

NEW

2025.10

B279E

DXAS

TRISTAR DRILL SERIES
EXCHANGEABLE HEAD CARBIDE DRILL



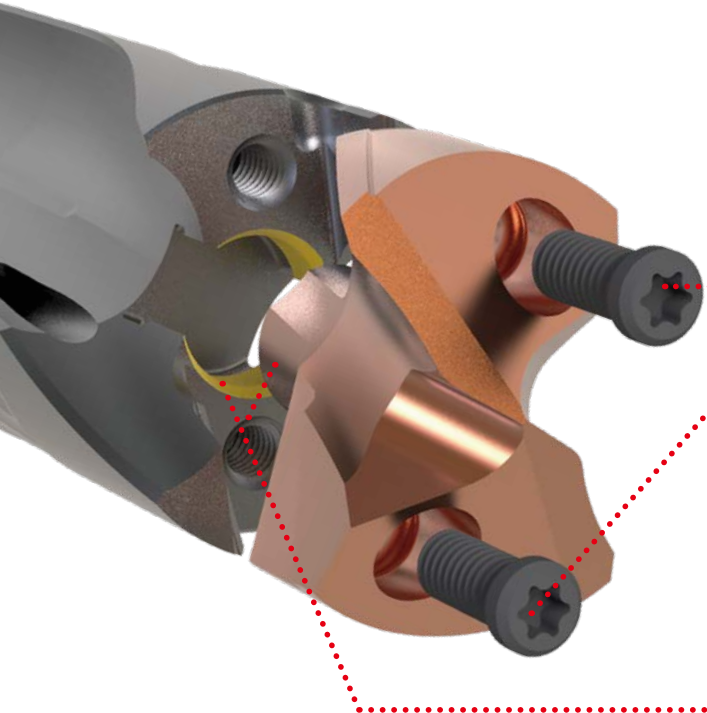
 **MITSUBISHI MATERIALS**

DXAS

EXCHANGEABLE HEAD CARBIDE DRILL

REVOLUTIONISING THE HEAD REPLACEMENT SYSTEM

Dramatically reduces running costs and achieves machining accuracy and efficiency comparable to solid drills.

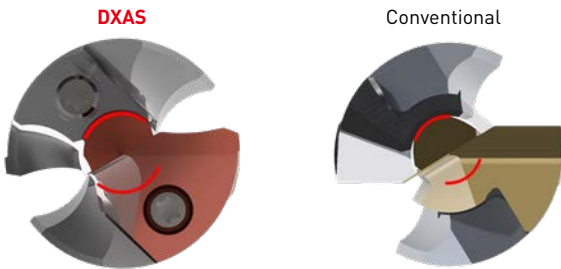


STRONG AND INTUITIVE TWO-SCREW SYSTEM

The two-screw fastening suppresses deformation of the holder and enables high-strength fastening, so it is less likely to loosen and securely fixes the head, even in high-stress machining environments.

PERFECT CENTERING

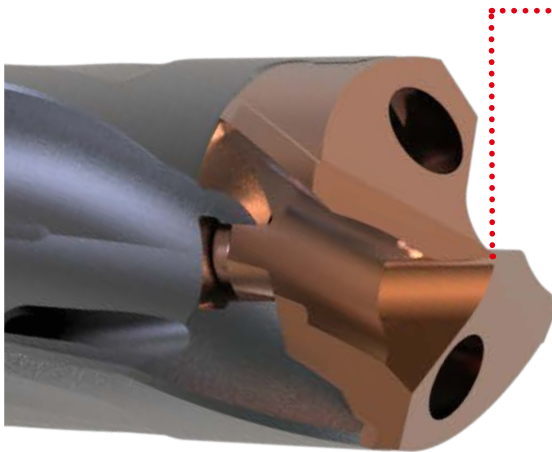
"Perfect Centering" minimises the misalignment of the central axes of the head and holder that occurs when fastened, achieving hole precision comparable to that of a solid drill.



	DXAS	Conventional	Conventional
	Head exchangeable type		Solid drills
Cylindricity (mm)	0.05	0.22	0.06

DXAS

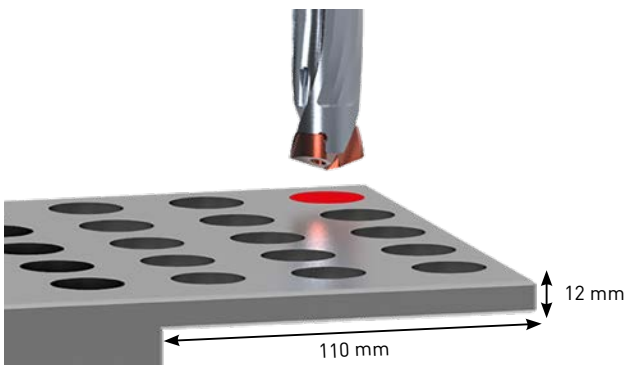
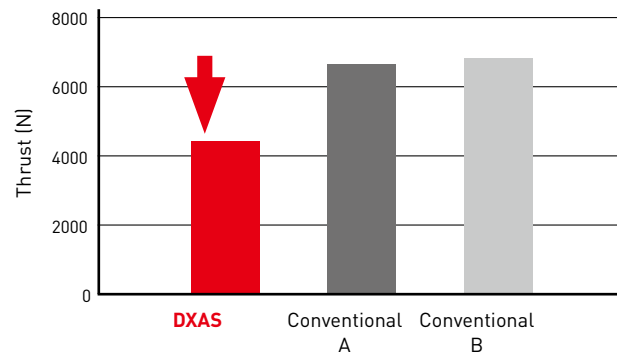
STABLE MACHINING EVEN FOR LOW RIGIDITY WORKPIECES



XR POINT THINNING

By smoothly curling the chips, low resistance and excellent chip separation are achieved. The low resistance design achieves highly efficient machining and reduces power consumption during machining.

REDUCED TO 60 %



DIN CK50: COMPARISON WITH ONE-SIDED HOLDING WHEN DRILLING THIN PLATE

The high-strength fastening mechanism and low-resistance blade geometry have dramatically improved the processing stability of low-rigidity workpieces. High-precision drilling can be achieved even in thin plates, improving quality.

Material	Carbon steel (DIN CK50)
Tool	Ø 30.0 mm, L/D = 5l
Vc (m/min)	70
fr (mm/rev)	0.35
Hole depth	12 mm (Through hole)
Cutting mode	Wet cutting Internal coolant Water-soluble coolant, 1MPa

BURR CONDITION ON THE EXIT SIDE



DXAS



Conventional

DXAS

Conventional

Hole oversize (mm)	0.076	0.125
Machine Load value (%)	88	124

DXAS

STABLE MACHINING EVEN FOR DEEP HOLES

NEW COOLANT SYSTEM

The new design ejects coolant from the flute directly onto the cutting edge, achieving excellent cooling.



DXAS



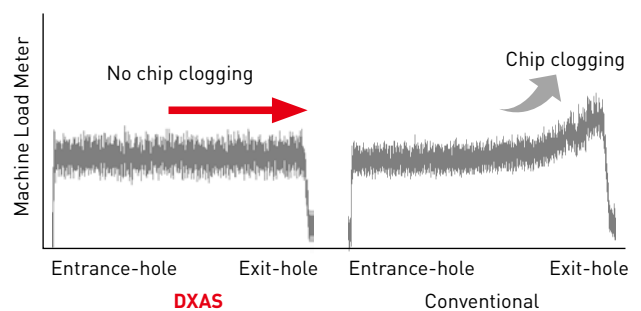
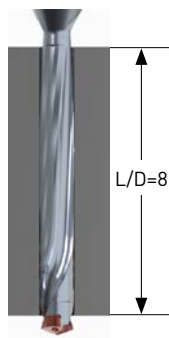
Conventional

FLUTE DESIGN WITH EXCELLENT CHIP EVACUATION

The strong point geometry at the tip directs chips into the wide end section of the flute, and the variable flute design achieves high chip removal performance.

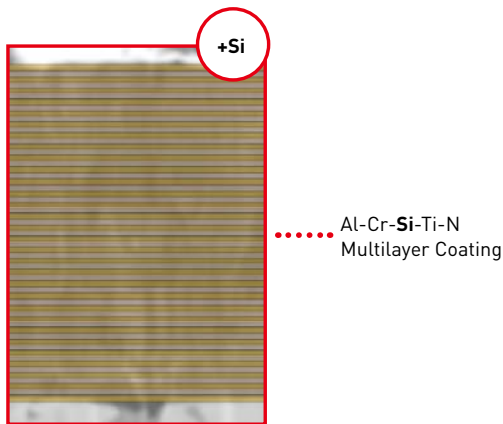
DIN CK50: COMPARISON OF CHIP REMOVAL WHEN DRILLING LARGE DIAMETER DEEP HOLES

Material	Carbon steel (DIN CK50)
Tool	Ø 30.0 mm, L/D = 8
Vc (m/min)	70
fr (mm/rev)	0.25
Hole depth	240 mm (Through hole)
Cutting mode	Wet cutting Internal coolant Water-soluble coolant, 1MPa



DXAS

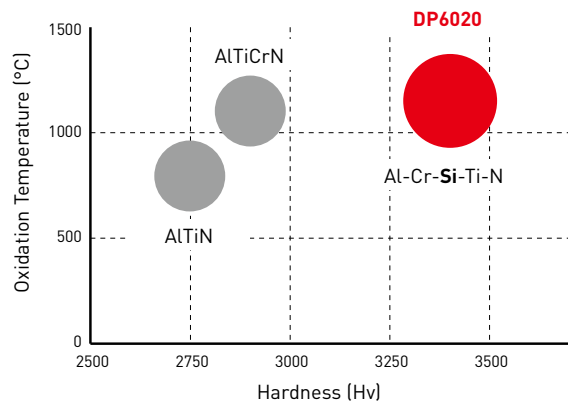
P CLASS DRILLING HEAD



*By Image

DP6020 WITH EXCELLENT HEAT RESISTANCE AND HARDNESS

By adding Si, the coating hardness and the temperature at which oxidation started to occur were significantly raised. This multi-layer structure also improves wear and crack resistance during cutting and provided excellent wear resistance even during high-speed, high feed machining.



HIGH STRENGTH NEGATIVE CUTTING EDGE

The negative rake blade improves wear resistance. It also breaks up chips when penetrating the workpiece, preventing them from wrapping around the holder.

CUTTING EDGE WEAR PHOTO



DXAS

Can continue after 115 m



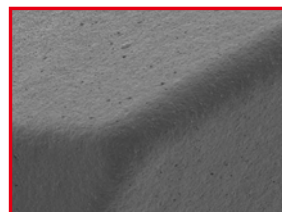
Conventional

Breakage at 45 m

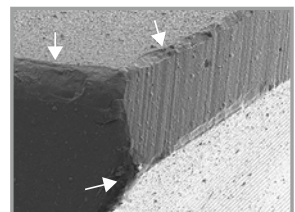
HIGH-QUALITY CUTTING EDGE

The cutting edge is less susceptible to stress concentration and has excellent adhesion to the coating, providing both wear resistance and prevention of sudden breakage.

ENLARGED PHOTO OF CUTTING EDGE



DXAS



Conventional

TRISTAR DRILL SERIES

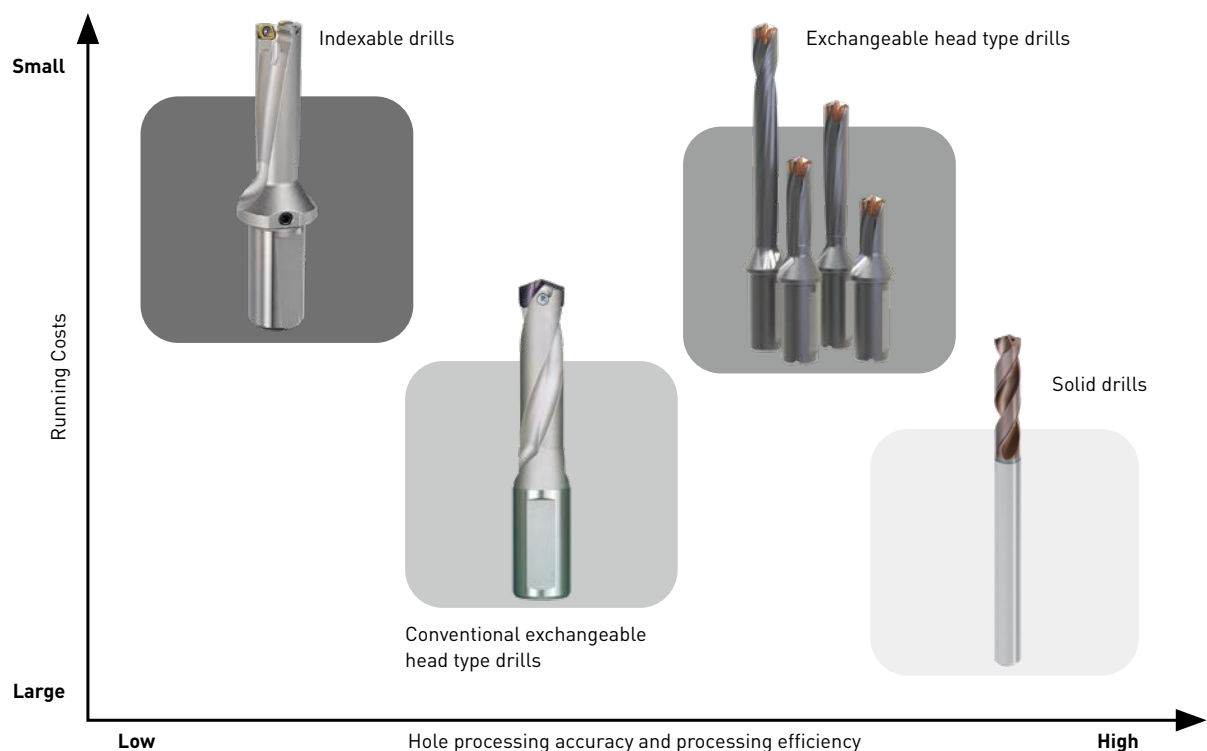
REDUCED RUNNING COSTS – HIGH PRECISION – HIGH EFFICIENCY

TRISTAR, A NEW GENERATION DRILL SERIES FROM MITSUBISHI MATERIALS PROVIDES 3 STRONG ADVANTAGES

- Reduced running costs
- High precision
- High efficiency

Exceptionally long life and reduces running costs compared to conventional replaceable head drills. In addition, it achieves machining accuracy and efficiency comparable to that of solid drills.

SOLID CARBIDE TRISTAR DRILL SERIES

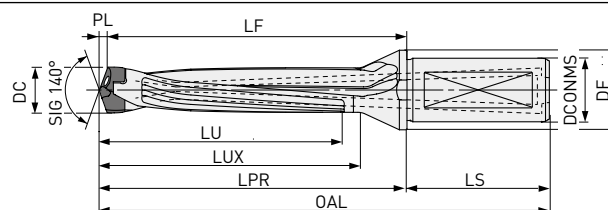


DXAS



TRISTAR DRILL SERIES

P **K**



DC < 18	18 < DC < 30	30 < DC
0.019	0.023	0.027
0.001	0.002	0.002
DCONMS = 25 DCONMS = 32		
0	0	
-0.013	-0.016	



Order number	Stock	Hole depth (L/D)	No. of teeth	DC	LU	LUX	LPR	LS	OAL	LF	PL	DCONMS	DF	Applicable Heads
DXAS1800X1F25	●	1.5	2	18	32.0	40.0	58	56	114	55.0	3.0	25	31.3	DXAS1800P
DXAS1800X3F25	●	3	2	18	59.0	67.0	85	56	141	82.0	3.0	25	31.3	
DXAS1800X5F25	●	5	2	18	95.0	103.0	121	56	177	118.0	3.0	25	31.3	
DXAS1800X8F25	●	8	2	18	149.0	157.0	175	56	231	172.0	3.0	25	31.3	
DXAS1900X1F25	●	1.5	2	19	33.5	41.5	59.5	56	115.5	56.3	3.2	25	31.3	DXAS1900P
DXAS1900X3F25	●	3	2	19	62.0	70.0	88	56	144	84.8	3.2	25	31.3	
DXAS1900X5F25	●	5	2	19	100.0	108.0	126	56	182	122.8	3.2	25	31.3	
DXAS1900X8F25	●	8	2	19	157.0	165.0	183	56	239	179.8	3.2	25	31.3	
DXAS2000X1F25	●	1.5	2	20	35.0	43.0	61	56	117	57.6	3.4	25	31.3	DXAS2000P
DXAS2000X3F25	●	3	2	20	65.0	73.0	91	56	147	87.6	3.4	25	31.3	
DXAS2000X5F25	●	5	2	20	105.0	113.0	131	56	187	127.6	3.4	25	31.3	
DXAS2000X8F25	●	8	2	20	165.0	173.0	191	56	247	187.6	3.4	25	31.3	
DXAS2100X1F25	●	1.5	2	21	36.5	44.5	62.5	56	118.5	58.9	3.6	25	31.3	DXAS2100P
DXAS2100X3F25	●	3	2	21	68.0	76.0	94	56	150	90.4	3.6	25	31.3	
DXAS2100X5F25	●	5	2	21	110.0	118.0	136	56	192	132.4	3.6	25	31.3	
DXAS2100X8F25	●	8	2	21	173.0	181.0	199	56	255	195.4	3.6	25	31.3	
DXAS2200X1F25	●	1.5	2	22	38.0	46.0	64	56	120	60.3	3.7	25	31.3	DXAS2200P
DXAS2200X3F25	●	3	2	22	71.0	79.0	97	56	153	93.3	3.7	25	31.3	
DXAS2200X5F25	●	5	2	22	115.0	123.0	141	56	197	137.3	3.7	25	31.3	
DXAS2200X8F25	●	8	2	22	181.0	189.0	207	56	263	203.3	3.7	25	31.3	
DXAS2300X1F25	●	1.5	2	23	39.5	47.5	65.5	56	121.5	61.6	3.9	25	31.3	DXAS2300P
DXAS2300X3F25	●	3	2	23	74.0	82.0	100	56	156	96.1	3.9	25	31.3	
DXAS2300X5F25	●	5	2	23	120.0	128.0	146	56	202	142.1	3.9	25	31.3	
DXAS2300X8F25	●	8	2	23	189.0	197.0	215	56	271	211.1	3.9	25	31.3	
DXAS2400X1F25	●	1.5	2	24	41.0	49.0	67	56	123	62.9	4.1	25	31.3	DXAS2400P
DXAS2400X3F25	●	3	2	24	77.0	85.0	103	56	159	98.9	4.1	25	31.3	
DXAS2400X5F25	●	5	2	24	125.0	133.0	151	56	207	146.9	4.1	25	31.3	
DXAS2400X8F25	●	8	2	24	197.0	205.0	223	56	279	218.9	4.1	25	31.3	

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DXAS – TRISTAR DRILL SERIES

Order number	Stock	Hole depth (L/D)	No. of teeth	DC	LU	LUX	LPR	LS	OAL	LF	PL	DCONMS	DF	Applicable Heads
DXAS2500X1F25	●	1.5	2	25	42.5	50.5	68.5	56	124.5	64.3	4.2	25	31.3	DXAS2500P* DXAS2550P
DXAS2500X3F25	●	3	2	25	80.0	88.0	106	56	162	101.8	4.2	25	31.3	
DXAS2500X5F25	●	5	2	25	130.0	138.0	156	56	212	151.8	4.2	25	31.3	
DXAS2500X8F25	●	8	2	25	205.0	213.0	231	56	287	226.8	4.2	25	31.3	
DXAS2600X1F32	●	1.5	2	26	44.0	52.0	77	60	137	72.6	4.4	32	41.3	DXAS2600P* DXAS2650P DXAS2670P
DXAS2600X3F32	●	3	2	26	83.0	91.0	116	60	176	111.6	4.4	32	41.3	
DXAS2600X5F32	●	5	2	26	135.0	143.0	168	60	228	163.6	4.4	32	41.3	
DXAS2600X8F32	●	8	2	26	213.0	221.0	246	60	306	241.6	4.4	32	41.3	
DXAS2700X1F32	●	1.5	2	27	45.5	53.5	78.5	60	138.5	73.9	4.6	32	41.3	DXAS2700P* DXAS2750P
DXAS2700X3F32	●	3	2	27	86.0	94.0	119	60	179	114.4	4.6	32	41.3	
DXAS2700X5F32	●	5	2	27	140.0	148.0	173	60	233	168.4	4.6	32	41.3	
DXAS2700X8F32	●	8	2	27	221.0	229.0	254	60	314	249.4	4.6	32	41.3	
DXAS2800X1F32	●	1.5	2	28	47.0	55.0	80	60	140	75.3	4.7	32	41.3	DXAS2800P* DXAS2850P
DXAS2800X3F32	●	3	2	28	89.0	97.0	122	60	182	117.3	4.7	32	41.3	
DXAS2800X5F32	●	5	2	28	145.0	153.0	178	60	238	173.3	4.7	32	41.3	
DXAS2800X8F32	●	8	2	28	229.0	237.0	262	60	322	257.3	4.7	32	41.3	
DXAS2900X1F32	●	1.5	2	29	48.5	56.5	81.5	60	141.5	76.6	4.9	32	41.3	DXAS2900P* DXAS2950P
DXAS2900X3F32	●	3	2	29	92.0	100.0	125	60	185	120.1	4.9	32	41.3	
DXAS2900X5F32	●	5	2	29	150.0	158.0	183	60	243	178.1	4.9	32	41.3	
DXAS2900X8F32	●	8	2	29	237.0	245.0	270	60	330	265.1	4.9	32	41.3	
DXAS3000X1F32	●	1.5	2	30	50.0	58.0	83	60	143	77.9	5.1	32	41.3	DXAS3000P*
DXAS3000X3F32	●	3	2	30	95.0	103.0	128	60	188	122.9	5.1	32	41.3	
DXAS3000X5F32	●	5	2	30	155.0	163.0	188	60	248	182.9	5.1	32	41.3	
DXAS3000X8F32	●	8	2	30	245.0	253.0	278	60	338	272.9	5.1	32	41.3	

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1. The above dimensions (*) are for when installing the inserts.

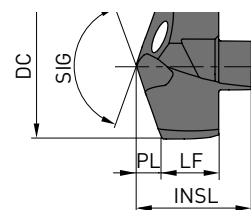
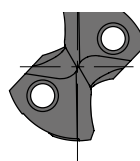


SPARE PARTS

Drill diameter (DC)	 Clamp Screw	Clamp Torque (N x m)	 Wrench	Drive Size
18 – 19	TPS25-1	1.0	TIP07F	7IP
20 – 22	TPS3-1	2.0	TIP10F	10IP
23 – 25	TPS351-1	2.5	TIP10W	10IP
26 – 30	TPS43	4.0	TIP15W	15IP

DXAS

INSERTS



DC < 18	18 < DC < 30	30 < DC
0.019	0.023	0.027
0.001	0.002	0.002

Order number	DP6020	DC	LF	LPR	PL	SIG	Applicable holder
DXAS1800P	●	18.0	7.0	10.0	3.0	140°	DXAS1800
DXAS1810P	●	18.1	6.9	10.0	3.1	140°	
DXAS1820P	●	18.2	6.9	10.0	3.1	140°	
DXAS1830P	●	18.3	6.9	10.0	3.1	140°	
DXAS1840P	●	18.4	6.9	10.0	3.1	140°	
DXAS1850P	●	18.5	6.9	10.0	3.1	140°	
DXAS1860P	●	18.6	6.9	10.0	3.1	140°	
DXAS1870P	●	18.7	6.8	10.0	3.2	140°	
DXAS1880P	●	18.8	6.8	10.0	3.2	140°	
DXAS1890P	●	18.9	6.8	10.0	3.2	140°	
DXAS1900P	●	19.0	6.8	10.0	3.2	140°	DXAS1900
DXAS1910P	●	19.1	6.8	10.0	3.2	140°	
DXAS1920P	●	19.2	6.7	10.0	3.3	140°	
DXAS1930P	●	19.3	6.7	10.0	3.3	140°	
DXAS1940P	●	19.4	6.7	10.0	3.3	140°	
DXAS1950P	●	19.5	6.7	10.0	3.3	140°	
DXAS1960P	●	19.6	6.7	10.0	3.3	140°	
DXAS1970P	●	19.7	6.7	10.0	3.3	140°	
DXAS1980P	●	19.8	6.6	10.0	3.4	140°	
DXAS1990P	●	19.9	6.6	10.0	3.4	140°	
DXAS2000P	●	20.0	8.1	11.5	3.4	140°	DXAS2000
DXAS2050P	●	20.5	8.0	11.5	3.5	140°	DXAS2100
DXAS2100P	●	21.0	7.9	11.5	3.6	140°	
DXAS2150P	●	21.5	7.9	11.5	3.6	140°	DXAS2200
DXAS2200P	●	22.0	7.8	11.5	3.7	140°	
DXAS2250P	●	22.5	7.7	11.5	3.8	140°	DXAS2300
DXAS2300P	●	23.0	9.1	13.0	3.9	140°	
DXAS2350P	●	23.5	9.0	13.0	4.0	140°	DXAS2400
DXAS2400P	●	24.0	8.9	13.0	4.1	140°	
DXAS2450P	●	24.5	8.9	13.0	4.1	140°	DXAS2500
DXAS2470P	●	24.7	8.8	13.0	4.2	140°	
DXAS2500P	●	25.0	8.8	13.0	4.2	140°	DXAS2600
DXAS2550P	●	25.5	8.7	13.0	4.3	140°	
DXAS2600P	●	26.0	10.1	14.5	4.4	140°	DXAS2700
DXAS2650P	●	26.5	10.0	14.5	4.5	140°	
DXAS2670P	●	26.7	10.0	14.5	4.5	140°	DXAS2800
DXAS2700P	●	27.0	9.9	14.5	4.6	140°	
DXAS2750P	●	27.5	9.8	14.5	4.7	140°	DXAS2900
DXAS2800P	●	28.0	9.8	14.5	4.7	140°	
DXAS2850P	●	28.5	9.7	14.5	4.8	140°	DXAS3000
DXAS2900P	●	29.0	10.6	15.5	4.9	140°	
DXAS2950P	●	29.5	10.5	15.5	5.0	140°	DXAS3000
DXAS3000P	●	30.0	10.4	15.5	5.1	140°	

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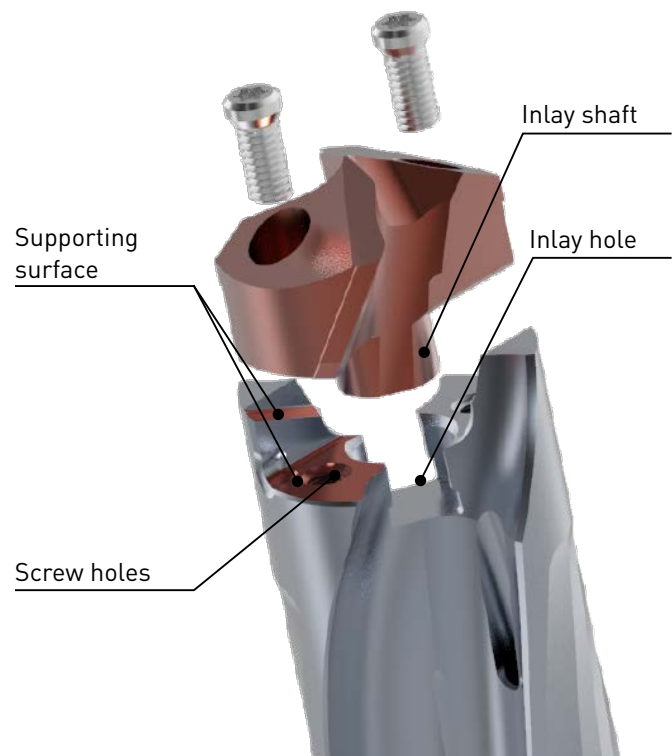
DXAS – RECOMMENDED CUTTING CONDITIONS

Material	DC	Hole depth (L/D)	Vc	n	Vf
P Mild steel DIN St37-2 etc.	18.0	1.5-8	110 (80 – 170)	1900	0.30 (0.20 – 0.45)
	19.0	1.5-8	110 (80 – 170)	1800	0.30 (0.20 – 0.45)
	20.0	1.5-8	110 (80 – 170)	1800	0.30 (0.20 – 0.45)
	21.0	1.5-8	110 (80 – 170)	1700	0.30 (0.20 – 0.45)
	22.0	1.5-8	110 (80 – 170)	1600	0.30 (0.20 – 0.45)
	23.0	1.5-8	110 (80 – 170)	1500	0.30 (0.20 – 0.45)
	24.0	1.5-8	110 (80 – 170)	1500	0.30 (0.20 – 0.45)
	25.0	1.5-8	110 (80 – 170)	1400	0.35 (0.25 – 0.45)
	26.0	1.5-8	110 (80 – 170)	1300	0.35 (0.25 – 0.45)
	27.0	1.5-8	110 (80 – 170)	1300	0.35 (0.25 – 0.45)
	28.0	1.5-8	110 (80 – 170)	1300	0.35 (0.25 – 0.45)
	29.0	1.5-8	110 (80 – 170)	1200	0.35 (0.25 – 0.45)
	30.0	1.5-8	110 (80 – 170)	1200	0.35 (0.25 – 0.45)
P Carbon steel DIN CK50 etc.	18.0	1.5-8	100 (70 – 170)	1800	0.30 (0.20 – 0.45)
	19.0	1.5-8	100 (70 – 170)	1700	0.30 (0.20 – 0.45)
	20.0	1.5-8	100 (70 – 170)	1600	0.30 (0.20 – 0.45)
	21.0	1.5-8	100 (70 – 170)	1500	0.30 (0.20 – 0.45)
	22.0	1.5-8	100 (70 – 170)	1400	0.30 (0.20 – 0.45)
	23.0	1.5-8	100 (70 – 170)	1400	0.30 (0.20 – 0.45)
	24.0	1.5-8	100 (70 – 170)	1300	0.30 (0.20 – 0.45)
	25.0	1.5-8	100 (70 – 170)	1300	0.35 (0.25 – 0.45)
	26.0	1.5-8	100 (70 – 170)	1200	0.35 (0.25 – 0.45)
	27.0	1.5-8	100 (70 – 170)	1200	0.35 (0.25 – 0.45)
	28.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)
	29.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)
	30.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)
K Alloy steel DIN 41CrMo4, DIN 20Cr4 etc.	18.0	1.5-8	100 (70 – 140)	1800	0.30 (0.20 – 0.45)
	19.0	1.5-8	100 (70 – 140)	1700	0.30 (0.20 – 0.45)
	20.0	1.5-8	100 (70 – 140)	1600	0.30 (0.20 – 0.45)
	21.0	1.5-8	100 (70 – 140)	1500	0.30 (0.20 – 0.45)
	22.0	1.5-8	100 (70 – 140)	1400	0.30 (0.20 – 0.45)
	23.0	1.5-8	100 (70 – 140)	1400	0.30 (0.20 – 0.45)
	24.0	1.5-8	100 (70 – 140)	1300	0.30 (0.20 – 0.45)
	25.0	1.5-8	100 (70 – 140)	1300	0.35 (0.25 – 0.45)
	26.0	1.5-8	100 (70 – 140)	1200	0.35 (0.25 – 0.45)
	27.0	1.5-8	100 (70 – 140)	1200	0.35 (0.25 – 0.45)
	28.0	1.5-8	100 (70 – 140)	1100	0.35 (0.25 – 0.45)
	29.0	1.5-8	100 (70 – 140)	1100	0.35 (0.25 – 0.45)
	30.0	1.5-8	100 (70 – 140)	1100	0.35 (0.25 – 0.45)
K Cast iron DIN GG30, DIN GGG45 etc.	18.0	1.5-8	100 (70 – 170)	1800	0.30 (0.20 – 0.45)
	19.0	1.5-8	100 (70 – 170)	1700	0.30 (0.20 – 0.45)
	20.0	1.5-8	100 (70 – 170)	1600	0.30 (0.20 – 0.45)
	21.0	1.5-8	100 (70 – 170)	1500	0.30 (0.20 – 0.45)
	22.0	1.5-8	100 (70 – 170)	1400	0.30 (0.20 – 0.45)
	23.0	1.5-8	100 (70 – 170)	1400	0.30 (0.20 – 0.45)
	24.0	1.5-8	100 (70 – 170)	1300	0.30 (0.20 – 0.45)
	25.0	1.5-8	100 (70 – 170)	1300	0.35 (0.25 – 0.45)
	26.0	1.5-8	100 (70 – 170)	1200	0.35 (0.25 – 0.45)
	27.0	1.5-8	100 (70 – 170)	1200	0.35 (0.25 – 0.45)
	28.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)
	29.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)
	30.0	1.5-8	100 (70 – 170)	1100	0.35 (0.25 – 0.45)

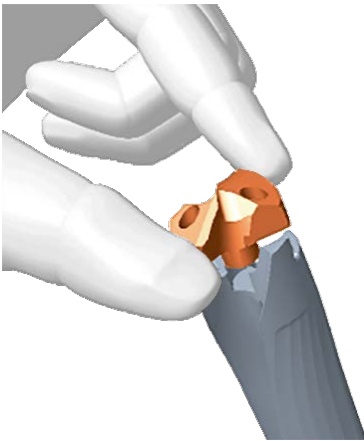
1. Refer to the table above for more details on how to set the cutting conditions according to the usage.
2. When using non-water-soluble cutting fluid, reduce the cutting speed to 80 % to 90 %.
3. When using L/D=8, the maximum feed rate should be 0.4 mm/rev.

HOW TO INSTALL THE HEAD

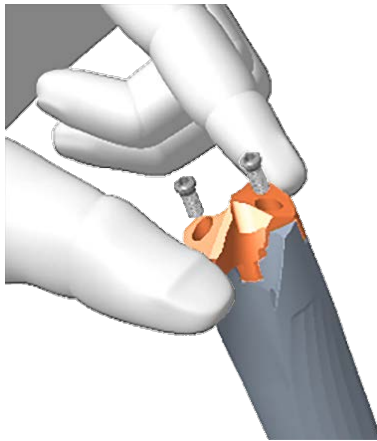
1. Thoroughly clean the head mounting area of the holder using an air blower, etc., and check that there are no foreign objects or dirt on the screw holes or the head support surface.
2. Insert the head's inlay shaft into the holder's inlay hole.
3. Insert the two clamp screws from the head and temporarily tighten each one.
4. While lightly pressing the head against the support surface of the holder, tighten the two clamp screws to the recommended torque.



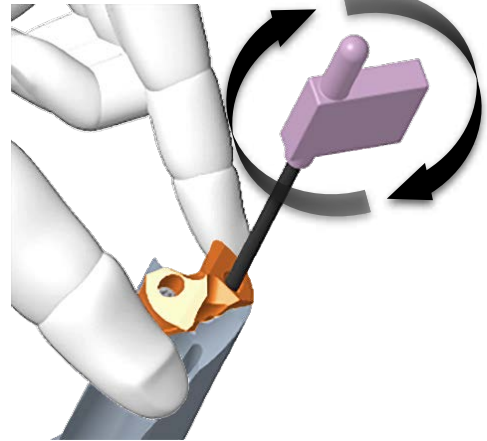
2.



3.



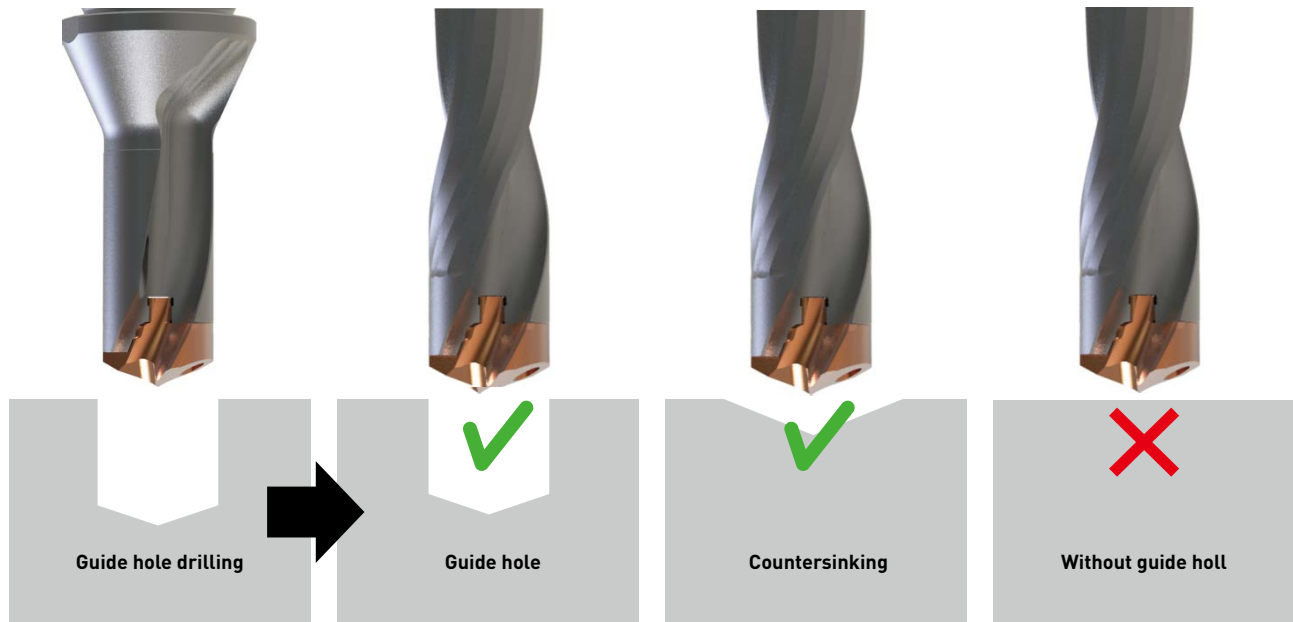
4.



OPERATIONAL GUIDANCE

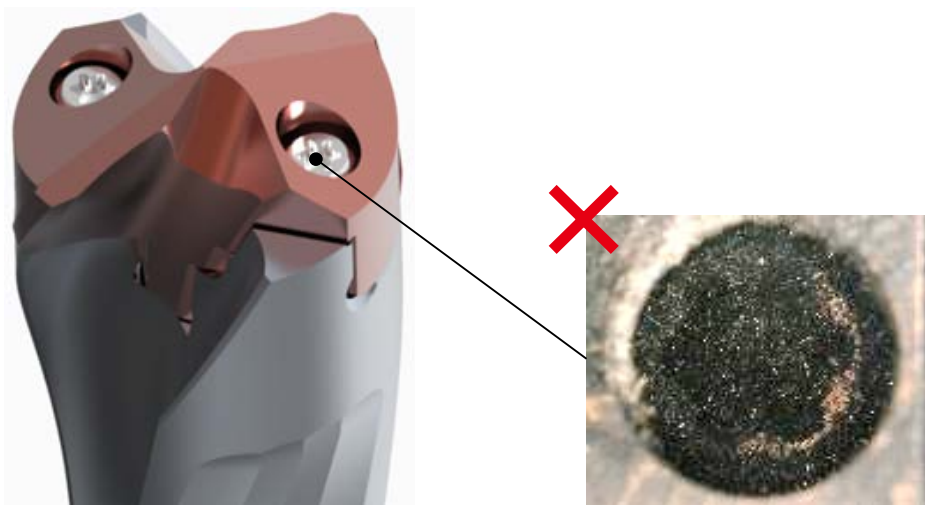
1. WHEN TO USE $L/D = 8$ AND HOW TO IMPROVE HOLE ACCURACY

Machining without guide holes increases the possibility of problems such as rifling occurring.



2. M.Q.L AND DRY MACHINING ARE NOT RECOMMENDED

M.Q.L. and dry machining are not recommended because sludge will accumulate on the clamping screws.



OPERATIONAL GUIDANCE

3. HOW TO PREVENT CHIP WRAPPING

We do not recommend lowering the feed rate when penetrating the workpiece, as this can cause chips to wrap around the drill and workpiece.

WHEN CUTTING CONDITIONS CAN BE INCREASED

We recommend improving the cutting speed and feed rate.



$V_c = 80 \text{ m/min}$
 $fr = 0.30 \text{ mm/rev}$



$V_c = 100 \text{ m/min}$
 $fr = 0.35 \text{ mm/rev}$



WHEN CUTTING CONDITIONS CANNOT BE INCREASED

It is recommended to introduce a peck and stop the feed when half the drill point protrudes when drilling through holes.



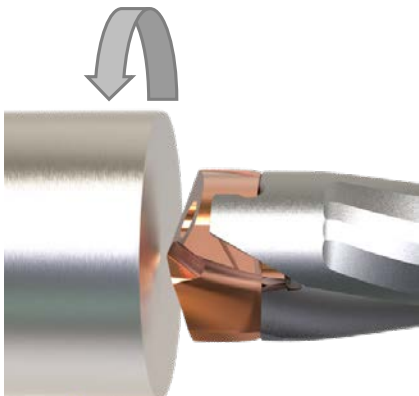
Long chips produced
when no peck feed is
used.



Chips are successfully
broken when a peck
feed is used.

4. HOW TO SUPPRESS CHATTER AND VIBRATION IN MACHINING OPERATIONS WHERE THE WORKPIECE IS ROTATING

To reduce chatter and vibration when machining workpieces with rotating shafts, try machining at a lower peripheral speed and higher feed rate.



When cutting speed is high



$V_c = 101 \text{ m/min}$
 $fr = 0.34 \text{ mm/rev}$
 $F = 391 \text{ mm/min}$

Low cutting speed and high feed rate



$V_c = 70 \text{ m/min}$
 $fr = 0.45 \text{ mm/rev}$
 $F = 358 \text{ mm/min}$



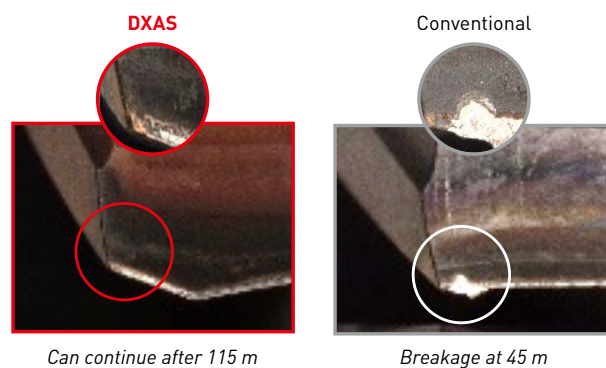
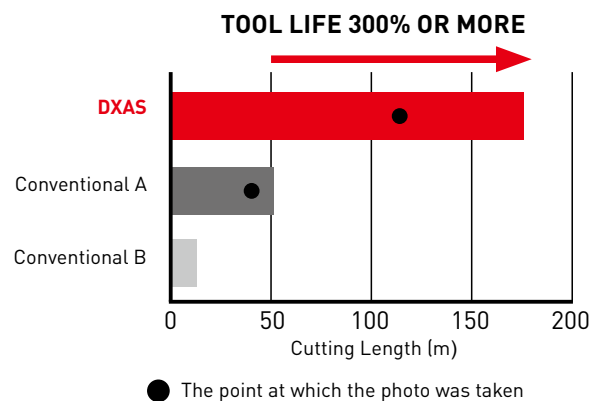
DXAS

APPLICATION EXAMPLES

DIN CK50: TOOL LIFE COMPARISON UNDER GENERAL CUTTING CONDITIONS ($F = 531 \text{ mm/min}$)

It has an overwhelming tool life that is more than three times longer than conventional products. In addition to significantly reducing running costs, it also reduces the frequency of head replacement.

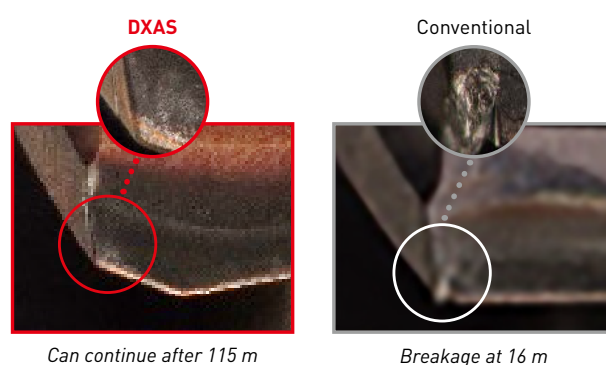
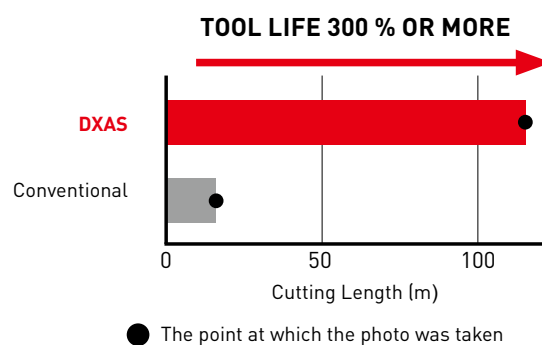
Material	Carbon steel (DIN CK50)
Tool	$\varnothing 18.0 \text{ mm}$, $L/D = 5$
V_c (m/min)	100
f_r (mm/rev)	0.3
Hole depth	90 mm (Through hole)
Cutting mode	Wet cutting Internal coolant Water-soluble coolant, 1MPa



DIN CK50: TOOL LIFE COMPARISON AT HIGHLY EFFICIENT CUTTING CONDITIONS ($F = 955 \text{ mm/min}$)

DXAS has excellent wear resistance even under high-efficiency conditions, achieving more than three times the normal tool life. The low resistance design enables stable machining.

Material	Carbon steel (DIN CK50)
Tool	$\varnothing 18.0 \text{ mm}$, $L/D = 5$
V_c (m/min)	120
f_r (mm/rev)	0.45
Hole depth	90 mm (Through hole)
Cutting mode	Wet cutting Internal coolant Water-soluble coolant, 1MPa



SYMBOLS

 Recommended cutting conditions	MACHINING TYPE
NEW Completely new products or expansions released in the current Spring or Autumn product launch and are not included in the latest version of the General Catalogue.	 Roughing
NEW Products or expansions that have already been introduced in one of the previous Spring or Autumn product launches but are not included in the latest General Catalogue.	 Medium cutting
APPLICATION	 Light cutting
 Face milling	 Pre-finishing
 Chamfer milling	 Finishing
 Shoulder milling with R	 Fine-finishing
 Face milling close to a wall	TOOL MATERIAL
 Shoulder milling	 Ultra micro grain carbide Ultra micro grain carbide substrate material.
 Side milling	 Cubic boron nitride Mitsubishi Materials' original CBN material.
 Slot milling	 Ceramic For high speed efficient machining of super alloys due to the excellent high temperature strength property.
 Ramping	 High hardness powder metallurgy HSS High hardness powder metallurgy HSS substrate material.
 Pocket milling	 High grade high alloy HSS High grade high alloy HSS substrate material.
 Slot milling with R	 Cobalt high speed steel Cobalt high speed steel substrate material.
 Copy milling	 High speed steel High speed steel substrate material.
 T-Slot milling	

SYMBOLS

COATING



SMART MIRACLE coating

New smooth and dense coating technology for high efficiency milling of difficult to cut materials.



CRN coating

Newly developed CrN coating for Copper Electrodes machining.



Violet coating

Increased tool life of 2-3 times more than TiN coated products.



DP coating

New generation coating suitable for a wide range of materials.



MIRACLE coating

The original Miracle (Al,Ti)N coating. Also suitable for dry cutting.



[Al, Ti]N coating

[Al,Ti]N highly versatile application range.



[Al,Ti,Cr]N multi-layer coating

For carbon, alloy and hardened steels.



IMPACT MIRACLE coating

Single phase nano crystal coating technology has higher film hardness and heat resistance.



MIRACLE coating

The original MIRACLE (Al,Ti)N coating. Also suitable for dry cutting.



VFR coating

The [AlCrSi]N/[AlTiSi]N PVD multilayer coating is ideal for machining of extremely hard materials up to 70 HRC.



DLC coating

Hardness similar to CVD diamond coating achieved with high adhesion strength.



Diamond coating

Suitable for CFRP and CFRP-aluminium materials.



Diamond coating

Suitable for graphite machining.



Diamond coating

The original CVD diamond coating.



CVD Diamond coating

Unique multi-layer micro-grain diamond crystal control technology drastically improves wear resistance and smoothness.

CUTTING EDGE PROPERTIES



Sharp corner edge

Indicates the end mill has a sharp corner edge.



Gash land

Indicates the end mill cutting edge has a protective chamfer.



Rake angle



Helix angle

Indicates the helix angle of the end mill.



Point angle

Indicates the drill point angle.



Roughing flute geometry



Variable helix



Rounded gash



Corner angle

WEB THINNING



X type point geometry

X web thinning used at the drill point.



XR type point geometry

XR web thinning used at the drill point.



S type point geometry

Easy cutting geometry.



N type point geometry

Effective when the point web is thick.



Chipbreaker

SYMBOLS

TOLERANCES



Tolerance of taper angle
Indicates the tolerance of the taper angle.



R tolerance
Indicates the radial tolerance of a ball nose end mill.



R tolerance
Indicates the radial tolerance of the corner radius.



R tolerance
Indicates the radial tolerance of a cutter with a corner radius.



Outside diameter tolerance
Indicates the diameter tolerance of the end mill.



Peak tolerance
Indicates the tolerance for the end diameter.



Shank diameter tolerance



Shank diameter tolerance



Drill tolerance / diameter

COOLANT HOLES



External coolant



Internal coolant



Internal coolant



Centered, internal coolant hole



Radial, internal coolant holes



Internal coolant holes



Internal coolant holes

MEMO

MEMO

EUROPEAN SALES COMPANIES

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