NEW ITEMS AVAILABLE.
PLEASE REFER TO OSW23 UPDATE - SEPTEMBER.

G2
GENERAL PURPOSE

Range of general-purpose endmills, featuring new cutting geometries and innovative coatings for enhanced performance. The answer given by Osawa to the market demand for higher performance tools. Thanks to a fully optimized manufacturing process and to large production batches the G2 range excels in the cost-performance ratio.

Gamma di frese per uso generico, dotate di geometria di taglio e rivestimenti innovativi per garantire prestazioni ancora più elevate. La risposta di Osawa ad un mercato che chiede utensili sempre più performanti e competitivi. L'innovazione nei processi produttivi consente alla gamma G2 di eccellere nel rapporto qualità-prezzo.

Produktpalette von Fräser für allgemeine Anwendungen, ausgestattet mit einer Schnittgeometrie und innovativen Beschichtungen zur Gewährleistung noch höheren Leistungen. Die Antwort von Osawa auf einen Markt, der immer leistungsstärkere und wettbewerbsfähigere Werkzeuge fordert. Dank der Innovation der Produktionsprozesse zeichnet sich die Produktreihe G2 durch ein außergewöhnliches Preis-Leistungsverhältnis aus.

Gamme de fraises pour un usage général, dotées de géométrie de coupe et de revêtements innovants pour garantir des prestations encore plus élevées. C'est la réponse d'Osawa à un marché qui nécessite d'outils de plus en plus performants et compétitifs. L'innovation des processus de production permet à la gamme G2 d'avoir un rapport qualité-prix excellent.

Gama de fresas para uso genérico, provistas de geometría de corte y revestimientos innovadores para garantizar prestaciones aún más elevadas. La respuesta de Osawa a un mercado que pide herramientas cada vez con mayor rendimiento y más competitivas. La innovación en los procesos de producción permite a la gama G2 sobresalir en la relación calidad-precio.

Ассортимент фрез общего назначения, с новой геометрией и покрытиями, гарантирующими высокоэффективную работу. Это ответ компании Osawa на запросы рынка, который требует всё более конкурентоспособные инструменты с высокими эксплуатационными характеристиками. Инновации в производственных процессах и большие изготавливаемые партии позволяют серии G2 иметь превосходное соотношение цена-качество.

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

GB205

cylindrical shank, 2 flutes

OSAWA NORM | N | MG / BR | <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/-0.020			4	3		50	2	GB205010	●
1.5	0/-0.020			4	4.5		50	2	GB205015	●
2	0/-0.020			4	6		50	2	GB205020	●
3	0/-0.020			4	8		50	2	GB205030	●
4	0/-0.020			4	11		50	2	GB205040	●
5	0/-0.020			6	13		50	2	GB205050	●
6	0/-0.020			6	15		50	2	GB205060	●
8	0/-0.025			8	20		60	2	GB205080	●
10	0/-0.025			10	30		75	2	GB205100	●
12	0/-0.025			12	30		75	2	GB205120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

GB205

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	**0.5D x D**	**0.5D x D**	**0.3D x D**	**0.5D x D**
	Vc (m/min)	**50÷60**	**30÷50**	**20÷40**	**70÷90**
	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	0.014	0.012	0.011	0.018
	5	0.018	0.015	0.014	0.023
	6	0.023	0.020	0.017	0.030
	8	0.030	0.026	0.023	0.039
	10	0.038	0.032	0.029	0.049
	12	0.045	0.038	0.034	0.059

< D3 mm: ap = 0.2D

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 0.2D**	**1.5D x 0.3D**
	Vc (m/min)	**50÷60**	**30÷50**	**20÷40**	**70÷90**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.004	0.003	0.006
	2	0.009	0.007	0.007	0.011
	3	0.013	0.011	0.009	0.016
	4	0.018	0.015	0.013	0.023
	5	0.023	0.019	0.017	0.029
	6	0.029	0.024	0.022	0.037
	8	0.038	0.032	0.028	0.049
	10	0.048	0.040	0.036	0.062
	12	0.056	0.048	0.042	0.073

< D3 mm: ae = 0.2D

DRILLING	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)	**40÷50**	**30÷40**	**20÷30**	**60÷80**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.002	0.002	0.002	0.003
	2	0.004	0.004	0.003	0.006
	3	0.006	0.005	0.005	0.008
	4	0.009	0.007	0.007	0.011
	5	0.011	0.010	0.008	0.015
	6	0.014	0.012	0.011	0.019
	8	0.019	0.016	0.014	0.024
	10	0.024	0.020	0.018	0.031
	12	0.028	0.024	0.021	0.037

< D3 mm: ap = 0.5D

G2CS2

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/-0.020			4	3		50	2	G2CS2010	●
1.5	0/-0.020			4	4.5		50	2	G2CS2015	●
2	0/-0.020			4	6		50	2	G2CS2020	●
2.5	0/-0.020			4	7		50	2	G2CS2025	●
3	0/-0.020			4	8		50	2	G2CS2030	●
3.5	0/-0.020			4	10		50	2	G2CS2035	●
4	0/-0.020			4	11		50	2	G2CS2040	●
4.5	0/-0.020			6	13		50	2	G2CS2045	●
5	0/-0.020			6	13		50	2	G2CS2050	●
5.5	0/-0.020			6	13		50	2	G2CS2055	●
6	0/-0.020			6	15		50	2	G2CS2060	●
6.5	0/-0.025			8	17		60	2	G2CS2065	●
7	0/-0.025			8	17		60	2	G2CS2070	●
7.5	0/-0.025			8	17		60	2	G2CS2075	●
8	0/-0.025			8	20		60	2	G2CS2080	●
8.5	0/-0.025			10	23		75	2	G2CS2085	●
9	0/-0.025			10	23		75	2	G2CS2090	●
10	0/-0.025			10	30		75	2	G2CS2100	●
10.5	0/-0.025			12	25		75	2	G2CS2105	●
11	0/-0.025			12	28		75	2	G2CS2110	●
12	0/-0.025			12	30		75	2	G2CS2120	●
13	0/-0.030			16	33		100	2	G2CS2130	●
14	0/-0.030			14	26		83	2	G2CS2140	●
15	0/-0.030			16	40		100	2	G2CS2150	●
16	0/-0.030			16	32		92	2	G2CS2160	●
17	0/-0.030			20	40		100	2	G2CS2170	●
18	0/-0.030			20	40		100	2	G2CS2180	●
20	0/-0.030			20	40		100	2	G2CS2200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

G2CS2

	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

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

G2WS2

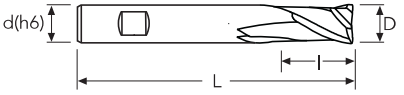
weldon shank, 2 flutes

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
3	0/-0.020			6	8		57	2	G2WS2030	●
4	0/-0.020			6	11		57	2	G2WS2040	●
5	0/-0.020			6	13		57	2	G2WS2050	●
6	0/-0.020			6	13		57	2	G2WS2060	●
8	0/-0.025			8	19		63	2	G2WS2080	●
10	0/-0.025			10	22		72	2	G2WS2100	●
12	0/-0.025			12	26		83	2	G2WS2120	●
14	0/-0.030			14	26		83	2	G2WS2140	●
16	0/-0.030			16	32		92	2	G2WS2160	●
20	0/-0.030			20	38		104	2	G2WS2200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

G2WS2

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	**0.5D 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**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.012	0.010	0.009	0.016
	4	0.016	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

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 0.5D**	**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**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	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

DRILLING	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**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	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

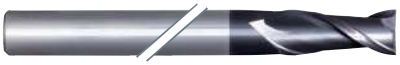
INFO
CARBIDE DRILLS
PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA
HSS DRILLS
LFTA
SUTA
HSS-HSS/CO
CARBIDE END-MILLS
G2
MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH
HSS END-MILLS
CARBIDE BURRS

G2210-11-12

cylindrical shank, 2 flutes, long

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

G2210



G2211-G2212

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
2	0/-0.030			4	9		75	2	G2210020	●
3	0/-0.030			4	15		75	2	G2210030	●
4	0/-0.030			4	20		75	2	G2210040	●
5	0/-0.030			6	25		75	2	G2210050	●
6	0/-0.030			6	25		75	2	G2210060	●
5	0/-0.030			6	30		100	2	G2211050	●
6	0/-0.030			6	30		100	2	G2211060	●
8	0/-0.035			8	35		100	2	G2211080	●
10	0/-0.035			10	40		100	2	G2211100	●
12	0/-0.035			12	45		100	2	G2211120	●
8	0/-0.035			8	40		150	2	G2212080	●
10	0/-0.035			10	50		150	2	G2212100	●
12	0/-0.035			12	50		150	2	G2212120	●
16	0/-0.040			16	70		150	2	G2212160	●

● stock standard ○ non-standard stock ▽ stock exhaustion

G2210-G2211

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	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**70÷90**	**45÷65**	**30÷50**	**80÷120**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.007	0.006	0.005	0.009
	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

< D3 mm: ap = 0.2D

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 0.5D**	**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**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.008	0.007	0.006	0.011
	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

< D3 mm: ae = 0.2D

DRILLING	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)	**60÷80**	**40÷60**	**25÷35**	**70÷100**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.004	0.004	0.003	0.005
	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

< 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

CUTTING PARAMETERS

G2212

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)	**55÷75**	**40÷60**	**20÷40**	**70÷90**
D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
8	0.026	0.022	0.020	0.034
10	0.032	0.027	0.024	0.042
12	0.036	0.031	0.027	0.047
14	0.042	0.036	0.032	0.055
16	0.048	0.041	0.036	0.062

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)	**55÷75**	**40÷60**	**20÷40**	**70÷90**
D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
8	0.031	0.027	0.023	0.041
10	0.038	0.033	0.029	0.050
12	0.043	0.037	0.032	0.056
14	0.050	0.043	0.038	0.066
16	0.058	0.049	0.043	0.075

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)	**50÷70**	**35÷55**	**20÷30**	**60÷80**
D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
8	0.016	0.013	0.012	0.020
10	0.019	0.016	0.014	0.025
12	0.022	0.018	0.016	0.028
14	0.025	0.021	0.019	0.033
16	0.029	0.024	0.022	0.037

GB305

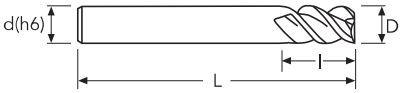
cylindrical shank, 3 flutes

OSAWA NORM | N | MG / BR | <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
1	0/-0.020			4	3		50	3	GB305010	●
1.5	0/-0.020			4	4.5		50	3	GB305015	●
2	0/-0.020			4	6		50	3	GB305020	●
3	0/-0.020			4	8		50	3	GB305030	●
4	0/-0.020			4	11		50	3	GB305040	●
5	0/-0.020			6	13		50	3	GB305050	●
6	0/-0.020			6	15		50	3	GB305060	●
8	0/-0.025			8	20		60	3	GB305080	●
10	0/-0.025			10	30		75	3	GB305100	●
12	0/-0.025			12	30		75	3	GB305120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

GB305

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	**0.5D x D**	**0.5D x D**	**0.5D x D**	**0.5D x D**
	Vc (m/min)	**50÷60**	**30÷50**	**20÷40**	**70÷90**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.003	0.003	0.002	0.004
	2	0.006	0.005	0.004	0.008
	3	0.009	0.007	0.006	0.011
	4	0.012	0.010	0.009	0.016
	5	0.015	0.013	0.012	0.020
	6	0.020	0.017	0.015	0.026
	8	0.026	0.022	0.019	0.033
	10	0.032	0.028	0.024	0.042
	12	0.038	0.033	0.029	0.050

< D3 mm: ap = 0.2D

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)	**50÷70**	**40÷60**	**20÷40**	**80÷100**
	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	0.014	0.012	0.011	0.019
	5	0.018	0.016	0.014	0.024
	6	0.024	0.020	0.018	0.031
	8	0.031	0.026	0.023	0.040
	10	0.039	0.033	0.029	0.051
	12	0.046	0.039	0.035	0.060

< D3 mm: ae = 0.1D

G2CSH3

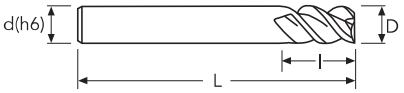
cylindrical shank, 3 flutes

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
1	0/-0.020			4	3		50	3	G2CSH3010	●
1.5	0/-0.020			4	4.5		50	3	G2CSH3015	●
2	0/-0.020			4	6		50	3	G2CSH3020	●
2.5	0/-0.020			4	7		50	3	G2CSH3025	●
3	0/-0.020			4	8		50	3	G2CSH3030	●
3.5	0/-0.020			4	10		50	3	G2CSH3035	●
4	0/-0.020			4	11		50	3	G2CSH3040	●
4.5	0/-0.020			6	13		50	3	G2CSH3045	●
5	0/-0.020			6	13		50	3	G2CSH3050	●
5.5	0/-0.020			6	13		50	3	G2CSH3055	●
6	0/-0.020			6	15		50	3	G2CSH3060	●
6.5	0/-0.025			8	17		60	3	G2CSH3065	●
7	0/-0.025			8	17		60	3	G2CSH3070	●
7.5	0/-0.025			8	17		60	3	G2CSH3075	●
8	0/-0.025			8	20		60	3	G2CSH3080	●
8.5	0/-0.025			10	23		75	3	G2CSH3085	●
9	0/-0.025			10	23		75	3	G2CSH3090	●
10	0/-0.025			10	30		75	3	G2CSH3100	●
11	0/-0.025			12	28		75	3	G2CSH3110	●
12	0/-0.025			12	30		75	3	G2CSH3120	●
14	0/-0.030			14	26		83	3	G2CSH3140	●
16	0/-0.030			16	32		92	3	G2CSH3160	●
18	0/-0.030			20	40		100	3	G2CSH3180	●
20	0/-0.030			20	40		100	3	G2CSH3200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

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

G2CSH3

	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)
	1	0.003	0.003	0.002	0.004
	2	0.006	0.005	0.005	0.008
	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

< 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 0.3D**	**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)
	1	0.004	0.003	0.003	0.005
	2	0.008	0.006	0.006	0.010
	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

< D3 mm: ae = 0.1D

G2WSH3

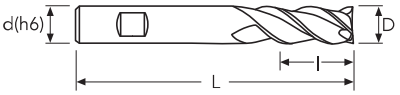
weldon shank, 3 flutes

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/-0.020			6	8		57	3	G2WSH3030	●
4	0/-0.020			6	11		57	3	G2WSH3040	●
5	0/-0.020			6	13		57	3	G2WSH3050	●
6	0/-0.020			6	13		57	3	G2WSH3060	●
8	0/-0.025			8	19		63	3	G2WSH3080	●
10	0/-0.025			10	22		72	3	G2WSH3100	●
12	0/-0.025			12	26		83	3	G2WSH3120	●
14	0/-0.030			14	26		83	3	G2WSH3140	●
16	0/-0.030			16	32		92	3	G2WSH3160	●
20	0/-0.030			20	38		104	3	G2WSH3200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2WSH3

	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

< 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 0.3D**	**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

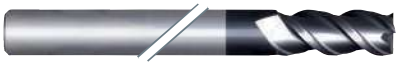
< D3 mm: ae = 0.1D

G2310-11-12

cylindrical shank, 3 flutes, long

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

G2310

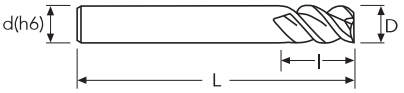


G2311-G2312

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
2	0/-0.030			4	9		75	3	G2310020	●
3	0/-0.030			4	15		75	3	G2310030	●
4	0/-0.030			4	20		75	3	G2310040	●
5	0/-0.030			6	25		75	3	G2310050	●
6	0/-0.030			6	25		75	3	G2310060	●
4	0/-0.030			6	25		100	3	G2311040	●
5	0/-0.030			6	30		100	3	G2311050	●
6	0/-0.030			6	30		100	3	G2311060	●
7	0/-0.030			8	35		100	3	G2311070	●
8	0/-0.035			8	35		100	3	G2311080	●
9	0/-0.035			10	40		100	3	G2311090	●
10	0/-0.035			10	40		100	3	G2311100	●
11	0/-0.035			12	45		100	3	G2311110	●
12	0/-0.035			12	45		100	3	G2311120	●
8	0/-0.035			8	40		150	3	G2312080	●
10	0/-0.035			10	50		150	3	G2312100	●
12	0/-0.035			12	50		150	3	G2312120	●
16	0/-0.040			16	70		150	3	G2312160	●
20	0/-0.040			20	80		150	3	G2312200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2310-G2311

	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)	**60÷80**	**35÷55**	**25÷35**	**80÷100**
SLOTTING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.006	0.005	0.004	0.007
	3	0.008	0.007	0.006	0.011
	4	0.011	0.010	0.008	0.015
	5	0.014	0.012	0.011	0.018
	6	0.017	0.014	0.013	0.022
	8	0.023	0.019	0.017	0.029
	10	0.028	0.024	0.021	0.037
	12	0.036	0.031	0.027	0.047

< 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 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**	**1.5D x 0.3D**
	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	0.007	0.006	0.005	0.009
	3	0.011	0.009	0.008	0.014
	4	0.014	0.012	0.011	0.018
	5	0.018	0.015	0.013	0.023
	6	0.021	0.018	0.016	0.027
	8	0.028	0.024	0.021	0.037
	10	0.035	0.030	0.026	0.046
	12	0.045	0.038	0.034	0.059

< D3 mm: ae = 0.1D

G2312

	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)	**55÷75**	**40÷60**	**20÷40**	**70÷90**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.020	0.017	0.015	0.026
	10	0.025	0.021	0.019	0.033
	12	0.032	0.027	0.024	0.042
	14	0.037	0.031	0.028	0.048
	16	0.045	0.038	0.034	0.059

GB405

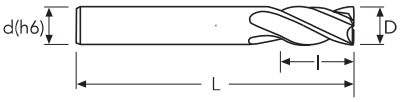
cylindrical shank, 4 flutes

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
1	0/-0.020			4	3		50	4	GB405010	●
1.5	0/-0.020			4	4.5		50	4	GB405015	●
2	0/-0.020			4	6		50	4	GB405020	●
3	0/-0.020			4	8		50	4	GB405030	●
4	0/-0.020			4	11		50	4	GB405040	●
5	0/-0.020			6	13		50	4	GB405050	●
6	0/-0.020			6	15		50	4	GB405060	●
8	0/-0.025			8	20		60	4	GB405080	●
10	0/-0.025			10	30		75	4	GB405100	●
12	0/-0.025			12	30		75	4	GB405120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

GB405

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 0.2D**	**1.5D x 0.2D**	**1.5D x 0.2D**	**1.5D x 0.2D**
Vc (m/min)	**50÷70**	**40÷50**	**20÷40**	**80÷100**
D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
1	0.003	0.003	0.002	0.004
2	0.006	0.006	0.005	0.008
3	0.010	0.008	0.007	0.013
4	0.013	0.011	0.010	0.017
5	0.016	0.014	0.012	0.021
6	0.020	0.017	0.015	0.026
8	0.026	0.022	0.019	0.034
10	0.031	0.026	0.023	0.040
12	0.036	0.031	0.027	0.047

< D3 mm: ae = 0.1D

G2CS4

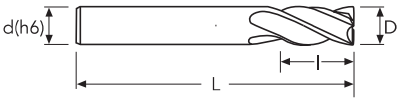
cylindrical shank, 4 flutes

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/-0.020			4	3		50	4	G2CS4010	●
1.5	0/-0.020			4	4.5		50	4	G2CS4015	●
2	0/-0.020			4	6		50	4	G2CS4020	●
2.5	0/-0.020			4	7		50	4	G2CS4025	●
3	0/-0.020			4	8		50	4	G2CS4030	●
3.5	0/-0.020			4	10		50	4	G2CS4035	●
4	0/-0.020			4	11		50	4	G2CS4040	●
4.5	0/-0.020			6	13		50	4	G2CS4045	●
5	0/-0.020			6	13		50	4	G2CS4050	●
5.5	0/-0.020			6	13		50	4	G2CS4055	●
6	0/-0.020			6	15		50	4	G2CS4060	●
6.5	0/-0.025			8	17		60	4	G2CS4065	●
7	0/-0.025			8	17		60	4	G2CS4070	●
7.5	0/-0.025			8	17		60	4	G2CS4075	●
8	0/-0.025			8	20		60	4	G2CS4080	●
8.5	0/-0.025			10	23		75	4	G2CS4085	●
9	0/-0.025			10	23		75	4	G2CS4090	●
9.5	0/-0.025			10	25		75	4	G2CS4095	●
10	0/-0.025			10	30		75	4	G2CS4100	●
10.5	0/-0.025			12	25		75	4	G2CS4105	●
11	0/-0.025			12	30		75	4	G2CS4110	●
11.5	0/-0.025			12	28		75	4	G2CS4115	●
12	0/-0.025			12	30		75	4	G2CS4120	●
12.5	0/-0.030			14	26		83	4	G2CS4125	●
13	0/-0.030			14	26		83	4	G2CS4130	●
13.5	0/-0.030			14	26		83	4	G2CS4135	●
14	0/-0.030			14	26		83	4	G2CS4140	●
14.5	0/-0.030			16	32		92	4	G2CS4145	●
15	0/-0.030			16	32		92	4	G2CS4150	●
15.5	0/-0.030			16	32		92	4	G2CS4155	●
16	0/-0.030			16	32		92	4	G2CS4160	●
17	0/-0.030			20	40		100	4	G2CS4170	●
18	0/-0.030			20	40		100	4	G2CS4180	●
19	0/-0.030			20	40		100	4	G2CS4190	●
20	0/-0.030			20	40		100	4	G2CS4200	●
22	0/-0.030			25	40		100	4	G2CS4220	●
25	0/-0.030			25	40		100	4	G2CS4250	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CS4

	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**	**1.5D x 0.2D**
	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

G2WS4

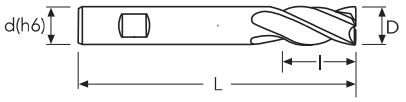
weldon shank, 4 flutes

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
3	0/-0.020			6	8		57	4	G2WS4030	●
4	0/-0.020			6	11		57	4	G2WS4040	●
5	0/-0.020			6	13		57	4	G2WS4050	●
6	0/-0.020			6	13		57	4	G2WS4060	●
8	0/-0.025			8	19		63	4	G2WS4080	●
10	0/-0.025			10	22		72	4	G2WS4100	●
12	0/-0.025			12	26		83	4	G2WS4120	●
14	0/-0.030			14	26		83	4	G2WS4140	●
16	0/-0.030			16	32		92	4	G2WS4160	●
20	0/-0.030			20	38		104	4	G2WS4200	●

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

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2WS4

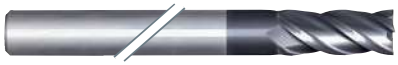
	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
	ap x ae	**1.5D x 0.2D**	**1.5D x 0.2D**	**1.5D x 0.2D**	**1.5D x 0.2D**
	Vc (m/min)	**80÷100**	**50÷70**	**30÷50**	**100÷120**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	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

G2410-11-12-13

cylindrical shank, 4 flutes, long

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

G2410

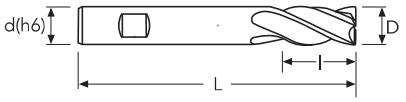


G2411-G2412-G2413

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
2	0/-0.030			4	9		75	4	G2410020	●
2.5	0/-0.030			4	10		75	4	G2410025	●
3	0/-0.030			4	15		75	4	G2410030	●
3.5	0/-0.030			4	15		75	4	G2410035	●
4	0/-0.030			4	20		75	4	G2410040	●
4.5	0/-0.030			6	20		75	4	G2410045	●
5	0/-0.030			6	25		75	4	G2410050	●
6	0/-0.030			6	25		75	4	G2410060	●
3	0/-0.030			6	15		100	4	G2411030	●
4	0/-0.030			6	25		100	4	G2411040	●
5	0/-0.030			6	30		100	4	G2411050	●
6	0/-0.030			6	30		100	4	G2411060	●
7	0/-0.030			8	35		100	4	G2411070	●
8	0/-0.035			8	35		100	4	G2411080	●
9	0/-0.035			10	40		100	4	G2411090	●
10	0/-0.035			10	40		100	4	G2411100	●
11	0/-0.035			12	45		100	4	G2411110	●
12	0/-0.035			12	45		100	4	G2411120	●
8	0/-0.035			8	40		150	4	G2412080	●
10	0/-0.035			10	50		150	4	G2412100	●
12	0/-0.035			12	50		150	4	G2412120	●
16	0/-0.040			16	70		150	4	G2412160	●
18	0/-0.040			20	80		150	4	G2412180	●
20	0/-0.040			20	80		150	4	G2412200	●
16	0/-0.040			16	40		200	4	G2413160	●
20	0/-0.040			20	40		200	4	G2413200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2410-G2411

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 0.1D**	**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**
	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

< D3 mm: ae = 0.1D

G2412-G2413

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 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**
	Vc (m/min)	**55÷75**	**40÷60**	**20÷40**	**70÷90**
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	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	0.065	0.055	0.049	0.085

G2CSHM

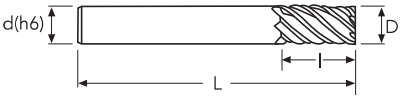
cylindrical shank, multi flute

OSAWA NORM | N | MG PV200 | <45 HRC | 45° | SQUARE | Z6

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
6	0/-0.020			6	15		50	6	G2CSHM060	●
8	0/-0.025			8	20		60	6	G2CSHM080	●
10	0/-0.025			10	30		75	6	G2CSHM100	●
12	0/-0.025			12	30		75	6	G2CSHM120	●
14	0/-0.030			14	30		83	6	G2CSHM140	●
16	0/-0.030			16	35		92	6	G2CSHM160	●
20	0/-0.030			20	40		100	6	G2CSHM200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CSHM

SIDE MILLING

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 0.1D**	**1.5D x 0.1D**	**1.5D x 0.1D**	
Vc (m/min)	**100÷120**	**70÷90**	**50÷70**	
D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
6	0.016	0.014	0.012	
8	0.020	0.017	0.015	
10	0.025	0.021	0.019	
12	0.030	0.026	0.023	
14	0.035	0.030	0.026	
16	0.040	0.034	0.030	
20	0.050	0.043	0.038	

G2CSFR

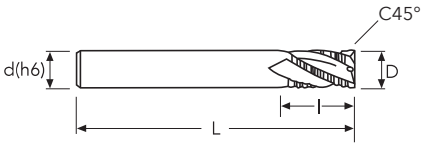
cylindrical shank, roughing HR

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | C45° | HR FINE | Z3~Z4

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
4	0/-0.070	0.28	+/-0.020	6	11		50	3	G2CSFR040	●
5	0/-0.070	0.35	+/-0.020	6	13		50	3	G2CSFR050	●
6	0/-0.070	0.42	+/-0.020	6	15		50	3	G2CSFR060	●
7	0/-0.070	0.49	+/-0.020	8	20		60	3	G2CSFR070	●
8	0/-0.070	0.56	+/-0.020	8	20		60	3	G2CSFR080	●
9	0/-0.070	0.63	+/-0.020	10	25		75	3	G2CSFR090	●
10	0/-0.070	0.70	+/-0.020	10	30		75	4	G2CSFR100	●
11	0/-0.070	0.77	+/-0.020	12	30		75	4	G2CSFR110	●
12	0/-0.070	0.84	+/-0.020	12	30		75	4	G2CSFR120	●
13	0/-0.070	0.91	+/-0.020	14	30		83	4	G2CSFR130	●
14	0/-0.070	0.98	+/-0.020	14	30		83	4	G2CSFR140	●
15	0/-0.070	1.05	+/-0.020	16	30		92	4	G2CSFR150	●
16	0/-0.070	1.12	+/-0.020	16	35		92	4	G2CSFR160	●
20	0/-0.070	1.40	+/-0.020	20	40		100	4	G2CSFR200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CSFR

	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)	**70÷90**	**50÷70**	**30÷50**	
SIDE MILLING	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	0.060	0.051	0.045	
	12	0.072	0.061	0.054	
	14	0.085	0.072	0.064	
	16	0.096	0.082	0.072	
	20	0.120	0.102	0.090	

D6-8: Z3
D10-20: Z4

G2WSFR

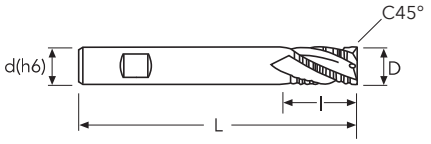
weldon shank, roughing HR

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | C45° | HR FINE | Z3~Z4

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/-0.070	0.42	+/-0.020	6	13		57	3	G2WSFR060	●
8	0/-0.070	0.56	+/-0.020	8	19		63	3	G2WSFR080	●
10	0/-0.070	0.70	+/-0.020	10	22		72	4	G2WSFR100	●
12	0/-0.070	0.84	+/-0.020	12	26		83	4	G2WSFR120	●
14	0/-0.070	0.98	+/-0.020	14	26		83	4	G2WSFR140	●
16	0/-0.070	1.12	+/-0.020	16	32		92	4	G2WSFR160	●
20	0/-0.070	1.40	+/-0.020	20	38		104	4	G2WSFR200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2WSFR

	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)	**70÷90**	**50÷70**	**30÷50**	
SIDE MILLING	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	0.060	0.051	0.045	
	12	0.072	0.061	0.054	
	14	0.085	0.072	0.064	
	16	0.096	0.082	0.072	
	20	0.120	0.102	0.090	

D6-8: Z3
D10-20: Z4

G2CS2R

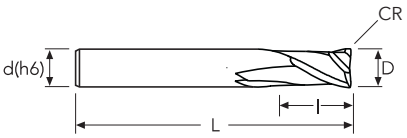
cylindrical shank, 2 flutes, corner radius

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

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SLOTTING | SIDE MILLING | DRILLING



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	4	2		50	2	G2CS2R02010	●
1.5	0/-0.020	0.20	+/-0.010	4	3		50	2	G2CS2R02015	●
1.5	0/-0.020	0.50	+/-0.010	4	3		50	2	G2CS2R05015	●
2	0/-0.020	0.20	+/-0.010	4	4		50	2	G2CS2R02020	●
2	0/-0.020	0.50	+/-0.010	4	4		50	2	G2CS2R05020	●
2.5	0/-0.020	0.20	+/-0.010	4	5		50	2	G2CS2R02025	●
2.5	0/-0.020	0.50	+/-0.010	4	5		50	2	G2CS2R05025	●
3	0/-0.020	0.20	+/-0.010	4	6		50	2	G2CS2R02030	●
3	0/-0.020	0.50	+/-0.010	4	6		50	2	G2CS2R05030	●
3	0/-0.020	1.00	+/-0.010	4	6		50	2	G2CS2R10030	●
4	0/-0.020	0.20	+/-0.010	4	8		50	2	G2CS2R02040	●
4	0/-0.020	0.50	+/-0.010	4	8		50	2	G2CS2R05040	●
4	0/-0.020	1.00	+/-0.010	4	8		50	2	G2CS2R10040	●
5	0/-0.020	0.50	+/-0.010	6	10		50	2	G2CS2R05050	●
5	0/-0.020	1.00	+/-0.010	6	10		50	2	G2CS2R10050	●
6	0/-0.020	0.20	+/-0.010	6	12		50	2	G2CS2R02060	●
6	0/-0.020	0.50	+/-0.010	6	12		50	2	G2CS2R05060	●
6	0/-0.020	1.00	+/-0.010	6	12		50	2	G2CS2R10060	●
6	0/-0.020	1.50	+/-0.010	6	12		50	2	G2CS2R15060	●
6	0/-0.020	2.00	+/-0.010	6	12		50	2	G2CS2R20060	●
8	0/-0.025	0.50	+/-0.010	8	16		60	2	G2CS2R05080	●
8	0/-0.025	1.00	+/-0.010	8	16		60	2	G2CS2R10080	●
8	0/-0.025	1.50	+/-0.010	8	16		60	2	G2CS2R15080	●
8	0/-0.025	2.00	+/-0.010	8	16		60	2	G2CS2R20080	●
10	0/-0.025	0.50	+/-0.010	10	20		75	2	G2CS2R05100	●
10	0/-0.025	1.00	+/-0.010	10	20		75	2	G2CS2R10100	●
10	0/-0.025	1.50	+/-0.010	10	20		75	2	G2CS2R15100	●
10	0/-0.025	2.00	+/-0.010	10	20		75	2	G2CS2R20100	●
12	0/-0.025	0.50	+/-0.010	12	24		75	2	G2CS2R05120	●
12	0/-0.025	1.00	+/-0.010	12	24		75	2	G2CS2R10120	●
12	0/-0.025	1.50	+/-0.010	12	24		75	2	G2CS2R15120	●
12	0/-0.025	2.00	+/-0.010	12	24		75	2	G2CS2R20120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CS2R

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	**0.5D 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**
	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

< D3 mm: ap = 0.2D

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 0.5D**	**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**
	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

< D3 mm: ae = 0.2D

DRILLING	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**
	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

< D3 mm: ap = 0.5D

G2CS4R

cylindrical shank, 4 flutes, corner radius

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

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SIDE MILLING

D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020	0.20	+/-0.010	4	2		50	4	G2CS4R02010	●
1.5	0/-0.020	0.20	+/-0.010	4	3		50	4	G2CS4R02015	●
1.5	0/-0.020	0.50	+/-0.010	4	3		50	4	G2CS4R05015	●
2	0/-0.020	0.20	+/-0.010	4	4		50	4	G2CS4R02020	●
2	0/-0.020	0.50	+/-0.010	4	4		50	4	G2CS4R05020	●
2.5	0/-0.020	0.20	+/-0.010	4	5		50	4	G2CS4R02025	●
2.5	0/-0.020	0.50	+/-0.010	4	5		50	4	G2CS4R05025	●
3	0/-0.020	0.20	+/-0.010	4	6		50	4	G2CS4R02030	●
3	0/-0.020	0.50	+/-0.010	4	6		50	4	G2CS4R05030	●
3	0/-0.020	1.00	+/-0.010	4	6		50	4	G2CS4R10030	●
4	0/-0.020	0.20	+/-0.010	4	8		50	4	G2CS4R02040	●
4	0/-0.020	0.50	+/-0.010	4	8		50	4	G2CS4R05040	●
4	0/-0.020	1.00	+/-0.010	4	8		50	4	G2CS4R10040	●
5	0/-0.020	0.50	+/-0.010	6	10		50	4	G2CS4R05050	●
5	0/-0.020	1.00	+/-0.010	6	10		50	4	G2CS4R10050	●
6	0/-0.020	0.20	+/-0.010	6	12		50	4	G2CS4R02060	●
6	0/-0.020	0.50	+/-0.010	6	12		50	4	G2CS4R05060	●
6	0/-0.020	1.00	+/-0.010	6	12		50	4	G2CS4R10060	●
6	0/-0.020	1.50	+/-0.010	6	12		50	4	G2CS4R15060	●
6	0/-0.020	2.00	+/-0.010	6	12		50	4	G2CS4R20060	●
8	0/-0.025	0.50	+/-0.010	8	16		60	4	G2CS4R05080	●
8	0/-0.025	1.00	+/-0.010	8	16		60	4	G2CS4R10080	●
8	0/-0.025	1.50	+/-0.010	8	16		60	4	G2CS4R15080	●
8	0/-0.025	2.00	+/-0.010	8	16		60	4	G2CS4R20080	●
10	0/-0.025	0.50	+/-0.010	10	20		75	4	G2CS4R05100	●
10	0/-0.025	1.00	+/-0.010	10	20		75	4	G2CS4R10100	●
10	0/-0.025	1.50	+/-0.010	10	20		75	4	G2CS4R15100	●
10	0/-0.025	2.00	+/-0.010	10	20		75	4	G2CS4R20100	●
10	0/-0.025	2.50	+/-0.010	10	20		75	4	G2CS4R25100	●
10	0/-0.025	3.00	+/-0.010	10	20		75	4	G2CS4R30100	●
12	0/-0.025	0.50	+/-0.010	12	24		75	4	G2CS4R05120	●
12	0/-0.025	1.00	+/-0.010	12	24		75	4	G2CS4R10120	●
12	0/-0.025	1.50	+/-0.010	12	24		75	4	G2CS4R15120	●
12	0/-0.025	2.00	+/-0.010	12	24		75	4	G2CS4R20120	●
12	0/-0.025	2.50	+/-0.010	12	24		75	4	G2CS4R25120	●
12	0/-0.025	3.00	+/-0.010	12	24		75	4	G2CS4R30120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CS4R

	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**	**1.5D x 0.2D**
	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

< D3 mm: ae = 0.1D

G2CL4R

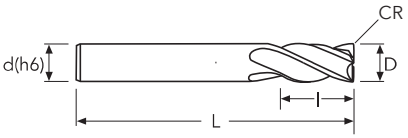
cylindrical shank, 4 flutes, long, corner radius

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

P	M	K	N	S	H
★	☆	★	☆		

★ 1st choice ☆ suitable

SIDE MILLING



D	D Tol.	CR	CR Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
2	0/-0.030	0.20	+/-0.010	4	4		75	4	G2CL4R02020	●
2	0/-0.030	0.50	+/-0.010	4	4		75	4	G2CL4R05020	●
3	0/-0.030	0.20	+/-0.010	4	6		75	4	G2CL4R02030	●
3	0/-0.030	0.50	+/-0.010	4	6		75	4	G2CL4R05030	●
3	0/-0.030	1.00	+/-0.010	4	6		75	4	G2CL4R10030	●
4	0/-0.030	0.20	+/-0.010	4	8		75	4	G2CL4R02040	●
4	0/-0.030	0.50	+/-0.010	4	8		75	4	G2CL4R05040	●
4	0/-0.030	1.00	+/-0.010	4	8		75	4	G2CL4R10040	●
5	0/-0.030	0.50	+/-0.010	6	10		75	4	G2CL4R05050	●
5	0/-0.030	1.00	+/-0.010	6	10		75	4	G2CL4R10050	●
6	0/-0.030	0.50	+/-0.010	6	12		75	4	G2CL4R05060	●
6	0/-0.030	1.00	+/-0.010	6	12		75	4	G2CL4R10060	●
8	0/-0.035	0.50	+/-0.010	8	16		100	4	G2CL4R05080	●
8	0/-0.035	1.00	+/-0.010	8	16		100	4	G2CL4R10080	●
8	0/-0.035	2.00	+/-0.010	8	16		100	4	G2CL4R20080	●
10	0/-0.035	0.50	+/-0.010	10	20		100	4	G2CL4R05100	●
10	0/-0.035	1.00	+/-0.010	10	20		100	4	G2CL4R10100	●
10	0/-0.035	2.00	+/-0.010	10	20		100	4	G2CL4R20100	●
12	0/-0.035	0.50	+/-0.010	12	24		100	4	G2CL4R05120	●
12	0/-0.035	1.00	+/-0.010	12	24		100	4	G2CL4R10120	●
12	0/-0.035	2.00	+/-0.010	12	24		100	4	G2CL4R20120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CL4R

	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**	**1.5D x 0.2D**
	Vc (m/min)	**55÷75**	**40÷60**	**20÷40**	**70÷90**
SIDE MILLING	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.004
	2	0.006	0.005	0.005	0.007
	3	0.009	0.008	0.007	0.010
	4	0.012	0.010	0.009	0.013
	5	0.015	0.013	0.011	0.017
	6	0.017	0.014	0.013	0.019
	8	0.023	0.020	0.017	0.030
	10	0.029	0.025	0.022	0.038
	12	0.036	0.031	0.027	0.047

< D3 mm: ae = 0.1D

GB255

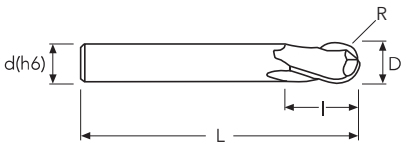
cylindrical shank, 2 flutes ball nose

OSAWA NORM | N | MG / BR | <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/-0.020	0.50	+/-0.015	4	2		50	2	GB255010	●
1.5	0/-0.020	0.75	+/-0.015	4	3		50	2	GB255015	●
2	0/-0.020	1.00	+/-0.015	4	4		50	2	GB255020	●
3	0/-0.020	1.50	+/-0.015	4	6		50	2	GB255030	●
4	0/-0.020	2.00	+/-0.015	4	8		50	2	GB255040	●
5	0/-0.020	2.50	+/-0.015	6	10		50	2	GB255050	●
6	0/-0.020	3.00	+/-0.015	6	12		50	2	GB255060	●
8	0/-0.025	4.00	+/-0.015	8	16		60	2	GB255080	●
10	0/-0.025	5.00	+/-0.015	10	20		75	2	GB255100	●
12	0/-0.025	6.00	+/-0.015	12	24		75	2	GB255120	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

GB255

	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)		**50÷70**	**35÷55**	**20÷40**	**80÷120**
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

G2CSB2

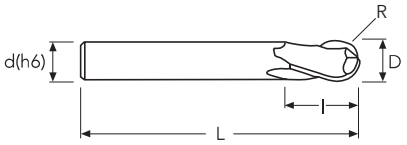
cylindrical shank, 2 flutes ball nose

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/-0.020	0.50	+/-0.015	4	2		50	2	G2CSB2010	●
1.5	0/-0.020	0.75	+/-0.015	4	3		50	2	G2CSB2015	●
2	0/-0.020	1.00	+/-0.015	4	4		50	2	G2CSB2020	●
2.5	0/-0.020	1.25	+/-0.015	4	5		50	2	G2CSB2025	●
3	0/-0.020	1.50	+/-0.015	4	6		50	2	G2CSB2030	●
3.5	0/-0.020	1.75	+/-0.015	4	7		50	2	G2CSB2035	●
4	0/-0.020	2.00	+/-0.015	4	8		50	2	G2CSB2040	●
4.5	0/-0.020	2.25	+/-0.015	6	9		50	2	G2CSB2045	●
5	0/-0.020	2.50	+/-0.015	6	10		50	2	G2CSB2050	●
5.5	0/-0.020	2.75	+/-0.015	6	11		50	2	G2CSB2055	●
6	0/-0.020	3.00	+/-0.015	6	12		50	2	G2CSB2060	●
6.5	0/-0.025	3.25	+/-0.015	8	13		60	2	G2CSB2065	●
7	0/-0.025	3.50	+/-0.015	8	14		60	2	G2CSB2070	●
8	0/-0.025	4.00	+/-0.015	8	16		60	2	G2CSB2080	●
9	0/-0.025	4.50	+/-0.015	10	18		75	2	G2CSB2090	●
10	0/-0.025	5.00	+/-0.015	10	20		75	2	G2CSB2100	●
12	0/-0.025	6.00	+/-0.015	12	24		75	2	G2CSB2120	●
16	0/-0.030	8.00	+/-0.015	16	30		92	2	G2CSB2160	●
20	0/-0.030	10.00	+/-0.015	20	30		100	2	G2CSB2200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CSB2

COPYING

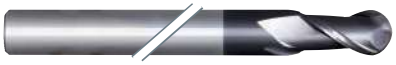
Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
Hardness/Rm		≤700 N/mm²	600÷1000 N/mm²	≤35 HRC	
ap x ae		**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**	**0.1D x 0.1D**
Vc (m/min)		**80÷100**	**60÷80**	**40÷60**	**110÷130**
D (mm)	**D(eff.) (mm)**	**fz (mm/z)**	**fz (mm/z)**	**fz (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
16	**9.60**	0.150	0.113	0.105	0.180
20	**12.00**	0.180	0.135	0.126	0.216

G2250-51

cylindrical shank, 2 flutes ball nose, long

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

G2250

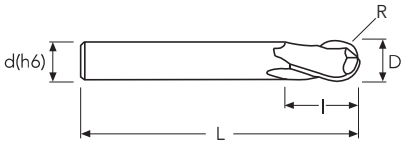


G2251

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/-0.025	0.50	+/-0.015	4	2		75	2	G2250010	●
1.5	0/-0.025	0.75	+/-0.015	4	3		75	2	G2250015	●
2	0/-0.025	1.00	+/-0.015	4	4		75	2	G2250020	●
3	0/-0.025	1.50	+/-0.015	4	6		75	2	G2250030	●
4	0/-0.025	2.00	+/-0.015	4	8		75	2	G2250040	●
5	0/-0.025	2.50	+/-0.015	6	10		75	2	G2250050	●
6	0/-0.025	3.00	+/-0.015	6	12		100	2	G2250060	●
8	0/-0.030	4.00	+/-0.015	8	16		100	2	G2250080	●
10	0/-0.030	5.00	+/-0.015	10	20		100	2	G2250100	●
12	0/-0.030	6.00	+/-0.015	12	24		100	2	G2250120	●
6	0/-0.025	3.00	+/-0.015	6	12		150	2	G2251060	●
8	0/-0.030	4.00	+/-0.015	8	16		150	2	G2251080	●
10	0/-0.030	5.00	+/-0.015	10	20		150	2	G2251100	●
12	0/-0.030	6.00	+/-0.015	12	24		150	2	G2251120	●
16	0/-0.035	8.00	+/-0.015	16	30		150	2	G2251160	●
20	0/-0.035	10.00	+/-0.015	20	30		150	2	G2251200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2250

	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

G2251

	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)		**60÷80**	**40÷60**	**35÷45**	**90÷110**
COPYING	D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	6	**3.60**	0.058	0.044	0.041	0.070
	8	**4.80**	0.066	0.049	0.046	0.079
	10	**6.00**	0.077	0.057	0.054	0.092
	12	**7.20**	0.087	0.066	0.061	0.105
	16	**9.60**	0.122	0.092	0.085	0.146
	20	**12.00**	0.146	0.110	0.102	0.175

G2CSB4

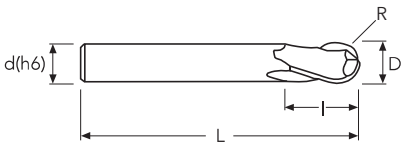
cylindrical shank, 4 flutes ball nose

OSAWA NORM | N | MG PV200 | <45 HRC | 30° | BALL NOSE | Z4 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/-0.020	0.50	+/-0.015	4	2		50	4	G2CSB4010	●
1.5	0/-0.020	0.75	+/-0.015	4	3		50	4	G2CSB4015	●
2	0/-0.020	1.00	+/-0.015	4	4		50	4	G2CSB4020	●
3	0/-0.020	1.50	+/-0.015	4	6		50	4	G2CSB4030	●
4	0/-0.020	2.00	+/-0.015	4	8		50	4	G2CSB4040	●
5	0/-0.020	2.50	+/-0.015	6	10		50	4	G2CSB4050	●
6	0/-0.020	3.00	+/-0.015	6	12		50	4	G2CSB4060	●
8	0/-0.025	4.00	+/-0.015	8	16		60	4	G2CSB4080	●
10	0/-0.025	5.00	+/-0.015	10	20		75	4	G2CSB4100	●
12	0/-0.025	6.00	+/-0.015	12	24		75	4	G2CSB4120	●
16	0/-0.030	8.00	+/-0.015	16	30		92	4	G2CSB4160	●
20	0/-0.030	10.00	+/-0.015	20	30		100	4	G2CSB4200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

CUTTING PARAMETERS

G2CSB4

COPYING

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 0.3D**	**0.1D x 0.3D**	**0.1D x 0.3D**	**0.1D x 0.3D**
Vc (m/min)		**80÷100**	**60÷80**	**40÷60**	**110÷130**
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
16	**9.60**	0.150	0.113	0.105	0.180
20	**12.00**	0.180	0.135	0.126	0.216