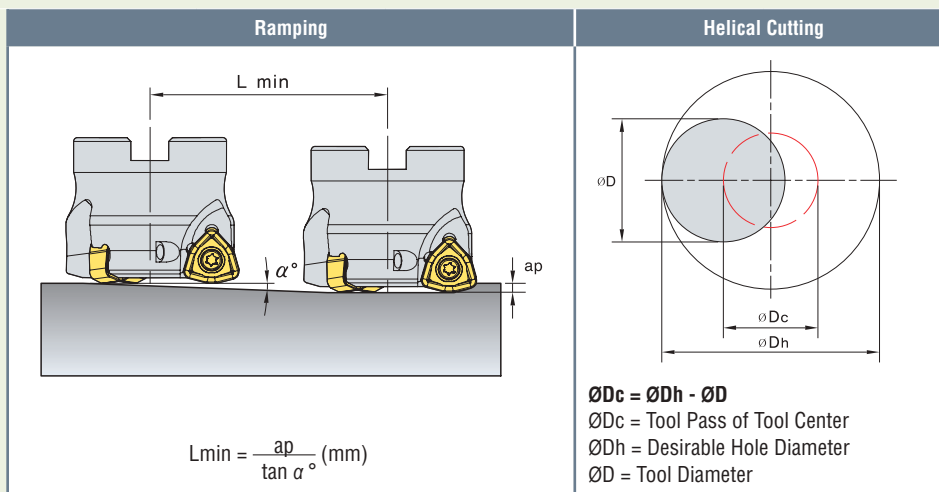


HRM DOUBLE

RAMPING • HELICAL CUTTING

CUTTING DATA

- Adjust feed to under 70% of recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size



ORDER CODE	Tool Dia. $\varnothing D$	Efficient Cutting Dia. $\varnothing D_e$	Max. ap	Max. Angle α°	Cutting Length L_{min}	Cutting Dia. D_h Min	Cutting Dia. D_h Max
HRMDS END MILL							
HRMDS0616HR	16	9.5	1	4.8	11	23.8	29.6
HRMDS0617HR	17	10.5	1	4.1	13	25.8	31.6
HRMDS0618HR	18	11.5	1	3.5	16	27.8	33.6
HRMDS0620HR	20	13.5	1	2.5	22	31.8	37.6
HRMDS0621HR	21	14.5	1	2.2	26	33.8	39.6
HRMDS0625HR	25	18.5	1	1.3	44	41.8	47.6
HRMDS0626HR	26	19.5	1	1.2	47	43.8	49.6
HRMDS0632HR	32	25.5	1	0.6	95	55.8	61.6
HRMDS0633HR	33	26.5	1	0.5	114	57.8	63.6
HRMDS0925HR	25	15.4	1.5	5.4	15.8	37.6	46.8
HRMDS0926HR	26	16.4	1.5	5	17	39.6	48.8
HRMDS0930HR	30	20.4	1.5	3.9	22	47.6	56.8
HRMDS0932HR	32	22.3	1.5	3.5	24.5	51.6	60.8
HRMDS0933HR	33	23.3	1.5	3.3	25.8	53.6	62.8
HRMDS0935HR	35	25.4	1.5	3	28.3	57.6	66.8
HRMDS0940HR	40	30.2	1.5	2.5	34.5	67.6	76.8
HRMDS0950HR	50	40.2	1.5	1.8	47	87.6	96.8
HRMDS1332HR	32	19.3	2	5.7	20	47	60
HRMDS1333HR	33	20.3	2	5.4	21.3	49	62
HRMDS1335HR	35	22.3	2	4.8	24	53	66
HRMDS1340HR	40	27.2	2	3.7	30.7	63	76
HRMDS1350HR	50	37	2	2.6	44	83	96
HRMDS1363HR	63	50	2	1.9	61.3	109	122
HRMDCM FACE MILL							
HRMDCM09040HR	40	30.2	1.5	2.5	34.5	67.6	76.8
HRMDCM09050HR	50	40.2	1.5	1.8	47	87.6	96.8
HRMDCM09063HR	63	53.1	1.5	1.4	63.3	113.6	122.8
HRMDC(M)09080HR	80	70.1	1.5	1	84.5	147.6	156.8
HRMDC(M)09100HR	100	90	1.5	0.8	109.5	187.6	196.8
HRMDCM13050HR	50	37	2	2.6	44	83	96
HRMDCM13063HR	63	50	2	1.9	61.3	109	122
HRMDC(M)13080HR	80	66.9	2	1.4	84	143	156
HRMDC(M)13100HR	100	86.9	2	1	110.7	183	196
HRMDC(M)13125HR	125	111.9	2	0.8	144	233	246
HRMDC(M)16080HR	80	63.3	2.5	1.4	102	138	156
HRMDC(M)16100HR	100	83.3	2.5	1	143	178	196
HRMDC(M)16125HR	125	108.3	2.5	0.7	204	228	246
HRMDC(M)16160R	160	143.3	2.5	0.5	286	298	316
HRMDC(M)16200R	200	183.3	2.5	0.3	477	378	396
HRMDC(M)16250R	250	233.3	2.5	0.2	716	478	496
HRMDC(M)16315R	315	298.3	2.5	0.1	1432	608	626

CORNER R PROGRAMMING

Information for uncut part by using "Input. R" for CAM program.

INSERT	Cutting Condition		Approx. R	
	Max. ap (mm)	Max. f_z (mm/t)	Input. R	Uncut
WNMX060312ZNN-MM	1.0	1.2	1.8	0.4
WNMX09T316ZNN-MM	1.5	2.0	2.5	0.6
WNMX130520ZNN-MM	2.0	3.0	3.0	0.8
WNMX160720ZNN-MM	2.5	3.5	3.5	1.2

*Uncut part will be effected by poor machine condition or weak clamping of workpiece, etc

HRM DOUBLE

CUTTING DATA

RECOMMENDED CUTTING CONDITIONS

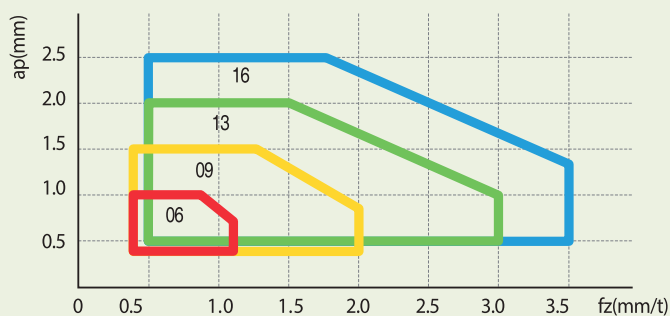
ISO	Material	Hardness/Type	Grades	vc(m/min) Recommended	vc(m/min) Grade Range
P STEEL	General Structural Steel, Mild Steel, Low Carbon Steel	Under 200 HB	PC3500/PC3600	280	(180-290)
			PC5300/PC5400	230	(150-240)
	Carbon Steel, Low Alloy Steel	Under 30 HRC	PC3500/PC3600	195	(100-220)
			PC5300/PC5400	170	(100-200)
	High Carbon Steel, Alloy Steel	30-40 HRC	PC3500/PC3600	160	(100-200)
			PC5300/PC5400	150	(100-180)
P HARDENED STEEL	Hardened Steel	40-50 HRC	PC2510	120	(80-180)
	High Hardened Steel	50-60 HRC	PC2505	60	(30-75)
M STAINLESS STEEL	Ferritic / martensitic	410, 420, 430 etc	PC5300	160	(100-160)
			PC9530	150	(80-150)
	Austenitic	303, 304, 316 etc	PC5300	130	(90-140)
			PC9530	120	(80-150)
	Duplex / Super Duplex	-	PC5300	100	(70-110)
			PC9530	90	(80-100)
K CAST IRON	Low tensile	Grey cast iron	PC6510	160	(140-230)
			PC5300	145	(110-180)
	High tensile	Grey cast iron	PC6510	135	(110-150)
			PC5300	120	(90-130)
	Ferric	Ductile cast iron	PC6510	110	(80-120)
			PC5300	95	(80-100)
Pearlitic	Ductile cast iron	PC6510	100	(90-110)	
		PC5300	85	(70-95)	
S HRSA	Incoloy	-	PC5300	60	(50-70)
			PC5400	50	(45-55)
	Inconel, Nimonic, Hastelloy	-	PC5300	55	(50-60)
			PC5400	45	(40-50)
	Stellite	-	PC5300	25	(20-30)
			PC5400	20	(17-23)
	Pure Titanium	-	PC5300	130	(120-140)
			PC5400	105	(95-115)
	Titanium Alloy (TiAl6V4)	-	PC5300	65	(60-70)
			PC5400	55	(55-60)

INTERFERENCE PREVENTION

Side clearance prevents interference between the tool and workpiece, even in deep hole machining.

TOOL	ØD	Ød	t
HRMDS0617HR-2_16	17	16	1
HRMDS0618HR-2_16	18	16	2
HRMDS0621HR-2_20	21	20	1
HRMDS0626HR-3_25	26	25	1
HRMDS0633HR-4_32	33	32	1
HRMDS0926HR-2_25	26	25	1
HRMDS0933HR-3_32	33	32	1
HRMDS0935HR-4_32	35	32	3
HRMDS0940HR-4_32	40	32	8
HRMDS0950HR-5_32	50	32	18
HRMDS0950HR-5_40	50	40	10
HRMDS0950HR-5_42	50	42	8
HRMDS1333HR-3_32	33	32	1
HRMDS1335HR-4_32	35	32	3
HRMDS1340HR-4_30	40	30	8
HRMDS1350HR-4_32	50	32	18
HRMDS1350HR-4_40	50	40	10
HRMDS1350HR-4_42	50	42	8
HRMDS1363HR-5_32	63	32	31
HRMDS1363HR-5_40	63	40	23
HRMDS1363HR-5_42	63	42	21

INSERT SIZES & APPLICATION RANGE



INDEXABLE MILLING

EDGE PREPARATION

HOLE MAKING

TAPS & DIES

THREAD & GROOVE MILLING

TOOL HOLDING