

Karnasch
PROFESSIONAL TOOLS

Mũi khoan từ - Annular Cutters / Rail Cutters

Đường kính, chiều dài đa dạng

Vật liệu thép gió HSS hoặc mũi hợp kim TCT

Tiêu chuẩn cân Weldon - Nitto

Độ bền và chất lượng vượt trội đến từ Đức

up to Ø 140mm

GERMAN QUALITY PRODUCT

PATENTED

PRECISION. PERFECTION. PERFORMANCE.

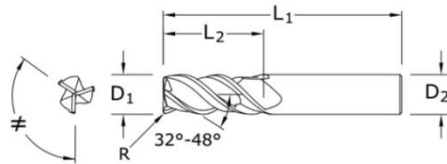


Dao Phay Bo Góc 3F Phi 20 KYOCERA SGS 33MCR KSP43453

Kyocera SGS (KSPT) là thương hiệu là nhà sản xuất dụng cụ cắt gọt solid carbide hàng đầu thế giới.

Thông số kỹ thuật:

- Thương hiệu: KYOCERA SGS - Series 33MCR dao phay hiệu suất cao (high performance)
- Vật liệu gia công: Chuyên phay các loại vật liệu thép, inox, gang, titan, hợp kim thép
- Đường kính lưỡi dao: 20mm với góc bo R1.0
- Đường kính cán dao: 20mm
- Chiều dài lưỡi cắt: 46mm
- Tổng chiều dài dao: 104mm
- Góc xoắn lưỡi cắt 32° và 38°



TOLERANCES (mm)

3-6 DIAMETER

$D_1 = +0,000/-0,030$

$D_2 = h_6$

$R = +0,000/-0,050$

>6-10 DIAMETER

$D_1 = +0,000/-0,040$

$D_2 = h_6$

$R = +0,000/-0,050$

>10-20 DIAMETER

$D_1 = +0,000/-0,050$

$D_2 = h_6$

$R = +0,000/-0,050$

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS

For patent
information visit
www.ksptpatents.com

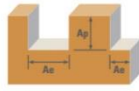
33MCR
METRIC SERIES














CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	CORNER RADIUS R	EDP NO. TI-NAMITE-A (AlTiN)
3,0	9,0	57,0	6,0	0,3	43445
3,0	9,0	57,0	6,0	0,5	43470
4,0	12,0	57,0	6,0	0,3	43446
4,0	12,0	57,0	6,0	0,5	43471
5,0	15,0	57,0	6,0	0,3	43447
5,0	15,0	57,0	6,0	0,5	43472
6,0	18,0	57,0	6,0	0,5	43448
6,0	18,0	57,0	6,0	1,0	43473
6,0	18,0	57,0	6,0	1,5	43474
6,0	18,0	57,0	6,0	2,0	43475
8,0	20,0	63,0	8,0	0,5	43449
8,0	20,0	63,0	8,0	1,0	43476
8,0	20,0	63,0	8,0	1,5	43477
8,0	20,0	63,0	8,0	2,0	43478
10,0	27,0	72,0	10,0	0,5	43450
10,0	27,0	72,0	10,0	1,0	43479
10,0	27,0	72,0	10,0	1,5	43480
10,0	27,0	72,0	10,0	2,0	43481
10,0	27,0	72,0	10,0	2,5	43482
12,0	30,0	83,0	12,0	0,5	43451
12,0	30,0	83,0	12,0	1,0	43483
12,0	30,0	83,0	12,0	1,5	43484
12,0	30,0	83,0	12,0	2,0	43485
12,0	30,0	83,0	12,0	2,5	43486
12,0	30,0	83,0	12,0	3,0	43487
12,0	30,0	83,0	12,0	4,0	43488
16,0	38,0	92,0	16,0	1,0	43452
16,0	38,0	92,0	16,0	1,5	43489
16,0	38,0	92,0	16,0	2,0	43490
16,0	38,0	92,0	16,0	2,5	43491
16,0	38,0	92,0	16,0	3,0	43492
16,0	38,0	92,0	16,0	4,0	43493
20,0	46,0	104,0	20,0	1,0	43453
20,0	46,0	104,0	20,0	2,0	43494
20,0	46,0	104,0	20,0	2,5	43495
20,0	46,0	104,0	20,0	3,0	43496
20,0	46,0	104,0	20,0	4,0	43497

- Specially engineered step core design provides stability for aggressive ramping and rigidity when flutes are completely engaged
- Open design at axial end accommodates material flow and load reduction during machining operations
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

METRIC

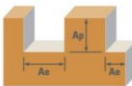












Series 33



Series 33MCR Metric	Hardness			Vc (m/min)	Diameter (D ₁) (mm)								
		Ae x D ₁	Ap x D ₁		3	6	8	10	12	16	20		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	 ≤ 275 Bhn or ≤ 28 HRC	Profile ≤ 0.5	≤ 1.5	168	RPM	17773	8886	6665	5332	4443	3332	2666
					(134-201)	Fz	0.012	0.029	0.049	0.061	0.074	0.100	0.107
					Feed (mm/min)	640	768	981	981	992	998	853	
		 1	≤ 1	134	RPM	14218	7109	5332	4265	3555	2666	2133	
				(107-161)	Fz	0.012	0.029	0.049	0.061	0.074	0.100	0.107	
				Feed (mm/min)	512	614	785	785	793	798	682		
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	 ≤ 375 Bhn or ≤ 40 HRC	Profile ≤ 0.5	≤ 1.5	96	RPM	10179	5089	3817	3054	2545	1909	1527
					(77-115)	Fz	0.010	0.022	0.036	0.045	0.055	0.074	0.080
					Feed (mm/min)	293	330	415	415	421	425	366	
		 1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	
				(61-91)	Fz	0.010	0.022	0.036	0.045	0.055	0.074	0.080	
				Feed (mm/min)	233	262	330	330	334	337	291		
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	 ≤ 375 Bhn or ≤ 40 HRC	Profile ≤ 0.5	≤ 1.5	56	RPM	5978	2989	2242	1793	1495	1121	897
					(45-68)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064
					Feed (mm/min)	129	151	201	201	194	198	172	
		 1	≤ 1	44	RPM	4686	2343	1757	1406	1171	879	703	
				(35-53)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	
				Feed (mm/min)	101	118	157	157	152	155	135		
	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	 ≤ 220 Bhn or ≤ 19 HRC	Profile ≤ 0.5	≤ 1.5	136	RPM	14380	7190	5392	4314	3595	2696	2157
					(109-163)	Fz	0.008	0.026	0.045	0.056	0.067	0.090	0.096
					Feed (mm/min)	362	569	725	725	725	725	621	
		 1	≤ 1	108	RPM	11471	5736	4302	3441	2868	2151	1721	
				(87-130)	Fz	0.008	0.026	0.045	0.056	0.067	0.090	0.096	
				Feed (mm/min)	289	454	578	578	578	578	496		
CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	 ≤ 260 Bhn or ≤ 26 HRC	Profile ≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	
				(83-124)	Fz	0.007	0.019	0.034	0.043	0.050	0.067	0.072	
				Feed (mm/min)	237	316	422	422	415	411	356		
	 1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309		
			(66-99)	Fz	0.007	0.019	0.034	0.043	0.050	0.067	0.072		
			Feed (mm/min)	188	251	335	335	330	327	283			
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	 ≤ 275 Bhn or ≤ 28 HRC	Profile ≤ 0.5	≤ 1.5	149	RPM	15834	7917	5938	4750	3958	2969	2375
					(119-179)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.085
					Feed (mm/min)	433	570	722	722	712	707	608	
		 1	≤ 1	119	RPM	12602	6301	4726	3781	3151	2363	1890	
				(95-143)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.085	
				Feed (mm/min)	345	454	575	575	567	563	484		

continued on next page

METRIC Series 33

Series 33MCR Metric	Hardness			Vc (m/min)	Diameter (D1) (mm)								
		Ae x D1	Ap x D1		3	6	8	10	12	16	20		
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L		≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648
					(83-124)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	237	316	396	396	395	396	343	
			1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309
					(66-99)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	188	251	314	314	314	314	272	
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450		≤ 0.5	≤ 1.5	94	RPM	10017	5009	3756	3005	2504	1878	1503
					(76-113)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	216	288	361	361	361	361	313	
			1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212
					(61-91)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	174	233	291	291	291	291	252	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400		≤ 0.5	≤ 1.5	24	RPM	2585	1293	969	776	646	485	388
					(20-29)	Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059
					Feed (mm/min)	48	65	81	65	79	78	68	
			1	≤ 1	20	RPM	2100	1050	788	630	525	394	315
					(16-24)	Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059
					Feed (mm/min)	39	53	66	66	64	64	55	
	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene		≤ 0.5	≤ 1.5	19	RPM	2003	1002	751	601	501	376	301
					(15-23)	Fz	0.005	0.012	0.019	0.024	0.029	0.038	0.043
					Feed (mm/min)	29	36	43	43	43	43	38	
			1	≤ 1	15	RPM	1583	792	594	475	396	297	238
					(12-18)	Fz	0.005	0.012	0.019	0.024	0.029	0.038	0.043
					Feed (mm/min)	23	28	34	34	34	34	30	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si		≤ 0.5	≤ 1.5	66	RPM	6947	3474	2605	2084	1737	1303	1042
					(52-79)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	150	200	250	250	250	250	217	
			1	≤ 1	52	RPM	5493	2747	2060	1648	1373	1030	824
					(41-62)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	119	158	198	198	198	198	171	
	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		≤ 0.5	≤ 1.5	23	RPM	2424	1212	909	727	606	454	364
					(18-27)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	52	70	87	87	87	87	76	
			1	≤ 1	18	RPM	1939	969	727	582	485	364	291
					(15-22)	Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069
					Feed (mm/min)	42	56	70	70	70	70	60	

Bhn (Brinell) HRC (Rockwell C)
 rpm = (Vc x 1000) / (D₁ x 3.14)
 mm/min = Fz x 3 x rpm
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x D₁ maximum)
 refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)