MDTA

GENERAL PURPOSE

MDTA is the Osawa range of micrograin carbide end mills with PV200 coating. MDTA endmills have been developed for general purpose milling up to 45 HRC. The exclusive and innovative PV200 coating (3500HV) ensures the best performance, even in applications with air blow or MQL (Minimum Quantity Lubrication).

MDTA sono le frese Osawa in metallo duro micrograna con rivestimento PV200 sviluppate per la fresatura di materiali generici sino a 45 HRC. L'esclusivo e innovativo rivestimento PV200 (3500HV) garantisce performance elevate anche in lavorazioni con impiego di refrigerazione con getto d'aria o MQL (Minimum Quantity Lubrication).

MDTA sind Fräser von Osawa aus Mikrokörnungs-Hartmetall mit Beschichtung PV200, die für das Fräsen von allgemeinen Materialien bis zu 45 HRC entwickelt wurden. Die exklusive und innovative Beschichtung PV200 (3500HV) gewährleistet auch bei Bearbeitungen mit Kühlung durch Luftstrahl oder MQL (Minimum Quantity Lubrication) hohe Leistungen.

MDTA sont les fraises Osawa en carbure micrograin avec revêtement PV200 développées pour le fraisage de matériaux génériques jusqu'à 45 HRC. Le revêtement PV200 (3500HV) exclusif et innovant garantit des performances élevées même pour les usinages employant un système de lubrification avec jet d'air ou MQL (Minimum Quantity Lubrication).

MDTA son las fresas Osawa de metal duro micrograno con revestimiento PV200 desarrolladas para el fresado de materiales genéricos hasta 45 HRC. Su exclusivo e innovador revestimiento PV200 (3500HV) garantiza rendimientos elevados incluso en elaboraciones con el uso de refrigeración con chorro de aire o MQL (Minimum Quantity Lubrication).

MDTA - это фрезы фирмы Osawa из твёрдого сплава с мелкозернистой структурой и покрытием PV200, предназначенные для стандартной обработки материалов с твёрдостью до 45 HRC. Эксклюзивное и инновационное покрытие PV200 (3500HV) гарантирует высокую производительность, даже, при обработке с обдувом воздухом или с масляным туманом.

MDTACS2

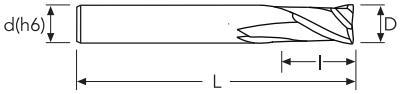
cylindrical shank, 2 flutes

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | SQUARE | Z2

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING | DRILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.015			3	3		40	2	MDTACS2010403	●
1	0/-0.015			4	3		40	2	MDTACS2010404	●
1.5	0/-0.015			3	4.5		40	2	MDTACS2015403	●
1.5	0/-0.015			4	4.5		40	2	MDTACS2015404	●
2	0/-0.015			2	8		32	2	MDTACS2020	●
2	0/-0.015			3	6.5		40	2	MDTACS2020403	●
2	0/-0.015			4	6.5		40	2	MDTACS2020404	●
2.5	0/-0.015			3	6.5		40	2	MDTACS2025403	●
2.5	0/-0.015			4	6.5		40	2	MDTACS2025404	●
3	0/-0.020			3	9		40	2	MDTACS2030403	●
4	0/-0.020			4	12		50	2	MDTACS2040504	●
5	0/-0.020			6	15		50	2	MDTACS2050506	●
6	0/-0.020			6	16		50	2	MDTACS2060	●
8	0/-0.020			8	20		64	2	MDTACS208064	●
10	0/-0.020			10	22		70	2	MDTACS2100	●
12	0/-0.020			12	25		75	2	MDTACS212075	●
14	0/-0.020			14	25		75	2	MDTACS2140	●
16	0/-0.020			16	32		90	2	MDTACS216090	●
20	0/-0.020			20	38		100	2	MDTACS220038	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTACS2

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.008	0.007	0.006	0.010
	3	0.012	0.010	0.009	0.016
	4	0.016	0.014	0.012	0.021
	5	0.020	0.017	0.015	0.026
	6	0.025	0.021	0.019	0.033
	8	0.032	0.027	0.024	0.042
	10	0.038	0.032	0.029	0.049
	12	0.045	0.038	0.034	0.059
	14	0.052	0.044	0.039	0.068
	16	0.060	0.051	0.045	0.078
	18	0.070	0.060	0.053	0.091
	20	0.080	0.068	0.060	0.104

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.005	0.004	0.004	0.006
	2	0.010	0.008	0.007	0.012
	3	0.014	0.012	0.011	0.019
	4	0.019	0.016	0.014	0.025
	5	0.024	0.020	0.018	0.031
	6	0.030	0.026	0.023	0.039
	8	0.038	0.033	0.029	0.050
	10	0.046	0.039	0.034	0.059
	12	0.054	0.046	0.041	0.070
	14	0.062	0.053	0.047	0.081
	16	0.072	0.061	0.054	0.094
	18	0.084	0.071	0.063	0.109
	20	0.096	0.082	0.072	0.125

< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**D x D**	**D x D**	**D x D**	**D x D**
	Vc (m/min)	**70÷90**	**40÷60**	**25÷35**	**80÷100**
DRILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.002	0.002	0.002	0.003
	2	0.005	0.004	0.004	0.006
	3	0.007	0.006	0.005	0.009
	4	0.010	0.008	0.007	0.012
	5	0.012	0.010	0.009	0.016
	6	0.015	0.013	0.011	0.020
	8	0.019	0.016	0.014	0.025
	10	0.023	0.019	0.017	0.030
	12	0.027	0.023	0.020	0.035
	14	0.031	0.027	0.023	0.041
	16	0.036	0.031	0.027	0.047
	18	0.042	0.036	0.032	0.055
	20	0.048	0.041	0.036	0.062

< D3 mm: ap = 0.5D

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDTA210

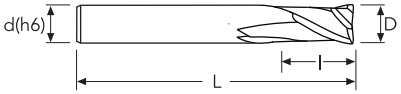
cylindrical shank, 2 flutes, long

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | SQUARE | Z2

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING | DRILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.030			3	20		60	2	MDTA210030	●
4	0/-0.030			4	20		60	2	MDTA210040	●
5	0/-0.030			5	25		75	2	MDTA210050	●
6	0/-0.030			6	30		75	2	MDTA210060	●
8	0/-0.030			8	30		75	2	MDTA210080	●
10	0/-0.030			10	40		100	2	MDTA210100	●
12	0/-0.030			12	45		100	2	MDTA210120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTA210

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**70÷90**	**45÷65**	**30÷40**	**70÷80**
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.010	0.009	0.008	0.013
	4	0.014	0.012	0.011	0.018
	5	0.018	0.015	0.014	0.023
	6	0.023	0.019	0.017	0.029
	8	0.030	0.026	0.023	0.039
	10	0.035	0.030	0.026	0.046
	12	0.041	0.035	0.031	0.053

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**
	Vc (m/min)	**70÷90**	**45÷65**	**30÷50**	**80÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0,012	0,010	0,009	0,016
	4	0,017	0,014	0,013	0,022
	5	0,022	0,018	0,016	0,028
	6	0,027	0,023	0,020	0,035
	8	0,036	0,031	0,027	0,047
	10	0,042	0,036	0,032	0,055
	12	0,049	0,042	0,037	0,064

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**	**1.5D x 0.5D**
	Vc (m/min)	**60÷80**	**40÷60**	**25÷35**	**70÷100**
DRILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.006	0.005	0.005	0.008
	4	0.008	0.007	0.006	0.011
	5	0.011	0.009	0.008	0.014
	6	0.014	0.011	0.010	0.018
	8	0.018	0.015	0.014	0.023
	10	0.021	0.018	0.016	0.027
	12	0.025	0.021	0.018	0.032

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDCL2

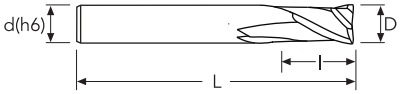
cylindrical shank, 2 flutes, long

OSAWA NORM | N | MG / BR | <45 HRC | 30° | SQUARE | Z2

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.020			3	30		75	2	MDCL2030	●
4	0/-0.020			4	30		75	2	MDCL2040	●
5	0/-0.020			5	40		100	2	MDCL2050	●
6	0/-0.020			6	50		150	2	MDCL2060	●
8	0/-0.020			8	50		150	2	MDCL2080	●
10	0/-0.020			10	60		150	2	MDCL2100	●
12	0/-0.020			12	75		150	2	MDCL2120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

MDCL2

SLOTTING	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.3D x D**	**0.3D x D**	**0.3D x D**	**0.3D x D**
	Vc (m/min)	**40÷50**	**25÷35**	**20÷30**	**60÷80**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.010	0.008	0.007	0.011
	4	0.013	0.011	0.010	0.014
	5	0.016	0.014	0.012	0.018
	6	0.020	0.017	0.015	0.022
	8	0.026	0.022	0.019	0.033
	10	0.030	0.026	0.023	0.040
	12	0.036	0.031	0.027	0.047

SIDE MILLING	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**
	Vc (m/min)	**45÷55**	**30÷40**	**25÷35**	**70÷90**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.012	0.010	0.009	0.013
	4	0.015	0.013	0.012	0.017
	5	0.019	0.016	0.014	0.021
	6	0.024	0.020	0.018	0.027
	8	0.031	0.026	0.023	0.040
	10	0.036	0.031	0.027	0.047
	12	0.043	0.037	0.032	0.056

MDTACS3

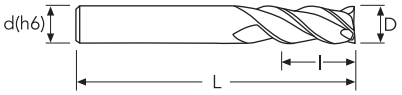
cylindrical shank, 3 flutes

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | SQUARE | Z3

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.015			3	3		40	3	MDTACS3010403	●
1	0/-0.015			4	3		40	3	MDTACS3010404	●
1.5	0/-0.015			3	4.5		40	3	MDTACS3015403	●
1.5	0/-0.015			4	4.5		40	3	MDTACS3015404	●
2	0/-0.015			3	6.5		40	3	MDTACS3020403	●
2	0/-0.015			4	6.5		40	3	MDTACS3020404	●
2.5	0/-0.015			3	6.5		40	3	MDTACS3025403	●
2.5	0/-0.015			4	6.5		40	3	MDTACS3025404	●
3	0/-0.020			3	9		40	3	MDTACS3030403	●
4	0/-0.020			4	12		50	3	MDTACS3040504	●
5	0/-0.020			6	15		50	3	MDTACS3050506	●
6	0/-0.020			6	16		50	3	MDTACS3060	●
8	0/-0.020			8	20		64	3	MDTACS308064	●
10	0/-0.020			10	22		70	3	MDTACS3100	●
12	0/-0.020			12	25		75	3	MDTACS312075	●
14	0/-0.020			14	25		75	3	MDTACS3140	●
16	0/-0.020			16	32		90	3	MDTACS316090	●
20	0/-0.020			20	38		100	3	MDTACS320038	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTACS3

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.008	0.007	0.006	0.010
	3	0.011	0.009	0.008	0.014
	4	0.014	0.012	0.011	0.019
	5	0.018	0.015	0.013	0.023
	6	0.021	0.018	0.016	0.027
	8	0.028	0.023	0.021	0.036
	10	0.035	0.030	0.026	0.046
	12	0.044	0.037	0.033	0.057
	14	0.052	0.044	0.039	0.067
	16	0.059	0.050	0.045	0.077
	18	0.066	0.056	0.050	0.086
	20	0.072	0.061	0.054	0.093

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.005	0.004	0.003	0.006
	2	0.009	0.008	0.007	0.012
	3	0.013	0.011	0.010	0.017
	4	0.017	0.015	0.013	0.022
	5	0.021	0.018	0.016	0.027
	6	0.025	0.021	0.019	0.033
	8	0.033	0.028	0.025	0.043
	10	0.042	0.036	0.032	0.055
	12	0.053	0.045	0.040	0.069
	14	0.062	0.053	0.047	0.081
	16	0.071	0.061	0.053	0.093
	18	0.079	0.067	0.059	0.103
	20	0.086	0.073	0.064	0.112

< D3 mm: ae = 0.1D

MDTAWSH3

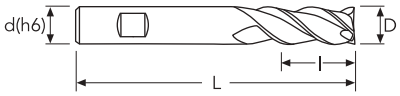
weldon shank, 3 flutes

OSAWA NORM | N | MG PV200 | <45 HRC | 45° | SQUARE | Z3

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.030			6	7		57	3	MDTAWSH3030	●
4	0/-0.030			6	8		57	3	MDTAWSH3040	●
5	0/-0.030			6	10		57	3	MDTAWSH3050	●
6	0/-0.030			6	10		57	3	MDTAWSH3060	●
8	0/-0.030			8	16		63	3	MDTAWSH3080	●
10	0/-0.030			10	19		72	3	MDTAWSH3100	●
12	0/-0.030			12	22		83	3	MDTAWSH3120	●
14	0/-0.030			14	22		83	3	MDTAWSH3140	●
16	0/-0.030			16	26		92	3	MDTAWSH3160	●
20	0/-0.030			20	32		104	3	MDTAWSH3200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTAWSH3

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**80÷120**
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.009	0.008	0.007	0.012
	4	0.013	0.011	0.009	0.016
	5	0.016	0.013	0.012	0.020
	6	0.019	0.016	0.014	0.024
	8	0.025	0.021	0.019	0.033
	10	0.031	0.027	0.023	0.041
	12	0.040	0.034	0.030	0.052
	14	0.046	0.039	0.035	0.060
	16	0.056	0.048	0.042	0.073
	18	0.065	0.055	0.049	0.085
	20	0.075	0.064	0.056	0.098

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**
	Vc (m/min)	**90÷110**	**60÷80**	**40÷60**	**110÷130**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.011	0.010	0.008	0.015
	4	0.015	0.013	0.011	0.020
	5	0.019	0.016	0.014	0.024
	6	0.023	0.019	0.017	0.029
	8	0.030	0.026	0.023	0.039
	10	0.038	0.032	0.028	0.049
	12	0.048	0.041	0.036	0.062
	14	0.056	0.047	0.042	0.072
	16	0.068	0.057	0.051	0.088
	18	0.078	0.066	0.059	0.101
	20	0.090	0.077	0.068	0.117

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDTACS4

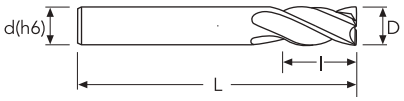
cylindrical shank, 4 flutes

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | SQUARE | Z4

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.015			3	3		40	4	MDTACS4010403	●
1	0/-0.015			4	3		40	4	MDTACS4010404	●
1.5	0/-0.015			3	4.5		40	4	MDTACS4015403	●
1.5	0/-0.015			4	4.5		40	4	MDTACS4015404	●
2	0/-0.015			2	8		32	4	MDTACS4020	●
2	0/-0.015			3	6.5		40	4	MDTACS4020403	●
2	0/-0.015			4	6.5		40	4	MDTACS4020404	●
2.5	0/-0.015			3	6.5		40	4	MDTACS4025403	●
2.5	0/-0.015			4	6.5		40	4	MDTACS4025404	●
3	0/-0.020			3	9		40	4	MDTACS4030403	●
4	0/-0.020			4	12		50	4	MDTACS4040504	●
5	0/-0.020			6	15		50	4	MDTACS4050506	●
6	0/-0.020			6	16		50	4	MDTACS4060	●
8	0/-0.020			8	20		64	4	MDTACS408064	●
10	0/-0.020			10	22		70	4	MDTACS4100	●
12	0/-0.020			12	25		75	4	MDTACS412075	●
14	0/-0.020			14	25		75	4	MDTACS4140	●
16	0/-0.020			16	32		90	4	MDTACS416090	●
20	0/-0.020			20	38		100	4	MDTACS420038	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTACS4

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.2D**	**1.5D x 0.2D**	**1.5D x 0.2D**	**0.5D x D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.007	0.006	0.005	0.009
	3	0.010	0.009	0.008	0.013
	4	0.013	0.011	0.010	0.017
	5	0.016	0.014	0.012	0.021
	6	0.019	0.016	0.014	0.025
	8	0.025	0.021	0.019	0.033
	10	0.032	0.027	0.024	0.042
	12	0.040	0.034	0.030	0.052
	14	0.047	0.040	0.035	0.061
	16	0.054	0.046	0.041	0.070
	18	0.060	0.051	0.045	0.078
	20	0.065	0.055	0.049	0.085
	22	0.073	0.062	0.055	0.095
	25	0.083	0.071	0.062	0.108

< D3 mm: ae = 0.1D

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDTA410

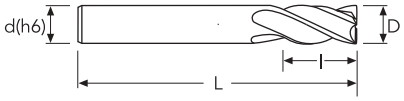
cylindrical shank, 4 flutes, long

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | SQUARE | Z4

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.030			3	20		60	4	MDTA410030	●
4	0/-0.030			4	20		60	4	MDTA410040	●
5	0/-0.030			5	25		75	4	MDTA410050	●
6	0/-0.030			6	30		75	4	MDTA410060	●
8	0/-0.030			8	30		75	4	MDTA410080	●
10	0/-0.030			10	40		100	4	MDTA410100	●
12	0/-0.030			12	45		100	4	MDTA410120	●
14	0/-0.030			14	45		100	4	MDTA410140	●
16	0/-0.030			16	45		100	4	MDTA410160	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTA410

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**
	Vc (m/min)	**70÷90**	**45÷65**	**30÷50**	**80÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.006	0.005	0.005	0.008
	3	0.009	0.008	0.007	0.012
	4	0.012	0.010	0.009	0.015
	5	0.014	0.012	0.011	0.019
	6	0.017	0.015	0.013	0.022
	8	0.023	0.019	0.017	0.029
	10	0.029	0.024	0.022	0.037
	12	0.036	0.031	0.027	0.047
	14	0.042	0.036	0.032	0.065
	16	0.048	0.041	0.036	0.062

MDCL4

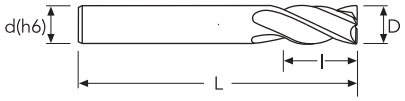
cylindrical shank, 4 flutes, long

OSAWA NORM | N | MG / BR | <45 HRC | 30° | SQUARE | Z4

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SIDE MILLING



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.020			3	30		75	4	MDCL4030	●
4	0/-0.020			4	30		75	4	MDCL4040	●
5	0/-0.020			5	40		100	4	MDCL4050	●
6	0/-0.020			6	50		150	4	MDCL4060	●
8	0/-0.020			8	50		150	4	MDCL4080	●
10	0/-0.020			10	60		150	4	MDCL4100	●
12	0/-0.035			12	75		150	4	MDCL4120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDCL4

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**
	Vc (m/min)	**45÷55**	**30÷40**	**25÷35**	**70÷90**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.008	0.007	0.006	0.009
	4	0.010	0.009	0.008	0.011
	5	0.013	0.011	0.010	0.014
	6	0.015	0.013	0.011	0.017
	8	0.020	0.017	0.015	0.026
	10	0.026	0.022	0.019	0.033
	12	0.032	0.027	0.024	0.042
	14	0.038	0.032	0.028	0.049
	16	0.043	0.037	0.032	0.056
	20	0.052	0.044	0.039	0.068

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDTAUPR

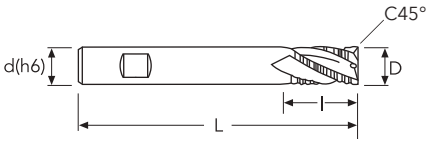
weldon shank, roughing HR, unequal pitch

OSAWA NORM | N | MG / PV200 | <45 HRC | 40° | C45° | HR FINE | Z3 UP ≤ Ø8 | Z4 UP > Ø8

P	M	K	N	S	H
★	☆	★			

★ 1st choice ☆ suitable

SIDE MILLING



D	D Tol.	C45°	C45° Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
6	0/-0.030	0.10	+/-0.020	6	16		57	3	MDTAUPR060	●
8	0/-0.030	0.20	+/-0.020	8	16		63	3	MDTAUPR080	●
10	0/-0.030	0.20	+/-0.020	10	22		72	4	MDTAUPR100	●
12	0/-0.030	0.20	+/-0.020	12	26		83	4	MDTAUPR120	●
14	0/-0.030	0.30	+/-0.020	14	26		83	4	MDTAUPR140	●
16	0/-0.030	0.30	+/-0.020	16	32		92	4	MDTAUPR160	●
20	0/-0.030	0.40	+/-0.020	20	38		104	4	MDTAUPR200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTAUPR

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**0.5D x D**	**0.5D x D**	**1.5D x 0.1D**	
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
	6	0.030	0.026	0.023	
	8	0.045	0.038	0.034	
	10	0.055	0.047	0.041	
	12	0.065	0.055	0.049	
	14	0.075	0.064	0.056	
	16	0.085	0.072	0.064	
	20	0.100	0.085	0.075	

D6-8: Z3
D10-20: Z4

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**	
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
	6	0.040	0.034	0.030	
	8	0.055	0.047	0.041	
	10	0.065	0.055	0.049	
	12	0.080	0.068	0.060	
	14	0.090	0.077	0.068	
	16	0.100	0.085	0.075	
	20	0.120	0.102	0.090	

D6-8: Z3
D10-20: Z4

INFO

CARBIDE DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA

HSS DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE END-MILLS

G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS END-MILLS

CARBIDE BURRS

MDTACSB2

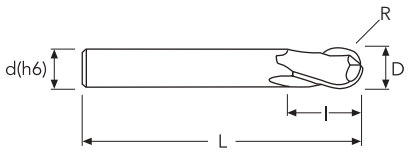
cylindrical shank, 2 flutes ball nose

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | BALL NOSE | Z2 BALL

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

COPYING



D	D Tol.	R	R Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.030	0.50	0/-0.020	3	3		40	2	MDTACSB2010	●
1.5	0/-0.030	0.75	0/-0.020	3	5		40	2	MDTACSB2015	●
2	0/-0.030	1.00	0/-0.020	3	7		40	2	MDTACSB2020	●
2.5	0/-0.030	1.25	0/-0.020	3	8		40	2	MDTACSB2025	●
3	0/-0.030	1.50	0/-0.020	3	10		40	2	MDTACSB2030	●
4	0/-0.030	2.00	0/-0.020	4	12		40	2	MDTACSB2040	●
5	0/-0.030	2.50	0/-0.020	5	14		50	2	MDTACSB2050	●
6	0/-0.030	3.00	0/-0.020	6	7		50	2	MDTACSB2060	●
8	0/-0.030	4.00	0/-0.020	8	9		60	2	MDTACSB2080	●
10	0/-0.030	5.00	0/-0.020	10	10		60	2	MDTACSB2100	●
12	0/-0.030	6.00	0/-0.020	12	14		70	2	MDTACSB2120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTACSB2

	Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm		≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae		**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**
	Vc (m/min)		**80÷100**	**60÷80**	**40÷60**	**110÷130**
COPYING	D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	**0.60**	0.030	0.023	0.021	0.036
	2	**1.20**	0.040	0.030	0.028	0.048
	3	**1.80**	0.050	0.038	0.035	0.060
	4	**2.40**	0.060	0.045	0.042	0.072
	5	**3.00**	0.070	0.053	0.049	0.084
	6	**3.60**	0.080	0.060	0.056	0.096
	8	**4.80**	0.090	0.068	0.063	0.108
	10	**6.00**	0.105	0.079	0.074	0.126
	12	**7.20**	0.120	0.090	0.084	0.144

MDTA250

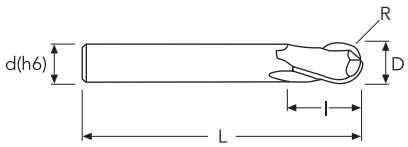
cylindrical shank, 2 flutes ball nose, long

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | BALL NOSE | Z2 BALL

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

COPYING



D	D Tol.	R	R Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
3	0/-0.030	1.50	0/-0.020	3	5		75	2	MDTA250030	●
4	0/-0.030	2.00	0/-0.020	4	8		75	2	MDTA250040	●
5	0/-0.030	2.50	0/-0.020	5	9		75	2	MDTA250050	●
6	0/-0.030	3.00	0/-0.020	6	10		100	2	MDTA250060	●
8	0/-0.030	4.00	0/-0.020	8	12		100	2	MDTA250080	●
10	0/-0.030	5.00	0/-0.020	10	14		100	2	MDTA250100	●
12	0/-0.030	6.00	0/-0.020	12	16		100	2	MDTA250120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

MDTA250

	Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm		≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae		**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**
	Vc (m/min)		**70÷90**	**50÷70**	**40÷50**	**100÷120**
COPYING	D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	**0.60**	0.027	0.020	0.019	0.032
	2	**1.20**	0.036	0.027	0.025	0.043
	3	**1.80**	0.045	0.034	0.032	0.054
	4	**2.40**	0.054	0.041	0.038	0.065
	5	**3.00**	0.063	0.047	0.044	0.076
	6	**3.60**	0.072	0.054	0.050	0.086
	8	**4.80**	0.081	0.061	0.057	0.097
	10	**6.00**	0.095	0.071	0.066	0.113
	12	**7.20**	0.108	0.081	0.076	0.130