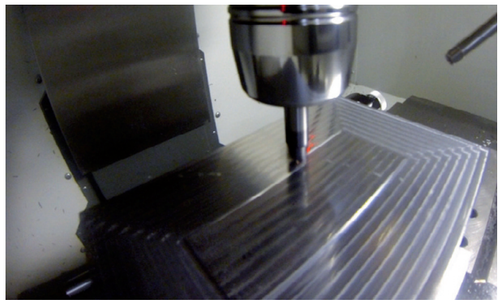
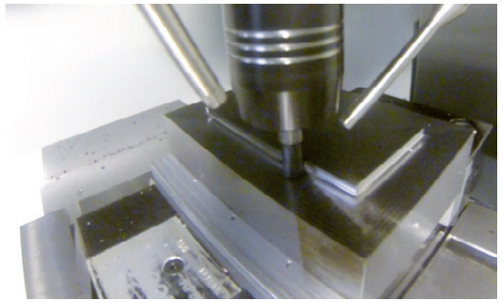
Face milling



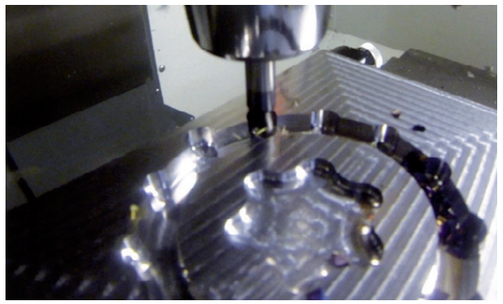
Operation: face milling
Material: 1.2767
n = 5’570 rev/min
Vf = 3’310 mm/min
ap = 0.4 mm
ae = 4 mm

Routing



Operation: routing
Material: 1.2767
n = 6’366 rev/min
Vf = 3’184 mm/min
ap = 5 mm
ae = 2 mm

Plunge milling



Operation: plunge milling
Material: 1.2767
n = 4’456 rev/min
Vf = 891 mm/min
ap = 10 mm
ae = 3 mm

The videos are available on
www.youtube.com

DIXI POLYTOOL S.A.
Av. du Technicum 37
CH-2400 Le Locle

Tel. +41 (0)32 933 54 44
Fax +41 (0)32 931 89 16

dixipoly@dixi.ch

www.dixipolytool.com

DIXI polytool

Boost your productivity

- Ideal for 3D pocketing and plunge milling
- For roughing molds and dies

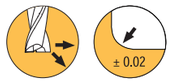
HIGH FEED **END MILLS**

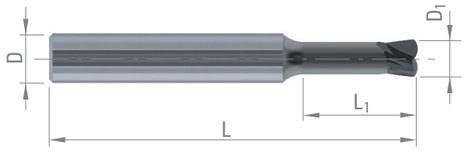
since 1946

DIXI 7702

HIGH SPEED END MILLS

Z = 2



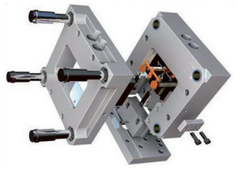


Steel + Pb	Low alloyed steel	High alloyed steel	DUPLEX stainless steel	Steel Cast iron > 45 HRC
Cast iron	Refractory alloy	Titanium, titanium alloy	Cu alloy Silver Gold	Alliage Cu difficile
Al	Graphite			

D_1	L_1	D_{h5}	L	XIDUR
0.50	1.50	6	40	305279
0.80	2.40	6	40	305280
1.00	3.00	6	40	997920
1.50	4.50	6	40	997921
2.00	6.00	6	40	997922
3.00	9.00	6	40	997923
4.00	12.00	6	57	997924
5.00	15.00	6	57	997925
6.00	18.00	8	63	997926
8.00	24.00	10	80	997927
10.00	30.00	10	80	997928
12.00	36.00	12	80	997929

Application fields

Molds and dies



Aerospace

Medical

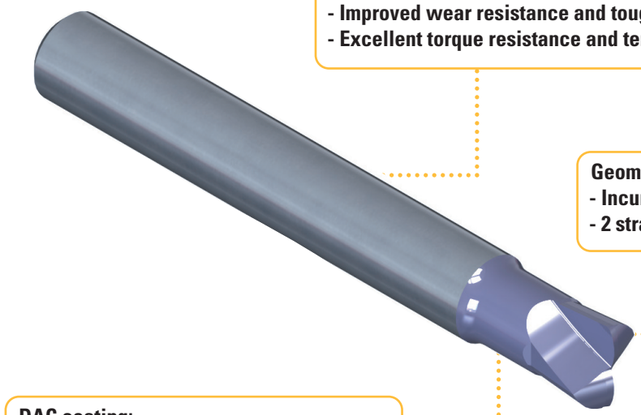
General mecanics

Application examples

3D pocketing / Deep grooves

Profile milling / 3D pocketing

DIXI 7702



Carbide:
- **Improved wear resistance and toughness**
- **Excellent torque resistance and tenacity**

Geometry:
- **Incurved shape allows efficient milling**
- **2 straight flutes**

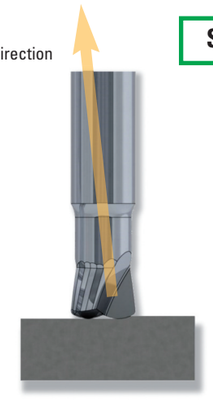
DAC coating:
- **Excellent adhesion to the substract**
- **High temperature resistance**

Concept and advantages of high feed end mills DIXI 7702

High feed end mills

Stable

Cutting forces direction

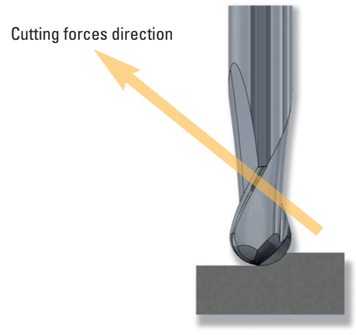


Reincorfed geometry, incurved shape and great stability allows the use of high feed rate (till 10'000 mm/min).

Ball nose/corner radius end mills

Vibrations

Cutting forces direction

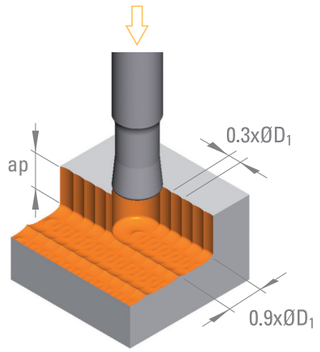


The cutting forces direction is more radial than axial, it generates vibrations and tool banding.

CUTTING CONDITIONS

Plunge milling

	Materials to be machined	XIDUR Vc [m/min]	α [°]
P	Unalloyed steel / Low alloyed steel < 600 N/mm²	175	<1xØD$_1$
P	Unalloyed steel / Low alloyed steel 600 – 1500 N/mm²	140	<1xØD$_1$
P	Lead alloyed cutting steel	175	<1xØD$_1$
P	High alloyed steel 700 – 1500 N/mm²	140	<1xØD$_1$
H	Hardened steel >50HRC	110	<0.8xØD$_1$
M	Stainless steel 400 – 700 N/mm²	110	<0.8xØD$_1$
M	DUPLEX stainless steel > 800 N/mm²	80	<1xØD$_1$
K	Grey cast iron / Nodular pearlitic iron < 250 HB	110	<1xØD$_1$
K	Alloyed cast iron / Nodular pearlitic iron > 250 HB	70	<1xØD$_1$
K	Nodular ferritic cast iron / Malleable cast iron	80	<1xØD$_1$
S	Special alloys / Heat resistant stainless steel	30	<0.8xØD$_1$
S	Titanium, titanium alloys	70	<0.8xØD$_1$

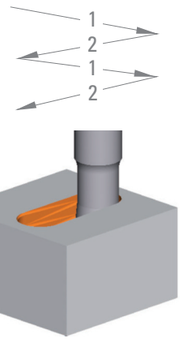


Feed per tooth **fz [mm]**

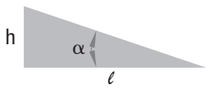
Ø D$_1$ 0.50	Ø D$_1$ 0.80	Ø D$_1$ 1.00	Ø D$_1$ 1.50	Ø D$_1$ 2.00	Ø D$_1$ 3.00	Ø D$_1$ 4.00	Ø D$_1$ 5.00	Ø D$_1$ 6.00	Ø D$_1$ 8.00	Ø D$_1$ 10.00	Ø D$_1$ 12.00
0.004	0.006	0.008	0.012	0.016	0.024	0.032	0.040	0.048	0.064	0.080	0.096
0.003	0.005	0.006	0.010	0.013	0.019	0.026	0.032	0.038	0.051	0.064	0.077
0.004	0.006	0.008	0.012	0.016	0.024	0.032	0.040	0.048	0.064	0.080	0.096
0.003	0.005	0.006	0.010	0.013	0.019	0.026	0.032	0.038	0.051	0.064	0.077
0.003	0.004	0.006	0.008	0.011	0.017	0.022	0.028	0.034	0.045	0.056	0.067
0.003	0.004	0.006	0.008	0.011	0.017	0.022	0.028	0.034	0.045	0.056	0.067
0.003	0.004	0.006	0.008	0.011	0.017	0.022	0.028	0.034	0.045	0.056	0.067
0.004	0.006	0.008	0.012	0.016	0.024	0.032	0.040	0.048	0.064	0.080	0.096
0.003	0.005	0.006	0.010	0.013	0.019	0.026	0.032	0.038	0.051	0.064	0.077
0.003	0.004	0.006	0.008	0.011	0.017	0.022	0.028	0.034	0.045	0.056	0.067
0.002	0.004	0.005	0.007	0.010	0.014	0.019	0.024	0.029	0.038	0.048	0.058
0.003	0.004	0.006	0.008	0.011	0.017	0.022	0.028	0.034	0.045	0.056	0.067

Ramping

	Materials to be machined	XIDUR Vc [m/min]	α [°]
P	Unalloyed steel / Low alloyed steel < 600 N/mm²	250	<1xØD$_1$
P	Unalloyed steel / Low alloyed steel 600 – 1500 N/mm²	200	0.75
P	Lead alloyed cutting steel	250	0.75
P	High alloyed steel 700 – 1500 N/mm²	200	0.75
H	Hardened steel >50HRC	80	0.75
M	Stainless steel 400 – 700 N/mm²	110	0.50
M	DUPLEX stainless steel > 800 N/mm²	80	0.50
K	Grey cast iron / Nodular pearlitic iron < 250 HB	150	0.75
K	Alloyed cast iron / Nodular pearlitic iron > 250 HB	100	0.75
K	Nodular ferritic cast iron / Malleable cast iron	110	0.75
S	Special alloys / Heat resistant stainless steel	40	0.50
S	Titanium, titanium alloys	100	0.50



Ramping value calculation:



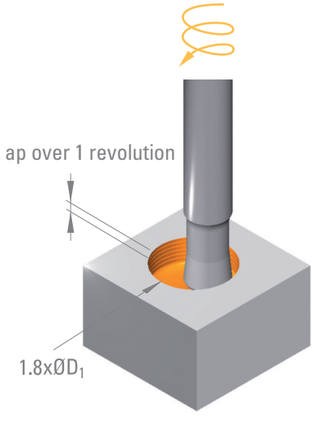
1. h = ℓ x tan α
2. Return to the horizontal position ℓ

Feed per tooth **fz [mm]**

Ø D$_1$ 0.50	Ø D$_1$ 0.80	Ø D$_1$ 1.00	Ø D$_1$ 1.50	Ø D$_1$ 2.00	Ø D$_1$ 3.00	Ø D$_1$ 4.00	Ø D$_1$ 5.00	Ø D$_1$ 6.00	Ø D$_1$ 8.00	Ø D$_1$ 10.00	Ø D$_1$ 12.00
0.013	0.021	0.026	0.040	0.053	0.079	0.106	0.132	0.158	0.211	0.264	0.317
0.012	0.019	0.024	0.036	0.048	0.072	0.096	0.120	0.144	0.192	0.240	0.288
0.013	0.021	0.026	0.040	0.053	0.079	0.106	0.132	0.158	0.211	0.264	0.317
0.012	0.019	0.024	0.036	0.048	0.072	0.096	0.120	0.144	0.192	0.240	0.288
0.004	0.006	0.008	0.012	0.016	0.024	0.032	0.040	0.048	0.064	0.080	0.096
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.007	0.012	0.014	0.022	0.029	0.043	0.058	0.072	0.086	0.115	0.144	0.173
0.006	0.010	0.013	0.019	0.026	0.038	0.051	0.064	0.077	0.102	0.128	0.154
0.007	0.012	0.014	0.022	0.029	0.043	0.058	0.072	0.086	0.115	0.144	0.173
0.008	0.013	0.017	0.025	0.034	0.050	0.067	0.084	0.101	0.134	0.168	0.202

Helical milling

	Materials to be machined	XIDUR Vc [m/min]	α [°]
P	Unalloyed steel / Low alloyed steel < 600 N/mm²	250	0.75
P	Unalloyed steel / Low alloyed steel 600 – 1500 N/mm²	200	0.75
P	Lead alloyed cutting steel	250	0.75
P	High alloyed steel 700 – 1500 N/mm²	200	0.75
H	Hardened steel >50HRC	80	0.75
M	Stainless steel 400 – 700 N/mm²	110	0.50
M	DUPLEX stainless steel > 800 N/mm²	80	0.50
K	Grey cast iron / Nodular pearlitic iron < 250 HB	150	0.75
K	Alloyed cast iron / Nodular pearlitic iron > 250 HB	100	0.75
K	Nodular ferritic cast iron / Malleable cast iron	110	0.75
S	Special alloys / Heat resistant stainless steel	40	0.50
S	Titanium, titanium alloys	100	0.50



Value calculation of helical pitch:

ap over 1 revolution = π x D$_1$ x tan α

Feed per tooth **fz [mm]**

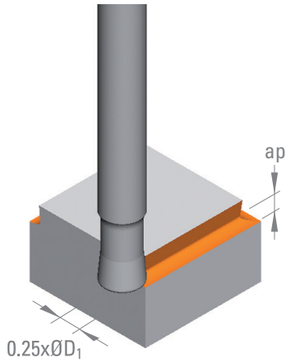
Ø D$_1$ 0.50	Ø D$_1$ 0.80	Ø D$_1$ 1.00	Ø D$_1$ 1.50	Ø D$_1$ 2.00	Ø D$_1$ 3.00	Ø D$_1$ 4.00	Ø D$_1$ 5.00	Ø D$_1$ 6.00	Ø D$_1$ 8.00	Ø D$_1$ 10.00	Ø D$_1$ 12.00
0.018	0.028	0.035	0.053	0.070	0.106	0.141	0.176	0.211	0.282	0.352	0.422
0.016	0.026	0.032	0.048	0.064	0.096	0.128	0.160	0.192	0.256	0.320	0.384
0.018	0.028	0.035	0.053	0.070	0.106	0.141	0.176	0.211	0.282	0.352	0.422
0.016	0.026	0.032	0.048	0.064	0.096	0.128	0.160	0.192	0.256	0.320	0.384
0.005	0.008	0.010	0.014	0.019	0.029	0.038	0.048	0.058	0.077	0.096	0.115
0.013	0.020	0.026	0.038	0.051	0.077	0.102	0.128	0.154	0.205	0.256	0.307
0.013	0.020	0.026	0.038	0.051	0.077	0.102	0.128	0.154	0.205	0.256	0.307
0.013	0.020	0.026	0.038	0.051	0.077	0.102	0.128	0.154	0.205	0.256	0.307
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.008	0.012	0.015	0.023	0.030	0.046	0.061	0.076	0.091	0.122	0.152	0.182
0.011	0.018	0.022	0.034	0.045	0.067	0.090	0.112	0.134	0.179	0.224	0.269

www.dixipolytool.com

CUTTING CONDITIONS

Routing

	Materials to be machined	XIDUR Vc [m/min]	ap [mm]
P	Unalloyed steel / Low alloyed steel < 600 N/mm²	250	<0.5xØD_1
P	Unalloyed steel / Low alloyed steel 600 – 1500 N/mm²	200	<0.5xØD_1
P	Lead alloyed cutting steel	250	<0.5xØD_1
P	High alloyed steel 700 – 1500 N/mm²	200	<0.5xØD_1
H	Hardened steel >50HRC	80	<0.4xØD_1
M	Stainless steel 400 – 700 N/mm²	110	<0.4xØD_1
M	DUPLEX stainless steel > 800 N/mm²	80	<0.4xØD_1
K	Grey cast iron / Nodular pearlitic iron < 250 HB	150	<0.5xØD_1
K	Alloyed cast iron / Nodular pearlitic iron > 250 HB	100	<0.5xØD_1
K	Nodular ferritic cast iron / Malleable cast iron	110	<0.5xØD_1
S	Special alloys / Heat resistant stainless steel	40	<0.4xØD_1
S	Titanium, titanium alloys	100	<0.4xØD_1



Feed per tooth **fz [mm]**

Ø D_1 0.50	Ø D_1 0.80	Ø D_1 1.00	Ø D_1 1.50	Ø D_1 2.00	Ø D_1 3.00	Ø D_1 4.00	Ø D_1 5.00	Ø D_1 6.00	Ø D_1 8.00	Ø D_1 10.00	Ø D_1 12.00
0.010	0.017	0.021	0.031	0.042	0.062	0.083	0.104	0.125	0.166	0.208	0.250
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.010	0.017	0.021	0.031	0.042	0.062	0.083	0.104	0.125	0.166	0.208	0.250
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.005	0.008	0.010	0.014	0.019	0.029	0.038	0.048	0.058	0.077	0.096	0.115
0.008	0.013	0.016	0.024	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
0.008	0.013	0.016	0.024	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
0.008	0.013	0.016	0.024	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
0.006	0.009	0.011	0.017	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
0.005	0.008	0.010	0.016	0.021	0.031	0.042	0.052	0.062	0.083	0.104	0.125
0.006	0.009	0.011	0.017	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
0.007	0.011	0.014	0.020	0.027	0.041	0.054	0.068	0.082	0.109	0.136	0.163

Face milling

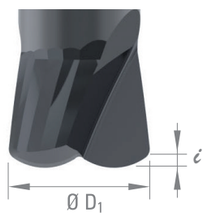
	Materials to be machined	XIDUR Vc [m/min]	ap [mm]
P	Unalloyed steel / Low alloyed steel < 600 N/mm²	250	<1x *i*
P	Unalloyed steel / Low alloyed steel 600 – 1500 N/mm²	200	<1x *i*
P	Lead alloyed cutting steel	250	<1x *i*
P	High alloyed steel 700 – 1500 N/mm²	200	<1x *i*
H	Hardened steel >50HRC	80	<0.8x *i*
M	Stainless steel 400 – 700 N/mm²	110	<0.8x *i*
M	DUPLEX stainless steel > 800 N/mm²	80	<0.8x *i*
K	Grey cast iron / Nodular pearlitic iron < 250 HB	150	<1x *i*
K	Alloyed cast iron / Nodular pearlitic iron > 250 HB	100	<1x *i*
K	Nodular ferritic cast iron / Malleable cast iron	110	<1x *i*
S	Special alloys / Heat resistant stainless steel	40	<0.5x *i*
S	Titanium, titanium alloys	100	<0.5x *i*

Feed per tooth **fz [mm]**

Ø D_1 0.50	Ø D_1 0.80	Ø D_1 1.00	Ø D_1 1.50	Ø D_1 2.00	Ø D_1 3.00	Ø D_1 4.00	Ø D_1 5.00	Ø D_1 6.00	Ø D_1 8.00	Ø D_1 10.00	Ø D_1 12.00
0.022	0.035	0.044	0.066	0.088	0.132	0.176	0.220	0.264	0.352	0.440	0.528
0.020	0.032	0.040	0.060	0.080	0.120	0.160	0.200	0.240	0.320	0.400	0.480
0.022	0.035	0.044	0.066	0.088	0.132	0.176	0.220	0.264	0.352	0.440	0.528
0.020	0.032	0.040	0.060	0.080	0.120	0.160	0.200	0.240	0.320	0.400	0.480
0.006	0.010	0.012	0.018	0.024	0.036	0.048	0.060	0.072	0.096	0.120	0.144
0.016	0.026	0.032	0.048	0.064	0.096	0.128	0.160	0.192	0.256	0.320	0.384
0.016	0.026	0.032	0.048	0.064	0.096	0.128	0.160	0.192	0.256	0.320	0.384
0.016	0.026	0.032	0.048	0.064	0.096	0.128	0.160	0.192	0.256	0.320	0.384
0.012	0.019	0.024	0.036	0.048	0.072	0.096	0.120	0.144	0.192	0.240	0.288
0.012	0.019	0.024	0.036	0.048	0.072	0.096	0.120	0.144	0.192	0.240	0.288
0.010	0.015	0.019	0.029	0.038	0.058	0.077	0.096	0.115	0.154	0.192	0.230
0.014	0.022	0.028	0.042	0.056	0.084	0.112	0.140	0.168	0.224	0.280	0.336
0.025	**0.04**	**0.05**	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
i value											

This tool doesn't have centre cutting edge

For face milling operation, the *i* value is depending on the Ø D_1



www.dixipolytool.com