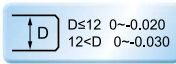
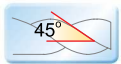
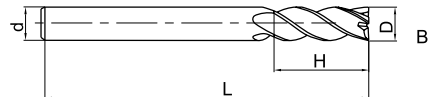
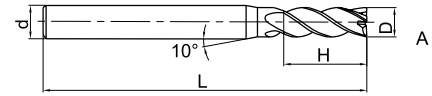


Milling · Fräsen

Solid Carbide end mills · Vollhartmetallschaftfräser

GM-4E series for general machining · **GM-4E** Serie für allgemeine Bearbeitung

4-flute flattened end mills with straight shank
4-Schneiden Eckfräser mit Zylinderschaft



Type Typ	Dimension(mm) Abmessungen				Teeth Zähne Z	Geometry Ausführung	Grade Sorte KMG 303
	D	d	H	L			
GM-4E-D1.0S	1.0	4	3	50	4	A	●
GM-4E-D1.5S	1.5	4	4	50	4	A	●
GM-4E-D2.0S	2.0	4	6	50	4	A	●
GM-4E-D2.5S	2.5	4	8	50	4	A	●
GM-4E-D3.0S	3.0	4	8	50	4	A	●
GM-4E-D4.0S	4.0	4	11	50	4	B	●
GM-4E-D1.0	1.0	6	3	50	4	A	●
GM-4E-D1.5	1.5	6	4	50	4	A	●
GM-4E-D2.0	2.0	6	6	50	4	A	●
GM-4E-D2.5	2.5	6	8	50	4	A	●
GM-4E-D3.0	3.0	6	8	50	4	A	●
GM-4E-D3.5	3.5	6	10	50	4	A	●
GM-4E-D4.0	4.0	6	11	50	4	A	●
GM-4E-D4.5	4.5	6	11	50	4	A	●
GM-4E-D5.0	5.0	6	13	50	4	A	●
GM-4E-D5.5	5.5	6	16	50	4	A	●
GM-4E-D6.0	6.0	6	16	50	4	B	●
GM-4E-D7.0	7.0	8	20	60	4	A	●
GM-4E-D8.0	8.0	8	20	60	4	B	●
GM-4E-D9.0	9.0	10	22	75	4	A	●
GM-4E-D10.0	10.0	10	25	75	4	B	●
GM-4E-D11.0	11.0	12	26	75	4	A	●
GM-4E-D12.0	12.0	12	30	75	4	B	●
GM-4E-D14.0	14.0	14	32	75	4	B	●
GM-4E-D16.0	16.0	16	45	100	4	B	●
GM-4E-D18.0	18.0	18	45	100	4	B	●
GM-4E-D20.0	20.0	20	45	100	4	B	●

Material Overview · Material Übersicht

✓ = Very suitable · Sehr empfohlen
✓ = Suitable · Empfohlen

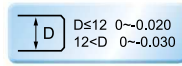
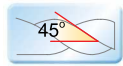
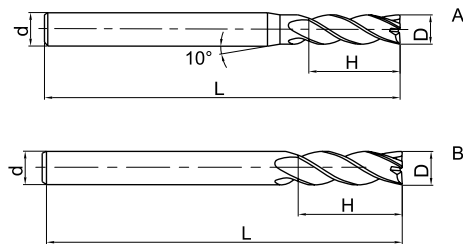
KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff Stahl	Alloy steel Legierter Stahl	Quenched and tempered steel · Vergüteter Stahl		Hardened steel · Gehärteter Stahl		Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg	Aluminum alloy Alu Leg	Titanium alloy Titan Leg	Heat resist alloy warmfeste Leg
		~40HRC	~50HRC	~55HRC	~68HRC						
✓	✓	✓	✓			✓	✓				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

GM-4EL series for general machining · GM-4EL Serie für allgemeine Bearbeitung

4-flute flattened end mills with straight shank and long cutting edge
4-Schneiden Eckfräser mit langer Schneide und Zylinderschaft



Type Typ	Dimension (mm) Abmessungen				Teeth Zähne Z	Geometry Ausführung	Grade Sorte KMG 303
	D	d	H	L			
GM-4EL-D3.0	3.0	6	12	75	4	A	●
GM-4EL-D4.0	4.0	6	15	75	4	A	●
GM-4EL-D5.0	5.0	6	20	75	4	A	●
GM-4EL-D6.0	6.0	6	20	75	4	B	●
GM-4EL-D8.0	8.0	8	25	100	4	B	●
GM-4EL-D10.0	10.0	10	30	100	4	B	●
GM-4EL-D12.0	12.0	12	35	100	4	B	●
GM-4EL-D14.0	14.0	14	40	100	4	B	●
GM-4EL-D16.0	16.0	16	50	150	4	B	●
GM-4EL-D20.0	20.0	20	55	150	4	B	●

B

Solid Carbide end mills
Vollhartmetallschaftfräser

Material Overview · Material Übersicht

✓ = Very suitable · Sehr empfohlen
✓ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff Stahl	Alloy steel Legierter Stahl	Quenched and tempered steel · Vergüteter Stahl		Hardened steel · Gehärteter Stahl		Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg	Aluminum alloy Alu Leg	Titanium alloy Titan Leg	Heat resist alloy warmfeste Leg
		~40HRC	~50HRC	~55HRC	~68HRC						
✓	✓	✓	✓			✓	✓				

Code key B231
ISO Kennzeichen

Cutting data B431-456
Schnittdaten

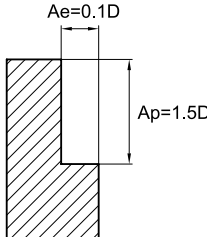
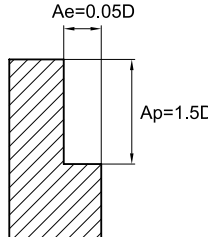
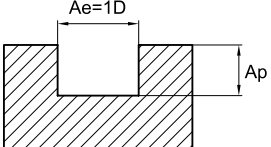
Graphics identification & application B232
Graphische Werkzeug- & Anwendungsbeschr.

Order form for non-standard products B497-B498
Bestellformular für Sonderwerkzeuge

Recommended cutting data · Empfohlene Schnittdaten

GM-4E | GM-4EL

Workpiece material Werkstückmaterial	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm ²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
	Diameter Ø Durchmesser (mm)	Rotating Drehzahl (min ⁻¹)	Feed Vorschub (mm/min)	Rotating Drehzahl (min ⁻¹)	Feed Vorschub (mm/min)	Rotating Drehzahl (min ⁻¹)	Feed Vorschub (mm/min)	Rotating Drehzahl (min ⁻¹)	Feed Vorschub (mm/min)	Rotating Drehzahl (min ⁻¹)	Feed Vorschub (mm/min)	Rotating Drehzahl (min ⁻¹)
1	20000	250	20000	250	20000	200	20000	200	20000	90	20000	150
2	15000	400	15000	400	15000	360	15000	350	11150	100	13000	225
3	14000	680	14000	680	13000	630	10600	525	7500	120	8500	410
4	10800	700	10800	700	10000	640	8000	535	5500	125	6500	420
5	8200	730	8200	730	7600	670	6400	560	4500	125	5000	440
6	7000	750	7000	750	6400	690	5300	575	3700	135	4200	450
8	5200	740	5200	740	4800	680	4000	565	2800	135	3200	460
10	4200	730	4200	730	3800	670	3200	560	2200	135	2500	435
12	3500	730	3500	730	3200	670	2650	560	1850	135	2100	435
14	3000	680	3000	680	2700	630	2300	525	1600	125	1800	410
16	2600	680	2600	680	2400	630	2000	525	1400	120	1600	410
18	2300	670	2300	670	2100	620	1800	515	1250	105	1400	405
20	2050	670	2050	670	1900	620	1600	515	1100	105	1250	405

Max. cutting depth max Schnitttiefe									
	 <table border="1" data-bbox="798 1400 1085 1523"> <thead> <tr> <th colspan="2">Milling slot · Nutenfräsen</th> </tr> <tr> <th>Ø</th> <th>Ap</th> </tr> </thead> <tbody> <tr> <td>Ø1 ≤ D < Ø3</td> <td>0.15D</td> </tr> <tr> <td>Ø3 ≤ D</td> <td>0.3D</td> </tr> </tbody> </table>	Milling slot · Nutenfräsen		Ø	Ap	Ø1 ≤ D < Ø3	0.15D	Ø3 ≤ D	0.3D
Milling slot · Nutenfräsen									
Ø	Ap								
Ø1 ≤ D < Ø3	0.15D								
Ø3 ≤ D	0.3D								

- The above table shows the standard value of side milling. When slot milling, of rotating speed 50%~70% and feed rate like mentioned above 40%~60%.
- Please select high precise machine and tool holder.
- Please use air blow or cutting liquid with high mist retardant property.
- Down milling is recommended in side milling.
- Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
- Make overhang as short as possible if no interference.

- Die obige Tabelle zeigt Standard Werte für das Eckfräsen. Bei Nutenfräsen, Schnittgeschwindigkeit auf 50-70% und den Vorschub auf 40-60% reduzieren.
- Bitte präzise Maschinen und Werkzeughalter verwenden.
- Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
- Empfohlene Fräsmethode: Gleichlaufräsen.
- Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
- Werkzeugauskragung so kurz wie möglich wählen.