



High Efficiency Modular Drill

MagicDrill **DRA** High Precision Insert for Steel Machining

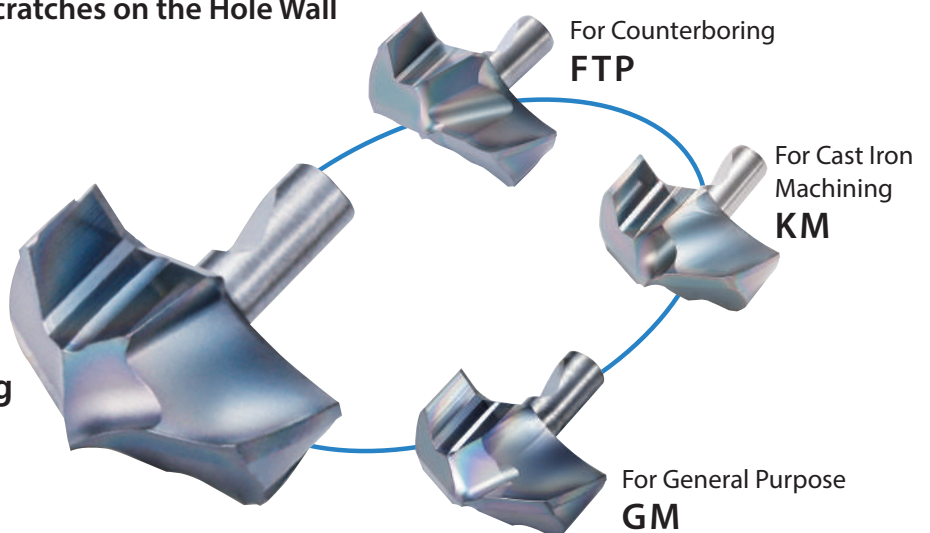


Newly Developed Insert Provides High-precision Drilling Capabilities

Improved Centripetal Forces with Special Two-step Bottom
Excellent Cylindricity, Roundness and Surface Finish in Steel Machining
Unique Flute Shape Reduces Scratches on the Hole Wall



High Precision
Steel Machining
HQP



High Efficiency Modular Drill

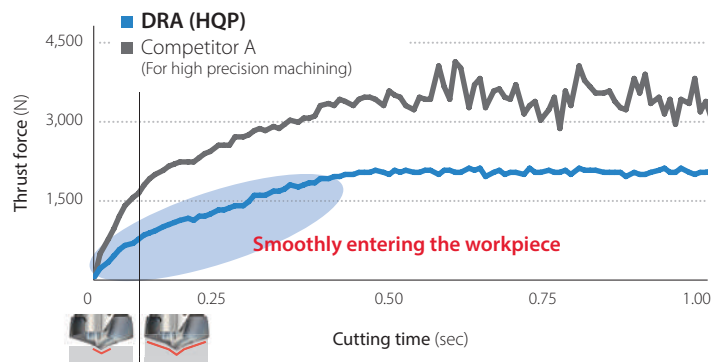
MagicDrill **DRA** High Precision Insert for Steel Machining

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

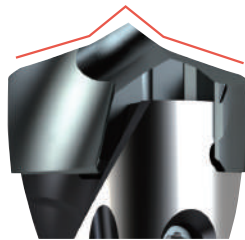
Special two-step bottom, large rake angle and double margin design reduce initial shock for higher-precision machining

Cutting force comparison when entering the workpiece (Internal evaluation)

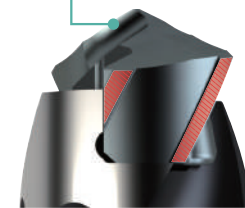


Cutting Conditions : $V_c = 100$ m/min, $f = 0.25$ mm/rev, $H = 30$ mm, Wet Workpiece : S50C $\phi 16$ (3D)

Special Two-step Bottom



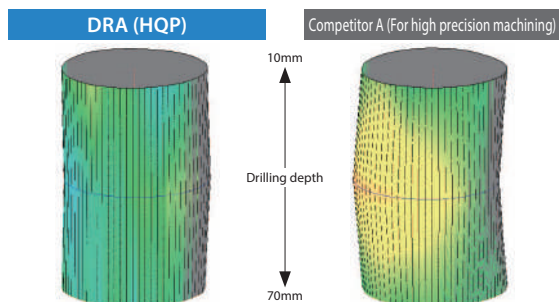
Large Rake Angle



Double Margin

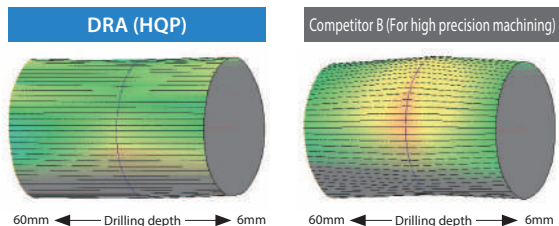
Cylindricity and roundness comparison (Internal evaluation)

Machining Center (BT50)



Cutting Conditions : $V_c = 100$ m/min, $f = 0.25$ mm/rev, $H = 80$ mm, Wet Workpiece : S50C $\phi 16$ (5D)

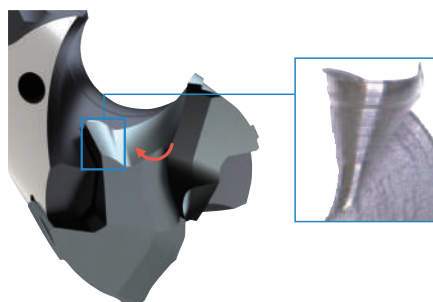
Lathes



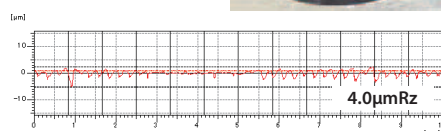
Cutting Conditions : $V_c = 120$ m/min, $f = 0.3$ mm/rev, $H = 65$ mm, Wet Workpiece : SCM435 $\phi 13$ (5D)

2 Excellent Surface Finish with Unique Flute Shape

Controlled chips reduce scratches on the hole wall



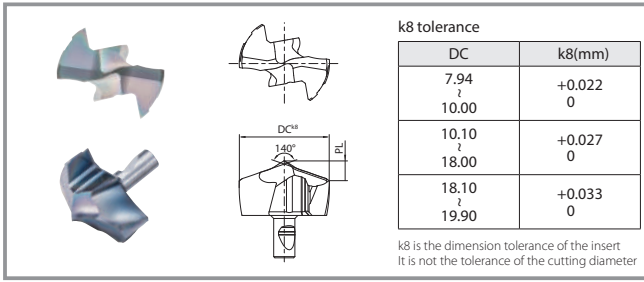
Hole wall surface finish comparison (Internal evaluation)



Cutting Conditions : $V_c = 100$ m/min, $f = 0.25$ mm/rev, $H = 80$ mm, Wet Workpiece : S50C $\phi 16$ (5D)



DRA Insert (HQP - High-Precision Insert for Steel) Drilling Diameter $\phi 7.94 \sim \phi 19.90$



For more details on DRA toolholder, see the KYOCERA general product catalog chapter K or the DRA product brochure.

Insert

Description	Dimensions (mm)		Grade PR1525	Applicable Toolholder
	DC	PL		
DA 0794M-HQP	7.94	1.90	●	SS10-DRA080M-○ SF12-DRA080M-○
0800M-HQP	8.00	1.91	●	
0810M-HQP	8.10	1.93	●	
0820M-HQP	8.20	1.94	●	
0830M-HQP	8.30	1.96	●	
0840M-HQP	8.40	1.98	●	
DA 0850M-HQP	8.50	1.99	●	SS10-DRA085M-○ SF12-DRA085M-○
0860M-HQP	8.60	2.01	●	
0870M-HQP	8.70	2.03	●	
0880M-HQP	8.80	2.05	●	
0890M-HQP	8.90	2.06	●	
DA 0900M-HQP	9.00	2.19	●	SS10-DRA090M-○ SF12-DRA090M-○
0910M-HQP	9.10	2.21	●	
0920M-HQP	9.20	2.22	●	
0930M-HQP	9.30	2.24	●	
0940M-HQP	9.40	2.26	●	
DA 0950M-HQP	9.50	2.27	●	SS10-DRA095M-○ SF12-DRA095M-○
0960M-HQP	9.60	2.29	●	
0970M-HQP	9.70	2.31	●	
0980M-HQP	9.80	2.32	●	
0990M-HQP	9.90	2.34	●	
DA 1000M-HQP	10.00	2.35	●	SS12-DRA100M-○ SF16-DRA100M-○
1010M-HQP	10.10	2.36	●	
1020M-HQP	10.20	2.38	●	
1030M-HQP	10.30	2.40	●	
1040M-HQP	10.40	2.41	●	
DA 1050M-HQP	10.50	2.43	●	SS12-DRA105M-○ SF16-DRA105M-○
1060M-HQP	10.60	2.44	●	
1070M-HQP	10.70	2.46	●	
1080M-HQP	10.80	2.47	●	
1090M-HQP	10.90	2.49	●	
DA 1100M-HQP	11.00	2.65	●	SS12-DRA110M-○ SF16-DRA110M-○
1110M-HQP	11.10	2.67	●	
1120M-HQP	11.20	2.68	●	
1130M-HQP	11.30	2.70	●	
1140M-HQP	11.40	2.72	●	
DA 1150M-HQP	11.50	2.73	●	SS12-DRA115M-○ SF16-DRA115M-○
1160M-HQP	11.60	2.75	●	
1170M-HQP	11.70	2.76	●	
1180M-HQP	11.80	2.78	●	
1190M-HQP	11.90	2.80	●	
DA 1200M-HQP	12.00	2.79	●	SS14-DRA120M-○ SF16-DRA120M-○
1210M-HQP	12.10	2.81	●	
1220M-HQP	12.20	2.82	●	
1230M-HQP	12.30	2.84	●	
1240M-HQP	12.40	2.86	●	
DA 1250M-HQP	12.50	2.87	●	SS14-DRA125M-○ SF16-DRA125M-○
1260M-HQP	12.60	2.89	●	
1270M-HQP	12.70	2.91	●	
1280M-HQP	12.80	2.92	●	
1290M-HQP	12.90	2.94	●	
DA 1300M-HQP	13.00	2.98	●	SS14-DRA130M-○ SF16-DRA130M-○
1310M-HQP	13.10	2.99	●	
1320M-HQP	13.20	3.01	●	
1330M-HQP	13.30	3.02	●	
1340M-HQP	13.40	3.04	●	
DA 1350M-HQP	13.50	3.06	●	SS14-DRA135M-○ SF16-DRA135M-○
1360M-HQP	13.60	3.07	●	
1370M-HQP	13.70	3.09	●	
1380M-HQP	13.80	3.10	●	
1390M-HQP	13.90	3.12	●	
DA 1400M-HQP	14.00	3.11	●	SS16-DRA140M-○ SF16-DRA140M-○
1410M-HQP	14.10	3.12	●	
1420M-HQP	14.20	3.14	●	
1430M-HQP	14.30	3.16	●	
1440M-HQP	14.40	3.17	●	

Description	Dimensions (mm)		Grade PR1525	Applicable Toolholder
	DC	PL		
DA 1450M-HQP	14.50	3.19	●	SS16-DRA145M-○ SF16-DRA145M-○
1460M-HQP	14.60	3.21	●	
1470M-HQP	14.70	3.22	●	
1480M-HQP	14.80	3.24	●	
1490M-HQP	14.90	3.25	●	
DA 1500M-HQP	15.00	3.33	●	SS16-DRA150M-○ SF20-DRA150M-○
1510M-HQP	15.10	3.35	●	
1520M-HQP	15.20	3.36	●	
1530M-HQP	15.30	3.38	●	
1540M-HQP	15.40	3.39	●	
1550M-HQP	15.50	3.41	●	
1560M-HQP	15.60	3.42	●	
1570M-HQP	15.70	3.44	●	
1580M-HQP	15.80	3.46	●	
1590M-HQP	15.90	3.47	●	
DA 1600M-HQP	16.00	3.55	●	SS18-DRA160M-○ SF20-DRA160M-○
1610M-HQP	16.10	3.57	●	
1620M-HQP	16.20	3.58	●	
1630M-HQP	16.30	3.60	●	
1640M-HQP	16.40	3.62	●	
1650M-HQP	16.50	3.63	●	
1660M-HQP	16.60	3.65	●	
1670M-HQP	16.70	3.66	●	
1680M-HQP	16.80	3.68	●	
1690M-HQP	16.90	3.69	●	
DA 1700M-HQP	17.00	3.73	●	SS18-DRA170M-○ SF20-DRA170M-○
1710M-HQP	17.10	3.75	●	
1720M-HQP	17.20	3.77	●	
1730M-HQP	17.30	3.78	●	
1740M-HQP	17.40	3.80	●	
1750M-HQP	17.50	3.81	●	
1760M-HQP	17.60	3.83	●	
1770M-HQP	17.70	3.84	●	
1780M-HQP	17.80	3.86	●	
1790M-HQP	17.90	3.88	●	
DA 1800M-HQP	18.00	3.97	●	SS20-DRA180M-○ SF25-DRA180M-○
1810M-HQP	18.10	3.98	●	
1820M-HQP	18.20	4.00	●	
1830M-HQP	18.30	4.02	●	
1840M-HQP	18.40	4.03	●	
1850M-HQP	18.50	4.05	●	
1860M-HQP	18.60	4.06	●	
1870M-HQP	18.70	4.08	●	
1880M-HQP	18.80	4.09	●	
1890M-HQP	18.90	4.11	●	
DA 1900M-HQP	19.00	4.20	●	SS20-DRA190M-○ SF25-DRA190M-○
1910M-HQP	19.10	4.22	●	
1920M-HQP	19.20	4.23	●	
1930M-HQP	19.30	4.25	●	
1940M-HQP	19.40	4.26	●	
1950M-HQP	19.50	4.28	●	
1960M-HQP	19.60	4.29	●	
1970M-HQP	19.70	4.31	●	
1980M-HQP	19.80	4.33	●	
1990M-HQP	19.90	4.34	●	

Inserts sold in 1 piece boxes
●: Standard Stock

Recommended Cutting Conditions ★1st Recommendation

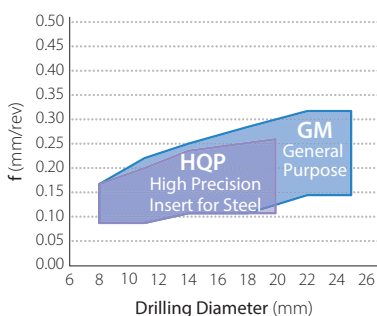
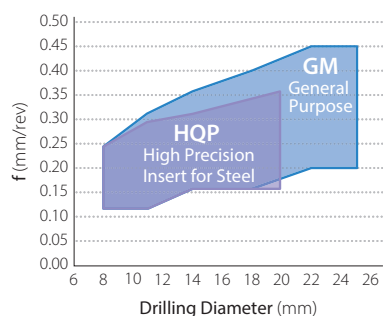
HQP High Precision Insert for Steel

Workpiece	Cutting Speed Vc (m/min)	Spindle Revolution(min ⁻¹)	Drilling Dia. øDC (mm)				Notes
	PR1525	Feed Rate(mm/rev)	ø8	ø11	ø14	ø19	
Low Carbon Steel	★ 80 – 180	Spindle Revolution(min ⁻¹)	3,180 – 7,160	2,310 – 5,210	1,810 – 4,090	1,410 – 3,180	Wet
		Feed Rate(mm/rev)	0.12 – 0.24	0.12 – 0.28	0.16 – 0.32	0.16 – 0.36	
Carbon Steel	★ 80 – 150	Spindle Revolution(min ⁻¹)	3,180 – 7,160	2,310 – 5,210	1,810 – 4,090	1,410 – 3,180	
		Feed Rate(mm/rev)	0.12 – 0.24	0.12 – 0.28	0.16 – 0.32	0.16 – 0.36	
Alloy Steel	★ 70 – 120	Spindle Revolution(min ⁻¹)	2,790 – 4,780	2,030 – 3,470	1,590 – 2,730	1,240 – 2,120	
		Feed Rate(mm/rev)	0.12 – 0.24	0.12 – 0.28	0.16 – 0.32	0.16 – 0.36	
Mold Steel	★ 50 – 90	Spindle Revolution(min ⁻¹)	1,990 – 3,580	1,450 – 2,600	1,140 – 2,050	880 – 1,590	
		Feed Rate(mm/rev)	0.08 – 0.17	0.08 – 0.2	0.11 – 0.23	0.11 – 0.26	

Note : Above conditions are for 1.5D and 3D type. As drilling depth increases (1.5D/3D 5D 8D 12D), feed rates should be reduced.
Recommended feed rate : 1.5D/3D = 100% of listed starting recommendations, 5D = 80% or less, 8D/12D = 70% or less.

Low Carbon Steel/Carbon Steel/Alloy Steel

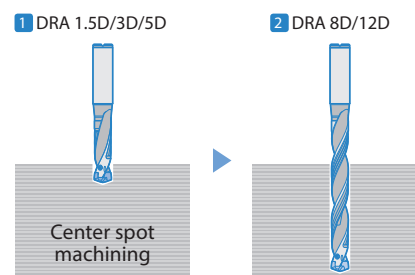
Mold Steel



Cautions for machining with 8D/12D holder

Recommended machining

- 1 Make a center spot using DRA 1.5D/3D/5D type
(Center spot should be at least half of cutting diameter)
- 2 Then drill the hole using DRA (8D/12D type)



Applicable Workpiece Recommendations

Applicable Workpiece				Non-recommended Workpieces			
Plain Surface	Stacked Plates	Concave Surface	Pipe Material	Hole Expansion	Half Cylindrical	Slant Surface	Cored Hole

For more details on machining precautions, see the KYOCERA general product catalog chapter K (Same as GM chipbreaker).