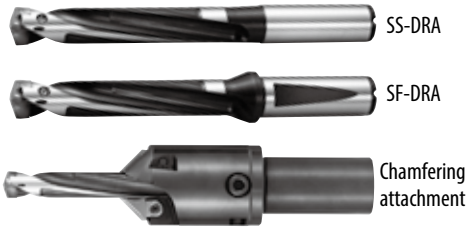
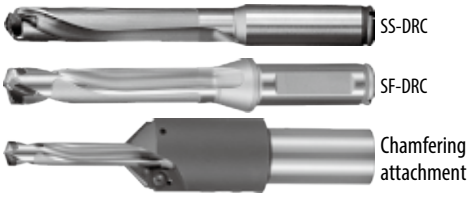
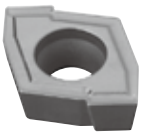
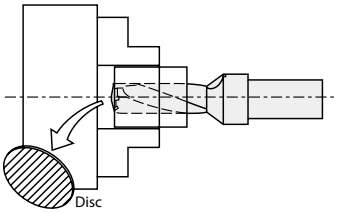
K

Product lineup

Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
DRA K4	 Screw clamp	ø7.94~ø25.50 (1.5D) ø7.94~ø33.0 (3D/5D/8D) ø12~ø25.5 (12D)	Module type with double edges 	Lineup  SS-DRA SF-DRA Chamfering attachment
DRC K32	 Self-clamping	ø7.94~ø25.99 (3D/5D/8D)	Module type with double edges 	Lineup  SS-DRC SF-DRC Chamfering attachment
DRV K48	 Silver coating	ø12~ø60 (2D/3D/4D 5D/6D)	Individually designed Inner & outer edges  Outer edge  Inner edge	Chip shape (Workpiece material: S50C) drill dia. ø20 Chip from outer edge  Chip from inner edge 
DRZ K74	DRZ  DRZ-CR	ø13~ø59 (2D/3D) ø13~ø50 (4D) ø27~ø50 (5D)	Inner & outer edges on one insert 	Chip shape (Workpiece material: S50C) drill dia. ø23 Chip from outer edge  Chip from inner edge 
DRZ-CR [Cartridge type] (Made to order) K83		ø60~ (2D/3D/4D)		

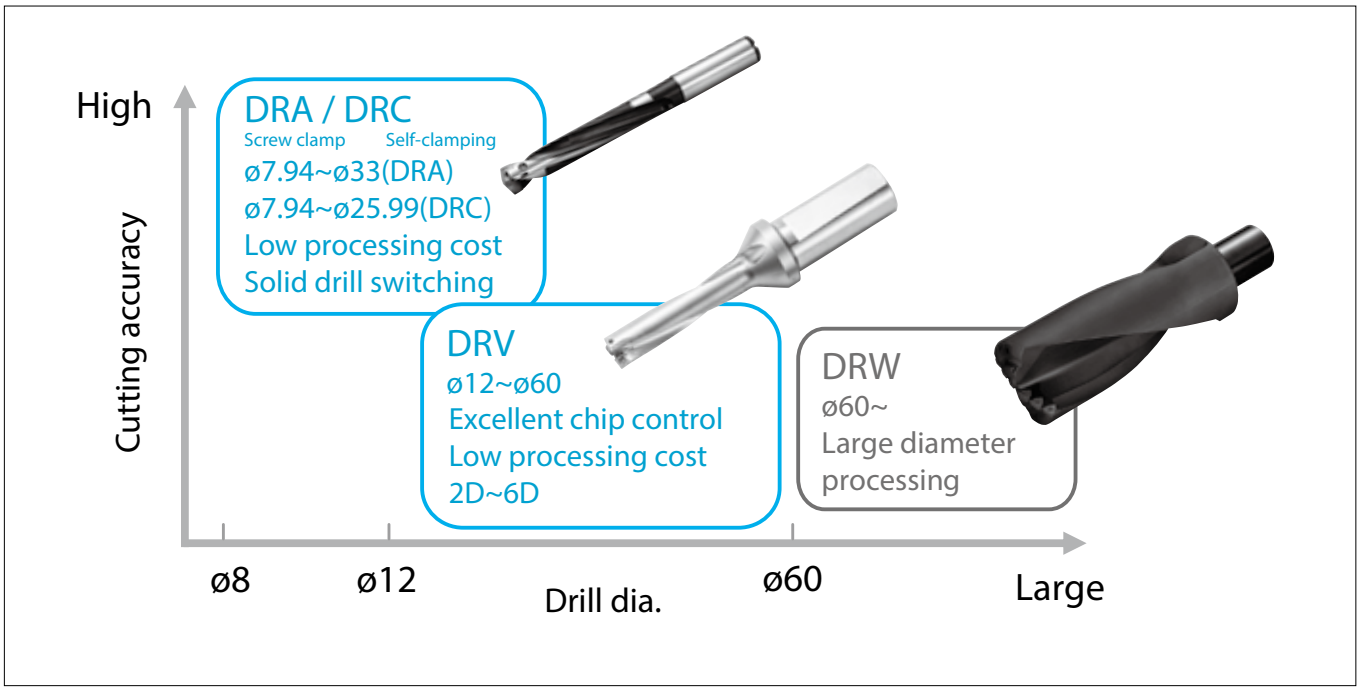
Caution



When drilling through the workpiece, a disk may be ejected.
Proper machine guarding is necessary to prevent injury.
The safety cover is necessary for the conventional lathe machines to prevent any accidents.

Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
DRW (Made to order for some products) K88		ø60~ (1D/2D/3D)	Inner & outer edges on one insert 	Custom-order item  BT integral arbor type is also available  Maximum drilling diameter is ø200.

MagicDrill series application map



High efficiency modular drill

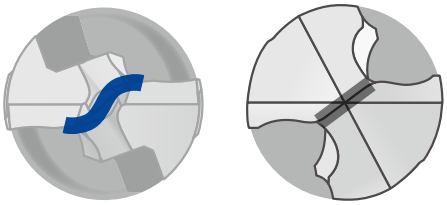
MagicDrill DRA

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.

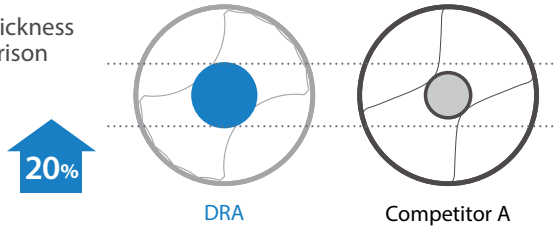
Cutting edge image



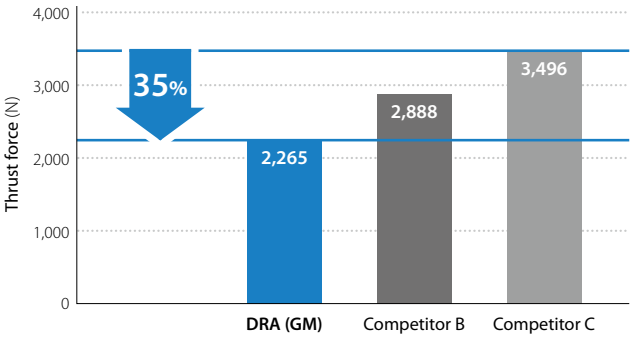
2 Optimal web thickness reduces deflection

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

Web thickness comparison

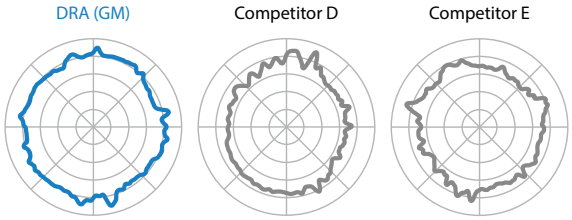


Cutting force comparison (Internal evaluation)



Cutting conditions: Vc = 120 m/min, f = 0.25 mm/rev
Drilling diameter ø14, L/D = 5, Drilling depth 45 mm, Wet, Workpiece material: S50C

Roundness · Cylindricity comparison (Internal evaluation)



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

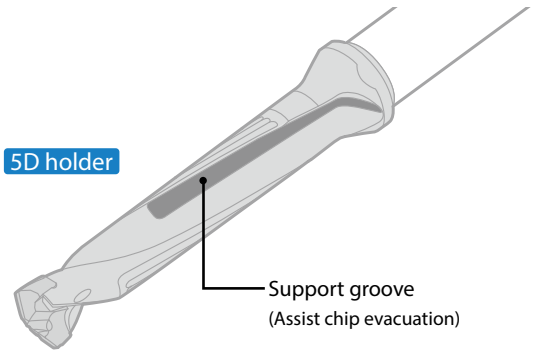
Cutting conditions: Vc = 120 m/min, f = 0.3 mm/rev
Drilling diameter ø14, L/D = 5, Measurement position 55 mm,
Wet, Workpiece material: S50C

3 Fine chip breaking even in deep hole drilling applications

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

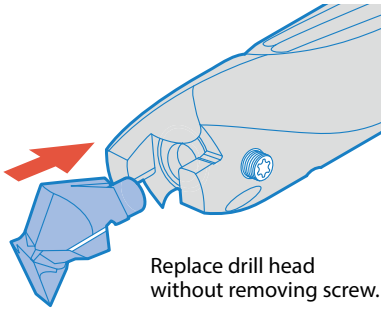
Chip comparison
(Internal evaluation)

Cutting conditions: Vc = 60 m/min, f = 0.2 mm/rev, Drilling diameter ø14, L/D = 5
Drilling depth 70 mm, Wet, Workpiece material: SUS304

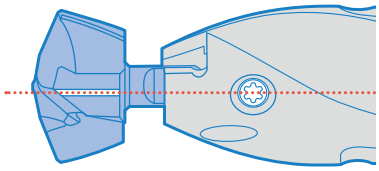


4 Easy drill head replacement

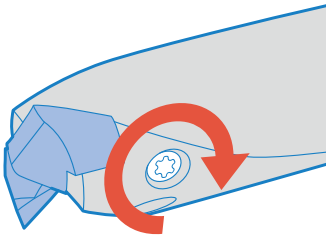
Replace drill head without removing screw.



Replace drill head without removing screw.



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



Fix the drill head by tightening the screw.

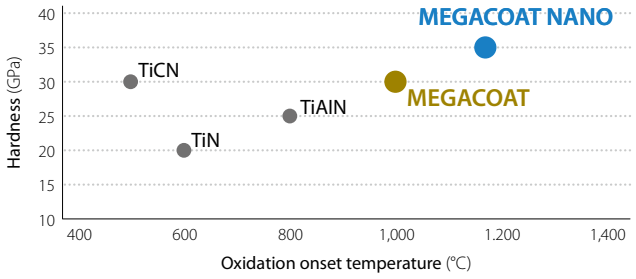
5 Long tool life and stable machining of various workpieces

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.

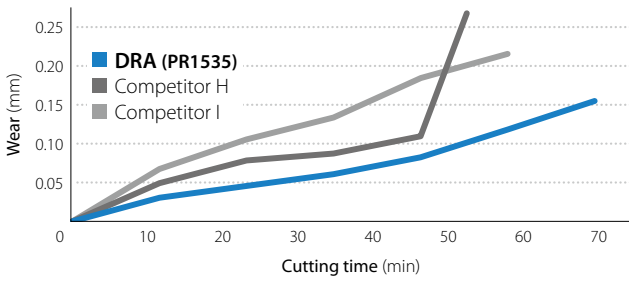
1st recommendation

Steel / Stainless steel	Cast iron
PR1535	PR1525

Coating properties



Wear resistance comparison (Internal evaluation)

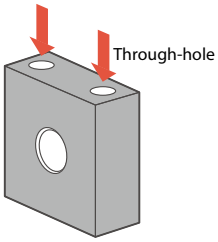


Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev
Drilling dia. ø14, L/D = 5, Drilling depth 45 mm, Wet, Workpiece material: SCM440H

Case studies

Attachment SS400

Vc = 70 m/min (n = 1,240 min^{-1})
f = 0.23 mm/rev (Vf = 285 mm/min)
Drilling depth 100 mm
Wet (Internal coolant)
With center hole drilling
SF25-DRA180M-8
DA1800M-GM PR1535



Cutting time

DRA ø18-8D — **45** sec — 30%

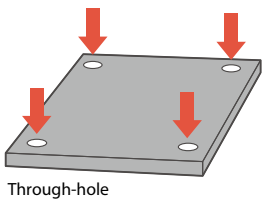
Competitor J ø18-7D (Modular drill) — **65** sec

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

(User evaluation)

Plate SUS304

Vc = 60 m/min (n = 2,120 min^{-1})
f = 0.12 mm/rev (Vf = 254 mm/min)
Drilling depth 15 mm
Wet (Internal coolant)
SS10-DRA090M-3
DA0900M-GM PR1535



Number of holes

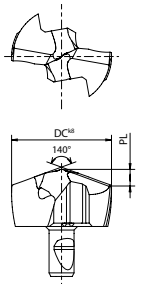
DRA ø9-3D — **500** — 5 times

Competitor K ø9-3D (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)

DRA drill heads (GM - General purpose)

					Carbon steel / Alloy steel	○	●	P
					Mold and die steel			
					Stainless steel	○	●	M
					Cast iron	●	○	K
					Non-ferrous metals			N
Drill head		Description			Dimension (mm)		Tolerance (mm)		Carbide		Applicable toolholder ➡ K16~K19 K22~K26
					DC	PL	k8 (min.)	k8 (max.)	PVD		
									PR1525	PR1535	
	 General purpose	DA	0794M-GM		7.94	1.34	0	+0.022	●	●	SF12-DRA080M-○ SS10-DRA080M-○
			0800M-GM		8	1.35			●	●	
			0810M-GM		8.1	1.37			●	●	
			0820M-GM		8.2	1.38			●	●	
			0830M-GM		8.3	1.4			●	●	
			0840M-GM		8.4	1.42			●	●	
		DA	0850M-GM		8.5	1.44	0	+0.022	●	●	SF12-DRA085M-○ SS10-DRA085M-○
			0860M-GM		8.6	1.46			●	●	
			0870M-GM		8.7	1.48			●	●	
			0880M-GM		8.8	1.49			●	●	
			0890M-GM		8.9	1.51			●	●	
		DA	0900M-GM		9	1.52	0	+0.022	●	●	SF12-DRA090M-○ SS10-DRA090M-○
			0910M-GM		9.1	1.54			●	●	
			0920M-GM		9.2	1.56			●	●	
			0930M-GM		9.3	1.58			●	●	
			0940M-GM		9.4	1.59			●	●	
		DA	0950M-GM		9.5	1.61	0	+0.022	●	●	SF12-DRA095M-○ SS10-DRA095M-○
			0960M-GM		9.6	1.63			●	●	
			0970M-GM		9.7	1.65			●	●	
			0980M-GM		9.8	1.67			●	●	
			0990M-GM		9.9	1.68			●	●	
		DA	1000M-GM		10	1.7	0	+0.022	●	●	SF16-DRA100M-○ SS12-DRA100M-○
			1010M-GM		10.1	1.72		+0.027	●	●	
			1020M-GM		10.2	1.74		+0.027	●	●	
			1030M-GM		10.3	1.75		+0.027	●	●	
			1040M-GM		10.4	1.77		+0.027	●	●	
		DA	1050M-GM		10.5	1.79	0	+0.027	●	●	SF16-DRA105M-○ SS12-DRA105M-○
			1060M-GM		10.6	1.81			●	●	
			1070M-GM		10.7	1.83			●	●	
			1080M-GM		10.8	1.85			●	●	
			1090M-GM		10.9	1.86			●	●	
		DA	1100M-GM		11	1.87	0	+0.027	●	●	SF16-DRA110M-○ SS12-DRA110M-○
			1110M-GM		11.1	1.89			●	●	
			1120M-GM		11.2	1.91			●	●	
			1130M-GM		11.3	1.92			●	●	
			1140M-GM		11.4	1.94			●	●	
		DA	1150M-GM		11.5	1.96	0	+0.027	●	●	SF16-DRA115M-○ SS12-DRA115M-○
			1160M-GM		11.6	1.98			●	●	
			1170M-GM		11.7	2			●	●	
			1180M-GM		11.8	2.01			●	●	
			1190M-GM		11.9	2.03			●	●	
		DA	1200M-GM		12	2.03	0	+0.027	●	●	SF16-DRA120M-○ SS14-DRA120M-○
			1210M-GM		12.1	2.05			●	●	
			1220M-GM		12.2	2.07			●	●	
			1230M-GM		12.3	2.08			●	●	
			1240M-GM		12.4	2.1			●	●	

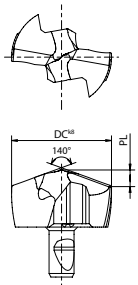
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

● : Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (GM - General purpose)

						Carbon steel / Alloy steel	○	●	P
						Mold and die steel			
						Stainless steel	○	●	M
						Cast iron	●	○	K
						Non-ferrous metals			N
Drill head		Description		Dimension (mm)		Tolerance (mm)		Carbide	Applicable toolholder ➡ K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
	 General purpose	DA	1250M-GM	12.5	2.12	0	+0.027	●	●	SF16-DRA125M-○ SS14-DRA125M-○
			1260M-GM	12.6	2.14			●	●	
			1270M-GM	12.7	2.16			●	●	
			1280M-GM	12.8	2.17			●	●	
			1290M-GM	12.9	2.19			●	●	
		DA	1300M-GM	13	2.2	0	+0.027	●	●	SF16-DRA130M-○ SS14-DRA130M-○
			1310M-GM	13.1	2.22			●	●	
			1320M-GM	13.2	2.24			●	●	
			1330M-GM	13.3	2.25			●	●	
			1340M-GM	13.4	2.27			●	●	
		DA	1350M-GM	13.5	2.29	0	+0.027	●	●	SF16-DRA135M-○ SS14-DRA135M-○
			1360M-GM	13.6	2.31			●	●	
			1370M-GM	13.7	2.33			●	●	
			1380M-GM	13.8	2.35			●	●	
			1390M-GM	13.9	2.36			●	●	
		DA	1400M-GM	14	2.33	0	+0.027	●	●	SF16-DRA140M-○ SS16-DRA140M-○
			1410M-GM	14.1	2.34			●	●	
			1420M-GM	14.2	2.36			●	●	
			1430M-GM	14.3	2.38			●	●	
			1440M-GM	14.4	2.4			●	●	
		DA	1450M-GM	14.5	2.42	0	+0.027	●	●	SF16-DRA145M-○ SS16-DRA145M-○
			1460M-GM	14.6	2.43			●	●	
			1470M-GM	14.7	2.45			●	●	
			1480M-GM	14.8	2.47			●	●	
			1490M-GM	14.9	2.49			●	●	
		DA	1500M-GM	15	2.52	0	+0.027	●	●	SF20-DRA150M-○ SS16-DRA150M-○
			1510M-GM	15.1	2.54			●	●	
			1520M-GM	15.2	2.55			●	●	
			1530M-GM	15.3	2.57			●	●	
			1540M-GM	15.4	2.59			●	●	
			1550M-GM	15.5	2.61			●	●	
			1560M-GM	15.6	2.63			●	●	
			1570M-GM	15.7	2.65			●	●	
			1580M-GM	15.8	2.66			●	●	
			1590M-GM	15.9	2.68			●	●	
		DA	1600M-GM	16	2.69	0	+0.027	●	●	SF20-DRA160M-○ SS18-DRA160M-○
			1610M-GM	16.1	2.71			●	●	
			1620M-GM	16.2	2.73			●	●	
			1630M-GM	16.3	2.75			●	●	
			1640M-GM	16.4	2.76			●	●	
			1650M-GM	16.5	2.78			●	●	
			1660M-GM	16.6	2.8			●	●	
			1670M-GM	16.7	2.82			●	●	
			1680M-GM	16.8	2.84			●	●	
			1690M-GM	16.9	2.86			●	●	

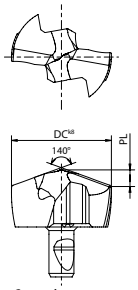
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

● : Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (GM - General purpose)

					Carbon steel / Alloy steel	○	●	P
					Mold and die steel			
					Stainless steel	○	●	M
					Cast iron	●	○	K
					Non-ferrous metals			N
Drill head		Description			Dimension (mm)		Tolerance (mm)		Carbide		Applicable toolholder ➡ K16~K19 K22~K26
					DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
	 General purpose	DA	1700M-GM		17	2.86	0	+0.027	●	●	SF20-DRA170M-○ SS18-DRA170M-○
			1710M-GM		17.1	2.88			●	●	
			1720M-GM		17.2	2.9			●	●	
			1730M-GM		17.3	2.92			●	●	
			1740M-GM		17.4	2.93			●	●	
			1750M-GM		17.5	2.95			●	●	
			1760M-GM		17.6	2.97			●	●	
			1770M-GM		17.7	2.99			●	●	
			1780M-GM		17.8	3.01			●	●	
			1790M-GM		17.9	3.03			●	●	
		DA	1800M-GM		18	3.04	0	+0.027	●	●	SF25-DRA180M-○ SS20-DRA180M-○
			1810M-GM		18.1	3.06		+0.033	●	●	
			1820M-GM		18.2	3.07		+0.033	●	●	
			1830M-GM		18.3	3.09		+0.033	●	●	
			1840M-GM		18.4	3.11		+0.033	●	●	
			1850M-GM		18.5	3.13		+0.033	●	●	
			1860M-GM		18.6	3.15		+0.033	●	●	
			1870M-GM		18.7	3.17		+0.033	●	●	
			1880M-GM		18.8	3.18		+0.033	●	●	
			1890M-GM		18.9	3.2		+0.033	●	●	
		DA	1900M-GM		19	3.21	0	+0.033	●	●	SF25-DRA190M-○ SS20-DRA190M-○
			1910M-GM		19.1	3.23			●	●	
			1920M-GM		19.2	3.25			●	●	
			1930M-GM		19.3	3.27			●	●	
			1940M-GM		19.4	3.29			●	●	
			1950M-GM		19.5	3.3			●	●	
			1960M-GM		19.6	3.32			●	●	
			1970M-GM		19.7	3.34			●	●	
			1980M-GM		19.8	3.36			●	●	
			1990M-GM		19.9	3.38			●	●	
		DA	2000M-GM		20	3.37	0	+0.033	●	●	SF25-DRA200M-○ SS25-DRA200M-○
			2010M-GM		20.1	3.39			●	●	
			2020M-GM		20.2	3.41			●	●	
			2030M-GM		20.3	3.43			●	●	
			2040M-GM		20.4	3.45			●	●	
			2050M-GM		20.5	3.46			●	●	
			2060M-GM		20.6	3.48			●	●	
			2070M-GM		20.7	3.5			●	●	
			2080M-GM		20.8	3.52			●	●	
			2090M-GM		20.9	3.54			●	●	
		DA	2100M-GM		21	3.54	0	+0.033	●	●	SF25-DRA210M-○ SS25-DRA210M-○
			2150M-GM		21.5	3.63			●	●	
		DA	2200M-GM		22	3.71	0	+0.033	●	●	SF25-DRA220M-○ SS25-DRA220M-○
			2250M-GM		22.5	3.8			●	●	
		DA	2300M-GM		23	3.87	0	+0.033	●	●	SF25-DRA230M-○ SS25-DRA230M-○
			2350M-GM		23.5	3.96			●	●	
		DA	2400M-GM		24	4.04	0	+0.033	●	●	SF25-DRA240M-○ SS25-DRA240M-○
			2450M-GM		24.5	4.13			●	●	
		DA	2500M-GM		25	4.2	0	+0.033	●	●	SF25-DRA250M-○ SS32-DRA250M-○
			2550M-GM		25.5	4.29			●	●	
		DA	2600M-GM		26	4.8	0	+0.033	●	●	SF32-DRA260M-○
			2650M-GM		26.5	4.9			●	●	

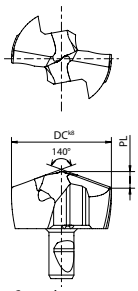
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

DA drill heads are sold in 1 piece boxes

● : Standard item

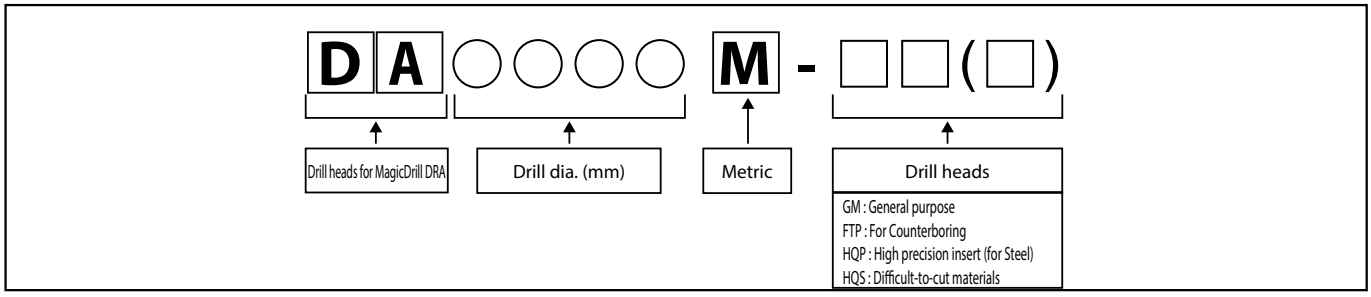
DRA drill heads (GM - General purpose)

						Carbon steel / Alloy steel	○	●	P	
						Mold and die steel				
						Stainless steel	○	●	M	
						Cast iron	●	○	K	
						Non-ferrous metals			N	
Drill head			Description			Dimension (mm)		Tolerance (mm)		Carbide		Applicable toolholder ➡ K23~K25
						DC	PL	k8 (min.)	k8 (max.)	PVD PR1525	PVD PR1535	
	 General purpose	DA	2700M-GM 2750M-GM			27 27.5	4.99 5.09	0	+0.033	● ●	● ●	SF32-DRA270M-○
		DA	2800M-GM 2850M-GM			28 28.5	4.73 4.83	0	+0.033	● ●	● ●	SF32-DRA280M-○
		DA	2900M-GM 2950M-GM			29 29.5	4.9 5.01	0	+0.033	● ●	● ●	SF32-DRA290M-○
		DA	3000M-GM 3050M-GM			30 30.5	5.07 5.17	0	+0.033 +0.039	● ●	● ●	SF32-DRA300M-○
		DA	3100M-GM 3150M-GM			31 31.5	5.26 5.37	0	+0.039	● ●	● ●	SF32-DRA310M-○
		DA	3200M-GM 3250M-GM 3300M-GM			32 32.5 33	5.41 5.51 5.62	0	+0.039	● ● ●	● ● ●	SF32-DRA320M-○

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K28

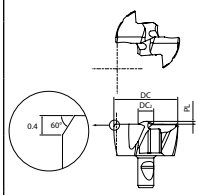
Description Identification System (Drill heads)



● : Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (FTP - Counterboring)

							Carbon steel / Alloy steel	○	●	P
							Mold and die steel			
							Stainless steel	○	●	M
							Cast iron	●	○	K
							Non-ferrous metals			N
Drill head		Description		Dimension (mm)			Tolerance (mm)		Carbide PVD		Applicable toolholder ⇒ K16~K19 K22~K26
				DC	DC_2	PL	k8 (min.)	k8 (max.)	PR1525	PR1535	
	 Counterboring	DA	0800M-FTP 0830M-FTP	8 8.3	2.9	0.4	0	+0.022	● ●	● ●	SF12-DRA080M-○ SS10-DRA080M-○
		DA	0850M-FTP 0880M-FTP	8.5 8.8	2.9	0.4	0	+0.022	● ●	● ●	SF12-DRA085M-○ SS10-DRA085M-○
		DA	0900M-FTP 0930M-FTP	9 9.3	3	0.43	0	+0.022	● ●	● ●	SF12-DRA090M-○ SS10-DRA090M-○
		DA	0950M-FTP	9.5	3	0.43	0	+0.022	●	●	SF12-DRA095M-○ SS10-DRA095M-○
		DA	1000M-FTP 1030M-FTP	10 10.3	3.3	0.46	0	+0.022 +0.027	● ●	● ●	SF16-DRA100M-○ SS12-DRA100M-○
		DA	1050M-FTP 1080M-FTP	10.5 10.8	3.3	0.46	0	+0.027	● ●	● ●	SF16-DRA105M-○ SS12-DRA105M-○
		DA	1100M-FTP	11	3.4	0.5	0	+0.027	●	●	SF16-DRA110M-○ SS12-DRA110M-○
		DA	1150M-FTP	11.5	3.4	0.5	0	+0.027	●	●	SF16-DRA115M-○ SS12-DRA115M-○
		DA	1200M-FTP	12	3.7	0.53	0	+0.027	●	●	SF16-DRA120M-○ SS14-DRA120M-○
		DA	1250M-FTP 1270M-FTP	12.5 12.7	3.7	0.53	0	+0.027	● ●	● ●	SF16-DRA125M-○ SS14-DRA125M-○
		DA	1300M-FTP	13	3.9	0.56	0	+0.027	●	●	SF16-DRA130M-○ SS14-DRA130M-○
		DA	1350M-FTP	13.5	3.9	0.56	0	+0.027	●	●	SF16-DRA135M-○ SS14-DRA135M-○
		DA	1400M-FTP	14	4.2	0.6	0	+0.027	●	●	SF16-DRA140M-○ SS16-DRA140M-○
		DA	1450M-FTP	14.5	4.2	0.6	0	+0.027	●	●	SF16-DRA145M-○ SS16-DRA145M-○
		DA	1500M-FTP 1550M-FTP	15 15.5	4.4	0.65	0	+0.027	● ●	● ●	SF20-DRA150M-○ SS16-DRA150M-○
		DA	1600M-FTP 1650M-FTP	16 16.5	4.6	0.7	0	+0.027	● ●	● ●	SF20-DRA160M-○ SS18-DRA160M-○
		DA	1700M-FTP 1750M-FTP	17 17.5	5	0.75	0	+0.027	● ●	● ●	SF20-DRA170M-○ SS18-DRA170M-○
		DA	1800M-FTP 1850M-FTP	18 18.5	5	0.8	0	+0.027 +0.033	● ●	● ●	SF25-DRA180M-○ SS20-DRA180M-○
		DA	1900M-FTP 1950M-FTP	19 19.5	5.3	0.85	0	+0.033	● ●	● ●	SF25-DRA190M-○ SS20-DRA190M-○
		DA	2000M-FTP 2050M-FTP	20 20.5	5.7	0.9	0	+0.033	● ●	● ●	SF25-DRA200M-○ SS25-DRA200M-○
		DA	2100M-FTP 2150M-FTP	21 21.5	6	0.95	0	+0.033	● ●	● ●	SF25-DRA210M-○ SS25-DRA210M-○
		DA	2200M-FTP 2250M-FTP	22 22.5	6.4	1	0	+0.033	● ●	● ●	SF25-DRA220M-○ SS25-DRA220M-○
		DA	2300M-FTP 2350M-FTP	23 23.5	6.6	1.05	0	+0.033	● ●	● ●	SF25-DRA230M-○ SS25-DRA230M-○
		DA	2400M-FTP 2450M-FTP	24 24.5	6.8	1.1	0	+0.033	● ●	● ●	SF25-DRA240M-○ SS25-DRA240M-○
		DA	2500M-FTP 2540M-FTP	25 25.4	7	1.2	0	+0.033	● ●	● ●	SF25-DRA250M-○ SS32-DRA250M-○

k8 is the dimension tolerance of the drill head. 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 ⇒ K28

DA drill heads are sold in 1 piece boxes

● : Standard item

Double margin type

High-precision drill heads for steel machining

PR1525

HQP

Drilling diameter ø7.94 ~ ø19.9

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

For difficult-to-cut materials/ stainless steel machining

PR1535

HQS

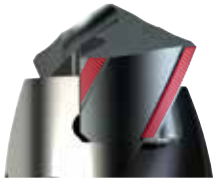
Drilling diameter ø8.00 ~ ø19.5

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

Special two-step bottom

Suppress sudden fracture when entering the workpiece
Improvement of cutting edge strength

Double margin



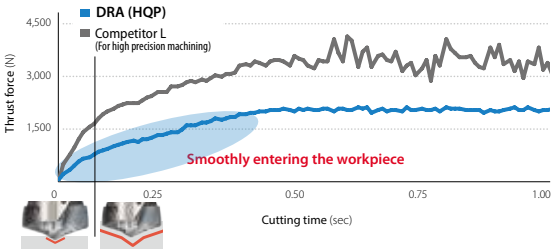
Optimized for difficult-to-cut materials machining
Improvement of heat resistance

Unique flute shape

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

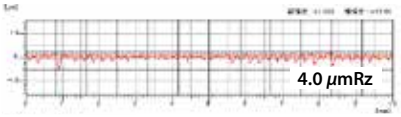
High-precision drill heads for steel machining HQP

Cutting force comparison when entering the workpiece
(Internal evaluation)



Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev, H = 30 mm, Wet
Workpiece material: S50C ø16 (3D)

Hole wall surface finish comparison
(Internal evaluation)

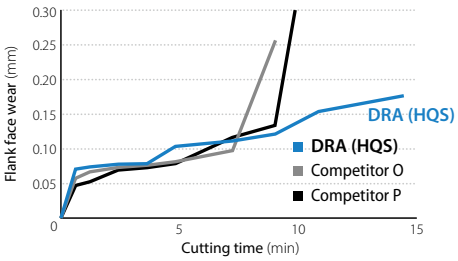


Cutting conditions: Vc = 100 m/min, f = 0.25 mm/rev, H = 80 mm, Wet
Workpiece material: S50C ø16 (5D)

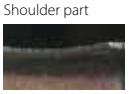
For difficult-to-cut materials/ stainless steel machining HQS

Inconel

Wear resistance comparison (Internal evaluation)



Shoulder part



Normal wear condition

Fracture on the shoulder of drill head

Chisel part

Good without fracture

Fracture on the chisel

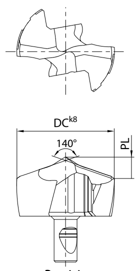
DRA (HQS) | Competitor O | DRA (HQS) | Competitor P

Cutting conditions: Vc = 20 m/min, f = 0.15 mm/rev, Drilling diameter ø14.5 (3D)
Drilling depth 40 mm, Wet (internal/external), Workpiece material: Inconel 718, BT50 M/C

DRA drill heads (HQP - Precision / for Carbon steel)

Work material	PR1525	
Carbon steel / Alloy steel	●	P
Mold and die steel		P
Stainless steel		M
Cast iron		K
Non-ferrous metals		N

Drill head



Precision

Description		Dimension (mm) DC	Dimension (mm) PL	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR1525	Applicable toolholder ➡ K16~K19 K22~K26
DA	0794M-HQP	7.94	1.9	0	+0.022	●	SF12-DRA080M-〇 SS10-DRA080M-〇
	0800M-HQP	8	1.91			●	
	0810M-HQP	8.1	1.93			●	
	0820M-HQP	8.2	1.94			●	
	0830M-HQP	8.3	1.96			●	
	0840M-HQP	8.4	1.98			●	
DA	0850M-HQP	8.5	1.99	0	+0.022	●	SF12-DRA085M-〇 SS10-DRA085M-〇
	0860M-HQP	8.6	2.01			●	
	0870M-HQP	8.7	2.03			●	
	0880M-HQP	8.8	2.05			●	
	0890M-HQP	8.9	2.06			●	
DA	0900M-HQP	9	2.19	0	+0.022	●	SF12-DRA090M-〇 SS10-DRA090M-〇
	0910M-HQP	9.1	2.21			●	
	0920M-HQP	9.2	2.22			●	
	0930M-HQP	9.3	2.24			●	
	0940M-HQP	9.4	2.26			●	
DA	0950M-HQP	9.5	2.27	0	+0.022	●	SF12-DRA095M-〇 SS10-DRA095M-〇
	0960M-HQP	9.6	2.29			●	
	0970M-HQP	9.7	2.31			●	
	0980M-HQP	9.8	2.32			●	
	0990M-HQP	9.9	2.34			●	
DA	1000M-HQP	10	2.35	0	+0.022	●	SF16-DRA100M-〇 SS12-DRA100M-〇
	1010M-HQP	10.1	2.36		+0.027	●	
	1020M-HQP	10.2	2.38		+0.027	●	
	1030M-HQP	10.3	2.4		+0.027	●	
	1040M-HQP	10.4	2.41		+0.027	●	
DA	1050M-HQP	10.5	2.43	0	+0.027	●	SF16-DRA105M-〇 SS12-DRA105M-〇
	1060M-HQP	10.6	2.44			●	
	1070M-HQP	10.7	2.46			●	
	1080M-HQP	10.8	2.47			●	
	1090M-HQP	10.9	2.49			●	
DA	1100M-HQP	11	2.65	0	+0.027	●	SF16-DRA110M-〇 SS12-DRA110M-〇
	1110M-HQP	11.1	2.67			●	
	1120M-HQP	11.2	2.68			●	
	1130M-HQP	11.3	2.7			●	
	1140M-HQP	11.4	2.72			●	
DA	1150M-HQP	11.5	2.73	0	+0.027	●	SF16-DRA115M-〇 SS12-DRA115M-〇
	1160M-HQP	11.6	2.75			●	
	1170M-HQP	11.7	2.76			●	
	1180M-HQP	11.8	2.78			●	
	1190M-HQP	11.9	2.8			●	
DA	1200M-HQP	12	2.79	0	+0.027	●	SF16-DRA120M-〇 SS14-DRA120M-〇
	1210M-HQP	12.1	2.81			●	
	1220M-HQP	12.2	2.82			●	
	1230M-HQP	12.3	2.84			●	
	1240M-HQP	12.4	2.86			●	
DA	1250M-HQP	12.5	2.87	0	+0.027	●	SF16-DRA125M-〇 SS14-DRA125M-〇
	1260M-HQP	12.6	2.89			●	
	1270M-HQP	12.7	2.91			●	
	1280M-HQP	12.8	2.92			●	
	1290M-HQP	12.9	2.94			●	

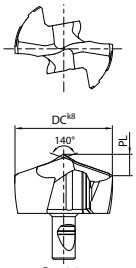
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K29

●: Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQP - Precision / for Carbon steel)

						Carbon steel / Alloy steel		●		P
						Mold and die steel				
						Stainless steel				M
						Cast iron				K
						Non-ferrous metals				N
Drill head			Description			Dimension (mm)		Tolerance (mm)		Carbide / PVD / PR1525	Applicable toolholder ➡ K16~K19 K22~K26
						DC	PL	k8 (min.)	k8 (max.)		
		DA	1300M-HQP			13	2.98	0	+0.027	●	SF16-DRA130M-○ SS14-DRA130M-○
			1310M-HQP			13.1	2.99			●	
			1320M-HQP			13.2	3.01			●	
			1330M-HQP			13.3	3.02			●	
			1340M-HQP			13.4	3.04			●	
		DA	1350M-HQP			13.5	3.06	0	+0.027	●	SF16-DRA135M-○ SS14-DRA135M-○
			1360M-HQP			13.6	3.07			●	
			1370M-HQP			13.7	3.09			●	
			1380M-HQP			13.8	3.1			●	
			1390M-HQP			13.9	3.12			●	
		DA	1400M-HQP			14	3.11	0	+0.027	●	SF16-DRA140M-○ SS16-DRA140M-○
			1410M-HQP			14.1	3.12			●	
			1420M-HQP			14.2	3.14			●	
			1430M-HQP			14.3	3.16			●	
			1440M-HQP			14.4	3.17			●	
		DA	1450M-HQP			14.5	3.19	0	+0.027	●	SF16-DRA145M-○ SS16-DRA145M-○
			1460M-HQP			14.6	3.21			●	
			1470M-HQP			14.7	3.22			●	
			1480M-HQP			14.8	3.24			●	
			1490M-HQP			14.9	3.25			●	
	 Precision	DA	1500M-HQP			15	3.33	0	+0.027	●	SF20-DRA150M-○ SS16-DRA150M-○
			1510M-HQP			15.1	3.35			●	
			1520M-HQP			15.2	3.36			●	
			1530M-HQP			15.3	3.38			●	
			1540M-HQP			15.4	3.39			●	
			1550M-HQP			15.5	3.41			●	
			1560M-HQP			15.6	3.42			●	
			1570M-HQP			15.7	3.44			●	
			1580M-HQP			15.8	3.46			●	
			1590M-HQP			15.9	3.47			●	
		DA	1600M-HQP			16	3.55	0	+0.027	●	SF20-DRA160M-○ SS18-DRA160M-○
			1610M-HQP			16.1	3.57			●	
			1620M-HQP			16.2	3.58			●	
			1630M-HQP			16.3	3.6			●	
			1640M-HQP			16.4	3.62			●	
			1650M-HQP			16.5	3.63			●	
			1660M-HQP			16.6	3.65			●	
			1670M-HQP			16.7	3.66			●	
			1680M-HQP			16.8	3.68			●	
			1690M-HQP			16.9	3.69			●	
		DA	1700M-HQP			17	3.73	0	+0.027	●	SF20-DRA170M-○ SS18-DRA170M-○
			1710M-HQP			17.1	3.75			●	
			1720M-HQP			17.2	3.77			●	
			1730M-HQP			17.3	3.78			●	
			1740M-HQP			17.4	3.8			●	
			1750M-HQP			17.5	3.81			●	
			1760M-HQP			17.6	3.83			●	
			1770M-HQP			17.7	3.84			●	
			1780M-HQP			17.8	3.86			●	
			1790M-HQP			17.9	3.88			●	

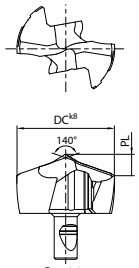
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K29

● : Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQP - Precision / for Carbon steel)

						Carbon steel / Alloy steel		●		P
						Mold and die steel				
						Stainless steel				M
						Cast iron				K
						Non-ferrous metals				N
Drill head			Description			Dimension (mm)		Tolerance (mm)		Carbide / PVD / PR1525	Applicable toolholder ⇒ K16~K19 K22~K26
						DC	PL	k8 (min.)	k8 (max.)		
	 Precision		DA	1800M-HQP		18	3.97	0	+0.027	●	SF25-DRA180M-○ SS20-DRA180M-○
				1810M-HQP		18.1	3.98		+0.033	●	
				1820M-HQP		18.2	4		+0.033	●	
				1830M-HQP		18.3	4.02		+0.033	●	
				1840M-HQP		18.4	4.03		+0.033	●	
				1850M-HQP		18.5	4.05		+0.033	●	
				1860M-HQP		18.6	4.06		+0.033	●	
				1870M-HQP		18.7	4.08		+0.033	●	
				1880M-HQP		18.8	4.09		+0.033	●	
				1890M-HQP		18.9	4.11		+0.033	●	
			DA	1900M-HQP		19	4.2	0	+0.033	●	SF25-DRA190M-○ SS20-DRA190M-○
				1910M-HQP		19.1	4.22			●	
				1920M-HQP		19.2	4.23			●	
				1930M-HQP		19.3	4.25			●	
				1940M-HQP		19.4	4.26			●	
				1950M-HQP		19.5	4.28			●	
				1960M-HQP		19.6	4.29			●	
				1970M-HQP		19.7	4.31			●	
				1980M-HQP		19.8	4.33			●	
				1990M-HQP		19.9	4.34			●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

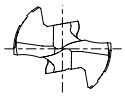
Recommended cutting conditions ⇒ K29

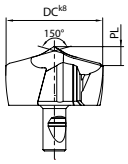
● : Standard item

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQS - For difficult-to-cut materials / stainless steel)

						Carbon steel / Alloy steel				P
						Mold and die steel				
						Stainless steel			●	M
						Cast iron				K
						Non-ferrous metals				N
Drill head			Description			Dimension (mm)		Tolerance (mm)		Carbide
						DC	PL	k8 (min.)	k8 (max.)	PVD / PR1535
		DA	0800M-HQS			8	1.76	0	+0.022	●
			0820M-HQS			8.2	1.78			●
		DA	0850M-HQS			8.5	1.82	0	+0.022	●
			0870M-HQS			8.7	1.85			●
			0880M-HQS			8.8	1.86			●
		DA	0900M-HQS			9	1.97	0	+0.022	●
			0930M-HQS			9.3	2.01			●
			0940M-HQS			9.4	2.02			●
		DA	0950M-HQS			9.5	2.03	0	+0.022	●
			0970M-HQS			9.7	2.05			●
			0980M-HQS			9.8	2.06			●
		DA	1000M-HQS			10	2.17	0	+0.022	●
			1030M-HQS			10.3	2.21		+0.027	●
			1040M-HQS			10.4	2.22		+0.027	●
		DA	1050M-HQS			10.5	2.23	0	+0.027	●
			1080M-HQS			10.8	2.27			●
		DA	1100M-HQS			11	2.38	0	+0.027	●
		DA	1150M-HQS			11.5	2.44	0	+0.027	●
		DA	1200M-HQS			12	2.5	0	+0.027	●
		DA	1250M-HQS			12.5	2.57	0	+0.027	●
			1260M-HQS			12.6	2.58			●
		DA	1300M-HQS			13	2.68	0	+0.027	●
		DA	1350M-HQS			13.5	2.74	0	+0.027	●
			1390M-HQS			13.9	2.78			●
		DA	1400M-HQS			14	2.79	0	+0.027	●
			1420M-HQS			14.2	2.81			●
		DA	1450M-HQS			14.5	2.85	0	+0.027	●
		DA	1500M-HQS			15	2.96	0	+0.027	●
			1520M-HQS			15.2	2.99			●
			1530M-HQS			15.3	3			●
			1550M-HQS			15.5	3.02			●
			1570M-HQS			15.7	3.04			●
		DA	1600M-HQS			16	3.18	0	+0.027	●
			1610M-HQS			16.1	3.2			●
			1620M-HQS			16.2	3.21			●
			1630M-HQS			16.3	3.22			●
			1650M-HQS			16.5	3.25			●
		DA	1700M-HQS			17	3.38	0	+0.027	●
			1750M-HQS			17.5	3.44			●
			1770M-HQS			17.7	3.46			●
		DA	1800M-HQS			18	3.59	0	+0.027	●
			1810M-HQS			18.1	3.6		+0.033	●
			1850M-HQS			18.5	3.65		+0.033	●
		DA	1900M-HQS			19	3.79	0	+0.033	●
			1930M-HQS			19.3	3.82			●
			1950M-HQS			19.5	3.84			●





Difficult-to-cut materials

Drill head	Applicable toolholder ⇒ K16~K19 K22~K26
DA 0800M-HQS 0820M-HQS	SF12-DRA080M-○ SS10-DRA080M-○
DA 0850M-HQS 0870M-HQS 0880M-HQS	SF12-DRA085M-○ SS10-DRA085M-○
DA 0900M-HQS 0930M-HQS 0940M-HQS	SF12-DRA090M-○ SS10-DRA090M-○
DA 0950M-HQS 0970M-HQS 0980M-HQS	SF12-DRA095M-○ SS10-DRA095M-○
DA 1000M-HQS 1030M-HQS 1040M-HQS	SF16-DRA100M-○ SS12-DRA100M-○
DA 1050M-HQS 1080M-HQS	SF16-DRA105M-○ SS12-DRA105M-○
DA 1100M-HQS	SF16-DRA110M-○ SS12-DRA110M-○
DA 1150M-HQS	SF16-DRA115M-○ SS12-DRA115M-○
DA 1200M-HQS	SF16-DRA120M-○ SS14-DRA120M-○
DA 1250M-HQS 1260M-HQS	SF16-DRA125M-○ SS14-DRA125M-○
DA 1300M-HQS	SF16-DRA130M-○ SS14-DRA130M-○
DA 1350M-HQS 1390M-HQS	SF16-DRA135M-○ SS14-DRA135M-○
DA 1400M-HQS 1420M-HQS	SF16-DRA140M-○ SS16-DRA140M-○
DA 1450M-HQS	SF16-DRA145M-○ SS16-DRA145M-○
DA 1500M-HQS 1520M-HQS 1530M-HQS 1550M-HQS 1570M-HQS	SF20-DRA150M-○ SS16-DRA150M-○
DA 1600M-HQS 1610M-HQS 1620M-HQS 1630M-HQS 1650M-HQS	SF20-DRA160M-○ SS18-DRA160M-○
DA 1700M-HQS 1750M-HQS 1770M-HQS	SF20-DRA170M-○ SS18-DRA170M-○
DA 1800M-HQS 1810M-HQS 1850M-HQS	SF25-DRA180M-○ SS20-DRA180M-○
DA 1900M-HQS 1930M-HQS 1950M-HQS	SF25-DRA190M-○ SS20-DRA190M-○

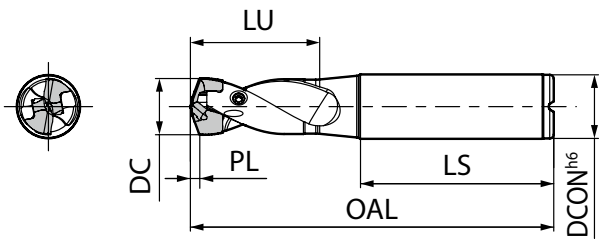
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ⇒ K29

● : Standard item

DA drill heads are sold in 1 piece boxes

SS-DRA (Drilling depth : 1.5 x DC)



1.5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
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-...	-

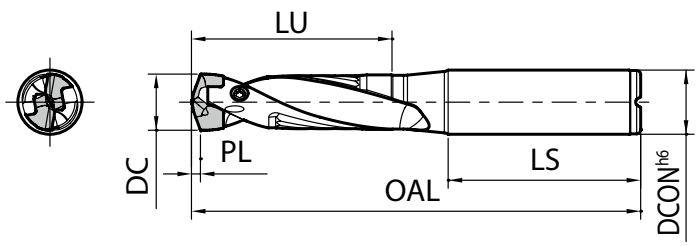
Description Identification System (Toolholder)

□□ ○○ - DRA ○○○ M - ○

- □□ ○○ : Shank type — SS : Straight Shank, SF : Flanged Shank
- ○○ : Shank dia.(mm)
- ○○○ : Minimum drill head dia.
- M : Metric
- ○ : Drilling depth — 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

SS-DRA (Drilling depth : 3 x DC)



3D

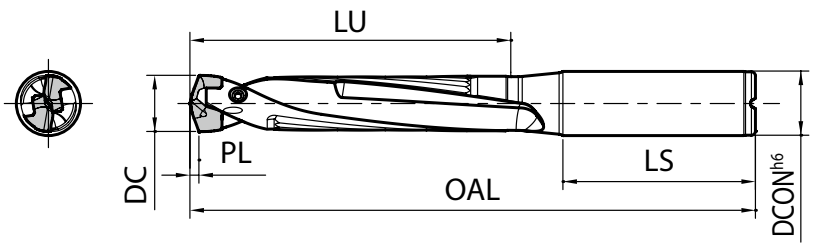
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads ➡ K6~K15	Applicable chamfering attachment ➡ K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
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-...	-

● : Standard item

SS-DRA (Drilling depth : 5 x DC)



5D

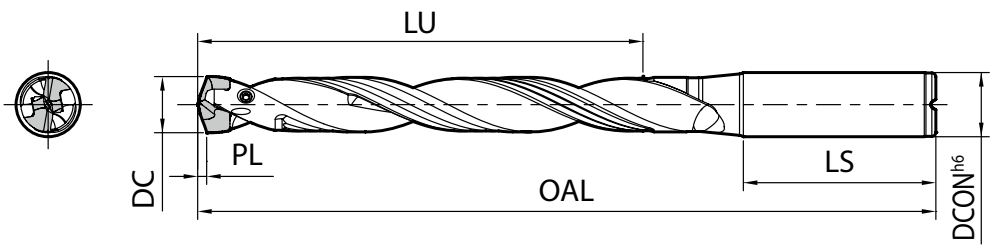
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
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-...	-

● : Standard item

SS-DRA (Drilling depth : 8 x DC)



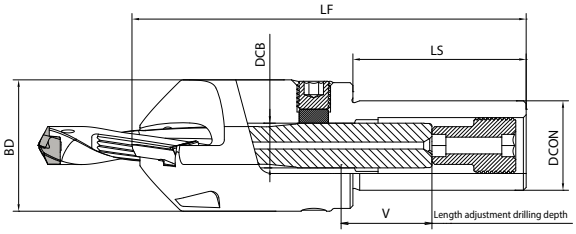
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads ➡ K6~K15	Applicable chamfering attachment ➡ K20
			DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
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-...	-

● : Standard item

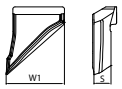
Chamfering attachment



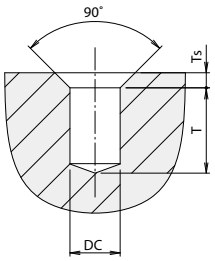
Dimensions

Description	Availability	Applicable drill shank dia. (mm) DCB	Dimension (mm)					Applicable inserts
			DCON	BD	LF	LS	V(Max.)	
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	

Applicable inserts

Insert		Description	MEGACOAT NANO	Dimension (mm)	
			PR1535	W1	S
		CT12T3-45DA	●	13.54	3.97

Drilling depth and chamfering dimension



Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm)		Applicable chamfering holder
		T (3D Drill)		T (5D Drill)		T (8D Drill)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts	Ts max.	
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: Maximum chamfer depth with recommended cutting conditions for DRA
Ts max. : Adjusting cutting conditions, such as reducing feed to 50% and/or lower cutting speed, is required.

● : Standard item

Spare parts

Chamfering holder	Adjustment screw		For fixing drills					For mounting inserts		
			Clamp	Clamp screw			Plunge screw	Clamp	Clamp screw	Wrench
Description		Hexagon hole two side widths (mm)			Hexagon hole two side widths (mm)	Tightening 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				

Method to use DRA chamfering attachment

1. Mount DRA drill into the chamfering attachment.

Fig. 1 Install the DRA

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

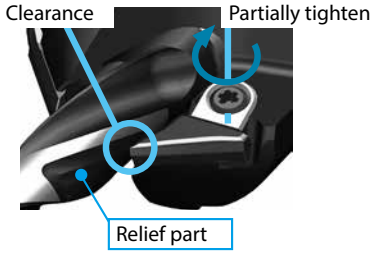


Fig. 2 Install inserts

3. Adjust drilling depth by turning adjustment screw with hexagon wrench

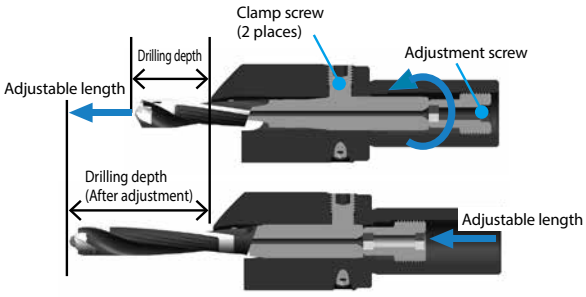


Fig. 3 Adjustment of drilling depth

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

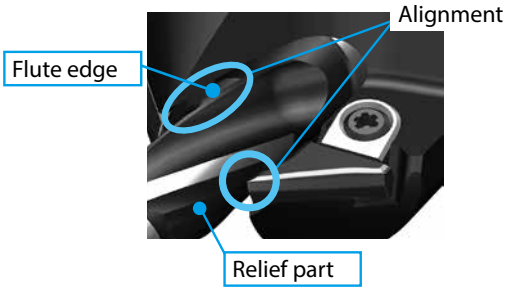


Fig. 4 DRA alignment

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

Table 1 Recommended torque

Chamfering attachment	Clamp screw	
	Recommended torque (N·m)	Hexagon hole two side widths (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.
(Recommended torque 3.5N·m)

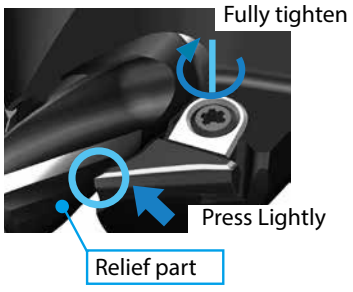
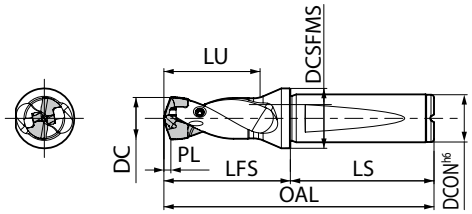


Fig. 5 Fully tighten

Cautions

- Chamfering attachment is dedicated for 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 isr ecommended.
- Please do not operate the plunge screws.

SF-DRA (Drilling depth : 1.5 x DC)



1.5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
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-...

Description Identification System (Toolholder)

□□○○ - DRA ○○○ M - ○

- □□ Shank type
  - SS : Straight Shank
  - SF : Flanged Shank
- ○○ Shank dia.(mm)
- ○○○ Minimum drill head dia.
- M Metric
- ○ Drilling depth
  - 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)

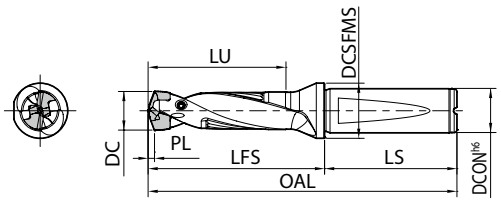


Fig. 1

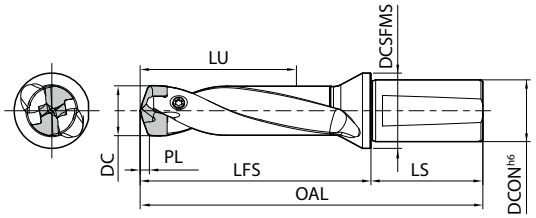


Fig. 2

3D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ⇒ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
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-...

● : Standard item

SF-DRA (Drilling depth : 5 x DC)

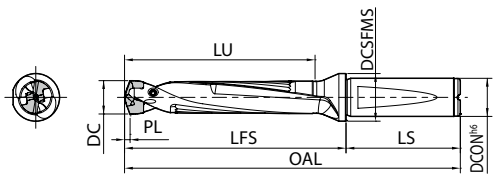


Fig. 1

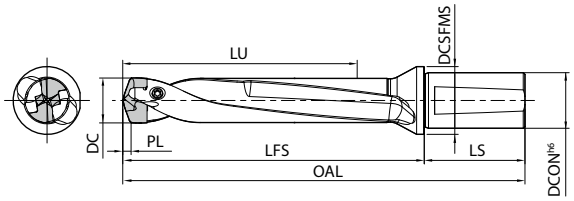


Fig. 2

5D

For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
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-...

● : Standard item

SF-DRA (Drilling depth : 8 x DC)

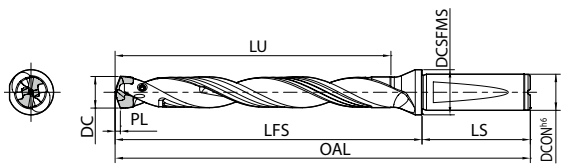


Fig. 1

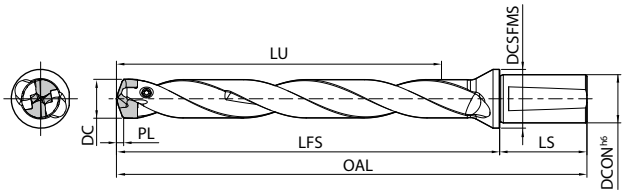


Fig. 2

8D

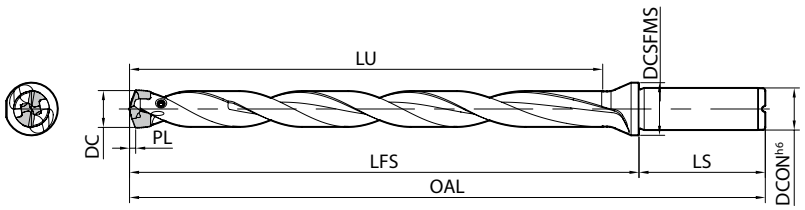
For PL indicates distance from drill point to corner edge **K6~K15**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS			Screw	Wrench	Wrench	
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-...

● : Standard item

SF-DRA (Drilling depth : 12 x DC)



12D

For PL indicates distance from drill point to corner edge **K6~K15**

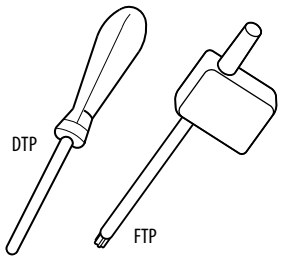
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads ➡ K6~K15
			DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
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-...

● : Standard item

Spare parts

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

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

Recommended cutting conditions

General purpose GM

Workpiece material	Recommended drill heads grades / Vc (m/min)		n (min^{-1})	Drill dia. DC (mm)							
	PR1535	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	ø29	ø33
Low carbon steel	★ 100 - 180	☆ 100 - 180	n (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	1,100 - 1,980	970 - 1,740
			f (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	0.2 - 0.45	0.2 - 0.45
Carbon steel	★ 100 - 150	☆ 100 - 150	n (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	1,100 - 1,650	970 - 1,450
			f (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	0.2 - 0.45	0.2 - 0.45
Alloy steel	★ 70 - 120	☆ 70 - 120	n (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	770 - 1,320	680 - 1,160
			f (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	0.2 - 0.45	0.2 - 0.45
Mold steel	★ 50 - 90	☆ 50 - 90	n (min^{-1})	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590	720 - 1,300	640 - 1,150	550 - 990	490 - 870
			f (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	0.14 - 0.32	0.14 - 0.32
Stainless steel	★ 40 - 70	☆ 40 - 70	n (min^{-1})	1,590 - 2,790	1,160 - 2,030	910 - 1,590	710 - 1,240	580 - 1,010	510 - 890	440 - 770	390 - 680
			f (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	0.15 - 0.35	0.15 - 0.35
				*Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5 x DC. The combination of internal and external coolant is recommended							
Titanium alloys	★ 30 - 40	☆ 30 - 40	n (min^{-1})	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710	430 - 580	380 - 510	330 - 440	290 - 390
			f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18	0.12 - 0.18	0.12 - 0.23	0.12 - 0.23	0.12 - 0.23
				*Feed rate 0.15 mm/rev or less is recommended until drilling depth reaches 0.5 x DC. The combination of internal and external coolant is recommended							
Gray cast iron	☆ 90 - 170	★ 90 - 170	n (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	990 - 1,870	870 - 1,640
			f (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	0.24 - 0.45	0.24 - 0.45
Nodular cast iron	☆ 40 - 120	★ 40 - 120	n (min^{-1})	1,590 - 4,780	1,160 - 3,470	910 - 2,730	710 - 2,120	580 - 1,740	510 - 1,530	440 - 1,320	390 - 1,160
			f (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	0.2 - 0.45	0.2 - 0.45

Recommended cutting conditions above is for 1.5D/3D type.
As drilling depth increases (1.5D/3D → 5D → 8D → 12D), cutting speed and feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5/3D type=100%, 5D type=80% or less
Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

Counterboring FTP

Workpiece material	Recommended drill head grades / Vc (m/min)		n (min^{-1})	Drill dia. DC (mm)					
	PR1535	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25
Low carbon steel	★ 80 - 150	☆ 80 - 150	n (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
			f (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	n (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
			f (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	n (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
			f (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
Mold steel	★ 40 - 70	☆ 40 - 70	n (min^{-1})	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (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	n (min^{-1})	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (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 0.5 x DC. The combination of internal and external coolant is recommended					
Gray cast iron	☆ 70 - 140	★ 70 - 140	n (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
			f (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	n (min^{-1})	1,600 - 4,000	1,150 - 2,900	900 - 2,750	700 - 1,750	600 - 1,450	500 - 1,250
			f (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

* 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 50% or under when inclination angle is 30 or under. Set the feed rate 30% or under when inclination angle is over 30°
Traversing is not recommended. Applicable to 1.5D,3D,5D,8D and 12D holders. Prepared hole (0.5xDC) is needed when using 8D/12D holder
Recommended feed rate : 1.5/3D type=100%, 5D type=80% or less
Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

High precision insert for steel HQP

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min^{-1})	Drill dia. DC (mm)			
	PR1525	f (mm/rev)	ø8	ø11	ø14	ø18
Low carbon steel	80 - 180	n (min^{-1})	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Carbon steel	80 - 150	n (min^{-1})	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Alloy steel	70 - 120	n (min^{-1})	2,790 - 4,780	2,030 - 3,470	1,590 - 2,730	1,240 - 2,120
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Mold steel	50 - 90	n (min^{-1})	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590
		f (mm/rev)	0.08 - 0.17	0.08 - 0.2	0.11 - 0.23	0.11 - 0.26

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

Difficult-to-cut materials / Stainless steel HQS

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min^{-1})	Drill dia. DC (mm)			
	PR1535	f (mm/rev)	ø8	ø11	ø14	ø18
Stainless steel	40 - 50	n (min^{-1})	1,590 - 1,990	1,160 - 1,450	910-1,140	710 - 880
		f (mm/rev)	0.08 - 0.12	0.10 - 0.15	0.10-0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Heat-resistant alloy	15 - 20	n (min^{-1})	600 - 800	430 - 580	340 - 450	270 - 350
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Titanium alloy	30 - 40	n (min^{-1})	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

If chip clogging occurs at the entrance to drilling, refer to "Cautions for machining with HQS drill head" in **K31**.

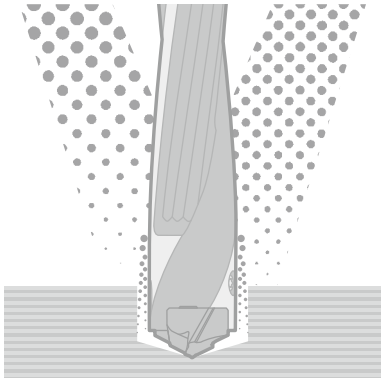
Coolant * Dry machining is not recommended.

1st recommendation

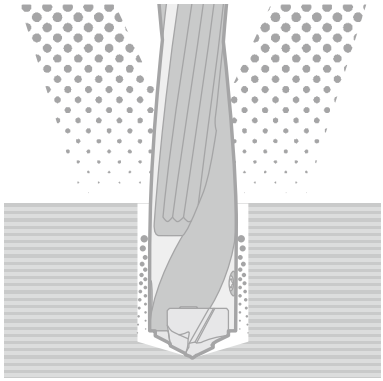
Internal coolant

Internal and external coolant is recommended

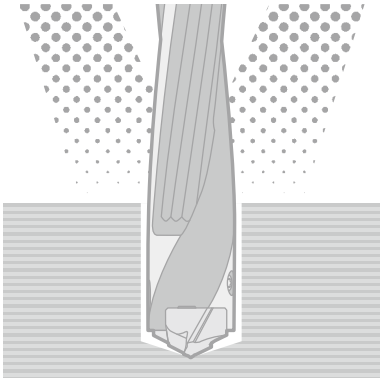
Drilling depth less than 1DC



Stainless steel, high feed rate



In case of external coolant

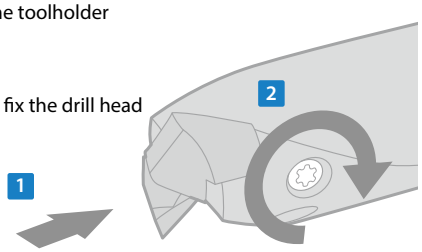


Lathe: 3DC or less
Vertical M/C: 1.5DC or less

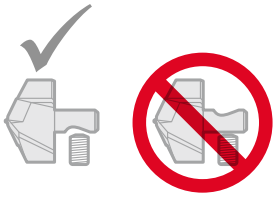
How to attach drill heads

1 Install drill head onto the toolholder in the right direction

2 Tighten clamp screw to fix the drill head
K27



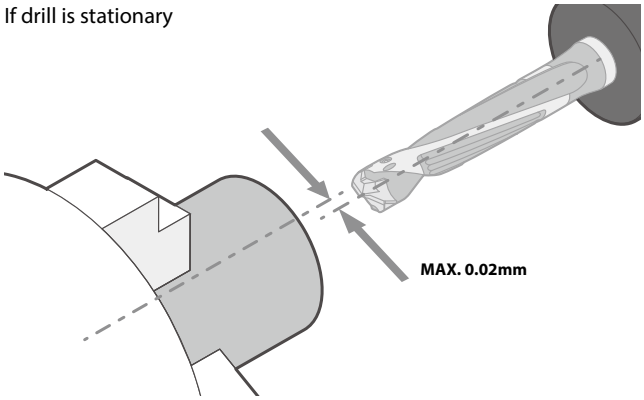
Be careful of the drill head direction



* 1 Remove dust on chip pockets using air blow for every replacement.
* 2 Make sure that the locating surfaces of the drill head closely contacts the toolholder.

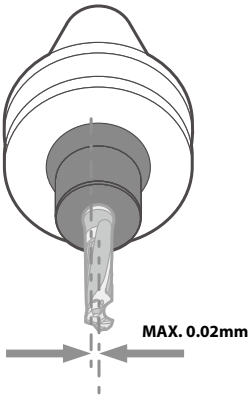
Core deviation

If drill is stationary



This can be used with a boring sleeve and collet chuck, please be sure to set deviation amount 0.02mm or under between workpiece and drill.

If drill is rotating



Make sure to use arbor that is not deformed.
Center of arbor deviation must be within 0.02mm.

Cautions for installation on machining center

For installation of MagicDrill DRA

1st choice

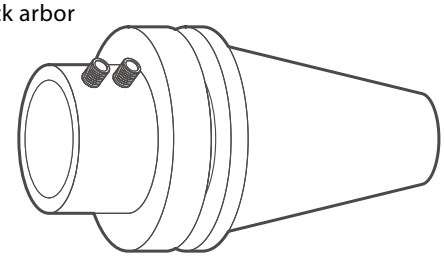
Hydro chuck, power chuck, collet chuck, etc.

- Hydro chuck
- Power chuck
- Collet chuck

Install MagicDrill DRA to the chucks

2nd choice

Side lock arbor

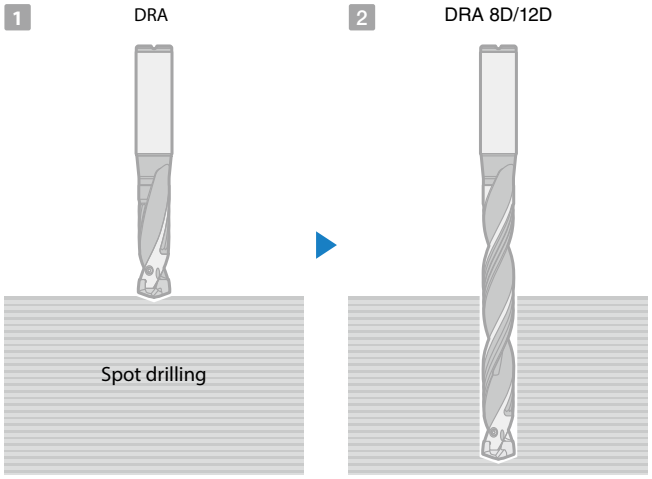


Example of side lock arbor

Cautions for machining with 8D/12D holder

Recommended machining

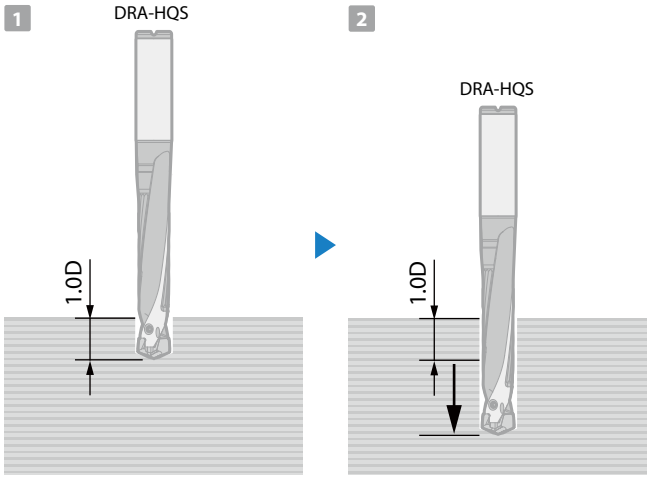
1. **Make a center spot using DRA 1.5D/3D/5D type. (Center spot should be at least half of cutting diameter)**
2. **Then drill the hole using DRA (8D/12D type).**



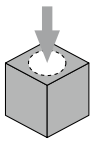
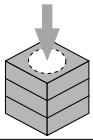
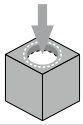
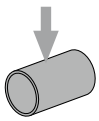
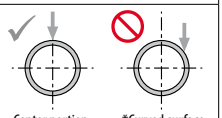
Cautions for machining with HQS drill head

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 shall be 0.08 mm/rev or less.**
2. **After 1.0D, machining at the feed rate within the recommended range.**

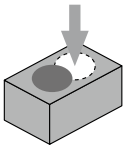


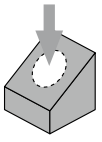
Applicable workpieces

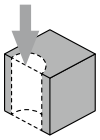
Applications	Shape of workpiece	Caution for machining
Plain surface		1. When machining stainless steel, for hole depths of up to 0.5DC, keep feed rate at 0.15mm/rev or less. 2. Internal coolant is recommended for smooth chip removal. For stainless steel, the combination of internal and external coolant 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 half of recommended feed or less for continuous hole machining. 2. Utilize a step feeding if chips are not broken short at the inlet.
Pipe material		1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas.  Center portion machining *Curved surface portion machining

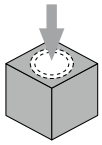
* Machining possible with FTP and 1.5D toolholder

Not recommended workpieces

Applications	Shape of workpiece
*Hole expansion	

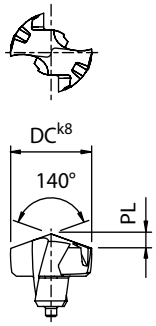
Applications	Shape of workpiece
*Slant surface	

Applications	Shape of workpiece
Half cylindrical	

Applications	Shape of workpiece
*Cored hole	

* Machining possible with FTP and 1.5D toolholder

DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 0794M-SC	7.94	1.37	0	+0.022	●	SF12-DRC080M-○ SS10-DRC080M-○
	0800M-SC	8	1.38			●	
	0810M-SC	8.1	1.4			●	
	0820M-SC	8.2	1.42			●	
	0830M-SC	8.3	1.43			●	
	0840M-SC	8.4	1.45			●	
	DC 0850M-SC	8.5	1.47	0	+0.022	●	SF12-DRC085M-○ SS10-DRC085M-○
	0860M-SC	8.6	1.48			●	
	0870M-SC	8.7	1.5			●	
	0880M-SC	8.8	1.52			●	
	0890M-SC	8.9	1.54			●	
	DC 0900M-SC	9	1.55	0	+0.022	●	SF12-DRC090M-○ SS10-DRC090M-○
	0910M-SC	9.1	1.57			●	
	0920M-SC	9.2	1.59			●	
	0930M-SC	9.3	1.61			●	
	0940M-SC	9.4	1.62			●	
	DC 0950M-SC	9.5	1.64	0	+0.022	●	SF12-DRC095M-○ SS10-DRC095M-○
	0960M-SC	9.6	1.66			●	
	0970M-SC	9.7	1.67			●	
	0980M-SC	9.8	1.69			●	
	0990M-SC	9.9	1.71			●	
	DC 1000M-SC	10	1.72	0	+0.022	●	SF16-DRC100M-○ SS12-DRC100M-○
	1010M-SC	10.1	1.74		+0.027	●	
	1020M-SC	10.2	1.76		+0.027	●	
	1030M-SC	10.3	1.78		+0.027	●	
	1040M-SC	10.4	1.8		+0.027	●	
	DC 1050M-SC	10.5	1.81	0	+0.027	●	SF16-DRC105M-○ SS12-DRC105M-○
	1060M-SC	10.6	1.83			●	
	1070M-SC	10.7	1.85			●	
	1080M-SC	10.8	1.86			●	
	1090M-SC	10.9	1.88			●	
	DC 1100M-SC	11	1.9	0	+0.027	●	SF16-DRC110M-○ SS12-DRC110M-○
	1110M-SC	11.1	1.91			●	
	1120M-SC	11.2	1.93			●	
	1130M-SC	11.3	1.95			●	
	1140M-SC	11.4	1.97			●	
	DC 1150M-SC	11.5	1.98	0	+0.027	●	SF16-DRC115M-○ SS12-DRC115M-○
	1160M-SC	11.6	2			●	
	1170M-SC	11.7	2.02			●	
	1180M-SC	11.8	2.04			●	
	1190M-SC	11.9	2.06			●	
	DC 1200M-SC	12	2.07	0	+0.027	●	SF16-DRC120M-○ SS14-DRC120M-○
	1210M-SC	12.1	2.09			●	
	1220M-SC	12.2	2.11			●	
	1230M-SC	12.3	2.12			●	
	1240M-SC	12.4	2.14			●	
	DC 1250M-SC	12.5	2.16	0	+0.027	●	SF16-DRC125M-○ SS14-DRC125M-○
	1260M-SC	12.6	2.17			●	
	1270M-SC	12.7	2.19			●	
	1280M-SC	12.8	2.21			●	
	1290M-SC	12.9	2.23			●	
	DC 1300M-SC	13	2.24	0	+0.027	●	SF16-DRC130M-○ SS14-DRC130M-○
	1310M-SC	13.1	2.26			●	
	1320M-SC	13.2	2.28			●	
	1330M-SC	13.3	2.3			●	
	1340M-SC	13.4	2.31			●	

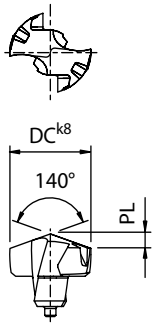
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

DC drill heads are sold in 1 piece boxes

● : Standard item

DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 1350M-SC	13.5	2.33	0	+0.027	●	SF16-DRC135M-○ SS14-DRC135M-○
	1360M-SC	13.6	2.35			●	
	1370M-SC	13.7	2.36			●	
	1380M-SC	13.8	2.38			●	
	1390M-SC	13.9	2.4			●	
	DC 1400M-SC	14	2.41	0	+0.027	●	SF16-DRC140M-○ SS16-DRC140M-○
	1410M-SC	14.1	2.43			●	
	1420M-SC	14.2	2.45			●	
	1430M-SC	14.3	2.47			●	
	1440M-SC	14.4	2.49			●	
	DC 1450M-SC	14.5	2.5	0	+0.027	●	SF16-DRC145M-○ SS16-DRC145M-○
	1460M-SC	14.6	2.52			●	
	1470M-SC	14.7	2.54			●	
	1480M-SC	14.8	2.55			●	
	1490M-SC	14.9	2.57			●	
	DC 1500M-SC	15	2.59	0	+0.027	●	SF20-DRC150M-○ SS16-DRC150M-○
	1510M-SC	15.1	2.6			●	
	1520M-SC	15.2	2.62			●	
	1530M-SC	15.3	2.64			●	
	1540M-SC	15.4	2.66			●	
	1550M-SC	15.5	2.68			●	
	1560M-SC	15.6	2.7			●	
	1570M-SC	15.7	2.71			●	
	1580M-SC	15.8	2.73			●	
	DC 1600M-SC	16	2.76	0	+0.027	●	SF20-DRC160M-○ SS18-DRC160M-○
	1610M-SC	16.1	2.78			●	
	1620M-SC	16.2	2.8			●	
	1630M-SC	16.3	2.81			●	
	1640M-SC	16.4	2.83			●	
	1650M-SC	16.5	2.85			●	
	1660M-SC	16.6	2.87			●	
	1670M-SC	16.7	2.89			●	
	1680M-SC	16.8	2.9			●	
	1690M-SC	16.9	2.92			●	
	DC 1700M-SC	17	2.93	0	+0.027	●	SF20-DRC170M-○ SS18-DRC170M-○
	1710M-SC	17.1	2.95			●	
	1720M-SC	17.2	2.97			●	
	1730M-SC	17.3	2.99			●	
	1740M-SC	17.4	3			●	
	1750M-SC	17.5	3.02			●	
	1760M-SC	17.6	3.04			●	
	1770M-SC	17.7	3.06			●	
	1780M-SC	17.8	3.08			●	
	1790M-SC	17.9	3.09			●	
	DC 1800M-SC	18	3.1	0	+0.027	●	SF25-DRC180M-○ SS20-DRC180M-○
	1810M-SC	18.1	3.12		+0.033	●	
	1820M-SC	18.2	3.14		+0.033	●	
	1830M-SC	18.3	3.16		+0.033	●	
	1840M-SC	18.4	3.18		+0.033	●	
	1850M-SC	18.5	3.19		+0.033	●	
	1860M-SC	18.6	3.21		+0.033	●	
	1870M-SC	18.7	3.23		+0.033	●	
	1880M-SC	18.8	3.25		+0.033	●	
	1890M-SC	18.9	3.27		+0.033	●	

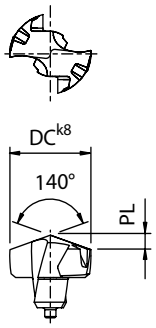
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

● : Standard item

DC drill heads are sold in 1 piece boxes

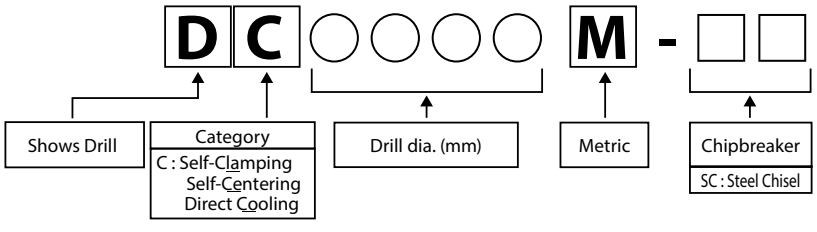
DRC drill heads (SC - Carbide - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm) DC	Dimension (mm) PL	Tolerance (mm) k8 (min.)	Tolerance (mm) k8 (max.)	Carbide PVD PR0315	Applicable toolholder ➡ K35~K37 K40~K42
 	DC 1900M-SC	19	3.28	0	+0.033	●	SF25-DRC190M-○ SS20-DRC190M-○
	1910M-SC	19.1	3.29			●	
	1920M-SC	19.2	3.31			●	
	1930M-SC	19.3	3.33			●	
	1940M-SC	19.4	3.35			●	
	1950M-SC	19.5	3.37			●	
	1960M-SC	19.6	3.39			●	
	1970M-SC	19.7	3.4			●	
	1980M-SC	19.8	3.42			●	
	1990M-SC	19.9	3.44			●	
	DC 2000M-SC	20	3.45	0	+0.033	●	SF25-DRC200M-○ SS25-DRC200M-○
	2010M-SC	20.1	3.47			●	
	2020M-SC	20.2	3.48			●	
	2030M-SC	20.3	3.5			●	
	2040M-SC	20.4	3.52			●	
	2050M-SC	20.5	3.54			●	
	2060M-SC	20.6	3.56			●	
	2070M-SC	20.7	3.58			●	
	2080M-SC	20.8	3.59			●	
	2090M-SC	20.9	3.61			●	
	2099M-SC	20.99	3.63			●	
	DC 2100M-SC	21	3.62	0	+0.033	●	SF25-DRC210M-○ SS25-DRC210M-○
	2150M-SC	21.5	3.71			●	
	DC 2200M-SC	22	3.79	0	+0.033	●	SF25-DRC220M-○ SS25-DRC220M-○
	2250M-SC	22.5	3.88			●	
	DC 2300M-SC	23	3.97	0	+0.033	●	SF25-DRC230M-○ SS25-DRC230M-○
	2350M-SC	23.5	4.06			●	
	DC 2400M-SC	24	4.14	0	+0.033	●	SF25-DRC240M-○ SS25-DRC240M-○
	2450M-SC	24.5	4.23			●	
	DC 2500M-SC	25	4.31	0	+0.033	●	SF25-DRC250M-○ SS32-DRC250M-○
	2550M-SC	25.5	4.4			●	
	2599M-SC	25.99	4.49			●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➡ K44

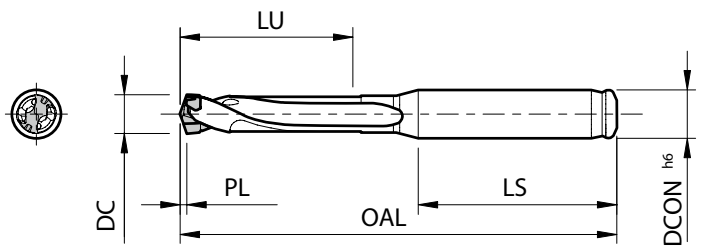
Description Identification System (Drill heads)



● : Standard item

DC drill heads are sold in 1 piece boxes

SS-DRC (Drilling depth : 3 x DC)



3D

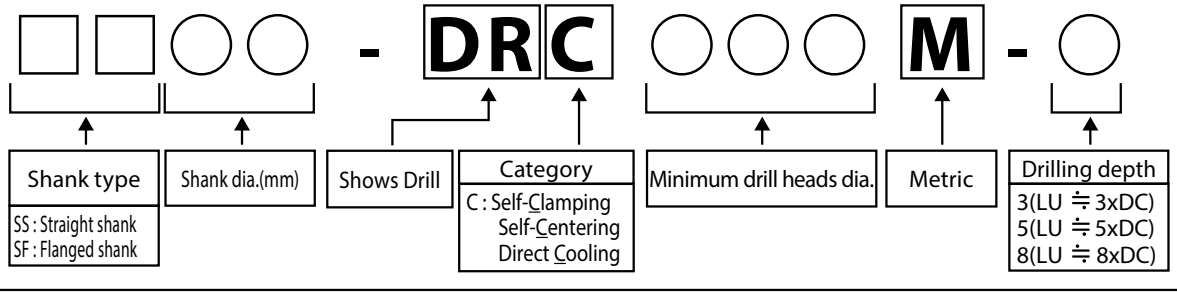
For PL indicates distance from drill point to corner edge **K32~K34**

Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-3	●	7.94	8.49	10	79	25.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-3	●	8.5	8.99		81	27				DC0850M-SC~DC0890M-SC	
	DRC090M-3	●	9	9.49		83	28.5				DC0900M-SC~DC0940M-SC	
	DRC095M-3	●	9.5	9.99		85	30				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-3	●	10	10.49	12	92	31.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-3	●	10.5	10.99		94	33				DC1050M-SC~DC1090M-SC	
	DRC110M-3	●	11	11.49		96	34.5				DC1100M-SC~DC1140M-SC	
	DRC115M-3	●	11.5	11.99		98	36				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-3	●	12	12.49	14	101	37.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-3	●	12.5	12.99		103	39				DC1250M-SC~DC1290M-SC	
	DRC130M-3	●	13	13.49		105	40.5				DC1300M-SC~DC1340M-SC	
	DRC135M-3	●	13.5	13.99		107	42				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-3	●	14	14.49	16	112	43.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-3	●	14.5	14.99		114	45				DC1450M-SC~DC1490M-SC	
	DRC150M-3	●	15	15.99		118	48				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-3	●	16	16.99	18	122	51	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-3	●	17	17.99		127	54				DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-3	●	18	18.99	20	133	57	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	-
	DRC190M-3	●	19	19.99		137	60				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-3	●	20	20.99	25	147	63	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-3	●	21	21.99		151	66				DC2100M-SC~DC2150M-SC	
	DRC220M-3	●	22	22.99		156	69				DC2200M-SC~DC2250M-SC	
	DRC230M-3	●	23	23.99		160	72				DC2300M-SC~DC2350M-SC	
	DRC240M-3	●	24	24.99		164	75				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-3	●	25	25.99	32	172	78	60	Yes		DC2500M-SC~DC2599M-SC	

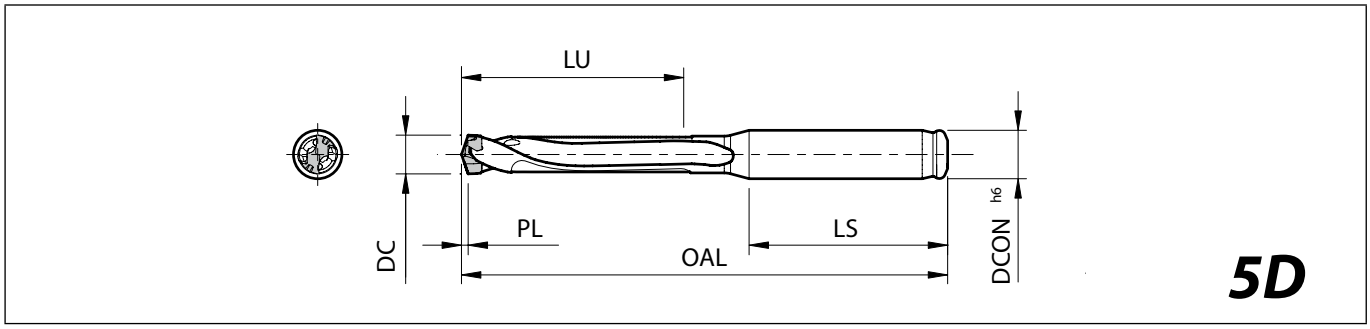
* Choose „WDRC17“, when purchasing wrench only.

Description Identification System (Toolholder)



● : Standard item

SS-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

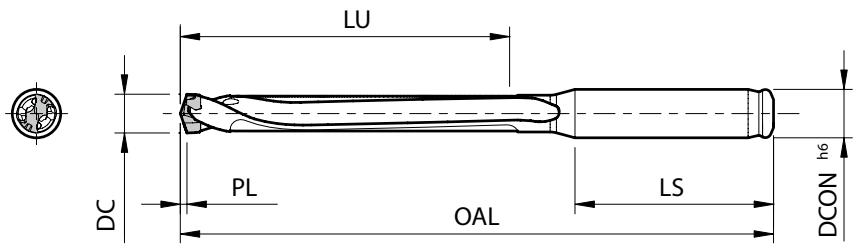
Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-5	●	7.94	8.49	10	97	42.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-5	●	8.5	8.99		100	45				DC0850M-SC~DC0890M-SC	
	DRC090M-5	●	9	9.49		103	47.5				DC0900M-SC~DC0940M-SC	
	DRC095M-5	●	9.5	9.99		107	50				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-5	●	10	10.49	12	115	52.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-5	●	10.5	10.99		118	55				DC1050M-SC~DC1090M-SC	
	DRC110M-5	●	11	11.49		121	57.5				DC1100M-SC~DC1140M-SC	
	DRC115M-5	●	11.5	11.99		124	60				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-5	●	12	12.49	14	127	62.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-5	●	12.5	12.99		130	65				DC1250M-SC~DC1290M-SC	
	DRC130M-5	●	13	13.49		133	67.5				DC1300M-SC~DC1340M-SC	
	DRC135M-5	●	13.5	13.99		137	70				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-5	●	14	14.49	16	143	72.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-5	●	14.5	14.99		146	75				DC1450M-SC~DC1490M-SC	
	DRC150M-5	●	15	15.99		152	80				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-5	●	16	16.99	18	158	85	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-5	●	17	17.99		165	90			WDRC17	DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-5	●	18	18.99	20	173	95	50	Yes		DC1800M-SC~DC1890M-SC	-
	DRC190M-5	●	19	19.99		179	100				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-5	●	20	20.99	25	191	105	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-5	●	21	21.99		198	110				DC2100M-SC~DC2150M-SC	
	DRC220M-5	●	22	22.99		204	115				DC2200M-SC~DC2250M-SC	
	DRC230M-5	●	23	23.99		210	120				DC2300M-SC~DC2350M-SC	
	DRC240M-5	●	24	24.99		216	125				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-5	●	25	25.99	32	227	130	60	Yes		DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item

SS-DRC (Drilling depth : 8 x DC)



8D

For PL indicates distance from drill point to corner edge **K32~K34**

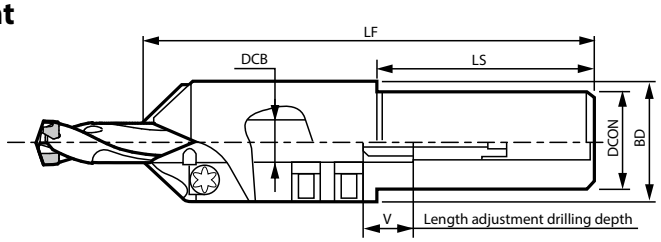
Toolholder dimensions

Description		Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34	Applicable chamfering attachment ➡ K38
			DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10-	DRC080M-8	●	7.94	8.49	10	122.5	68	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	DRC085M-8	●	8.5	8.99		127	72				DC0850M-SC~DC0890M-SC	
	DRC090M-8	●	9	9.49		131.5	76				DC0900M-SC~DC0940M-SC	
	DRC095M-8	●	9.5	9.99		137	80				DC0950M-SC~DC0990M-SC	
SS12-	DRC100M-8	●	10	10.49	12	146.5	84	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	DRC105M-8	●	10.5	10.99		151	88				DC1050M-SC~DC1090M-SC	
	DRC110M-8	●	11	11.49		155.5	92				DC1100M-SC~DC1140M-SC	
	DRC115M-8	●	11.5	11.99		160	96				DC1150M-SC~DC1190M-SC	
SS14-	DRC120M-8	●	12	12.49	14	164.5	100	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	DRC125M-8	●	12.5	12.99		169	104				DC1250M-SC~DC1290M-SC	
	DRC130M-8	●	13	13.49		173.5	108				DC1300M-SC~DC1340M-SC	
	DRC135M-8	●	13.5	13.99		179	112				DC1350M-SC~DC1390M-SC	
SS16-	DRC140M-8	●	14	14.49	16	186.5	116	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	DRC145M-8	●	14.5	14.99		191	120				DC1450M-SC~DC1490M-SC	
	DRC150M-8	●	15	15.99		200	128				DC1500M-SC~DC1580M-SC	
SS18-	DRC160M-8	●	16	16.99	18	209	136	48	Yes		DC1600M-SC~DC1690M-SC	S32-CH18
	DRC170M-8	●	17	17.99		219	144				DC1700M-SC~DC1790M-SC	
SS20-	DRC180M-8	●	18	18.99	20	230	152	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	-
	DRC190M-8	●	19	19.99		239	160				DC1900M-SC~DC1990M-SC	
SS25-	DRC200M-8	●	20	20.99	25	254	168	56	Yes		DC2000M-SC~DC2099M-SC	
	DRC210M-8	●	21	21.99		264	176				DC2100M-SC~DC2150M-SC	
	DRC220M-8	●	22	22.99		273	184				DC2200M-SC~DC2250M-SC	
	DRC230M-8	●	23	23.99		282	192				DC2300M-SC~DC2350M-SC	
	DRC240M-8	●	24	24.99		291	200				DC2400M-SC~DC2450M-SC	
SS32-	DRC250M-8	●	25	25.99	32	305	208	60	Yes		DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item

Chamfering attachment

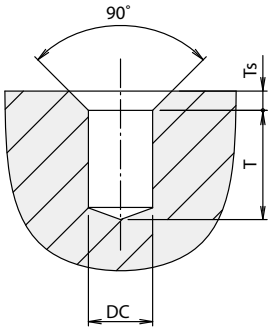


Dimensions

Description	Availability	Applicable Drill Shank Dia. (mm) DCB	Dimension (mm)					Applicable Inserts K39
			DCON	BD	LF	LS	V	
S20-CH10	●	10	20	29	122	52	17	CT08T2-45A
S32-CH12	●	12	32	38	133	62	21	CT12T3-45A
S32-CH14	●	14		40	137		16	
S32-CH16	●	16		42	141		19	
S32-CH18	●	18		47	144		15	

Chamfering attachment is dedicated for Straight Shank SS-DRC.
It cannot be used for Flanged Shank SF-DRC.

Drilling depth and chamfering dimension

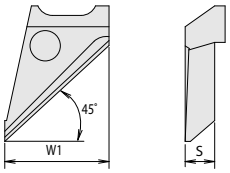


Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm) Ts		Applicable chamfering holder
		T(3D drill)		T(5D drill)		T(8D drill)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts 100	Ts max.	
7.94	8.49	11	19	21	37	47	63	2.5	5.0	S20-CH10
8.50	8.99	12	21	24	40	51	67			
9.00	9.49	12	23	27	43	56	72			
9.50	9.99	13	25	31	47	61	77			
10.00	10.49	13	26	28	49	60	81	3.5	7.0	S32-CH12
10.50	10.99	14	28	31	52	64	85			
11.00	11.49	14	30	34	55	69	90			
11.50	11.99	15	32	37	58	73	94			
12.00	12.49	15	30	41	56	79	94	4.0	8.0	S32-CH14
12.50	12.99	17	32	44	59	83	96			
13.00	13.49	19	34	47	62	88	103			
13.50	13.99	21	36	51	66	93	108			
14.00	14.49	19	37	50	68	94	112	4.0	8.0	S32-CH16
14.50	14.99	21	39	53	71	98	116			
15.00	15.99	25	43	59	77	107	125			
16.00	16.99	30	44	66	80	117	131	4.0	8.0	S32-CH18
17.00	17.99	35	49	73	87	127	141			

Ts 100: Max. chamfering dimension at the full feed.
Ts max.: Max. chamfering dimension at a 50% feed reduction.
(Max. chamfering dimension of machining possible without step feeding)

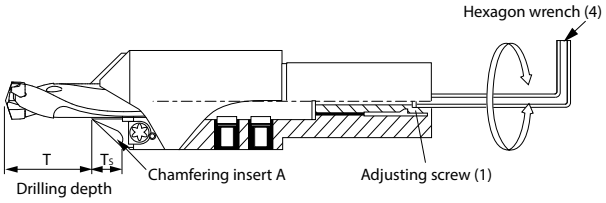
● : Standard item

Applicable inserts

Insert		Description	Dimension (mm)		PVD coated carbide	Applicable chamfering holder
			W1	S	PR0315	K38
		CT08T2-45A	8	2.83	●	S20-CH10
		CT12T3-45A	12	3.98	●	S32-CH12 ~ S32-CH18

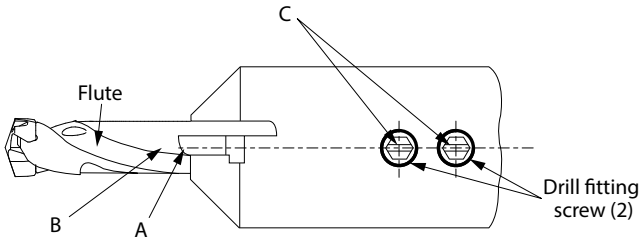
Method to use DRC chamfering attachment

I. Drilling depth adjustment



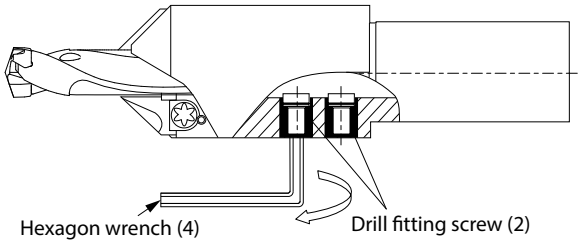
Insert drill into chamfering holder.
Next, temporarily attach the chamfering insert A.
Turn the adjusting screw (1) with the hexagon wrench (4).
to set the drilling depth T.

II. Drill location check



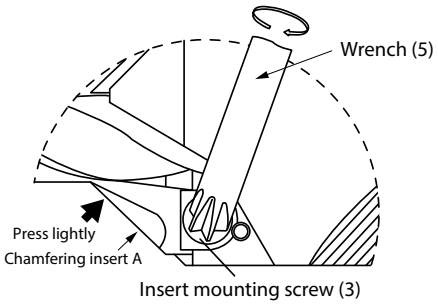
Rotate the drill so that the lower end of the chamfering insert A is aligned with the body clearance B of the drill.
Set it so that slot C and the drill fitting screws (2) are lined up as shown in the figure above.

III. Fix the drill



Tighten the drill fitting screws (2) with the hexagon wrench (4)
(When using a torque wrench, please refer to the table below)

IV. Installation of the chamfering insert



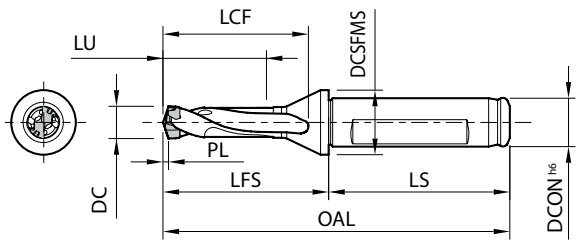
Press the chamfering insert A lightly into the drill and tighten the insert mounting screw (3) with wrench (5).

Spare parts

Chamfering holder	Tightening torque [N•m]	Adjusting screw (1)	Drill fitting screw (2)	Insert mounting screw (3)	Hexagon wrench (4)	Wrench (5)
S20-CH10	10	AJ-6X38	FS-10	MT-3	LW-3	DT-9
S32-CH12	15	AJ-8X44-9.5	FS-12	MT-4	LW-4	DT-15
S32-CH14	20	AJ-10X46	FS-14		LW-5	
S32-CH16	30		FS-16			
S32-CH18	45		FS-18			

● : Standard item

SF-DRC (Drilling depth : 3 x DC)



3D

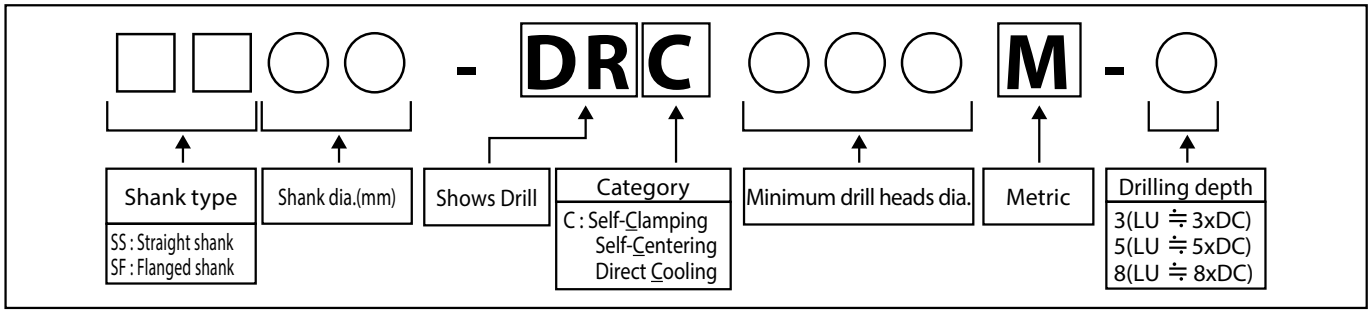
For PL indicates distance from drill point to corner edge **K32~K34**

Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ⇒ K32~K34
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-3	●	7.94	8.49	12	86	41	35	26	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-3	●	8.5	8.99		88	43	37	27					DC0850M-SC~DC0890M-SC
	DRC090M-3	●	9	9.49		90	45	39	29					DC0900M-SC~DC0940M-SC
	DRC095M-3	●	9.5	9.99		92	47	41	30					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-3	●	10	10.49	16	97	49	43	32	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-3	●	10.5	10.99		99	51	45	33					DC1050M-SC~DC1090M-SC
	DRC110M-3	●	11	11.49		101	53	47	35					DC1100M-SC~DC1140M-SC
	DRC115M-3	●	11.5	11.99		103	55	49	36					DC1150M-SC~DC1190M-SC
	DRC120M-3	●	12	12.49		106	58	52	38				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-3	●	12.5	12.99		108	60	54	39					DC1250M-SC~DC1290M-SC
	DRC130M-3	●	13	13.49		110	62	56	41					DC1300M-SC~DC1340M-SC
	DRC135M-3	●	13.5	13.99		112	64	58	42					DC1350M-SC~DC1390M-SC
	DRC140M-3	●	14	14.49		114	66	60	44				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-3	●	14.5	14.99		116	68	62	45					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-3	●	15	15.99	20	122	72	66	48	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-3	●	16	16.99		126	76	70	51					DC1600M-SC~DC1690M-SC
	DRC170M-3	●	17	17.99		131	81	75	54				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-3	●	18	18.99	25	141	85	79	57	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-3	●	19	19.99		145	89	83	60					DC1900M-SC~DC1990M-SC
	DRC200M-3	●	20	20.99		149	93	87	63					DC2000M-SC~DC2099M-SC
	DRC210M-3	●	21	21.99		153	97	91	66					DC2100M-SC~DC2150M-SC
	DRC220M-3	●	22	22.99		158	102	96	69					DC2200M-SC~DC2250M-SC
	DRC230M-3	●	23	23.99		162	106	100	72					DC2300M-SC~DC2350M-SC
	DRC240M-3	●	24	24.99		166	110	104	75					DC2400M-SC~DC2450M-SC
	DRC250M-3	●	25	25.99		170	114	108	78					DC2500M-SC~DC2599M-SC

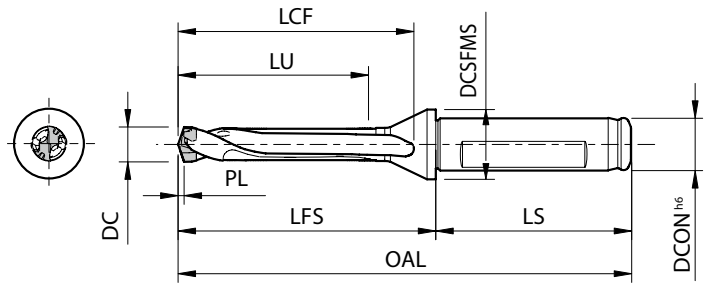
* Choose„WDRC17“, when purchasing wrench only.

Description Identification System (Toolholder)



● : Standard item

SF-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

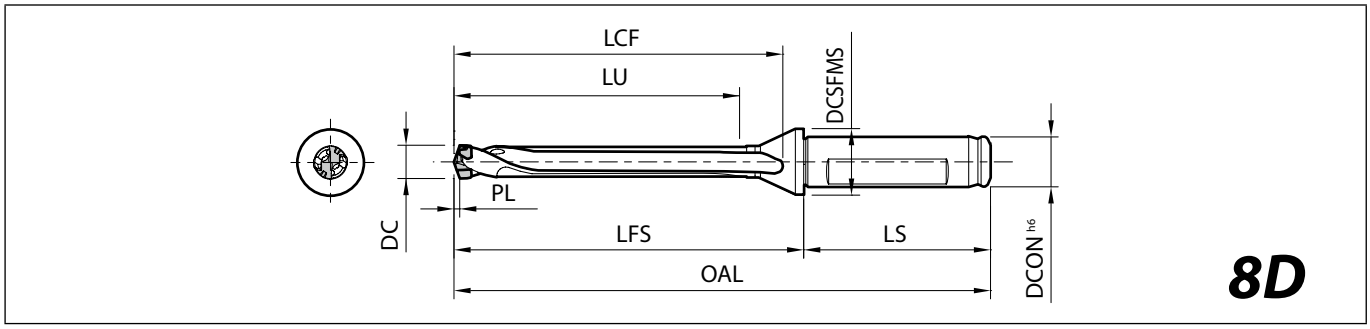
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ➡ K32~K34
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-5	●	7.94	8.49	12	104	59	53	43	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-5	●	8.5	8.99		107	62	56	45					DC0850M-SC~DC0890M-SC
	DRC090M-5	●	9	9.49		110	65	59	48					DC0900M-SC~DC0940M-SC
	DRC095M-5	●	9.5	9.99		114	69	63	50					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-5	●	10	10.49	16	120	72	66	53	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-5	●	10.5	10.99		123	75	69	55					DC1050M-SC~DC1090M-SC
	DRC110M-5	●	11	11.49		126	78	72	58					DC1100M-SC~DC1140M-SC
	DRC115M-5	●	11.5	11.99		129	81	75	60					DC1150M-SC~DC1190M-SC
	DRC120M-5	●	12	12.49		132	84	78	63				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-5	●	12.5	12.99		135	87	81	65					DC1250M-SC~DC1290M-SC
	DRC130M-5	●	13	13.49		138	90	84	68					DC1300M-SC~DC1340M-SC
	DRC135M-5	●	13.5	13.99		142	94	88	70					DC1350M-SC~DC1390M-SC
	DRC140M-5	●	14	14.49		145	97	91	73				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-5	●	14.5	14.99		148	100	94	75					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-5	●	15	15.99	20	156	106	100	80	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-5	●	16	16.99		162	112	106	85					DC1600M-SC~DC1690M-SC
	DRC170M-5	●	17	17.99		169	119	113	90				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-5	●	18	18.99	25	181	125	119	95	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-5	●	19	19.99		187	131	125	100					DC1900M-SC~DC1990M-SC
	DRC200M-5	●	20	20.99		193	137	131	105					DC2000M-SC~DC2099M-SC
	DRC210M-5	●	21	21.99		200	144	138	110					DC2100M-SC~DC2150M-SC
	DRC220M-5	●	22	22.99		206	150	144	115					DC2200M-SC~DC2250M-SC
	DRC230M-5	●	23	23.99		212	156	150	120					DC2300M-SC~DC2350M-SC
	DRC240M-5	●	24	24.99		218	162	156	125					DC2400M-SC~DC2450M-SC
	DRC250M-5	●	25	25.99		225	169	163	130					DC2500M-SC~DC2599M-SC

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item

SF-DRC (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge **K32~K34**

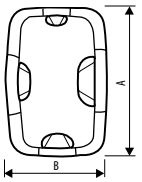
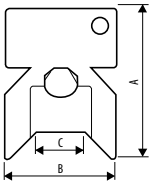
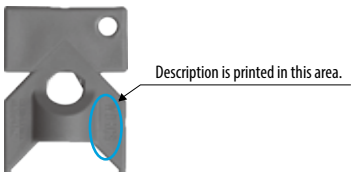
Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Spare parts	Applicable drill heads ⇒ **K32~K34**
			DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench	
SF12-	DRC080M-8	●	7.94	8.49	12	129	84	79	68	45	16	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC
	DRC085M-8	●	8.5	8.99		134	89	83	72					DC0850M-SC~DC0890M-SC
	DRC090M-8	●	9	9.49		138	93	88	76					DC0900M-SC~DC0940M-SC
	DRC095M-8	●	9.5	9.99		144	99	93	80					DC0950M-SC~DC0990M-SC
SF16-	DRC100M-8	●	10	10.49	16	151	103	97	84	48	20	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC
	DRC105M-8	●	10.5	10.99		156	108	102	88					DC1050M-SC~DC1090M-SC
	DRC110M-8	●	11	11.49		160	112	107	92					DC1100M-SC~DC1140M-SC
	DRC115M-8	●	11.5	11.99		165	117	111	96					DC1150M-SC~DC1190M-SC
	DRC120M-8	●	12	12.49		169	121	116	100				WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC
	DRC125M-8	●	12.5	12.99		174	126	120	104					DC1250M-SC~DC1290M-SC
	DRC130M-8	●	13	13.49		178	130	124	108					DC1300M-SC~DC1340M-SC
	DRC135M-8	●	13.5	13.99		184	136	130	112					DC1350M-SC~DC1390M-SC
	DRC140M-8	●	14	14.49		188	140	134	116				WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC
	DRC145M-8	●	14.5	14.99		193	145	139	120					DC1450M-SC~DC1490M-SC
SF20-	DRC150M-8	●	15	15.99	20	204	154	148	128	50	25	Yes		DC1500M-SC~DC1580M-SC
	DRC160M-8	●	16	16.99		213	163	157	136					DC1600M-SC~DC1690M-SC
	DRC170M-8	●	17	17.99		223	173	167	144				WDRC17	DC1700M-SC~DC1790M-SC
SF25-	DRC180M-8	●	18	18.99	25	238	182	176	152	56	32	Yes		DC1800M-SC~DC1890M-SC
	DRC190M-8	●	19	19.99		247	191	185	160					DC1900M-SC~DC1990M-SC
	DRC200M-8	●	20	20.99		256	200	194	168					DC2000M-SC~DC2099M-SC
	DRC210M-8	●	21	21.99		266	210	204	176					DC2100M-SC~DC2150M-SC
	DRC220M-8	●	22	22.99		275	219	213	184					DC2200M-SC~DC2250M-SC
	DRC230M-8	●	23	23.99		284	228	222	192					DC2300M-SC~DC2350M-SC
	DRC240M-8	●	24	24.99		293	237	231	200					DC2400M-SC~DC2450M-SC
	DRC250M-8	●	25	25.99		303	247	241	208					DC2500M-SC~DC2599M-SC

* Choose„WDRC17“, when purchasing wrench only.

● : Standard item

Wrench

Shape		Description	Dimension (mm)			Remarks
			A	B	C	
		WDRC17	77	52	-	· WDRC17(Multiple type wrench) has four drill head entry points. If using an drill head ranging from DC1700M-SC to DC2099M-SC, use the entry point printed as "ø17.00~ø20.99". · WDRC17 can be used instead of WDRC8~14 wrench.
		WDRC8	43	33	ø10.2	
		WDRC10			ø12.2	
		WDRC12			ø14.2	
		WDRC14			ø17.2	

Method to change MagicDrill DRC drill heads

How to attach drill heads

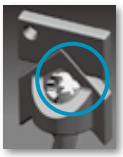
1. Fix drill holder on arbor. For drill head exchange, fix arbor on the machine or set on toolpresetter.
2. Use compressed air to remove dust.

3. Install drill head onto holder.
(Use gloves to protect your hand from any danger.)

4. Turn lightly in a clockwise direction.
(Use gloves to protect your hand from any danger.)

5. Align the wrench properly with the drill head.

6. Make sure the wrench is aligned with the wrench slots on the drill head.



(Improper alignment shown)

Slot for wrench

7. Turn the wrench in a slow counterclockwise direction.
8. Completed.

How to detach drill heads

1. Use compressed air to remove dust.
2. Align the wrench properly with the drill head.

3. Make sure the wrench is aligned with the wrench slots on the drill head.

4. Turn the wrench in a counterclockwise direction.

5. Once lock is released, drill head can be turned by fingers.
(Use gloves to protect your hand from any danger.)

6. Remove drill head.
(Use gloves to protect your hand from any danger.)

Recommended cutting conditions

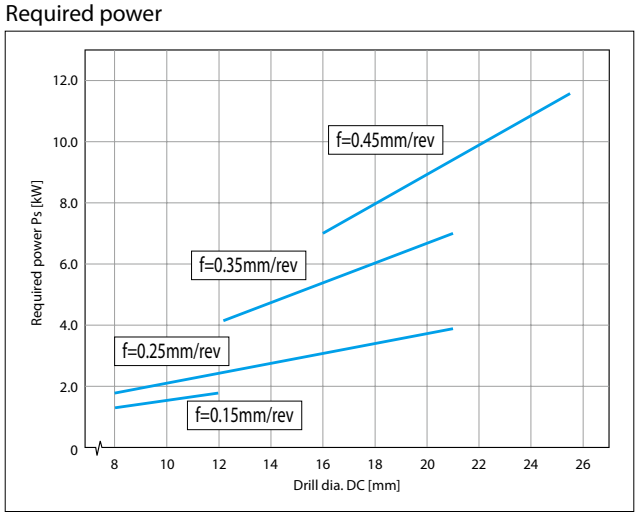
Workpiece material		Hard-ness (HB)	Cutting conditions		Drill dia. DC (mm)								Remarks
			Vc (m/min)	n (min^{-1}) / f (mm/rev)	ø8	ø10	ø12	ø14	ø16	ø18	ø20	ø25	
Low carbon steel	SS400 S10C~S25C	125	120 -180	n (min^{-1})	4,780 - 7,170	3,820 - 5,730	3,180 - 4,780	2,730 - 4,090	2,390 - 3,580	2,120 - 3,180	1,910 - 2,870	1,530 - 2,290	Coolant
				f (mm/rev)	0.11 - 0.20	0.13 - 0.24	0.14 - 0.28	0.17 - 0.32	0.19 - 0.35	0.23 - 0.38	0.25 - 0.41	0.30 - 0.50	
Carbon steel	S30C~S58C (Annealed)	190	100 -150	n (min^{-1})	3,980 - 5,970	3,180 - 4,780	2,650 - 3,980	2,270 - 3,410	1,990 - 2,990	1,770 - 2,650	1,590 - 2,390	1,270 - 1,910	
				f (mm/rev)	0.13 - 0.24	0.15 - 0.29	0.17 - 0.33	0.19 - 0.36	0.22 - 0.41	0.25 - 0.46	0.28 - 0.48	0.32 - 0.60	
	S30C~S58C (Heat treated)	250	80 -120	n (min^{-1})	3,180 - 4,780	2,550 - 3,820	2,120 - 3,180	1,820 - 2,730	1,590 - 2,390	1,420 - 2,120	1,270 - 1,910	1,020 - 1,530	
				f (mm/rev)	0.13 - 0.21	0.15 - 0.25	0.18 - 0.31	0.21 - 0.39	0.23 - 0.45	0.25 - 0.53	0.28 - 0.61	0.38 - 0.64	
		300	50 -75	n (min^{-1})	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.28	0.21 - 0.32	0.23 - 0.35	0.25 - 0.41	0.28 - 0.41	0.32 - 0.45	
Alloy steel	SCM,SCr (Annealed)	180	70 -95	n (min^{-1})	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.15 - 0.28	0.16 - 0.35	0.21 - 0.37	0.23 - 0.46	0.25 - 0.46	0.25 - 0.51	0.30 - 0.51	0.35 - 0.60	
	SCM,SCr (Heat treated)	275	70 -95	n (min^{-1})	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.11 - 0.21	0.14 - 0.25	0.19 - 0.30	0.21 - 0.33	0.23 - 0.37	0.28 - 0.43	0.28 - 0.46	0.32 - 0.58	
		300	60 -90	n (min^{-1})	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.30 - 0.50	
		350	50 -70	n (min^{-1})	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.28 - 0.50	
Stainless steel	SUS304 SUS316	220	60 -80	n (min^{-1})	2,390 - 3,180	1,910 - 2,550	1,590 - 2,120	1,360 - 1,820	1,190 - 1,590	1,060 - 1,420	960 - 1,270	760 - 1,020	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.28 - 0.42	
	SUS630	300	50 -70	n (min^{-1})	1,990 - 2,790	1,590 - 2,230	1,330 - 1,860	1,140 - 1,590	1,000 - 1,390	880 - 1,240	800 - 1,110	640 - 890	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.25 - 0.40	
Gray cast iron	FC150~FC200	180	120 -170	n (min^{-1})	4,780 - 6,770	3,820 - 5,410	3,180 - 4,510	2,730 - 3,870	2,390 - 3,380	2,120 - 3,010	1,910 - 2,710	1,530 - 2,170	
				f (mm/rev)	0.17 - 0.32	0.20 - 0.37	0.23 - 0.43	0.27 - 0.48	0.30 - 0.55	0.33 - 0.61	0.33 - 0.61	0.40 - 0.74	
	FC250~FC350	260	90 -120	n (min^{-1})	3,580 - 4,780	2,870 - 3,820	2,390 - 3,180	2,050 - 2,730	1,790 - 2,390	1,590 - 2,120	1,430 - 1,910	1,150 - 1,530	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.42	0.26 - 0.47	0.28 - 0.53	0.30 - 0.58	0.36 - 0.70	
Nodular cast iron	FCD400~FCD500	160	60 -90	n (min^{-1})	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.30	0.19 - 0.35	0.22 - 0.40	0.24 - 0.45	0.28 - 0.51	0.28 - 0.56	0.34 - 0.67	
	FCD600~FCD800	250	40 -65	n (min^{-1})	1,590 - 2,590	1,270 - 2,070	1,060 - 1,730	910 - 1,480	800 - 1,290	710 - 1,150	640 - 1,040	510 - 830	
				f (mm/rev)	0.10 - 0.19	0.12 - 0.22	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.51	0.25 - 0.53	0.30 - 0.60	

As drilling depth increases (3D→5D→8D), feed rates should be reduced.

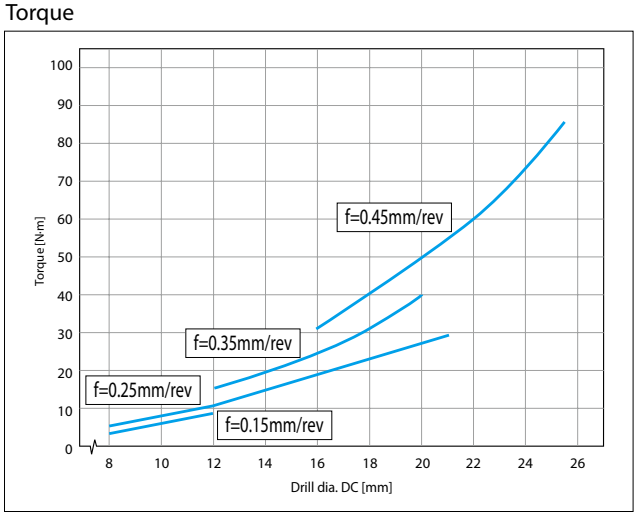
Reference charts

Cutting conditions: Workpiece material heat treated steel (Hardness 240HB) Vc = 80 m/min, wet

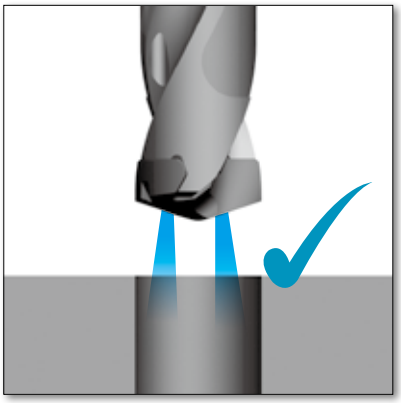
Required power



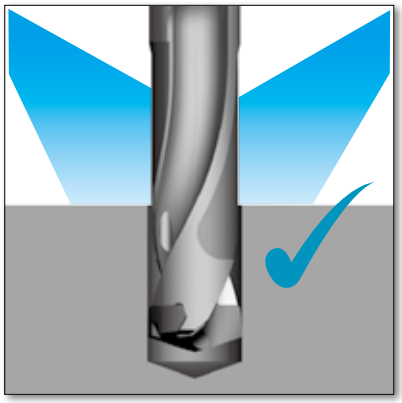
Torque



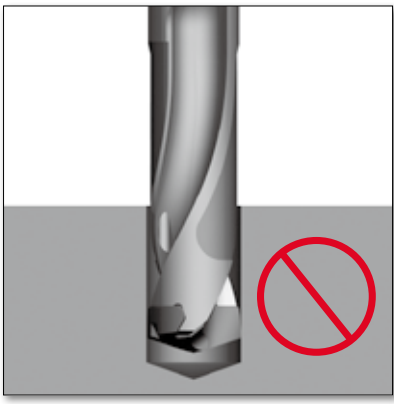
Coolant



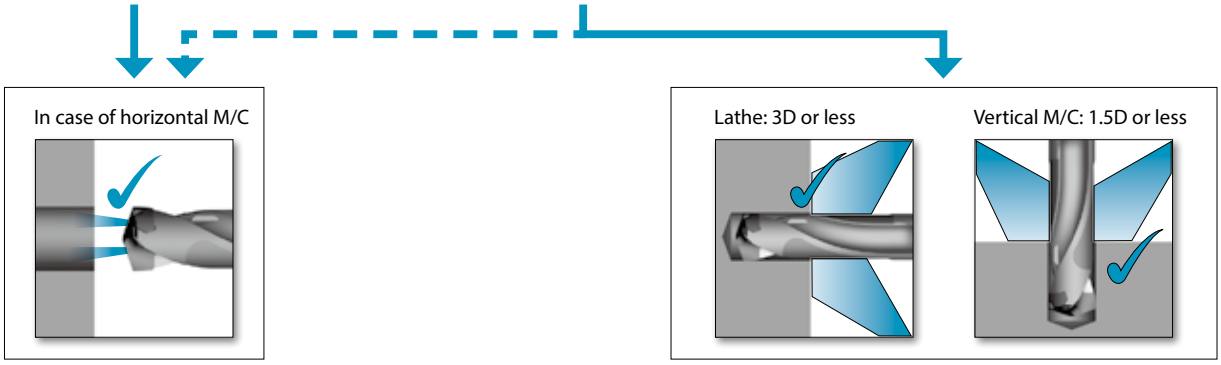
1. Internal coolant is recommended.



2. In case of using external coolant system



3. Dry machining is not recommended.

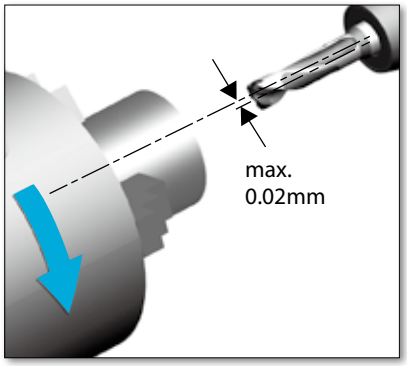


Internal coolant is recommended for horizontal machining center because external coolant may not sufficiently be applied to inside because the tool is revolving.

Precautions for use

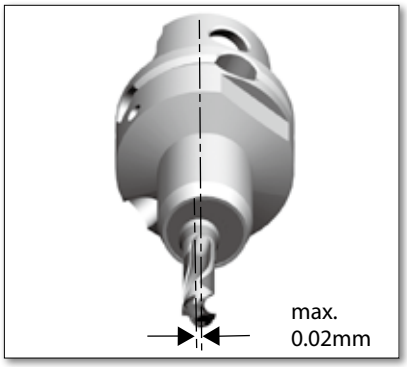
Core deviation

1. If drill is stationary



This can be used with a boring sleeve (Screw clamp) and collet chuck,
please be sure to set deviation amount within 0.02mm between workpiece and drill.

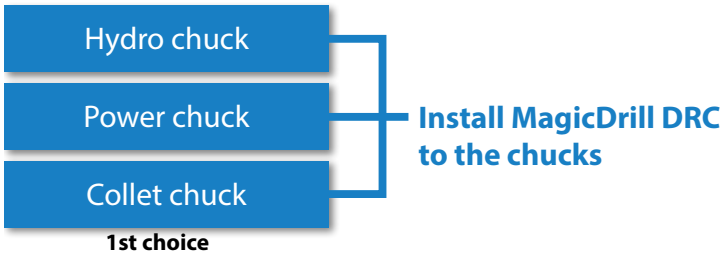
2. If drill is rotating



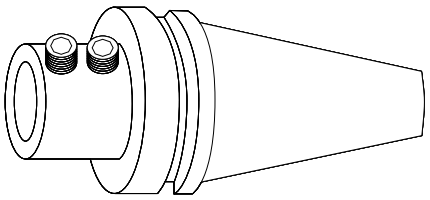
Make sure to use arbor that is not deformed.
Center of arbor deviation must be within 0.02mm.

Cautions for installation on machining center

For installation of MagicDrill DRC,
1st choice hydro chuck, power chuck, collet chuck, etc.
2nd choice side lock arbor

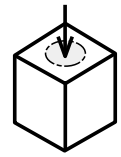
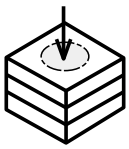
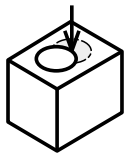
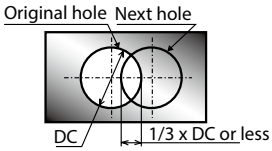
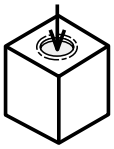
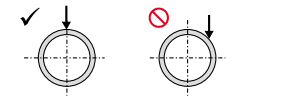


1st choice

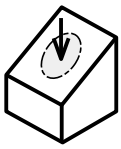
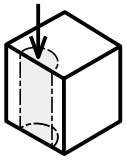
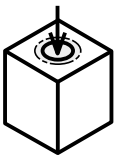


Example of side lock arbor
2nd choice

Applicable workpieces

Applications	Shape of workpiece	Caution for machining
Plain surface		1. Due to good chip control, step machining is not necessary for low carbon steel. 2. When machining SUS304, for hole depths of more than 2.5D, utilize the step machining process. 3. In order to have smooth chip removal, we recommend internal coolant.
Stacked plates		1. Fix stacked plates securely to ensure so that they do not slip while machining.
Hole expansion		1. If the overlap amount is 1/3 x DC or less, machining is possible. 
Concave surface		1. When machining concave holes, set the feed rates at half or less than continuous hole machining.
Pipe material		1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas. 

Not recommended workpieces

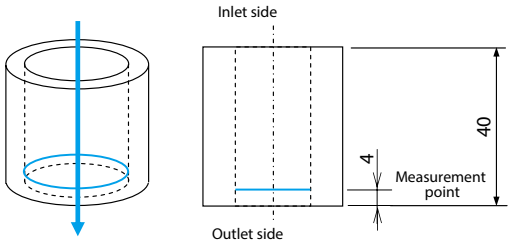
Applications	Shape of workpiece
Slant surface	
Half cylindrical	
Cored hole	

Comparison of Machining Precision

Cutting Condition and Measurement Point

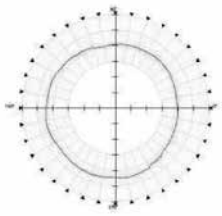
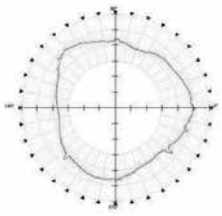
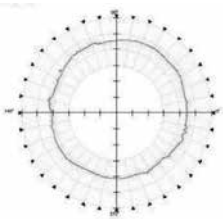
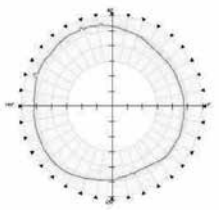
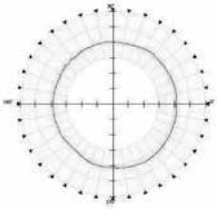
<Cutting Conditions>

Workpiece Material	S45C
Vc	100m/min
f	0.2mm/rev, 0.3mm/rev
Drilling Depth H	Through hole (40mm)
Coolant	Wet (Internal coolant)
Tool	ø14-3D type
Machine	M/C



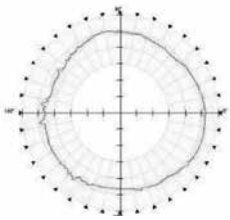
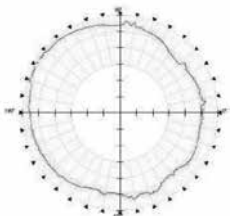
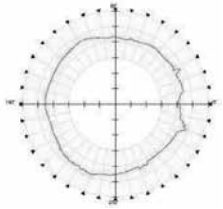
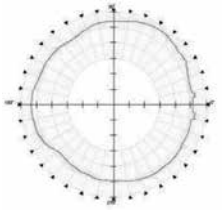
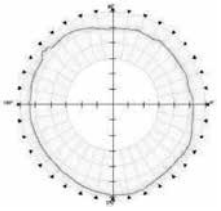
Roundness

1) Roundness (f=0.2mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
				
Roundness : 5.5µm	Roundness : 22.5µm	Roundness : 6.4µm	Roundness : 9.8µm	Roundness : 5.2µm

(Internal evaluation)

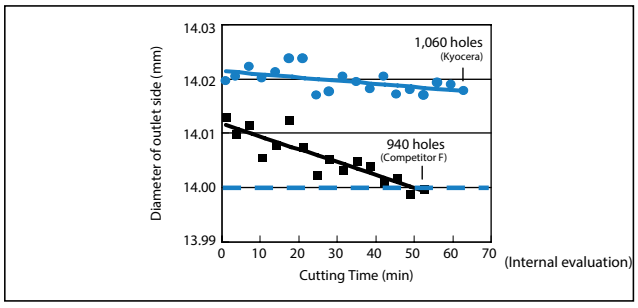
2) Roundness (f=0.3mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
				
Roundness : 10.7µm	Roundness : 15.2µm	Roundness : 12.0µm	Roundness : 11.8µm	Roundness : 12.3µm

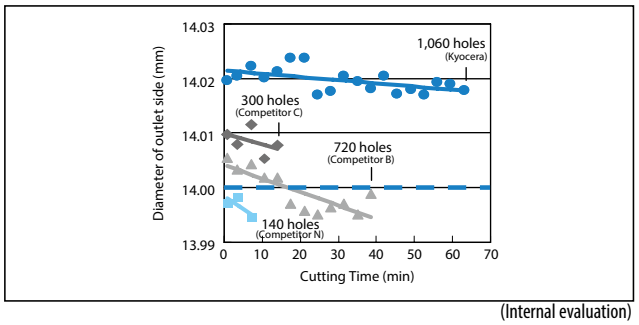
(Internal evaluation)

Comparison of Hole Dia. (f=0.3mm/rev)

1) Comparison with indexable drill



2) Comparison with carbide solid drill



(Internal evaluation)

K

Drilling

High efficiency indexable insert drill

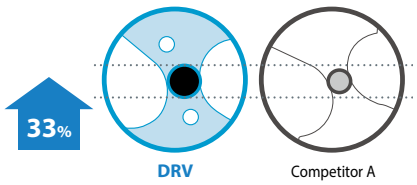
MagicDrill DRV

Economical inserts with 4 cutting edges.
Excellent chip evacuation with 6D maximum deep-hole drilling.

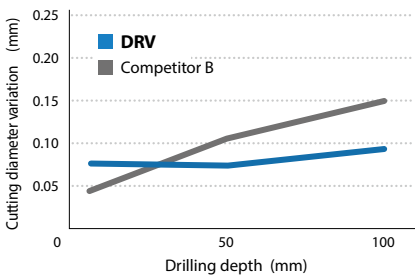
1 Excellent drilling precision with less variation in cutting diameter
Up to 6D drilling capabilities with a low cutting force design

Optimal web thickness reduces chattering with a low cutting force design

Web thickness comparison
(Internal evaluation)

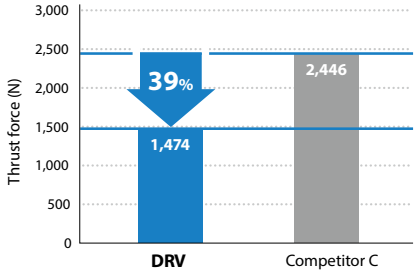


Comparison of cutting diameter variation
(Internal evaluation)



Cutting conditions: Vc = 150 m/min, f = 0.06 mm/rev
Drill dia. ø20(5D), wet Workpiece material: S50C

Cutting force comparison
(Internal evaluation)



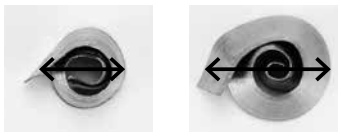
Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev
Drill dia. ø20(3D), wet Workpiece material: S50C

2 Unique insert design to control chip flow

Outer edge Smooth chip evacuation with compact chips

Unique insert pattern to differentiate between outside and inside inserts

Chipshape comparison of outer insert cutting edge (Internal evaluation)



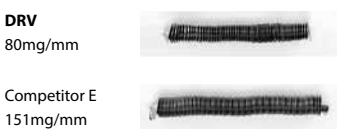
DRV: 10mm Competitor D: 12mm

16% Diameter of chips

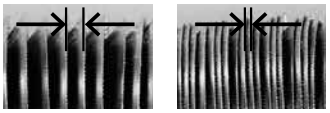
Cutting conditions: Vc = 150 m/min, f = 0.06 mm/rev, Drill dia. ø20(3D), wet workpiece material: S50C

Inner edge Excellent chip evacuation as well as less wear resistance with reduced chips weight

Weight per unit of length for chips generated by the inner edge
(Internal evaluation)



Pitch comparison of chips generated by the inner edge (Internal evaluation)

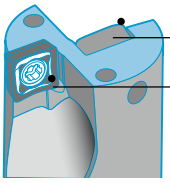


DRV: 1.2mm Competitor E: 0.5mm

47% Weight of chips

Cutting conditions: Vc = 250 m/min, f = 0.08 mm/rev, Drill dia. ø20(5D), wet workpiece material: SUS304

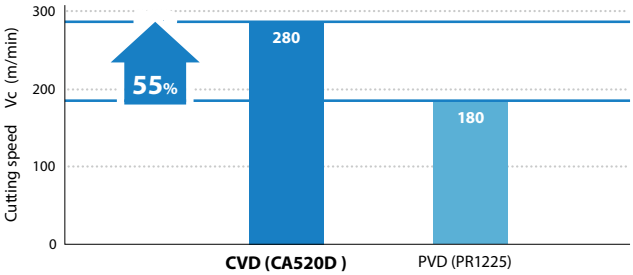
3 CVD insert on the outer edge for highly efficient drilling



New grades developed for drilling

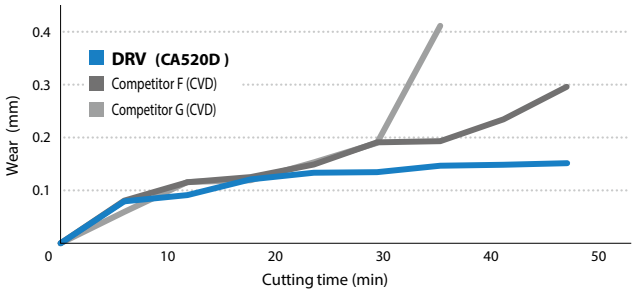
High speed and highly efficient machining available with the combination
Of CVD (Outer edge) and PVD (Inner edge) inserts.

Recommended cutting speed (Maximum value)



Drill dia. ø20(3D) workpiece material: S50C

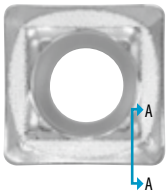
Wear resistance comparison (Internal evaluation)



Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev, Drill dia. ø20(3D) , wet
workpiece material: SCM440H

4 Economical inserts with 4 cutting edges 4 types of chipbreakers for various machining applications

General purpose GM chipbreaker

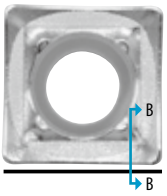


Chipbreaker for steel machining
Stable deep-hole machining with low cutting force

A-A Section

Edge shape optimized for
various machining applications

Tough edge GH chipbreaker

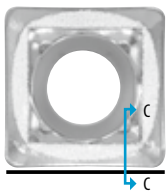


1st recommendation for machining cast iron
Good for continuous steel machining
Reduced breakages common in through-hole machining

B-B Section

Negative land with
Strong edge

For stainless steel machining SM chipbreaker



Stable chip control when machining
gummy stainless steel.
Reduces chip clogging in the holder body

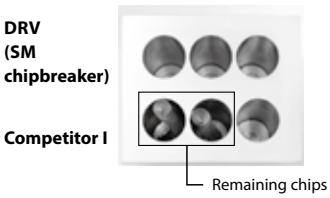
C-C Section

Sharp cutting and
large rake angle

Chip control comparison (Internal evaluation)

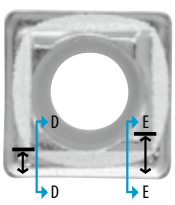
Cutting conditions: Vc = 100 m/min, f = 0.1 Mm/rev
drill dia. Ø20(3d), drilling depth 60mm
wet, workpiece material: SUS304

Comparison of remaining chips (Internal evaluation)

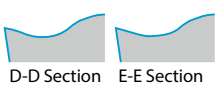


Cutting conditions: Vc = 150 m/min, f = 0.08 Mm/rev
drill dia. Ø25(5d),
drilling depth 98mm, wet,
workpiece material: SUS304

For machining soft steel XM chipbreaker



Stable chip control of outer cutting edge



D-D Section E-E Section

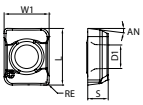
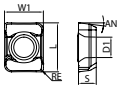
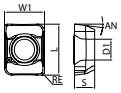
Excellent chip control
With the changing
Width of the chipbreaker

Chip control comparison (Internal evaluation)

Cutting conditions: Vc = 200 m/min, f = 0.12 mm/rev
Drill dia. ø16(3D), Drilling depth 48 mm
Wet Workpiece material: SS400

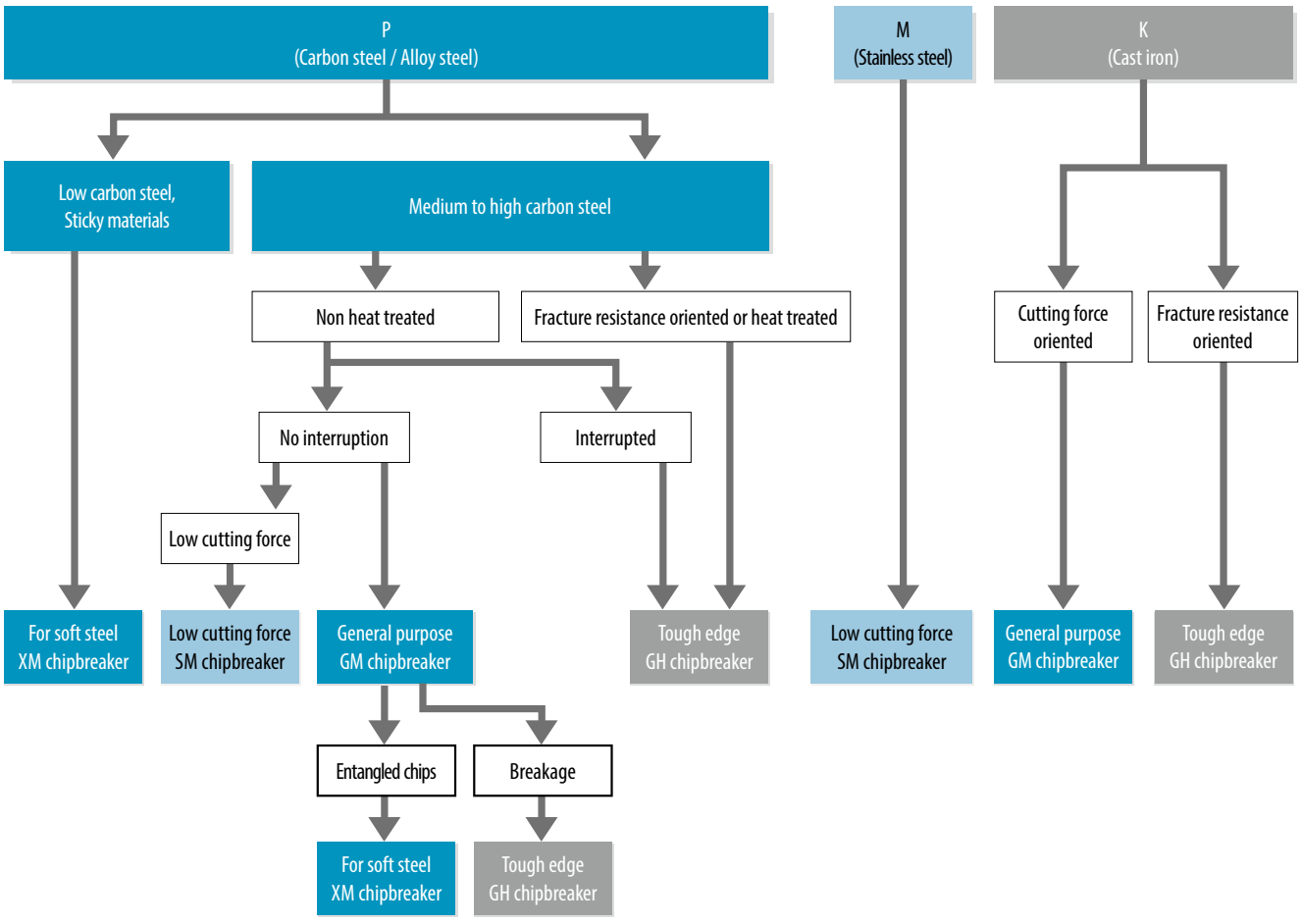
LCMT (outer edge)

Classification of usage ★ : High speed and highly efficient drilling ☆ : Stable machining oriented			Carbon steel / Alloy steel	★	☆	P
			Mold and die steel	★	☆	P
			Stainless steel	★	☆	M
			Cast iron	★	☆	K

Insert		Description	No. of edges	Dimension (mm) S	D1	RE	L	W1	Angle (°) AN	Carbide CVD CA415D / CA520D	Carbide PVD PR1225	Applicable toolholder
	 Tough edge	LCMT 030203-GH-E	2	2	2.3	0.3	5.54	4.4	7	●	●	S20-DRV...M-○-03
	 General purpose	LCMT 030203-GM-E	2	2	2.3	0.3	5.54	4.4	7	●	●	
	 Stainless steel	LCMT 030203-SM-E	2	2	2.3	0.3	5.54	4.4	7		●	

Recommended cutting conditions ➡ **K68~K69**

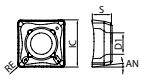
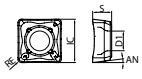
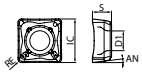
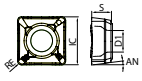
Chipbreaker selection chart



● : Standard item

SCMT (outer edge)

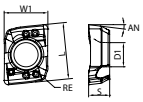
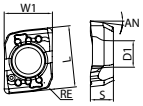
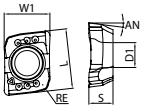
Classification of usage ★ : High speed and highly efficient drilling ☆ : Stable machining oriented												
								Carbon steel / Alloy steel		★	☆	P
								Mold and die steel		★	☆	P
								Stainless steel		★	☆	M
								Cast iron	★		☆	K

Insert		Description		No. of edges	Dimension (mm)				Angle (°)	Carbide			Applicable toolholder ➡ K54~K62
					IC	S	D1	RE	AN	CVD		PVD	
										CA415D	CA520D	PR1225	
	 Tough edge	SCMT	040205-GH-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04
		SCMT	050205-GH-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05
		SCMT	060205-GH-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06
		SCMT	070305-GH-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07
		SCMT	090405-GH-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09
		SCMT	110406-GH-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11
		SCMT	140508-GH-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14
		SCMT	170608-GH-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17
	 General purpose	SCMT	040205-GM-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04
		SCMT	050205-GM-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05
		SCMT	060205-GM-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06
		SCMT	070305-GM-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07
		SCMT	090405-GM-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09
		SCMT	110406-GM-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11
		SCMT	140508-GM-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14
		SCMT	170608-GM-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17
	 Stainless steel	SCMT	040205-SM-E	4	4.8	2.2	2.4	0.5	7		●	●	S..-DRV...M-○-04
		SCMT	050205-SM-E	4	5.25	2.6	2.4	0.5	7		●	●	S..-DRV...M-○-05
		SCMT	060205-SM-E	4	6.4	2.8	2.9	0.5	7		●	●	S..-DRV...M-○-06
		SCMT	070305-SM-E	4	7.65	3.2	3.5	0.5	7		●	●	S..-DRV...M-○-07
		SCMT	090405-SM-E	4	9.1	4.1	4	0.5	7		●	●	S..-DRV...M-○-09
		SCMT	110406-SM-E	4	11	4.5	4.6	0.6	7		●	●	S..-DRV...M-○-11
		SCMT	140508-SM-E	4	13.8	5	5.7	0.8	7		●	●	S..-DRV...M-○-14
		SCMT	170608-SM-E	4	16.8	6.58	6.9	0.8	7		●	●	S..-DRV...M-○-17
	 Low carbon steel	SCMT	040205-XM-E	4	4.8	2.2	2.4	0.5	7		●	●	S..-DRV...M-○-04
		SCMT	050205-XM-E	4	5.25	2.6	2.4	0.5	7		●	●	S..-DRV...M-○-05
		SCMT	060205-XM-E	4	6.4	2.8	2.9	0.5	7		●	●	S..-DRV...M-○-06
		SCMT	070305-XM-E	4	7.65	3.2	3.5	0.5	7		●	●	S..-DRV...M-○-07
		SCMT	090405-XM-E	4	9.1	4.1	4	0.5	7		●	●	S..-DRV...M-○-09
		SCMT	110406-XM-E	4	11	4.5	4.6	0.6	7		●	●	S..-DRV...M-○-11
		SCMT	140508-XM-E	4	13.8	5	5.7	0.8	7		●	●	S..-DRV...M-○-14
		SCMT	170608-XM-E	4	16.8	6.58	6.9	0.8	7		●	●	S..-DRV...M-○-17

Recommended cutting conditions ➡ K68~K69

● : Standard item

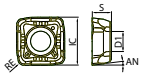
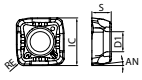
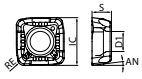
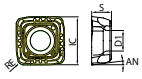
LCMT (inner edge)

			Carbon steel / Alloy steel										P
			Mold and die steel										
			Stainless steel										M
			Cast iron										K
Insert		Description	No. of edges	Dimension (mm)						Angle (°)	Carbide		Applicable toolholder ➡ K54, K56 K58, K60 K62
				S	D1	RE	L	W1	AN	PVD PR1535			
	 Tough edge	LCMT 030205-GH-I	2	2	2.3	0.5	5.37	4.16	7	●		
	 General purpose	LCMT 030205-GM-I	2	2	2.3	0.5	5.37	4.16	7	●		S20-DRV...M-○-03
	 Stainless steel	LCMT 030205-SM-I	2	2	2.3	0.5	5.37	4.16	7	●		

Recommended cutting conditions ➡ K68~K69

● : Standard item

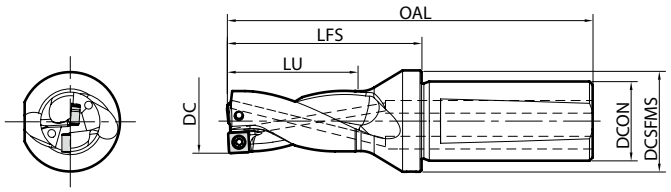
SCMT (inner edge)

Insert		Description		No. of edges	Dimension (mm) IC	S	D1	RE	Angle (°) AN	Carbide PVD PR1535	Applicable toolholder ⇒ K54~K62
		Carbon steel / Alloy steel									P
		Mold and die steel									
		Stainless steel									M
		Cast iron									K
	 Tough edge	SCMT	040209-GH-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-GH-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-GH-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-GH-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-GH-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-GH-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-GH-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-GH-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 General purpose	SCMT	040209-GM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-GM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-GM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-GM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-GM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-GM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-GM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-GM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 Stainless steel	SCMT	040209-SM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-SM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-SM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-SM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-SM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-SM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-SM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-SM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17
	 Low carbon steel	SCMT	040209-XM-I	4	5	2.2	2.4	0.9	7	●	S..-DRV...M-○-04
		SCMT	050210-XM-I	4	5.7	2.6	2.4	1	7	●	S..-DRV...M-○-05
		SCMT	060210-XM-I	4	6.9	2.8	2.9	1	7	●	S..-DRV...M-○-06
		SCMT	070310-XM-I	4	8.2	3.2	3.5	1	7	●	S..-DRV...M-○-07
		SCMT	090410-XM-I	4	9.8	4.1	4	1	7	●	S..-DRV...M-○-09
		SCMT	110410-XM-I	4	11.9	4.5	4.6	1	7	●	S..-DRV...M-○-11
		SCMT	140510-XM-I	4	14.9	5	5.7	1	7	●	S..-DRV...M-○-14
		SCMT	170610-XM-I	4	17.9	6.58	6.9	1	7	●	S..-DRV...M-○-17

Recommended cutting conditions ⇒ K68~K69

● : Standard item

DRV (Drilling depth : 2 x DC)



2D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ⇒ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-2-03	●	2	12	20	82	39	24	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-2-03	●		12.5		83	40	25			+0.2					
	DRV130M-2-03	●		13		84	41	26			+0.15					
	DRV135M-2-03	●		13.5		85	42	27			+0.1					
S20-	DRV140M-2-04	●	2	14	20	92	49	28	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-2-04	●		14.5		93	50	29			+0.35					
	DRV150M-2-04	●		15		94	51	30			+0.3					
	DRV155M-2-04	●		15.5		95	52	31			+0.25					
S25-	DRV160M-2-05	●	2	16	25	110	56	32	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-2-05	●		16.5		111	57	33			+0.35					
	DRV170M-2-05	●		17		112	58	34			+0.3					
	DRV175M-2-05	●		17.5		113	59	35			+0.25					
	DRV180M-2-05	●		18		114	60	36			+0.2					
	DRV185M-2-05	●		18.5		115	61	37			+0.15					
S25-	DRV190M-2-06	●	2	19	25	113	59	38	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-2-06	●		19.5		114	60	39			+0.6					
	DRV200M-2-06	●		20		115	61	40			+0.55					
	DRV205M-2-06	●		20.5		116	62	41			0.5					
	DRV210M-2-06	●		21		117	63	42			+0.45					
	DRV215M-2-06	●		21.5		118	64	43			+0.35					
	DRV220M-2-06	●		22		119	65	44			+0.3					
S25-	DRV225M-2-07	●	2	22.5	25	120	66	45	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-2-07	●		23		121	67	46			+0.8					
	DRV235M-2-07	●		23.5		122	68	47			+0.75					
	DRV240M-2-07	●		24		123	69	48			+0.7					
	DRV245M-2-07	●		24.5		124	70	49			+0.65					
	DRV250M-2-07	●		25		125	71	50			+0.6					
	DRV255M-2-07	●		25.5		126	72	51			+0.5					
	DRV260M-2-07	●		26		127	73	52			+0.45					
S32-	DRV270M-2-09	●	2	27	32	136	77	54	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-2-09	●		28		138	79	56			+0.95					
	DRV290M-2-09	●		29		140	81	58			+0.85					
	DRV300M-2-09	●		30		142	83	60			+0.75					
	DRV310M-2-09	●		31		144	85	62			+0.6					
	DRV320M-2-09	●		32		146	87	64			+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K68**
Trouble shooting ⇒ **K65**

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S40-	DRV330M-2-11	●	2	33	40	161	92	66	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-2-11	●		34		163	94	68			+1.15					
	DRV350M-2-11	●		35		165	96	70			+1					
	DRV360M-2-11	●		36		167	98	72			+0.9					
	DRV370M-2-11	●		37		169	100	74			+0.8					
	DRV380M-2-11	●		38		171	102	76			+0.65					
	DRV390M-2-11	●		39		173	104	78			+0.55					
S40-	DRV400M-2-14	●	2	40	40	181	112	80	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-2-14	●		41		183	114	82			+1.6					
	DRV420M-2-14	●		42		185	116	84			+1.5					
	DRV430M-2-14	●		43		187	118	86			+1.4					
	DRV440M-2-14	●		44		189	120	88			+1.3					
	DRV450M-2-14	●		45		191	122	90			+1.15					
	DRV460M-2-14	●		46		193	124	92	54		+1.05					
	DRV470M-2-14	●		47		195	126	94			+0.95					
	DRV480M-2-14	●		48		197	128	96			+0.8					
	DRV490M-2-14	●		49		199	130	98			+0.7					
S40-	DRV500M-2-17	●	2	50	40	198	129	100	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-2-17	●		51		200	131	102			+1.95					
	DRV520M-2-17	●		52		202	133	104			+1.85					
	DRV530M-2-17	●		53		204	135	106			+1.75					
	DRV540M-2-17	●		54		206	137	108			+1.65					
	DRV550M-2-17	●		55		208	139	110			+1.5					
	DRV560M-2-17	●		56		210	141	112			+1.4					
	DRV570M-2-17	●		57		212	143	114	64		+1.3					
	DRV580M-2-17	●		58		214	145	116			+1.15					
	DRV590M-2-17	●		59		216	147	118			+1.05					
	DRV600M-2-17	●		60		218	149	120			+0.95					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

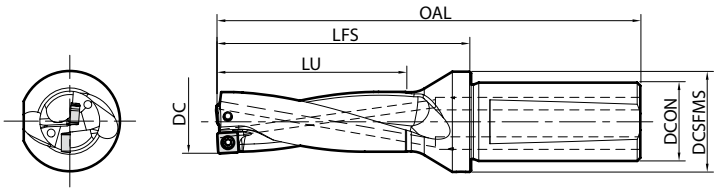
Hole Dia. Tolerance (2D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRV (Drilling depth : 3 x DC)



3D

Toolholder dimensions

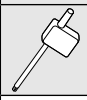
Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-3-03	●	2	12	20	94	51	36	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-3-03	●		12.5		96	53	37.5			+0.2					
	DRV130M-3-03	●		13		97	54	39			+0.15					
	DRV135M-3-03	●		13.5		99	56	40.5			+0.1					
S20-	DRV140M-3-04	●	2	14	20	106	63	42	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-3-04	●		14.5		108	65	43.5			+0.35					
	DRV150M-3-04	●		15		109	66	45			+0.3					
	DRV155M-3-04	●		15.5		111	68	46.5			+0.25					
S25-	DRV160M-3-05	●	2	16	25	126	72	48	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-3-05	●		16.5		127	73	49.5			+0.35					
	DRV170M-3-05	●		17		129	75	51			+0.3					
	DRV175M-3-05	●		17.5		130	76	52.5			+0.25					
	DRV180M-3-05	●		18		132	78	54			+0.2					
	DRV185M-3-05	●		18.5		133	79	55.5			+0.15					
S25-	DRV190M-3-06	●	2	19	25	132	78	57	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-3-06	●		19.5		134	80	58.5			+0.6					
	DRV200M-3-06	●		20		135	81	60			+0.55					
	DRV205M-3-06	●		20.5		137	83	61.5			+0.5					
	DRV210M-3-06	●		21		138	84	63			+0.45					
	DRV215M-3-06	●		21.5		140	86	64.5			+0.35					
	DRV220M-3-06	●		22		141	87	66			+0.3					
S25-	DRV225M-3-07	●	2	22.5	25	142	88	67.5	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-3-07	●		23		144	90	69			+0.8					
	DRV235M-3-07	●		23.5		145	91	70.5			+0.75					
	DRV240M-3-07	●		24		147	93	72			+0.7					
	DRV245M-3-07	●		24.5		148	94	73.5			+0.65					
	DRV250M-3-07	●		25		150	96	75			+0.6					
	DRV255M-3-07	●		25.5		151	97	76.5			+0.5					
	DRV260M-3-07	●		26		153	99	78			+0.45					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S32-	DRV265M-3-09	●	2	26.5	32	161	102	79.5	41	Yes	+1.15	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV270M-3-09	●		27		163	104	81			+1.05					
	DRV275M-3-09	●		27.5		164	105	82.5			+1					
	DRV280M-3-09	●		28		166	107	84			+0.95					
	DRV285M-3-09	●		28.5		167	108	85.5			+0.9					
	DRV290M-3-09	●		29		169	110	87			+0.85					
	DRV295M-3-09	●		29.5		170	111	88.5			+0.8					
	DRV300M-3-09	●		30		172	113	90			+0.75					
	DRV305M-3-09	●		30.5		173	114	91.5			+0.65					
	DRV310M-3-09	●		31		175	116	93			+0.6					
	DRV315M-3-09	●		31.5		176	117	94.5			+0.55					
	DRV320M-3-09	●		32		178	119	96			+0.5					
S40-	DRV330M-3-11	●	2	33	40	194	125	99	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-3-11	●		34		197	128	102			+1.15					
	DRV350M-3-11	●		35		200	131	105			+1					
	DRV360M-3-11	●		36		203	134	108			+0.9					
	DRV370M-3-11	●		37		206	137	111			+0.8					
	DRV380M-3-11	●		38		209	140	114			+0.65					
	DRV390M-3-11	●		39		212	143	117			+0.55					
S40-	DRV400M-3-14	●	2	40	40	221	152	120	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-3-14	●		41		224	155	123			+1.6					
	DRV420M-3-14	●		42		227	158	126			+1.5					
	DRV430M-3-14	●		43		230	161	129			+1.4					
	DRV440M-3-14	●		44		233	164	132			+1.3					
	DRV450M-3-14	●		45		236	167	135			+1.15					
	DRV460M-3-14	●		46		239	170	138	54		+1.05					
	DRV470M-3-14	●		47		242	173	141			+0.95					
	DRV480M-3-14	●		48		245	176	144			+0.8					
	DRV490M-3-14	●		49		248	179	147			+0.7					
S40-	DRV500M-3-17	●	2	50	40	248	179	150	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-3-17	●		51		251	182	153			+1.95					
	DRV520M-3-17	●		52		254	185	156			+1.85					
	DRV530M-3-17	●		53		257	188	159			+1.75					
	DRV540M-3-17	●		54		260	191	162			+1.65					
	DRV550M-3-17	●		55		263	194	165			+1.5					
	DRV560M-3-17	●		56		266	197	168			+1.4					
	DRV570M-3-17	●		57		269	200	171	64		+1.3					
	DRV580M-3-17	●		58		272	203	174			+1.15					
	DRV590M-3-17	●		59		275	206	177			+1.05					
	DRV600M-3-17	●		60		278	209	180			+0.95					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

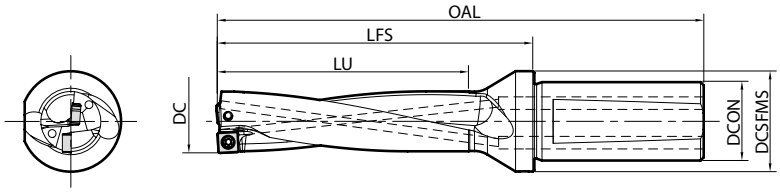
Hole Dia. Tolerance (3D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRV (Drilling depth : 4 x DC)



4D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-4-03	●	2	12	20	106	63	48	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV125M-4-03	●		12.5		108	65	50			+0.2					
	DRV130M-4-03	●		13		110	67	52			+0.15					
	DRV135M-4-03	●		13.5		112	69	54			+0.1					
S20-	DRV140M-4-04	●	2	14	20	120	77	56	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV145M-4-04	●		14.5		122	79	58			+0.35					
	DRV150M-4-04	●		15		124	81	60			+0.3					
	DRV155M-4-04	●		15.5		126	83	62			+0.25					
S25-	DRV160M-4-05	●	2	16	25	142	88	64	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV165M-4-05	●		16.5		144	90	66			+0.35					
	DRV170M-4-05	●		17		146	92	68			+0.3					
	DRV175M-4-05	●		17.5		148	94	70			+0.25					
	DRV180M-4-05	●		18		150	96	72			+0.2					
	DRV185M-4-05	●		18.5		152	98	74			+0.15					
S25-	DRV190M-4-06	●	2	19	25	151	97	76	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV195M-4-06	●		19.5		153	99	78			+0.6					
	DRV200M-4-06	●		20		155	101	80			+0.55					
	DRV205M-4-06	●		20.5		157	103	82			+0.5					
	DRV210M-4-06	●		21		159	105	84			+0.45					
	DRV215M-4-06	●		21.5		161	107	86			+0.35					
	DRV220M-4-06	●		22		163	109	88			+0.3					
S25-	DRV225M-4-07	●	2	22.5	25	165	111	90	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV230M-4-07	●		23		167	113	92			+0.8					
	DRV235M-4-07	●		23.5		169	115	94			+0.75					
	DRV240M-4-07	●		24		171	117	96			+0.7					
	DRV245M-4-07	●		24.5		173	119	98			+0.65					
	DRV250M-4-07	●		25		175	121	100			+0.6					
	DRV255M-4-07	●		25.5		177	123	102			+0.5					
	DRV260M-4-07	●		26		179	125	104			+0.45					
S32-	DRV270M-4-09	●	2	27	32	190	131	108	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-4-09	●		28		194	135	112			+0.95					
	DRV290M-4-09	●		29		198	139	116			+0.85					
	DRV300M-4-09	●		30		202	143	120			+0.75					
	DRV310M-4-09	●		31		206	147	124			+0.6					
	DRV320M-4-09	●		32		210	151	128			+0.5					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ K68
Trouble shooting ➡ K65

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S40-	DRV330M-4-11	●	2	33	40	227	158	132	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-4-11	●		34		231	162	136			+1.15					
	DRV350M-4-11	●		35		235	166	140			+1					
	DRV360M-4-11	●		36		239	170	144			+0.9					
	DRV370M-4-11	●		37		243	174	148			+0.8					
	DRV380M-4-11	●		38		247	178	152			+0.65					
	DRV390M-4-11	●		39		251	182	156			+0.55					
S40-	DRV400M-4-14	●	2	40	40	261	192	160	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-4-14	●		41		265	196	164			+1.6					
	DRV420M-4-14	●		42		269	200	168			+1.5					
	DRV430M-4-14	●		43		273	204	172			+1.4					
	DRV440M-4-14	●		44		277	208	176			+1.3					
	DRV450M-4-14	●		45		281	212	180			+1.15					
	DRV460M-4-14	●		46		285	216	184	54		+1.05					
	DRV470M-4-14	●		47		289	220	188			+0.95					
S50-	DRV480M-4-14	●		48	50	293	224	192	59		+0.8					
	DRV490M-4-14	●		49		297	228	196			+0.7					
S50-	DRV500M-4-17	●	2	50	50	298	229	200	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-4-17	●		51		302	233	204			+1.95					
	DRV520M-4-17	●		52		306	237	208			+1.85					
	DRV530M-4-17	●		53		310	241	212			+1.75					
	DRV540M-4-17	●		54		314	245	216			+1.65					
	DRV550M-4-17	●		55		318	249	220			+1.5					
	DRV560M-4-17	●		56		322	253	224			+1.4					
	DRV570M-4-17	●		57		326	257	228	64		+1.3					
	DRV580M-4-17	●		58		330	261	232			+1.15					
	DRV590M-4-17	●		59		334	265	236			+1.05					
	DRV600M-4-17	●		60		338	269	240			+0.95					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K68**
Trouble shooting ➡ **K65**

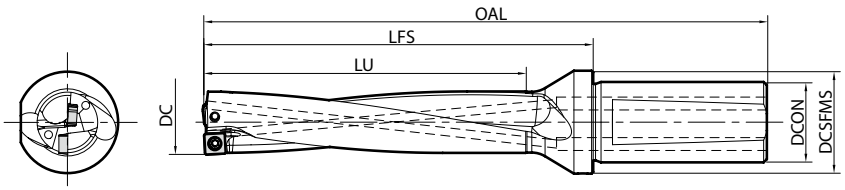
Hole Dia. Tolerance (4D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRV (Drilling depth : 5 x DC)



5D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-5-03	●	2	12	20	118	75	60	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV130M-5-03	●		13		123	80	65			+0.15					
S20-	DRV140M-5-04	●	2	14	20	134	91	70	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV150M-5-04	●		15		139	96	75			+0.3					
S25-	DRV160M-5-05	●	2	16	25	158	104	80	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV170M-5-05	●		17		163	109	85			+0.3					
	DRV180M-5-05	●		18		168	114	90			+0.2					
S25-	DRV190M-5-06	●	2	19	25	170	116	95	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV200M-5-06	●		20		175	121	100			+0.55					
	DRV210M-5-06	●		21		180	126	105			+0.45					
	DRV220M-5-06	●		22		185	131	110			+0.3					
S25-	DRV230M-5-07	●	2	23	25	190	136	115	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV240M-5-07	●		24		195	141	120			+0.7					
	DRV250M-5-07	●		25		200	146	125			+0.6					
	DRV260M-5-07	●		26		205	151	130			+0.45					
S32-	DRV270M-5-09	●	2	27	32	217	158	135	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-5-09	●		28		222	163	140			+0.95					
	DRV290M-5-09	●		29		227	168	145			+0.85					
	DRV300M-5-09	●		30		232	173	150			+0.75					
	DRV310M-5-09	●		31		237	178	155			+0.6					
	DRV320M-5-09	●		32		242	183	160			+0.5					
S40-	DRV330M-5-11	●	2	33	40	260	191	165	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-5-11	●		34		265	196	170			+1.15					
	DRV350M-5-11	●		35		270	201	175			+1					
	DRV360M-5-11	●		36		275	206	180			+0.9					
	DRV370M-5-11	●		37		280	211	185			+0.8					
	DRV380M-5-11	●		38		285	216	190			+0.65					
	DRV390M-5-11	●		39		290	221	195			+0.55					

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K51, K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
																
S40-	DRV400M-5-14	●	2	40	40	301	232	200	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-5-14	●		41		306	237	205			+1.6					
	DRV420M-5-14	●		42		311	242	210			+1.5					
	DRV430M-5-14	●		43		316	247	215			+1.4					
	DRV440M-5-14	●		44		321	252	220			+1.3					
	DRV450M-5-14	●		45		326	257	225			+1.15					
	DRV460M-5-14	●		46		331	262	230	54		+1.05					
	DRV470M-5-14	●		47		336	267	235			+0.95					
S50-	DRV480M-5-14	●		48	50	341	272	240	59		+0.8					
	DRV490M-5-14	●		49		346	277	245			+0.7					
S50-	DRV500M-5-17	●	2	50	50	348	279	250	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV510M-5-17	●		51		353	284	255			+1.95					
	DRV520M-5-17	●		52		358	289	260			+1.85					
	DRV530M-5-17	●		53		363	294	265			+1.75					
	DRV540M-5-17	●		54		368	299	270			+1.65					
	DRV550M-5-17	●		55		373	304	275			+1.5					
	DRV560M-5-17	●		56		378	309	280			+1.4					
	DRV570M-5-17	●		57		383	314	285	64		+1.3					
	DRV580M-5-17	●		58		388	319	290			+1.15					
	DRV590M-5-17	●		59		393	324	295			+1.05					
	DRV600M-5-17	●		60		398	329	300			+0.95					

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

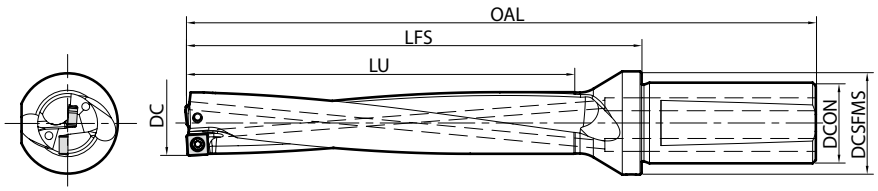
Hole Dia. Tolerance (5D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRV (Drilling depth : 6 x DC)



6D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K50~K53
				DC	DCON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S20-	DRV120M-6-03	●	2	12	20	130	87	72	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	DRV130M-6-03	●		13		136	93	78			+0.15					
S20-	DRV140M-6-04	●	2	14	20	148	105	84	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	DRV150M-6-04	●		15		154	111	90			+0.3					
S25-	DRV160M-6-05	●	2	16	25	174	120	96	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	DRV170M-6-05	●		17		180	126	102			+0.3					
	DRV180M-6-05	●		18		186	132	108			+0.2					
S25-	DRV190M-6-06	●	2	19	25	189	135	114	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	DRV200M-6-06	●		20		195	141	120			+0.55					
	DRV210M-6-06	●		21		201	147	126			+0.45					
	DRV220M-6-06	●		22		207	153	132			+0.3					
S25-	DRV230M-6-07	●	2	23	25	213	159	138	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	DRV240M-6-07	●		24		219	165	144			+0.7					
	DRV250M-6-07	●		25		225	171	150			+0.6					
	DRV260M-6-07	●		26		231	177	156			+0.45					
S32-	DRV270M-6-09	●	2	27	32	244	185	162	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	DRV280M-6-09	●		28		250	191	168			+0.95					
	DRV290M-6-09	●		29		256	197	174			+0.85					
	DRV300M-6-09	●		30		262	203	180			+0.75					
	DRV310M-6-09	●		31		268	209	186			+0.6					
	DRV320M-6-09	●		32		274	215	192			+0.5					
S40-	DRV330M-6-11	●	2	33	40	293	224	198	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	DRV340M-6-11	●		34		299	230	204			+1.15					
	DRV350M-6-11	●		35		305	236	210			+1					
	DRV360M-6-11	●		36		311	242	216			+0.9					
	DRV370M-6-11	●		37		317	248	222			+0.8					
	DRV380M-6-11	●		38		323	254	228			+0.65					
	DRV390M-6-11	●		39		329	260	234			+0.55					
S40-	DRV400M-6-14	●	2	40	40	341	272	240	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	DRV410M-6-14	●		41		347	278	246			+1.6					
	DRV420M-6-14	●		42		353	284	252			+1.5					
	DRV430M-6-14	●		43		359	290	258			+1.4					
	DRV440M-6-14	●		44		365	296	264			+1.3					
	DRV450M-6-14	●		45		371	302	270			+1.15					
S50-	DRV500M-6-17	●	2	50	50	398	329	300	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	DRV550M-6-17	●		55		428	359	330			+1.5					
	DRV600M-6-17	●		60		458	389	360	64		+0.95					

When offset drilling, reduce feed rate to 0.04 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K69**
Trouble shooting ➡ **K65**

● : Standard item

Hole Dia. Tolerance (6D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.45 0
ø40 - ø60	+0.50 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

Insert grade selection guide

Select CVD for the outer edge when performing high speed and high efficiency drilling. Drilling for high efficiency, abrasion resistance and long tool life.
Select PVD for the outer edge for stable drilling and a better surface finish.
PVD is recommended for the outer edge when chattering occurs or drilling with lathe is not available, even if cutting conditions are increased.

High speed and high efficiency drilling

Outer edge: CVD (CA520D/CA415D)

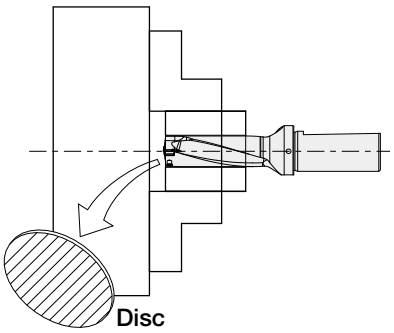
Inner edge: PVD (PR1535).

Stable machining oriented
(1st recommendation for lathe machining)

Outer edge: PVD (PR1225).

Inner edge: PVD (PR1535).

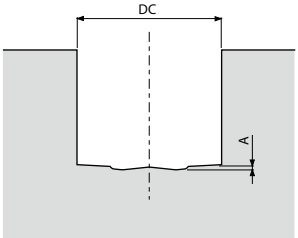
Caution



When drilling through the workpiece, a disk may be ejected.
Proper machine guarding is necessary to prevent injury.

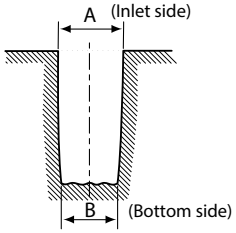
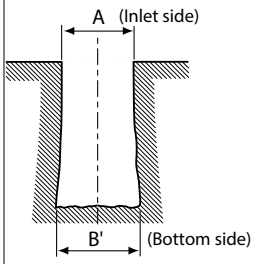
DRV hole bottom shape (mm)

Insert size	DC	A	Insert size	DC	A	Insert size	DC	A	Insert size	DC	A
03	12.0	0.70	06	19.0	1.2	09	26.5	1.2	14	40.0	1.9
	12.5			19.5			27.0			41.0	
	13.0			20.0			27.5	1.3		42.0	2.0
	13.5			20.5	1.3		28.0			43.0	
04	14.0	1.0		21.0			28.5			44.0	
	14.5			21.5			29.0			45.0	2.1
	15.0			22.0			29.5	1.4		46.0	
	15.5		07	22.5	1.2		30.0			47.0	
05	16.0	1.1		23.0			30.5			48.0	2.2
	16.5			23.5			31.0			49.0	
	17.0			24.0			31.5	1.5	17	50.0	2.0
	17.5			24.5	1.3		32.0			51.0	2.1
	18.0	1.2		25.0		11	33.0	1.5		52.0	
	18.5			25.5			34.0			53.0	
				26.0			35.0			54.0	2.2
							36.0	1.6		55.0	
							37.0			56.0	
							38.0			57.0	2.3
							39.0	1.7		58.0	
										59.0	2.4
										60.0	



Common for 2D, 3D, 4D, 5D, 6D type
* Above is numeric guideline. (Varies within ±0.1mm depending on workpiece materials and cutting conditions)

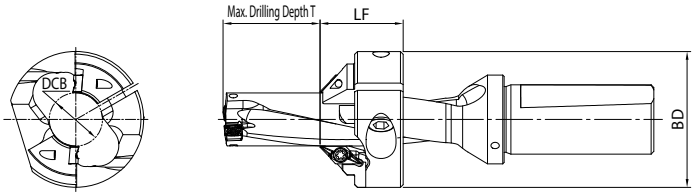
Trouble shooting (DRV / DRZ)

Trouble condition	Condition		Cause	Countermeasures
Hole diameter becomes smaller (At hole bottom)		There is no problem for inlet, however gradually hole diameter is getting smaller at the bottom. A>B	Chip jam (External or internal edge chip stuck)	Change the cutting conditions · Increase the cutting speed · Lower the feed rate **K68, K69, K85**
Hole diameter becomes larger (At hole bottom)		There is no problem for inlet, however gradually hole diameter is getting larger at the bottom. A<B'	Internal edge chip jam.	Change the cutting conditions · Increase the cutting speed · Lower the feed rate **K68, K69, K85** Check the core height **K72, K73** **K86, K87**
Hole diameter is small (From the hole inlet)		Hole diameter is small from inlet. (At turning moment)	Inappropriate adjustment of hole diameter.	In case of using lathe machine, use X-axis and adjustment hole diameter. **K72** **K86**
			No core at internal edge. (No core remains)	Adjust the center height. **K72, K73** **K86, K87**

Indication of tool life of MagicDrill (DRV/ DRZ)

How to judge tool life	Indication of judging tool life
Judgement of tool condition and insert wear	· When an insert is new, the toolholder is slightly bent to the side during drilling (therefore, the drill diameter is slightly bigger during drilling). Once drilling is finished, the toolholder will return back to normal size. No tool marks will appear on the finished surface (This depends on workpiece and cutting condition. Slight tool mark might appear if cutting force on external dia. is too low.) · When an insert is at the end of its tool life, gradually the external corner part gets worn out. Also the toolholder does not bend slightly outwards, and it starts to bend inwards. After the drilling is finished, the toolholder returns to the normal position. When taking off a toolholder under this condition, the cutting edge of the insert creates external tool marks on the finished surface of the workpiece.
Checking hole diameter	When hole diameter is measured, suddenly it shows small diameter. In this case, a worn out insert can be the cause and it must be exchange.
Checking the surface on the outlet side	If insert wear progresses, the burrs of penetrated hole entrance becomes bigger. This is a clear indication that the tool must be exchanged.
Variation of drilling noise	Light drilling noise at the beginning turns to brady noise which contains vibration noise.
Variation of vibration	As the end of tool life is getting closer, there is more vibration and the drilling noise changes. However, when drilling smaller diameters these factors are difficult to detect.

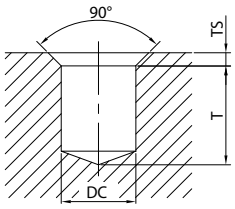
Chamfering attachment



Dimensions

Description	Availability	Applicable drills	Dimension (mm)			Applicable inserts	Spare parts			
			BD	DCB	LF		Clamp Screw	Wrench	Clamp bolt	Wrench
DRV-CH17	●	S25-DRV165M-◯-05 S25-DRV170M-◯-05	47	16.2	30	CH0503-45	SB-3080TR	FT-10	HH6X18	LW-5
DRV-CH18	●	S25-DRV175M-◯-05 S25-DRV180M-◯-05	47	17.2	30					
DRV-CH19	●	S25-DRV185M-◯-05 S25-DRV190M-◯-06	49	18.2	30					
DRV-CH20	●	S25-DRV195M-◯-06 S25-DRV200M-◯-06	49	19.2	30					
DRV-CH21	●	S25-DRV205M-◯-06 S25-DRV210M-◯-06	49	20.2	30					
DRV-CH22	●	S25-DRV215M-◯-06 S25-DRV220M-◯-06	49	21.2	30					
DRV-CH23	●	S25-DRV225M-◯-07 S25-DRV230M-◯-07	51	22.2	30					
DRV-CH24	●	S25-DRV235M-◯-07 S25-DRV240M-◯-07	51	23.2	30					
DRV-CH25	●	S25-DRV245M-◯-07 S25-DRV250M-◯-07	53	24.2	30					
DRV-CH26	●	S25-DRV255M-◯-07 S25-DRV260M-◯-07	53	25.2	30					
DRV-CH27	●	S32-DRV265M-◯-09 S32-DRV270M-◯-09	64	26	35				HH8X20	LW-6

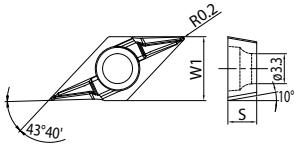
Max. drilling depth and chamfering dimension



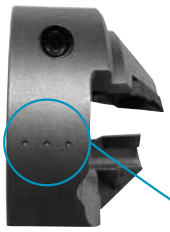
Drill dia. (mm)	Max. drilling depth T (mm)					Max. chamfering dimension (mm)	Applicable chamfering attachment
DC	2D drill	3D drill	4D drill	5D drill	6D drill	Ts	
ø16.5	0.5	17	33.5	-	-	2.5	DRV-CH17
ø17	1.5	18.5	35.5	52.5	69.5		
ø17.5	2.5	20	37.5	-	-		DRV-CH18
ø18	3.5	21.5	39.5	57.5	75.5		
ø18.5	4.5	23	41.5	-	-		DRV-CH19
ø19	5.5	24.5	43.5	62.5	81.5		
ø19.5	6.5	26	45.5	-	-		DRV-CH20
ø20	7.5	27.5	47.5	67.5	87.5		
ø20.5	8.5	29	49.5	-	-		DRV-CH21
ø21	9.5	30.5	51.5	72.5	93.5		
ø21.5	10.5	32	53.5	-	-		DRV-CH22
ø22	11.5	33.5	55.5	77.5	99.5		
ø22.5	12.5	35	57.5	-	-		DRV-CH23
ø23	13.5	36.5	59.5	82.5	105.5		
ø23.5	14.5	38	61.5	-	-		DRV-CH24
ø24	15.5	39.5	63.5	87.5	111.5		
ø24.5	16.5	41	65.5	-	-		DRV-CH25
ø25	17.5	42.5	67.5	92.5	117.5		
ø25.5	18.5	44	69.5	-	-		DRV-CH26
ø26	19.5	45.5	71.5	97.5	123.5		
ø26.5	-	47	-	-	-		DRV-CH27
ø27	16.5	43.5	75.5	97.5	124.5		

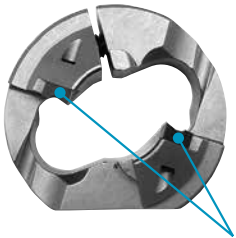
● : Standard item

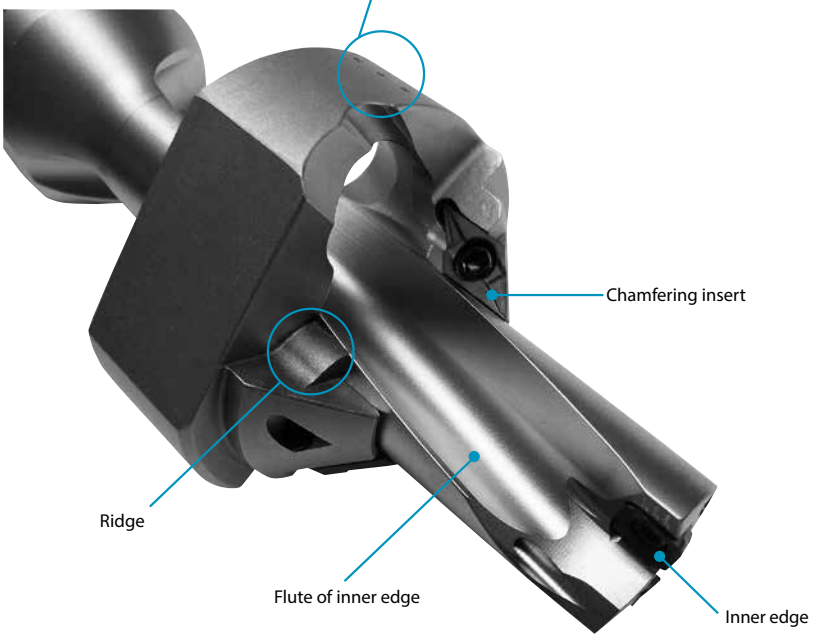
Applicable insert

Insert		Description	Dimension (mm)		MEGACOAT NANO	Applicable chamfering attachment
			W1	S	PR1535	
		CH0503-45	7.05	3.18	●	DRV-CH○○

How to install chamfering attachment







Instructions
1. Install the attachment over the DRV body so that "..." mark on the side of the attachment aligns with the inside flute edge (see image).
2. Adjust the position to avoid interference between the chamfering inserts, chamfering attachment ridges, and drill body flutes. Then fasten the clamp bolt with the recommended torque below.

Recommended tightening torque

Description	Tightening torque (N m)	Clamp bolt	Wrench
DRV-CH17~CH26	10	HH6X18	LW-5
DRV-CH27	14	HH8X20	LW-6

● : Standard item

Recommended cutting conditions DRV 2D-4D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type							
	PVD coated carbide				CVD coated carbide							2D~3D				4D			
	PR1225				CA520D				CA415D			f (mm/rev)							
	GM	GH	XM	SM	GM	GH	XM	SM	GM	GH		GM	GH	XM	SM	GM	GH	XM	SM
Low carbon steel	-	-	★ 120-200	☆ 120-200	-	-	★ 150-280	☆ 150-280	-	-	ø12-ø13.5	-	-	-	0.04-0.06	-	-	-	0.04-0.06
											ø14-ø15.5	-	-	0.04-0.09	0.04-0.07	-	-	0.04-0.08	0.04-0.07
											ø16-ø18.5	-	-	0.04-0.10	0.04-0.08	-	-	0.04-0.08	0.04-0.08
											ø19-ø22	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.10	0.04-0.08
											ø22.5-ø26	-	-	0.04-0.14	0.06-0.10	-	-	0.04-0.12	0.05-0.10
											ø26.5-ø32	-	-	0.06-0.14	0.06-0.10	-	-	0.04-0.12	0.05-0.10
											ø33-ø39	-	-	0.06-0.14	0.06-0.10	-	-	0.06-0.12	0.05-0.10
											ø40-ø60	-	-	0.06-0.16	0.08-0.12	-	-	0.06-0.16	0.05-0.10
Carbon steel	★ 100-180	☆ 100-180	☆ 100-180	☆ 100-180	★ 150-280	☆ 150-280	☆ 150-280	☆ 150-280	-	-	ø12-ø13.5	0.04-0.14	0.04-0.14	-	0.04-0.10	0.04-0.10	0.04-0.10	-	0.04-0.08
											ø14-ø15.5	0.04-0.14	0.04-0.14	0.04-0.10	0.04-0.10	0.04-0.10	0.04-0.10	0.04-0.08	0.04-0.08
											ø16-ø18.5	0.06-0.16	0.06-0.16	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.12	0.04-0.10	0.05-0.10
											ø19-ø26	0.08-0.20	0.08-0.20	0.06-0.14	0.06-0.14	0.07-0.16	0.07-0.16	0.04-0.12	0.05-0.12
											ø26.5-ø32	0.08-0.20	0.08-0.20	0.06-0.14	0.06-0.14	0.07-0.16	0.07-0.16	0.04-0.12	0.05-0.12
											ø33-ø39	0.08-0.20	0.08-0.20	0.06-0.16	0.06-0.14	0.07-0.16	0.07-0.16	0.06-0.14	0.05-0.12
											ø40-ø60	0.08-0.20	0.08-0.20	0.06-0.18	0.06-0.14	0.07-0.16	0.07-0.16	0.06-0.16	0.05-0.12
Alloy steel	★ 100-160	☆ 100-160	☆ 100-160	-	★ 140-220	☆ 140-220	☆ 140-220	-	-	-	ø12-ø13.5	0.04-0.12	0.04-0.12	-	-	0.04-0.10	0.04-0.10	-	-
											ø14-ø15.5	0.04-0.14	0.04-0.14	-	-	0.04-0.10	0.04-0.10	-	-
											ø16-ø18.5	0.06-0.16	0.06-0.16	-	-	0.05-0.12	0.05-0.12	-	-
											ø19-ø26	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø26.5-ø32	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø33-ø39	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
											ø40-ø60	0.08-0.20	0.08-0.20	-	-	0.07-0.16	0.07-0.16	-	-
Mold steel	☆ 80-150	★ 80-150	-	-	☆ 130-210	★ 130-210	-	-	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.04-0.07	0.04-0.07	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.07	0.04-0.07	-	-
											ø16-ø18.5	0.06-0.12	0.06-0.12	-	-	0.05-0.10	0.05-0.10	-	-
											ø19-ø26	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø26.5-ø32	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø33-ø39	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
											ø40-ø60	0.08-0.15	0.08-0.15	-	-	0.06-0.12	0.06-0.12	-	-
Stainless steel (Austenitic related)	-	-	-	★ 70-140	-	-	-	★ 140-200	-	-	ø12-ø13.5	-	-	-	0.04-0.10	-	-	-	0.04-0.08
											ø14-ø15.5	-	-	-	0.04-0.10	-	-	-	0.04-0.08
											ø16-ø18.5	-	-	-	0.06-0.12	-	-	-	0.05-0.11
											ø19-ø26	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø26.5-ø32	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø33-ø39	-	-	-	0.06-0.14	-	-	-	0.06-0.12
											ø40-ø60	-	-	-	0.06-0.14	-	-	-	0.06-0.12
Gray cast iron	☆ 100-150	★ 100-150	-	-	-	-	-	-	☆ 150-220	★ 150-220	ø12-ø13.5	0.08-0.14	0.08-0.14	-	-	0.06-0.10	0.06-0.10	-	-
											ø14-ø15.5	0.08-0.14	0.08-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø16-ø18.5	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø19-ø26	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø26.5-ø32	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø33-ø39	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
											ø40-ø60	0.08-0.20	0.08-0.20	-	-	0.08-0.18	0.08-0.18	-	-
Nodular cast iron	☆ 80-120	★ 80-120	-	-	-	-	-	-	☆ 120-180	★ 120-180	ø12-ø13.5	0.08-0.12	0.08-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø14-ø15.5	0.08-0.12	0.08-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø16-ø18.5	0.08-0.16	0.08-0.16	-	-	0.08-0.14	0.08-0.14	-	-
											ø19-ø26	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø26.5-ø32	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø33-ø39	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-
											ø40-ø60	0.08-0.18	0.08-0.18	-	-	0.08-0.16	0.08-0.16	-	-

· Internal coolant is recommended

★: 1st recommendation ☆: 2nd recommendation

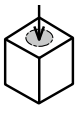
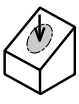
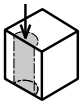
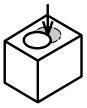
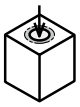
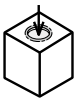
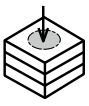
Recommended cutting conditions DRV 5D-6D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type							
	PVD coated carbide				CVD coated carbide							5D				6D			
	PR1225				CA520D				CA415D			f (mm/rev)							
	GM	GH	XM	SM	GM	GH	XM	SM	GM	GH		GM	GH	XM	SM	GM	GH	XM	SM
Low carbon steel	-	-	★ 120-200	☆ 120-200	-	-	★ 150-280	☆ 150-280	-	-	ø12-ø13.5	-	-	-	0.03-0.05	-	-	-	0.03-0.05
											ø14-ø15.5	-	-	0.04-0.07	0.04-0.06	-	-	0.04-0.06	0.04-0.06
											ø16-ø18.5	-	-	0.04-0.08	0.04-0.06	-	-	0.04-0.06	0.04-0.06
											ø19-ø22	-	-	0.04-0.10	0.04-0.07	-	-	0.04-0.07	0.04-0.07
											ø22.5-ø26	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.08	0.04-0.07
											ø26.5-ø32	-	-	0.04-0.12	0.04-0.08	-	-	0.04-0.08	0.04-0.07
											ø33-ø39	-	-	0.05-0.12	0.04-0.10	-	-	0.04-0.09	0.04-0.08
											ø40-ø60	-	-	0.06-0.14	0.04-0.10	-	-	0.06-0.12	0.04-0.08
Carbon steel	★ 100-180	☆ 100-180	☆ 100-180	☆ 100-180	★ 150-280	☆ 150-280	☆ 150-280	☆ 150-280	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	0.04-0.07	0.03-0.05	0.03-0.05	-	0.03-0.05
											ø14-ø15.5	0.04-0.08	0.04-0.08	0.04-0.07	0.04-0.07	0.04-0.06	0.04-0.06	0.04-0.06	0.04-0.06
											ø16-ø18.5	0.05-0.10	0.05-0.10	0.05-0.08	0.05-0.08	0.05-0.08	0.05-0.08	0.05-0.07	0.05-0.07
											ø19-ø26	0.06-0.12	0.06-0.12	0.05-0.10	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø26.5-ø32	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø33-ø39	0.06-0.12	0.06-0.12	0.05-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.05-0.08	0.05-0.08
											ø40-ø60	0.06-0.12	0.06-0.12	0.06-0.12	0.05-0.10	0.06-0.10	0.06-0.10	0.06-0.10	0.05-0.08
Alloy steel	★ 100-160	☆ 100-160	☆ 100-160	-	★ 140-220	☆ 140-220	☆ 140-220	-	-	-	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø16-ø18.5	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø19-ø26	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø26.5-ø32	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø33-ø39	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø40-ø60	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
Mold steel	☆ 80-150	★ 80-150	-	-	☆ 130-210	★ 130-210	-	-	-	-	ø12-ø13.5	0.04-0.06	0.04-0.06	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.06	0.04-0.06	-	-	0.04-0.05	0.04-0.05	-	-
											ø16-ø18.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø19-ø26	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø26.5-ø32	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø33-ø39	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
											ø40-ø60	0.05-0.10	0.05-0.10	-	-	0.05-0.08	0.05-0.08	-	-
Stainless steel (Austenitic related)	-	-	-	★ 70-140	-	-	-	★ 140-200	-	-	ø12-ø13.5	-	-	-	0.04-0.08	-	-	-	0.03-0.05
											ø14-ø15.5	-	-	-	0.04-0.08	-	-	-	0.04-0.06
											ø16-ø18.5	-	-	-	0.04-0.10	-	-	-	0.04-0.09
											ø19-ø26	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø26.5-ø32	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø33-ø39	-	-	-	0.06-0.12	-	-	-	0.06-0.10
											ø40-ø60	-	-	-	0.06-0.12	-	-	-	0.06-0.10
Gray cast iron	☆ 100-150	★ 100-150	-	-	-	-	-	-	☆ 150-220	★ 150-220	ø12-ø13.5	0.04-0.10	0.04-0.10	-	-	0.04-0.08	0.04-0.08	-	-
											ø14-ø15.5	0.04-0.10	0.04-0.10	-	-	0.04-0.08	0.04-0.08	-	-
											ø16-ø18.5	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø19-ø26	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø26.5-ø32	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø33-ø39	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
											ø40-ø60	0.06-0.14	0.06-0.14	-	-	0.06-0.12	0.06-0.12	-	-
Nodular cast iron	☆ 80-120	★ 80-120	-	-	-	-	-	-	☆ 120-180	★ 120-180	ø12-ø13.5	0.04-0.08	0.04-0.08	-	-	0.03-0.05	0.03-0.05	-	-
											ø14-ø15.5	0.04-0.08	0.04-0.08	-	-	0.04-0.06	0.04-0.06	-	-
											ø16-ø18.5	0.06-0.10	0.06-0.10	-	-	0.06-0.08	0.06-0.08	-	-
											ø19-ø26	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø26.5-ø32	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø33-ø39	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-
											ø40-ø60	0.06-0.12	0.06-0.12	-	-	0.06-0.10	0.06-0.10	-	-

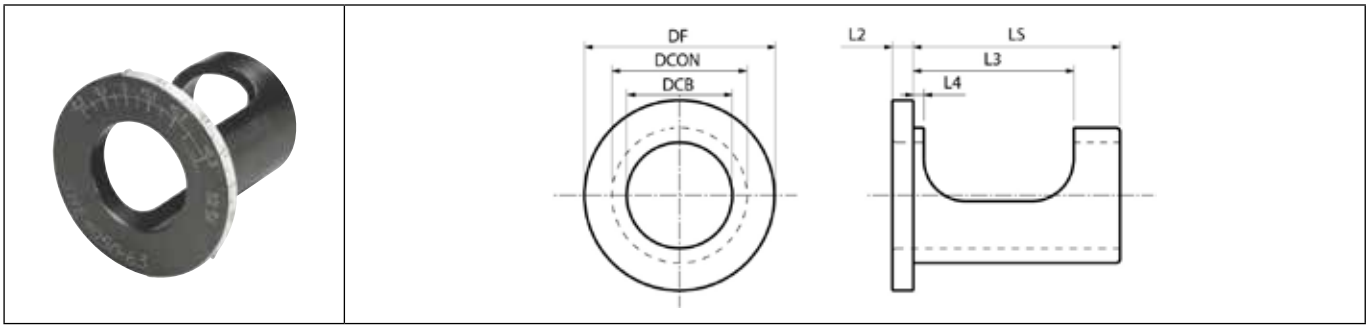
Internal coolant is recommended

★: 1st recommendation ☆: 2nd recommendation

Cutting conditions by application

Applications	Plain surface	Slant surface	Half cylindrical	Hole expansion	Cored hole	Concave surface	Stacked plates
Shape of workpiece							
Vc (m/min)	See above	120 (PVD insert is recommended for outer edge)					Not available
f (mm/rev)	See above	Half of the above recommended conditions is recommended.				Concave surface: Use half of the above recommended conditions . Continuous part: See above.	Not available
Coolant (Internal coolant)	Yes						Not available

SHE



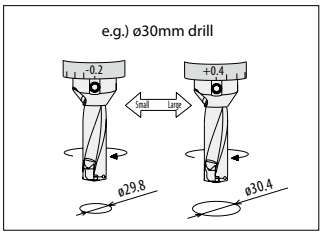
Toolholder dimensions

Description		Availability	Dimension (mm)							* Drill Dia. Adjustable Range	Center Height Adjustable Range
			DCB	DCON	DF	L2	L3	L4	LS		
SHE	2025-43	●	20	25	41	4	36	3	43	+0.4~-0.2	+0.2~-0.15
	2532-48	●	25	32	49	6	38	2.5	48	+0.4~-0.2	+0.2~-0.15
	3240-53	●	32	40	58		43		53	+0.4~-0.2	+0.2~-0.15
	4050-63	●	40	50	74		49	3	63	+0.6~-0.2	+0.3~-0.2

Diameter Adjustment Range adjusts the drill diameter.

● : Standard item

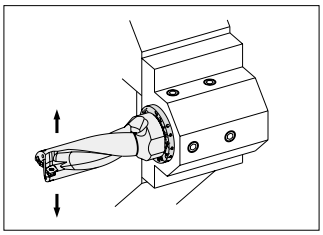
1. Diameter adjustment ~For machining center~



● Diameter adjustment range (mm)

Shank dia.	Adjustment range
ø20	+0.4~-0.2
ø25	
ø32	
ø40	+0.6~-0.2

2. Center height adjustment ~Fewer problems owing to height adjustment for lathes~



● Center height adjustment Range (mm)

Shank dia.	Adjustment range
ø20	+0.2~-0.15
ø25	
ø32	
ø40	+0.3~-0.2

How to use the adjustable sleeve

1. Hole diameter adjustment when drilling

1. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ). (Fig. 1)
2. When making the hole diameter larger, rotate the sleeve in (+) direction and to make it smaller, rotate the sleeve in (-) direction.
3. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
4. Using the bottom screw of the side-lock arbor, firmly tighten on the drill directly through the sleeve's window.
   The upper screw should be tightened slightly so that the sleeve will not be damaged.

Caution:
· Not applicable for collet chuck type arbor.
· Scale on the sleeve is the reference value.
Check the actual hole diameter after adjusting.

DRV

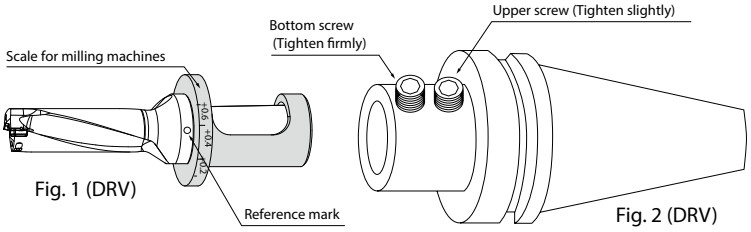


Fig. 1 (DRV)

Fig. 2 (DRV)

DRZ

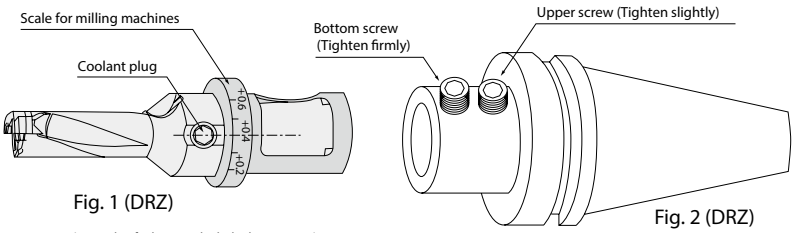


Fig. 1 (DRZ)

(Example of adjusting the hole dia. +0.4mm)

Fig. 2 (DRZ)

2. Center-height adjustment for lathes

Most lathe problem occur due to center height deviation.
The center height is appropriate if a core approximately 0.5mm diameter remains at the center of the end face. (Fig. 3)
Center-height adjustment is necessary for the case as follows:

◆ No core remains or ◆ core diameter is more than 1mm

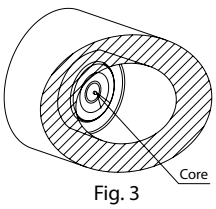


Fig. 3

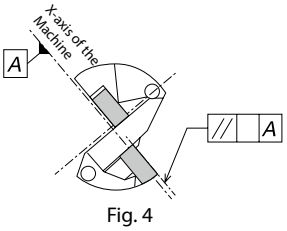


Fig. 4

1. Align the drill with the outer insert face parallel to the x-axis of the tool turret. (Fig. 4)
2. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ).
3. When no core remains, rotate the sleeve to (+) direction to make the core larger, and when the core diameter is 1mm or more, rotate the sleeve to (-) direction to make the core smaller.
4. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
5. After completing the adjustment, firmly tighten on the drill directly through the sleeve's window.

Note: depending on amount of the center height adjustment, the hole diameter may change. It is recommended that the hole diameter is checked after the center height adjustment.

Lathe installation

1. The top face of the outer insert should be parallel to the X-axis to allow for offset cutting. (Drill diameter can be changed by moving X-axis.)
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator. (Fig. 1)
   (It is also possible to use it by setting it in 180° reverse position)
   If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
   (It is also possible to use it by setting at 180° reverse position)

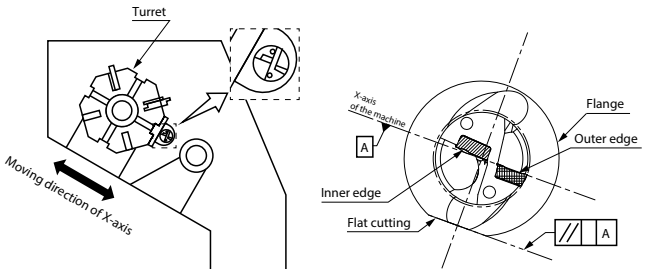


Fig. 1 Installed into the lathe

Drill diameter adjustment

1. Drill diameter adjustment

1. Drill diameter is adjusted by moving X-axis.
   The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
   For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
   (This movement of the axis is called "Offset")
   However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
   e.g.) In case of using ø20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset Limit of the Drill Diameter

For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the toolholder dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
When using ø20 drill, for example, it is possible to make a hole up to ø21.1 since "Max. offset (Radial)" is +0.55mm.

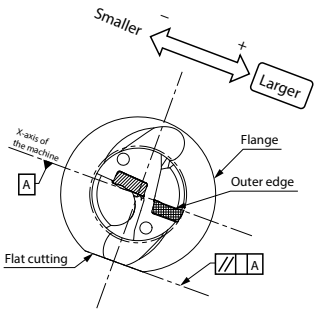


Fig. 2 Outer insert facing up

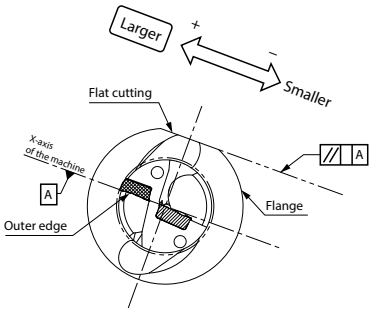


Fig. 3 Outer insert facing down

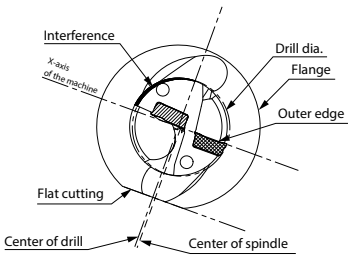


Fig. 4 Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center Height of the Inner Insert

When installing inner insert as shown in Fig. 1, it will be set around 0.05mm below the center of spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the center height carefully.

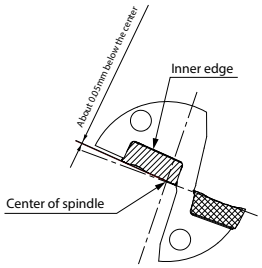


Fig. 5 Front view of the drill

2. How to Check the Center Height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position, a core about 0.5mm in diameter, will remain after machining.
Adjustment of center height is required if a large core diameter of 1mm or more remains.
* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.

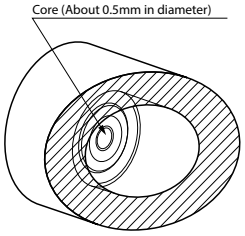


Fig. 6 Center core

3. Center height adjustment

a) When there are no remaining cores and insert breakage near the center of the drill.
This happens when the inner insert is set above the center height. (Fig. 7)

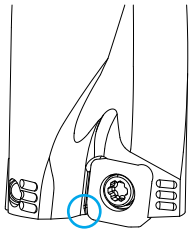


Fig. 7 Insert breakage near the center of the drill

[How to adjust]

1. Install the drill rotated 180°.
   Most problems will be solved by this method. (Fig. 8)

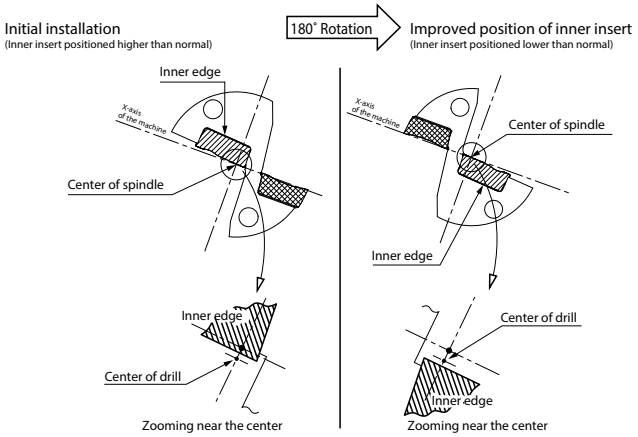


Fig. 8

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90° counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
   Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
   The best solution is to readjust the center position of the turret itself.

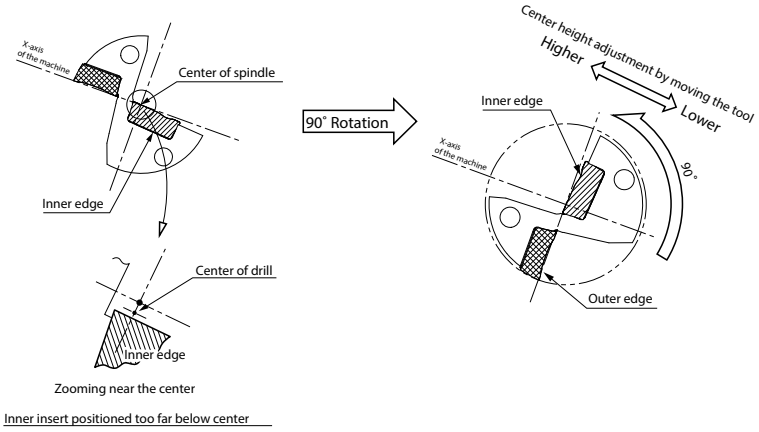


Fig. 9

b) Core with excessively large diameter (More than 1mm)
This occurs when the inner insert is excessively below the center.
This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

Install the drill rotating 90˚ as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.

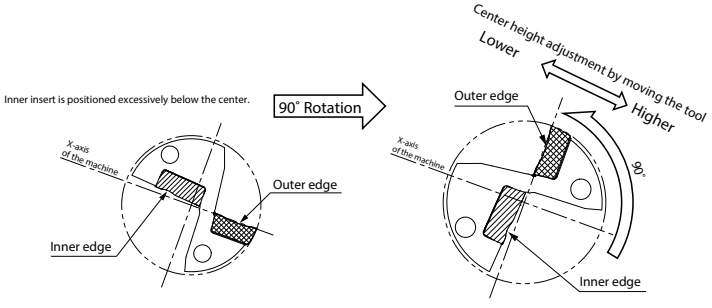
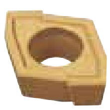
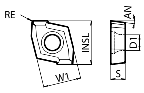
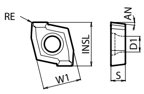
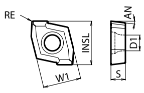


Fig. 10

ZCMT

Insert		Description	S	D1	RE	INSL	W1	AN	PR1210	PR1225	PR1230	KW10	Applicable toolholder
		Carbon steel / Alloy steel								○	●		P
		Mold and die steel									●		P
		Stainless steel								●	○		M
		Cast iron							●				K
		Non-ferrous metals										●	N
Insert		Description	Dimension (mm) S	D1	RE	INSL	W1	Angle (°) AN	Carbide PVD PR1210	PR1225	PR1230	- KW10	Applicable toolholder ➡ K76~K83
	 General purpose	ZCMT 050203	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
		ZCMT 06T204	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06
		ZCMT 080304	3.18	2.9	0.4	9.7	8.2	7	●	●	●	●	S..-DRZ....-08
		ZCMT 10T304	3.97	4.4	0.4	12	10.4	7	●	●	●	●	S..-DRZ....-10
		ZCMT 12T306	3.97	5.6	0.6	14.3	12.8	7	●	●	●	●	S..-DRZ....-12
		ZCMT 150408	4.76	5.6	0.8	17.8	15.8	7	●	●	●	●	S..-DRZ....-15
		ZCMT 200608	6.35	6.5	0.8	22.8	20.3	7			●	●	S..-DRZ....-20
	 Deep drilling / Low cutting force	ZCMT 050203SP	2.38	2.3	0.3	5.9	5	7		●	●	●	S..-DRZ....-05
		ZCMT 06T204SP	2.8	2.5	0.4	7	6	7		●	●	●	S..-DRZ....-06
		ZCMT 080304SP	3.18	2.9	0.4	9.7	8.2	7		●	●	●	S..-DRZ....-08
		ZCMT 10T304SP	3.97	4.4	0.4	12	10.4	7		●	●	●	S..-DRZ....-10
		ZCMT 12T304SP	3.97	5.6	0.4	14.3	12.8	7		●	●	●	S..-DRZ....-12
		ZCMT 150406SP	4.76	5.6	0.6	17.8	15.8	7		●	●	●	S..-DRZ....-15
	 Stainless steel	ZCMT 050203SU	2.38	2.3	0.3	5.9	5	7		●	●		S..-DRZ....-05
		ZCMT 06T204SU	2.8	2.5	0.4	7	6	7		●	●		S..-DRZ....-06

Recommended cutting conditions ➡ K85

Features of SP Chipbreaker
1. Less cutting force with large rake angle
2. Suitable for chip control of sticky materials such as stainless steel or soft steel.
3. Larger size inserts have smaller corner-R(RE) than standard chipbreaker type and can reduce burrs.

● : Standard item

Suitable chipbreaker (ZCMT)

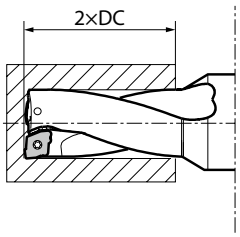
Workpiece material	Insert size	ZCMT05									ZCMT06									ZCMT08					
	Chipbreaker	Standard			SP			SU			Standard			SP			SU			Standard			SP		
	Drilling depth	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D
Low carbon steel		☆	☆	-	★	★	★	-	-	-	☆	☆	-	★	★	★	☆	☆	☆	☆	☆	-	★	★	★
Carbon steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Alloy steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Mold steel		★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	★
Stainless steel		☆	☆	-	★	★	★	☆	☆	-	-	-	-	☆	☆	☆	★	★	★	☆	☆	-	★	★	★
Cast iron		★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆
Aluminum alloys		☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★
Brass		★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆
Titanium alloys		☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★

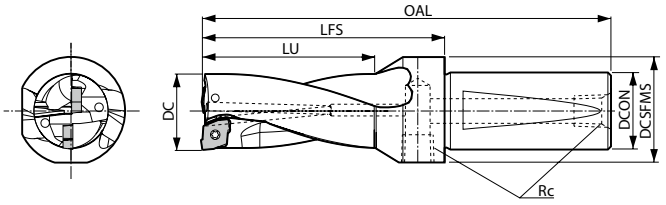
Workpiece material	Insert size	ZCMT10								ZCMT12								ZCMT15								ZCMT20		
	Chipbreaker	Standard				SP				Standard				SP				Standard				SP				Standard		
	Drilling depth	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D
Low carbon steel		☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	★	★	★
Carbon steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Alloy steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Mold steel		★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★
Stainless steel		☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	★	★	★
Cast iron		★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★
Aluminum alloys		☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★
Brass		★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★
Titanium alloys		☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★

Standard chipbreakers (Without symbol) may function better when interrupted drilling.
When drilling aluminum alloys, chips become long and difficult to be discharged at the depth over 2D.
5D type is the same as 4D type.

★: 1st choice ☆: 2nd choice

DRZ (Drilling depth : 2 x DC)





2D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max. (mm)	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ⇒ K74
																	
S20-	DRZ1326-05	●	2	13	20	95	52	26	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135270-05	●		13.5				27									
	DRZ1428-05	●		14		98	55	28									
	DRZ145290-05	●		14.5				29									
	DRZ1530-05	●		15		100	57	30									
	DRZ155310-05	●		15.5				31									
S25-	DRZ1632-06	●	2	16	25	115	61	32	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165330-06	●		16.5				33				+0.9					
	DRZ1734-06	●		17		116	62	34				+0.8					
	DRZ175350-06	●		17.5				35				+0.7					
	DRZ1836-06	●		18		118	64	36				+0.6					
	DRZ185370-06	●		18.5				37									
	DRZ1938-06	●		19		120	66	38				+0.5					
	DRZ195390-06	●		19.5				39									
	DRZ2040-06	●		20		123	69	40									
	DRZ205410-06	●		20.5		125	71	41				+0.3					
	DRZ2142-06	●		21				42				+0.2					
S25-	DRZ215430-08	●	2	21.5	25	128	74	43	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2244-08	●		22				44				+1.6					
	DRZ225450-08	●		22.5				45				+1.4					
	DRZ2346-08	●		23		130	76	46				+1.3					
	DRZ235470-08	●		23.5				47				+1.2					
	DRZ2448-08	●		24		131	77	48	35			+1.1					
	DRZ245490-08	●		24.5				49				+0.9					
	DRZ2550-08	●		25		133	79	50				+0.8					
	DRZ255510-08	●		25.5				51				+0.7					
	DRZ2652-08	●		26		135	81	52				+0.6					
	DRZ265530-08	●		26.5				53				+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ⇒ K74
				DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
																	
S32-	DRZ2754-10	●	2	27	32	149	90	54	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ275550-10	●		27.5				55				+2.3					
	DRZ2856-10	●		28		151	92	56				+2.2					
	DRZ285570-10	●		28.5				57				+2.1					
	DRZ2958-10	●		29		153	94	58				+2					
	DRZ295590-10	●		29.5				59				+1.8					
	DRZ3060-10	●		30		154	95	60	45			+1.7					
	DRZ305610-10	●		30.5				61				+1.5					
	DRZ3162-10	●		31		155	96	62				+1.5					
	DRZ315630-10	●		31.5				63				+1.3					
	DRZ3264-10	●		32		158	99	64				+1.2					
	DRZ325650-10	●		32.5				65				+1					
S40-	DRZ3366-12	●	2	33	40	173	104	66	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ3468-12	●		34		176	107	68				+2.7					
	DRZ3570-12	●		35		177	108	70				+2.4					
	DRZ3672-12	●		36		180	111	72				+2.2					
	DRZ3774-12	●		37		181	112	74				+1.9					
	DRZ3876-12	●		38		183	114	76				+1.7					
	DRZ3978-12	●		39		185	116	78				+1.4					
	DRZ4080-12	●		40				80				+1.2					
S40-	DRZ4182-15	●	2	41	40	186	117	82	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ4284-15	●		42		188	119	84				+3.7					
	DRZ4386-15	●		43		190	121	86				+3.5					
	DRZ4488-15	●		44		192	123	88				+3.2					
	DRZ4590-15	●		45				90				+3					
	DRZ4692-15	●		46		198	129	92	60			+2.7					
	DRZ4794-15	●		47		201	132	94				+2.5					
	DRZ4896-15	●		48		203	134	96				+2.2					
	DRZ4998-15	●		49		204	135	98				+2					
	DRZ50100-15	●		50				100				+1.7					
	DRZ51102-15	●		51		205	136	102				+1.2					
	DRZ52104-15	●		52				104				+1					
	DRZ53106-15	●		53		208	139	106				+0.7					
S40-	DRZ54108-20	●	2	54	40	214	145	108	65	Rc1/4	Yes	+5	GP-2	SB-60120TR	DT-25	-	ZCMT200608
	DRZ55110-20	●		55		215	146	110				+4.7					
	DRZ56112-20	●		56		217	148	112				+4.4					
	DRZ57114-20	●		57		219	150	114				+4.1					
	DRZ58116-20	●		58		221	152	116				+3.8					
	DRZ59118-20	●		59		223	154	118				+3.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

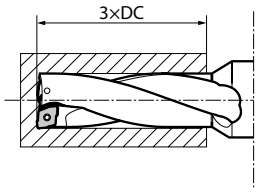
Hole Dia. Tolerance (2D type)

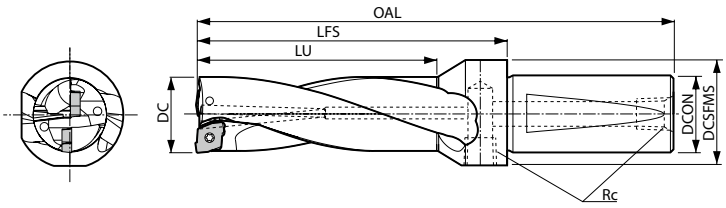
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRZ (Drilling depth : 3 x DC)





3D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max. (mm)	Spare parts: Plug	Screw	Wrench	Wrench	Applicable inserts ⇒ K74
S20-	DRZ1339-05	●	2	13	20	108	65	39	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135405-05	●		13.5				40.5									
	DRZ1442-05	●		14		112	69	42									
	DRZ145435-05	●		14.5				43.5									
	DRZ1545-05	●		15		115	72	45									
	DRZ155465-05	●		15.5				46.5									
S25-	DRZ1648-06	●	2	16	25	131	77	48	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165495-06	●		16.5				49.5				+0.9					
	DRZ1751-06	●		17		133	79	51				+0.8					
	DRZ175525-06	●		17.5				52.5				+0.7					
	DRZ1854-06	●		18		136	82	54				+0.6					
	DRZ185555-06	●		18.5				55.5									
	DRZ1957-06	●		19		139	85	57				+0.5					
	DRZ195585-06	●		19.5				58.5									
	DRZ2060-06	●		20		143	89	60				+0.5					
	DRZ205615-06	●		20.5		146	92	61.5				+0.3					
	DRZ2163-06	●		21		146	92	63				+0.2					
S25-	DRZ215645-08	●	2	21.5	25	147	93	64.5	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2266-08	●		22				66				+1.6					
	DRZ225675-08	●		22.5				67.5				+1.4					
	DRZ2369-08	●		23		150	96	69				+1.3					
	DRZ235705-08	●		23.5				70.5				+1.2					
	DRZ2472-08	●		24		152	98	72	35			+1.1					
	DRZ245735-08	●		24.5				73.5				+0.9					
	DRZ2575-08	●		25		155	101	75				+0.8					
	DRZ255765-08	●		25.5				76.5				+0.7					
	DRZ2678-08	●		26		158	104	78				+0.6					
	DRZ265795-08	●		26.5				79.5				+0.5					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

Hole Dia. Tolerance (3D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

Toolholder dimensions

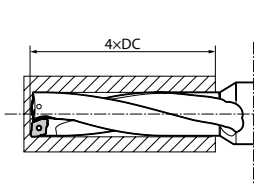
Description		Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ⇒ K74
				DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
																	
S32-	DRZ2781-10	●	2	27	32	173	114	81	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ275825-10	●		27.5				82.5				+2.3					
	DRZ2884-10	●		28		176	117	84				+2.2					
	DRZ285855-10	●		28.5				85.5				+2.1					
	DRZ2987-10	●		29		179	120	87				+2					
	DRZ295885-10	●		29.5				88.5				+1.8					
	DRZ3090-10	●		30		181	122	90	45			+1.7					
	DRZ305915-10	●		30.5				91.5				+1.5					
	DRZ3193-10	●		31		183	124	93				+1.5					
	DRZ315945-10	●		31.5				94.5				+1.3					
	DRZ3296-10	●		32		187	128	96				+1.2					
	DRZ325975-10	●		32.5				97.5				+1					
S32-	DRZ3399-12	●	2	33	32	193	134	99	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34102-12	●		34		197	138	102				+2.7					
	DRZ35105-12	●		35		199	140	105				+2.4					
	DRZ36108-12	●		36		203	144	108				+2.2					
	DRZ37111-12	●		37		205	146	111				+1.9					
	DRZ38114-12	●		38		208	149	114				+1.7					
	DRZ39117-12	●		39		211	152	117				+1.4					
	DRZ40120-12	●		40		212	153	120				+1.2					
S40-	DRZ3399-12	●		33	40	203	134	99				+2.9					
	DRZ34102-12	●		34		207	138	102				+2.7					
	DRZ35105-12	●		35		209	140	105				+2.4					
	DRZ36108-12	●		36		213	144	108				+2.2					
	DRZ37111-12	●		37		215	146	111				+1.9					
	DRZ38114-12	●		38		218	149	114				+1.7					
	DRZ39117-12	●		39		221	152	117				+1.4					
	DRZ40120-12	●		40		222	153	120				+1.2					
S40-	DRZ41123-15	●	2	41	40	224	155	123	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ42126-15	●		42		227	158	126				+3.7					
	DRZ43129-15	●		43		230	161	129				+3.5					
	DRZ44132-15	●		44		233	164	132				+3.2					
	DRZ45135-15	●		45		234	165	135				+3					
	DRZ46138-15	●		46		241	172	138	60			+2.7					
	DRZ47141-15	●		47		245	176	141				+2.5					
	DRZ48144-15	●		48		248	179	144				+2.2					
	DRZ49147-15	●		49		250	181	147				+2					
	DRZ50150-15	●		50		251	182	150				+1.7					
	DRZ51153-15	●		51		254	185	153				+1.2					
	DRZ52156-15	●		52		257	188	156				+1					
	DRZ53159-15	●		53		260	191	159				+0.7					
S40-	DRZ54162-20	●	2	54	40	266	197	162	65	Rc1/4	Yes	+5	GP-2	SB-60120TR	DT-25	-	ZCMT200608
	DRZ55165-20	●		55		269	200	165				+4.7					
	DRZ56168-20	●		56		272	203	168				+4.4					
	DRZ57171-20	●		57		275	206	171				+4.1					
	DRZ58174-20	●		58		278	209	174				+3.8					
	DRZ59177-20	●		59		281	212	177				+3.5					

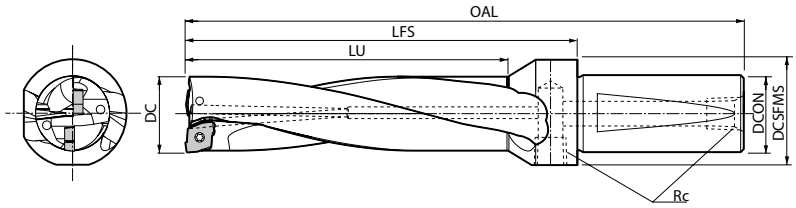
When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

● : Standard item

DRZ (Drilling depth : 4 x DC)





4D

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ⇨ K74
				DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
																	
S20-	DRZ1352-05	●	2	13	20	121	78	52	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
	DRZ135540-05	●		13.5				54									
	DRZ1456-05	●		14		126	83	56									
	DRZ145580-05	●		14.5				58									
	DRZ1560-05	●		15		130	87	60									
	DRZ155620-05	●		15.5				62									
S25-	DRZ1664-06	●	2	16	25	147	93	64	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
	DRZ165660-06	●		16.5				66				+0.9					
	DRZ1768-06	●		17		149	95	68				+0.8					
	DRZ175700-06	●		17.5				70				+0.7					
	DRZ1872-06	●		18		153	99	72				+0.6					
	DRZ185740-06	●		18.5				74									
	DRZ1976-06	●		19		157	103	76				+0.5					
	DRZ195780-06	●		19.5				78									
	DRZ2080-06	●		20		156	102	80				+0.5					
	DRZ205820-06	●		20.5		161	107	82				+0.3					
	DRZ2184-06	●		21		161	107	84				+0.2					
S25-	DRZ215860-08	●	2	21.5	25	169	115	86	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
	DRZ2288-08	●		22				88				+1.6					
	DRZ225900-08	●		22.5				90				+1.4					
	DRZ2392-08	●		23		173	119	92				+1.3					
	DRZ235940-08	●		23.5				94				+1.2					
	DRZ2496-08	●		24		176	122	96	35			+1.1					
	DRZ245980-08	●		24.5				98				+0.9					
	DRZ25100-08	●		25		180	126	100				+0.8					
	DRZ2551020-08	●		25.5				102				+0.7					
	DRZ26104-08	●		26		184	130	104				+0.6					
	DRZ2651060-08	●		26.5				106				+0.5					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇨ **K85**
Trouble shooting ⇨ **K65**

● : Standard item

Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts ➡ K74
				DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
																	
S32-	DRZ27108-10	●	2	27	32	200	141	108	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	DRZ2751100-10	●		27.5				110				+2.3					
	DRZ28112-10	●		28		204	145	112				+2.2					
	DRZ2851140-10	●		28.5				114				+2.1					
	DRZ29116-10	●		29		208	149	116				+2					
	DRZ2951180-10	●		29.5				118				+1.8					
	DRZ30120-10	●		30		211	152	120	45			+1.7					
	DRZ3051220-10	●		30.5				122				+1.5					
	DRZ31124-10	●		31		214	155	124									
	DRZ3151260-10	●		31.5				126				+1.3					
	DRZ32128-10	●		32		219	160	128				+1.2					
	DRZ3251300-10	●		32.5				130				+1					
S32-	DRZ33132-12	●	2	33	32	226	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34136-12	●		34		231	172	136				+2.7					
	DRZ35140-12	●		35		234	175	140				+2.4					
	DRZ36144-12	●		36		239	180	144				+2.2					
	DRZ37148-12	●		37		242	183	148				+1.9					
	DRZ38152-12	●		38		246	187	152				+1.7					
	DRZ39156-12	●		39		250	191	156				+1.4					
	DRZ40160-12	●		40		252	193	160				+1.2					
S40-	DRZ33132-12	●	2	33	40	236	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	DRZ34136-12	●		34		241	172	136				+2.7					
	DRZ35140-12	●		35		244	175	140				+2.4					
	DRZ36144-12	●		36		249	180	144				+2.2					
	DRZ37148-12	●		37		252	183	148				+1.9					
	DRZ38152-12	●		38		256	187	152				+1.7					
	DRZ39156-12	●		39		260	191	156				+1.4					
	DRZ40160-12	●		40		262	193	160				+1.2					
S40-	DRZ41164-15	●	2	41	40	265	196	164	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
	DRZ42168-15	●		42		269	200	168				+3.7					
	DRZ43172-15	●		43		273	204	172				+3.5					
	DRZ44176-15	●		44		277	208	176				+3.2					
	DRZ45180-15	●		45		279	210	180				+3					
	DRZ46184-15	●		46		287	218	184	60			+2.7					
	DRZ47188-15	●		47		292	223	188				+2.5					
	DRZ48192-15	●		48		296	227	192				+2.2					
	DRZ49196-15	●		49		300	231	196				+2					
	DRZ50200-15	●		50		301	232	200				+1.7					

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ➡ **K85**
Trouble shooting ➡ **K65**

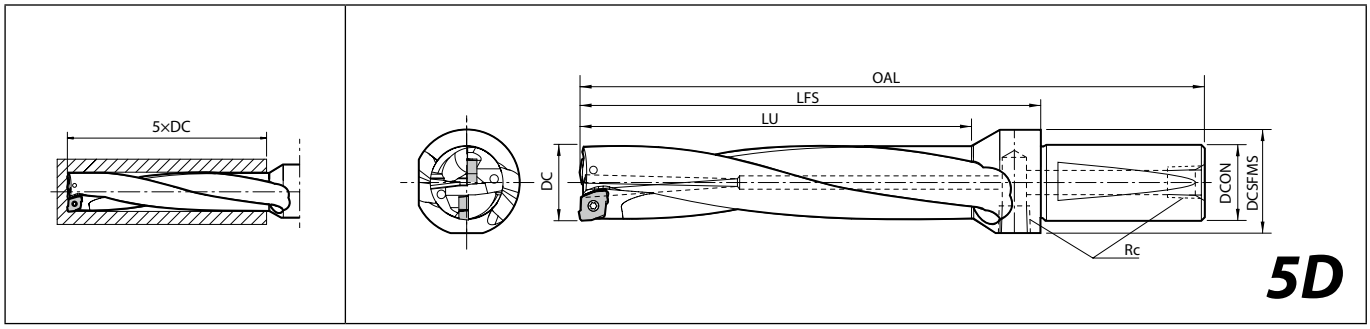
Hole Dia. Tolerance (4D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.25 -0.10
ø27~ø40	+0.30 -0.15
ø41~ø50	+0.35 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRZ (Drilling depth : 5 x DC)



Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm) DC	DCON	OAL	LFS	LU	DCSFMS	Rc	Coolant hole	Radial offset max. (mm)	Spare parts: Plug	Screw	Wrench	Applicable inserts ⇒ K74
S32-	DRZ27135-10	●	2	27	32	277	168	135	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	ZCMT10T304 ZCMT10T304SP
	DRZ28140-10	●		28		232	173	140				+2.2				
	DRZ29145-10	●		29		237	178	145				+2				
	DRZ30150-10	●		30		241	182	150	45			+1.7				
	DRZ31155-10	●		31		245	186	155				+1.5				
	DRZ32160-10	●		32		251	192	160				+1.2				
S40-	DRZ33165-12	●	2	33	40	269	200	165	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	DRZ34170-12	●		34		275	206	170				+2.7				
	DRZ35175-12	●		35		279	210	175				+2.4				
	DRZ36180-12	●		36		285	216	180				+2.2				
	DRZ37185-12	●		37		289	220	185				+1.9				
	DRZ38190-12	●		38		294	225	190				+1.7				
	DRZ39195-12	●		39		299	230	195				+1.4				
	DRZ40200-12	●		40		302	233	200				+1.2				
S40-	DRZ41205-15	●	2	41	40	306	237	205	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	ZCMT150406SP ZCMT150408
	DRZ42210-15	●		42		311	242	210				+3.7				
	DRZ43215-15	●		43		316	247	215				+3.5				
	DRZ44220-15	●		44		321	252	220				+3.2				
	DRZ45225-15	●		45		324	255	225				+3				
	DRZ46230-15	●		46		333	264	230	60			+2.7				
	DRZ47235-15	●		47		339	270	235				+2.5				
	DRZ48240-15	●		48		344	275	240				+2.2				
	DRZ49245-15	●		49		349	280	245				+2				
	DRZ50250-15	●		50		351	282	250				+1.7				

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page **K70** for Adjustable Sleeve (SHE).

Recommended cutting conditions ⇒ **K85**
Trouble shooting ⇒ **K65**

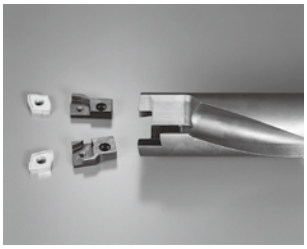
Hole Dia. Tolerance (5D type)

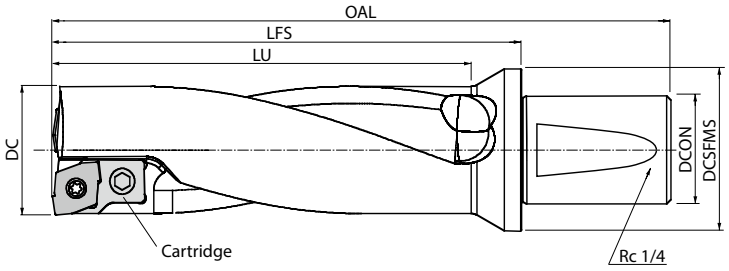
DC	Hole Dia. Tolerance (mm)
ø27~ø40	+0.35 -0.15
ø41~ø50	+0.40 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item

DRZ-CR (for Large Dia. (ø60 or over))





Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max. (mm)	Spare parts				Applicable inserts K74
				DC	DCON	OAL	LFS	LU	DCSFMS			Cartridge (inner edge)	Cartridge (outer edge)	Screw	Wrench	
S50-	DRZ60180-20CR	MTO	2	60	50	286	217	195	75	Yes	+3	DR20CR-IN (1pc)	DR20CR-OUT (1pc)	SB-60120TR	DT-25	ZCMT200608
	DRZ65195-20CR	MTO		65		296	227	206			+1.5					
	DRZ70210-20CR	MTO		70		308	239	220			+0.2					
S50-	DRZ75225-12CR	MTO	4	75	50	330	261	225	80	Yes	Offset N.A.	DR12CR-IN (2pcs)	DR12CR-OUT (2pcs)	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	DRZ80240-12CR	MTO		80		340	271	240								

Clamp screws for cartridges are included in toolholders : HH6X12 for DR20CR and HH4X12 for DR12CR.

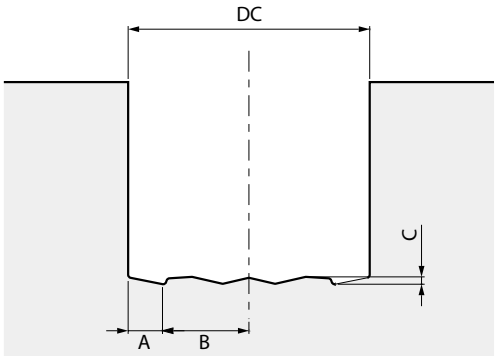
Recommended cutting conditions K85

MTO : Made to order

DRZ hole bottom shape (Common for 2D, 3D, 4D, 5D) (mm)

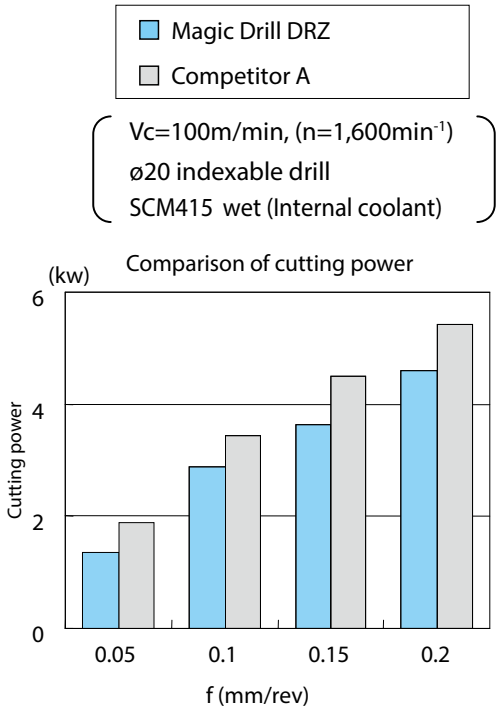
DC	A	B	C	DC	A	B	C	DC	A	B	C
13.0	2.1	4.4	0.4	21.5	3.1	7.7	0.6	33.0	5.7	10.8	0.8
13.5		4.7		22.0		7.9		34.0		11.3	
14.0		4.9		22.5		8.2		35.0		11.8	
14.5		5.2		23.0		8.4		36.0		12.3	
15.0		5.4	0.5	23.5		8.7		37.0		12.8	
15.5		5.7		24.0		8.9	0.7	38.0		13.3	0.9
16.0	2.7	5.3	0.6	24.5		9.2		39.0		13.8	
16.5		5.6		25.0		9.4		40.0		14.3	
17.0		5.8		25.5		9.7		41.0	6.5	14.0	1.0
17.5		6.1		26.0		9.9		42.0		14.5	
18.0		6.3		26.5		10.2		43.0		15.0	
18.5		6.6	0.7	27.0	4.0	9.5	0.7	44.0		15.5	
19.0		6.8		27.5		9.8		45.0		16.0	
19.5		7.1		28.0		10.0		46.0		16.5	
20.0		7.3		28.5		10.3		47.0		17.0	
20.5		7.6		29.0		10.5		48.0		17.5	1.1
21.0		7.8	0.8	29.5		10.8		49.0		18.0	
				30.0		11.0		50.0		18.5	
				30.5		11.3		51.0		19.0	
				31.0		11.5	0.8	52.0		19.5	
				31.5		11.8		53.0		20.0	
				32.0		12.0		54.0	8.5	18.5	1.2
				32.5		12.3		55.0		19.0	
								56.0		19.5	
								57.0		20.0	
								58.0		20.5	
								59.0		21.0	

* Above is numeric guideline.
(Varies within ±0.1mm depending on workpiece materials and cutting conditions)



Cutting power

ø20 cutting power comparison



Case studies

MagicDrill dia.		ø16	ø27		ø50	
Machine		Competitor A	Competitor B		Competitor C	Competitor D
Machine power		AC 5.5/7.5 kW	AC 5.5/7.5 kW		AC 5.5/7.5 kW	AC 7.5/11 kW
Cutting conditions	Vc (mm/min)	150	130	150	120	110	157
	f (mm/rev)	0.06	0.13		0.1	0.08	0.12
Workpiece material		SS400	SCM435		SCM415	SS400	
Required power (Load meter values)		60%	80%	95%	100%	60%	100%
Remarks		-	-		With conventional drill, limited up to ø40	-	

Formula for calculating required power (Approximate value)

Recommended cutting conditions (Coolant)

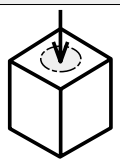
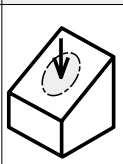
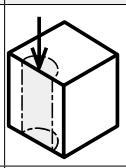
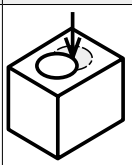
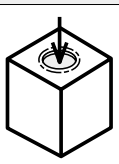
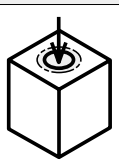
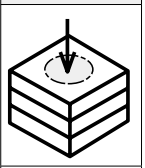
Workpiece material	Recommended insert grades (Vc: m/min)				DC (mm)	Drill type (Drilling depth)			
	MEGACOAT			Carbide		2D	3D	4D	5D
	PR1230	PR1225	PR1210	KW10		f (mm/rev)			
	Standard SP SU	Standard SP SU	Standard	Standard SP					
Low carbon steel	★ 120~220	☆ 120~220	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Carbon steel	★ 100~160	☆ 100~160	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Alloy steel	★ 80~140	☆ 80~140	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Mold steel	★ 70~130	☆ 70~130	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.07	-
					ø16~ø26.5	0.08~0.12	0.06~0.10	0.06~0.08	-
					ø27~ø50	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
					ø50~	0.08~0.15	0.06~0.12	0.06~0.10	-
Stainless steel (Austenitic related)	☆ 60~120	★ 60~120	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.06	-
					ø16~ø26.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø27~ø50	0.06~0.10	0.06~0.12	0.04~0.10	0.04~0.07
					ø50~	0.06~0.12	0.06~0.12	0.04~0.10	-
Gray cast iron	-	-	★ 100~150	☆ 100~120	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Nodular cast iron	-	-	★ 80~120	☆ 80~100	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Non-ferrous metals	-	-	-	★ 200~600	ø13~ø15.5	0.06~0.12	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.18	0.08~0.15	0.06~0.15	-
					ø27~ø50	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
					ø50~	0.08~0.20	0.08~0.18	0.06~0.15	-
Titanium alloys	-	-	-	★ 40~70	ø13~ø15.5	0.05~0.06	0.05~0.06	0.05~0.06	-
					ø16~ø26.5	0.05~0.07	0.05~0.07	0.05~0.07	-
					ø27~ø50	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05
					ø50~	0.06~0.08	0.06~0.08	0.06~0.08	-

· Apply a sufficient amount of coolant.

★: 1st recommendation ☆: 2nd recommendation

Cutting conditions by application

[Workpiece material: S50C]

Applications		Plain surface	Slant surface	Half cylindrical	Hole expansion	Concave surface	Cored hole	Stacked plates
Shape of workpiece								
DRZ	Cutting speed Vc (m/min)	120	120	120	120	120	120	Not available
DRZ	f (mm/rev)	0.1	0.05	0.05	0.05	Concave surface 0.05 Continuous part 0.1	*0.05	Not available
Coolant (Internal)		Yes	Yes	Yes	Yes	Yes	Yes	Not available

* Cutting width (Torus-shaped part) when drilling cored hole. (Same as when using a boring bar).

Drill type	2D ~ 3D	4D ~ 5D
Cutting width (Torus-shaped part)	0.1 x DC or less	Not recommended

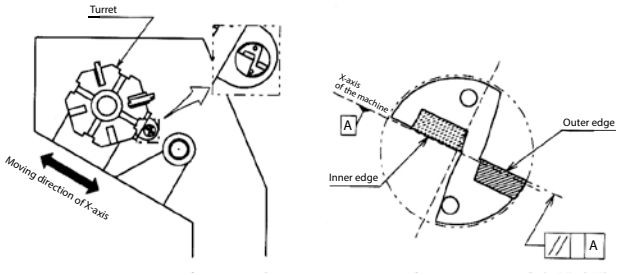
e.g.) In case of drilling using DRZ3090-10 (3 x DC)
1. For milling, pre-drilled hole should be cut ø24 (ø30 - 0.1 x 30 x 2) or bigger
2. For turning, ap should be set ap = 3mm (0.1 x 30) or under

Max. depth for drilling with external coolant

In case of using external coolant system, chip evacuation will be bad. Therefore ap should be measured within 1.5 times (1.5 x DC) of drill diameter (DC).

Lathe installation (DRZ)

1. The top face of the outer insert should be parallel to the X-axis to allow for offset machining.
   Drill diameter can be changed by moving X-axis.
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator.
   (It is also possible to use it by setting it in 180˚ reverse position)
   If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
   (It is also possible to use it by setting at 180˚ reverse position)



(Fig. 1) Installed to the lathe

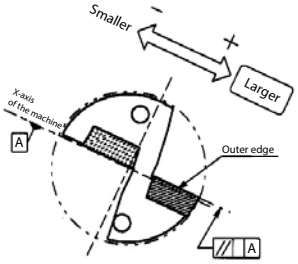
Drill diameter adjustment

1. Drill diameter adjustment

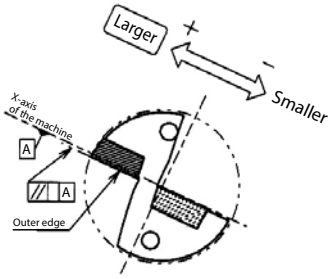
1. Drill diameter is adjusted by moving X-axis.
   The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
   For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
   (This movement of the axis is called "Offset")
   However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
   e.g.) In case of using ø20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset limit of the drill diameter

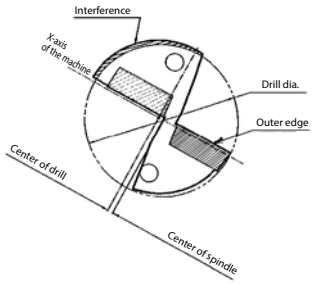
For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
e.g.) In case of using ø20 drill, it is possible to make a hole up to ø21 since "Max. Offset (Radial)" is +0.5mm.



(Fig. 2) Outer insert facing up



(Fig. 3) Outer insert facing down

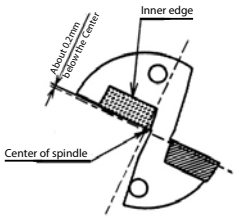


(Fig. 4) Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center height of the inner insert

When installing inner insert as shown in Fig. 1, it will be set around 0.2mm below the Center of Spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of Spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the Center Height carefully.

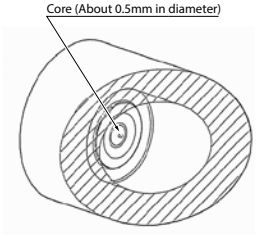


(Fig. 5) Front view of the drill

2. How to check the center height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position,
a core about 0.5mm in diameter, will remain after machining.
In the following cases, it is necessary to adjust the center height.
· No core remains
· Core diameter is more than 1mm

* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.

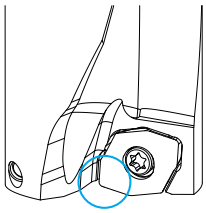


(Fig. 6) Center core

3. Center height adjustment

a) No core remains / Core with Excessively Small Diameter

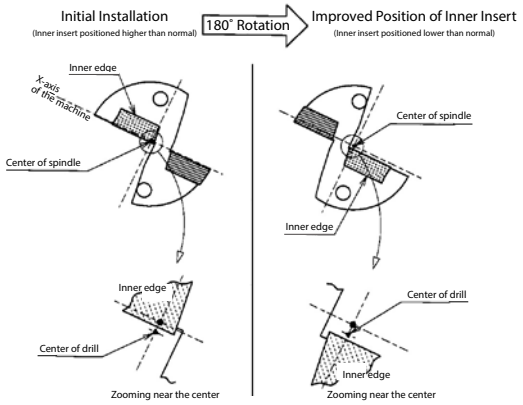
This happens when the inner insert is set above the center height.
In this case, adjustment is necessary since insert breakage will be probable at the center of the drill. (Fig. 7)



(Fig. 7) Insert breakage near the center of the drill

[How to adjust]

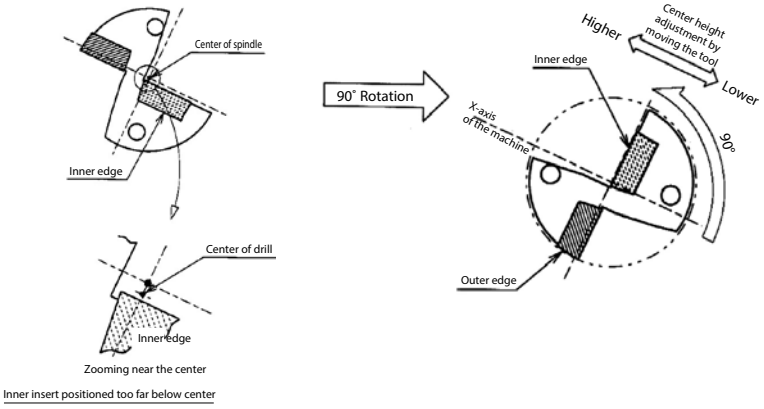
1. Install the drill rotated 180˚.
   Most problems will be solved by this method. (Fig. 8)



(Fig. 8)

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90˚ counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
   Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
   The best solution is to readjust the center position of the turret itself.



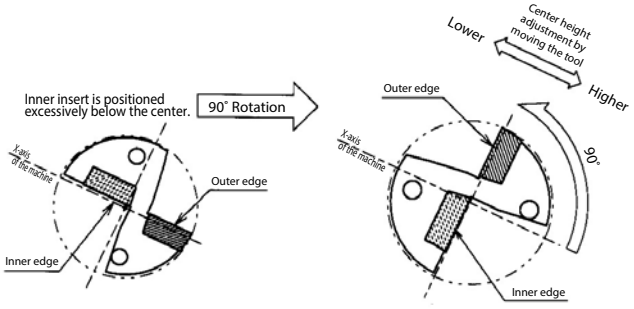
(Fig. 9)

b) Core with excessively large diameter (More than 1mm)

This occurs when the inner insert is excessively below the center.
This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

Install the drill rotating 90˚ as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction.
(However, this makes it impossible to adjust the drill diameter)
Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.



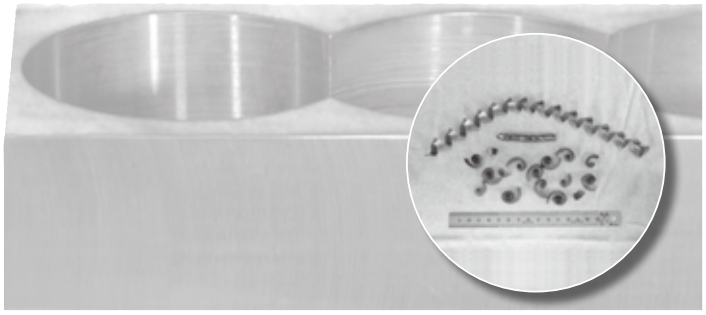
(Fig. 10)

Large diameter indexable drill

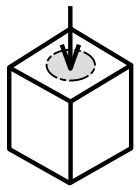
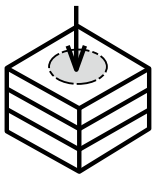
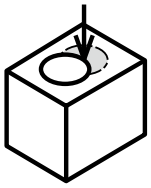
MagicDrill DRW

Sharp cutting and enhanced chip evacuation.
Superior fracture resistance and long tool life with MEGACOAT NANO PR1535 grade.

Applicable diameter: ø60~ø100 mm
Drilling depth: 1D, 2D, 3D
Use single type of insert.

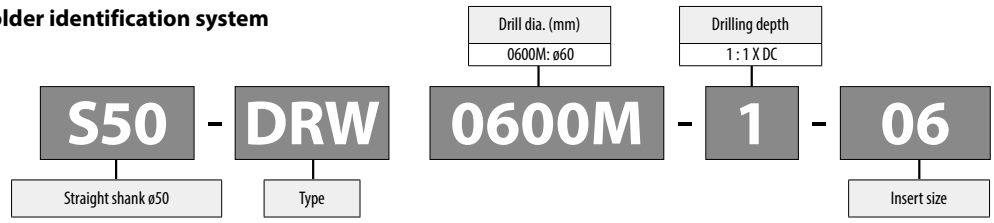


Applicable workpiece

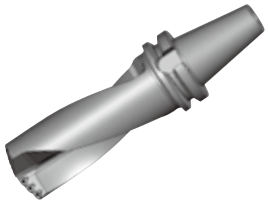
Plain surface	Stacked plates	Hole expansion	Slant surface
			

* Hole expansion: Overlap amount of through hole must be 0.2 x DC or less.
Expansion of blind holes is not possible because chips are built up in the next hole and will cause chip biting.

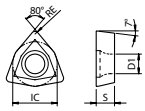
Toolholder identification system



DRW custom-order item (Applicable drill diameter: ø22~ø200 mm)

 BT integral arbor type is also available.	 Max. ø200 is applicable	**Standard item**  Straight shank (1D~3D)

WCMT

						Carbon steel / Alloy steel		●		P
						Mold and die steel		●		P
						Stainless steel	●		○	M
						Cast iron		●		K
						Non-ferrous metals				N
Insert		Description			No. of edges	Dimension (mm)				Carbide		Applicable toolholder ⇨ K90~K93
						IC	S	D1	RE	CVD	PVD	
										CA6535	PR1230 / PR1535	
		WCMT	050308		3	7.94	3.18	3.2	0.8		●	-
		WCMT	06T308		3	9.525	3.97	3.7	0.8	●	● ●	S50-DRW...-06

● : Standard item

DRW

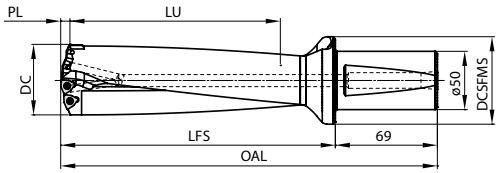


Fig. 1

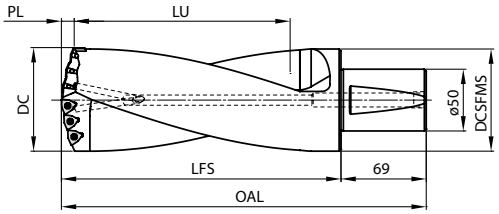


Fig. 2

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-1-06	MTO	4	60	175	106	60	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-1-06	MTO		61	176	107	61		7.7		1			
	DRW0620M-1-06	MTO		62	178	109	62		7.8		1			
	DRW0630M-1-06	MTO		63	179	110	63		7.9		1			
	DRW0640M-1-06	MTO		64	182	113	64		8		1			
	DRW0650M-1-06	MTO		65	184	115	65		8.2		2			
	DRW0660M-1-06	MTO		66	185	116	66	64	8.3		2			
	DRW0670M-1-06	MTO		67	187	118	67	65	8.4		2			
	DRW0680M-1-06	MTO		68	189	120	68	66	8.5		2			
	DRW0690M-1-06	MTO		69	190	121	69	67	8.6		2			
	DRW0700M-1-06	MTO		70	192	123	70	68	8.7		2			
	DRW0710M-1-06	MTO		71	193	124	71	69	8.8		2			
	DRW0720M-1-06	MTO		72	195	126	72	70	9		2			
	DRW0730M-1-06	MTO		73	198	129	73	71	9.1		2			
	DRW0740M-1-06	MTO		74	199	130	74	72	9.2		2			
S50-	DRW0750M-1-06	MTO	6	75	201	132	75	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-1-06	MTO		76	203	134	76	74	9.4		2			
	DRW0770M-1-06	MTO		77	204	135	77	75	9.5		2			
	DRW0780M-1-06	MTO		78	206	137	78	76	9.7		2			
	DRW0790M-1-06	MTO		79	207	138	79	77	9.8		2			
	DRW0800M-1-06	MTO		80			80	78			2			
	DRW0810M-1-06	MTO		81	208	139	81	79			2			
	DRW0820M-1-06	MTO		82			82	80	9.9		2			
	DRW0830M-1-06	MTO		83	210	141	83	81			2			
	DRW0840M-1-06	MTO		84			84	82			2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

MTO : Made to order

Toolholder dimensions (Drilling depth : 1 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ➡ K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
														
S50-	DRW0850M-1-06	MTO	6	85	211	142	85	83	10.5	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0860M-1-06	MTO		86	213	144	86	84						
	DRW0870M-1-06	MTO		87	215	146	87	85						
	DRW0880M-1-06	MTO		88	216	147	88	86						
	DRW0890M-1-06	MTO		89	218	149	89	87						
	DRW0900M-1-06	MTO		90	219	150	90	88	11					
	DRW0910M-1-06	MTO		91	220	151	91	89						
	DRW0920M-1-06	MTO		92	222	153	92	90						
	DRW0930M-1-06	MTO		93	223	154	93	91						
	DRW0940M-1-06	MTO		94	225	156	94	92						
	DRW0950M-1-06	MTO		95	226	157	95	93	11.6					
	DRW0960M-1-06	MTO		96	228	159	96	94						
	DRW0970M-1-06	MTO		97			97	95						
	DRW0980M-1-06	MTO		98	230	161	98	96						
	DRW0990M-1-06	MTO		99	231	162	99	97						
	DRW1000M-1-06	MTO		100	232	163	100	98	12.2					

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

MTO : Made to order

Toolholder dimensions (Drilling depth : 2 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ➡ K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-2-06	●	4	60	235	166	120	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-2-06	MTO		61	237	168	122		7.7		1			
	DRW0620M-2-06	MTO		62	240	171	124		7.8		1			
	DRW0630M-2-06	MTO		63	242	173	126		7.9		1			
	DRW0640M-2-06	MTO		64	246	177	128		8		1			
	DRW0650M-2-06	●		65	249	180	130		8.2		2			
	DRW0660M-2-06	MTO		66	251	182	132	64	8.3		2			
	DRW0670M-2-06	MTO		67	254	185	134	65	8.4		2			
	DRW0680M-2-06	MTO		68	257	188	136	66	8.5		2			
	DRW0690M-2-06	MTO		69	259	190	138	67	8.6		2			
	DRW0700M-2-06	●		70	262	193	140	68	8.7		2			
	DRW0710M-2-06	MTO		71	264	195	142	69	8.8		2			
	DRW0720M-2-06	MTO		72	267	198	144	70	9		2			
	DRW0730M-2-06	MTO		73	271	202	146	71	9.1		2			
	DRW0740M-2-06	●		74	273	204	148	72	9.2		2			
S50-	DRW0750M-2-06	●	6	75	276	207	150	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-2-06	MTO		76	279	210	152	74	9.4		2			
	DRW0770M-2-06	MTO		77	281	212	154	75	9.5		2			
	DRW0780M-2-06	MTO		78	284	215	156	76	9.7		2			
	DRW0790M-2-06	MTO		79	286	217	158	77	9.8		2			
	DRW0800M-2-06	●		80	287	218	160	78	9.9		2			
	DRW0810M-2-06	MTO		81	289	220	162	79			2			
	DRW0820M-2-06	MTO		82	292	223	164	80			2			
	DRW0830M-2-06	MTO		83	293	224	166	81			2			
	DRW0840M-2-06	MTO		84	294	225	168	82			2			
	DRW0850M-2-06	●		85	296	227	170	83	10.5		2			
	DRW0860M-2-06	MTO		86	299	230	172	84			2			
	DRW0870M-2-06	MTO		87	302	233	174	85			2			
	DRW0880M-2-06	MTO		88	304	235	176	86			2			
	DRW0890M-2-06	MTO		89	307	238	178	87			2			
	DRW0900M-2-06	●		90	309	240	180	88	11		2			
	DRW0910M-2-06	MTO		91	311	242	182	89			2			
	DRW0920M-2-06	MTO		92	314	245	184	90			2			
	DRW0930M-2-06	MTO		93	316	247	186	91			2			
	DRW0940M-2-06	●		94	319	250	188	92			2			
	DRW0950M-2-06	●		95	321	252	190	93	11.6		2			
	DRW0960M-2-06	MTO		96	324	255	192	94			2			
	DRW0970M-2-06	MTO		97	325	256	194	95			2			
	DRW0980M-2-06	MTO		98	328	259	196	96			2			
	DRW0990M-2-06	MTO		99	330	261	198	97			2			
	DRW1000M-2-06	●		100	332	263	200	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

● : Standard item MTO : Made to order

Toolholder dimensions (Drilling depth : 3 x DC)

Description		Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ➡ K89
				DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
S50-	DRW0600M-3-06	●	4	60	295	226	180	63	7.6	Yes	1	SB-3592TR	DT-10	WCMT06T308
	DRW0610M-3-06	MTO		61	298	229	183		7.7		1			
	DRW0620M-3-06	MTO		62	302	233	186		7.8		1			
	DRW0630M-3-06	MTO		63	305	236	189		7.9		1			
	DRW0640M-3-06	MTO		64	310	241	192		8		1			
	DRW0650M-3-06	●		65	314	245	195		8.2		2			
	DRW0660M-3-06	MTO		66	317	248	198	64	8.3		2			
	DRW0670M-3-06	MTO		67	321	252	201	65	8.4		2			
	DRW0680M-3-06	MTO		68	325	256	204	66	8.5		2			
	DRW0690M-3-06	MTO		69	328	259	207	67	8.6		2			
	DRW0700M-3-06	●		70	332	263	210	68	8.7		2			
	DRW0710M-3-06	MTO		71	335	266	213	69	8.9		2			
	DRW0720M-3-06	MTO		72	339	270	216	70	9		2			
	DRW0730M-3-06	MTO		73	344	275	219	71	9.1		2			
	DRW0740M-3-06	●		74	347	278	222	72	9.2		2			
S50-	DRW0750M-3-06	●	6	75	351	282	225	73	9.3	Yes	2	SB-3592TR	DT-10	WCMT06T308
	DRW0760M-3-06	MTO		76	355	286	228	74	9.4		2			
	DRW0770M-3-06	MTO		77	358	289	231	75	9.5		2			
	DRW0780M-3-06	MTO		78	362	293	234	76	9.7		2			
	DRW0790M-3-06	MTO		79	365	296	237	77	9.8		2			
	DRW0800M-3-06	●		80	367	298	240	78			2			
	DRW0810M-3-06	MTO		81	370	301	243	79			2			
	DRW0820M-3-06	MTO		82	374	305	246	80	9.9		2			
	DRW0830M-3-06	MTO		83	376	307	249	81			2			
	DRW0840M-3-06	MTO		84	378	309	252	82			2			
	DRW0850M-3-06	●		85	381	312	255	83			2			
	DRW0860M-3-06	MTO		86	385	316	258	84			2			
	DRW0870M-3-06	MTO		87	389	320	261	85	10.5		2			
	DRW0880M-3-06	MTO		88	392	323	264	86			2			
	DRW0890M-3-06	MTO		89	396	327	267	87			2			
	DRW0900M-3-06	●		90	399	330	270	88			2			
	DRW0910M-3-06	MTO		91	402	333	273	89			2			
	DRW0920M-3-06	MTO		92	406	337	276	90	11		2			
	DRW0930M-3-06	MTO		93	409	340	279	91			2			
	DRW0940M-3-06	●		94	413	344	282	92			2			
	DRW0950M-3-06	●		95	416	347	285	93			2			
	DRW0960M-3-06	MTO		96	420	351	288	94			2			
	DRW0970M-3-06	MTO		97	422	353	291	95	11.6		2			
	DRW0980M-3-06	MTO		98	426	357	294	96			2			
	DRW0990M-3-06	MTO		99	429	360	297	97			2			
	DRW1000M-3-06	●		100	432	363	300	98	12.2		2			

Offset Drilling
Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
Do not set it to a negative value to make the diameter smaller.

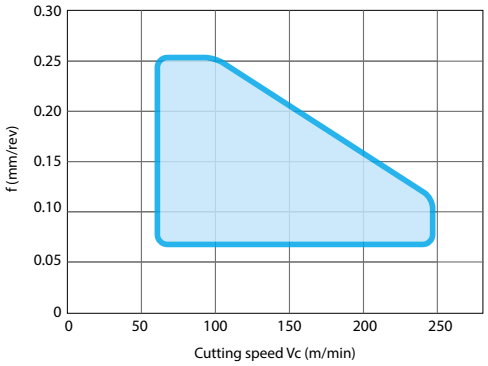
● : Standard item MTO : Made to order

Recommended cutting conditions

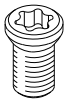
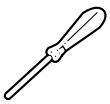
Workpiece material	Vc (m/min)	f (mm/rev)
Carbon steel	80~200	0.07~0.25
Alloy steel	80~160	0.07~0.25
Mold steel	70~150	0.06~0.20
Gray cast iron	100~240	0.07~0.30
Nodular cast iron	80~150	0.07~0.25

· Apply enough amount of coolant (Internal supply).
· Feed rate should be calculated as single insert.

Application map (Carbon steel / Alloy steel)



Spare parts

Description	Clamp screw	Wrench
		
S50-DRW. . .-06	SB-3592TR	DT-10

Hole dia. tolerance

DC	Hole diameter tolerance (mm)
ø60~ø100	0~+0.4

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

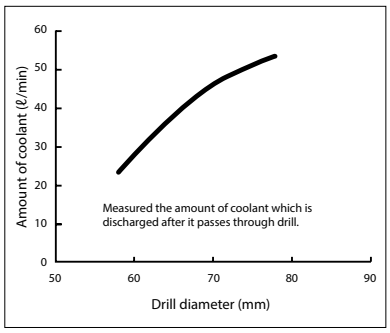
Offset drilling

Offset for DRW should be 0~+0.15 mm in radius
(0~+0.3mm in diameter).
Do not set it to a negative value to make the diameter smaller.

External coolant is not recommended because the amount of chips will be enormous.
Use internal coolant.
See the graph of "Drill diameter and coolant amount".

Higher output is preferable.
What is important is enough torque rather than high spindle rate.
See the examples of required power as below.

Drill diameter and coolant amount



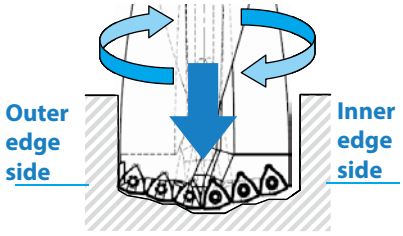
Drill dia.	Workpiece material	Machine	Cutting conditions	Spindle power	*Required power
ø75 (2D)	SCM415	M/C	Vc=130m/min (n=550min^{-1}) f=0.12mm/rev (Vf=66mm/min)	22kW	60%
ø85 (2D)	SCM	M/C	Vc=150m/min (n=560min^{-1}) f=0.1mm/rev (Vf=56mm/min)	30kW	85%
ø94 (2D)	S45C	NC lathe	Vc=120m/min (n=410min^{-1}) f=0.1mm/rev (Vf=41mm/min)	20kW	100%
ø94 (2D)	SUS304	NC lathe	Vc=80m/min (n=270min^{-1}) f=0.2mm/rev (Vf=54mm/min)	20kW	40%

* The required power was read on the load meter.

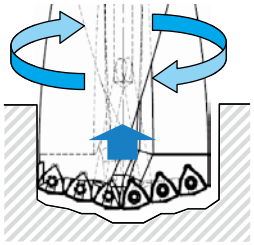
During processing, force of deflection is applied to the center of the drill.
If the drill is just pulled out from the position where processing is finished, tool markings will be made.
To prevent tool markings, perform offset before pulling out the drill.

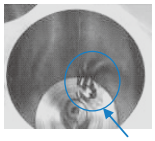
How to prevent tool markings

1. Drilling the hole (The spindle revolves)



2. Turn back approximately 0.5 mm (The spindle revolves)

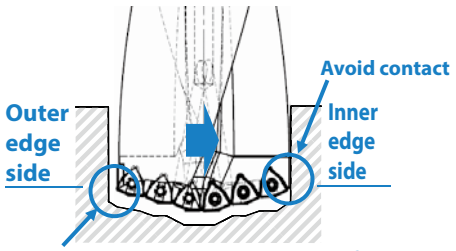




Chips are adhering to the bottom when drilling stops.

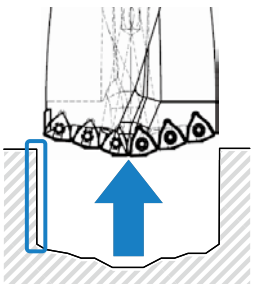
- Without turning back, chips remains adhering to the bottom.
- If offset (3) is performed without turning back, the bottom of drill contacts with the inner surface of hole.
- Turning back is necessary for blind holes but not for through holes.

3. Stop revolution and perform offset (The spindle stops)



Make a clearance to prevent the tool from contacting when pulling out. (Approximately 0.1~0.2 mm)

4. Pull out the drill



Tool markings are not made (or are only slight even if made).

Example of drilling program

```
G90G54G0G43X0Y0Z100.0H10
S477M03
Z2.5M8
G01Z -80.0F48
Z-79.5M19   ← The spindle stops at the specified position
X0.2Y0.2
Z100.0M9
```

* The M code and X and Y moving directions are unique to the equipment.