

THE NEW VALUE FRONTIER



High Efficiency Modular Drill

MagicDrill DRA  
Counterboring Insert

High Efficiency Modular Drill

# MagicDrill **DRA** Counterboring Insert



**Pilot Point Geometry and Double Margin improved hole accuracy**

**Excellent Chip Evacuation with Large Thinning Cutting Edge Angle**

**Reduce Burr by large Helix Angle and Corner Chamfer**

**MEGACOAT NANO coating technology for long tool life and stable machining**



# MagicDrill **DRA** Counterboring Insert

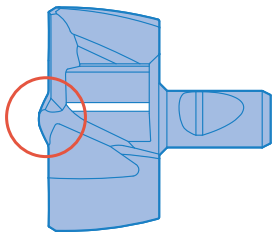
Pilot Point Geometry and Double Margin improved hole accuracy

High Efficient Machining Available through Problem Solving at Counterboring

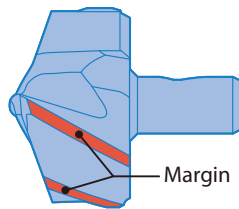
## 1 Pilot Point Geometry and Double Margin improved hole accuracy

Improved Centripetal Force with Pilot Point Geometry  
Double Margin reduced hole bending and waviness

Pilot Point Geometry

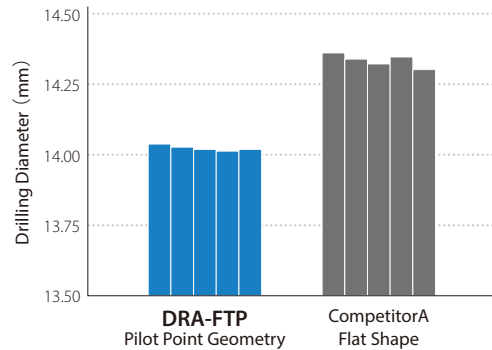


Double Margin



Comparison of Hole Precision

(In-house Evaluation)

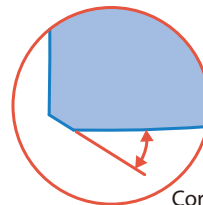


Cutting Conditions:  $V_c = 80$  m/min,  $f = 0.25$  mm/rev  
Drilling Diameter  $\phi 14$ , Drilling Depth 20 mm, Wet Workpiece: S45C

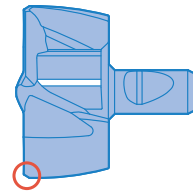
## 2 Reduce Burr by large Helix Angle and Corner Chamfer

Corner Chamfer offers Enhanced Chipping and Burr Resistance

Corner Shape

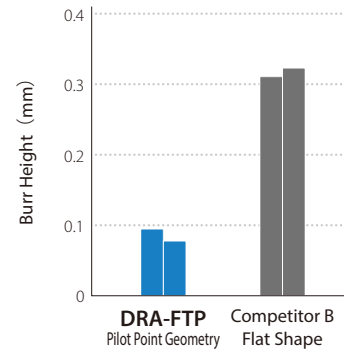


Corner  
30° Chamfer



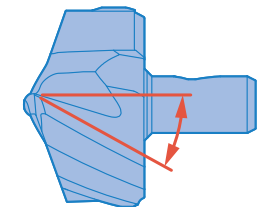
Burr Height Comparison

(In-house Evaluation)



Cutting Conditions:  $V_c = 80$  m/min,  $f = 0.25$  mm/rev  
Drilling Diameter  $\phi 14$ , Drilling Depth 20 mm, Wet Workpiece: S45C

Helix Angle 30°

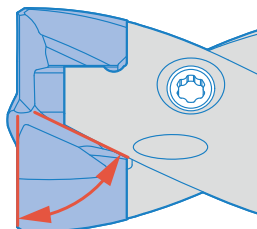


Improved Edge Sharpness with Large Helix Angle

## 3 Excellent Chipping Evacuation with Large Thinning cutting edge angle and Groove shape

Advanced Chipping Evacuation Compact Chips Clogging

Large Thinning cutting edge angle



Chip Comparison

(In-house Evaluation)

Cutting Conditions:  $V_c = 55$  m/min,  $f = 0.1$  mm/rev  
Drilling Diameter  $\phi 14$ , Drilling Depth 20 mm, Wet Workpiece: SUS304



(First Chip)

DRA-FTP  
Pilot Point Geometry



Competitor C  
Pilot Point Geometry

# 4 Long tool life and stable machining of various workpieces

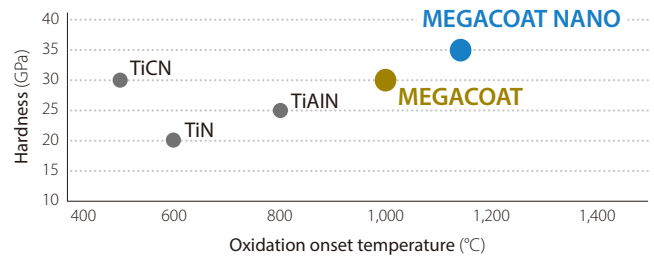
MEGACOAT NANO grade PR1535 is used to machine various materials from steel to stainless steel, with the combination of a tough substrate and a special nano layer coating

1st Recommendation

Steel - SUS PR1535	Cast Iron PR1525
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## Coating properties

(In-house Inspection)



## Insert for DRA Drilling Diameter $\phi 8.00 - \phi 25.4$

\* Uncut area remains in blind hole due to chamfer on the shoulder part

### k8 tolerance

$\phi Dc$	k8 (mm)
8.00 – 10.00	+0.022 0
10.30 – 18.00	+0.027 0
18.50 – 25.4	+0.033 0

k8 is the dimension tolerance of the insert.

Note  
Applicable to 1.5D, 3D, 5D and 8D holders. Prepared hole (0.5D) is needed when using 8D holder

## Insert

Refer to the Kyocera general catalog about the applicable holders

Description	Dimension (mm)			Grade		Applicable Toolholder
	$\phi Dc$	$\phi D2$	Lp	PR1535	PR1525	
DA0800M-FTP	8.00	2.90	0.40	●	●	SS10-DRA080M-○ SF12-DRA080M-○
DA0830M-FTP	8.30			●	●	
DA0850M-FTP	8.50			●	●	SS10-DRA085M-○ SF12-DRA085M-○
DA0880M-FTP	8.80			●	●	
DA0900M-FTP	9.00	3.00	0.43	●	●	SS10-DRA090M-○ SF12-DRA090M-○
DA0930M-FTP	9.30			●	●	
DA0950M-FTP	9.50			●	●	SS10-DRA095M-○ SF12-DRA095M-○
DA1000M-FTP	10.00	3.30	0.46	●	●	SS12-DRA100M-○ SF16-DRA100M-○
DA1030M-FTP	10.30			●	●	
DA1050M-FTP	10.50			●	●	SS12-DRA105M-○ SF16-DRA105M-○
DA1080M-FTP	10.80			●	●	
DA1100M-FTP	11.00	3.40	0.50	●	●	SS12-DRA110M-○ SF16-DRA110M-○
DA1150M-FTP	11.50			●	●	SS12-DRA115M-○ SF16-DRA115M-○
DA1200M-FTP	12.00	3.70	0.53	●	●	SS14-DRA120M-○ SF16-DRA120M-○
DA1250M-FTP	12.50			●	●	SS14-DRA125M-○ SF16-DRA125M-○
DA1270M-FTP	12.70			●	●	
DA1300M-FTP	13.00	3.90	0.56	●	●	SS14-DRA130M-○ SF16-DRA130M-○
DA1350M-FTP	13.50			●	●	SS14-DRA135M-○ SF16-DRA135M-○
DA1400M-FTP	14.00	4.20	0.60	●	●	SS16-DRA140M-○ SF16-DRA140M-○
DA1450M-FTP	14.50			●	●	SS16-DRA145M-○ SF16-DRA145M-○
DA1500M-FTP	15.00	4.40	0.65	●	●	SS16-DRA150M-○ SF20-DRA150M-○

Description	Dimension (mm)			Grade		Applicable Toolholder
	$\phi Dc$	$\phi D2$	Lp	PR1535	PR1525	
DA1550M-FTP	15.50	4.40	0.65	●	●	SS16-DRA150M-○ SF20-DRA150M-○
DA1600M-FTP	16.00	4.60	0.70	●	●	SS18-DRA160M-○ SF20-DRA160M-○
DA1650M-FTP	16.50			●	●	
DA1700M-FTP	17.00	5.00	0.75	●	●	SS18-DRA170M-○ SF20-DRA170M-○
DA1750M-FTP	17.50			●	●	
DA1800M-FTP	18.00	5.00	0.80	●	●	SS20-DRA180M-○ SF25-DRA180M-○
DA1850M-FTP	18.50			●	●	
DA1900M-FTP	19.00	5.30	0.85	●	●	SS20-DRA190M-○ SF25-DRA190M-○
DA1950M-FTP	19.50			●	●	
DA2000M-FTP	20.00	5.70	0.90	●	●	SS25-DRA200M-○ SF25-DRA200M-○
DA2050M-FTP	20.50			●	●	
DA2100M-FTP	21.00	6.00	0.95	●	●	SS25-DRA210M-○ SF25-DRA210M-○
DA2150M-FTP	21.50			●	●	
DA2200M-FTP	22.00	6.40	1.00	●	●	SS25-DRA220M-○ SF25-DRA220M-○
DA2250M-FTP	22.50			●	●	
DA2300M-FTP	23.00	6.60	1.05	●	●	SS25-DRA230M-○ SF25-DRA230M-○
DA2350M-FTP	23.50			●	●	
DA2400M-FTP	24.00	6.80	1.10	●	●	SS25-DRA240M-○ SF25-DRA240M-○
DA2450M-FTP	24.50			●	●	
DA2500M-FTP	25.00	7.00	1.20	●	●	SS25-DRA250M-○ SF25-DRA250M-○
DA2540M-FTP	25.40			●	●	

Inserts sold in 1 piece boxes  
● : Std stock

## Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

Workpiece Material	Recommended Grade / Cutting Speed (m/min)		Spindle Revolution (min <sup>-1</sup> )	Drilling Diameter øDc (mm)						Notes
	PR1535	PR1525		Feed Rate (mm/rev)	ø8	ø11	ø14	ø18	ø22	
Low Carbon Steel	★ 80 – 150	☆ 80 – 150	Spindle Revolution (min <sup>-1</sup> )	3,150 – 6,000	2,300 – 4,350	1,800 – 3,400	1,400 – 2,650	1,150 – 2,200	1,000 – 1,900	Wet
			Feed Rate (mm/rev)	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.40	0.20 – 0.45	0.20 – 0.45	
Carbon Steel	★ 80 – 120	☆ 80 – 120	Spindle Revolution (min <sup>-1</sup> )	3,150 – 4,750	2,300 – 3,450	1,800 – 2,700	1,400 – 2,100	1,150 – 1,750	1,000 – 1,500	
			Feed Rate (mm/rev)	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.40	0.20 – 0.45	0.20 – 0.45	
Alloy Steel	★ 70 – 120	☆ 70 – 120	Spindle Revolution (min <sup>-1</sup> )	2,800 – 4,750	2,000 – 3,450	1,600 – 2,700	1,250 – 2,100	1,000 – 1,750	900 – 1,500	
			Feed Rate (mm/rev)	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.40	0.20 – 0.40	0.20 – 0.45	
Tool Steel	★ 40 – 70	☆ 40 – 70	Spindle Revolution (min <sup>-1</sup> )	1,600 – 2,800	1,150 – 2,000	900 – 1,600	700 – 1,250	600 – 1,000	500 – 900	
			Feed Rate (mm/rev)	0.08 – 0.17	0.08 – 0.22	0.11 – 0.25	0.11 – 0.28	0.14 – 0.30	0.14 – 0.32	
Stainless Steel	★ 40 – 70	☆ 40 – 70	Spindle Revolution (min <sup>-1</sup> )	1,600 – 2,800	1,150 – 2,000	900 – 1,600	700 – 1,250	600 – 1,000	500 – 900	
			Feed Rate (mm/rev)	0.10 – 0.20	0.10 – 0.20	0.10 – 0.24	0.15 – 0.24	0.15 – 0.24	0.15 – 0.28	
			Feed Rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5D mm.							
Gray Cast Iron	☆ 70 – 140	★ 70 – 140	Spindle Revolution (min <sup>-1</sup> )	2,800 – 5,600	2,000 – 4,050	1,600 – 3,200	1,250 – 2,500	1,000 – 2,000	900 – 1,800	
			Feed Rate (mm/rev)	0.14 – 0.29	0.14 – 0.37	0.19 – 0.43	0.19 – 0.45	0.24 – 0.45	0.24 – 0.45	
Nodular Cast Iron	☆ 40 – 100	★ 40 – 100	Spindle Revolution (min <sup>-1</sup> )	1,600 – 4,000	1,150 – 2,900	900 – 2,750	700 – 1,750	600 – 1,450	500 – 1,250	
			Feed Rate (mm/rev)	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.40	0.2 – 0.45	0.2 – 0.45	

Notes: The recommended cutting conditions are for drilling on plain surface  
 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 and 8D holders. Prepared hole (0.5D) is needed when using 8D holder

## Applicable workpiece and Non-recommended workpiece

Plain Surface	Stacked Plates	Pipe Material		*Hole Expansion	Cored Hole	Concave Surface	Slant Surface	Half Cylindrical
← 1.5D Holder Recommended →								Non-recommended
← Over 3D Holder Recommended →		Over 3D Holder not Recommended Shape						

\*Overlap should be under 1/3xD in hole expansion with 1.5D holder

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