Design

Optimal Web Thickness Limits Deflection

Fine Chip Breaking and Smooth Deep Hole Cutting

Easy Insert Replacement

DRA Magic Drill

Product Video

View Online

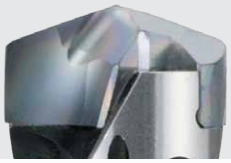
Excellent Hole Accuracy with a Low Cutting Force Design
5 Advantages to Efficiently Solve Common Drilling Difficulties

4 different insert designs offer a variety of machining applications

General Purpose

For Steel/Stainless Steel Machining
1st Recommendation **GM**

For a wide range of drilling applications
Special chisel edge reduces thrust force and controls vibration
Excellent hole accuracy



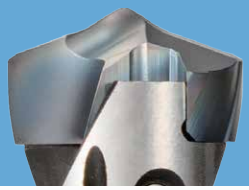
Drilling Diameter
Ø0.313" ~ Ø1.299"
Ø7.94mm ~ Ø33mm

PR1535
PR1525

Double Margin Type

High-Precision Insert for Steel Machining **HQP**

Special two-step bottom and double margin
Reduces shock for higher-precision machining of steel



Drilling Diameter
Ø0.313" ~ Ø0.783"
Ø7.94mm ~ Ø19.90mm

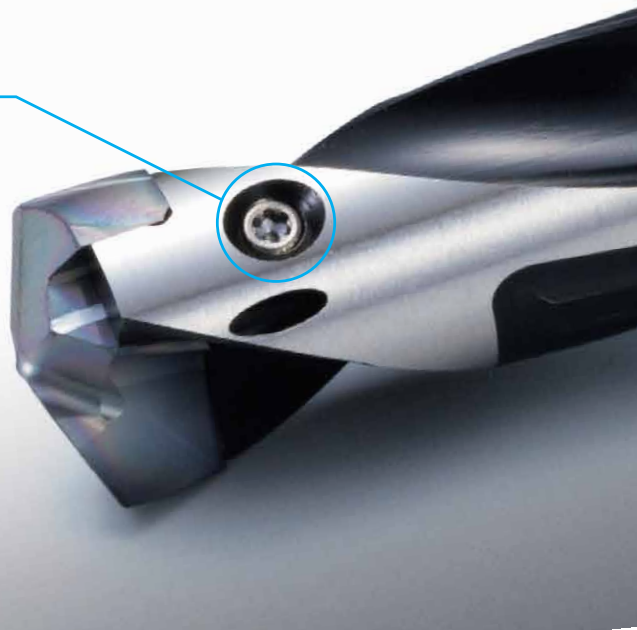
PR1525

Extensive lineup of toolholders for shallow to deep hole drilling

Drilling Depth	1.5D	3D	5D	8D	12D
SS-DRA Straight shank 		Ø0.313" ~ Ø1.004" Ø7.94mm ~ Ø25.5mm			
SF-DRA Flanged shank 	Ø0.313" ~ Ø1.004" Ø7.94 ~ Ø25.5mm	Ø0.313" ~ Ø1.299" Ø7.94mm ~ Ø33mm			Ø0.472" ~ Ø1.004" Ø12.0 ~ Ø25.5mm

Easy Insert Replacement P4

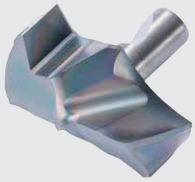
Insert can be replaced without removing screw



Steel Beam Drilling

For Steel Beam Drilling **FTP-H**

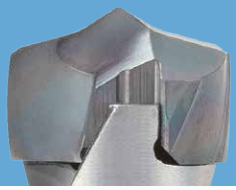
Reinforced chamfer edge for higher rigidity insert



Drilling Diameter
Ø0.551" ~ Ø1.024"
Ø14.00mm ~ Ø26.00mm
PR1535

For Difficult-to-cut Materials / Stainless Steel Machining **HQS**

Special two-step bottom and double margin
Improving stability of difficult-to-cut materials and stainless steel during machining operations



Drilling Diameter
Ø0.315" ~ Ø0.768"
Ø8.00mm ~ Ø19.50mm
PR1535

For Counterboring **FTP**

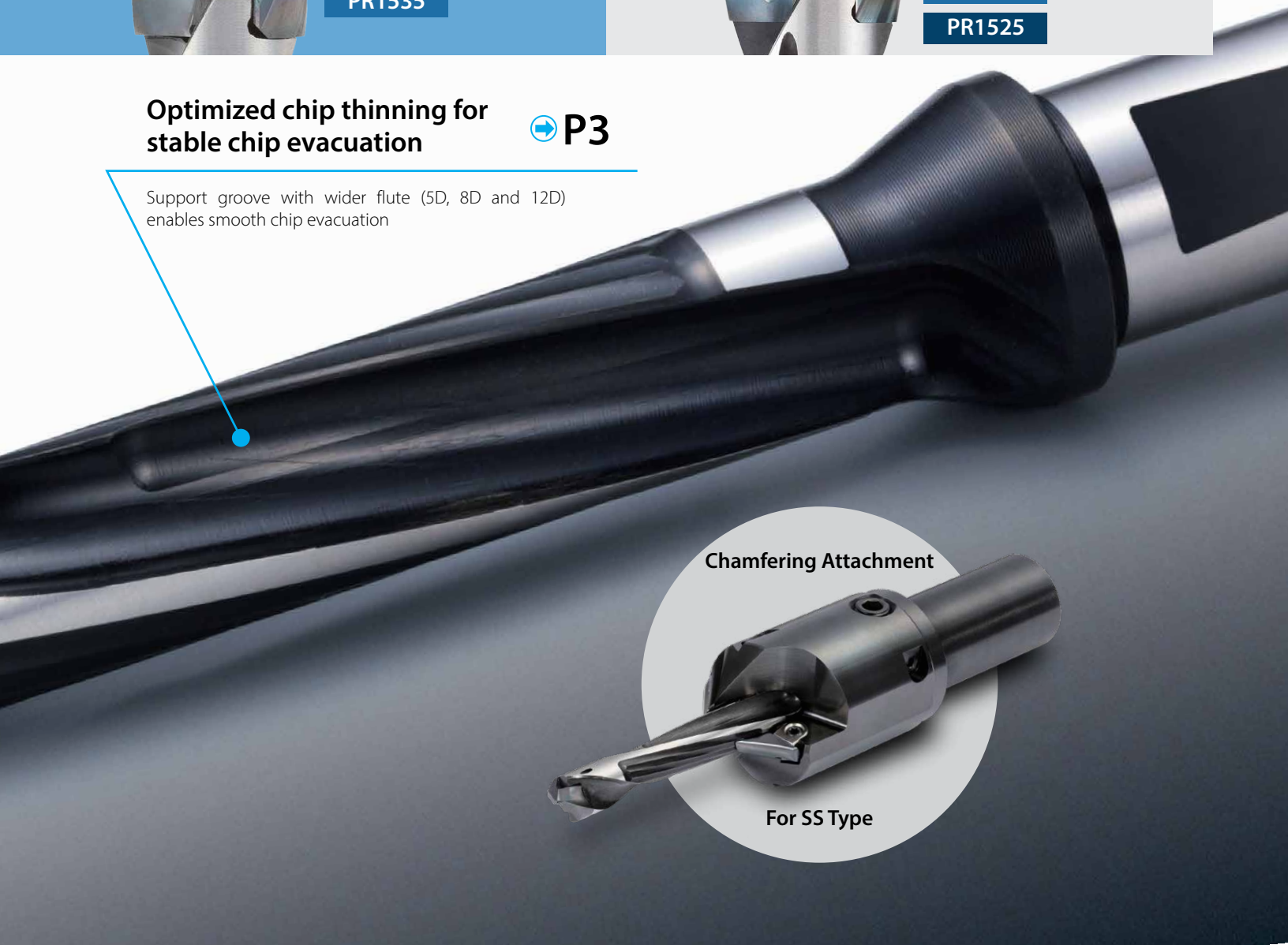
Improved hole accuracy with pilot point geometry and double margin specs

Drilling Diameter
Ø0.315" ~ Ø1.000"
Ø8.00mm ~ Ø25.40mm
PR1535
PR1525

Optimized chip thinning for stable chip evacuation

P3

Support groove with wider flute (5D, 8D and 12D) enables smooth chip evacuation



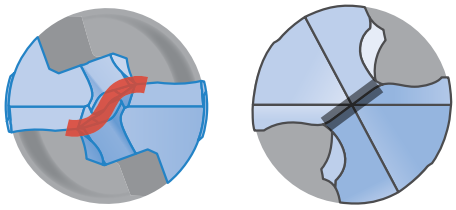
Chamfering Attachment

For SS Type

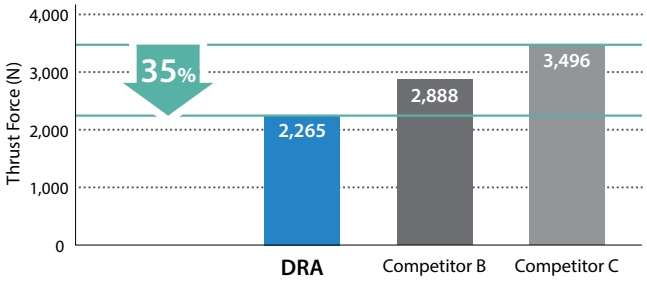
1 Low Cutting Force Design Improves Hole Accuracy

The special chisel edge with S-curve reduces thrust force and controls vibration

Cutting Edge Image



Cutting Force Comparison
(Internal Evaluation)

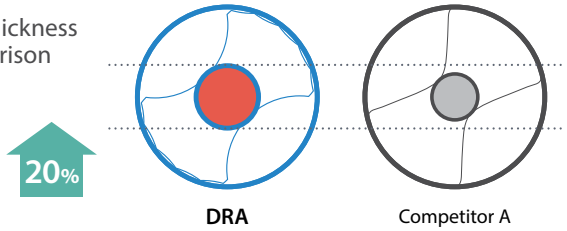


Cutting Conditions : Vc = 390 sfm, f = 0.010 ipr,
Drilling Diameter Ø0.551", Drilling Depth 1.772", Wet , Workpiece : 1049 Steel

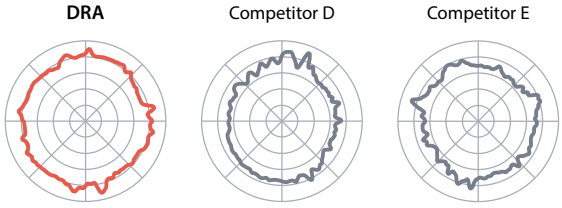
2 Optimal Web Thickness Limits Deflection

The hole accuracy is improved by controlling drill deflection with a 20% thicker web compared with Competitor A

Web Thickness Comparison



Roundness · Cylindricity Comparison
(Internal Evaluation)



	DRA	Competitor D	Competitor E
Roundness	18.7 µm	31.1 µm	27.3 µm
Cylindricity	23.6 µm	34.3 µm	30.1 µm

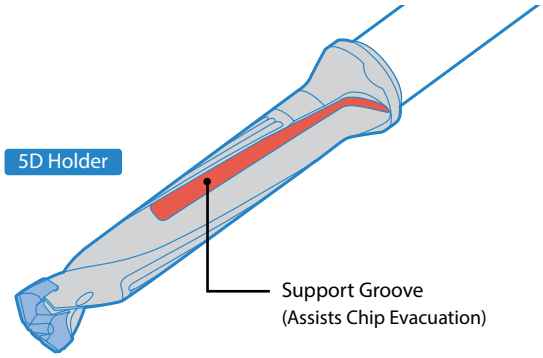
Cutting Conditions : Vc = 390 sfm, f = 0.012 ipr
Drilling Diameter Ø0.551", Measurement Position 2.165", Wet Workpiece : 1049 Steel

3 Fine Chip Breaking Even in Deep Hole Drilling Applications

Optimized chip thinning for stable chip evacuation
Support groove with wider flute (5D, 8D, and 12D) enables smooth chip evacuation

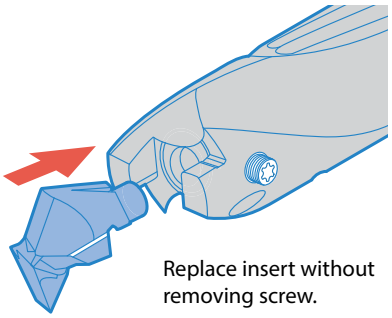
Chip Comparison
(Internal Evaluation)

Cutting Conditions : Vc = 200 sfm, f = 0.008 ipr, Drilling Diameter 0.551"
Drilling Depth 2.756", Wet Workpiece : 304 Stainless Steel

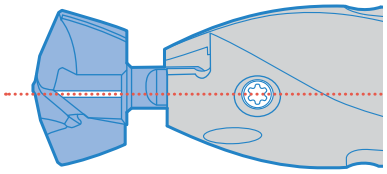


4 Easy Insert Replacement

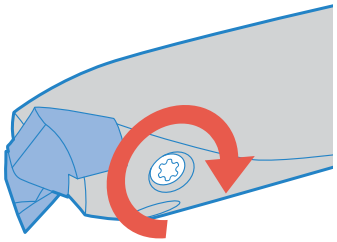
Replace insert without removing screw



Replace insert without removing screw.



Install the insert onto toolholder.
(Align insert guide line with screw position)



Fix the insert by tightening the screw.

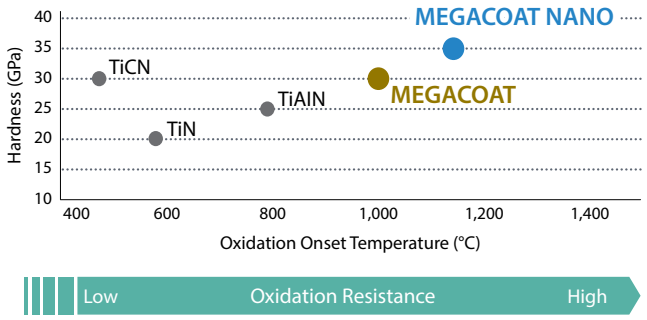
5 Long Tool Life and Stable Machining of Various Workpieces

MEGACOAT NANO grade PR1535 is used to machine various materials from steel to stainless steel, with the combination of a tough substrate and a special nano layer coating

1st Recommendation

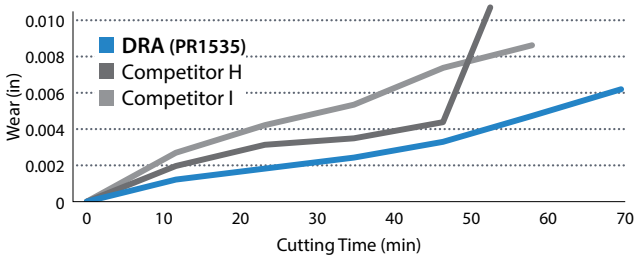
Steel	Cast Iron
PR1535	PR1525

Coating Properties



Wear Resistance Comparison

(Internal Evaluation)

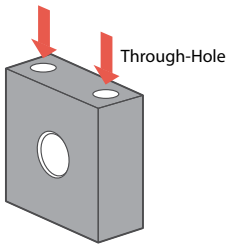


Cutting Conditions : Vc = 330 sfm, f = 0.010 ipr,
Cutting Diameter Ø0.551", Cutting Depth 1.772", Wet
Workpiece : 4140H

Case Studies

Attachment - Structural Steel

Vc = 230 sfm (n = 1,240 rpm)
f = 0.009 ipr (Vf = 11.221in/min)
Cutting Depth 3.937"
Wet (Internal Coolant)
With Center Hole Drilling
SF0750-DRA180M-8
DA1800M-GM PR1535



Cutting Time

DRA Ø0.709"-8D — **45 sec**

30% Cutting Time

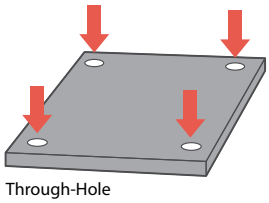
Competitor J Ø0.709"-7D — **65 sec**

Competitor J applied a peck cycle to avoid chip clogging.
DRA controlled chip evacuation without pecking.

(User Evaluation)

Plate - Stainless Steel

Vc = 195 sfm (n = 2,120 rpm)
f = 0.005 ipr (Vf = 10 in/min)
Cutting Depth 0.591"
Wet (Internal Coolant)
SS0375-DRA090M-3
DA0900M-GM PR1535



No. of Holes

DRA Ø0.354"-3D — **500**

Tool Life X5

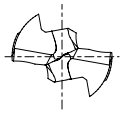
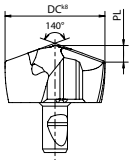
Competitor K Ø0.354"-3D — **100**

DRA extended the tool life by 5 times compared to Competitor K.
DRA maintained stable machining and excellent surface finish with less cutting noise.

(User Evaluation)

DRA Insert (GM - General Purpose)

Carbon Steel / Alloy Steel	○	● P
Stainless Steel	○	● M
Cast Iron	●	○ K

Insert	Part Number	Dimensions DC in	Dimensions DC mm	Dimensions PL (mm)	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR1525	Carbide PVD PR1535	Applicable Toolholder (Page 16-32)
	  General Purpose	DA 0794M-GM	0.313	7.94	1.34			●	●	
		0800M-GM	0.315	8.00	1.35			●	●	
		0810M-GM	0.319	8.10	1.37			●	●	
		0818M-GM	0.322	8.18	1.38	0	+0.022	□	●	SF...-DRA080M-○ SS...-DRA080M-○
		0820M-GM	0.323	8.20	1.38			●	●	
		0830M-GM	0.327	8.30	1.40			●	●	
		0840M-GM	0.331	8.40	1.42			●	●	
		DA 0850M-GM	0.335	8.50	1.44			●	●	
		0860M-GM	0.339	8.60	1.46			●	●	
		0870M-GM	0.343	8.70	1.48	0	+0.022	●	●	SF...-DRA085M-○ SS...-DRA085M-○
		0880M-GM	0.346	8.80	1.49			●	●	
		0890M-GM	0.350	8.90	1.51			●	●	
		DA 0900M-GM	0.354	9.00	1.52			●	●	
		0910M-GM	0.358	9.10	1.54			●	●	
		0920M-GM	0.362	9.20	1.56	0	+0.022	●	●	SF...-DRA090M-○ SS...-DRA090M-○
		0930M-GM	0.366	9.30	1.58			●	●	
		0940M-GM	0.370	9.40	1.59			●	●	
		DA 0950M-GM	0.374	9.50	1.61			●	●	
		0953M-GM	0.375	9.53	1.62			□	●	
		0960M-GM	0.378	9.60	1.63	0	+0.022	●	●	SF...-DRA095M-○ SS...-DRA095M-○
		0970M-GM	0.382	9.70	1.65			●	●	
		0980M-GM	0.386	9.80	1.67			●	●	
		0990M-GM	0.390	9.90	1.68			●	●	
		DA 1000M-GM	0.394	10.00	1.70		+0.022	●	●	
		1010M-GM	0.398	10.10	1.72		+0.027	●	●	
		1020M-GM	0.402	10.20	1.74	0	+0.027	●	●	SF...-DRA100M-○ SS...-DRA100M-○
		1030M-GM	0.406	10.30	1.75		+0.027	●	●	
		1040M-GM	0.409	10.40	1.77		+0.027	●	●	
		DA 1050M-GM	0.413	10.50	1.79			●	●	
		1060M-GM	0.417	10.60	1.81			●	●	
		1070M-GM	0.421	10.70	1.83	0	+0.027	●	●	SF...-DRA105M-○ SS...-DRA105M-○
		1072M-GM	0.422	10.72	1.84			□	●	
		1080M-GM	0.425	10.80	1.85			●	●	
		1090M-GM	0.429	10.90	1.86			●	●	
		DA 1100M-GM	0.433	11.00	1.87			●	●	
		1110M-GM	0.437	11.10	1.89			●	●	
		1120M-GM	0.441	11.20	1.91	0	+0.027	●	●	SF...-DRA110M-○ SS...-DRA110M-○
		1130M-GM	0.445	11.30	1.92			●	●	
		1140M-GM	0.449	11.40	1.94			●	●	
		DA 1150M-GM	0.453	11.50	1.96			●	●	
		1160M-GM	0.457	11.60	1.98			●	●	
		1170M-GM	0.461	11.70	2.00	0	+0.027	●	●	SF...-DRA115M-○ SS...-DRA115M-○
		1180M-GM	0.465	11.80	2.01			●	●	
		1190M-GM	0.469	11.90	2.03			●	●	
		DA 1200M-GM	0.472	12.00	2.03			●	●	
		1210M-GM	0.476	12.10	2.05			●	●	
		1220M-GM	0.480	12.20	2.07	0	+0.027	●	●	SF...-DRA120M-○ SS...-DRA120M-○
		1230M-GM	0.484	12.30	2.08			●	●	
		1240M-GM	0.488	12.40	2.10			●	●	
		DA 1250M-GM	0.492	12.50	2.12			●	●	
		1260M-GM	0.496	12.60	2.14			●	●	
		1270M-GM	0.500	12.70	2.16	0	+0.027	●	●	SF...-DRA125M-○ SS...-DRA125M-○
		1280M-GM	0.504	12.80	2.17			●	●	
		1290M-GM	0.508	12.90	2.19			●	●	
		DA 1300M-GM	0.512	13.00	2.20			●	●	
		1310M-GM	0.516	13.10	2.22			●	●	
		1320M-GM	0.520	13.20	2.24	0	+0.027	●	●	SF...-DRA130M-○ SS...-DRA130M-○
		1330M-GM	0.524	13.30	2.25			●	●	
		1340M-GM	0.528	13.40	2.27			●	●	

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.

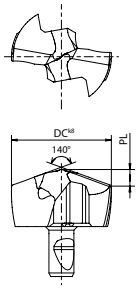
Recommended Cutting Conditions (Page 35)

DA inserts are sold in 1 piece boxes

● : Standard Item □ : Quoted Item (Made to Order)

DRA Insert (GM - General Purpose) Continued...

Carbon Steel / Alloy Steel	○	● P
Stainless Steel	○	● M
Cast Iron	●	○ K

Insert	Part Number	Dimensions DC in	Dimensions DC mm	Dimensions PL (mm)	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR1525	Carbide PVD PR1535	Applicable Toolholder (Page 16-32)
  General Purpose	DA 1350M-GM	0.531	13.50	2.29	0	+0.027	●	●	SF...-DRA135M-○ SS...-DRA135M-○
	1360M-GM	0.535	13.60	2.31			●	●	
	1370M-GM	0.539	13.70	2.33			●	●	
	1380M-GM	0.543	13.80	2.35			●	●	
	1390M-GM	0.547	13.90	2.36			●	●	
	DA 1400M-GM	0.551	14.00	2.33	0	+0.027	●	●	SF...-DRA140M-○ SS...-DRA140M-○
	1410M-GM	0.555	14.10	2.34			●	●	
	1420M-GM	0.559	14.20	2.36			●	●	
	1430M-GM	0.563	14.30	2.38			●	●	
	1440M-GM	0.567	14.40	2.40			●	●	
	DA 1450M-GM	0.571	14.50	2.42	0	+0.027	●	●	SF...-DRA145M-○ SS...-DRA145M-○
	1460M-GM	0.575	14.60	2.43			●	●	
	1468M-GM	0.578	14.68	2.44			□	●	
	1470M-GM	0.579	14.70	2.45			●	●	
	1480M-GM	0.583	14.80	2.47			●	●	
	1490M-GM	0.587	14.90	2.49			●	●	
	DA 1500M-GM	0.591	15.00	2.52	0	+0.027	●	●	SF...-DRA150M-○ SS...-DRA150M-○
	1510M-GM	0.594	15.10	2.54			●	●	
	1520M-GM	0.598	15.20	2.55			●	●	
	1530M-GM	0.602	15.30	2.57			●	●	
	1540M-GM	0.606	15.40	2.59			●	●	
	1550M-GM	0.610	15.50	2.61			●	●	
	1560M-GM	0.614	15.60	2.63			●	●	
	1570M-GM	0.618	15.70	2.65			●	●	
	1580M-GM	0.622	15.80	2.66			●	●	
	1588M-GM	0.625	15.88	2.69			□	●	
	1590M-GM	0.626	15.90	2.68			●	●	
	DA 1600M-GM	0.630	16.00	2.69	0	+0.027	●	●	SF...-DRA160M-○ SS...-DRA160M-○
	1610M-GM	0.634	16.10	2.71			●	●	
	1620M-GM	0.638	16.20	2.73			●	●	
	1630M-GM	0.642	16.30	2.75			●	●	
	1640M-GM	0.646	16.40	2.76			●	●	
	1650M-GM	0.650	16.50	2.78			●	●	
	1660M-GM	0.654	16.60	2.80			●	●	
	1667M-GM	0.656	16.67	2.81			□	●	
	1670M-GM	0.657	16.70	2.82			●	●	
	1680M-GM	0.661	16.80	2.84			●	●	
	1690M-GM	0.665	16.90	2.86			●	●	
	DA 1700M-GM	0.669	17.00	2.86	0	+0.027	●	●	SF...-DRA170M-○ SS...-DRA170M-○
	1710M-GM	0.673	17.10	2.88			●	●	
	1720M-GM	0.677	17.20	2.90			●	●	
	1730M-GM	0.681	17.30	2.92			●	●	
	1740M-GM	0.685	17.40	2.93			●	●	
	1746M-GM	0.687	17.46	2.94			□	●	
	1750M-GM	0.689	17.50	2.95			●	●	
	1760M-GM	0.693	17.60	2.97			●	●	
	1770M-GM	0.697	17.70	2.99			●	●	
	1780M-GM	0.701	17.80	3.01			●	●	
	1790M-GM	0.705	17.90	3.03			●	●	
	DA 1800M-GM	0.709	18.00	3.04	0	+0.027	●	●	SF...-DRA180M-○ SS...-DRA180M-○
	1810M-GM	0.713	18.10	3.06	0	+0.033	●	●	
	1820M-GM	0.717	18.20	3.07	0	+0.033	●	●	
	1830M-GM	0.720	18.30	3.09	0	+0.033	●	●	
	1840M-GM	0.724	18.40	3.11	0	+0.033	●	●	
	1850M-GM	0.728	18.50	3.13	0	+0.033	●	●	
	1860M-GM	0.732	18.60	3.15	0	+0.033	●	●	
	1870M-GM	0.736	18.70	3.17	0	+0.033	●	●	
	1880M-GM	0.740	18.80	3.18	0	+0.033	●	●	
	1890M-GM	0.744	18.90	3.20	0	+0.033	●	●	

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.

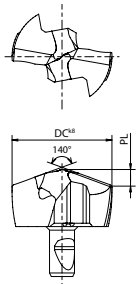
Recommended Cutting Conditions Page 35

DA inserts are sold in 1 piece boxes

● : Standard Item □ : Quoted Item (Made to Order)

DRA Insert (GM - General Purpose) Continued...

Carbon Steel / Alloy Steel	○	● P
Stainless Steel	○	● M
Cast Iron	●	○ K

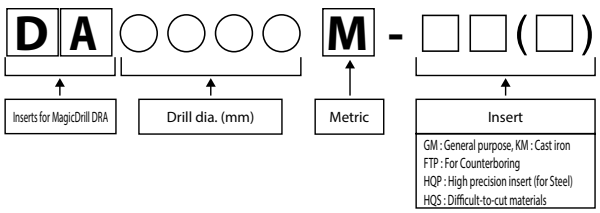
Insert	Part Number	Dimensions DC in	Dimensions DC mm	Dimensions PL (mm)	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR1525	Carbide PVD PR1535	Applicable Toolholder Page 16-32
  General Purpose	DA 1900M-GM	0.748	19.00	3.21			●	●	
	1905M-GM	0.750	19.05	0.13			□	●	
	1910M-GM	0.752	19.10	3.23			●	●	
	1920M-GM	0.756	19.20	3.25			●	●	
	1930M-GM	0.760	19.30	3.27			●	●	
	1940M-GM	0.764	19.40	3.29	0	+0.033	●	●	SF...-DRA190M-○ SS...-DRA190M-○
	1950M-GM	0.768	19.50	3.30			●	●	
	1960M-GM	0.772	19.60	3.32			●	●	
	1970M-GM	0.776	19.70	3.34			●	●	
	1980M-GM	0.780	19.80	3.36			●	●	
	1990M-GM	0.783	19.90	3.38			●	●	
	DA 2000M-GM	0.787	20.00	3.37			●	●	
	2010M-GM	0.791	20.10	3.39			●	●	
	2020M-GM	0.795	20.20	3.41			●	●	
	2030M-GM	0.799	20.30	3.43			●	●	
	2040M-GM	0.803	20.40	3.45			●	●	
	2050M-GM	0.807	20.50	3.46	0	+0.033	●	●	SF...-DRA200M-○ SS...-DRA200M-○
	2060M-GM	0.811	20.60	3.48			●	●	
	2064M-GM	0.813	20.64	3.48			□	●	
	2070M-GM	0.815	20.70	3.50			●	●	
	2080M-GM	0.819	20.80	3.52			●	●	
	2090M-GM	0.823	20.90	3.54			●	●	
	DA 2100M-GM	0.827	21.00	3.54	0	+0.033	●	●	SF...-DRA210M-○
	2150M-GM	0.846	21.50	3.63			●	●	SS...-DRA210M-○
	DA 2200M-GM	0.866	22.00	3.71			●	●	
	2223M-GM	0.875	22.23	3.76	0	+0.033	●	●	SF...-DRA220M-○ SS...-DRA220M-○
	2250M-GM	0.886	22.50	3.80			●	●	
	DA 2300M-GM	0.906	23.00	3.87			●	●	
	2350M-GM	0.925	23.50	3.96	0	+0.033	●	●	SF...-DRA230M-○ SS...-DRA230M-○
	2381M-GM	0.937	23.81	4.01			●	●	
	DA 2400M-GM	0.945	24.00	4.04	0	+0.033	●	●	SF...-DRA240M-○
	2450M-GM	0.965	24.50	4.13			●	●	SS...-DRA240M-○
	DA 2500M-GM	0.984	25.00	4.20			●	●	
	2540M-GM	1.000	25.40	4.27	0	+0.033	□	●	SF...-DRA250M-○ SS...-DRA250M-○
	2550M-GM	1.004	25.50	4.29			●	●	
	DA 2600M-GM	1.024	26.00	4.80	0	+0.033	●	●	SF...-DRA260M-○
	2650M-GM	1.043	26.50	4.90			●	●	
	DA 2700M-GM	1.063	27.00	4.99	0	+0.033	●	●	SF...-DRA270M-○
	2750M-GM	1.083	27.50	5.09			●	●	
	DA 2800M-GM	1.102	28.00	4.73	0	+0.033	●	●	SF...-DRA280M-○
	2850M-GM	1.122	28.50	4.83			●	●	
	DA 2900M-GM	1.142	29.00	4.90	0	+0.033	●	●	SF...-DRA290M-○
	2950M-GM	1.161	29.50	5.01			●	●	
	DA 3000M-GM	1.181	30.00	5.07	0	+0.033	●	●	SF...-DRA300M-○
	3050M-GM	1.201	30.50	5.17	0	+0.039	●	●	
	DA 3100M-GM	1.220	31.00	5.26	0	+0.039	●	●	SF...-DRA310M-○
	3150M-GM	1.240	31.50	5.37			●	●	
	DA 3200M-GM	1.260	32.00	5.41			●	●	
	3250M-GM	1.280	32.50	5.51	0	+0.039	●	●	SF...-DRA320M-○
	3300M-GM	1.299	33.00	5.62			●	●	

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.

Recommended Cutting Conditions Page 35

● : Standard Item □ : Quoted Item (Made to Order)

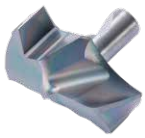
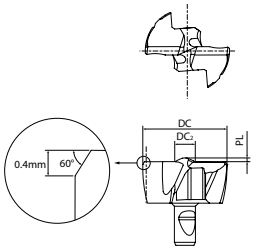
Part Number Identification System (Insert)



DA inserts are sold in 1 piece boxes

DA Insert (FTP - Flat Bottom / Counterboring)

Carbon Steel / Alloy Steel	○ ●	P
Stainless Steel	○ ●	M
Cast Iron	● ○	K

Insert		Part Number	Dimensions					Tolerance (mm)		Carbide		Applicable Tool-holder Page 16-32
			DC		DC2		PL (mm)	k8 (min.)	k8 (max.)	PVD		
			in	mm	in	mm				PR1525	PR1535	
	 Flat Bottom / Counterboring	DA 0800M-FTP	0.315	8.00	0.114	2.90	0.40	0	+0.022	●	●	SF...-DRA080M-○ SS...-DRA080M-○
		0830M-FTP	0.327	8.30						●	●	
		DA 0850M-FTP	0.335	8.50	0.114	2.90	0.40	0	+0.022	●	●	SF...-DRA085M-○ SS...-DRA085M-○
		0880M-FTP	0.346	8.80						●	●	
		DA 0900M-FTP	0.354	9.00	0.118	3.00	0.43	0	+0.022	●	●	SF...-DRA090M-○ SS...-DRA090M-○
		0930M-FTP	0.366	9.30						●	●	
		DA 0950M-FTP	0.374	9.50	0.118	3.00	0.43	0	+0.022	●	●	SF...-DRA095M-○ SS...-DRA095M-○
		DA 1000M-FTP	0.394	10.00	0.130	3.30	0.46	0	+0.022	●	●	SF...-DRA100M-○ SS...-DRA100M-○
		1030M-FTP	0.406	10.30					+0.027	●	●	
		DA 1050M-FTP	0.413	10.50	0.130	3.30	0.46	0	+0.027	●	●	SF...-DRA105M-○ SS...-DRA105M-○
		1080M-FTP	0.425	10.80						●	●	
		DA 1100M-FTP	0.433	11.00	0.134	3.40	0.50	0	+0.027	●	●	SF...-DRA110M-○ SS...-DRA110M-○
		DA 1150M-FTP	0.453	11.50	0.134	3.40	0.50	0	+0.027	●	●	SF...-DRA115M-○ SS...-DRA115M-○
		DA 1200M-FTP	0.472	12.00	0.146	3.70	0.53	0	+0.027	●	●	SF...-DRA120M-○ SS...-DRA120M-○
		DA 1250M-FTP	0.492	12.50	0.146	3.70	0.53	0	+0.027	●	●	SF...-DRA125M-○ SS...-DRA125M-○
		1270M-FTP	0.500	12.70						●	●	
		DA 1300M-FTP	0.512	13.00	0.154	3.90	0.56	0	+0.027	●	●	SF...-DRA130M-○ SS...-DRA130M-○
		DA 1350M-FTP	0.531	13.50	0.154	3.90	0.56	0	+0.027	●	●	SF...-DRA135M-○ SS...-DRA135M-○
		DA 1400M-FTP	0.551	14.00	0.165	4.20	0.60	0	+0.027	●	●	SF...-DRA140M-○ SS...-DRA140M-○
		DA 1450M-FTP	0.571	14.50	0.165	4.20	0.60	0	+0.027	●	●	SF...-DRA145M-○ SS...-DRA145M-○
		DA 1500M-FTP	0.591	15.00	0.173	4.40	0.65	0	+0.027	●	●	SF...-DRA150M-○ SS...-DRA150M-○
		1550M-FTP	0.610	15.50						●	●	
		DA 1600M-FTP	0.630	16.00	0.181	4.60	0.70	0	+0.027	●	●	SF...-DRA160M-○ SS...-DRA160M-○
		1650M-FTP	0.650	16.50						●	●	
		DA 1700M-FTP	0.669	17.00	0.197	5.00	0.75	0	+0.027	●	●	SF...-DRA170M-○ SS...-DRA170M-○
		1750M-FTP	0.689	17.50						●	●	
		DA 1800M-FTP	0.709	18.00	0.197	5.00	0.80	0	+0.027	●	●	SF...-DRA180M-○ SS...-DRA180M-○
		1850M-FTP	0.728	18.50					+0.033	●	●	
		DA 1900M-FTP	0.748	19.00	0.209	5.30	0.85	0	+0.033	●	●	SF...-DRA190M-○ SS...-DRA190M-○
		1950M-FTP	0.768	19.50						●	●	
		DA 2000M-FTP	0.787	20.00	0.224	5.70	0.90	0	+0.033	●	●	SF...-DRA200M-○ SS...-DRA200M-○
		2050M-FTP	0.807	20.50						●	●	
		DA 2100M-FTP	0.827	21.00	0.236	6.00	0.95	0	+0.033	●	●	SF...-DRA210M-○ SS...-DRA210M-○
		2150M-FTP	0.846	21.50						●	●	
		DA 2200M-FTP	0.866	22.00	0.252	6.40	1.00	0	+0.033	●	●	SF...-DRA220M-○ SS...-DRA220M-○
		2250M-FTP	0.886	22.50						●	●	
		DA 2300M-FTP	0.906	23.00	0.260	6.60	1.05	0	+0.033	●	●	SF...-DRA230M-○ SS...-DRA230M-○
		2350M-FTP	0.925	23.50						●	●	
		DA 2400M-FTP	0.945	24.00	0.268	6.80	1.10	0	+0.033	●	●	SF...-DRA240M-○ SS...-DRA240M-○
		2450M-FTP	0.965	24.50						●	●	
		DA 2500M-FTP	0.984	25.00	0.276	7.00	1.20	0	+0.033	●	●	SF...-DRA250M-○ SS...-DRA250M-○
		2540M-FTP	1.000	25.40						●	●	

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.
Applicable to 1.5D,3D,5D,8D and 12D holders, Prepared hole (0.5xDC) is needed when using 8D/12D holder.

Recommended Cutting Conditions Page 36

DA inserts are sold in 1 piece boxes

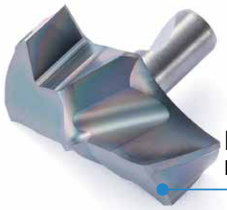
● : Standard Item

FTP-H Insert

Specialized high-performance in steel beam drilling

1 **Optimized chip control**

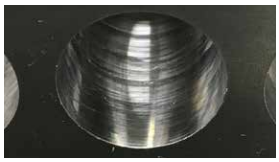
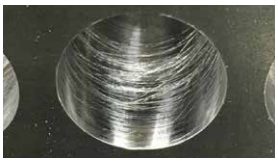
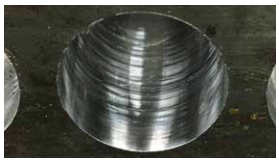
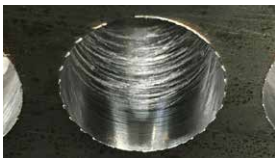
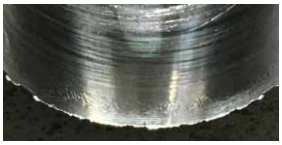
2 **Excellent surface finish**



Reinforced chamfer
Higher rigidity of insert

Controlled chips reduce scratches on the hole wall

Hole quality comparison (Internal evaluation)

	DRA (FTP-H)	Competitor K
Hole Entrance		
	Good	Rifling
Hole Exit		
	Good	Burrs and chattering marks
		

Cutting Conditions:
Vc = 260 sfm, f = 0.008 ipr
Drilling diameter ø26mm (1.024") (3D)
Drilling depth 40mm (1.575")
Through spindle coolant
Workpiece: structural steel St52
BT50 M/C

Case Study

Structure Part S355

Vc = 260 sfm (n = 979 rpm),
f = 0.008 ipr (Vf = 7.717 ipm),

Drilling depth 0.591" through-hole
Coolant = Oil mist lubrication

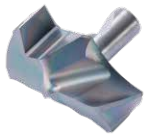
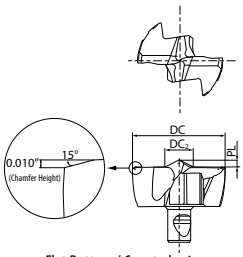
SF25-DRA250M-3
DA2600M-XFTP PR1535

Competitor K: ø26mm-3D

FTP-H acchieved tool life of 45 m with no issues.

Shortened process time.
Good chip control.

DA Insert (FTP-H - Steel Beam Drilling)

Insert		Part Number	Carbon Steel / Alloy Steel							●	P
			Dimensions					Tolerance (mm)		Carbide	Applicable Toolholder Page 16-32
			DC		DC2		PL (mm)	k8 (min.)	k8 (max.)	PVD	
			in	mm	in	mm				PR1535	
	 Flat Bottom / Counterboring	DA 1400M-FTP-H	0.551	14.00	0.165	4.20	0.60	0	+0.022	●	SF...-DRA140M-◯ SS...-DRA140M-◯
		DA 1600M-FTP-H	0.630	16.00	0.181	4.60	0.70	0	+0.027	●	SF...-DRA160M-◯ SS...-DRA160M-◯
		DA 1800M-FTP-H	0.709	18.00	0.197	5.00	0.80	0	+0.027	●	SF...-DRA180M-◯ SS...-DRA180M-◯
		DA 2000M-FTP-H	0.787	20.00	0.224	5.70	0.90	0	+0.027	●	SF...-DRA200M-◯ SS...-DRA200M-◯
		DA 2100M-FTP-H	0.827	21.00	0.236	6.00	0.95	0	+0.027	●	SF...-DRA210M-◯ SS...-DRA210M-◯
		DA 2200M-FTP-H	0.866	22.00	0.252	6.40	1.00	0	+0.027	●	SF...-DRA220M-◯ SS...-DRA220M-◯
		DA 2400M-FTP-H	0.945	24.00	0.268	6.80	1.10	0	+0.027	●	SF...-DRA240M-◯ SS...-DRA240M-◯
		DA 2600M-FTP-H	1.024	26.00	0.276	7.00	1.20	0	+0.027	●	SF...-DRA260M-◯

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.
Applicable to 1.5D,3D,5D,8D and 12D holders, Prepared hole (0.5xDC) is needed when using 8D/12D holder.

Recommended Cutting Conditions Page 36

DA inserts are sold in 1 piece boxes

● : Standard Item

HQP Insert

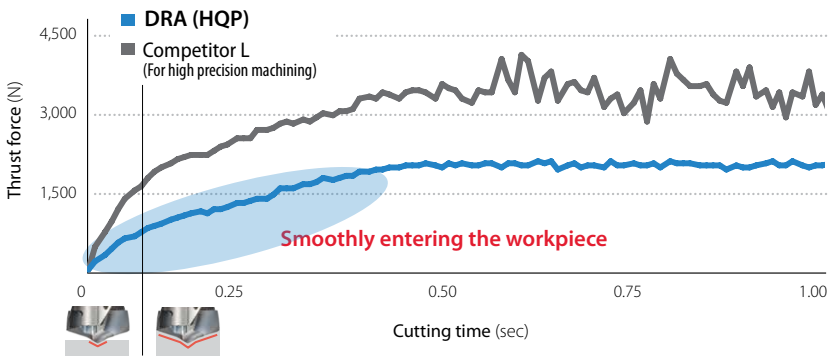
Double Margin
for High-Precision
Steel Machining

Improved Centripetal Forces with Special Two-step Bottom Excellent Cylindricity, Roundness and Surface Finish in Steel Machining

1 Improved centripetal forces delivers high-precision machining Capabilities for both machining centers and lathes

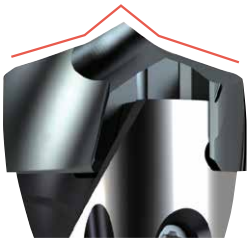
Special two-step bottom, large rake angle and double margin design reduce initial shock for higher precision machining

Cutting Force Comparison when Entering Workpiece (Internal Evaluation)

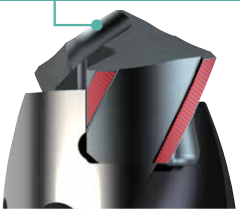


Cutting Conditions: Vc = 330 sfm, f = 0.010 ipr, H = 1.181", Wet Workpiece : 1049 Ø0.630" (3D)

Special Two-step Bottom



Large Rake Angle

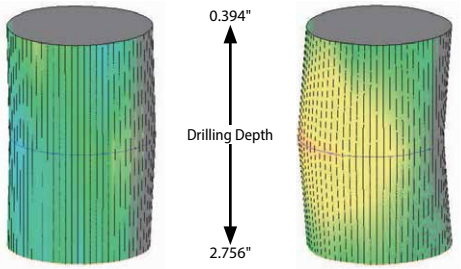


Double Margin

Cylindricity and Roundness Comparison (Internal Evaluation)

Machining Center (BT50)

DRA (HQP) | Competitor A (High Precision)



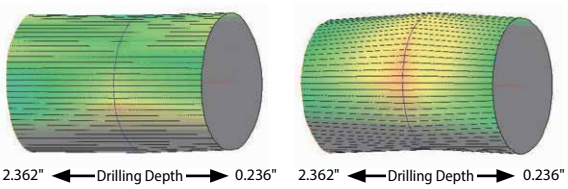
Cylindricity: 19 μm
Roundness: 17 μm (2.756")

Cylindricity: 52 μm
Roundness: 19 μm (2.756")

Cutting Conditions: Vc = 330 sfm, f = 0.010 ipr, H = 3.150", Wet
Workpiece: 1049 Ø0.630" (5D)

Lathes

DRA (HQP) | Competitor B (High Precision)



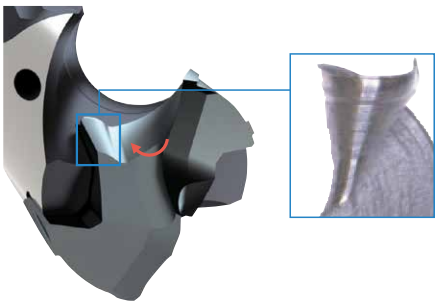
Cylindricity: 19 μm
Roundness: 9 μm

Cylindricity: 71 μm
Roundness: 12 μm

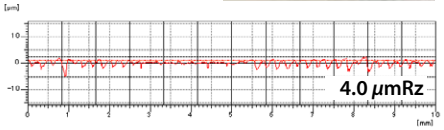
Cutting Conditions: Vc = 390 sfm, f = 0.012 ipr, H = 2.559", Wet
Workpiece: 4137 Ø0.512" (5D)

2 Excellent Surface Finish with Unique Flute Shape

Controlled chips reduce scratches on the hole wall

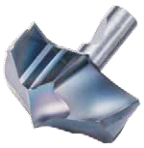
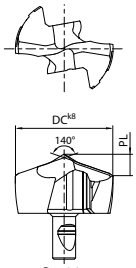


Hole Wall Surface Finish Comparison (Internal Evaluation)



Cutting Conditions: Vc = 330 sfm, f = 0.010 ipr, H = 3.150", Wet
Workpiece: 1049 Ø0.630" (5D)

DRA Insert (HQP - Precision / for Carbon Steel)

Insert		Part Number	Carbide	PVD	Dimensions DC in	Dimensions DC mm	Dimensions PL (mm)	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Applicable Toolholder
			Carbon Steel / Alloy Steel	●						P
				PR1525						Page 16-32
	 Precision	DA 0794M-HQP		●	0.313	7.94	1.90			
		0800M-HQP		●	0.315	8.00	1.91			
		0810M-HQP		●	0.319	8.10	1.93	0	+0.022	SF...-DRA080M-◯ SS...-DRA080M-◯
		0820M-HQP		●	0.323	8.20	1.94			
		0830M-HQP		●	0.327	8.30	1.96			
		0840M-HQP		●	0.331	8.40	1.98			
		DA 0850M-HQP		●	0.335	8.50	1.99			
		0860M-HQP		●	0.339	8.60	2.01			
		0870M-HQP		●	0.343	8.70	2.03	0	+0.022	SF...-DRA085M-◯ SS...-DRA085M-◯
		0880M-HQP		●	0.346	8.80	2.05			
		0890M-HQP		●	0.350	8.90	2.06			
		DA 0900M-HQP		●	0.354	9.00	2.19			
		0910M-HQP		●	0.358	9.10	2.21			
		0920M-HQP		●	0.362	9.20	2.22	0	+0.022	SF...-DRA090M-◯ SS...-DRA090M-◯
		0930M-HQP		●	0.366	9.30	2.24			
		0940M-HQP		●	0.370	9.40	2.26			
		DA 0950M-HQP		●	0.374	9.50	2.27			
		0960M-HQP		●	0.378	9.60	2.29			
		0970M-HQP		●	0.382	9.70	2.31	0	+0.022	SF...-DRA095M-◯ SS...-DRA095M-◯
		0980M-HQP		●	0.386	9.80	2.32			
		0990M-HQP		●	0.390	9.90	2.34			
		DA 1000M-HQP		●	0.394	10.00	2.35		+0.022	
		1010M-HQP		●	0.398	10.10	2.36		+0.027	
		1020M-HQP		●	0.402	10.20	2.38	0	+0.027	SF...-DRA100M-◯ SS...-DRA100M-◯
		1030M-HQP		●	0.406	10.30	2.40		+0.027	
		1040M-HQP		●	0.409	10.40	2.41		+0.027	
		DA 1050M-HQP		●	0.413	10.50	2.43			
		1060M-HQP		●	0.417	10.60	2.44			
		1070M-HQP		●	0.421	10.70	2.46	0	+0.027	SF...-DRA105M-◯ SS...-DRA105M-◯
		1080M-HQP		●	0.425	10.80	2.47			
		1090M-HQP		●	0.429	10.90	2.49			
		DA 1100M-HQP		●	0.433	11.00	2.65			
		1110M-HQP		●	0.437	11.10	2.67			
		1120M-HQP		●	0.441	11.20	2.68	0	+0.027	SF...-DRA110M-◯ SS...-DRA110M-◯
		1130M-HQP		●	0.445	11.30	2.70			
		1140M-HQP		●	0.449	11.40	2.72			
		DA 1150M-HQP		●	0.453	11.50	2.73			
		1160M-HQP		●	0.457	11.60	2.75			
		1170M-HQP		●	0.461	11.70	2.76	0	+0.027	SF...-DRA115M-◯ SS...-DRA115M-◯
		1180M-HQP		●	0.465	11.80	2.78			
		1190M-HQP		●	0.469	11.90	2.80			
		DA 1200M-HQP		●	0.472	12.00	2.79			
		1210M-HQP		●	0.476	12.10	2.81			
		1220M-HQP		●	0.480	12.20	2.82	0	+0.027	SF...-DRA120M-◯ SS...-DRA120M-◯
		1230M-HQP		●	0.484	12.30	2.84			
		1240M-HQP		●	0.488	12.40	2.86			
		DA 1250M-HQP		●	0.492	12.50	2.87			
		1260M-HQP		●	0.496	12.60	2.89			
		1270M-HQP		●	0.500	12.70	2.91	0	+0.027	SF...-DRA125M-◯ SS...-DRA125M-◯
		1280M-HQP		●	0.504	12.80	2.92			
		1290M-HQP		●	0.508	12.90	2.94			
		DA 1300M-HQP		●	0.512	13.00	2.98			
		1310M-HQP		●	0.516	13.10	2.99			
		1320M-HQP		●	0.520	13.20	3.01	0	+0.027	SF...-DRA130M-◯ SS...-DRA130M-◯
		1330M-HQP		●	0.524	13.30	3.02			
		1340M-HQP		●	0.528	13.40	3.04			
		DA 1350M-HQP		●	0.531	13.50	3.06			
		1360M-HQP		●	0.535	13.60	3.07			
		1370M-HQP		●	0.539	13.70	3.09	0	+0.027	SF...-DRA135M-◯ SS...-DRA135M-◯
		1380M-HQP		●	0.543	13.80	3.10			
		1390M-HQP		●	0.547	13.90	3.12			

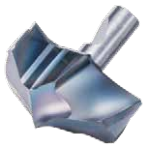
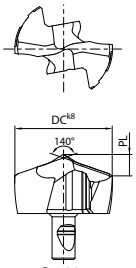
k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.

Recommended Cutting Conditions Page 37

DA inserts are sold in 1 piece boxes

● : Standard Item

DRA Insert (HQP - Precision / for Carbon Steel) Continued...

Insert		Part Number	Carbon Steel / Alloy Steel					●	P
			Dimensions			Tolerance (mm)		Carbide	Applicable Toolholder ➡ Page 16-32
			DC		PL (mm)	k8 (min.)	k8 (max.)	PVD	
			in	mm				PR1525	
	 Precision	DA 1400M-HQP	0.551	14.00	3.11			●	SF...-DRA140M-○ SS...-DRA140M-○
		1410M-HQP	0.555	14.10	3.12			●	
		1420M-HQP	0.559	14.20	3.14	0	+0.027	●	
		1430M-HQP	0.563	14.30	3.16			●	
		1440M-HQP	0.567	14.40	3.17			●	
		DA 1450M-HQP	0.571	14.50	3.19			●	SF...-DRA145M-○ SS...-DRA145M-○
		1460M-HQP	0.575	14.60	3.21			●	
		1470M-HQP	0.579	14.70	3.22	0	+0.027	●	
		1480M-HQP	0.583	14.80	3.24			●	
		1490M-HQP	0.587	14.90	3.25			●	
		DA 1500M-HQP	0.591	15.00	3.33			●	SF...-DRA150M-○ SS...-DRA150M-○
		1510M-HQP	0.594	15.10	3.35			●	
		1520M-HQP	0.598	15.20	3.36			●	
		1530M-HQP	0.602	15.30	3.38			●	
		1540M-HQP	0.606	15.40	3.39	0	+0.027	●	
		1550M-HQP	0.610	15.50	3.41			●	
		1560M-HQP	0.614	15.60	3.42			●	
		1570M-HQP	0.618	15.70	3.44			●	
		1580M-HQP	0.622	15.80	3.46			●	
		1590M-HQP	0.626	15.90	3.47			●	
		DA 1600M-HQP	0.630	16.00	3.55			●	SF...-DRA160M-○ SS...-DRA160M-○
		1610M-HQP	0.634	16.10	3.57			●	
		1620M-HQP	0.638	16.20	3.58			●	
		1630M-HQP	0.642	16.30	3.60			●	
		1640M-HQP	0.646	16.40	3.62	0	+0.027	●	
		1650M-HQP	0.650	16.50	3.63			●	
		1660M-HQP	0.654	16.60	3.65			●	
		1670M-HQP	0.657	16.70	3.66			●	
		1680M-HQP	0.661	16.80	3.68			●	
		1690M-HQP	0.665	16.90	3.69			●	
		DA 1700M-HQP	0.669	17.00	3.73			●	SF...-DRA170M-○ SS...-DRA170M-○
		1710M-HQP	0.673	17.10	3.75			●	
		1720M-HQP	0.677	17.20	3.77			●	
		1730M-HQP	0.681	17.30	3.78			●	
		1740M-HQP	0.685	17.40	3.80	0	+0.027	●	
		1750M-HQP	0.689	17.50	3.81			●	
		1760M-HQP	0.693	17.60	3.83			●	
		1770M-HQP	0.697	17.70	3.84			●	
		1780M-HQP	0.701	17.80	3.86			●	
		1790M-HQP	0.705	17.90	3.88			●	
		DA 1800M-HQP	0.709	18.00	3.97		+0.027	●	SF...-DRA180M-○ SS...-DRA180M-○
		1810M-HQP	0.713	18.10	3.98		+0.033	●	
		1820M-HQP	0.717	18.20	4.00		+0.033	●	
		1830M-HQP	0.720	18.30	4.02		+0.033	●	
		1840M-HQP	0.724	18.40	4.03	0	+0.033	●	
		1850M-HQP	0.728	18.50	4.05		+0.033	●	
		1860M-HQP	0.732	18.60	4.06		+0.033	●	
		1870M-HQP	0.736	18.70	4.08		+0.033	●	
		1880M-HQP	0.740	18.80	4.09		+0.033	●	
		1890M-HQP	0.744	18.90	4.11		+0.033	●	
		DA 1900M-HQP	0.748	19.00	4.20			●	SF...-DRA190M-○ SS...-DRA190M-○
		1910M-HQP	0.752	19.10	4.22			●	
		1920M-HQP	0.756	19.20	4.23			●	
		1930M-HQP	0.760	19.30	4.25			●	
		1940M-HQP	0.764	19.40	4.26	0	+0.033	●	
		1950M-HQP	0.768	19.50	4.28			●	
		1960M-HQP	0.772	19.60	4.29			●	
		1970M-HQP	0.776	19.70	4.31			●	
		1980M-HQP	0.780	19.80	4.33			●	
		1990M-HQP	0.783	19.90	4.34			●	

k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter.

Recommended Cutting Conditions ➡ Page 37

DA inserts are sold in 1 piece boxes

● : Standard Item

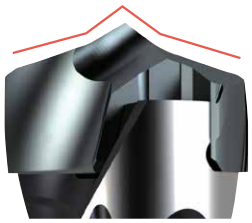
HQS Insert

Double Margin
for Difficult-to-Cut Materials
and Stainless Steel Machining

Unique design for machining difficult-to-cut materials such as Inconel
High quality and stable machining provide long tool life

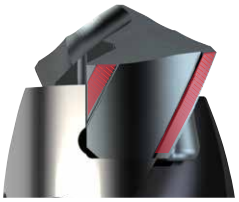
1 Three features specializing in machining difficult-to-cut materials

Special Two-step Tip Edge



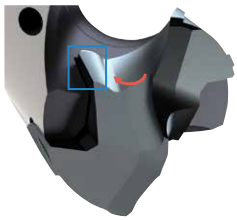
- Supresses sudden fractures from occuring when entering the workpiece
- Improvement of cutting edge strength

Double Margin



- Optimized for difficult-to-cut materials
- Improvement of heat resistance

Unique Flute Shape

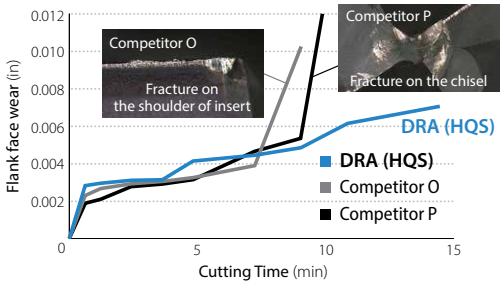


- Superior chip control
- Prevents damage to hole walls
- Excellent finished surface

2 Long tool life and high-quality machining of Inconel and stainless steel

Inconel

Wear Resistance Comparison (Internal evaluation)



DRA (HQS)

Normal wear condition

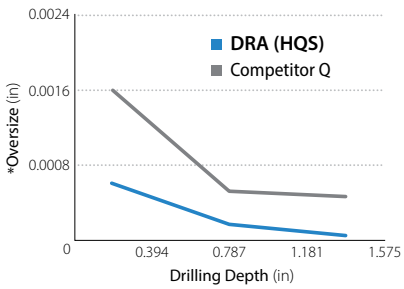
Good without fracture

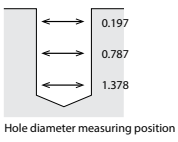
Cutting Conditions: Vc = 70 sfm, f = 0.006 ipr, Drilling Diameter Ø14.5mm (0.571") (3xD)
Drilling Depth 1.575", Wet (internal/external), Workpiece: Inconel 718, BT50 M/C

The shoulder part and chisel part of competitor were fractured and the tool life was shortened.
HQS maintains long tool life.

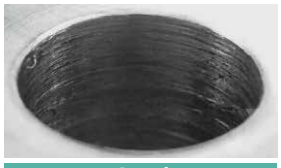
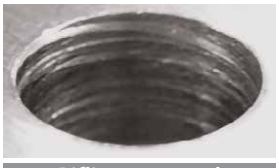
Stainless Steel

Hole Diameter Accuracy Comparison (Internal evaluation)





After machining

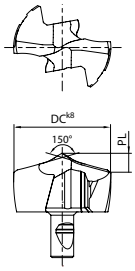
DRA (HQS)	Competitor Q
	
Good	Rifling occurred

Cutting Conditions: Vc = 130 sfm, f = 0.004 ipr, Drilling Diameter Ø10.8mm (0.425") (5xD)
Drilling Depth 1.575", Wet (internal/external), Workpiece: 304, BT50 M/C
*Oversize is the difference between the actual hole diameter and the drill diameter

HQS has excellent centripetal properties with special two-step bottom and double margin and provides superior hole diameter accuracy

DRA Insert (HQS - For Difficult-to-Cut Materials / Stainless Steel)

			Stainless Steel					●	M
			Heat Resistant Alloy					●	S
			Titanium Alloy					●	
Insert		Part Number	Dimensions			Tolerance (mm)		Carbide	Applicable Toolholder ➡ Page 16-32
			DC		PL (mm)	k8 (min.)	k8 (max.)	PVD	
			in	mm				PR1535	
		DA 0800M-HQS	0.315	8.00	1.76	0	+0.022	●	SF...-DRA080M-○
		0820M-HQS	0.323	8.20	1.78			●	SS...-DRA080M-○
		DA 0850M-HQS	0.335	8.50	1.82	0	+0.022	●	SF...-DRA085M-○
		0870M-HQS	0.343	8.70	1.85			●	SS...-DRA085M-○
		0880M-HQS	0.346	8.80	1.86			●	
		DA 0900M-HQS	0.354	9.00	1.97	0	+0.022	●	SF...-DRA090M-○
		0930M-HQS	0.366	9.30	2.01			●	SS...-DRA090M-○
		0940M-HQS	0.370	9.40	2.02			●	
		DA 0950M-HQS	0.374	9.50	2.03	0	+0.022	●	SF...-DRA095M-○
		0970M-HQS	0.382	9.70	2.05			●	SS...-DRA095M-○
		0980M-HQS	0.386	9.80	2.06			●	
		DA 1000M-HQS	0.394	10.00	2.17	0	+0.022	●	SF...-DRA100M-○
		1030M-HQS	0.406	10.30	2.21		+0.027	●	SS...-DRA100M-○
		1040M-HQS	0.409	10.40	2.22		+0.027	●	
		DA 1050M-HQS	0.413	10.50	2.23	0	+0.027	●	SF...-DRA105M-○
		1080M-HQS	0.425	10.80	2.27			●	SS...-DRA105M-○
		DA 1100M-HQS	0.433	11.00	2.38	0	+0.027	●	SF...-DRA110M-○ SS...-DRA110M-○
		DA 1150M-HQS	0.453	11.50	2.44	0	+0.027	●	SF...-DRA115M-○ SS...-DRA115M-○
		DA 1200M-HQS	0.472	12.00	2.50	0	+0.027	●	SF...-DRA120M-○ SS...-DRA120M-○
		DA 1250M-HQS	0.492	12.50	2.57	0	+0.027	●	SF...-DRA125M-○
		1260M-HQS	0.496	12.60	2.58			●	SS...-DRA125M-○
		DA 1300M-HQS	0.512	13.00	2.68	0	+0.027	●	SF...-DRA130M-○ SS...-DRA130M-○
		DA 1350M-HQS	0.531	13.50	2.74	0	+0.027	●	SF...-DRA135M-○
		1390M-HQS	0.547	13.90	2.78			●	SS...-DRA135M-○
		DA 1400M-HQS	0.551	14.00	2.79	0	+0.027	●	SF...-DRA140M-○
		1420M-HQS	0.559	14.20	2.81			●	SS...-DRA140M-○
		DA 1450M-HQS	0.571	14.50	2.85	0	+0.027	●	SF...-DRA145M-○ SS...-DRA145M-○
		DA 1500M-HQS	0.591	15.00	2.96	0	+0.027	●	SF...-DRA150M-○
		1520M-HQS	0.598	15.20	2.99			●	SS...-DRA150M-○
		1530M-HQS	0.602	15.30	3.00			●	
		1550M-HQS	0.610	15.50	3.02			●	
		1570M-HQS	0.618	15.70	3.04			●	
		DA 1600M-HQS	0.630	16.00	3.18	0	+0.027	●	SF...-DRA160M-○
		1610M-HQS	0.634	16.10	3.20			●	SS...-DRA160M-○
		1620M-HQS	0.638	16.20	3.21			●	
		1630M-HQS	0.642	16.30	3.22			●	
		1650M-HQS	0.650	16.50	3.25			●	
		DA 1700M-HQS	0.669	17.00	3.38	0	+0.027	●	SF...-DRA170M-○
		1750M-HQS	0.689	17.50	3.44			●	SS...-DRA170M-○
		1770M-HQS	0.697	17.70	3.46			●	
		DA 1800M-HQS	0.709	18.00	3.59	0	+0.027	●	SF...-DRA180M-○
		1810M-HQS	0.713	18.10	3.60		+0.033	●	SS...-DRA180M-○
		1850M-HQS	0.728	18.50	3.65		+0.033	●	
		DA 1900M-HQS	0.748	19.00	3.79	0	+0.033	●	SF...-DRA190M-○
		1930M-HQS	0.760	19.30	3.82			●	SS...-DRA190M-○
		1950M-HQS	0.768	19.50	3.84			●	

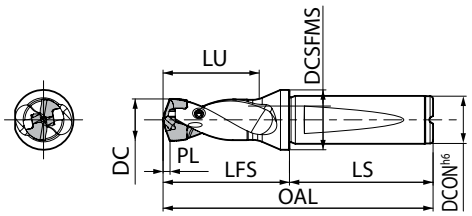


k8 is the dimension tolerance of the insert. It is not the dimension tolerance of the hole diameter. Recommended Cutting Conditions ➡ Page 36

DA inserts are sold in 1 piece boxes

● : Standard Item

SF-DRA (Drilling Depth : 1.5 x DC)



1.5D

PL indicates distance from drill point to corner edge **Page 6-15**

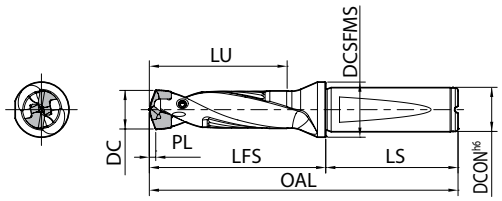
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
Inch	SF0500- DRA080M-1.5	●	0.313	0.334	0.500	2.805	1.033	0.504	1.772	0.630	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-1.5	●	0.335	0.353		2.854	1.083	0.531							DA0850M-... ~ DA0890M-...
	DRA090M-1.5	●	0.354	0.373		2.904	1.132	0.563							DA0900M-... ~ DA0940M-...
	DRA095M-1.5	●	0.374	0.393		2.953	1.181	0.591							DA0950M-... ~ DA0990M-...
	SF0625- DRA100M-1.5	●	0.394	0.412	0.625	3.120	1.230	0.622	1.890	0.787	Yes	HS-2534TRP	-	FTP-5	DA1000M-... ~ DA1040M-...
	DRA105M-1.5	●	0.413	0.432		3.169	1.280	0.650							DA1050M-... ~ DA1090M-...
	DRA110M-1.5	●	0.433	0.452		3.258	1.368	0.681							DA1100M-... ~ DA1140M-...
	DRA115M-1.5	●	0.453	0.471		3.307	1.417	0.709							DA1150M-... ~ DA1190M-...
	DRA120M-1.5	●	0.472	0.491		3.356	1.467	0.740							DA1200M-... ~ DA1240M-...
	DRA125M-1.5	●	0.492	0.511		3.406	1.516	0.768							DA1250M-... ~ DA1290M-...
	DRA130M-1.5	●	0.512	0.530		3.455	1.565	0.799							DA1300M-... ~ DA1340M-...
	DRA135M-1.5	●	0.531	0.550		3.504	1.614	0.827							DA1350M-... ~ DA1390M-...
	DRA140M-1.5	●	0.551	0.570		3.553	1.663	0.858				HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-1.5	●	0.571	0.590		3.602	1.713	0.886							DA1450M-... ~ DA1490M-...
	SF0750- DRA150M-1.5	●	0.591	0.629	0.750	3.819	1.850	0.917	1.969	0.984	Yes	HS-3048TRP	DTP-6	-	DA1500M-... ~ DA1590M-...
	DRA160M-1.5	●	0.630	0.668		3.957	1.988	0.976							DA1600M-... ~ DA1690M-...
	DRA170M-1.5	●	0.669	0.708		4.055	2.087	1.035							DA1700M-... ~ DA1790M-...
	DRA180M-1.5	●	0.709	0.747		4.193	2.224	1.094				HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	DRA190M-1.5	●	0.748	0.786		4.291	2.323	1.154							DA1900M-... ~ DA1990M-...
	SF1000- DRA200M-1.5	●	0.787	0.826	1.000	4.626	2.421	1.213	2.205	1.260	Yes	HS-4067TRP	DTP-7	-	DA2000M-... ~ DA2090M-...
	DRA210M-1.5	●	0.827	0.865		4.724	2.520	1.272							DA2100M-... ~ DA2150M-...
	DRA220M-1.5	●	0.866	0.905		4.862	2.657	1.331							DA2200M-... ~ DA2250M-...
	DRA230M-1.5	●	0.906	0.944		4.961	2.756	1.390							DA2300M-... ~ DA2381M-...
	DRA240M-1.5	●	0.945	0.983		5.059	2.854	1.449							DA2400M-... ~ DA2450M-...
	DRA250M-1.5	●	0.984	1.004		5.157	2.953	1.508							DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 3 x DC)



3D

PL indicates distance from drill point to corner edge **Page 6-15**

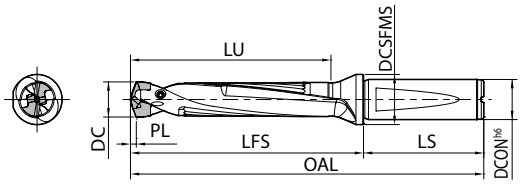
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
Inch	SF0500- DRA080M-3	●	0.313	0.334	0.500	3.307	1.535	1.004	1.772	0.630	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-3	●	0.335	0.353		3.386	1.614	1.063							DA0850M-... ~ DA0890M-...
	DRA090M-3	●	0.354	0.373		3.465	1.693	1.122							DA0900M-... ~ DA0940M-...
	DRA095M-3	●	0.374	0.393		3.543	1.772	1.181							DA0950M-... ~ DA0990M-...
	SF0625- DRA100M-3	●	0.394	0.412	0.625	3.740	1.850	1.240	1.890	0.787	Yes	HS-2534TRP	-	FTP-5	DA1000M-... ~ DA1040M-...
	DRA105M-3	●	0.413	0.432		3.819	1.929	1.299							DA1050M-... ~ DA1090M-...
	DRA110M-3	●	0.433	0.452		3.937	2.047	1.358							DA1100M-... ~ DA1140M-...
	DRA115M-3	●	0.453	0.471		4.016	2.126	1.417							DA1150M-... ~ DA1190M-...
	DRA120M-3	●	0.472	0.491		4.094	2.205	1.476							DA1200M-... ~ DA1240M-...
	DRA125M-3	●	0.492	0.511		4.173	2.283	1.535							DA1250M-... ~ DA1290M-...
	DRA130M-3	●	0.512	0.530		4.252	2.362	1.594							DA1300M-... ~ DA1340M-...
	DRA135M-3	●	0.531	0.550		4.331	2.441	1.654							DA1350M-... ~ DA1390M-...
	DRA140M-3	●	0.551	0.570		4.409	2.520	1.713				HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-3	●	0.571	0.590		4.488	2.598	1.772							DA1450M-... ~ DA1490M-...
	SF0750- DRA150M-3	●	0.591	0.629	0.750	4.764	2.795	1.890	1.969	0.984	Yes	HS-3048TRP	DTP-6	-	DA1500M-... ~ DA1590M-...
	DRA160M-3	●	0.630	0.668		4.961	2.992	2.008							DA1600M-... ~ DA1690M-...
	DRA170M-3	●	0.669	0.708		5.118	3.150	2.126							DA1700M-... ~ DA1790M-...
	DRA180M-3	●	0.709	0.747		5.315	3.346	2.244				HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	DRA190M-3	●	0.748	0.786		5.472	3.504	2.362							DA1900M-... ~ DA1990M-...
	SF1000- DRA200M-3	●	0.787	0.826	1.000	5.866	3.661	2.480	2.205	1.260	Yes	HS-4067TRP	DTP-7	-	DA2000M-... ~ DA2090M-...
	DRA210M-3	●	0.827	0.865		6.024	3.819	2.598							DA2100M-... ~ DA2150M-...
	DRA220M-3	●	0.866	0.905		6.220	4.016	2.717							DA2200M-... ~ DA2250M-...
	DRA230M-3	●	0.906	0.944		6.378	4.173	2.835							DA2300M-... ~ DA2381M-...
	DRA240M-3	●	0.945	0.983		6.535	4.331	2.953							DA2400M-... ~ DA2450M-...
	DRA250M-3	●	0.984	1.004		6.693	4.488	3.071							DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 5 x DC)



5D

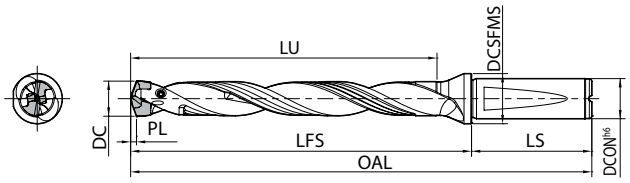
PL indicates distance from drill point to corner edge **Page 6-15**

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
Inch	SF0500- DRA080M-5	●	0.313	0.334	0.500	3.976	2.205	1.673	1.772	0.630	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-5	●	0.335	0.353		4.094	2.323	1.772							DA0850M-... ~ DA0890M-...
	DRA090M-5	●	0.354	0.373		4.213	2.441	1.870							DA0900M-... ~ DA0940M-...
	DRA095M-5	●	0.374	0.393		4.331	2.559	1.969							DA0950M-... ~ DA0990M-...
	SF0625- DRA100M-5	●	0.394	0.412	0.625	4.567	2.677	2.067	1.890	0.787	Yes	HS-2534TRP	-	FTP-5	DA1000M-... ~ DA1040M-...
	DRA105M-5	●	0.413	0.432		4.685	2.795	2.165							DA1050M-... ~ DA1090M-...
	DRA110M-5	●	0.433	0.452		4.843	2.953	2.264							DA1100M-... ~ DA1140M-...
	DRA115M-5	●	0.453	0.471		4.961	3.071	2.362							DA1150M-... ~ DA1190M-...
	DRA120M-5	●	0.472	0.491		5.079	3.189	2.461							DA1200M-... ~ DA1240M-...
	DRA125M-5	●	0.492	0.511		5.197	3.307	2.559							DA1250M-... ~ DA1290M-...
	DRA130M-5	●	0.512	0.530		5.315	3.425	2.657							DA1300M-... ~ DA1340M-...
	DRA135M-5	●	0.531	0.550		5.433	3.543	2.756							DA1350M-... ~ DA1390M-...
	DRA140M-5	●	0.551	0.570		5.551	3.661	2.854				HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-5	●	0.571	0.590		5.669	3.780	2.953							DA1450M-... ~ DA1490M-...
	SF0750- DRA150M-5	●	0.591	0.629	0.750	6.024	4.055	3.150	1.969	0.984	Yes	HS-3048TRP	DTP-6	-	DA1500M-... ~ DA1590M-...
	DRA160M-5	●	0.630	0.668		6.299	4.331	3.346							DA1600M-... ~ DA1690M-...
	DRA170M-5	●	0.669	0.708		6.535	4.567	3.543							DA1700M-... ~ DA1790M-...
	DRA180M-5	●	0.709	0.747		6.811	4.843	3.740				HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	DRA190M-5	●	0.748	0.786		7.047	5.079	3.937							DA1900M-... ~ DA1990M-...
	SF1000- DRA200M-5	●	0.787	0.826	1.000	7.520	5.315	4.134	2.205	1.260	Yes	HS-4067TRP	DTP-7	-	DA2000M-... ~ DA2090M-...
	DRA210M-5	●	0.827	0.865		7.756	5.551	4.331							DA2100M-... ~ DA2150M-...
	DRA220M-5	●	0.866	0.905		8.031	5.827	4.528							DA2200M-... ~ DA2250M-...
	DRA230M-5	●	0.906	0.944		8.268	6.063	4.724							DA2300M-... ~ DA2381M-...
	DRA240M-5	●	0.945	0.983		8.504	6.299	4.921							DA2400M-... ~ DA2450M-...
	DRA250M-5	●	0.984	1.004		8.740	6.535	5.116							DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 8 x DC)



8D

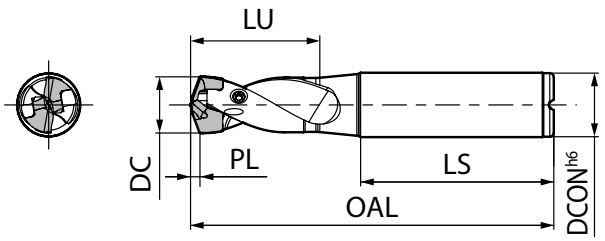
PL indicates distance from drill point to corner edge **Page 6-15**

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
Inch	SF0500- DRA080M-8	●	0.313	0.334	0.500	4.961	3.189	2.677	1.772	0.630	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-8	●	0.335	0.353		5.157	3.386	2.835							DA0850M-... ~ DA0890M-...
	DRA090M-8	●	0.354	0.373		5.315	3.543	2.992							DA0900M-... ~ DA0940M-...
	DRA095M-8	●	0.374	0.393		5.512	3.740	3.150							DA0950M-... ~ DA0990M-...
	SF0625- DRA100M-8	●	0.394	0.412	0.625	5.787	3.898	3.307	1.890	0.787	Yes	HS-2534TRP	-	FTP-5	DA1000M-... ~ DA1040M-...
	DRA105M-8	●	0.413	0.432		5.984	4.094	3.465							DA1050M-... ~ DA1090M-...
	DRA110M-8	●	0.433	0.452		6.181	4.291	3.622							DA1100M-... ~ DA1140M-...
	DRA115M-8	●	0.453	0.471		6.378	4.488	3.780							DA1150M-... ~ DA1190M-...
	DRA120M-8	●	0.472	0.491		6.535	4.646	3.937							DA1200M-... ~ DA1240M-...
	DRA125M-8	●	0.492	0.511		6.732	4.843	4.094							DA1250M-... ~ DA1290M-...
	DRA130M-8	●	0.512	0.530		6.890	5.000	4.252							DA1300M-... ~ DA1340M-...
	DRA135M-8	●	0.531	0.550		7.087	5.197	4.409							DA1350M-... ~ DA1390M-...
	DRA140M-8	●	0.551	0.570		7.244	5.354	4.567				HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-8	●	0.571	0.590		7.441	5.551	4.724							DA1450M-... ~ DA1490M-...
	SF0750- DRA150M-8	●	0.591	0.629	0.750	7.913	5.945	5.039	1.969	0.984	Yes	HS-3048TRP	DTP-6	-	DA1500M-... ~ DA1590M-...
	DRA160M-8	●	0.630	0.668		8.307	6.339	5.354							DA1600M-... ~ DA1690M-...
	DRA170M-8	●	0.669	0.708		8.661	6.693	5.669							DA1700M-... ~ DA1790M-...
	DRA180M-8	●	0.709	0.747		9.055	7.087	5.984				HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	DRA190M-8	●	0.748	0.786		9.409	7.441	6.299							DA1900M-... ~ DA1990M-...
	SF1000- DRA200M-8	●	0.787	0.826	1.000	10.000	7.795	6.614	2.205	1.260	Yes	HS-4067TRP	DTP-7	-	DA2000M-... ~ DA2090M-...
	DRA210M-8	●	0.827	0.865		10.354	8.150	6.929							DA2100M-... ~ DA2150M-...
	DRA220M-8	●	0.866	0.905		10.748	8.543	7.244							DA2200M-... ~ DA2250M-...
	DRA230M-8	●	0.906	0.944		11.102	8.898	7.559							DA2300M-... ~ DA2381M-...
	DRA240M-8	●	0.945	0.983		11.457	9.252	7.874							DA2400M-... ~ DA2450M-...
	DRA250M-8	●	0.984	1.004		11.811	9.606	8.189							DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 1.5 x DC)



1.5D

PL indicates distance from drill point to corner edge **Page 6-15**

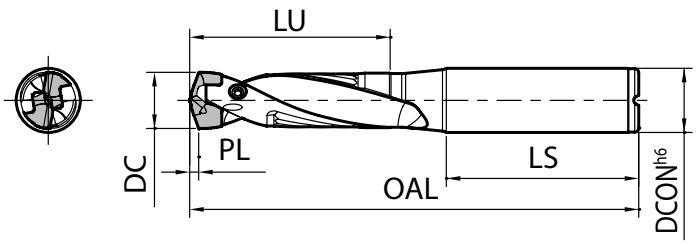
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench	
Inch	SS0375- DRA080M-1.5	●	0.313	0.334	0.375	2.608	0.504	1.575	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-1.5	●	0.335	0.353		2.657	0.531						DA0850M-... ~ DA0890M-...
	DRA090M-1.5	●	0.354	0.373		2.707	0.563						DA0900M-... ~ DA0940M-...
	SS0500- DRA095M-1.5	●	0.374	0.393	0.500	2.953	0.591	1.772	Yes	HS-2534TRP	-	FTP-5	DA0950M-... ~ DA0990M-...
	DRA100M-1.5	●	0.394	0.412		3.002	0.622						DA1000M-... ~ DA1040M-...
	DRA105M-1.5	●	0.413	0.432		3.051	0.650						DA1050M-... ~ DA1090M-...
	DRA110M-1.5	●	0.433	0.452		3.140	0.681						DA1100M-... ~ DA1140M-...
	DRA115M-1.5	●	0.453	0.471		3.189	0.709						DA1150M-... ~ DA1190M-...
	SS0625- DRA120M-1.5	●	0.472	0.491	0.625	3.356	0.740	1.890	Yes	HS-2534TRP	-	FTP-5	DA1200M-... ~ DA1240M-...
	DRA125M-1.5	●	0.492	0.511		3.406	0.768						DA1250M-... ~ DA1290M-...
	DRA130M-1.5	●	0.512	0.530		3.455	0.799						DA1300M-... ~ DA1340M-...
	DRA135M-1.5	●	0.531	0.550		3.504	0.827						DA1350M-... ~ DA1390M-...
	DRA140M-1.5	●	0.551	0.570		3.553	0.858			HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-1.5	●	0.571	0.590		3.602	0.886						DA1450M-... ~ DA1490M-...
	DRA150M-1.5	●	0.591	0.629		3.740	0.917						DA1500M-... ~ DA1590M-...
	SS0750- DRA160M-1.5	●	0.630	0.668	0.750	3.957	0.976	1.969	Yes	HS-3048TRP	DTP-6	-	DA1600M-... ~ DA1690M-...
	DRA170M-1.5	●	0.669	0.708		4.055	1.035						DA1700M-... ~ DA1790M-...
	DRA180M-1.5	●	0.709	0.747		4.193	1.094			HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	SS1000- DRA190M-1.5	●	0.748	0.786	1.000	4.528	1.154	2.205	Yes	HS-4067TRP	DTP-7	-	DA1900M-... ~ DA1990M-...
	DRA200M-1.5	●	0.787	0.826		4.626	1.213						DA2000M-... ~ DA2090M-...
	DRA210M-1.5	●	0.827	0.865		4.724	1.272						DA2100M-... ~ DA2150M-...
	DRA220M-1.5	●	0.866	0.905		4.862	1.331						DA2200M-... ~ DA2250M-...
	DRA230M-1.5	●	0.906	0.944		4.961	1.390						DA2300M-... ~ DA2381M-...
	DRA240M-1.5	●	0.945	0.983		5.059	1.449						DA2400M-... ~ DA2450M-...
	DRA250M-1.5	●	0.984	1.004		5.157	1.508						DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 3 x DC)



3D

PL indicates distance from drill point to corner edge Page 6-15

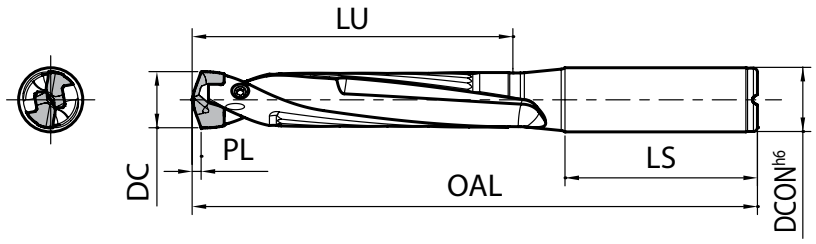
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench	
Inch	SS0375- DRA080M-3	●	0.313	0.334	0.375	3.110	1.004	1.575	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-3	●	0.335	0.353		3.189	1.063						DA0850M-... ~ DA0890M-...
	DRA090M-3	●	0.354	0.373		3.268	1.122						DA0900M-... ~ DA0940M-...
	SS0500- DRA095M-3	●	0.374	0.393	0.500	3.543	1.181	1.772	Yes	HS-2534TRP	-	FTP-5	DA0950M-... ~ DA0990M-...
	DRA100M-3	●	0.394	0.412		3.622	1.240						DA1000M-... ~ DA1040M-...
	DRA105M-3	●	0.413	0.432		3.701	1.299						DA1050M-... ~ DA1090M-...
	DRA110M-3	●	0.433	0.452		3.819	1.358						DA1100M-... ~ DA1140M-...
	DRA115M-3	●	0.453	0.471		3.898	1.417						DA1150M-... ~ DA1190M-...
	SS0625- DRA120M-3	●	0.472	0.491	0.625	4.094	1.476	1.890	Yes	HS-2534TRP	-	FTP-5	DA1200M-... ~ DA1240M-...
	DRA125M-3	●	0.492	0.511		4.173	1.535						DA1250M-... ~ DA1290M-...
	DRA130M-3	●	0.512	0.530		4.252	1.594						DA1300M-... ~ DA1340M-...
	DRA135M-3	●	0.531	0.550		4.331	1.654						DA1350M-... ~ DA1390M-...
	DRA140M-3	●	0.551	0.570		4.409	1.713			HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-3	●	0.571	0.590		4.488	1.772						DA1450M-... ~ DA1490M-...
	DRA150M-3	●	0.591	0.629		4.685	1.890						DA1500M-... ~ DA1590M-...
	SS0750- DRA160M-3	●	0.630	0.668	0.750	4.961	2.008	1.969	Yes	HS-3048TRP	DTP-6	-	DA1600M-... ~ DA1690M-...
	DRA170M-3	●	0.669	0.708		5.118	2.126						DA1700M-... ~ DA1790M-...
	DRA180M-3	●	0.709	0.747		5.315	2.244			HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	SS1000- DRA190M-3	●	0.748	0.786	1.000	5.472	2.362	2.205	Yes	HS-4067TRP	DTP-7	-	DA1900M-... ~ DA1990M-...
	DRA200M-3	●	0.787	0.826		5.866	2.480						DA2000M-... ~ DA2090M-...
	DRA210M-3	●	0.827	0.865		6.024	2.598						DA2100M-... ~ DA2150M-...
	DRA220M-3	●	0.866	0.905		6.220	2.717						DA2200M-... ~ DA2250M-...
	DRA230M-3	●	0.906	0.944		6.378	2.835						DA2300M-... ~ DA2381M-...
	DRA240M-3	●	0.945	0.983		6.535	2.953						DA2400M-... ~ DA2450M-...
	DRA250M-3	●	0.984	1.004		6.693	3.070						DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page Page 6-15 for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 5 x DC)



5D

PL indicates distance from drill point to corner edge **Page 6-15**

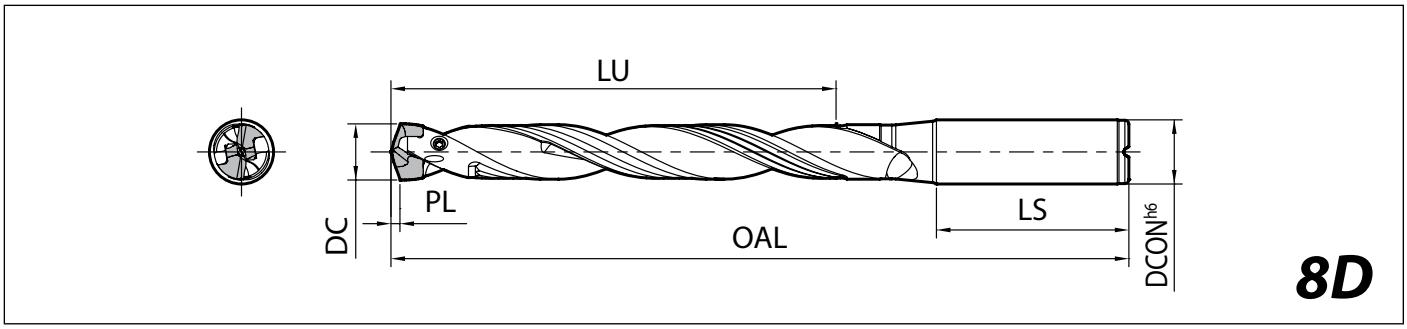
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench	
Inch	SS0375- DRA080M-5	●	0.313	0.334	0.375	3.780	1.673	1.575	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-5	●	0.335	0.353		3.898	1.772						DA0850M-... ~ DA0890M-...
	DRA090M-5	●	0.354	0.373		4.016	1.870						DA0900M-... ~ DA0940M-...
	SS0500- DRA095M-5	●	0.374	0.393	0.500	4.331	1.969	1.772	Yes	HS-2524TRP	-	FTP-5	DA0950M-... ~ DA0990M-...
	DRA100M-5	●	0.394	0.412		4.449	2.067						DA1000M-... ~ DA1040M-...
	DRA105M-5	●	0.413	0.432		4.567	2.165						DA1050M-... ~ DA1090M-...
	DRA110M-5	●	0.433	0.452		4.724	2.264						DA1100M-... ~ DA1140M-...
	DRA115M-5	●	0.453	0.471		4.843	2.362						DA1150M-... ~ DA1190M-...
	SS0625- DRA120M-5	●	0.472	0.491	0.625	5.079	2.461	1.890	Yes	HS-2534TRP	-	FTP-5	DA1200M-... ~ DA1240M-...
	DRA125M-5	●	0.492	0.511		5.197	2.559						DA1250M-... ~ DA1290M-...
	DRA130M-5	●	0.512	0.530		5.315	2.657						DA1300M-... ~ DA1340M-...
	DRA135M-5	●	0.531	0.550		5.433	2.756						DA1350M-... ~ DA1390M-...
	DRA140M-5	●	0.551	0.570		5.551	2.854			HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-5	●	0.571	0.590		5.669	2.953						DA1450M-... ~ DA1490M-...
	DRA150M-5	●	0.591	0.629		5.945	3.150						DA1500M-... ~ DA1590M-...
	SS0750- DRA160M-5	●	0.630	0.668	0.750	6.299	3.346	1.969	Yes	HS-3048TRP	DTP-6	-	DA1600M-... ~ DA1690M-...
	DRA170M-5	●	0.669	0.708		6.535	3.543						DA1700M-... ~ DA1790M-...
	DRA180M-5	●	0.709	0.747		6.811	3.740			HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	SS1000- DRA190M-5	●	0.748	0.786	1.000	7.047	3.937	2.205	Yes	HS-4067TRP	DTP-7	-	DA1900M-... ~ DA1990M-...
	DRA200M-5	●	0.787	0.826		7.520	4.134						DA2000M-... ~ DA2090M-...
	DRA210M-5	●	0.827	0.865		7.756	4.331						DA2100M-... ~ DA2150M-...
	DRA220M-5	●	0.866	0.905		8.031	4.528						DA2200M-... ~ DA2250M-...
	DRA230M-5	●	0.906	0.944		8.268	4.724						DA2300M-... ~ DA2381M-...
	DRA240M-5	●	0.945	0.983		8.504	4.921						DA2400M-... ~ DA2450M-...
	DRA250M-5	●	0.984	1.004		8.740	5.116						DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 8 x DC)



PL indicates distance from drill point to corner edge **Page 6-15**

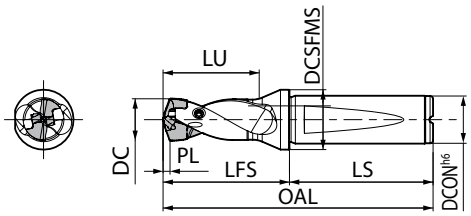
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench	
Inch	SS0375- DRA080M-8	●	0.313	0.334	0.375	4.764	2.677	1.575	Yes	HS-2524TRP	-	FTP-5	DA0794M-... ~ DA0840M-...
	DRA085M-8	●	0.335	0.353		4.961	2.835						DA0850M-... ~ DA0890M-...
	DRA090M-8	●	0.354	0.373		5.118	2.992						DA0900M-... ~ DA0940M-...
	SS0500- DRA095M-8	●	0.374	0.393	0.500	5.512	3.150	1.772	Yes	HS-2524TRP	-	FTP-5	DA0950M-... ~ DA0990M-...
	DRA100M-8	●	0.394	0.412		5.669	3.307						DA1000M-... ~ DA1040M-...
	DRA105M-8	●	0.413	0.432		5.866	3.465						DA1050M-... ~ DA1090M-...
	DRA110M-8	●	0.433	0.452		6.063	3.622						DA1100M-... ~ DA1140M-...
	DRA115M-8	●	0.453	0.471		6.260	3.780						DA1150M-... ~ DA1190M-...
	SS0625- DRA120M-8	●	0.472	0.491	0.625	6.535	3.937	1.890	Yes	HS-2534TRP	-	FTP-5	DA1200M-... ~ DA1240M-...
	DRA125M-8	●	0.492	0.511		6.732	4.094						DA1250M-... ~ DA1290M-...
	DRA130M-8	●	0.512	0.530		6.890	4.252						DA1300M-... ~ DA1340M-...
	DRA135M-8	●	0.531	0.550		7.087	4.409						DA1350M-... ~ DA1390M-...
	DRA140M-8	●	0.551	0.570		7.244	4.567			HS-3048TRP	DTP-6	-	DA1400M-... ~ DA1440M-...
	DRA145M-8	●	0.571	0.590		7.441	4.724						DA1450M-... ~ DA1490M-...
	DRA150M-8	●	0.591	0.629		7.835	5.039						DA1500M-... ~ DA1590M-...
	SS0750- DRA160M-8	●	0.630	0.668	0.750	8.307	5.354	1.969	Yes	HS-3048TRP	DTP-6	-	DA1600M-... ~ DA1690M-...
	DRA170M-8	●	0.669	0.708		8.661	5.669						DA1700M-... ~ DA1790M-...
	DRA180M-8	●	0.709	0.747		9.055	5.984			HS-4067TRP	DTP-7	-	DA1800M-... ~ DA1890M-...
	SS1000- DRA190M-8	●	0.748	0.786	1.000	9.409	6.299	2.205	Yes	HS-4067TRP	DTP-7	-	DA1900M-... ~ DA1990M-...
	DRA200M-8	●	0.787	0.826		10.000	6.614						DA2000M-... ~ DA2090M-...
	DRA210M-8	●	0.827	0.865		10.354	6.929						DA2100M-... ~ DA2150M-...
	DRA220M-8	●	0.866	0.905		10.748	7.244						DA2200M-... ~ DA2250M-...
	DRA230M-8	●	0.906	0.944		11.102	7.559						DA2300M-... ~ DA2381M-...
	DRA240M-8	●	0.945	0.983		11.457	7.874						DA2400M-... ~ DA2450M-...
	DRA250M-8	●	0.984	1.004		11.969	8.189						DA2500M-... ~ DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 1.5 x DC)



1.5D

PL indicates distance from drill point to corner edge **Page 6-15**

Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
mm	SF12- DRA080M-1.5	●	7.94	8.49	12	71.2	26.2	12.8	45	16	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-1.5	●	8.5	8.99		72.5	27.5	13.5							DA0850M-...~DA0890M-...
	DRA090M-1.5	●	9	9.49		73.7	28.7	14.3							DA0900M-...~DA0940M-...
	DRA095M-1.5	●	9.5	9.99		75	30	15							DA0950M-...~DA0990M-...
	SF16- DRA100M-1.5	●	10	10.49	16	79.2	31.2	15.8	48	20	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-1.5	●	10.5	10.99		80.5	32.5	16.5							DA1050M-...~DA1090M-...
	DRA110M-1.5	●	11	11.49		82.7	34.7	17.3							DA1100M-...~DA1140M-...
	DRA115M-1.5	●	11.5	11.99		84	36	18							DA1150M-...~DA1190M-...
	DRA120M-1.5	●	12	12.49		85.2	37.2	18.8							DA1200M-...~DA1240M-...
	DRA125M-1.5	●	12.5	12.99		86.5	38.5	19.5							DA1250M-...~DA1290M-...
	DRA130M-1.5	●	13	13.49		87.7	39.7	20.3							DA1300M-...~DA1340M-...
	DRA135M-1.5	●	13.5	13.99		89	41	21							DA1350M-...~DA1390M-...
	DRA140M-1.5	●	14	14.49		90.2	42.2	21.8				HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-1.5	●	14.5	14.99		91.5	43.5	22.5							DA1450M-...~DA1490M-...
	SF20- DRA150M-1.5	●	15	15.99	20	97	47	24	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-1.5	●	16	16.99		100.5	50.5	25.5							DA1600M-...~DA1690M-...
	DRA170M-1.5	●	17	17.99		103	53	27							DA1700M-...~DA1790M-...
	SF25- DRA180M-1.5	●	18	18.99	25	112.5	56.5	28.5	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-1.5	●	19	19.99		115	59	30							DA1900M-...~DA1990M-...
	DRA200M-1.5	●	20	20.99		117.5	61.5	31.5							DA2000M-...~DA2090M-...
	DRA210M-1.5	●	21	21.99		120	64	33							DA2100M-...~DA2150M-...
	DRA220M-1.5	●	22	22.99		123.5	67.5	34.5							DA2200M-...~DA2250M-...
	DRA230M-1.5	●	23	23.99		126	70	36							DA2300M-...~DA2350M-...
	DRA240M-1.5	●	24	24.99		128.5	72.5	37.5							DA2400M-...~DA2450M-...
	DRA250M-1.5	●	25	25.5		131	75	39							DA2500M-...~DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

Part Number Identification System (Toolholder)

□□○○ - DRA ○○○ M - ○

Shank Type	Shank Dia.(mm)	Minimum Insert Dia.	Metric	Drilling Depth
SS : Straight Shank SF : Flanged Shank				1.5(LU = 1.5 x DC) 3 (LU = 3 x DC) 5 (LU = 5 x DC) 8 (LU = 8 x DC) 12(LU = 12 x DC)

● : Standard Item

SF-DRA (Drilling Depth : 3 x DC)

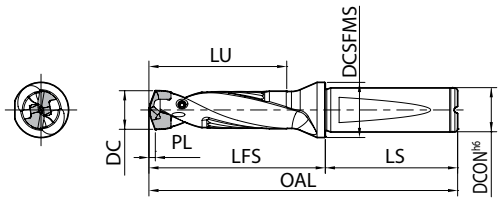


Fig. 1

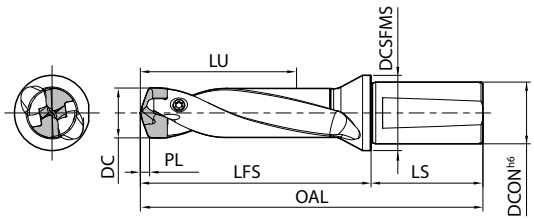


Fig. 2

3D

PL indicates distance from drill point to corner edge **Page 6-15**

Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Fig.	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
mm	SF12- DRA080M-3	●	7.94	8.49	12	84	39	25.5	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-3	●	8.5	8.99		86	41	27				1				DA0850M-...~DA0890M-...
	DRA090M-3	●	9	9.49		88	43	28.5				1				DA0900M-...~DA0940M-...
	DRA095M-3	●	9.5	9.99		90	45	30				1				DA0950M-...~DA0990M-...
	SF16- DRA100M-3	●	10	10.49	16	95	47	31.5	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-3	●	10.5	10.99		97	49	33				1				DA1050M-...~DA1090M-...
	DRA110M-3	●	11	11.49		100	52	34.5				1				DA1100M-...~DA1140M-...
	DRA115M-3	●	11.5	11.99		102	54	36				1				DA1150M-...~DA1190M-...
	DRA120M-3	●	12	12.49		104	56	37.5				1				DA1200M-...~DA1240M-...
	DRA125M-3	●	12.5	12.99		106	58	39				1				DA1250M-...~DA1290M-...
	DRA130M-3	●	13	13.49		108	60	40.5				1				DA1300M-...~DA1340M-...
	DRA135M-3	●	13.5	13.99		110	62	42				1				DA1350M-...~DA1390M-...
	DRA140M-3	●	14	14.49		112	64	43.5				1	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-3	●	14.5	14.99		114	66	45				1				DA1450M-...~DA1490M-...
	SF20- DRA150M-3	●	15	15.99	20	121	71	48	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-3	●	16	16.99		126	76	51				1				DA1600M-...~DA1690M-...
	DRA170M-3	●	17	17.99		130	80	54				1				DA1700M-...~DA1790M-...
	SF25- DRA180M-3	●	18	18.99	25	141	85	57	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-3	●	19	19.99		145	89	60				1				DA1900M-...~DA1990M-...
	DRA200M-3	●	20	20.99		149	93	63				1				DA2000M-...~DA2090M-...
	DRA210M-3	●	21	21.99		153	97	66				1				DA2100M-...~DA2150M-...
	DRA220M-3	●	22	22.99		158	102	69				1				DA2200M-...~DA2250M-...
	DRA230M-3	●	23	23.99		162	106	72				1				DA2300M-...~DA2350M-...
	DRA240M-3	●	24	24.99		166	110	75				1				DA2400M-...~DA2450M-...
	DRA250M-3	●	25	25.99		170	114	78				1				DA2500M-...~DA2550M-...
	SF32- DRA260M-3	●	26	26.99	32	178	120	81	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...
	DRA270M-3	●	27	27.99		181	123	84				2				DA2700M-...~DA2750M-...
	DRA280M-3	●	28	28.99		185	127	87				2				DA2800M-...~DA2850M-...
	DRA290M-3	●	29	29.99		189	131	90				2				DA2900M-...~DA2950M-...
	DRA300M-3	●	30	30.99		193	135	93				2				DA3000M-...~DA3050M-...
	DRA310M-3	●	31	31.99		196	138	96				2				DA3100M-...~DA3150M-...
	DRA320M-3	●	32	33		200	142	99				2				DA3200M-...~DA3300M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 5 x DC)

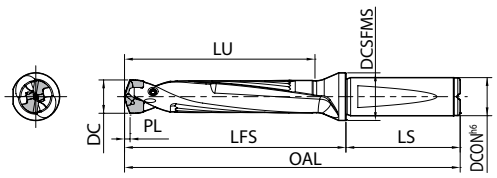


Fig. 1

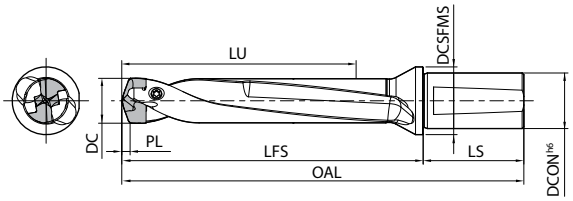


Fig. 2

5D

PL indicates distance from drill point to corner edge **Page 6-15**

Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Fig.	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
mm	SF12- DRA080M-5	●	7.94	8.49	12	101	56	42.5	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-5	●	8.5	8.99		104	59	45				1				DA0850M-...~DA0890M-...
	DRA090M-5	●	9	9.49		107	62	47.5				1				DA0900M-...~DA0940M-...
	DRA095M-5	●	9.5	9.99		110	65	50				1				DA0950M-...~DA0990M-...
	SF16- DRA100M-5	●	10	10.49	16	116	68	52.5	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-5	●	10.5	10.99		119	71	55				1				DA1050M-...~DA1090M-...
	DRA110M-5	●	11	11.49		123	75	57.5				1				DA1100M-...~DA1140M-...
	DRA115M-5	●	11.5	11.99		126	78	60				1				DA1150M-...~DA1190M-...
	DRA120M-5	●	12	12.49		129	81	62.5				1				DA1200M-...~DA1240M-...
	DRA125M-5	●	12.5	12.99		132	84	65				1				DA1250M-...~DA1290M-...
	DRA130M-5	●	13	13.49		135	87	67.5				1				DA1300M-...~DA1340M-...
	DRA135M-5	●	13.5	13.99		138	90	70				1				DA1350M-...~DA1390M-...
	DRA140M-5	●	14	14.49		141	93	72.5				1	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-5	●	14.5	14.99		144	96	75				1				DA1450M-...~DA1490M-...
	SF20- DRA150M-5	●	15	15.99	20	153	103	80	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-5	●	16	16.99		160	110	85				1				DA1600M-...~DA1690M-...
	DRA170M-5	●	17	17.99		166	116	90				1				DA1700M-...~DA1790M-...
	SF25- DRA180M-5	●	18	18.99	25	179	123	95	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-5	●	19	19.99		185	129	100				1				DA1900M-...~DA1990M-...
	DRA200M-5	●	20	20.99		191	135	105				1				DA2000M-...~DA2090M-...
	DRA210M-5	●	21	21.99		197	141	110				1				DA2100M-...~DA2150M-...
	DRA220M-5	●	22	22.99		204	148	115				1				DA2200M-...~DA2250M-...
	DRA230M-5	●	23	23.99		210	154	120				1				DA2300M-...~DA2350M-...
	DRA240M-5	●	24	24.99		216	160	125				1				DA2400M-...~DA2450M-...
	DRA250M-5	●	25	25.99		222	166	130				1				DA2500M-...~DA2550M-...
	SF32- DRA260M-5	●	26	26.99	32	232	174	135	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...
	DRA270M-5	●	27	27.99		237	179	140				2				DA2700M-...~DA2750M-...
	DRA280M-5	●	28	28.99		243	185	145				2				DA2800M-...~DA2850M-...
	DRA290M-5	●	29	29.99		249	191	150				2				DA2900M-...~DA2950M-...
	DRA300M-5	●	30	30.99		255	197	155				2				DA3000M-...~DA3050M-...
	DRA310M-5	●	31	31.99		260	202	160				2				DA3100M-...~DA3150M-...
	DRA320M-5	●	32	33		266	208	165				2				DA3200M-...~DA3300M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 8 x DC)

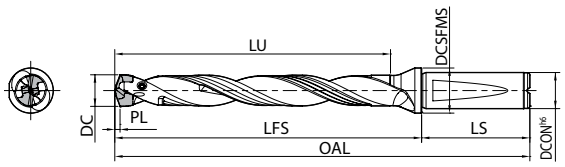


Fig. 1

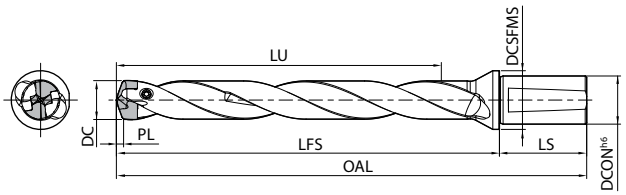


Fig. 2

8D

PL indicates distance from drill point to corner edge **Page 6-15**

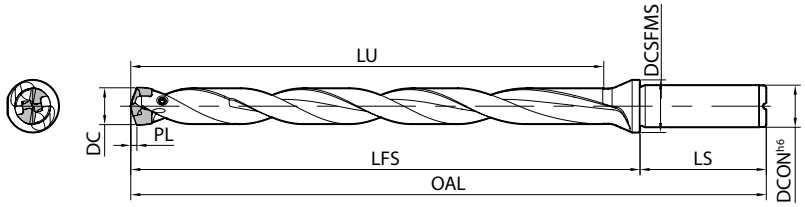
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Fig.	Spare Parts			Applicable Inserts **Page 6-15**
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
mm	SF12- DRA080M-8	●	7.94	8.49	12	126	81	68	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
	DRA085M-8	●	8.5	8.99		131	86	72				1				DA0850M-...~DA0890M-...
	DRA090M-8	●	9	9.49		135	90	76				1				DA0900M-...~DA0940M-...
	DRA095M-8	●	9.5	9.99		140	95	80				1				DA0950M-...~DA0990M-...
	SF16- DRA100M-8	●	10	10.49	16	147	99	84	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
	DRA105M-8	●	10.5	10.99		152	104	88				1				DA1050M-...~DA1090M-...
	DRA110M-8	●	11	11.49		157	109	92				1				DA1100M-...~DA1140M-...
	DRA115M-8	●	11.5	11.99		162	114	96				1				DA1150M-...~DA1190M-...
	DRA120M-8	●	12	12.49		166	118	100				1				DA1200M-...~DA1240M-...
	DRA125M-8	●	12.5	12.99		171	123	104				1				DA1250M-...~DA1290M-...
	DRA130M-8	●	13	13.49		175	127	108				1				DA1300M-...~DA1340M-...
	DRA135M-8	●	13.5	13.99		180	132	112				1				DA1350M-...~DA1390M-...
	DRA140M-8	●	14	14.49		184	136	116				1	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-8	●	14.5	14.99		189	141	120				1				DA1450M-...~DA1490M-...
	SF20- DRA150M-8	●	15	15.99	20	201	151	128	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-8	●	16	16.99		211	161	136				1				DA1600M-...~DA1690M-...
	DRA170M-8	●	17	17.99		220	170	144				1				DA1700M-...~DA1790M-...
	SF25- DRA180M-8	●	18	18.99	25	236	180	152	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-8	●	19	19.99		245	189	160				1				DA1900M-...~DA1990M-...
	DRA200M-8	●	20	20.99		254	198	168				1				DA2000M-...~DA2090M-...
	DRA210M-8	●	21	21.99		263	207	176				1				DA2100M-...~DA2150M-...
	DRA220M-8	●	22	22.99		273	217	184				1				DA2200M-...~DA2250M-...
	DRA230M-8	●	23	23.99		282	226	192				1				DA2300M-...~DA2350M-...
	DRA240M-8	●	24	24.99		291	235	200				1				DA2400M-...~DA2450M-...
	DRA250M-8	●	25	25.99		300	244	208				1				DA2500M-...~DA2550M-...
	SF32- DRA260M-8	●	26	26.99	32	313	255	216	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...
	DRA270M-8	●	27	27.99		321	263	224				2				DA2700M-...~DA2750M-...
	DRA280M-8	●	28	28.99		330	272	232				2				DA2800M-...~DA2850M-...
	DRA290M-8	●	29	29.99		339	281	240				2				DA2900M-...~DA2950M-...
	DRA300M-8	●	30	30.99		348	290	248				2				DA3000M-...~DA3050M-...
	DRA310M-8	●	31	31.99		356	298	256				2				DA3100M-...~DA3150M-...
	DRA320M-8	●	32	33		365	307	264				2				DA3200M-...~DA3300M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SF-DRA (Drilling Depth : 12 x DC)



12D

PL indicates distance from drill point to corner edge **Page 6-15**

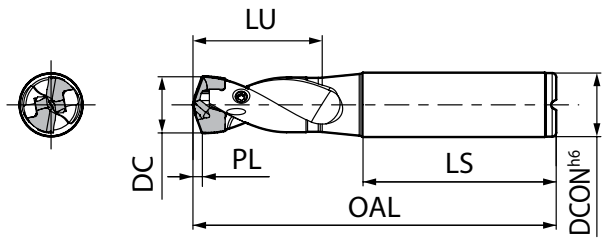
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions								Coolant Hole	Spare Parts			Applicable Inserts Page 6-15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
mm	SF16- DRA120M-12	●	12	12.49	16	216	168	150	48	20	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...
	DRA125M-12	●	12.5	12.99		223	175	156							DA1250M-...~DA1290M-...
	DRA130M-12	●	13	13.49		229	181	162							DA1300M-...~DA1340M-...
	DRA135M-12	●	13.5	13.99		236	188	168							DA1350M-...~DA1390M-...
	DRA140M-12	●	14	14.49		242	194	174				HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...
	DRA145M-12	●	14.5	14.99		249	201	180							DA1450M-...~DA1490M-...
	SF20- DRA150M-12	●	15	15.99	20	265	215	192	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
	DRA160M-12	●	16	16.99		279	229	204							DA1600M-...~DA1690M-...
	DRA170M-12	●	17	17.99		292	242	216							DA1700M-...~DA1790M-...
	SF25- DRA180M-12	●	18	18.99	25	312	256	228	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
	DRA190M-12	●	19	19.99		325	269	240							DA1900M-...~DA1990M-...
	DRA200M-12	●	20	20.99		338	282	252							DA2000M-...~DA2090M-...
	DRA210M-12	●	21	21.99		351	295	264							DA2100M-...~DA2150M-...
	DRA220M-12	●	22	22.99		365	309	276							DA2200M-...~DA2250M-...
	DRA230M-12	●	23	23.99		378	322	288							DA2300M-...~DA2350M-...
	DRA240M-12	●	24	24.99		391	335	300							DA2400M-...~DA2450M-...
	DRA250M-12	●	25	25.5		404	348	312							DA2500M-...~DA2550M-...

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 1.5 x DC)



1.5D

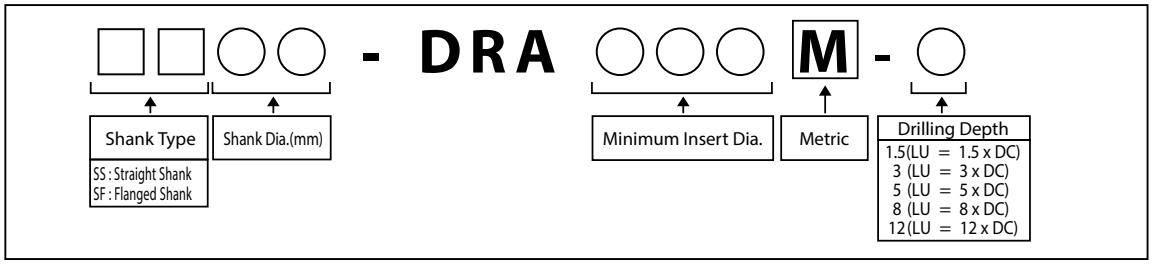
PL indicates distance from drill point to corner edge **Page 6-15**

Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**	Applicable Chamfering Attachment **Page 33**
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
mm	SS10- DRA080M-1.5	●	7.94	8.49	10	66.2	12.8	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-1.5	●	8.5	8.99		67.5	13.5						DA0850M-...~DA0890M-...	
	DRA090M-1.5	●	9	9.49		68.7	14.3						DA0900M-...~DA0940M-...	
	DRA095M-1.5	●	9.5	9.99		70	15						DA0950M-...~DA0990M-...	
	SS12- DRA100M-1.5	●	10	10.49	12	76.2	15.8	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-1.5	●	10.5	10.99		77.5	16.5						DA1050M-...~DA1090M-...	
	DRA110M-1.5	●	11	11.49		79.7	17.3						DA1100M-...~DA1140M-...	
	DRA115M-1.5	●	11.5	11.99		81	18						DA1150M-...~DA1190M-...	
	SS14- DRA120M-1.5	●	12	12.49	14	82.2	18.8	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-1.5	●	12.5	12.99		83.5	19.5						DA1250M-...~DA1290M-...	
	DRA130M-1.5	●	13	13.49		84.7	20.3						DA1300M-...~DA1340M-...	
	DRA135M-1.5	●	13.5	13.99		86	21						DA1350M-...~DA1390M-...	
	SS16- DRA140M-1.5	●	14	14.49	16	90.2	21.8	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-1.5	●	14.5	14.99		91.5	22.5						DA1450M-...~DA1490M-...	
	DRA150M-1.5	●	15	15.99		95	24						DA1500M-...~DA1590M-...	
	SS18- DRA160M-1.5	●	16	16.99	18	98.5	25.5	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-1.5	●	17	17.99		101	27						DA1700M-...~DA1790M-...	
	SS20- DRA180M-1.5	●	18	18.99	20	106.5	28.5	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-1.5	●	19	19.99		109	30						DA1900M-...~DA1990M-...	
	SS25- DRA200M-1.5	●	20	20.99	25	117.5	31.5	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-1.5	●	21	21.99		120	33						DA2100M-...~DA2150M-...	
	DRA220M-1.5	●	22	22.99		123.5	34.5						DA2200M-...~DA2250M-...	
	DRA230M-1.5	●	23	23.99		126	36						DA2300M-...~DA2350M-...	
	DRA240M-1.5	●	24	24.99		128.5	37.5						DA2400M-...~DA2450M-...	
	SS32- DRA250M-1.5	●	25	25.5	32	135	39	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

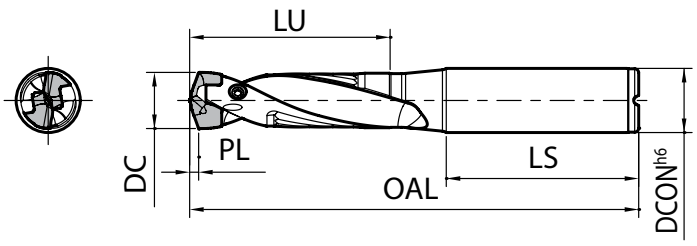
DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

Part Number Identification System (Toolholder)



● : Standard Item

SS-DRA (Drilling Depth : 3 x DC)



3D

PL indicates distance from drill point to corner edge Page 6-15

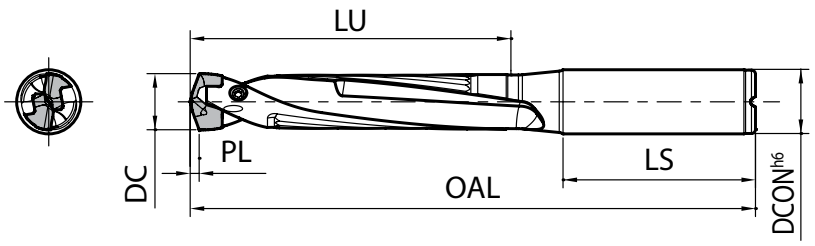
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts Page 6-15	Applicable Chamfering Attachment Page 33
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
mm	SS10- DRA080M-3	●	7.94	8.49	10	79	25.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-3	●	8.5	8.99		81	27						DA0850M-...~DA0890M-...	
	DRA090M-3	●	9	9.49		83	28.5						DA0900M-...~DA0940M-...	
	DRA095M-3	●	9.5	9.99		85	30						DA0950M-...~DA0990M-...	
	SS12- DRA100M-3	●	10	10.49	12	92	31.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-3	●	10.5	10.99		94	33						DA1050M-...~DA1090M-...	
	DRA110M-3	●	11	11.49		97	34.5						DA1100M-...~DA1140M-...	
	DRA115M-3	●	11.5	11.99		99	36						DA1150M-...~DA1190M-...	
	SS14- DRA120M-3	●	12	12.49	14	101	37.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-3	●	12.5	12.99		103	39						DA1250M-...~DA1290M-...	
	DRA130M-3	●	13	13.49		105	40.5						DA1300M-...~DA1340M-...	
	DRA135M-3	●	13.5	13.99		107	42						DA1350M-...~DA1390M-...	
	SS16- DRA140M-3	●	14	14.49	16	112	43.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-3	●	14.5	14.99		114	45						DA1450M-...~DA1490M-...	
	DRA150M-3	●	15	15.99		119	48						DA1500M-...~DA1590M-...	
	SS18- DRA160M-3	●	16	16.99	18	124	51	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-3	●	17	17.99		128	54						DA1700M-...~DA1790M-...	
	SS20- DRA180M-3	●	18	18.99	20	135	57	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~ DA1890M-...	S32-CH20-DRA
	DRA190M-3	●	19	19.99		139	60						DA1900M-...~DA1990M-...	
	SS25- DRA200M-3	●	20	20.99	25	149	63	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-3	●	21	21.99		153	66						DA2100M-...~DA2150M-...	
	DRA220M-3	●	22	22.99		158	69						DA2200M-...~DA2250M-...	
	DRA230M-3	●	23	23.99		162	72						DA2300M-...~DA2350M-...	
	DRA240M-3	●	24	24.99		166	75						DA2400M-...~DA2450M-...	
	SS32- DRA250M-3	●	25	25.5	32	174	78	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page Page 6-15 for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 5 x DC)



5D

PL indicates distance from drill point to corner edge **Page 6-15**

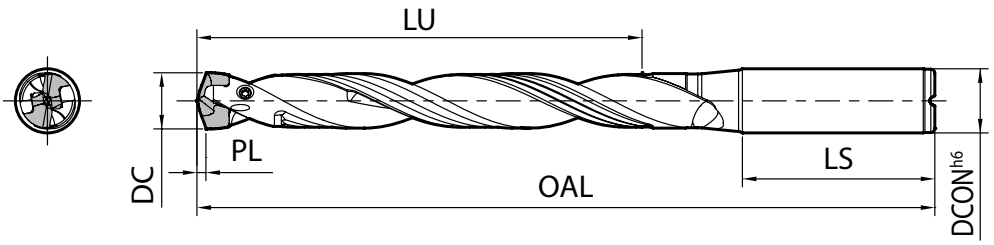
Toolholder Dimensions

Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts **Page 6-15**	Applicable Chamfering Attachment **Page 33**
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
mm	SS10- DRA080M-5	●	7.94	8.49	10	96	42.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-5	●	8.5	8.99		99	45						DA0850M-...~DA0890M-...	
	DRA090M-5	●	9	9.49		102	47.5						DA0900M-...~DA0940M-...	
	DRA095M-5	●	9.5	9.99		105	50						DA0950M-...~DA0990M-...	
	SS12- DRA100M-5	●	10	10.49	12	113	52.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-5	●	10.5	10.99		116	55						DA1050M-...~DA1090M-...	
	DRA110M-5	●	11	11.49		120	57.5						DA1100M-...~DA1140M-...	
	DRA115M-5	●	11.5	11.99		123	60						DA1150M-...~DA1190M-...	
	SS14- DRA120M-5	●	12	12.49	14	126	62.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-5	●	12.5	12.99		129	65						DA1250M-...~DA1290M-...	
	DRA130M-5	●	13	13.49		132	67.5						DA1300M-...~DA1340M-...	
	DRA135M-5	●	13.5	13.99		135	70						DA1350M-...~DA1390M-...	
	SS16- DRA140M-5	●	14	14.49	16	141	72.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-5	●	14.5	14.99		144	75						DA1450M-...~DA1490M-...	
	DRA150M-5	●	15	15.99		151	80						DA1500M-...~DA1590M-...	
	SS18- DRA160M-5	●	16	16.99	18	158	85	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-5	●	17	17.99		164	90						DA1700M-...~DA1790M-...	
	SS20- DRA180M-5	●	18	18.99	20	173	95	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-5	●	19	19.99		179	100						DA1900M-...~DA1990M-...	
	SS25- DRA200M-5	●	20	20.99	25	191	105	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-5	●	21	21.99		197	110						DA2100M-...~DA2150M-...	
	DRA220M-5	●	22	22.99		204	115						DA2200M-...~DA2250M-...	
	DRA230M-5	●	23	23.99		210	120						DA2300M-...~DA2350M-...	
	DRA240M-5	●	24	24.99		216	125						DA2400M-...~DA2450M-...	
	SS32- DRA250M-5	●	25	25.5	32	226	130	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

● : Standard Item

SS-DRA (Drilling Depth : 8 x DC)



8D

PL indicates distance from drill point to corner edge **Page 6-15**

Toolholder Dimensions

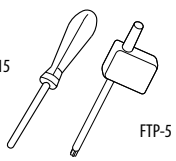
Unit	Part Number	Std. Item	Dimensions						Coolant Hole	Spare Parts			Applicable Inserts Page 6-15	Applicable Chamfering Attachment Page 33
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
mm	SS10- DRA080M-8	●	7.94	8.49	10	121	68	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	DRA085M-8	●	8.5	8.99		126	72						DA0850M-...~DA0890M-...	
	DRA090M-8	●	9	9.49		130	76						DA0900M-...~DA0940M-...	
	DRA095M-8	●	9.5	9.99		135	80						DA0950M-...~DA0990M-...	
	SS12- DRA100M-8	●	10	10.49	12	144	84	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	DRA105M-8	●	10.5	10.99		149	88						DA1050M-...~DA1090M-...	
	DRA110M-8	●	11	11.49		154	92						DA1100M-...~DA1140M-...	
	DRA115M-8	●	11.5	11.99		159	96						DA1150M-...~DA1190M-...	
	SS14- DRA120M-8	●	12	12.49	14	163	100	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	DRA125M-8	●	12.5	12.99		168	104						DA1250M-...~DA1290M-...	
	DRA130M-8	●	13	13.49		172	108						DA1300M-...~DA1340M-...	
	DRA135M-8	●	13.5	13.99		177	112						DA1350M-...~DA1390M-...	
	SS16- DRA140M-8	●	14	14.49	16	184	116	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	DRA145M-8	●	14.5	14.99		189	120						DA1450M-...~DA1490M-...	
	DRA150M-8	●	15	15.99		199	128						DA1500M-...~DA1590M-...	
	SS18- DRA160M-8	●	16	16.99	18	209	136	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	DRA170M-8	●	17	17.99		218	144						DA1700M-...~DA1790M-...	
	SS20- DRA180M-8	●	18	18.99	20	230	152	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	DRA190M-8	●	19	19.99		239	160						DA1900M-...~DA1990M-...	
	SS25- DRA200M-8	●	20	20.99	25	254	168	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	DRA210M-8	●	21	21.99		263	176						DA2100M-...~DA2150M-...	
	DRA220M-8	●	22	22.99		273	184						DA2200M-...~DA2250M-...	
	DRA230M-8	●	23	23.99		282	192						DA2300M-...~DA2350M-...	
	DRA240M-8	●	24	24.99		291	200						DA2400M-...~DA2450M-...	
	SS32- DRA250M-8	●	25	25.5	32	304	208	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

DC min. and max. show the cutting diameter range of inserts that will fit into the toolholder.
See applicable insert tables on Page **Page 6-15** for actual cutting diameters (DC).

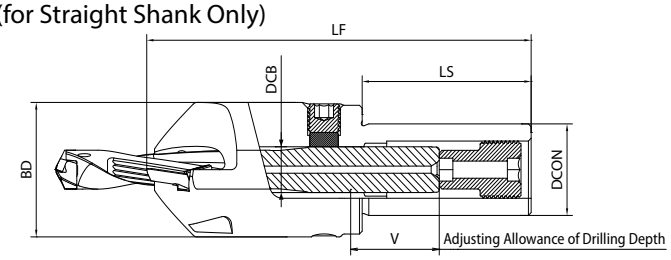
● : Standard Item

DRA Drill Spare Parts List

Clamp Screw	Part Number
HS-2524TRP HS-2534TRP HS-3048TRP HS-4067TRP  HS-50100TRP	HS-2524TRP
	HS-2534TRP
	HS-3048TRP
	HS-4067TRP
	HS-50100TRP

Wrench	Part Number	Torque
DTP-6 DTP-7 DTPM-15  FTP-5	FTP-5	0.5 Nm (4.4 in/lb)
	DTP-6	0.8 Nm (7.1 in/lb)
	DTP-7	1.2 Nm (10.6 in/lb)
	DTPM-15	3.5 Nm (31.0 in/lb)

Chamfering Attachment (for Straight Shank Only)

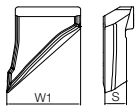


Dimensions

Unit	Part Number	Std. Item	Applicable Drill Shank Dia. DCB	Dimensions (mm)					Applicable Chamfer Insert
				DCON	BD	LF	LS	V (Max)	
mm	S20-CH10-DRA	●	10	20	39	110	52	18	CT12T3-45DA
	S32-CH12-DRA	●	12	32	43	130	62	24	
	S32-CH14-DRA	●	14	32	45	130	62	24	
	S32-CH16-DRA	●	16	32	47	141	62	24	
	S32-CH18-DRA	●	18	32	49	145	62	24	
	S32-CH20-DRA	●	20	32	53	150	62	24.5	

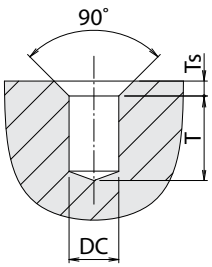
● : Standard Item

Applicable Insert

Shape		Part Number	MEGACOAT NANO	Dimensions (mm)	
			PR1535	W1	S
		CT12T3-45DA	●	13.54	3.97

● : Standard Item

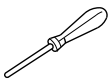
Drilling and Chamfering Depths



Cutting Dia. (mm) DC		Drilling Depth (mm)						Chamfering Dimensions (mm)		Applicable Chamfering Attachment
		T (3XD)		T (5XD)		T (8XD)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts	Tsmax.	
7.94	8.49	12.5	20	18	36	43	60	2.5	8	S20-CH10-DRA
8.50	8.99	12.5	21.5	21.5	38.5	48	64			
9.00	9.49	12.5	23	24	41	52	68			
9.50	9.99	12.5	24.5	27.5	43.5	57.5	72.5			
10.00	10.49	15.5	26	22	46	52	76	4	8	S32-CH12-DRA
10.50	10.99	16	27.5	24.5	48.5	56	80			
11.00	11.49	16.5	29	27	51	60	84			
11.50	11.99	17.5	30.5	29.5	53.5	64	88			
12.00	12.49	18	32	32	56	68	92	4	8	S32-CH14-DRA
12.50	12.99	19	34	35	59	72.5	96.5			
13.00	13.49	19.5	35.5	37.5	61.5	76	100			
13.50	13.99	20	36.5	39.5	63.5	80	104			
14.00	14.49	21	38.5	42.5	66.5	84.5	108.5	4	8	S32-CH16-DRA
14.50	14.99	21.5	40	45	69	88.5	112.5			
15.00	15.99	22.5	41.5	47.5	71.5	92.5	116.5			
16.00	16.99	24	44.5	52.5	76.5	100.5	124.5	4	8	S32-CH18-DRA
17.00	17.99	25.5	47.5	57.5	81.5	108.5	132.5			
18.00	18.99	27.5	51	64	87	121	141	4	8	S32-CH20-DRA
19.00	19.99	29.5	54	69	92	129	149			

Ts: Max. chamfering dimension at the full feed.
Tsmax.: Max. chamfering dimension at a 50% feed reduction.

Chamfer Attachment Spare Parts

Chamfering Attachment	Adjusting Screw		For Fixing Drills					For Mounting Inserts		
			Clamp	Clamp Screw			Plug Screw	Clamp	Clamp Screw	Wrench
Part Number		Width Across Flat (mm)			Width Across Flat (mm)	Torque [N·m]				
S20-CH10-DRA	AJ-12X22	6	CP-CH10	HS8X8	4	12	BNP6	C09N	W6X18N	DTM-15
S32-CH12-DRA	AJ-16X30		CP-CH12			15				
S32-CH14-DRA	AJ-20X30	8	CP-CH14	HS10X10	5	20				
S32-CH16-DRA			CP-CH16	HS12X10	6	30				
S32-CH18-DRA	AJ-22x35	10	CP-CH18			30				
S32-CH20-DRA			CP-CH20	HS16X10	8	45				

DRA Chamfering Attachment Method

1. Mount DRA drill into the chamfering attachment (Fig.1)

Fig.1 Install the DRA

2. Install an insert and tighten temporarily with clearance between the cutting edge and DRA body (Fig.2)

Fig.2 Install Inserts

3. Adjust drilling depth by turning adjustment screw withhexagon wrench (Fig.3)

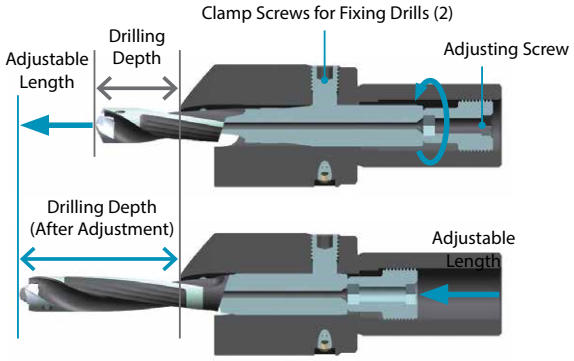


Fig.3 Adjustment of Drilling Depth

4. Align the flute edge and black relief part of the drill to the position shown by rotating the DRA drill (Fig.4)

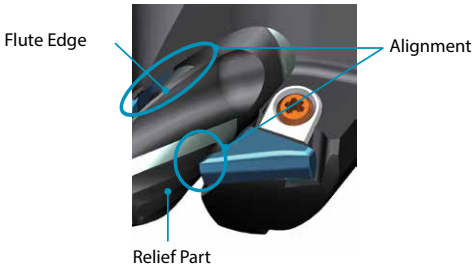


Fig.4 DRA Alignment

5. Fasten the two clamp screws for DRA (See table 1. for recommended torque)

Table1. Recommended Torque

Chamfering Attachment Part Number	Clamp Screw	
	Recommended Torque (N·m)	Width Across Flat (mm)
S20-CH10-DRA	12	4
S32-CH12-DRA	15	
S32-CH14-DRA	20	5
S32-CH16-DRA	30	6
S32-CH18-DRA	30	
S32-CH20-DRA	45	8

6. Tighten the inserts while lightly pressing the edge of insert against the relief part (Fig.5) (Recommended torque is 3.5Nm)

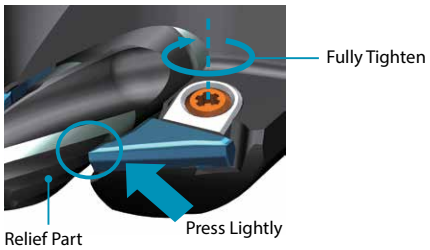


Fig.5 Fully Tighten

Cautions

- Chamfering attachment is compatible with straight shank SS-DRA. It cannot be used for flanged shank SF-DRA.
- Chamfering requires two chamfering inserts. Using one insert is not recommended.
- Only fully remove clamp screws when replacing them.
- Clamps and clamp screws for mounting inserts need to be replaced regularly.
- Screw locking adhesive is applied to adjustment screw. The effect will eventually wear off if the screws are used for a long time. Regular replacement is recommended.
- Please do not operate the plug screws.

GM Inserts - General Purpose

★ : 1st Recommendation ☆ : 2nd Recommendation

Workpiece Material	Recommended Grade / Cutting Speed (sfm)		Cutting Dia. DC (in)	Cutting Dia. DC (mm)	Holder Type (Cutting Depth) Feed Rate (ipr)			Notes
	PR1535	PR1525			1.5D & 3D	5D & 8D	12D	
Low Carbon Steel	★ 330-590	☆ 330-590	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	Coolant See Page 38
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	~	
			1.299	33.00	0.0079 ~ 0.0177	0.0063 ~ 0.0142		
Carbon Steel	★ 330-490	☆ 330-490	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	~	
			1.299	33.00	0.0079 ~ 0.0177	0.0063 ~ 0.0142		
Alloy Steel	★ 230-390	☆ 230-390	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	~	
			1.299	33.00	0.0079 ~ 0.0177	0.0063 ~ 0.0142		
Tool Steel	★ 160-300	☆ 160-300	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0067	0.0025 ~ 0.0054	0.0022 ~ 0.0047	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0031 ~ 0.0087	0.0025 ~ 0.0069	0.0022 ~ 0.0061	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0043 ~ 0.0098	0.0035 ~ 0.0079	0.0030 ~ 0.0069	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0043 ~ 0.0110	0.0035 ~ 0.0088	0.0030 ~ 0.0077	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0055 ~ 0.0126	0.0044 ~ 0.0101	0.0039 ~ 0.0088	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0055 ~ 0.0126	0.0044 ~ 0.0101	0.0039 ~ 0.0088	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0055 ~ 0.0126	0.0044 ~ 0.0101	~	
			1.299	33.00	0.0055 ~ 0.0126	0.0044 ~ 0.0101		
Stainless Steel※	★ 130-230	☆ 130-230	0.313 ~ 0.429	7.94 ~ 10.90	0.0039 ~ 0.0094	0.0031 ~ 0.0076	0.0028 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0039 ~ 0.0094	0.0031 ~ 0.0076	0.0028 ~ 0.0066	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0047 ~ 0.0118	0.0038 ~ 0.0094	0.0033 ~ 0.0083	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0059 ~ 0.0118	0.0047 ~ 0.0094	0.0041 ~ 0.0083	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0059 ~ 0.0118	0.0047 ~ 0.0094	0.0041 ~ 0.0083	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0059 ~ 0.0138	0.0047 ~ 0.0110	0.0041 ~ 0.0096	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0059 ~ 0.0138	0.0047 ~ 0.0110	~	
			1.299	33.00	0.0059 ~ 0.0138	0.0047 ~ 0.0110		
Gray Cast Iron	☆ 300-560	★ 300-560	0.313 ~ 0.429	7.94 ~ 10.90	0.0055 ~ 0.0114	0.0044 ~ 0.0091	0.0039 ~ 0.0080	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0055 ~ 0.0146	0.0044 ~ 0.0117	0.0039 ~ 0.0102	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0075 ~ 0.0169	0.0060 ~ 0.0135	0.0052 ~ 0.0119	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0075 ~ 0.0177	0.0060 ~ 0.0142	0.0052 ~ 0.0124	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0094 ~ 0.0177	0.0076 ~ 0.0142	0.0066 ~ 0.0124	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0094 ~ 0.0177	0.0076 ~ 0.0142	0.0066 ~ 0.0124	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0094 ~ 0.0177	0.0076 ~ 0.0142	~	
			1.299	33.00	0.0094 ~ 0.0177	0.0076 ~ 0.0142		
Nodular Cast Iron	☆ 130-390	★ 130-390	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.122	25.00 ~ 28.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			1.142 ~ 1.280	29.00 ~ 32.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	~	
			1.299	33.00	0.0079 ~ 0.0177	0.0063 ~ 0.0142		

※ Feed Rate 0.006 ipr or less is recommended for stainless steel until drilling depth reaches 0.5D.
Internal and External coolant recommended for Stainless, Heat-resistant Alloys, and Titanium

As drilling depth increases (**1.5D → 3D → 5D → 8D → 12D**), feed rates should be reduced.
Recommended Feed Rate Shows: **1.5D/3D** = 100%, **5D/8D** ≤ 80%, **12D** ≤ 70%
Recommended Cutting Speed: **8D** ≤ 80%, **12D** ≤ 70%

FTP Inserts - Flat Bottom, Counterboring / **FTP-H Inserts** Steel Beam Drilling

★ : 1st Recommendation ☆ : 2nd Recommendation

Workpiece Material	Recommended Grade / Cutting Speed (sfm)		Cutting Dia. DC (in)	Cutting Dia. DC (mm)	Holder Type (Cutting Depth) Feed Rate (ipr)			Notes
	PR1535	PR1525			1.5D & 3D	5D & 8D	12D	
Low Carbon Steel	★ 330-590	☆ 330-590	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	Coolant See Page 38
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
Carbon Steel	★ 330-490	☆ 330-490	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
Alloy Steel	★ 230-390	☆ 230-390	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0157	0.0063 ~ 0.0126	0.0055 ~ 0.0110	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
Tool Steel	★ 160-300	☆ 160-300	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0067	0.0025 ~ 0.0054	0.0022 ~ 0.0047	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0031 ~ 0.0087	0.0025 ~ 0.0069	0.0022 ~ 0.0061	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0043 ~ 0.0098	0.0035 ~ 0.0079	0.0030 ~ 0.0069	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0043 ~ 0.0110	0.0035 ~ 0.0088	0.0030 ~ 0.0077	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0055 ~ 0.0118	0.0044 ~ 0.0094	0.0039 ~ 0.0083	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0055 ~ 0.0126	0.0044 ~ 0.0101	0.0039 ~ 0.0088	
Stainless Steel ※	★ 130-230	☆ 130-230	0.313 ~ 0.429	7.94 ~ 10.90	0.0039 ~ 0.0079	0.0031 ~ 0.0063	0.0028 ~ 0.0055	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0039 ~ 0.0079	0.0031 ~ 0.0063	0.0028 ~ 0.0055	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0039 ~ 0.0094	0.0031 ~ 0.0076	0.0028 ~ 0.0066	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0059 ~ 0.0094	0.0047 ~ 0.0076	0.0041 ~ 0.0066	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0059 ~ 0.0094	0.0047 ~ 0.0076	0.0041 ~ 0.0066	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0059 ~ 0.0110	0.0047 ~ 0.0088	0.0041 ~ 0.0077	
Gray Cast Iron	☆ 300-560	★ 300-560	0.313 ~ 0.429	7.94 ~ 10.90	0.0055 ~ 0.0114	0.0044 ~ 0.0091	0.0039 ~ 0.0080	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0055 ~ 0.0146	0.0044 ~ 0.0117	0.0039 ~ 0.0102	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0075 ~ 0.0169	0.0060 ~ 0.0135	0.0052 ~ 0.0119	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0075 ~ 0.0177	0.0060 ~ 0.0142	0.0052 ~ 0.0124	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0094 ~ 0.0177	0.0076 ~ 0.0142	0.0066 ~ 0.0124	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0094 ~ 0.0177	0.0076 ~ 0.0142	0.0066 ~ 0.0124	
Nodular Cast Iron	☆ 130-390	★ 130-390	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
			0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0122	0.0038 ~ 0.0098	0.0033 ~ 0.0085	
			0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
			0.709 ~ 0.846	18.00 ~ 21.50	0.0063 ~ 0.0157	0.0050 ~ 0.0126	0.0044 ~ 0.0110	
			0.866 ~ 0.965	22.00 ~ 24.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	
			0.984 ~ 1.004	25.00 ~ 25.50	0.0079 ~ 0.0177	0.0063 ~ 0.0142	0.0055 ~ 0.0124	

※ Feed Rate 0.006 ipr or less is recommended for stainless steel until drilling depth reaches 0.5D.
Internal and External coolant recommended for Stainless, Heat-resistant Alloys, and Titanium

As drilling depth increases (**1.5D → 3D → 5D → 8D**), feed rates should be reduced.
Recommended Feed Rate Shows: **1.5D/3D** = 100%, **5D/8D** ≤ 80%, **12D** ≤ 70%
Recommended Cutting Speed: **8D** ≤ 80%, **12D** ≤ 70%

Notes: The recommended cutting conditions are for drilling on plain surfaces.
The conditions for drilling on slant hole shows the depth from the top of workpiece.
Set the feed rate under 50% when inclination angle is under 30°.
Set the feed rate under 30% when inclination angle is over 30°.
Traversing is not recommended.
Applicable to 1.5D, 3D, 5D, 8D, and 12D holders. Prepared hole (0.5 xDC) is needed when using 8D/12D holder.

Recommended Cutting Conditions

HQP Inserts - High Precision Insert for Steel

★ : 1st Recommendation ☆ : 2nd Recommendation

Workpiece Material	Recommended Grade / Cutting Speed (sfm)	Cutting Dia. DC (in)	Cutting Dia. DC (mm)	Holder Type (Cutting Depth) Feed Rate (ipr)			Notes
	PR1525			1.5D & 3D	5D	8D & 12D	
Low Carbon Steel	★ 260-590	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	Coolant See Page 38
		0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0110	0.0038 ~ 0.0088	0.0033 ~ 0.0077	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0126	0.0050 ~ 0.0101	0.0044 ~ 0.0088	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
Carbon Steel	★ 260-490	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
		0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0110	0.0038 ~ 0.0088	0.0033 ~ 0.0077	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0126	0.0050 ~ 0.0101	0.0044 ~ 0.0088	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
Alloy Steel	★ 230-390	0.313 ~ 0.429	7.94 ~ 10.90	0.0047 ~ 0.0094	0.0038 ~ 0.0076	0.0033 ~ 0.0066	
		0.433 ~ 0.547	11.00 ~ 13.90	0.0047 ~ 0.0110	0.0038 ~ 0.0088	0.0033 ~ 0.0077	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0063 ~ 0.0126	0.0050 ~ 0.0101	0.0044 ~ 0.0088	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0063 ~ 0.0142	0.0050 ~ 0.0113	0.0044 ~ 0.0099	
Tool Steel	★ 160-300	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0067	0.0025 ~ 0.0054	0.0022 ~ 0.0047	
		0.433 ~ 0.547	11.00 ~ 13.90	0.0031 ~ 0.0079	0.0025 ~ 0.0063	0.0022 ~ 0.0055	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0043 ~ 0.0091	0.0035 ~ 0.0072	0.0030 ~ 0.0063	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0043 ~ 0.0102	0.0035 ~ 0.0082	0.0030 ~ 0.0072	

As drilling depth increases (**1.5D → 3D → 5D → 8D → 12D**), feed rates should be reduced.
Recommended Feed Rate Shows: **1.5D/3D** = 100%, **5D** ≤ 80%, **8D/2D** ≤ 70%

HQS Inserts - for Difficult-to-Cut Materials / Stainless Steel

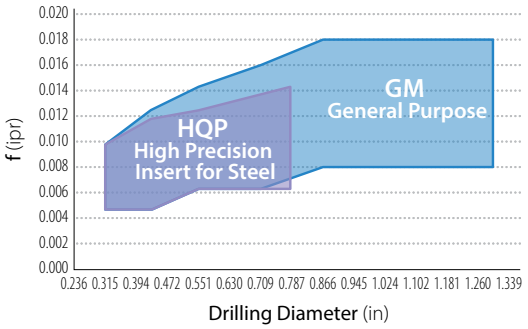
★ : 1st Recommendation ☆ : 2nd Recommendation

Workpiece Material	Recommended Grade / Cutting Speed (sfm)	Cutting Dia. DC (in)	Cutting Dia. DC (mm)	Holder Type (Cutting Depth) Feed Rate (ipr)			Notes
	PR1535			1.5D & 3D	5D	8D & 12D	
Stainless Steel※	★ 130-160	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0047	0.0025 ~ 0.0038	0.0022 ~ 0.0033	Coolant See Page 38
		0.433 ~ 0.547	11.00 ~ 13.90	0.0039 ~ 0.0059	0.0031 ~ 0.0047	0.0028 ~ 0.0041	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0039 ~ 0.0059	0.0031 ~ 0.0047	0.0028 ~ 0.0041	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0047 ~ 0.0071	0.0038 ~ 0.0057	0.0033 ~ 0.0050	
Heat-Resistant Alloy	★ 50-70	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0047	0.0025 ~ 0.0038	0.0022 ~ 0.0033	
		0.433 ~ 0.547	11.00 ~ 13.90	0.0031 ~ 0.0059	0.0025 ~ 0.0047	0.0022 ~ 0.0041	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0039 ~ 0.0059	0.0031 ~ 0.0047	0.0028 ~ 0.0041	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0047 ~ 0.0071	0.0038 ~ 0.0057	0.0033 ~ 0.0050	
Titanium Alloy	★ 100-130	0.313 ~ 0.429	7.94 ~ 10.90	0.0031 ~ 0.0047	0.0025 ~ 0.0038	0.0022 ~ 0.0033	
		0.433 ~ 0.547	11.00 ~ 13.90	0.0031 ~ 0.0059	0.0025 ~ 0.0047	0.0022 ~ 0.0041	
		0.551 ~ 0.705	14.00 ~ 17.90	0.0039 ~ 0.0059	0.0031 ~ 0.0047	0.0028 ~ 0.0041	
		0.709 ~ 0.784	18.00 ~ 19.90	0.0047 ~ 0.0071	0.0038 ~ 0.0057	0.0033 ~ 0.0050	

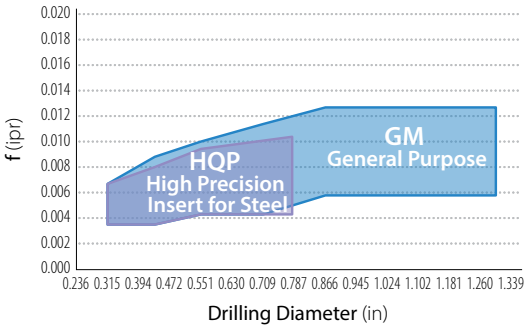
※Feed Rate 0.006 ipr or less is recommended for stainless steel until drilling depth reaches 0.5D.
Internal and External coolant recommended for Stainless, Heat-resistant Alloys, and Titanium

As drilling depth increases (**1.5D → 3D → 5D → 8D → 12D**), feed rates should be reduced.
Recommended Feed Rate Shows: **1.5D/3D** = 100%, **5D** ≤ 80%, **8D/2D** ≤ 70%

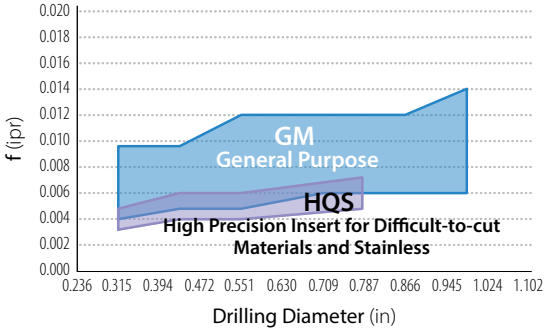
Low Carbon Steel/Carbon Steel/Alloy Steel



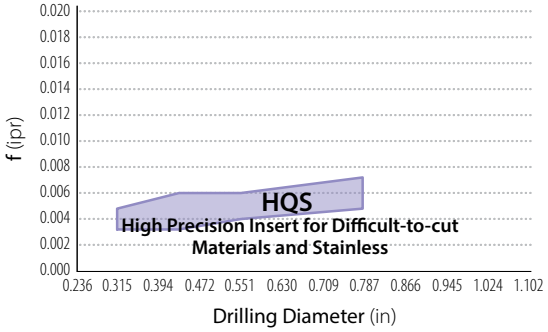
Mold Steel



Stainless Steel



Heat-resistant Alloy / Titanium Alloy



Machining Cautions

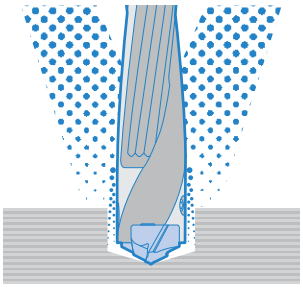
Coolant *Dry cutting is not recommended

1st Recommendation

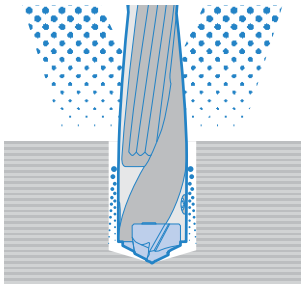
Internal coolant

Internal + External Coolant

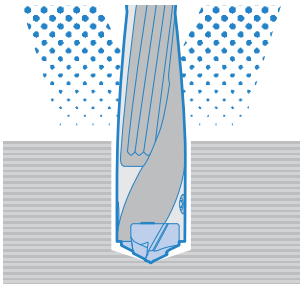
Drilling Depth is Less than 1D



Stainless Steel or High-feed Machining



External Coolant



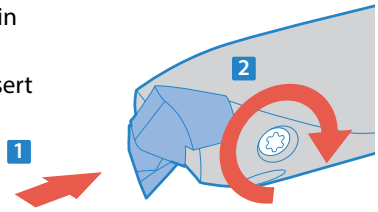
Lathe:
Max. Drill Depth 3D

Vertical M/C:
Max. Drill Depth 1.5D

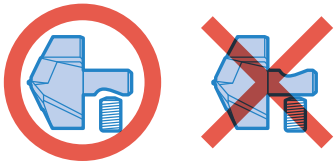
How to Attach Inserts

1 Install insert onto the toolholder in the right direction

2 Tighten clamp screw to fix the insert
(Torque: see page 31)



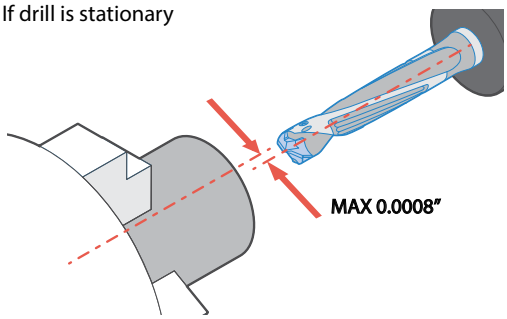
Be careful of the insert direction



*1 Remove dust on insert pocket using air blow for every replacement.
*2 Make sure that the locating surfaces of the insert closely contacts the toolholder.

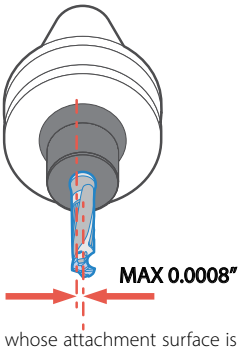
Core Deviation / Alignment Cautions

If drill is stationary



DRA works with both boring sleeve and collet-chuck. Center line deviation should be less than 0.0008" between workpiece and drill.

If drill is rotating



Do not use any arbor whose attachment surface is deformed. Center deviation must be less than 0.0008".

Toolholder Connection Cautions

1st Choice

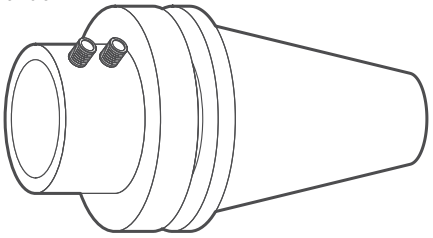
Hydro chuck, power chuck, collet chuck, etc.

- Hydro Chuck
- Power Chuck
- Collet Chuck

Install DRA into chucks

2nd Choice

Side lock arbor



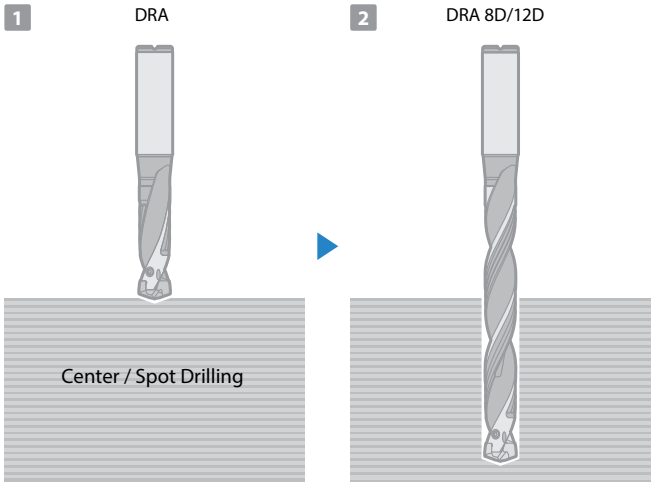
Example of side lock arbor

Cautions for Machining with 8D/12D Holder

Recommendations

1 Make a center spot using DRA 1.5D/3D/5D
(Depth of center spot should be at least half the cutting diameter)

2 Then drill the hole using DRA (8D/12D)

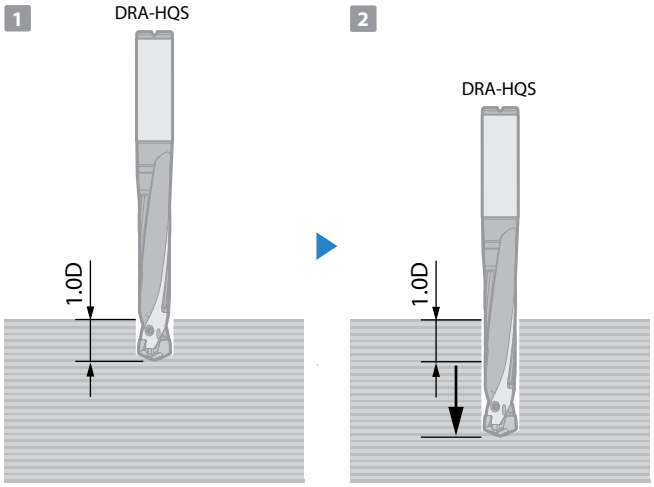


Cautions for Machining with HQS Inserts

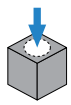
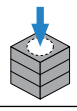
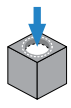
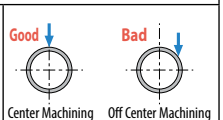
If chips are clogged at the entrance of drill hole machining in stainless steel machining, etc., the following machining method is recommended.

1 Up to 1.0D, the feed rate should be 0.003 ipr or less

2 After 1.0D, machine within the normal recommended range

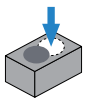


Applicable Workpiece Applications

Application	Workpiece Shape	Machining Caution
Plain Surface		1. When machining stainless steel, for hole depths of up to 0.5D, keep feed rate at less than 0.006 ipr. 2. Thru coolant is recommended for smooth chip removal. For stainless steel, the combination of thru and external coolant is recommended.
Stacked Plates		1. Fix stacked plates securely to ensure they do not slip while machining.
Concave Surface		1. When machining concave holes, set the feed rate at less than half of recommended feed for continuous hole machining. 2. Utilize a pecking cycle if chips are not broken short at the inlet.
Tubing		1. Hole machining on the centerline of the tubing is possible. 2. Do not machine on curved surface areas. 

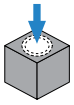
*Machining possible with FTP Inserts and 1.5D holders

Not Recommended Applications

Application	Workpiece Shape
*Hole Expansion	

Application	Workpiece Shape
*Angled Surface	

Application	Workpiece Shape
Half Cylindrical	

Application	Workpiece Shape
*Existing Hole	

*Machining possible with FTP Inserts and 1.5D holders

KYOCERA Precision Tools
238 Marc Drive
Cuyahoga Falls, OH 44223
Customer Service | 800.823.7284 - Option 1
Technical Support | 800.823.7284 - Option 2

Official Website | www.kyoceraprecisiontools.com
Distributor Website | portal.kyoceraprecisiontools.com
Email | ctsales@kyoceraptl.com