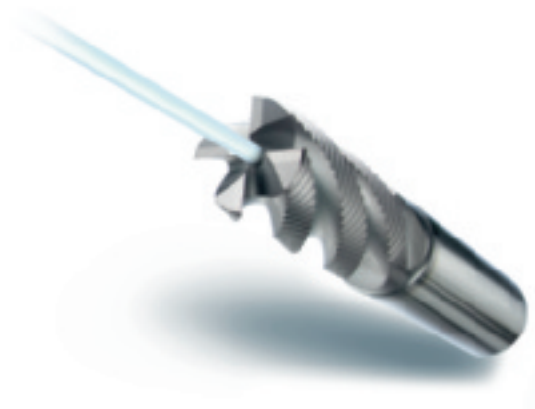


GC1640 - the high efficiency end mill



Kordell grade GC1640 is the next stage in optimized Plura milling performance. Advanced design and grade technology combine to offer wider application in demanding conditions and the latest in solid carbide end mill technology.

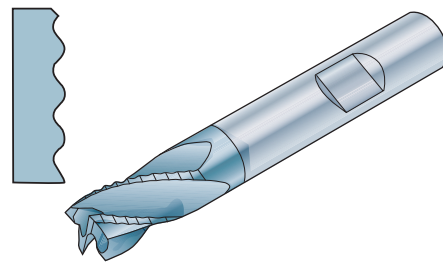
The improved grade gives a consistently reliable performance in toughness demanding roughing operations, to allow closer tolerances and higher precision in the application area to 48 Hrc.



Designed for the challenge

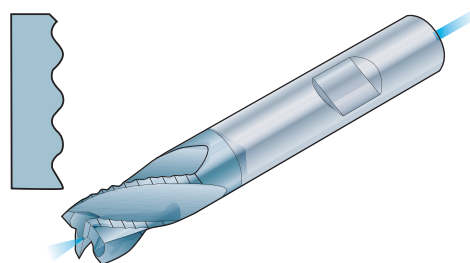
A stronger cutting edge provides the security needed to stabilize the entire machining process and reduce the negative impact of cutting forces, while also lowering power consumption. This makes GC1640 a good choice for unstable conditions and weak clamping.

A softening of cutting force comes from reduced radial engagement of the Kordell geometry. Corner radius profile is reduced to 0.4 mm, to give a stronger, firmer edge and the possibility for more continuous production.

**The coolant revolution**

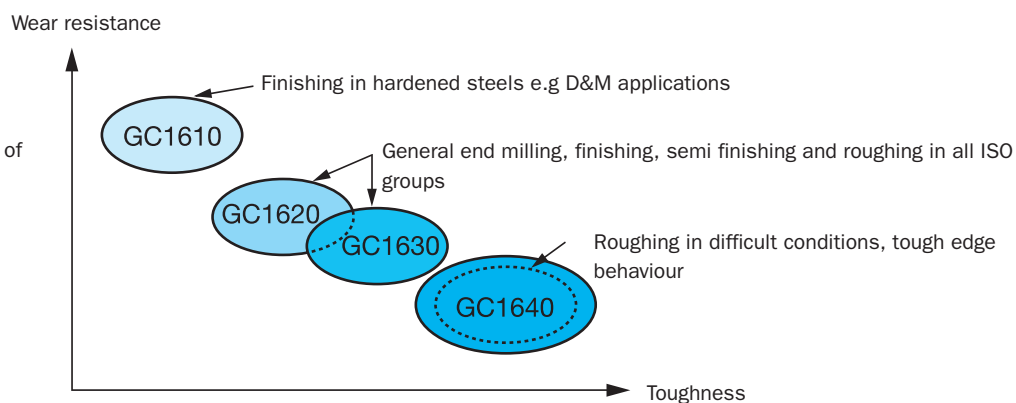
The addition of coolant through the tool offers unique benefits in the application area.

- Effective evacuation of chips from cutting area
- Improved surface finish
- Secure machining in slots and deep pockets
- Heat reduction at cutting zone, a safer performance in some steels



Compared to old GC1640, the improved properties of new grade and substrate combination reduce wear greatly, relative to milling length. This improves productivity with no loss of surface tolerance.

Increased wear resistance properties give a better overlap in the Plura family of high performance tools - an easier application choice where demands on the cutting edge are high.



The new first choice

Kordell grade GC1640 was tested in the external grooving of a rotor shaft in low hardness steel. Grade improvements and optimized wear properties allowed a significant improvement in number grooving operations completed with no visual tool wear after 5 full batches.

Material	Steel		
Tool	Kordell end mill 12 mm		
Machine	Niigata		
Coolant	Yes		
Grade	Old GC1640		New GC1640
Depth of cut (a_p), mm	25		25
Cutting speed (v_c), m/min	115		155
Working engagement (a_e), mm	0.4		0.4
Feed per tooth (f_z), mm	0.04		0.04
Tool life	72 Grooves		180 Grooves
	2 batches		5 batches (tool still ok)

CoroMill® Plura aerospace tools

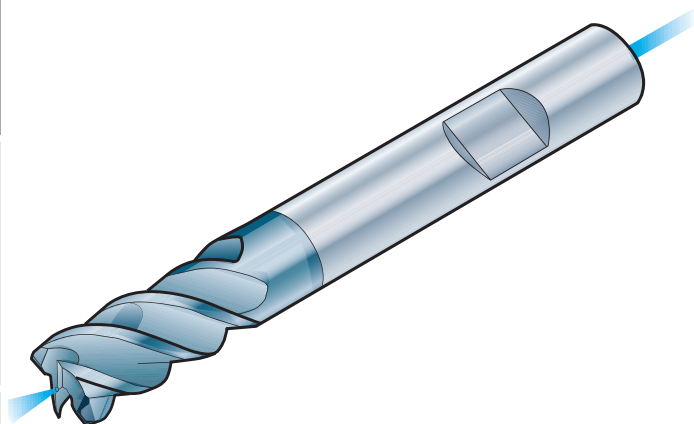
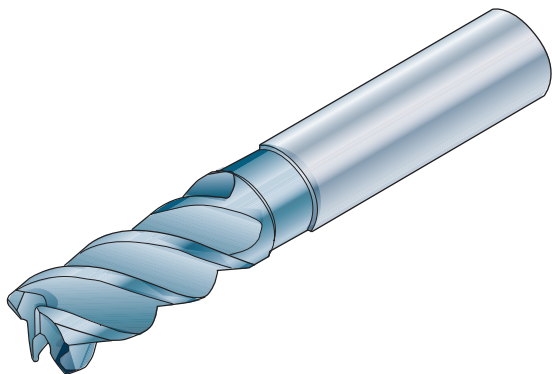
50° helix variable flute design (VFD) with radial relief

These new tools have shanks with radial relief for machining overhangs and deep pockets. The wide choice of radius options suits the typical component fillet radii. The 50° helix angle provides a smooth cutting action for increased tool life and the variable flute design provides good chip evacuation and rigidity.

- Tool dia up from 2.0 mm – 25 mm
- Corner radius options 0.2, 0.5, 1.0, 1.5, 2, 2.5, 3 and 4 mm
- Grade 1620 in P (positive) geometry for high speed machining (HSM)
- Relieved shanks
- Tolerance: shank h6, diameter h10

For producing the profile on a pocket or exterior a long edge reach is required with a radius to suit the demand at the bottom of the pocket. Cutter diameters are limited by the corner demands. Where the pocket depth is over $2 \times D_c$ the cutters are 'necked' (radial relief) to give the required clearance.

In aerospace manufacturing, small component corner radii and intricate features are designed to minimise the weight. The design is such that solid carbide is essential and the time taken to remove these features is a high percentage of the total manufacturing time even though the material removed is relatively small. Focusing on this area using HSM techniques is very important to achieve an optimized process.



Application areas

The diameters, corner radii and depth of cut capability as well as the geometry and grade make this assortment perfect for HSM techniques - low radial engagement with high axial depth of cut.

Used in the following applications:

2D roughing in confined spaces (dia too small for insert cutter)
Trochoidal milling and corner slicing

- 1. Aerospace frame structural parts – titanium pockets
- 2. Aerospace engine – casings discs and shaft – HRSA, titanium scallops
- 3. Die and Mould - steel mould base pockets

2D finish profiling, titanium (v_c200), HRSA (v_c75), steel (v_c300)



Tool diameter, mm

	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
0.2	X									
0.3		X								
0.5			X	X	X	X	X	X	X	
1.0					X	X	X	X	X	X
1.5						X	X	X		
2.0						X	X	X	X	X
2.5								X	X	X
3.0								X		X
4.0									X	X

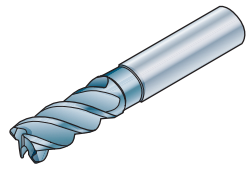
Radius

First choice end mill

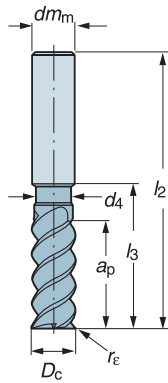
Centre cutting

Variable flute depth

Hardness ≤ 48HRc



Helix angle: -50°
Tolerances: D_c : h9
 dm_m : h6



D_c mm	Ordering code	Front type, Z_n	Dimensions, mm							Max a_p ¹⁾	Material							
			dm_m	d_4	l_2	l_3	Helix mm ²⁾	r_e	GC		M	K	S					
	Cylindrical shank																	
2	R216.23-02050ACC07P	3	6	1.92	57	9.5	5.60	0.2	7.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
3	R216.23-03050ACC08P	3	6	2.9	57	10	8.00	0.3	8.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
4	R216.23-04050BCC11P	3	6	3.8	57	15	11.20	0.5	11.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
5	R216.23-05050BCC13P	3	6	4.75	57	16	14.00	0.5	13.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
6	R216.24-06050BCC13P	4	6	5.7	57	19	16.00	0.5	13.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-06050CCC13P	4	6	5.7	57	19	16.00	1	13.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
8	R216.24-08050BCC19P	4	8	7.6	63	25	22.40	0.5	19.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-08050CCC19P	4	8	7.7	63	25	22.40	1	19.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-08050DCC19P	4	8	7.7	63	25	22.40	1.5	19.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-08050ECC19P	4	8	7.7	63	25	22.40	2	19.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
10	R216.24-10050BCC22P	4	10	9.5	72	30	28.00	0.5	22.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-10050CCC22P	4	10	9.5	72	30	28.00	1	22.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-10050DCC22P	4	10	9.5	72	30	28.00	1.5	22.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-10050ECC22P	4	10	9.5	72	30	28.00	2	22.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
12	R216.24-12050BCC26P	4	12	11.4	83	36	35.50	0.5	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-12050CCC26P	4	12	11.4	83	36	35.50	1	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-12050DCC26P	4	12	11.4	83	36	35.50	1.5	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-12050ECC26P	4	12	11.4	83	36	35.50	2	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-12050FCC26P	4	12	11.4	83	36	35.50	2.5	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-12050GCC26P	4	12	11.4	83	36	35.50	3	26.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
16	R216.24-16050BCC32P	4	16	15.2	92	42	45.00	0.5	32.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-16050CCC32P	4	16	15.2	92	42	45.00	1	32.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-16050ECC32P	4	16	15.2	92	42	45.00	2	32.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-16050FCC32P	4	16	15.2	92	42	45.00	2.5	32.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-16050ICC32P	4	16	15.2	92	42	45.00	4	32.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
20	R216.24-20050CCC38P	4	20	19	104	52	56.00	1	38.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-20050ECC38P	4	20	19	104	52	56.00	2	38.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-20050FCC38P	4	20	19	104	52	56.00	2.5	38.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-20050GCC38P	4	20	19	104	52	56.00	3	38.0	☆	☆	☆	☆	☆	☆	☆	☆	☆
	R216.24-20050ICC38P	4	20	19	104	52	56.00	4	38.0	☆	☆	☆	☆	☆	☆	☆	☆	☆

¹⁾ Maximum cutting edge length.
²⁾ Pitch per rev.

For more technical information, see our Metalcutting Technical guide

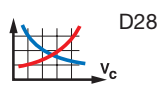
Z_n = number of cutting edges

Plura Guide

First choice: Use Plura Guide. Order number C-2948-063



= New item

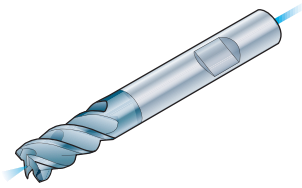


First choice end mill

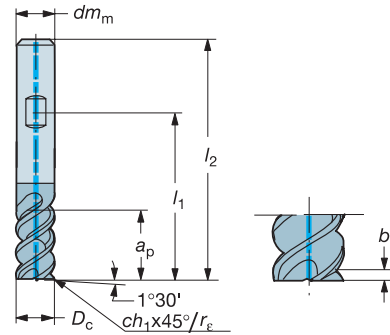
Variable flute

With internal coolant supply

Hardness <48HRC



Helix angle: -50°
 Tolerances: D_c : h12
 dm_m : h6



l_1 = programming length

D_c mm	Ordering code	Front type, z_n	Dimensions, mm					Material					
			dm_m	l_1	l_2	Helix f_{sh} mm ²⁾	Max a_p ¹⁾	P GC	M GC	K GC	S GC		
	Weldon												
6	R215.34C06050-BC13P	4	6	39	57	16.00	13.0	☆	☆	☆	☆		
8	R215.34C08050-BC19P	4	8	45	63	22.40	19.0	☆	☆	☆	☆		
10	R215.34C10050-BC22P	4	10	52	72	28.00	22.0	☆	☆	☆	☆		
12	R215.34C12050-BC26P	4	12	61	83	35.50	26.0	☆	☆	☆	☆		
16	R215.34C16050-BC32P	4	16	68	92	45.00	32.0	☆	☆	☆	☆		
20	R215.34C20050-BC38P	4	20	79	104	56.00	38.0	☆	☆	☆	☆		

¹⁾ Maximum cutting edge length.

²⁾ Pitch per rev.

For more technical information, see our Metalcutting Technical guide

z_n = number of cutting edges

Plura Guide



First choice: Use Plura Guide. Order number C-2948-063

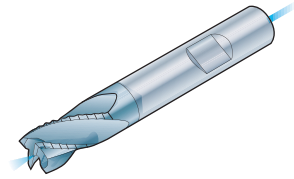
= New item



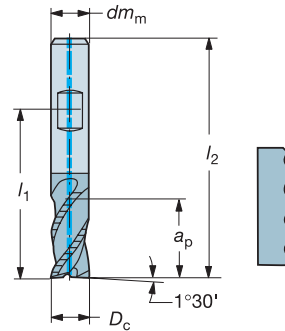
Roughing end mill

Kordell with internal coolant

Hardness <28HRC



Helix angle: -40°
Tolerances: D_c : h12
 dm_m : h6



l_1 = programming length

D_c mm	Ordering code	Front type, z_1	Dimensions, mm					Helix f_{sh} mm ²⁾	Max a_p ¹⁾	F	M	K	S
			dm_m	l_1	l_2	GC	GC			GC	GC		
	Weldon												
6	R215.34C06040-DS07K	4	6	36	54	25.00	7.0	☆	☆	☆	☆		
8	R215.34C08040-DS09K	4	8	40	58	31.50	9.0	☆	☆	☆	☆		
10	R215.34C10040-DS11K	4	10	46	66	40.00	11.0	☆	☆	☆	☆		
12	R215.34C12040-DS12K	4	12	50.5	73	45.00	12.0	☆	☆	☆	☆		
16	R215.34C16040-DS16K	4	16	58	82	63.00	16.0	☆	☆	☆	☆		
20	R215.34C20040-DS20K	4	20	67	92	80.00	20.0	☆	☆	☆	☆		
6	R215.34C06040-DC13K	4	6	39	57	25.00	13.0	☆	☆	☆	☆		
8	R215.34C08040-DC19K	4	8	45	63	31.50	19.0	☆	☆	☆	☆		
10	R215.34C10040-DC22K	4	10	52	72	40.00	22.0	☆	☆	☆	☆		
12	R215.34C12040-DC26K	4	12	60.5	83	45.00	26.0	☆	☆	☆	☆		
16	R215.34C16040-DC32K	4	16	68	92	63.00	32.0	☆	☆	☆	☆		
18	R215.34C18040-DC32K	4	18	68	92	71.00	32.0	☆	☆	☆	☆		
20	R215.34C20040-DC38K	4	20	79	104	80.00	38.0	☆	☆	☆	☆		

¹⁾ Maximum cutting edge length.

²⁾ Pitch per rev.

For more technical information, see our Metalcutting Technical guide

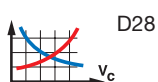
z_1 = number of cutting edges

Plura Guide



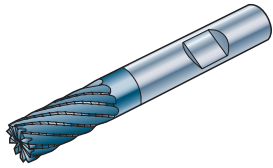
First choice: Use Plura Guide. Order number C-2948-063

= New item

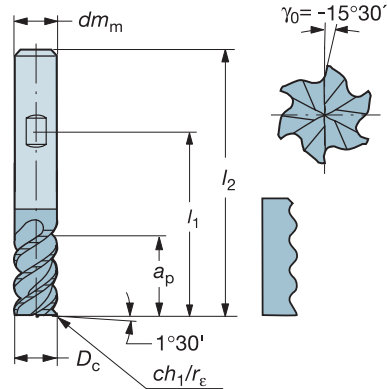


Roughing end mill

Kordell



Helix angle: -45°
 Tolerances: D_c : h12
 dm_m : h6



l_1 = programming length

D_c mm	Ordering code	Front type, z_n	Dimensions, mm					Helix λ_{sh} mm ²⁾	Max a_p ¹⁾	P	M	K	S
			dm_m	l_1	l_2	GC	GC			GC	GC		
	Weldon												
12	R216.35-12045-BC28K	5	12	60.5	83	45.00	28.0	☆	☆	☆	☆	☆	
16	R216.36-16045-BC32K	6	16	68	92	63.00	32.0	☆	☆	☆	☆	☆	
20	R216.36-20045-BC38K	6	20	79	104	80.00	38.0	☆	☆	☆	☆	☆	
25	R216.38-25045-BC45K	8	25	89	121		45.0	☆	☆	☆	☆	☆	

¹⁾ Maximum cutting edge length.

²⁾ Pitch per rev.

For more technical information, see our Metalcutting Technical guide

z_n = number of cutting edges

Plura Guide



First choice: Use Plura Guide. Order number C-2948-063

= New item

