

THE NEW VALUE FRONTIER



High efficiency modular drill

DRA

MagicDrill **DRA**



Excellent hole accuracy with a low cutting force design

Optimal web thickness reduces deflection

Fine chip breaking and smooth deep hole cutting

Easy insert replacement

NEW

For cast iron
KM



NEW

For counterboring
FTP



MagicDrill DRA

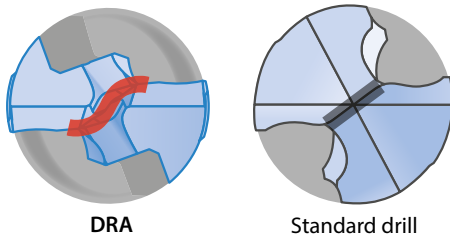
Excellent hole accuracy with a low cutting force design
5 advantages to solve common drilling difficulties

1

Low cutting force design improves hole accuracy

Special chisel edge with S-curve reduces thrust force and reduces vibration.

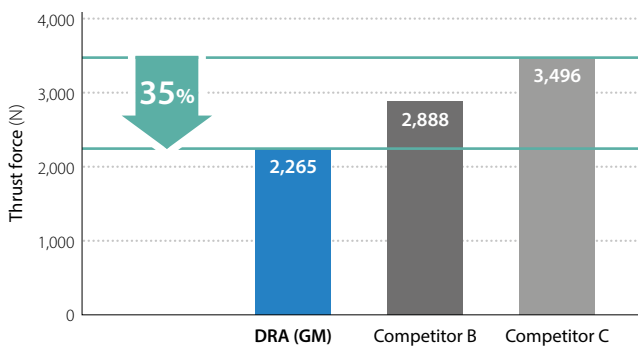
Cutting edge



DRA

Standard drill

Cutting force comparison (Internal evaluation)



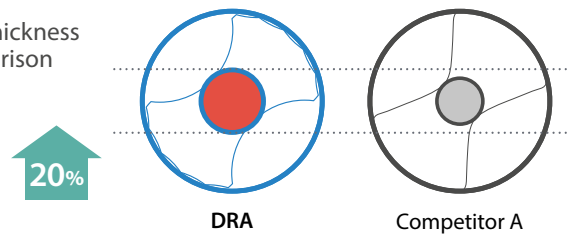
Cutting conditions: $V_c = 120$ m/min, $f = 0.25$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, drilling depth 45 mm, wet, workpiece: C50

2

Optimal web thickness reduces deflection

Improved hole accuracy by controlling drill deflection with a 20% thicker web compared with Competitor A.

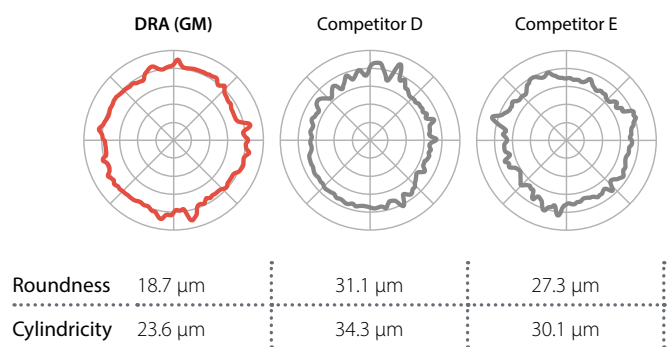
Web thickness comparison



DRA

Competitor A

Roundness · Cylindricity comparison (Internal evaluation)



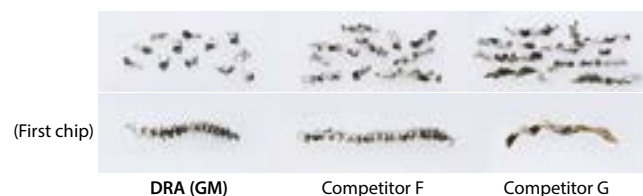
Cutting conditions: $V_c = 120$ m/min, $f = 0.3$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, measurement position 55 mm, wet, workpiece: C50

3

Fine chip breaking even in deep hole drilling applications

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

Chip comparison
(Internal evaluation)

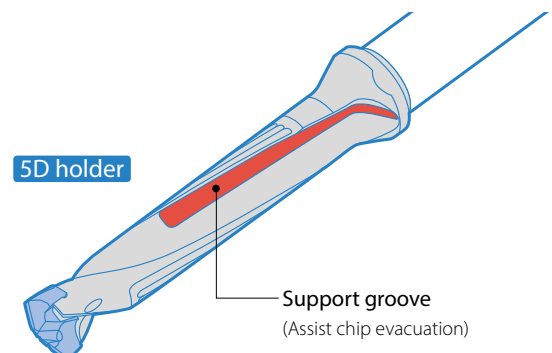


DRA (GM)

Competitor F

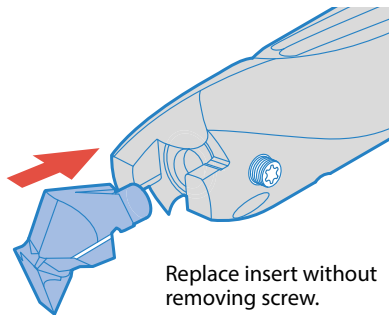
Competitor G

Cutting conditions: $V_c = 60$ m/min, $f = 0.2$ mm/rev, drilling diameter $\phi 14$, $L/D = 5$
Drilling depth 70 mm, wet, workpiece: X5CrNi1810

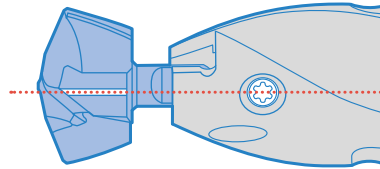


4 Easy insert replacement

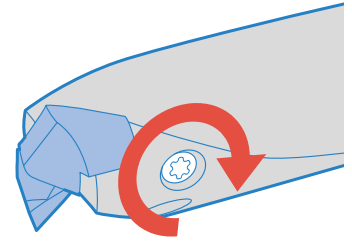
Replace insert without removing screw.



Replace insert without removing screw.



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



Fix the insert by tightening the screw.

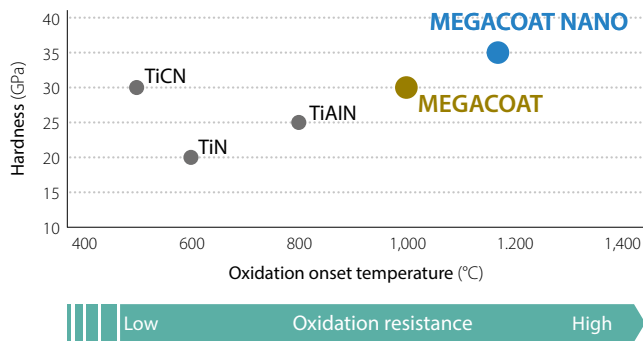
5 Long tool life and stable machining of various workpieces

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.

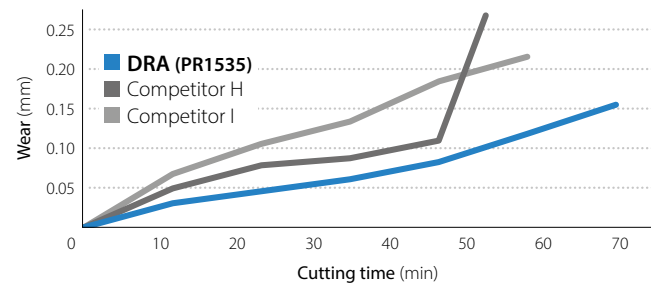
1st recommendation

Steel / Stainless steel PR1535	Cast iron PR1525
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Coating properties



Wear resistance comparison (Internal evaluation)

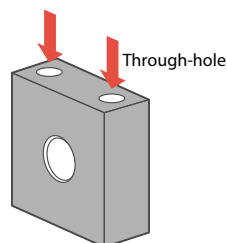


Cutting conditions: $V_c = 100$ m/min, $f = 0.25$ mm/rev
Drilling dia. $\phi 14$, L/D = 5, drilling depth 45 mm, wet, workpiece: 42CrMo4

Case studies

Attachment ST44-2

$V_c = 70$ m/min ($n = 1,240$ min⁻¹)
 $f = 0.23$ mm/rev ($V_f = 285$ mm/min)
Drilling depth 100 mm
Wet (Internal coolant)
With center hole drilling
SF25-DRA180M-8
DA1800M-GM PR1535



Cutting time

DRA $\phi 18$ -8D

45 sec



Competitor J
 $\phi 18$ -7D
(Modular drill)

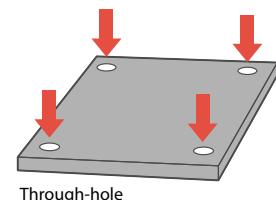
65 sec

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

(User evaluation)

Plate X5CrNi1810

$V_c = 60$ m/min ($n = 2,120$ min⁻¹)
 $f = 0.12$ mm/rev ($V_f = 254$ mm/min)
Drilling Depth 15 mm
Wet (Internal coolant)
SS10-DRA090M-3
DA0900M-GM PR1535



Number of holes

DRA $\phi 9$ -3D

500



Competitor K
 $\phi 9$ -3D
(Modular drill)

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)

For cast iron

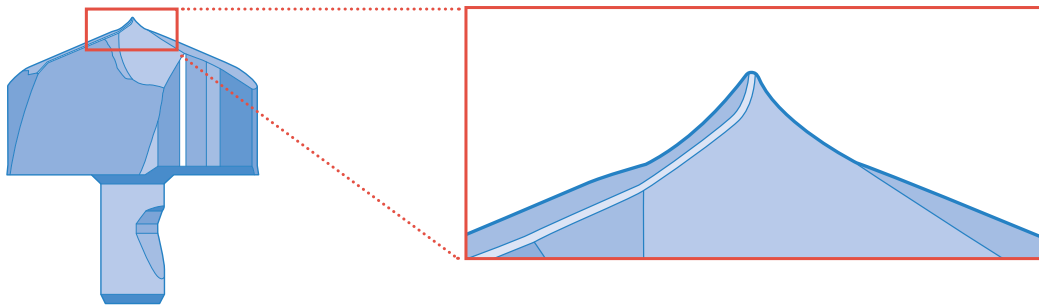
KM

Special chisel cutting edge design improves hole accuracy and tool life.

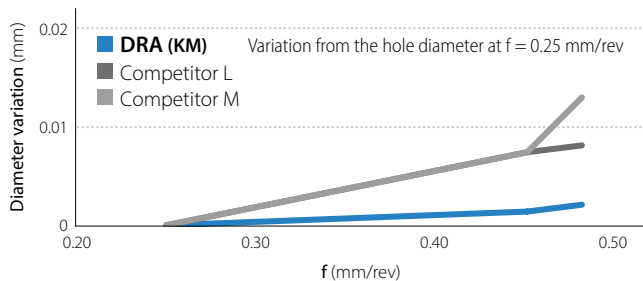
1

Chisel edge design for excellent hole accuracy when machining cast iron

Improved centripetal force with special chisel design reduces hole diameter variation during high-feed machining.

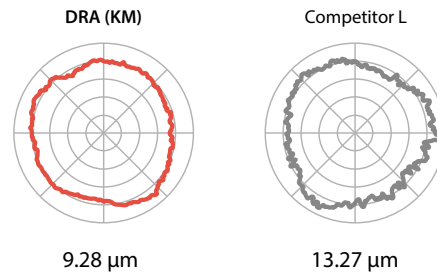


Hole diameter variation related to feed rate (Internal evaluation)



Cutting conditions: $V_c = 100$ m/min, $f = 0.25 - 0.48$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, measurement position 5 mm, wet, Workpiece: 600-3

Roundness comparison (Internal evaluation)

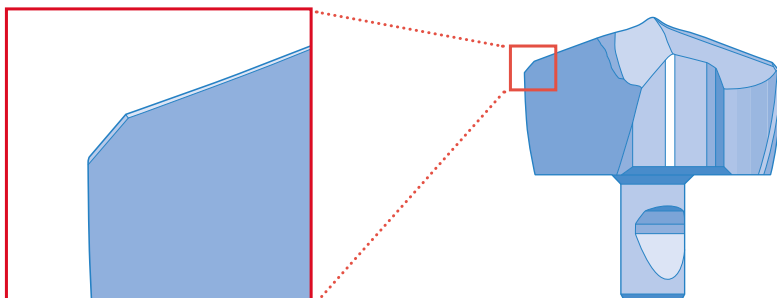


Cutting conditions: $V_c = 100$ m/min, $f = 0.25$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, measurement position 5 mm, wet, workpiece: 600-3

2

Fracture resistance

Large corner chamfer prevents fracturing and provides stable machining at high-feed and high load machining.



For counterboring

FTP

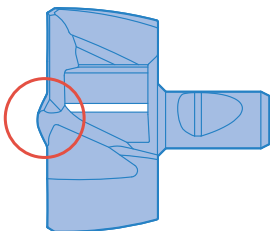
- Pilot point geometry and double margin improves hole accuracy
- High efficient machining available by solving problems at counterboring

1

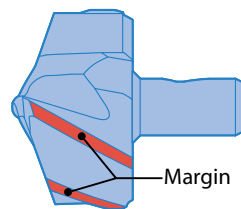
Pilot point geometry and double margin improved hole accuracy

Improved centripetal force with pilot point geometry. Double margin reduced hole bending and waviness.

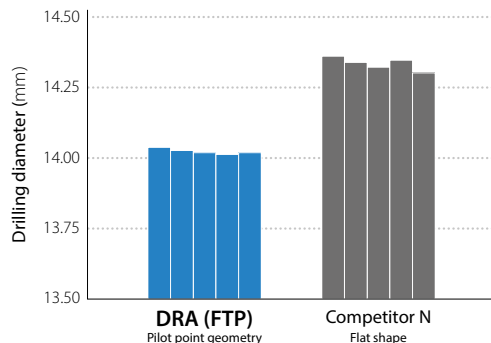
Pilot point geometry



Double margin



Comparison of hole precision (Internal evaluation)



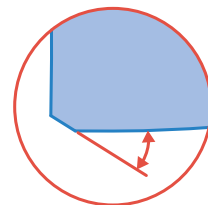
Cutting conditions: $V_c = 80$ m/min, $f = 0.25$ mm/rev, drilling diameter $\phi 14$, $L/D = 3$
Drilling depth 20 mm, wet, workpiece: C45

2

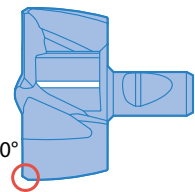
Reduce burr by large helix angle and corner chamfer

Corner chamfer offers enhanced chipping and burr resistance.

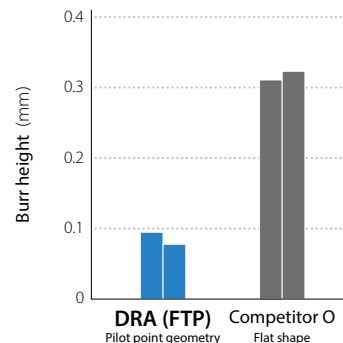
Corner shape



Corner 30° chamfer

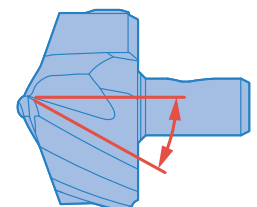


Burr height comparison (Internal evaluation)



Cutting conditions: $V_c = 80$ m/min, $f = 0.25$ mm/rev, drilling diameter $\phi 14$, $L/D = 3$
Drilling depth 20 mm, wet, workpiece: C45

Helix angle 30°



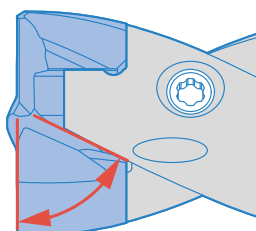
Improved edge sharpness with large helix angle

3

Excellent chip evacuation with large thinning angle and groove shape

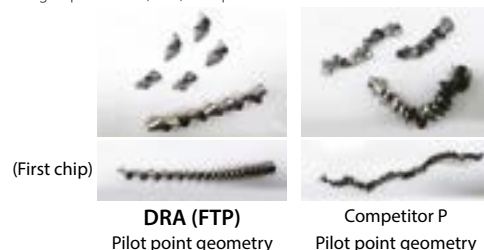
Excellent chip evacuation for minimized chip clogging.

Large thinning angle

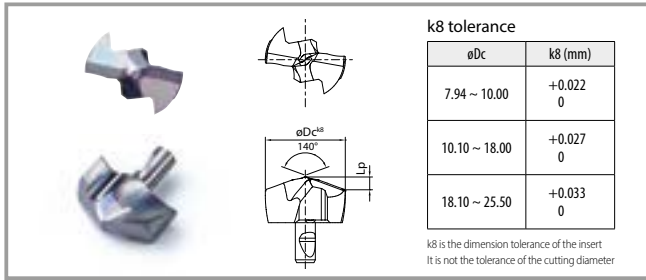


Chip comparison (Internal evaluation)

Cutting conditions: $V_c = 55$ m/min, $f = 0.1$ mm/rev, drilling diameter $\phi 14$, $L/D = 3$
Drilling depth 20 mm, wet, workpiece: X5CrNi1810



DRA insert (GM - General purpose) Drilling diameter $\phi 7.94 \sim \phi 25.50$



Insert

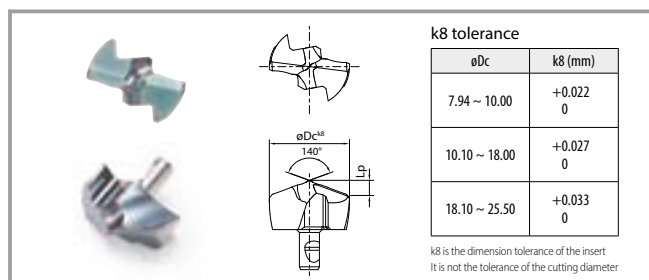
1st recommendation
Steel / Stainless Steel PR1535 Cast iron PR1525

Description	Dimensions (mm)		Grade		Applicable toolholder
	ϕD_c	Lp	PR1535	PR1525	
DA 0794M-GM	7.94	1.34	●	●	SS10-DRA080M-○ SF12-DRA080M-○
0800M-GM	8.00	1.35	●	●	
0810M-GM	8.10	1.37	●	●	
0820M-GM	8.20	1.38	●	●	
0830M-GM	8.30	1.40	●	●	
0840M-GM	8.40	1.42	●	●	SS10-DRA085M-○ SF12-DRA085M-○
DA 0850M-GM	8.50	1.44	●	●	
0860M-GM	8.60	1.46	●	●	
0870M-GM	8.70	1.48	●	●	
0880M-GM	8.80	1.49	●	●	
0890M-GM	8.90	1.51	●	●	SS10-DRA090M-○ SF12-DRA090M-○
DA 0900M-GM	9.00	1.52	●	●	
0910M-GM	9.10	1.54	●	●	
0920M-GM	9.20	1.56	●	●	
0930M-GM	9.30	1.58	●	●	
0940M-GM	9.40	1.59	●	●	SS10-DRA095M-○ SF12-DRA095M-○
DA 0950M-GM	9.50	1.61	●	●	
0960M-GM	9.60	1.63	●	●	
0970M-GM	9.70	1.65	●	●	
0980M-GM	9.80	1.67	●	●	
0990M-GM	9.90	1.68	●	●	SS12-DRA100M-○ SF16-DRA100M-○
DA 1000M-GM	10.00	1.70	●	●	
1010M-GM	10.10	1.72	●	●	
1020M-GM	10.20	1.74	●	●	
1030M-GM	10.30	1.75	●	●	
1040M-GM	10.40	1.77	●	●	SS12-DRA105M-○ SF16-DRA105M-○
DA 1050M-GM	10.50	1.79	●	●	
1060M-GM	10.60	1.81	●	●	
1070M-GM	10.70	1.83	●	●	
1080M-GM	10.80	1.85	●	●	
1090M-GM	10.90	1.86	●	●	SS12-DRA110M-○ SF16-DRA110M-○
DA 1100M-GM	11.00	1.87	●	●	
1110M-GM	11.10	1.89	●	●	
1120M-GM	11.20	1.91	●	●	
1130M-GM	11.30	1.92	●	●	
1140M-GM	11.40	1.94	●	●	SS12-DRA115M-○ SF16-DRA115M-○
DA 1150M-GM	11.50	1.96	●	●	
1160M-GM	11.60	1.98	●	●	
1170M-GM	11.70	2.00	●	●	
1180M-GM	11.80	2.01	●	●	
1190M-GM	11.90	2.03	●	●	SS14-DRA120M-○ SF16-DRA120M-○
DA 1200M-GM	12.00	2.03	●	●	
1210M-GM	12.10	2.05	●	●	
1220M-GM	12.20	2.07	●	●	
1230M-GM	12.30	2.08	●	●	
1240M-GM	12.40	2.10	●	●	SS14-DRA125M-○ SF16-DRA125M-○
DA 1250M-GM	12.50	2.12	●	●	
1260M-GM	12.60	2.14	●	●	
1270M-GM	12.70	2.16	●	●	
1280M-GM	12.80	2.17	●	●	
1290M-GM	12.90	2.19	●	●	SS14-DRA130M-○ SF16-DRA130M-○
DA 1300M-GM	13.00	2.20	●	●	
1310M-GM	13.10	2.22	●	●	
1320M-GM	13.20	2.24	●	●	
1330M-GM	13.30	2.25	●	●	
1340M-GM	13.40	2.27	●	●	SS14-DRA135M-○ SF16-DRA135M-○
DA 1350M-GM	13.50	2.29	●	●	
1360M-GM	13.60	2.31	●	●	
1370M-GM	13.70	2.33	●	●	
1380M-GM	13.80	2.35	●	●	
1390M-GM	13.90	2.36	●	●	SS16-DRA140M-○ SF16-DRA140M-○
DA 1400M-GM	14.00	2.33	●	●	
1410M-GM	14.10	2.34	●	●	
1420M-GM	14.20	2.36	●	●	
1430M-GM	14.30	2.38	●	●	
1440M-GM	14.40	2.40	●	●	

Description	Dimensions (mm)		Grade		Applicable toolholder
	ϕD_c	Lp	PR1535	PR1525	
DA 1450M-GM	14.50	2.42	●	●	SS16-DRA145M-○ SF16-DRA145M-○
1460M-GM	14.60	2.43	●	●	
1470M-GM	14.70	2.45	●	●	
1480M-GM	14.80	2.47	●	●	
1490M-GM	14.90	2.49	●	●	SS16-DRA150M-○ SF20-DRA150M-○
DA 1500M-GM	15.00	2.52	●	●	
1510M-GM	15.10	2.54	●	●	
1520M-GM	15.20	2.55	●	●	
1530M-GM	15.30	2.57	●	●	
1540M-GM	15.40	2.59	●	●	
1550M-GM	15.50	2.61	●	●	
1560M-GM	15.60	2.63	●	●	
1570M-GM	15.70	2.65	●	●	
1580M-GM	15.80	2.66	●	●	
1590M-GM	15.90	2.68	●	●	SS18-DRA160M-○ SF20-DRA160M-○
DA 1600M-GM	16.00	2.69	●	●	
1610M-GM	16.10	2.71	●	●	
1620M-GM	16.20	2.73	●	●	
1630M-GM	16.30	2.75	●	●	
1640M-GM	16.40	2.76	●	●	
1650M-GM	16.50	2.78	●	●	
1660M-GM	16.60	2.80	●	●	
1670M-GM	16.70	2.82	●	●	
1680M-GM	16.80	2.84	●	●	
1690M-GM	16.90	2.86	●	●	SS18-DRA170M-○ SF20-DRA170M-○
DA 1700M-GM	17.00	2.86	●	●	
1710M-GM	17.10	2.88	●	●	
1720M-GM	17.20	2.90	●	●	
1730M-GM	17.30	2.92	●	●	
1740M-GM	17.40	2.93	●	●	
1750M-GM	17.50	2.95	●	●	
1760M-GM	17.60	2.97	●	●	
1770M-GM	17.70	2.99	●	●	
1780M-GM	17.80	3.01	●	●	
1790M-GM	17.90	3.03	●	●	SS20-DRA180M-○ SF20-DRA180M-○
DA 1800M-GM	18.00	3.04	●	●	
1810M-GM	18.10	3.06	●	●	
1820M-GM	18.20	3.07	●	●	
1830M-GM	18.30	3.09	●	●	
1840M-GM	18.40	3.11	●	●	
1850M-GM	18.50	3.13	●	●	
1860M-GM	18.60	3.15	●	●	
1870M-GM	18.70	3.17	●	●	
1880M-GM	18.80	3.18	●	●	
1890M-GM	18.90	3.20	●	●	SS20-DRA190M-○ SF25-DRA190M-○
DA 1900M-GM	19.00	3.21	●	●	
1910M-GM	19.10	3.23	●	●	
1920M-GM	19.20	3.25	●	●	
1930M-GM	19.30	3.27	●	●	
1940M-GM	19.40	3.29	●	●	
1950M-GM	19.50	3.30	●	●	
1960M-GM	19.60	3.32	●	●	
1970M-GM	19.70	3.34	●	●	
1980M-GM	19.80	3.36	●	●	
1990M-GM	19.90	3.38	●	●	SS25-DRA200M-○ SF25-DRA200M-○
DA 2000M-GM	20.00	3.37	●	●	
2010M-GM	20.10	3.39	●	●	
2020M-GM	20.20	3.41	●	●	
2030M-GM	20.30	3.43	●	●	
2040M-GM	20.40	3.45	●	●	
2050M-GM	20.50	3.46	●	●	
2060M-GM	20.60	3.48	●	●	
2070M-GM	20.70	3.50	●	●	
2080M-GM	20.80	3.52	●	●	
2090M-GM	20.90	3.54	●	●	SS25-DRA210M-○ SF25-DRA210M-○
DA 2100M-GM	21.00	3.54	●	●	
2150M-GM	21.50	3.63	●	●	SS25-DRA220M-○ SF25-DRA220M-○
DA 2200M-GM	22.00	3.71	●	●	
2250M-GM	22.50	3.80	●	●	SS25-DRA230M-○ SF25-DRA230M-○
DA 2300M-GM	23.00	3.87	●	●	
2350M-GM	23.50	3.96	●	●	SS25-DRA240M-○ SF25-DRA240M-○
DA 2400M-GM	24.00	4.04	●	●	
2450M-GM	24.50	4.13	●	●	SS32-DRA250M-○ SF25-DRA250M-○
DA 2500M-GM	25.00	4.20	●	●	
2550M-GM	25.50	4.29	●	●	

Inserts sold in 1 piece boxes
● : Available

DRA insert (KM - Cast iron) Drilling diameter $\varnothing 7.94 \sim \varnothing 25.50$



Insert

Description	Dimensions (mm)		Grade	Applicable toolholder
	$\varnothing D_c$	L_p	PR1525	
DA 0794M-KM	7.94	1.82	●	SS10-DRA080M-○ SF12-DRA080M-○
0800M-KM	8.00	1.85	●	
0810M-KM	8.10	1.89	●	
0820M-KM	8.20	1.93	●	
0830M-KM	8.30	1.98	●	
0840M-KM	8.40	2.02	●	SS10-DRA085M-○ SF12-DRA085M-○
DA 0850M-KM	8.50	2.06	●	
0860M-KM	8.60	2.10	●	
0870M-KM	8.70	2.14	●	
0880M-KM	8.80	2.19	●	
0890M-KM	8.90	2.23	●	SS10-DRA090M-○ SF12-DRA090M-○
DA 0900M-KM	9.00	2.02	●	
0910M-KM	9.10	2.06	●	
0920M-KM	9.20	2.11	●	
0930M-KM	9.30	2.15	●	
0940M-KM	9.40	2.19	●	SS10-DRA095M-○ SF12-DRA095M-○
DA 0950M-KM	9.50	2.23	●	
0960M-KM	9.60	2.27	●	
0970M-KM	9.70	2.32	●	
0980M-KM	9.80	2.36	●	
0990M-KM	9.90	2.40	●	SS12-DRA100M-○ SF16-DRA100M-○
DA 1000M-KM	10.00	2.20	●	
1010M-KM	10.10	2.24	●	
1020M-KM	10.20	2.28	●	
1030M-KM	10.30	2.32	●	
1040M-KM	10.40	2.37	●	SS12-DRA105M-○ SF16-DRA105M-○
DA 1050M-KM	10.50	2.41	●	
1060M-KM	10.60	2.45	●	
1070M-KM	10.70	2.49	●	
1080M-KM	10.80	2.53	●	
1090M-KM	10.90	2.57	●	SS12-DRA110M-○ SF16-DRA110M-○
DA 1100M-KM	11.00	2.50	●	
1110M-KM	11.10	2.54	●	
1120M-KM	11.20	2.59	●	
1130M-KM	11.30	2.63	●	
1140M-KM	11.40	2.67	●	SS12-DRA115M-○ SF16-DRA115M-○
DA 1150M-KM	11.50	2.71	●	
1160M-KM	11.60	2.75	●	
1170M-KM	11.70	2.80	●	
1180M-KM	11.80	2.84	●	
1190M-KM	11.90	2.88	●	SS14-DRA120M-○ SF16-DRA120M-○
DA 1200M-KM	12.00	2.68	●	
1210M-KM	12.10	2.72	●	
1220M-KM	12.20	2.76	●	
1230M-KM	12.30	2.80	●	
1240M-KM	12.40	2.85	●	SS14-DRA125M-○ SF16-DRA125M-○
DA 1250M-KM	12.50	2.89	●	
1260M-KM	12.60	2.93	●	
1270M-KM	12.70	2.97	●	
1280M-KM	12.80	3.01	●	
1290M-KM	12.90	3.06	●	SS14-DRA130M-○ SF16-DRA130M-○
DA 1300M-KM	13.00	2.83	●	
1310M-KM	13.10	2.87	●	
1320M-KM	13.20	2.92	●	
1330M-KM	13.30	2.96	●	
1340M-KM	13.40	3.00	●	SS14-DRA135M-○ SF16-DRA135M-○
DA 1350M-KM	13.50	3.04	●	
1360M-KM	13.60	3.08	●	
1370M-KM	13.70	3.13	●	
1380M-KM	13.80	3.17	●	
1390M-KM	13.90	3.21	●	SS16-DRA140M-○ SF16-DRA140M-○
DA 1400M-KM	14.00	3.04	●	
1410M-KM	14.10	3.09	●	
1420M-KM	14.20	3.13	●	
1430M-KM	14.30	3.17	●	
1440M-KM	14.40	3.21	●	

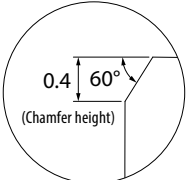
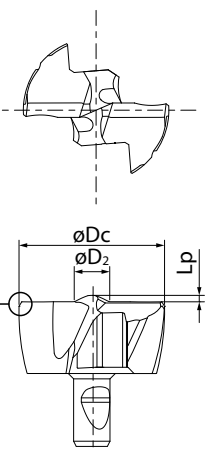
Description	Dimensions (mm)		Grade	Applicable toolholder
	$\varnothing D_c$	L_p	PR1525	
DA 1450M-KM	14.50	3.25	●	SS16-DRA145M-○ SF16-DRA145M-○
1460M-KM	14.60	3.30	●	
1470M-KM	14.70	3.34	●	
1480M-KM	14.80	3.38	●	
1490M-KM	14.90	3.42	●	
DA 1500M-KM	15.00	3.24	●	SS16-DRA150M-○ SF20-DRA150M-○
1510M-KM	15.10	3.28	●	
1520M-KM	15.20	3.33	●	
1530M-KM	15.30	3.37	●	
1540M-KM	15.40	3.41	●	
1550M-KM	15.50	3.45	●	
1560M-KM	15.60	3.49	●	
1570M-KM	15.70	3.54	●	
1580M-KM	15.80	3.58	●	
1590M-KM	15.90	3.62	●	
DA 1600M-KM	16.00	3.43	●	SS18-DRA160M-○ SF20-DRA160M-○
1610M-KM	16.10	3.47	●	
1620M-KM	16.20	3.51	●	
1630M-KM	16.30	3.55	●	
1640M-KM	16.40	3.60	●	
1650M-KM	16.50	3.64	●	
1660M-KM	16.60	3.68	●	
1670M-KM	16.70	3.72	●	
1680M-KM	16.80	3.76	●	
1690M-KM	16.90	3.81	●	
DA 1700M-KM	17.00	3.61	●	SS18-DRA170M-○ SF20-DRA170M-○
1710M-KM	17.10	3.65	●	
1720M-KM	17.20	3.69	●	
1730M-KM	17.30	3.74	●	
1740M-KM	17.40	3.78	●	
1750M-KM	17.50	3.82	●	
1760M-KM	17.60	3.86	●	
1770M-KM	17.70	3.90	●	
1780M-KM	17.80	3.95	●	
1790M-KM	17.90	3.99	●	
DA 1800M-KM	18.00	3.79	●	SS20-DRA180M-○ SF25-DRA180M-○
1810M-KM	18.10	3.83	●	
1820M-KM	18.20	3.88	●	
1830M-KM	18.30	3.92	●	
1840M-KM	18.40	3.96	●	
1850M-KM	18.50	4.00	●	
1860M-KM	18.60	4.04	●	
1870M-KM	18.70	4.08	●	
1880M-KM	18.80	4.13	●	
1890M-KM	18.90	4.17	●	
DA 1900M-KM	19.00	3.97	●	SS20-DRA190M-○ SF25-DRA190M-○
1910M-KM	19.10	4.01	●	
1920M-KM	19.20	4.05	●	
1930M-KM	19.30	4.09	●	
1940M-KM	19.40	4.14	●	
1950M-KM	19.50	4.18	●	
1960M-KM	19.60	4.22	●	
1970M-KM	19.70	4.26	●	
1980M-KM	19.80	4.30	●	
1990M-KM	19.90	4.35	●	
DA 2000M-KM	20.00	4.20	●	SS25-DRA200M-○ SF25-DRA200M-○
2010M-KM	20.10	4.24	●	
2020M-KM	20.20	4.28	●	
2030M-KM	20.30	4.33	●	
2040M-KM	20.40	4.37	●	
2050M-KM	20.50	4.41	●	
2060M-KM	20.60	4.45	●	
2070M-KM	20.70	4.49	●	
2080M-KM	20.80	4.54	●	
2090M-KM	20.90	4.58	●	
DA 2100M-KM	21.00	4.38	●	SS25-DRA210M-○ SF25-DRA210M-○
2150M-KM	21.50	4.59	●	
DA 2200M-KM	22.00	4.55	●	SS25-DRA220M-○ SF25-DRA220M-○
2250M-KM	22.50	4.76	●	
DA 2300M-KM	23.00	4.74	●	SS25-DRA230M-○ SF25-DRA230M-○
2350M-KM	23.50	4.94	●	
DA 2400M-KM	24.00	4.91	●	SS25-DRA240M-○ SF25-DRA240M-○
2450M-KM	24.50	5.12	●	
DA 2500M-KM	25.00	5.08	●	SS32-DRA250M-○ SF25-DRA250M-○
2550M-KM	25.50	5.29	●	

Inserts sold in 1 piece boxes
● : Available

DRA insert (FTP - Counterboring) Drilling diameter $\phi 8.00 \sim \phi 25.4$



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

k8 tolerance

ϕD_c	k8(mm)
8.00 ~ 10.00	+0.022 0
10.10 ~ 18.00	+0.027 0
18.10 ~ 25.40	+0.033 0

k8 is the dimension tolerance of the insert
It is not the tolerance of the cutting diameter

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

Insert

1st recommendation

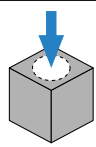
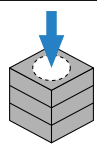
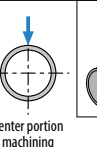
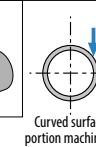
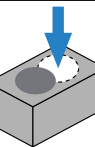
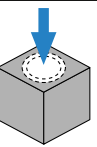
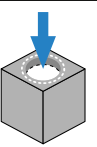
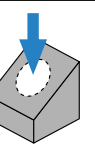
Steel / Stainless Steel PR1535	Cast Iron PR1525
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Description	Dimensions (mm)			Grade		Applicable toolholder
	ϕD_c	ϕD_2	L_p	PR1535	PR1525	
DA0800M-FTP	8.00	2.90	0.40	●	●	SS10-DRA080M-○ SF12-DRA080M-○
DA0830M-FTP	8.30			●	●	
DA0850M-FTP	8.50			●	●	SS10-DRA085M-○ 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			●	●	
DA1030M-FTP	10.30	3.30	0.46	●	●	SS12-DRA100M-○ SF16-DRA100M-○
DA1050M-FTP	10.50			●	●	
DA1080M-FTP	10.80			●	●	SS12-DRA105M-○ SF16-DRA105M-○
DA1100M-FTP	11.00			●	●	
DA1150M-FTP	11.50	3.40	0.50	●	●	SS12-DRA110M-○ SF16-DRA110M-○
DA1200M-FTP	12.00			●	●	SS12-DRA115M-○ SF16-DRA115M-○
DA1250M-FTP	12.50			●	●	SS14-DRA120M-○ SF16-DRA120M-○
DA1270M-FTP	12.70			●	●	
DA1300M-FTP	13.00	3.90	0.56	●	●	SS14-DRA125M-○ SF16-DRA125M-○
DA1350M-FTP	13.50			●	●	SS14-DRA130M-○ SF16-DRA130M-○
DA1400M-FTP	14.00			●	●	SS14-DRA135M-○ SF16-DRA135M-○
DA1450M-FTP	14.50			●	●	SS16-DRA140M-○ SF16-DRA140M-○
DA1500M-FTP	15.00	4.20	0.60	●	●	SS16-DRA145M-○ SF16-DRA145M-○
				●	●	SS16-DRA150M-○ SF20-DRA150M-○
				●	●	
				●	●	

Description	Dimensions (mm)			Grade		Applicable toolholder
	ϕD_c	ϕD_2	L_p	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			●	●	

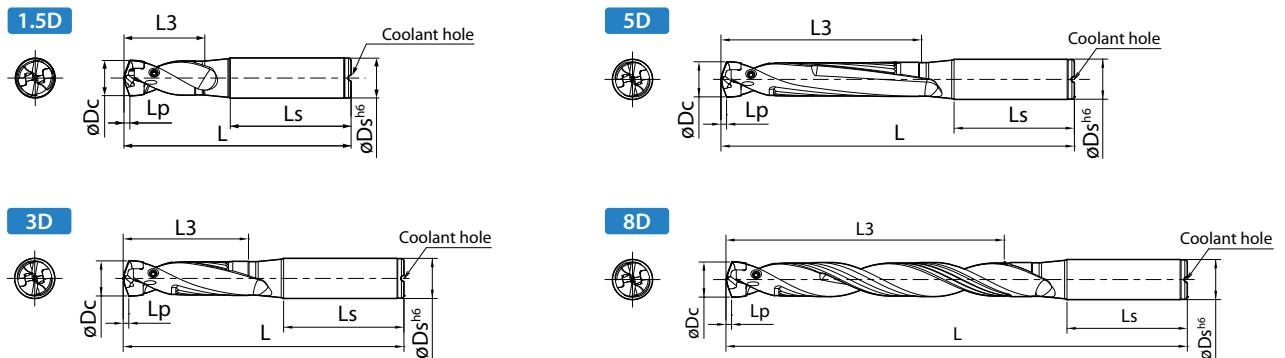
Inserts sold in 1 piece boxes
●: Available

Applicable workpiece and not recommended workpiece

Plain surface	Stacked plates	Pipe material	*Hole expansion	Cored hole	Concave surface	Slant surface	Half cylindrical
							
1.5D holder recommended				Not recommended			
Over 3D holder recommended		Over 3D holder not recommended shape					

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

DRA toolholder (Straight shank)



Toolholder dimensions 1.5D

Description	Availability	Dimensions (mm)						Applicable insert	Spare parts	
		øDc		øDs	L	L3	Ls		Clamp screw	Wrench
		min.	max.							
SS10-DRA080M-1.5	●	7.94	8.49	10	66.2	12.8	40	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SS10-DRA085M-1.5	●	8.50	8.99		67.5	13.5		DA0850M-... ~ DA0890M-...		
SS10-DRA090M-1.5	●	9.00	9.49		68.7	14.3		DA0900M-... ~ DA0940M-...		
SS10-DRA095M-1.5	●	9.50	9.99		70.0	15.0		DA0950M-... ~ DA0990M-...		
SS12-DRA100M-1.5	●	10.00	10.49	12	76.2	15.8	45	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SS12-DRA105M-1.5	●	10.50	10.99		77.5	16.5		DA1050M-... ~ DA1090M-...		
SS12-DRA110M-1.5	●	11.00	11.49		79.7	17.3		DA1100M-... ~ DA1140M-...		
SS12-DRA115M-1.5	●	11.50	11.99		81.0	18.0		DA1150M-... ~ DA1190M-...		
SS14-DRA120M-1.5	●	12.00	12.49	14	82.2	18.8	45	DA1200M-... ~ DA1240M-...	HS-2534TRP	
SS14-DRA125M-1.5	●	12.50	12.99		83.5	19.5		DA1250M-... ~ DA1290M-...		
SS14-DRA130M-1.5	●	13.00	13.49		84.7	20.3		DA1300M-... ~ DA1340M-...		
SS14-DRA135M-1.5	●	13.50	13.99		86.0	21.0		DA1350M-... ~ DA1390M-...		
SS16-DRA140M-1.5	●	14.00	14.49	16	90.2	21.8	48	DA1400M-... ~ DA1440M-...	HS-3048TRP	
SS16-DRA145M-1.5	●	14.50	14.99		91.5	22.5		DA1450M-... ~ DA1490M-...		
SS16-DRA150M-1.5	●	15.00	15.99		95.0	24.0		DA1500M-... ~ DA1590M-...		
SS18-DRA160M-1.5	●	16.00	16.99	18	98.5	25.5		DA1600M-... ~ DA1690M-...		
SS18-DRA170M-1.5	●	17.00	17.99		101.0	27.0		DA1700M-... ~ DA1790M-...		
SS20-DRA180M-1.5	●	18.00	18.99	20	106.5	28.5	50	DA1800M-... ~ DA1890M-...	HS-4067TRP	
SS20-DRA190M-1.5	●	19.00	19.99		109.0	30.0		DA1900M-... ~ DA1990M-...		
SS25-DRA200M-1.5	●	20.00	20.99	25	117.5	31.5	56	DA2000M-... ~ DA2090M-...		
SS25-DRA210M-1.5	●	21.00	21.99		120.0	33.0		DA2100M-... ~ DA2150M-...		
SS25-DRA220M-1.5	●	22.00	22.99		123.5	34.5		DA2200M-... ~ DA2250M-...		
SS25-DRA230M-1.5	●	23.00	23.99		126.0	36.0		DA2300M-... ~ DA2350M-...		
SS25-DRA240M-1.5	●	24.00	24.99		128.5	37.5		DA2400M-... ~ DA2450M-...		
SS32-DRA250M-1.5	●	25.00	25.50	32	135.0	39.0	60	DA2500M-... ~ DA2550M-...		

● : Available

Toolholder dimensions 3D

Description	Availability	Dimensions (mm)					Applicable insert	Spare parts		
		øDc		øDs	L	L3		Ls	Clamp screw	Wrench
		min.	max.							
SS10-DRA080M-3	●	7.94	8.49	10	79	25.5	40	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SS10-DRA085M-3	●	8.50	8.99		81	27.0		DA0850M-... ~ DA0890M-...		
SS10-DRA090M-3	●	9.00	9.49		83	28.5		DA0900M-... ~ DA0940M-...		
SS10-DRA095M-3	●	9.50	9.99		85	30.0		DA0950M-... ~ DA0990M-...		
SS12-DRA100M-3	●	10.00	10.49	12	92	31.5	45	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SS12-DRA105M-3	●	10.50	10.99		94	33.0		DA1050M-... ~ DA1090M-...		
SS12-DRA110M-3	●	11.00	11.49		97	34.5		DA1100M-... ~ DA1140M-...		
SS12-DRA115M-3	●	11.50	11.99		99	36.0		DA1150M-... ~ DA1190M-...		
SS14-DRA120M-3	●	12.00	12.49	14	101	37.5	48	DA1200M-... ~ DA1240M-...	HS-3048TRP	
SS14-DRA125M-3	●	12.50	12.99		103	39.0		DA1250M-... ~ DA1290M-...		
SS14-DRA130M-3	●	13.00	13.49		105	40.5		DA1300M-... ~ DA1340M-...		
SS14-DRA135M-3	●	13.50	13.99		107	42.0		DA1350M-... ~ DA1390M-...		
SS16-DRA140M-3	●	14.00	14.49	16	112	43.5	48	DA1400M-... ~ DA1440M-...	HS-3048TRP	
SS16-DRA145M-3	●	14.50	14.99		114	45.0		DA1450M-... ~ DA1490M-...		
SS16-DRA150M-3	●	15.00	15.99		119	48.0		DA1500M-... ~ DA1590M-...		
SS18-DRA160M-3	●	16.00	16.99	18	124	51.0	50	DA1600M-... ~ DA1690M-...	HS-4067TRP	
SS18-DRA170M-3	●	17.00	17.99		128	54.0		DA1700M-... ~ DA1790M-...		
SS20-DRA180M-3	●	18.00	18.99	20	135	57.0	56	DA1800M-... ~ DA1890M-...	HS-4067TRP	
SS20-DRA190M-3	●	19.00	19.99		139	60.0		DA1900M-... ~ DA1990M-...		
SS25-DRA200M-3	●	20.00	20.99	25	149	63.0	60	DA2000M-... ~ DA2090M-...	DTP-7	
SS25-DRA210M-3	●	21.00	21.99		153	66.0		DA2100M-... ~ DA2150M-...		
SS25-DRA220M-3	●	22.00	22.99		158	69.0		DA2200M-... ~ DA2250M-...		
SS25-DRA230M-3	●	23.00	23.99		162	72.0		DA2300M-... ~ DA2350M-...		
SS25-DRA240M-3	●	24.00	24.99		166	75.0		DA2400M-... ~ DA2450M-...		
SS32-DRA250M-3	●	25.00	25.50	32	174	78.0	DA2500M-... ~ DA2550M-...			

● : Available

Toolholder dimensions 5D

Description	Availability	Dimensions (mm)					Applicable insert	Spare parts		
		øDc		øDs	L	L3		Ls	Clamp screw	Wrench
		min.	max.							
SS10-DRA080M-5	●	7.94	8.49	10	96	42.5	40	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SS10-DRA085M-5	●	8.50	8.99		99	45.0		DA0850M-... ~ DA0890M-...		
SS10-DRA090M-5	●	9.00	9.49		102	47.5		DA0900M-... ~ DA0940M-...		
SS10-DRA095M-5	●	9.50	9.99		105	50.0		DA0950M-... ~ DA0990M-...		
SS12-DRA100M-5	●	10.00	10.49	12	113	52.5	45	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SS12-DRA105M-5	●	10.50	10.99		116	55.0		DA1050M-... ~ DA1090M-...		
SS12-DRA110M-5	●	11.00	11.49		120	57.5		DA1100M-... ~ DA1140M-...		
SS12-DRA115M-5	●	11.50	11.99		123	60.0		DA1150M-... ~ DA1190M-...		
SS14-DRA120M-5	●	12.00	12.49	14	126	62.5	45	DA1200M-... ~ DA1240M-...	HS-2534TRP	
SS14-DRA125M-5	●	12.50	12.99		129	65.0		DA1250M-... ~ DA1290M-...		
SS14-DRA130M-5	●	13.00	13.49		132	67.5		DA1300M-... ~ DA1340M-...		
SS14-DRA135M-5	●	13.50	13.99		135	70.0		DA1350M-... ~ DA1390M-...		
SS16-DRA140M-5	●	14.00	14.49	16	141	72.5	48	DA1400M-... ~ DA1440M-...	HS-3048TRP	
SS16-DRA145M-5	●	14.50	14.99		144	75.0		DA1450M-... ~ DA1490M-...		
SS16-DRA150M-5	●	15.00	15.99		151	80.0		DA1500M-... ~ DA1590M-...		
SS18-DRA160M-5	●	16.00	16.99	18	158	85.0		48		DA1600M-... ~ DA1690M-...
SS18-DRA170M-5	●	17.00	17.99		164	90.0	DA1700M-... ~ DA1790M-...			
SS20-DRA180M-5	●	18.00	18.99	20	173	95.0	50	DA1800M-... ~ DA1890M-...	HS-4067TRP	
SS20-DRA190M-5	●	19.00	19.99		179	100.0		DA1900M-... ~ DA1990M-...		
SS25-DRA200M-5	●	20.00	20.99	25	191	105.0	56	DA2000M-... ~ DA2090M-...	HS-4067TRP	
SS25-DRA210M-5	●	21.00	21.99		197	110.0		DA2100M-... ~ DA2150M-...		
SS25-DRA220M-5	●	22.00	22.99		204	115.0		DA2200M-... ~ DA2250M-...		
SS25-DRA230M-5	●	23.00	23.99		210	120.0		DA2300M-... ~ DA2350M-...		
SS25-DRA240M-5	●	24.00	24.99		216	125.0		DA2400M-... ~ DA2450M-...		
SS32-DRA250M-5	●	25.00	25.50	32	226	130.0	60	DA2500M-... ~ DA2550M-...		

● : Available

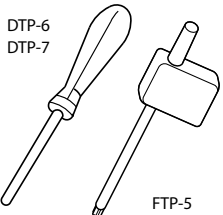
Toolholder dimensions **8D**

Description	Availability	Dimensions (mm)					Applicable insert	Spare parts		
		øDc		øDs	L	L3		Ls	Clamp screw	Wrench
		min.	max.							
SS10-DRA080M-8	●	7.94	8.49	10	121	68.0	40	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SS10-DRA085M-8	●	8.50	8.99		126	72.0		DA0850M-... ~ DA0890M-...		
SS10-DRA090M-8	●	9.00	9.49		130	76.0		DA0900M-... ~ DA0940M-...		
SS10-DRA095M-8	●	9.50	9.99		135	80.0		DA0950M-... ~ DA0990M-...		
SS12-DRA100M-8	●	10.00	10.49	12	144	84.0	45	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SS12-DRA105M-8	●	10.50	10.99		149	88.0		DA1050M-... ~ DA1090M-...		
SS12-DRA110M-8	●	11.00	11.49		154	92.0		DA1100M-... ~ DA1140M-...		
SS12-DRA115M-8	●	11.50	11.99		159	96.0		DA1150M-... ~ DA1190M-...		
SS14-DRA120M-8	●	12.00	12.49	14	163	100.0		DA1200M-... ~ DA1240M-...		
SS14-DRA125M-8	●	12.50	12.99		168	104.0		DA1250M-... ~ DA1290M-...		
SS14-DRA130M-8	●	13.00	13.49		172	108.0		DA1300M-... ~ DA1340M-...		
SS14-DRA135M-8	●	13.50	13.99		177	112.0		DA1350M-... ~ DA1390M-...		
SS16-DRA140M-8	●	14.00	14.49	16	184	116.0	48	DA1400M-... ~ DA1440M-...	HS-3048TRP	
SS16-DRA145M-8	●	14.50	14.99		189	120.0		DA1450M-... ~ DA1490M-...		
SS16-DRA150M-8	●	15.00	15.99		199	128.0		DA1500M-... ~ DA1590M-...		
SS18-DRA160M-8	●	16.00	16.99	18	209	136.0		DA1600M-... ~ DA1690M-...		
SS18-DRA170M-8	●	17.00	17.99		218	144.0		DA1700M-... ~ DA1790M-...		
SS20-DRA180M-8	●	18.00	18.99	20	230	152.0	50	DA1800M-... ~ DA1890M-...	HS-4067TRP	
SS20-DRA190M-8	●	19.00	19.99		239	160.0		DA1900M-... ~ DA1990M-...		
SS25-DRA200M-8	●	20.00	20.99	25	254	168.0	56	DA2000M-... ~ DA2090M-...		
SS25-DRA210M-8	●	21.00	21.99		263	176.0		DA2100M-... ~ DA2150M-...		
SS25-DRA220M-8	●	22.00	22.99		273	184.0		DA2200M-... ~ DA2250M-...		
SS25-DRA230M-8	●	23.00	23.99		282	192.0		DA2300M-... ~ DA2350M-...		
SS25-DRA240M-8	●	24.00	24.99		291	200.0		DA2400M-... ~ DA2450M-...		
SS32-DRA250M-8	●	25.00	25.50	32	304	208.0	60	DA2500M-... ~ DA2550M-...		

● : Available

Spare parts

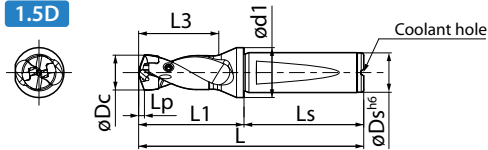
Clamp screw	Description
	HS-2524TRP
	HS-2534TRP
	HS-3048TRP
	HS-4067TRP

Wrench	Description	Torque (N · m)
	FTP-5	0.5
	DTP-6	0.8
	DTP-7	1.2

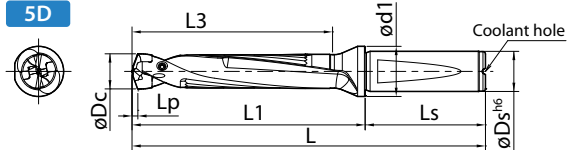
DRA toolholder (with flange)



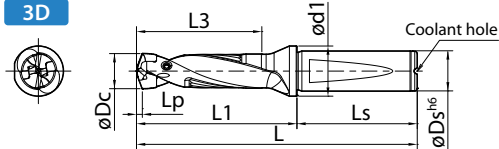
1.5D



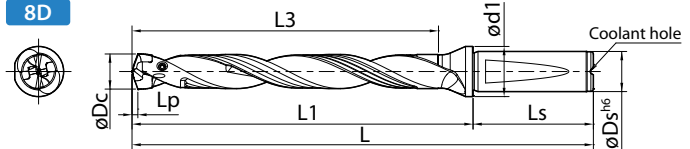
5D



3D



8D



Toolholder dimensions 1.5D

Description	Availability	Dimensions (mm)								Applicable insert	Spare parts	
		øDc		øDs	L	L1	L3	Ls	ød1		Clamp screw	Wrench
		min.	max.									
SF12-DRA080M-1.5	●	7.94	8.49	12	71.2	26.2	12.8	45	16	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SF12-DRA085M-1.5	●	8.50	8.99		72.5	27.5	13.5			DA0850M-... ~ DA0890M-...		
SF12-DRA090M-1.5	●	9.00	9.49		73.7	28.7	14.3			DA0900M-... ~ DA0940M-...		
SF12-DRA095M-1.5	●	9.50	9.99		75.0	30.0	15.0			DA0950M-... ~ DA0990M-...		
SF16-DRA100M-1.5	●	10.00	10.49	16	79.2	31.2	15.8	48	20	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SF16-DRA105M-1.5	●	10.50	10.99		80.5	32.5	16.5			DA1050M-... ~ DA1090M-...		
SF16-DRA110M-1.5	●	11.00	11.49		82.7	34.7	17.3			DA1100M-... ~ DA1140M-...		
SF16-DRA115M-1.5	●	11.50	11.99		84.0	36.0	18.0			DA1150M-... ~ DA1190M-...		
SF16-DRA120M-1.5	●	12.00	12.49		85.2	37.2	18.8			DA1200M-... ~ DA1240M-...		
SF16-DRA125M-1.5	●	12.50	12.99		86.5	38.5	19.5			DA1250M-... ~ DA1290M-...		
SF16-DRA130M-1.5	●	13.00	13.49		87.7	39.7	20.3			DA1300M-... ~ DA1340M-...		
SF16-DRA135M-1.5	●	13.50	13.99		89.0	41.0	21.0			DA1350M-... ~ DA1390M-...		
SF16-DRA140M-1.5	●	14.00	14.49		90.2	42.2	21.8			DA1400M-... ~ DA1440M-...		
SF16-DRA145M-1.5	●	14.50	14.99		91.5	43.5	22.5			DA1450M-... ~ DA1490M-...		
SF20-DRA150M-1.5	●	15.00	15.99	20	97.0	47.0	24.0	50	25	DA1500M-... ~ DA1590M-...	HS-3048TRP	
SF20-DRA160M-1.5	●	16.00	16.99		100.5	50.5	25.5			DA1600M-... ~ DA1690M-...		
SF20-DRA170M-1.5	●	17.00	17.99		103.0	53.0	27.0			DA1700M-... ~ DA1790M-...		
SF25-DRA180M-1.5	●	18.00	18.99	25	112.5	56.5	28.5	56	32	DA1800M-... ~ DA1890M-...	HS-4067TRP	DTP-7
SF25-DRA190M-1.5	●	19.00	19.99		115.0	59.0	30.0			DA1900M-... ~ DA1990M-...		
SF25-DRA200M-1.5	●	20.00	20.99		117.5	61.5	31.5			DA2000M-... ~ DA2090M-...		
SF25-DRA210M-1.5	●	21.00	21.99		120.0	64.0	33.0			DA2100M-... ~ DA2150M-...		
SF25-DRA220M-1.5	●	22.00	22.99		123.5	67.5	34.5			DA2200M-... ~ DA2250M-...		
SF25-DRA230M-1.5	●	23.00	23.99		126.0	70.0	36.0			DA2300M-... ~ DA2350M-...		
SF25-DRA240M-1.5	●	24.00	24.99		128.5	72.5	37.5			DA2400M-... ~ DA2450M-...		
SF25-DRA250M-1.5	●	25.00	25.50		131.0	75.0	39.0			DA2500M-... ~ DA2550M-...		

● : Available

Toolholder dimensions

3D

Description	Availability	Dimensions (mm)							Applicable insert	Spare parts		
		øDc		øDs	L	L1	L3	Ls		ød1	Clamp screw	Wrench
		min.	max.									
SF12-DRA080M-3	●	7.94	8.49	12	84	39	25.5	45	16	DA0794M-... ~ DA0840M-...	HS-2524TRP	
SF12-DRA085M-3	●	8.50	8.99		86	41	27.0			DA0850M-... ~ DA0890M-...		
SF12-DRA090M-3	●	9.00	9.49		88	43	28.5			DA0900M-... ~ DA0940M-...		
SF12-DRA095M-3	●	9.50	9.99		90	45	30.0			DA0950M-... ~ DA0990M-...		
SF16-DRA100M-3	●	10.00	10.49	16	95	47	31.5	48	20	DA1000M-... ~ DA1040M-...	HS-2534TRP	FTP-5
SF16-DRA105M-3	●	10.50	10.99		97	49	33.0			DA1050M-... ~ DA1090M-...		
SF16-DRA110M-3	●	11.00	11.49		100	52	34.5			DA1100M-... ~ DA1140M-...		
SF16-DRA115M-3	●	11.50	11.99		102	54	36.0			DA1150M-... ~ DA1190M-...		
SF16-DRA120M-3	●	12.00	12.49		104	56	37.5			DA1200M-... ~ DA1240M-...		
SF16-DRA125M-3	●	12.50	12.99		106	58	39.0			DA1250M-... ~ DA1290M-...		
SF16-DRA130M-3	●	13.00	13.49		108	60	40.5			DA1300M-... ~ DA1340M-...		
SF16-DRA135M-3	●	13.50	13.99		110	62	42.0			DA1350M-... ~ DA1390M-...		
SF16-DRA140M-3	●	14.00	14.49		112	64	43.5			DA1400M-... ~ DA1440M-...		
SF16-DRA145M-3	●	14.50	14.99		114	66	45.0			DA1450M-... ~ DA1490M-...		
SF20-DRA150M-3	●	15.00	15.99	20	121	71	48.0	50	25	DA1500M-... ~ DA1590M-...	HS-3048TRP	DTP-6
SF20-DRA160M-3	●	16.00	16.99		126	76	51.0			DA1600M-... ~ DA1690M-...		
SF20-DRA170M-3	●	17.00	17.99		130	80	54.0			DA1700M-... ~ DA1790M-...		
SF25-DRA180M-3	●	18.00	18.99	25	141	85	57.0	56	32	DA1800M-... ~ DA1890M-...	HS-4067TRP	DTP-7
SF25-DRA190M-3	●	19.00	19.99		145	89	60.0			DA1900M-... ~ DA1990M-...		
SF25-DRA200M-3	●	20.00	20.99		149	93	63.0			DA2000M-... ~ DA2090M-...		
SF25-DRA210M-3	●	21.00	21.99		153	97	66.0			DA2100M-... ~ DA2150M-...		
SF25-DRA220M-3	●	22.00	22.99		158	102	69.0			DA2200M-... ~ DA2250M-...		
SF25-DRA230M-3	●	23.00	23.99		162	106	72.0			DA2300M-... ~ DA2350M-...		
SF25-DRA240M-3	●	24.00	24.99		166	110	75.0			DA2400M-... ~ DA2450M-...		
SF25-DRA250M-3	●	25.00	25.50		170	114	78.0			DA2500M-... ~ DA2550M-...		

● : Available

Toolholder dimensions

5D

Description	Availability	Dimensions (mm)								Applicable insert	Spare parts	
		øDc		øDs	L	L1	L3	Ls	øD1		Clamp screw	Wrench
		min.	max.									
SF12-DRA080M-5	●	7.94	8.49	12	101	56	42.5	45	16	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SF12-DRA085M-5	●	8.50	8.99		104	59	45.0			DA0850M-... ~ DA0890M-...		
SF12-DRA090M-5	●	9.00	9.49		107	62	47.5			DA0900M-... ~ DA0940M-...		
SF12-DRA095M-5	●	9.50	9.99		110	65	50.0			DA0950M-... ~ DA0990M-...		
SF16-DRA100M-5	●	10.00	10.49	16	116	68	52.5	48	20	DA1000M-... ~ DA1040M-...	HS-2534TRP	FTP-5
SF16-DRA105M-5	●	10.50	10.99		119	71	55.0			DA1050M-... ~ DA1090M-...		
SF16-DRA110M-5	●	11.00	11.49		123	75	57.5			DA1100M-... ~ DA1140M-...		
SF16-DRA115M-5	●	11.50	11.99		126	78	60.0			DA1150M-... ~ DA1190M-...		
SF16-DRA120M-5	●	12.00	12.49		129	81	62.5			DA1200M-... ~ DA1240M-...		
SF16-DRA125M-5	●	12.50	12.99		132	84	65.0			DA1250M-... ~ DA1290M-...		
SF16-DRA130M-5	●	13.00	13.49		135	87	67.5			DA1300M-... ~ DA1340M-...		
SF16-DRA135M-5	●	13.50	13.99		138	90	70.0			DA1350M-... ~ DA1390M-...		
SF16-DRA140M-5	●	14.00	14.49		141	93	72.5			DA1400M-... ~ DA1440M-...		
SF16-DRA145M-5	●	14.50	14.99		144	96	75.0			DA1450M-... ~ DA1490M-...		
SF20-DRA150M-5	●	15.00	15.99	20	153	103	80.0	50	25	DA1500M-... ~ DA1590M-...	HS-3048TRP	DTP-6
SF20-DRA160M-5	●	16.00	16.99		160	110	85.0			DA1600M-... ~ DA1690M-...		
SF20-DRA170M-5	●	17.00	17.99		166	116	90.0			DA1700M-... ~ DA1790M-...		
SF25-DRA180M-5	●	18.00	18.99	25	179	123	95.0	56	32	DA1800M-... ~ DA1890M-...	HS-4067TRP	DTP-7
SF25-DRA190M-5	●	19.00	19.99		185	129	100.0			DA1900M-... ~ DA1990M-...		
SF25-DRA200M-5	●	20.00	20.99		191	135	105.0			DA2000M-... ~ DA2090M-...		
SF25-DRA210M-5	●	21.00	21.99		197	141	110.0			DA2100M-... ~ DA2150M-...		
SF25-DRA220M-5	●	22.00	22.99		204	148	115.0			DA2200M-... ~ DA2250M-...		
SF25-DRA230M-5	●	23.00	23.99		210	154	120.0			DA2300M-... ~ DA2350M-...		
SF25-DRA240M-5	●	24.00	24.99		216	160	125.0			DA2400M-... ~ DA2450M-...		
SF25-DRA250M-5	●	25.00	25.50		222	166	130.0			DA2500M-... ~ DA2550M-...		

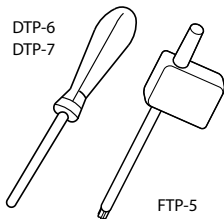
● : Available

Toolholder dimensions 8D

Description	Availability	Dimensions (mm)							Applicable insert	Spare parts		
		øDc		øDs	L	L1	L3	Ls		ød1	Clamp screw	Wrench
		min.	max.									
SF12-DRA080M-8	●	7.94	8.49	12	126	81	68.0	45	16	DA0794M-... ~ DA0840M-...	HS-2524TRP	FTP-5
SF12-DRA085M-8	●	8.50	8.99		131	86	72.0			DA0850M-... ~ DA0890M-...		
SF12-DRA090M-8	●	9.00	9.49		135	90	76.0			DA0900M-... ~ DA0940M-...		
SF12-DRA095M-8	●	9.50	9.99		140	95	80.0			DA0950M-... ~ DA0990M-...		
SF16-DRA100M-8	●	10.00	10.49	16	147	99	84.0	48	20	DA1000M-... ~ DA1040M-...	HS-2534TRP	
SF16-DRA105M-8	●	10.50	10.99		152	104	88.0			DA1050M-... ~ DA1090M-...		
SF16-DRA110M-8	●	11.00	11.49		157	109	92.0			DA1100M-... ~ DA1140M-...		
SF16-DRA115M-8	●	11.50	11.99		162	114	96.0			DA1150M-... ~ DA1190M-...		
SF16-DRA120M-8	●	12.00	12.49		166	118	100.0			DA1200M-... ~ DA1240M-...		
SF16-DRA125M-8	●	12.50	12.99		171	123	104.0			DA1250M-... ~ DA1290M-...		
SF16-DRA130M-8	●	13.00	13.49		175	127	108.0			DA1300M-... ~ DA1340M-...		
SF16-DRA135M-8	●	13.50	13.99		180	132	112.0			DA1350M-... ~ DA1390M-...		
SF16-DRA140M-8	●	14.00	14.49		184	136	116.0			DA1400M-... ~ DA1440M-...		
SF16-DRA145M-8	●	14.50	14.99		189	141	120.0			DA1450M-... ~ DA1490M-...		
SF20-DRA150M-8	●	15.00	15.99	20	201	151	128.0	50	25	DA1500M-... ~ DA1590M-...	HS-3048TRP	DTP-6
SF20-DRA160M-8	●	16.00	16.99		211	161	136.0			DA1600M-... ~ DA1690M-...		
SF20-DRA170M-8	●	17.00	17.99		220	170	144.0			DA1700M-... ~ DA1790M-...		
SF25-DRA180M-8	●	18.00	18.99	25	236	180	152.0	56	32	DA1800M-... ~ DA1890M-...	HS-4067TRP	DTP-7
SF25-DRA190M-8	●	19.00	19.99		245	189	160.0			DA1900M-... ~ DA1990M-...		
SF25-DRA200M-8	●	20.00	20.99		254	198	168.0			DA2000M-... ~ DA2090M-...		
SF25-DRA210M-8	●	21.00	21.99		263	207	176.0			DA2100M-... ~ DA2150M-...		
SF25-DRA220M-8	●	22.00	22.99		273	217	184.0			DA2200M-... ~ DA2250M-...		
SF25-DRA230M-8	●	23.00	23.99		282	226	192.0			DA2300M-... ~ DA2350M-...		
SF25-DRA240M-8	●	24.00	24.99		291	235	200.0			DA2400M-... ~ DA2450M-...		
SF25-DRA250M-8	●	25.00	25.50		300	244	208.0			DA2500M-... ~ DA2550M-...		

● : Available

Spare parts

Clamp screw	Description	Wrench	Description	Torque (N · m)
	HS-2524TRP		FTP-5	0.5
	HS-2534TRP		DTP-6	0.8
	HS-3048TRP		DTP-7	1.2
	HS-4067TRP			

Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

GM - General purpose

Workpiece	Recommended grade / Vc (m/min)		Spindle revolution (min ⁻¹)	Cutting diameter øDc (mm)						Notes
	PR1535	PR1525	Feed rate (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	
Low carbon steel	★ 100 – 180	☆ 100 – 180	min ⁻¹	3,980 – 7,160	2,890 – 5,210	2,270 – 4,090	1,770 – 3,180	1,450 – 2,600	1,270 – 2,290	Coolant see next page
			mm/rev	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.4	0.2 – 0.45	0.2 – 0.45	
Carbon steel	★ 100 – 150	☆ 100 – 150	min ⁻¹	3,980 – 5,970	2,890 – 4,340	2,270 – 3,410	1,770 – 2,650	1,450 – 2,170	1,270 – 1,910	
			mm/rev	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.4	0.2 – 0.45	0.2 – 0.45	
Alloy steel	★ 70 – 120	☆ 70 – 120	min ⁻¹	2,790 – 4,780	2,030 – 3,470	1,590 – 2,730	1,240 – 2,120	1,010 – 1,740	890 – 1,530	
			mm/rev	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.4	0.2 – 0.45	0.2 – 0.45	
Tool steel	★ 50 – 90	☆ 50 – 90	min ⁻¹	1,990 – 3,580	1,450 – 2,600	1,140 – 2,050	880 – 1,590	720 – 1,300	640 – 1,150	
			mm/rev	0.08 – 0.17	0.08 – 0.22	0.11 – 0.25	0.11 – 0.28	0.14 – 0.32	0.14 – 0.32	
Stainless steel	★ 40 – 70	☆ 40 – 70	min ⁻¹	1,590 – 2,790	1,160 – 2,030	910 – 1,590	710 – 1,240	580 – 1,010	510 – 890	
			mm/rev	0.1 – 0.24	0.1 – 0.24	0.12 – 0.3	0.15 – 0.3	0.15 – 0.3	0.15 – 0.35	
			Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5D mm							
Gray cast iron	☆ 90 – 170	★ 90 – 170	min ⁻¹	3,580 – 6,760	2,600 – 4,920	2,050 – 3,870	1,590 – 3,010	1,300 – 2,460	1,150 – 2,170	
			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 – 120	★ 40 – 120	min ⁻¹	1,590 – 4,780	1,160 – 3,470	910 – 2,730	710 – 2,120	580 – 1,740	510 – 1,530	
			mm/rev	0.12 – 0.24	0.12 – 0.31	0.16 – 0.36	0.16 – 0.4	0.2 – 0.45	0.2 – 0.45	

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

KM - Cast iron

Workpiece	Recommended grade / Vc (m/min)	Spindle revolution (min ⁻¹)	Cutting diameter øDc (mm)						Notes
	PR1525	Feed rate (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	
Gray cast Iron	90 – 170	min ⁻¹	3,580 – 6,760	2,600 – 4,920	2,050 – 3,870	1,590 – 3,010	1,300 – 2,460	1,150 – 2,170	Coolant see next page
		mm/rev	0.17 – 0.35	0.19 – 0.42	0.23 – 0.53	0.25 – 0.60	0.32 – 0.60	0.32 – 0.60	
Nodular cast iron	40 – 120	min ⁻¹	1,590 – 4,780	1,160 – 3,470	910 – 2,730	710 – 2,120	580 – 1,740	510 – 1,530	
		mm/rev	0.12 – 0.24	0.17 – 0.36	0.21 – 0.48	0.24 – 0.60	0.27 – 0.60	0.27 – 0.60	

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

FTP - Counterboring

Workpiece	Recommended grade / Vc (m/min)		Spindle revolution (min ⁻¹)	Cutting diameter øDc (mm)						Notes
	PR1535	PR1525	Feed rate (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	
Low carbon steel	★ 80 – 150	☆ 80 – 150	min ⁻¹	3,150 – 6,000	2,300 – 4,350	1,800 – 3,400	1,400 – 2,650	1,150 – 2,200	1,000 – 1,900	Coolant see next page
			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	min ⁻¹	3,150 – 4,750	2,300 – 3,450	1,800 – 2,700	1,400 – 2,100	1,150 – 1,750	1,000 – 1,500	
			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	min ⁻¹	2,800 – 4,750	2,000 – 3,450	1,600 – 2,700	1,250 – 2,100	1,000 – 1,750	900 – 1,500	
			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	min ⁻¹	1,600 – 2,800	1,150 – 2,000	900 – 1,600	700 – 1,250	600 – 1,000	500 – 900	
			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	min ⁻¹	1,600 – 2,800	1,150 – 2,000	900 – 1,600	700 – 1,250	600 – 1,000	500 – 900	
			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 0.15mm/rev or less is recommended until drilling depth reaches 0.5D mm							
Gray cast iron	☆ 70 – 140	★ 70 – 140	min ⁻¹	2,800 – 5,600	2,000 – 4,050	1,600 – 3,200	1,250 – 2,500	1,000 – 2,000	900 – 1,800	
			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	min ⁻¹	1,600 – 4,000	1,150 – 2,900	900 – 2,750	700 – 1,750	600 – 1,450	500 – 1,250	
			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. Applicable to 1.5D, 3D, 5D and 8D holders. Prepared hole (0.5D) is needed when using 8D holder. Traversing is not recommended. In the case of slant surface, only 1.5D holder is recommended. And, set the feed rate under 50% when inclination angle is under 30°, and under 30% when angle is over 30°.

Coolant *Dry cutting is not recommended

1st recommendation

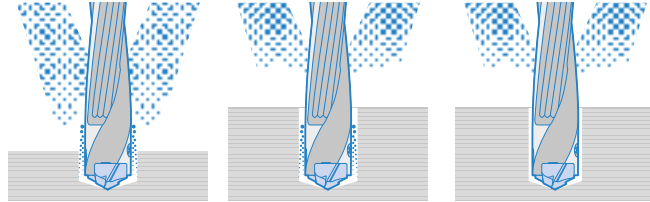
Internal coolant

The combination of internal and external coolant is recommended

In case of external coolant

Drilling depth is less than 1D

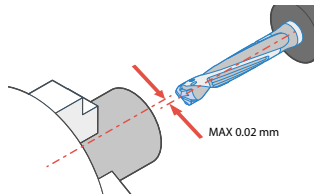
Stainless steel or high-feed machining



Lathe: Within 3D; Vertical M/C: Within 1.5D

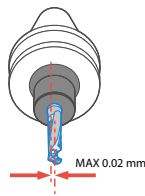
Center deviation / Alignment cautions

If drill is stationary



DRA works with both boring sleeve and collet-chuck. Center deviation should be less than 0.02 mm between workpiece and drill.

If drill is rotating



Do not use any arbor whose attachment surface is deformed. Center deviation must be less than 0.02 mm.

Caution for installation on machining center

How to install DRA

1st recommendation

Hydro-chuck, power-chuck, collet-chuck

Hydro-chuck

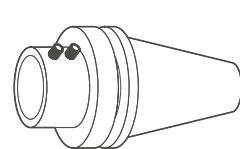
Power-chuck

Collet-chuck

Install DRA into these chucks

2nd recommendation

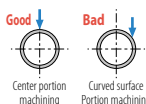
Side lock arbor



Example of side lock arbor

Applicable workpiece (for GM, KM)

Application	Workpiece shape	Caution for machining
Plain surface		- When machining stainless steel, for hole depths of up to 0.5D, keep feed rate at less than 0.15mm/rev. - Internal coolant is recommended for smooth chip removal. For stainless steel, the combination of internal and external coolant is recommended.
Stacked plates		Fix stacked plates securely to ensure they do not slip while machining.
Concave surface		- When machining concave holes, set the feed rate at less than half of recommended feed for continuous hole machining. - Utilize a pecking cycle if chips are not broken short at the inlet.
Pipe material		- Hole machining above the centerline of the pipe is possible. - Do not machine on curved surface areas.



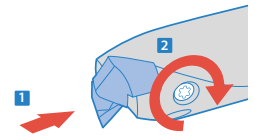
* See page7 for FTP

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 10 and 13



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.

Be careful of the insert direction



Other cautions

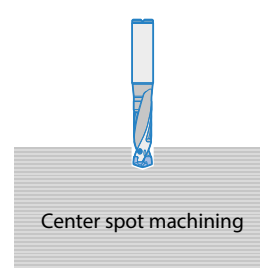
Cautions for machining with 8D holder

Recommended machining

1 Make a center spot using DRA 1.5D/3D/5D type. Center spot should be at least half of cutting diameter

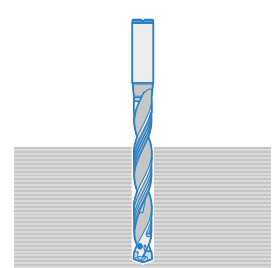
2 Then drill the hole using DRA (8D type)

1. DRA 1.5D/3D/5D



Center spot machining

2. DRA 8D



Non-recommended workpieces (for GM, KM)

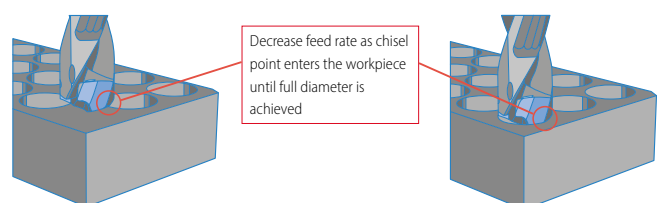
Application	Hole expansion	Slant surface	Half cylindrical	Cored hole
Workpiece shape				

* See page7 for FTP

Precautions for KM chipbreaker

At cast (rough) machining surface

Decrease feed to 0.15 mm/rev until full drill diameter has entered the workpiece



Decrease feed rate as chisel point enters the workpiece until full diameter is achieved