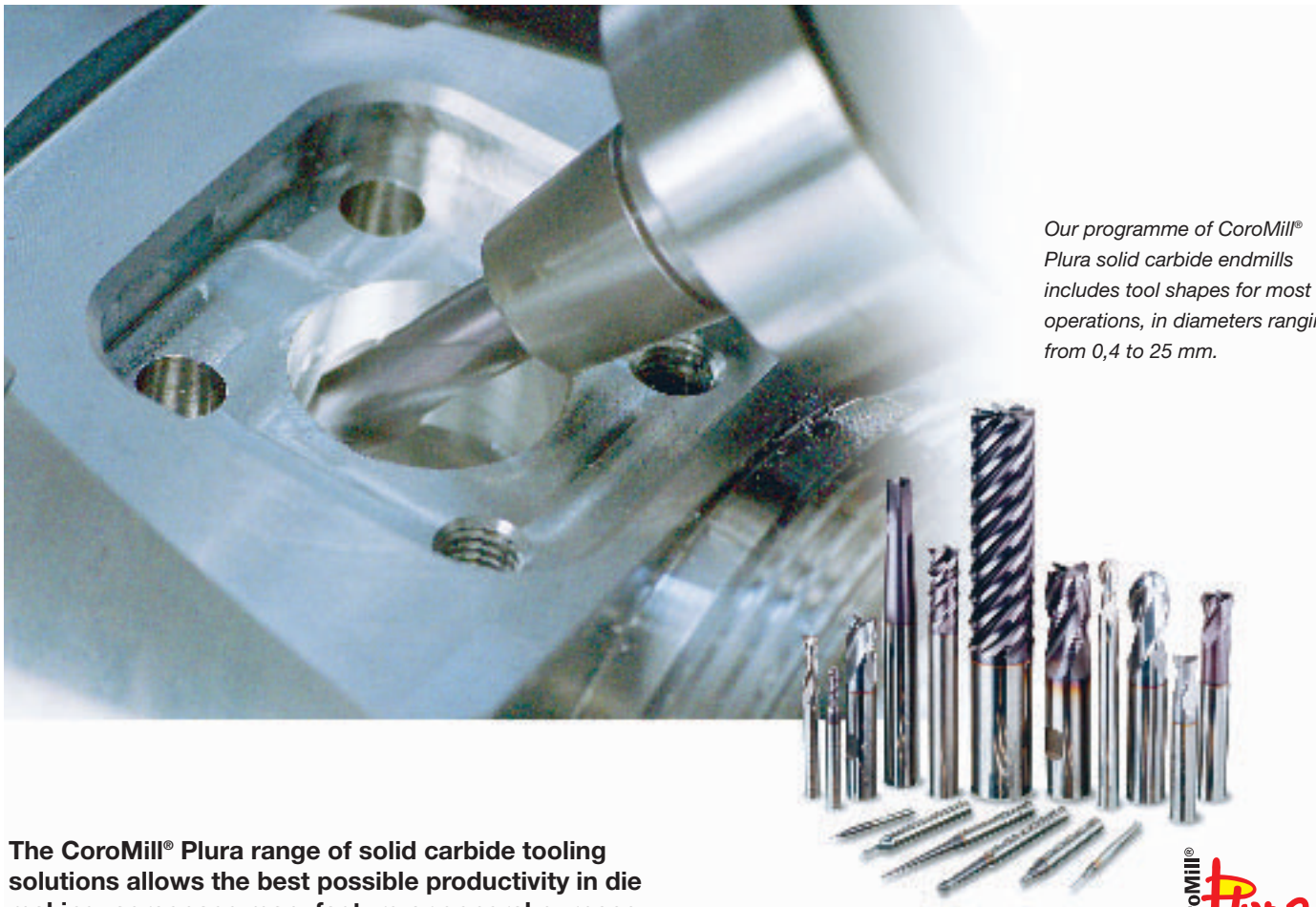
The evolution of CoroMill® Plura continues



Our programme of CoroMill® Plura solid carbide endmills includes tool shapes for most operations, in diameters ranging from 0,4 to 25 mm.

The CoroMill® Plura range of solid carbide tooling solutions allows the best possible productivity in die making, aerospace manufacture or general purpose milling.

Following the introduction of GC1610 grade for applications in hard workpieces and the general grades GC1620 and GC1630, Coromant now continues the evolution of the Plura family with another grade, GC1640.
GC1640 is a grade with a Coromant unique PVD TiAlN-coating and a new, very tough substrate based on the Pluratech technology.
With the GC1640 grade, the CoroMill Plura system provides the perfect solution for demanding operations like machining under unstable conditions.

CoroMill Plura and CoroGrip – made for each other

The advanced machining capabilities of Plura and the high precision CoroGrip holding chucks are a perfect match. CoroGrip's design provides clamping forces in excess of anything possible from shrink fit holders or hydraulic chucks, and a level of high stability which makes it the first choice for High Speed Machining (HSM).

CoroMill Plura has been specifically designed for HSM applications, with tool geometries and a new grade family profile allowing the best possible productivity in all workpiece materials.
Together these two complementary technologies can cope with any task you present, in conventional or multi-task machining.

Choosing your CoroMill® Plura endmill

Step 1: Select the Plura grade for your workpiece material

ISO H : Choose grade GC1610
for semi-finishing to finishing operations in hot work steel ≥ 43 HRC and cold work steel ≥ 52 HRC.

Choose grade GC1620
for roughing operations. See page A 151.

ISO P M K S H : Choose grade GC1620
for semi-finishing to finishing operations demanding wear resistance, especially in dry machining. This grade also performs well when machining stainless steels wet.

ISO P M K N S : Choose grade GC1630
for roughing to semi-finishing operations demanding edge line toughness. This grade also works well in machining of very soft and smearing steels.

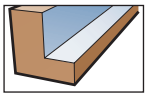
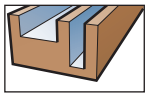
ISO P M K : Choose grade GC1640
for roughing operations where toughness is important or where stability demands a tough grade.

GC1610, GC1620	Dry	Wet
Finishing	GC1610	✗
Semi finishing		
Roughing	GC1620	

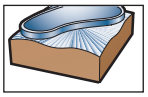
GC1620, GC1630, GC1640	Dry	Wet
Finishing	GC1620	
Semi finishing		GC1630
Roughing		GC1640

Step 2: Classify your machining operation

Milling of straight surfaces or grooving.
(see also keyway slotting – page A 173)

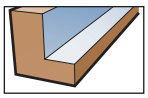
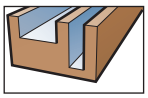
 

or profiling



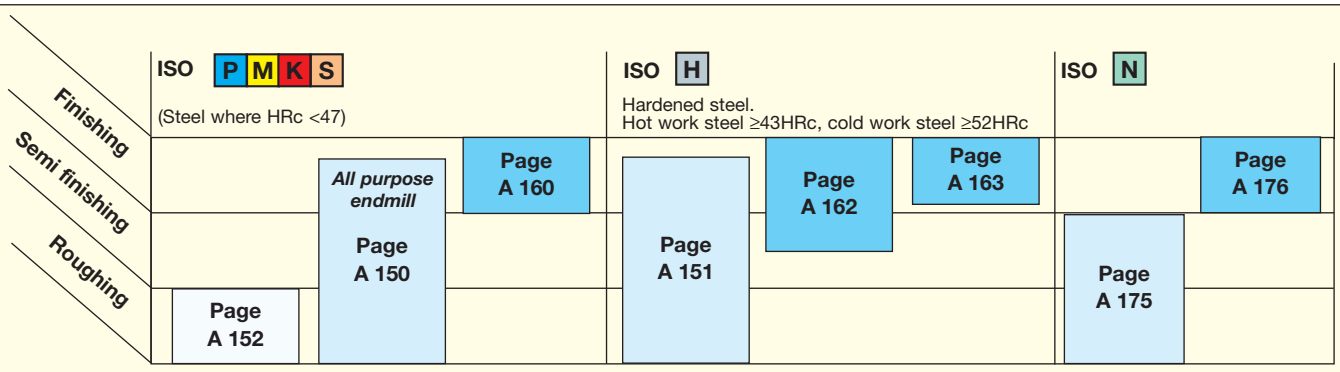
For cutting data and tool recommendation, please consult Pluraguide (C-2948-036).

Step 3: Select your CoroMill® Plura endmill

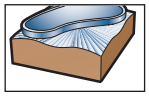
For straight surfaces and grooving

The “All purpose endmill” with variable flute depth for maximum stability, page A 150, is the first choice for roughing to finishing in ISO P, M, K and S materials.

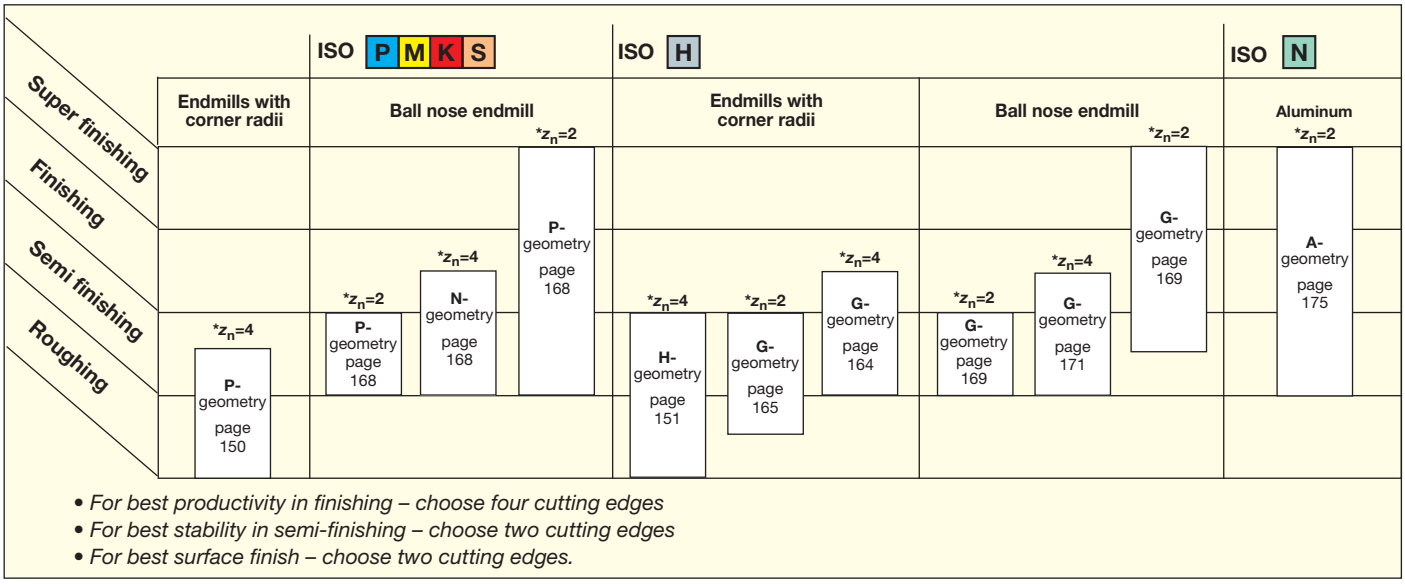


Note: Roughing endmills which suffer from chipping in steels ≥ 35 HRc or titanium, should be replaced with variable flute depth endmills.

SANDVIK Coromant



For profiling



- *For best productivity in finishing – choose four cutting edges*
- *For best stability in semi-finishing – choose two cutting edges*
- *For best surface finish – choose two cutting edges.*

*z_n=Total number of edges in the tool

Chamfering tools

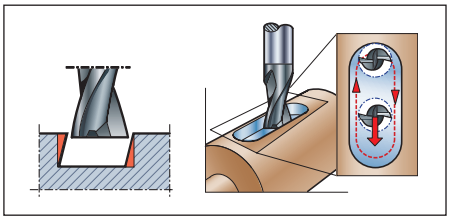
Tools for 30°, 45° chamfering in 0,5–6 mm radius are available, in grade GC1620 for all workpiece materials, page A 172.

Mini tools

For all applications where $D_c \leq 1$ mm is needed we recommend Sandvik Coromant's Mini tools on pages A 166 – A 167.

Keyway slotting

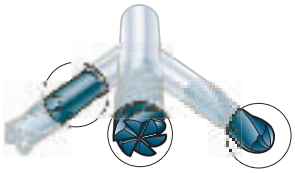
For this particular operation, some specific guidance can be given in addition to the general recommendations for milling of straight surfaces and grooving.
Due to the direction of the cutting forces and the tendency of the tool to bend, a slot milled in a single step will not have a perfectly square form.
The best accuracy and productivity will be achieved if the operation employs an undersized endmill, and is divided into two steps:
1. key slot milling – roughing of the full slot.
2. side milling – finishing all round the slot using up milling, to create true square corners.
Page A 173.



Key slot milling in two steps.

Engineered solutions

When our standard tools do not match your needs you can depend on Sandvik Coromant's experience in engineered tool solutions to provide the answer, however demanding the criteria.
Define the endmill you require and we will design it for you to your own specified dimensions. Forward your enquiry to us and we will supply a quotation including delivery time, price, and a design drawing.



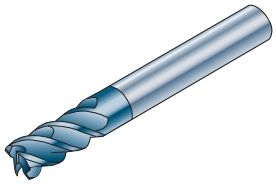
With engineered solutions Sandvik Coromant offer endless possibilities to change tool shapes, diameters and lengths.

All purpose endmill

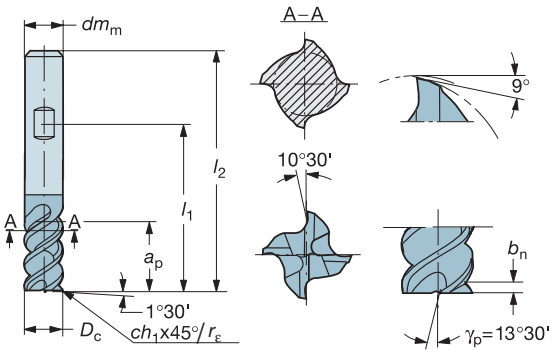
Variable flute depth tools

Hardness ≤48HRc

P M K S



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Radius r_ε	1620	1630	1640
Weldon				**Short**											
		4	6	**R216.34-06050-BC13P**	39	57	13	6	16	0,10	0,25	–	☆	☆	☆
		4	8	**08050-BC19P**	45	63	19	8	22,4	0,10	0,25	–	☆	☆	☆
		4	10	**10050-BC22P**	52	72	22	10	28	0,10	0,25	–	☆	☆	☆
		4	12	**12050-BC26P**	61	83	26	12	35,5	0,10	0,25	–	☆	☆	☆
		4	14	**14050-BC26P**	61	83	26	14	40	0,15	0,35	–	☆	☆	☆
		4	16	**16050-BC32P**	68	92	32	16	45	0,15	0,35	–	☆	☆	☆
		4	20	**20050-BC38P**	79	104	38	20	56	0,15	0,35	–	☆	☆	☆
		4	6	**R216.24-06050CBC13P**	39	57	13	6	16	–	–	1	☆	☆	
		4	8	**08050EBC19P**	45	63	19	8	22,4	–	–	2	☆	☆	
		4	10	**10050EBC22P**	52	72	22	10	28	–	–	2	☆	☆	
		4	12	**12050GBC26P**	61	83	26	12	35,5	–	–	3	☆	☆	
		4	14	**14050GBC26P**	61	83	26	14	40	–	–	3	☆	☆	
		4	16	**16050IBC32P**	68	92	32	16	45	–	–	4	☆	☆	
		4	20	**20050IBC38P**	79	104	38	20	56	–	–	4	☆	☆	
Cylindrical				**Long**											
		3	4	**R216.33-04050-AK11P**	–	57	11	6	11,2	0,10	0,25	–	☆	☆	
		3	5	**05050-AK13P**	–	57	13	6	14	0,10	0,25	–	☆	☆	
		4	6	**R216.34-06050-AK13P**	–	65	13	6	16	0,10	0,25	–	☆	☆	
		4	8	**08050-AK19P**	–	80	19	8	22,4	0,10	0,25	–	☆	☆	
		4	10	**10050-AK22P**	–	100	22	10	28	0,10	0,25	–	☆	☆	
		4	12	**12050-AK26P**	–	100	26	12	35,5	0,10	0,25	–	☆	☆	
		4	14	**14050-AK26P**	–	104	26	14	40	0,15	0,35	–	☆	☆	
		4	16	**16050-AK32P**	–	115	32	16	45	0,15	0,35	–	☆	☆	
		4	20	**20050-AK38P**	–	125	38	20	56	0,15	0,35	–	☆	☆	
		3	4	**R216.23-04050CAK11P**	–	57	11	6	11,2	–	–	1	☆	☆	
		3	5	**05050CAK13P**	–	57	13	6	14	–	–	1	☆	☆	
		4	6	**R216.24-06050CAK13P**	–	65	13	6	16	–	–	1	☆	☆	
		4	8	**08050EAK19P**	–	80	19	8	22,4	–	–	2	☆	☆	
		4	10	**10050EAK22P**	–	100	22	10	28	–	–	2	☆	☆	
		4	12	**12050GAK26P**	–	100	26	12	35,5	–	–	3	☆	☆	
		4	14	**14050GAK26P**	–	104	26	14	40	–	–	3	☆	☆	
		4	16	**16050IAK32P**	–	115	32	16	45	–	–	4	☆	☆	
		4	20	**20050IAK38P**	–	125	38	20	56	–	–	4	☆	☆	

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06050-BC13P 1620

Variable flute depth, ≤48HRc, ISO-P, M, K, S

For roughing to finishing in steel ≤48HRc, stainless steel, cast iron, HRSA and titanium

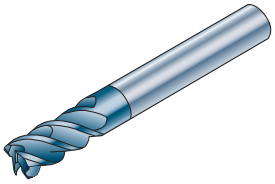
Generally this tool should be your first choice.
Always use the shortest possible tool protrusion. This tool has a differential pitch to improve stability in roughing applications. If you experience problems with too high axial forces try an endmill with four cutting edges and 30° helix, pages A 157 – A 158. If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156 (in weak materials and large a_p an endmill with four cutting edges and 45° helix might work, page A 159). For higher productivity in finishing applications we recomend an endmill with more edges, page A 160.

Roughing endmill

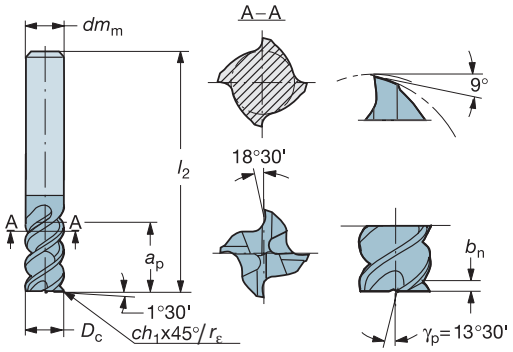
Variable flute depth tools

Hardness 43≤HRc≤63

P H



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	Max a_p [1]	dm_m	Helix l_{sh} [2] mm	ch_1	b_n	Radius r_ε	Grade 1620
Cylindrical		3	2	**R216.33- 02050-AK70H**	57	7	6	5,6	–	0,25	–	☆
		3	3	**03050-AK08H**	57	8	6	8	–	0,25	–	☆
		3	4	**04050-AK11H**	57	11	6	11,2	0,10	0,25	–	☆
		3	5	**05050-AK13H**	57	13	6	14	0,10	0,25	–	☆
		4	6	**R216.34- 06050-AK13H**	65	13	6	16	0,10	0,25	–	☆
		4	8	**08050-AK19H**	80	19	8	22,4	0,10	0,25	–	☆
		4	10	**10050-AK22H**	100	22	10	28	0,10	0,25	–	☆
		4	12	**12050-AK26H**	100	26	12	35,5	0,10	0,25	–	☆
		4	14	**14050-AK26H**	104	26	14	40	0,15	0,35	–	☆
		4	16	**16050-AK32H**	115	32	16	45	0,15	0,35	–	☆
		4	20	**20050-AK38H**	125	38	20	56	0,15	0,35	–	☆
		3	2	**R216.23- 02050BAK70H**	57	7	6	5,6	–	–	0,5	☆
		3	3	**03050BAK08H**	57	8	6	8	–	–	0,5	☆
		3	4	**04050CAK11H**	57	11	6	11,2	–	–	1	☆
		3	5	**05050CAK13H**	57	13	6	14	–	–	1	☆
		4	6	**R216.24- 06050CAK13H**	65	13	6	16	–	–	1	☆
		4	8	**08050EAK19H**	80	19	8	22,4	–	–	2	☆
		4	10	**10050EAK22H**	100	22	10	28	–	–	2	☆
		4	12	**12050GAK26H**	100	26	12	35,5	–	–	3	☆
		4	14	**14050GAK26H**	104	26	14	40	–	–	3	☆
		4	16	**16050IAK32H**	115	32	16	45	–	–	4	☆
		4	20	**20050IAK38H**	125	38	20	56	–	–	4	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.23-02050BAK70H 1620

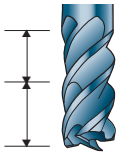
Variable flute depth, ISO-P, H

For warm work steels ≥43HRc.
For cold work steels ≥52HRc.

If you experience problems with this endmill we recommend you reduce the engagement since hardened steels are very demanding. For higher productivity with finishing engagements we recommend an endmill with more edges, page A 162.

Core: 85% of D_c

Core: 50% of D_c
Length: 1 x D_c

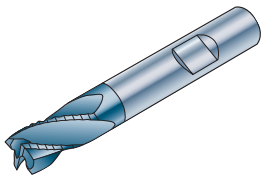


Roughing endmill

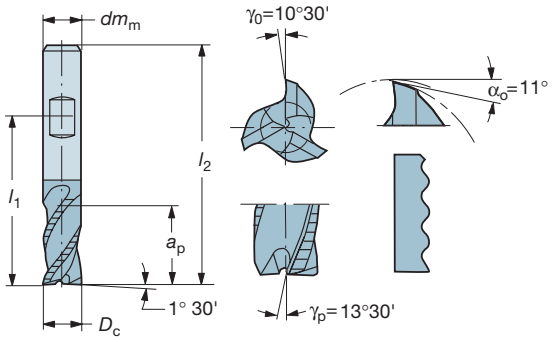
Kordell

Hardness <28HRc

P M K



Helix angle: ~30°, 40°
Tolerances: D_c — h14
dm_m — h6



l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	Grade 1640
Weldon	z_n = 3		Short					(30°)	
		6	**R216.33-06030-BS07K**	36	54	7	6	35,5	☆
		8	**08030-BS09K**	40	58	9	8	45	☆
		10	**10030-BS11K**	46	66	11	10	56	☆
		12	**12030-BS12K**	50,5	73	12	12	71	☆
		14	**14030-BS14K**	52,5	75	14	14	80	☆
		16	**16030-BS16K**	58	82	16	16	90	☆
		20	**20030-BS20K**	67	92	20	20	112	☆
	z_n = 4		Long					(40°)	
		6	**R216.34-06040-BC13K**	39	57	13	6	25	☆
		8	**08040-BC19K**	45	63	19	8	31,5	☆
		10	**10040-BC22K**	52	72	22	10	40	☆
		12	**12040-BC26K**	60,5	83	26	12	45	☆
		14	**14040-BC26K**	60,5	83	26	14	56	☆
		16	**16040-BC32K**	68	92	32	16	63	☆
		18	**18040-BC32K**	68	92	32	18	71	☆
		20	**20040-BC38K**	79	104	38	20	80	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-06030-BS07K 1640

Kordell, ISO-P, M, K

Primarily for roughing in steel <28HRc, stainless and cast iron.

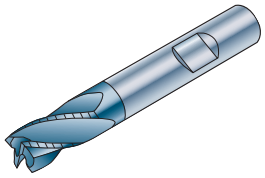
For materials >28HRc we recommend our endmill with variable flute depth, page A 150. If you experience problems with these endmills, primarily chipping, we recommend our endmill with variable flute depth, page A 150.

Roughing endmill

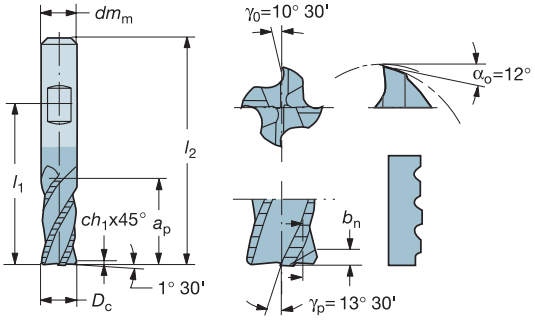
Chip dividing

Hardness <48HRc

S **Titanium**



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620
Weldon		4	6	**R216.34-06030-BC13B**	39	57	13	6	35,5	–	0,25	☆
		4	8	**08030-BC19B**	45	63	19	8	45	–	0,25	☆
		4	10	**10030-BC22B**	52	72	22	10	56	0,10	0,25	☆
		4	12	**12030-BC26B**	60,5	83	26	12	71	0,10	0,25	☆
		4	14	**14030-BC26B**	60,5	83	26	14	80	0,15	0,35	☆
		4	16	**16030-BC32B**	68	92	32	16	90	0,15	0,35	☆
		4	18	**18030-BC32B**	68	92	32	18	100	0,15	0,35	☆
		4	20	**20030-BC38B**	79	104	38	20	112	0,15	0,35	☆
		5	25	**R216.35-25030-BC45B**	93	125	45	25	140	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06030-BC13B 1620

Chip dividing, ISO-S

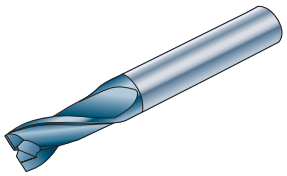
Primarily for roughing in titanium <48HRc.

The design shows the best improvement at large axial depth of cut. If you experience chipping with this tool then the toughness demands in your application are to high for this geometry and we would recommend using the endmill with variable flute depth, page A 150.

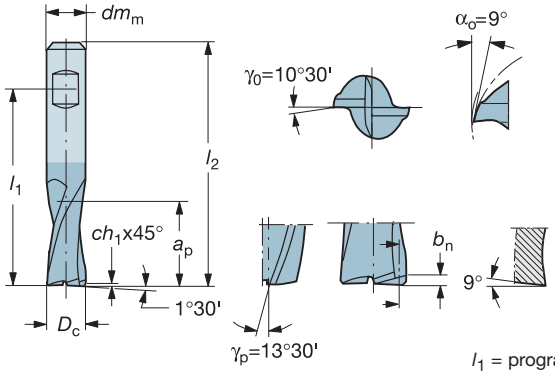
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Cylindrical	z_n = 2	1	**R216.32-01030-AC30P**	–	57	3	6	5,6	–	–	☆
		1,5	**01530-AC30P**	–	57	3	6	9,0	–	–	☆
		2	**02030-AC60P**	–	57	6	6	11,2	–	–	☆
		2,5	**02530-AC70P**	–	57	7	6	14,0	–	–	☆
		3	**03030-AC07P**	–	57	7	6	16	–	–	☆
		3,5	**03530-AC07P**	–	57	7	6	20,0	–	–	☆
		4	**04030-AC08P**	–	57	8	6	22,4	–	0,25	☆
		4,5	**04530-AC08P**	–	57	8	6	25,0	–	0,25	☆
		5	**05030-AC10P**	–	57	10	6	28	–	0,25	☆
		6	**06030-AC10P**	–	57	10	6	35,5	–	0,25	☆
		7	**07030-AC13P**	–	63	13	8	40,0	–	0,25	☆
		8	**08030-AC16P**	–	63	16	8	45	–	0,25	☆
		9	**09030-AC16P**	–	72	16	10	50,0	0,10	0,25	☆
		10	**10030-AC19P**	–	72	19	10	56	0,10	0,25	☆
		11	**11030-AC22P**	–	83	22	12	63	0,10	0,25	☆
		12	**12030-AC22P**	–	83	22	12	71	0,10	0,25	☆
		14	**14030-AC22P**	–	83	22	14	80	0,15	0,35	☆
		16	**16030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		18	**18030-AC26P**	–	92	26	18	100	0,15	0,35	☆
		20	**20030-AC32P**	–	104	32	20	112	0,15	0,35	☆
Weldon	z_n = 2	10	**R216.32-10030-BC19P**	52	72	19	10	56	0,10	0,25	☆
		12	**12030-BC22P**	60,5	83	22	12	71	0,10	0,25	☆
		16	**16030-BC26P**	68	92	26	16	90	0,15	0,35	☆
		18	**18030-BC26P**	68	92	26	18	100	0,15	0,35	☆
		20	**20030-BC32P**	79	104	32	20	112	0,15	0,35	☆

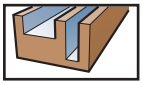
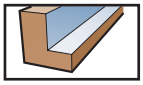
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.32-01030-AC30P 1630

2-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

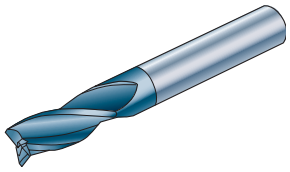
The problem solver–but bear in mind that with two cutting edges you can never achieve the highest metal removal rates. Moving from three to two cutting edges will not usually improve stability. In most applications, the shorter tool with two cutting edges for keyway slotting (page 173) will work better. For higher productivity try an endmill with three cutting edges and 45° helix, page A 156.

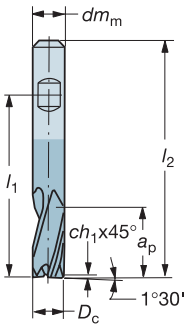
General purpose endmill

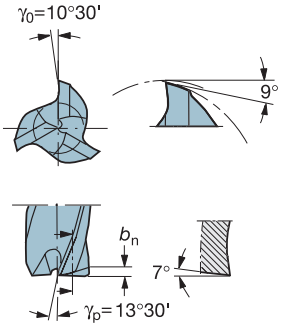
Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6





l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	Dimensions, mm l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Cylindrical	z_n = 3	1	**R216.33-01030-AC30P**	–	57	3	6	5,6	–	–	☆
		1,5	**01530-AC30P**	–	57	3	6	9	–	–	☆
		2	**02030-AC60P**	–	57	6	6	11,2	–	–	☆
		2,5	**02530-AC70P**	–	57	7	6	14	–	–	☆
		3	**03030-AC07P**	–	57	7	6	16	–	–	☆
		3,5	**03530-AC07P**	–	57	7	6	16	–	–	☆
		4	**04030-AC08P**	–	57	8	6	22,4	–	0,25	☆
		4,5	**04530-AC08P**	–	57	8	6	25	–	0,25	☆
		5	**05030-AC10P**	–	57	10	6	28	–	0,25	☆
		5,5	**05530-AC10P**	–	57	10	6	31,5	–	0,25	☆
		6	**06030-AC10P**	–	57	10	6	35,5	–	0,25	☆
		6,5	**06530-AC13P**	–	63	13	8	35,5	–	0,25	☆
		7	**07030-AC13P**	–	63	13	8	40	–	0,25	☆
		7,5	**07530-AC16P**	–	63	16	8	45	–	0,25	☆
		8	**08030-AC16P**	–	63	16	8	45	–	0,25	☆
		9	**09030-AC16P**	–	72	16	10	50	0,10	0,25	☆
		10	**10030-AC19P**	–	72	19	10	56	0,10	0,25	☆
		11	**11030-AC22P**	–	83	22	12	63	0,10	0,25	☆
		12	**12030-AC22P**	–	83	22	12	71	0,10	0,25	☆
		13	**13030-AC22P**	–	83	22	14	71	0,15	0,35	☆
		14	**14030-AC22P**	–	83	22	14	80	0,15	0,35	☆
		15	**15030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		16	**16030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		18	**18030-AC26P**	–	92	26	18	100	0,15	0,35	☆
		20	**20030-AC32P**	–	104	32	20	112	0,15	0,35	☆
Weldon	z_n = 3	6	**R216.33-06030-BC10P**	39	57	10	6	35,5	–	0,25	☆
		8	**08030-BC16P**	45	63	16	8	45	–	0,25	☆
		9	**09030-BC16P**	52	72	16	10	50	0,10	0,25	☆
		10	**10030-BC19P**	52	72	19	10	56	0,10	0,25	☆
		12	**12030-BC22P**	60.5	83	22	12	71	0,10	0,25	☆
		14	**14030-BC22P**	60.5	83	22	14	80	0,15	0,35	☆
		16	**16030-BC26P**	68	92	26	16	90	0,15	0,35	☆
		18	**18030-BC26P**	68	92	26	18	100	0,15	0,35	☆
		20	**20030-BC32P**	79	104	32	20	112	0,15	0,35	☆
			Extra long								
Cylindrical	z_n = 3	1	**R216.33-01030-AK40P**	–	57	4	6	5,6	–	–	☆
		1,5	**01530-AK60P**	–	57	6	6	9	–	–	☆
		2	**02030-AK80P**	–	57	8	6	11,2	–	–	☆
		3	**03030-AK12P**	–	57	12	6	18	–	–	☆
		4	**04030-AK14P**	–	57	14	6	22,4	–	0,25	☆
		5	**05030-AK16P**	–	50	16	6	28	–	0,25	☆
		6	**06030-AK22P**	–	65	22	6	35,5	–	0,25	☆
		8	**08030-AK28P**	–	80	28	8	45	–	0,25	☆
		10	**10030-AK32P**	–	100	32	10	56	0,10	0,25	☆
		12	**12030-AK38P**	–	100	38	12	71	0,10	0,25	☆
		16	**16030-AK50P**	–	115	50	16	90	0,15	0,35	☆
		20	**20030-AK50P**	–	125	50	20	112	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-01030-AC30P 1630

3-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium.

In most applications the shorter tool with three cutting edges for keyway slotting will work better, page A 173.

For higher productivity try a tool with four cutting edges and 30° helix, pages A 157-A 158.

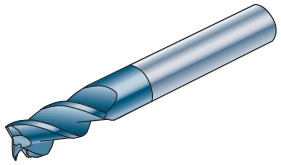
In most applications you will gain better stability with an endmill with three cutting edges and 45°helix, page A 156.

When you have problems with this endmill try an endmill with two cutting edges, page A 154.

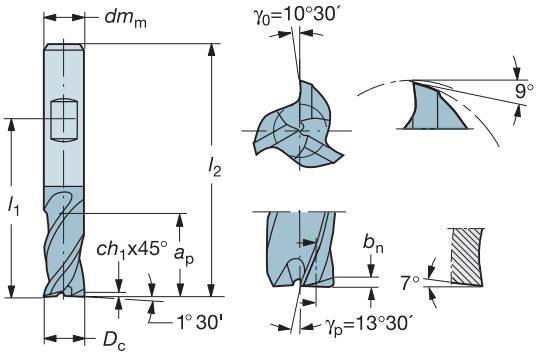
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~45°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical	z_n = 3	**R216.33-02045-AC60P**	2	–	57	6	6	6,3	–	–	☆	☆
		03045-AC07P	3	–	57	7	6	10	–	–	☆	☆
		04045-AC08P	4	–	57	8	6	12,5	0,10	0,25	☆	☆
		05045-AC10P	5	–	57	10	6	16	0,10	0,25	☆	☆
		06045-AC10P	6	–	57	10	6	20	0,10	0,25	☆	☆
		07045-AC13P	7	–	63	13	8	22,4	0,10	0,25	☆	☆
		08045-AC16P	8	–	63	16	8	25	0,10	0,25	☆	☆
		09045-AC16P	9	–	72	16	10	28	0,10	0,25	☆	☆
		10045-AC19P	10	–	72	19	10	31,5	0,10	0,25	☆	☆
		12045-AC22P	12	–	83	22	12	40	0,10	0,25	☆	☆
		14045-AC22P	14	–	83	22	14	45	0,15	0,35	☆	☆
		16045-AC26P	16	–	92	26	16	50	0,15	0,35	☆	☆
		18045-AC26P	18	–	92	26	18	56	0,15	0,35	☆	☆
		20045-AC32P	20	–	104	32	20	63	0,15	0,35	☆	☆
Weldon	z_n = 3	**R216.33-06045-BC10P**	6	39	57	10	6	20	0,10	0,25		☆
		08045-BC16P	8	45	63	16	8	25	0,10	0,25		☆
		10045-BC19P	10	52	72	19	10	31,5	0,10	0,25		☆
		12045-BC22P	12	60,5	83	22	12	40	0,10	0,25		☆
		14045-BC22P	14	60,5	83	22	14	45	0,15	0,35		☆
		16045-BC26P	16	68	92	26	16	50	0,15	0,35		☆
		18045-BC26P	18	68	92	26	18	56	0,15	0,35		☆
		20045-BC32P	20	79	104	32	20	63	0,15	0,35		☆

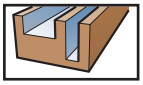
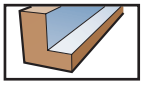
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-02045-AC60P 1620

3-45°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium. A very good tool in most applications!

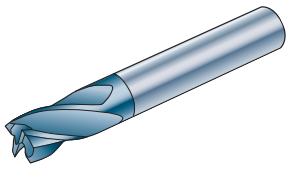
If you experience problems with too high axial forces try an endmill with three cutting edges and 30° helix, page A 173. If the chip room is not large enough try an endmill with two cutting edges and 30° helix, page A 154.

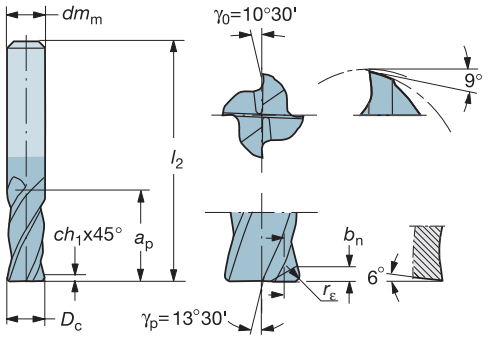
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical	z_n = 4	**Short**									
		R216.34-02030-AS40N	2	50	4	6	11,2	–	–	☆	☆
		03030-AS05N	3	50	5	6	18	–	–	☆	☆
		04030-AS08N	4	54	8	6	22,4	–	0,25	☆	☆
		05030-AS09N	5	54	9	6	28	–	0,25	☆	☆
		06030-AS10N	6	54	10	6	35,5	–	0,25	☆	☆
		07030-AS11N	7	58	11	8	40	–	0,25	☆	☆
		08030-AS12N	8	58	12	8	45	–	0,25	☆	☆
		10030-AS14N	10	66	14	10	56	0,10	0,25	☆	☆
		12030-AS16N	12	73	16	12	71	0,10	0,25	☆	☆
		14030-AS18N	14	75	18	14	80	0,15	0,35	☆	☆
		16030-AS22N	16	82	22	16	90	0,15	0,35	☆	☆
		18030-AS24N	18	84	24	18	100	0,15	0,35	☆	☆
		20030-AS26N	20	92	26	20	112	0,15	0,35	☆	☆
		Long									
		R216.34-02030-AC70N	2	57	7	6	11,2	–	–	☆	☆
		03030-AC08N	3	57	8	6	16	–	–	☆	☆
		03530-AC10N	3,5	57	10	6	20	–	–	☆	☆
		04030-AC11N	4	57	11	6	22,4	–	0,25	☆	☆
		04530-AC11N	4,5	57	11	6	25	–	0,25	☆	☆
		05030-AC13N	5	57	13	6	28	–	0,25	☆	☆
		05530-AC13N	5,5	57	13	6	31,5	–	0,25	☆	☆
		06030-AC13N	6	57	13	6	35,5	–	0,25	☆	☆
		06530-AC16N	6,5	63	16	8	35,5	–	0,25	☆	☆
		07030-AC16N	7	63	16	8	40	–	0,25	☆	☆
		08030-AC19N	8	63	19	8	45	–	0,25	☆	☆
		09030-AC19N	9	72	19	10	50	0,10	0,25	☆	☆
		10030-AC22N	10	72	22	10	56	0,10	0,25	☆	☆
		12030-AC26N	12	83	26	12	71	0,10	0,25	☆	☆
		14030-AC26N	14	83	26	14	80	0,15	0,35	☆	☆
		16030-AC32N	16	92	32	16	90	0,15	0,35	☆	☆
		18030-AC32N	18	92	32	18	100	0,15	0,35	☆	☆
		20030-AC38N	20	104	38	20	112	0,15	0,35	☆	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-02030-AS40N 1620

4-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

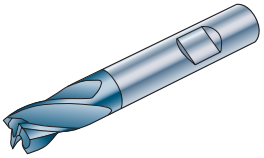
Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160. In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

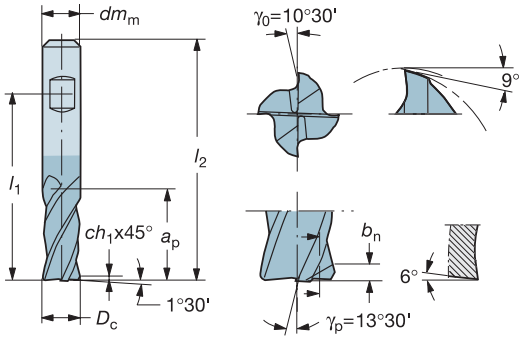
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	Dimensions, mm l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Weldon	z_n = 4	**Short**									
		R216.34-06030-BS10N	6	36	54	10	6	35,5	–	0,25	☆
		08030-BS12N	8	40	58	12	8	45	–	0,25	☆
		10030-BS14N	10	46	66	14	10	56	0,10	0,25	☆
		12030-BS16N	12	50,5	73	16	12	71	0,10	0,25	☆
		14030-BS18N	14	52,5	75	18	14	80	0,15	0,35	☆
		16030-BS22N	16	58	82	22	16	90	0,15	0,35	☆
		18030-BS24N	18	60	84	24	18	100	0,15	0,35	☆
		20030-BS26N	20	67	92	26	20	112	0,15	0,35	☆
		Long									
		R216.34-06030-BC13N	6	39	57	13	6	35,5	–	0,25	☆
		08030-BC19N	8	45	63	19	8	45	–	0,25	☆
		10030-BC22N	10	52	72	22	10	56	0,10	0,25	☆
		12030-BC26N	12	60,5	83	26	12	71	0,10	0,25	☆
		14030-BC26N	14	60,5	83	26	14	80	0,15	0,35	☆
		16030-BC32N	16	68	92	32	16	90	0,15	0,35	☆
		18030-BC32N	18	68	92	32	18	100	0,15	0,35	☆
		20030-BC38N	20	79	104	38	20	112	0,15	0,35	☆
		25030-BC45N	25	89	121	45	25	140	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06030-BS10N 1630

4-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

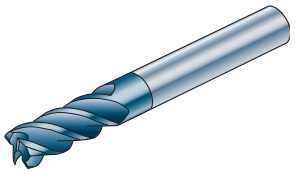
Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160. In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

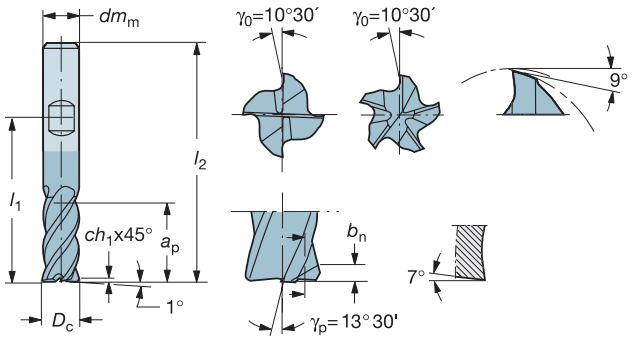
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~45°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical		4	2	**R216.34-02045-AC70N**	–	57	7	6	6,3	–	–	☆	☆
		4	3	**03045-AC08N**	–	57	8	6	10	–	–	☆	☆
		4	4	**04045-AC11N**	–	57	11	6	12,5	0,10	0,25	☆	☆
		4	5	**05045-AC13N**	–	57	13	6	16	0,10	0,25	☆	☆
		4	6	**06045-AC13N**	–	57	13	6	20	0,10	0,25	☆	☆
		4	8	**08045-AC19N**	–	63	19	8	25	0,10	0,25	☆	☆
		4	10	**10045-AC22N**	–	72	22	10	31,5	0,10	0,25	☆	☆
		4	12	**12045-AC26N**	–	83	26	12	40	0,10	0,25	☆	☆
		4	14	**14045-AC26N**	–	83	26	14	45	0,15	0,35	☆	☆
		4	16	**16045-AC32N**	–	92	32	16	50	0,15	0,35	☆	☆
		5	18	**R216.35-18045-AC32N**	–	92	32	18	56	0,15	0,35	☆	☆
		5	20	**R216.35-20045-AC38N**	–	104	38	20	63	0,15	0,35	☆	☆
Weldon		4	6	**R216.34-06045-BC13N**	39	57	13	6	20	0,10	0,25		☆
		4	8	**08045-BC19N**	45	63	19	8	25	0,10	0,25		☆
		4	10	**10045-BC22N**	52	72	22	10	31,5	0,10	0,25		☆
		4	12	**12045-BC26N**	60,5	83	26	12	40	0,10	0,25		☆
		4	14	**14045-BC26N**	60,5	83	26	14	45	0,15	0,35		☆
		4	16	**16045-BC32N**	68	92	32	16	50	0,15	0,35		☆
		5	20	**R216.35-20045-BC38N**	79	104	38	20	63	0,15	0,35		☆
Cylindrical				Extra long									
		4	6	**R216.34-06045-AK22N**	–	65	22	6	20	0,10	0,25	☆	
		4	8	**08045-AK28N**	–	80	28	8	28	0,10	0,25	☆	
		4	10	**10045-AK32N**	–	100	32	10	31,5	0,10	0,25	☆	
		4	12	**12045-AK40N**	–	100	40	12	40	0,10	0,25	☆	
		4	14	**14045-AK50N**	–	104	50	14	45	0,15	0,35	☆	
		5	16	**R216.35-16045-AK50N**	–	115	50	16	56	0,15	0,35	☆	
		5	20	**R216.35-20045-AK55N**	–	125	55	20	63	0,15	0,35	☆	
		6	20	**R216.36-20045-AK75N**	–	145	75	20	63	0,15	0,35	☆	
		8	25	**R216.38-25045-AK90N**	–	153	90	25	80	0,15	0,35	☆	

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-02045-AC70N 1620

4-45°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160.

You will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

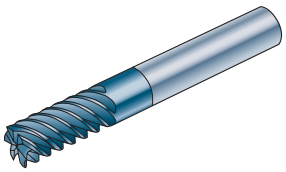
If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

Finishing endmill

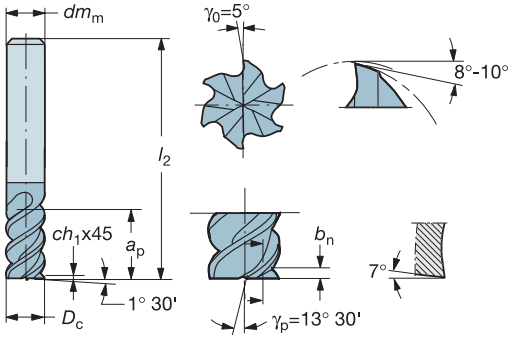
Non centre cutting

Hardness <48HRc

P M K S



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	a_p[1]	Max dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620
Cylindrical		4	3	**R215.34-03050-AC08L**	57	8	6	8	–	0,25	☆
		4	4	**R215.34-04050-AC11L**	57	11	6	11,2	0,10	0,25	☆
		5	5	**R215.35-05050-AC13L**	57	13	6	14	0,10	0,25	☆
		6	6	**R215.36-06050-AC13L**	57	13	6	16	0,10	0,25	☆
		6	8	**R215.36-08050-AC19L**	63	19	8	22,4	0,10	0,25	☆
		6	10	**R215.36-10050-AC22L**	72	22	10	28	0,10	0,25	☆
		6	12	**R215.36-12050-AC26L**	83	26	12	35,5	0,10	0,25	☆
		6	16	**R215.36-16050-AC32L**	92	32	16	45	0,15	0,35	☆
		8	20	**R215.38-20050-AC38L**	104	38	20	56	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.34-03050-AC08L 1620

New tool, 50°, ISO-P, M, K, S

For finishing applications in steel <48HRc, stainless steel, cast iron. HRSA and titanium.

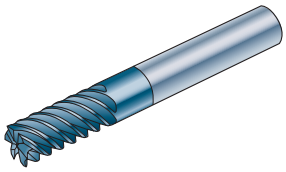
In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150. If the chip room is not large enough try an endmill with four cutting edges and 45° helix, Page A 159.

Finishing endmill

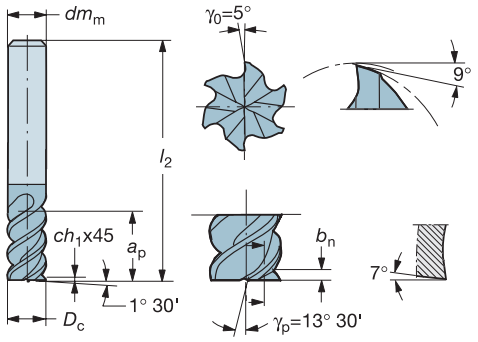
Non centre cutting

Hardness <48HRc

P M K S



Helix angle: ~60°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	a_p [1]	Max dm_m	Helix l_{sh} [2] mm	ch_1	b_n	Grade 1620
Cylindrical		6	6	**R215.36- 06060-AC13L**	57	13	6	11,2	0,10	0,25	☆
		6	8	**08060-AC19L**	63	19	8	16	0,10	0,25	☆
		6	10	**10060-AC22L**	72	22	10	20	0,10	0,25	☆
		6	12	**12060-AC26L**	83	26	12	22,4	0,10	0,25	☆
		6	14	**14060-AC26L**	83	26	14	28	0,15	0,35	☆
		6	16	**16060-AC32L**	92	32	16	31,5	0,15	0,35	☆
		6	18	**18060-AC32L**	92	32	18	35,5	0,15	0,35	☆
		6	20	**20060-AC38L**	104	38	20	40	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.36-06060-AC13L 1620

6-60°, ISO-P, M, K, S

For finishing applications in steel <48HRc, stainless steel, cast iron, HRSA and titanium.

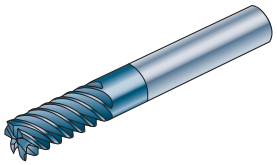
In most applications you will gain better stability with an endmill with six cutting edges and 50° helix, Page A 162 (new tool). If the chip room is not large enough try an endmill with four cutting edges and 50° helix, page A 150.

Finishing endmill

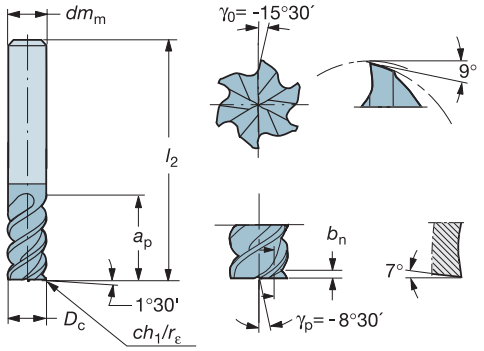
Non centre cutting

Hardness 43≤HRc≤63

P H



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	b_n	ch_1	r_ε	Grade 1610
Cylindrical		4	3	**R215.34-03050-AC08H**	57	8	6	8	–	–	–	☆
		4	4	**04050-AC11H**	57	11	6	11,2	0,25	0,10	–	☆
		6	6	**R215.36-06050-AC13H**	57	13	6	16	0,25	0,10	–	☆
		6	8	**08050-AC19H**	63	19	8	22,4	0,25	0,10	–	☆
		6	10	**10050-AC22H**	72	22	10	28	0,25	0,10	–	☆
		6	12	**12050-AC26H**	83	26	12	35,5	0,25	0,10	–	☆
		6	16	**16050-AC32H**	92	32	16	45	0,35	0,15	–	☆
		8	20	**R215.38-20050-AC38H**	104	38	20	56	0,35	0,15	–	☆
		4	3	**R215.24-03050BAC08H**	57	8	6	8	–	–	0,5	☆
		4	4	**04050BAC11H**	57	11	6	11,2	–	–	0,5	☆
		6	6	**R215.26-06050BAC13H**	57	13	6	16	–	–	0,5	☆
		6	8	**08050BAC19H**	63	19	8	22,4	–	–	0,5	☆
		6	10	**10050CAC22H**	72	22	10	28	–	–	1,0	☆
		6	10	**10050DAC22H**	72	22	10	28	–	–	1,5	☆
		6	10	**10050EAC22H**	72	22	10	28	–	–	2,0	☆
		6	12	**12050CAC26H**	83	26	12	35,5	–	–	1,0	☆
		6	16	**16050DAC32H**	92	32	16	45	–	–	1,5	☆
		8	20	**R215.28-20050DAC38H**	104	38	20	56	–	–	1,5	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.34-03050-AC08H 1610

6-50°H, ISO-P, H

For finishing applications in warm work steels ≥ 43 HRc.
For finishing applications in cold work steels≥52HRc.

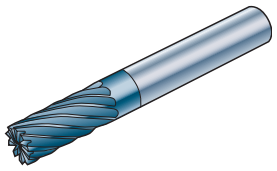
For higher productivity when working with very small a_e, try the multiflute, page A 163. If the chip room is not large enough try an endmill with four cutting edges and 50° helix, page A 151.

Finishing endmill

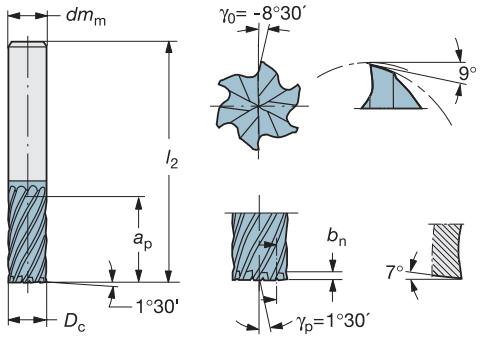
Non centre cutting

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6

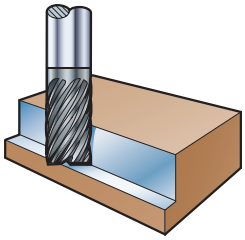


Shank type	Front type	z_n	D_c mm	Ordering code	Dimensions, mm l_2	a_p[1]	Max dm_m	b_n	Helix l_{sh}[2] mm	Grade 1610		
Cylindrical		6	5	**R215.36-05030-AC13H**	57	13	6	28	0,25	☆		
		6	6	**R215.36-06030-AC13H**	57	13	6	35,5	0,25	☆		
		8	8	**R215.38-08030-AC19H**	63	19	8	45	0,25	☆		
		10	10	**R215.3A-10030-AC22H**	72	22	10	56	0,25	☆		
		12	12	**R215.3C-12030-AC26H**	83	26	12	71	0,25	☆		
		14	14	**R215.3E-14030-AC26H**	83	26	14	80	0,35	☆		
		16	16	**R215.3G-16030-AC32H**	92	32	16	90	0,35	☆		
		16	20	**R215.3G-20030-AC38H**	104	38	20	112	0,35	☆		

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.36-05030-AC13H 1610

Best surface in hardened steel



Tool: R215.3A-10030-BC22H
Grade: 1610
Material: Tool steel 56 HRC
Cutting depths: a_p = 20 mm, a_e = 0,3 mm

	Test 1
Speed v_c, m/min	100
Feed/tooth f_z, mm/tooth	0,025
Feed v_f, mm/min	804
Method	Downmilling
Surface finish R_a, µm	0,13
Tool life, min	85

Multiflute, ISO-H

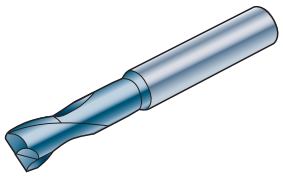
For finishing applications in warm work steels ≥ 43 HRc.
For finishing applications in cold work steels≥52HRc.

For higher productivity when working with very small a_e. If the chip room is not large enough try an endmill with six cutting edges and 50° helix, page A 162.

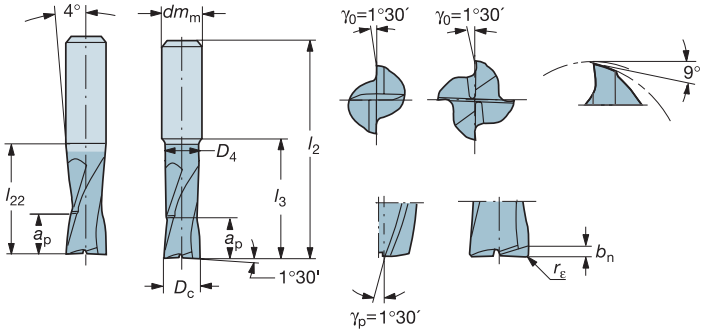
Corner radius endmill

Hardness 43≤HRc≤63

P H



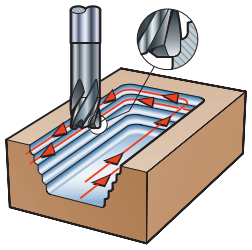
Helix angle: ~30°
Tolerances: D_c — h9
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	r_ε±0,01	l_2	D_4	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	l_3	Grade 1610
Cylindrical				Normal								
		2	2	**R216.22-02030AAI20G**	0,2	57	–	2	6	11,2	19	☆
		2	3	**03030BAI03G**	0,5	57	–	3	6	16	18	☆
		2	4	**04030BAI04G**	0,5	57	–	4	6	22,4	20	☆
		2	5	**05030BAI05G**	0,5	57	4,7	5	6	28	20	☆
		2	6	**06030CAI06G**	1	57	5,7	6	6	35,5	21	☆
		2	8	**08030CAI08G**	1	63	7,7	8	8	45	27	☆
		2	10	**10030DAI10G**	1,5	72	9,7	10	10	56	32	☆
		2	12	**12030DAI12G**	1,5	83	11,7	12	12	71	36	☆
		4	6	**R216.24-06030CAI06G**	1	57	5,7	6	6	35,5	21	☆
		4	8	**08030CAI08G**	1	63	7,7	8	8	45	27	☆
		4	10	**10030DAI10G**	1,5	72	9,7	10	10	56	32	☆
		4	12	**12030DAI12G**	1,5	83	11,7	12	12	71	36	☆
		4	16	**16030EAI16G**	2	92	15,5	16	16	90	42	☆
				Long								
		2	2	**R216.22-02030AAJ20G**	0,2	72	1,9	2	6	11,2	20	☆
		2	3	**03030AAJ03G**	0,3	72	2,9	3	6	18	20	☆
		4	4	**R216.24-04030AAJ04G**	0,4	72	3,8	4	6	22,4	20	☆
		4	5	**05030BAJ05G**	0,5	72	4,7	5	6	28	20	☆
		4	6	**06030BAJ06G**	0,5	72	5,7	6	6	35,5	24	☆
		4	8	**08030BAJ08G**	0,5	80	7,7	8	8	45	29	☆
		4	8	**08030CAJ08G**	1	80	7,7	8	8	45	29	☆
		4	8	**08030DAJ08G**	1,5	80	7,7	8	8	45	29	☆
		4	10	**10030BAJ10G**	0,5	100	9,7	10	10	56	35	☆
		4	10	**10030CAJ10G**	1	100	9,7	10	10	56	35	☆
		4	12	**12030BAJ12G**	0,5	100	11,7	12	12	71	36	☆
		4	12	**12030CAJ12G**	1	100	11,7	12	12	71	36	☆
		4	12	**12030EAJ12G**	2	100	11,7	12	12	71	36	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.22-02030AAI20G 1610



Machine: MC ISO 40
Tool: R216.24-10030DAI10G
Grade: 1610
Material: Tool steel 52 HRC
Cutting depths: a_p = 1 mm
a_e = 1 mm
Dry milling

Machining example	
Speed v_c, m/min	240
Rev/min	7775
Feed/tooth f_z, mm/tooth	0,075
Feed v_f, mm/min	2330
Tool life, min	200

Semi-finishing, ISO-P, H

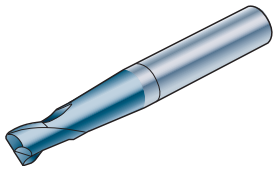
For finishing applications in warm work steels ≥ 43HRc.
For semi-finishing applications in cold work steels ≥52HRc.

For highest productivity in semi-finishing applications.
Always use the shortest possible tool protrusion.
When stability allows use an endmill with four cutting edges.

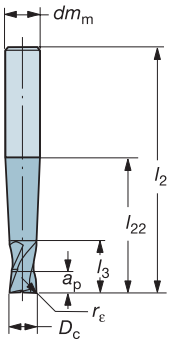
Corner radius endmill

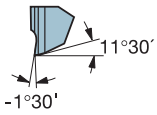
Hardness 43≤HRc≤63

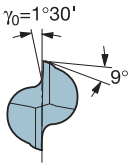
P H



Helix angle: 30°
Tolerances: D_c — h9
dm_m — h6







Shank type	Front type	D_c mm	Ordering code	r_ε±0,01	l_2	Max a_p[1]	dm_m	l_3	l_{22}	Grade 1610
Cylindrical			Extra long							
	z_n = 2	3	**R216.22-03030BAP03G**	0,5	80	3	6	4	36,9	☆
		4	**04030BAP04G**	0,5	90	4	6	5	50,7	☆
		6	**06030BAP06G**	0,5	96	6	8	7	52,7	☆
	z_n = 4	6	**R216.24-06030CAP06G**	1	96	6	8	7	52,7	☆
		8	**08030CAP08G**	1	100	8	10	10	52,6	☆
		10	**10030CAP10G**	1	125	10	12	12	67,3	☆
		10	**10030GAP10G**	3	125	10	12	12	67,3	☆
		12	**12030CAP12G**	1	135	12	14	14	69,3	☆
		12	**12030GAP12G**	3	135	12	14	14	69,3	☆
		16	**16030CAP16G**	1	150	16	16	–	–	☆
		16	**16030GAP16G**	3	150	16	16	–	–	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.22-03030BAP03G 1610

Semi-finishing, ISO-P, H

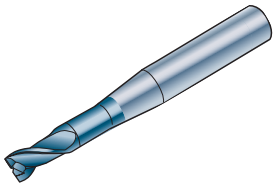
For finishing applications in warm work steels ≥ 43HRc.
For semi-finishing applications in cold work steels ≥52HRc.

For highest productivity in semi-finishing applications.
Always use the shortest possible tool protrusion.
When stability allows use an endmill with four cutting edges.

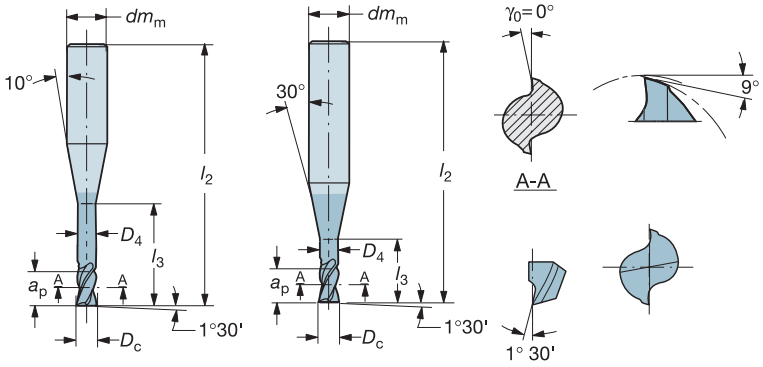
General purpose endmill

Hardness <63HRc

P M K N S H



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	l_3	Max a_p[1]	D_4	dm_m	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	z_n = 2	2,5 x D_c								
		R216.32-00430-AE04G	0,4	54	1	0,4	0,36	6	2,24	☆
		00530-AE05G	0,5	54	1,2	0,5	0,46	6	2,8	☆
		00630-AE06G	0,6	54	1,5	0,6	0,56	6	3,55	☆
		00830-AE08G	0,8	54	2	0,8	0,76	6	4,5	☆
		01030-AE10G	1,0	54	2,5	1,0	0,96	6	5,6	☆
		5 x D_c								
		R216.32-00530-AI05G	0,5	57	2,5	0,5	0,46	6	2,8	☆
		00630-AI06G	0,6	57	3	0,6	0,56	6	3,55	☆
		00830-AI08G	0,8	57	4	0,8	0,76	6	4,5	☆
		01030-AI10G	1,0	57	5	1,0	0,96	6	5,6	☆
		10 x D_c								
		R216.32-00530-AJ05G	0,5	57	5	0,5	0,46	6	2,8	☆
		00630-AJ06G	0,6	57	6	0,6	0,56	6	3,55	☆
		00830-AJ08G	0,8	57	8	0,8	0,76	6	4,5	☆
		01030-AJ10G	1,0	57	10	1,0	0,96	6	5,6	☆

[1] Maximum cutting edge length. [2] Pitch per rev.

Ordering example: 10 pieces R216.32-00430-AE04G 1620

Mini general purpose endmill

ISO-P, M, K, N, S, H

For steel <63HRc, stainless steel, cast iron, HRSA, titanium, aluminum and hardened steel

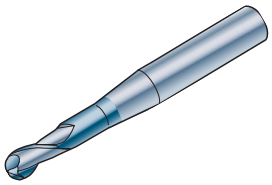
For all applications where D_c<1 mm is needed.

Always use the shortest possible tool protrusion.

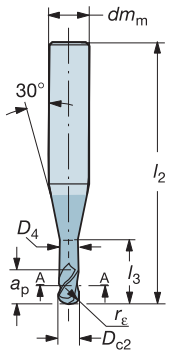
Ball nose endmill

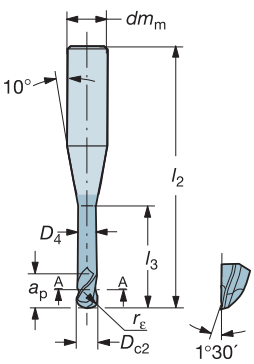
Hardness <63 HRc

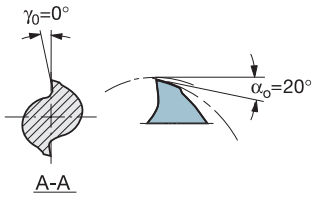
P M K N S H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6







Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0,01	l_2	l_3	Max a_p[1]	D_4	dm_m	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	z_n = 2	2,5 x D_c									
		R216.42- 00430-AE04G	0,4	0,2	54	1	0,4	0,36	6	2,24	☆
		00530-AE05G	0,5	0,25	54	1,2	0,5	0,46	6	2,8	☆
		00630-AE06G	0,6	0,3	54	1,5	0,6	0,56	6	3,55	☆
		00830-AE08G	0,8	0,4	54	2	0,8	0,76	6	4,5	☆
		01030-AE10G	1,0	0,5	54	2,5	1,0	0,96	6	5,6	☆
		5 x D_c									
		R216.42- 00530-AO05G	0,5	0,25	57	2,5	0,5	0,46	6	2,8	☆
		00630-AO06G	0,6	0,3	57	3	0,6	0,56	6	3,55	☆
		00830-AO08G	0,8	0,4	57	4	0,8	0,76	6	4,5	☆
		01030-AO10G	1,0	0,5	57	5	1,0	0,96	6	5,6	☆
		10 x D_c									
		R216.42- 00530-AJ05G	0,5	0,25	57	5	0,5	0,46	6	2,8	☆
		00630-AJ06G	0,6	0,3	57	6	0,6	0,56	6	3,55	☆
		00830-AJ08G	0,8	0,4	57	8	0,8	0,76	6	4,5	☆
		01030-AJ10G	1,0	0,5	57	10	1,0	0,96	6	5,6	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-00430-AE04G 1620

Mini ball nose, ISO-P, M, K, N, S, H

For steel <63HRc, stainless steel, cast iron, HRSA, titanium, aluminum and hardened steel

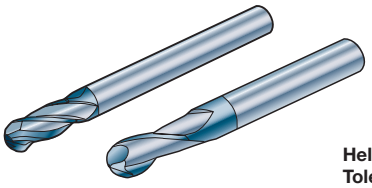
For all applications where D_{c2}<1 mm is needed.

Always use the shortest possible tool protrusion.

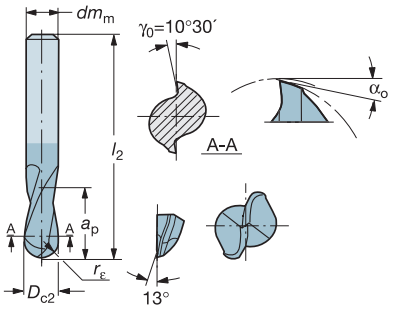
Ball nose endmill

Hardness <48 HRc

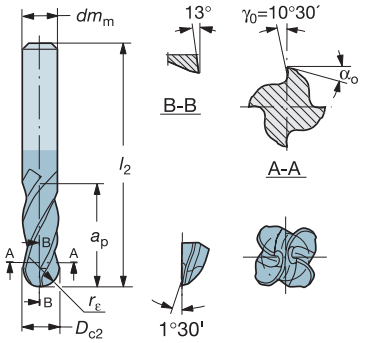
P M K S



Short



Long



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6

Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0,01	l_2	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	 z_n = 2	Short								
		R216.42-01030-AC30P	1	0,5	57	3	6	20°	5,6	☆
		01530-AC30P	1,5	0,75	57	3	6	20°	9	☆
		02030-AC60P	2	1,0	57	6	6	20°	11,2	☆
		02530-AC70P	2,5	1,25	57	7	6	20°	14	☆
		03030-AC07P	3	1,5	57	7	6	20°	16	☆
		04030-AC08P	4	2,0	57	8	6	14°	22,4	☆
		05030-AC10P	5	2,5	57	10	6	14°	28	☆
		06030-AC10P	6	3,0	57	10	6	14°	35,5	☆
		07030-AC13P	7	3,5	63	13	8	14°	40	☆
		08030-AC16P	8	4,0	63	16	8	14°	45	☆
		09030-AC16P	9	4,5	72	16	10	12°	50	☆
		10030-AC19P	10	5,0	72	19	10	12°	56	☆
		12030-AC22P	12	6,0	83	22	12	12°	71	☆
		14030-AC22P	14	7,0	83	22	14	12°	80	☆
		16030-AC26P	16	8,0	92	26	16	12°	90	☆
		18030-AC26P	18	9,0	92	26	18	12°	100	☆
		20030-AC32P	20	10,0	104	32	20	10°	112	☆
	 z_n = 4	Long								
		R216.44-03030-AK08N	3	1,5	80	8	6	20°	16	☆
		04030-AK11N	4	2,0	80	11	6	14°	22,4	☆
		05030-AK13N	5	2,5	80	13	6	14°	28	☆
		06030-AK13N	6	3,0	80	13	6	14°	35,5	☆
		07030-AK16N	7	3,5	100	16	8	14°	40	☆
		08030-AK19N	8	4,0	100	19	8	14°	45	☆
		09030-AK19N	9	4,5	100	19	10	12°	50	☆
		10030-AK22N	10	5,0	100	22	10	12°	56	☆
		12030-AK26N	12	6,0	100	26	12	12°	71	☆
		16030-AK32N	16	8,0	100	32	16	12°	90	☆
		20030-AK38N	20	10,0	125	38	20	10°	112	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-01030-AC30P 1620

Ball nose, <48HRc, ISO-P, M, K, S

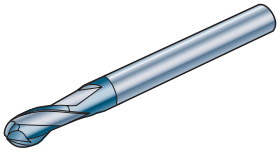
For profiling applications in steel <48HRc, stainless steel, cast iron, HRSA and titanium
Always use the shortest possible tool protrusion. In roughing applications where you need large chip room and good stability use a tool with two cutting edges.
In semi-finishing applications and general applications, use a tool with four cutting edges for best productivity.

In finishing/super-finishing applications use a tool with two cutting edges.
Use an endmill with two cutting edges for optimal stability and to avoid the transition area between four and two cutting edges.
A ball nose with four cutting edges has only two cutting edges over the tool centre.

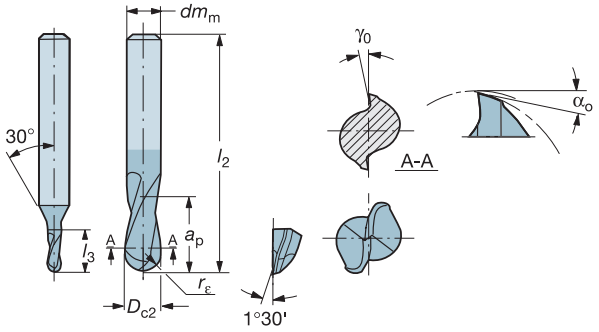
Ball nose endmill

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6



Shank type	Front type	D_{c2} mm	Ordering code	r_ε±0,01	l_2	l_3	Max a_p [1]	dm_m	α_o	Helix l_{sh} [2] mm	γ_o	Grade 1610
Cylindrical	z_n = 2	1	**R216.42-01030-AC15G**	0,5	57	4,5	1,5	6	19-21°	5,6	0-3°	☆
		2	**02030-AC30G**	1	57	6	3	6	19-21°	11,2	0-3°	☆
		3	**03030-AC04G**	1,5	57	6,9	4	6	19-21°	18	0-3°	☆
		4	**04030-AC05G**	2	57	14	5	6	13-15°	22,4	0-3°	☆
		5	**05030-AC06G**	2,5	57	15	6	6	13-15°	28	0-3°	☆
		6	**06030-AC10G**	3	57	–	10	6	13-15°	35,5	0-3°	☆
		8	**08030-AC16G**	4	63	–	16	8	13-15°	45	0-3°	☆
		10	**10030-AC19G**	5	72	–	19	10	11-13°	56	0-3°	☆
		12	**12030-AC22G**	6	83	–	22	12	11-13°	71	0-3°	☆
		1	**R216.42-01030-AK15G**	0,5	57	3	1,5	6	19-21°	5,6	0-3°	☆
		1,5	**01530-AK20G**	0,75	57	4	2	6	19-21°	9	0-3°	☆
		2	**02030-AK30G**	1,0	57	6	3	6	19-21°	11,2	0-3°	☆
		2,5	**02530-AK30G**	1,25	57	6	3	6	19-21°	14	0-3°	☆
		3	**03030-AK04G**	1,5	57	7	4	6	19-21°	16	0-3°	☆
		4	**04030-AK05G**	2,0	80	8	5	6	13-15°	22,4	0-3°	☆
		5	**05030-AK06G**	2,5	80	10	6	6	13-15°	28	0-3°	☆
		6	**06030-AK10G**	3,0	80	–	10	6	13-15°	35,5	0-3°	☆
		8	**08030-AK16G**	4,0	100	–	16	8	13-15°	45	0-3°	☆
		10	**10030-AK19G**	5,0	100	–	19	10	11-13°	56	0-3°	☆
		12	**12030-AK22G**	6,0	100	–	22	12	11-13°	71	0-3°	☆
		16	**16030-AK32G**	8,0	125	–	32	16	11-13°	90	0-3°	☆
		1	**R216.42-01030-AK15H**	0,5	57	3	1,5	6	19-21°	5,6	-13-16° [3]	☆
		1,5	**01530-AK20H**	0,75	57	4	2	6	19-21°	9	-13-16° [3]	☆
		2	**02030-AK25H**	1,0	57	6	2,5	6	19-21°	11,2	-13-16° [3]	☆
		2,5	**02530-AK30H**	1,25	57	6	3	6	19-21°	14	-13-16° [3]	☆
		3	**03030-AK04H**	1,5	57	7	4	6	19-21°	16	-13-16° [3]	☆
		4	**04030-AK05H**	2,0	80	8	5	6	13-15°	22,4	-13-16° [3]	☆
		5	**05030-AK06H**	2,5	80	10	6	6	13-15°	28	-13-16° [3])	☆
		6	**06030-AK07H**	3,0	80	–	7	6	13-15°	35,5	-13-16° [3]	☆
		8	**08030-AK09H**	4,0	100	–	9	8	13-15°	45	-13-16° [3]	☆
		10	**10030-AK11H**	5,0	100	–	11	10	11-13°	56	-13-16° [3]	☆
		12	**12030-AK12H**	6,0	100	–	12	12	11-13°	71	-13-16° [3]	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.
[3] -13-16 means minus 13° to minus 16°.

Ordering example: 10 pieces R216.42-01030-AC15G 1610

Ball nose, ISO-P, H

For profiling applications in warm work steels ≥43 HRc.
For profiling applications in cold work steels ≥52HRc.

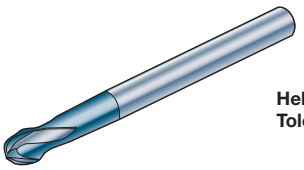
Always use the shortest possible tool protrusion.
First choice is G-geometry. When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry. In semi-finishing/finishing applications better productivity is possible with a ballnose with four cutting edges, pages A 170 – A 171.

When working along steep walls the spherical design ballnose will have shorter contact length, page A 170. When better accessibility or a neck behind the cutting edges is needed, page A 171.

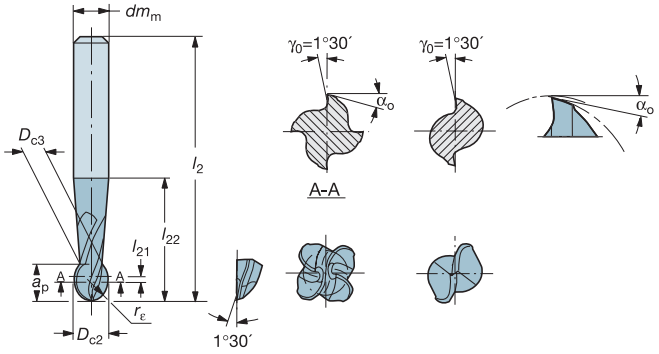
Ball nose endmill

Spherical design
Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6 (D_{c2}≤10~h5)



Shank type	Front type	Ordering code	D_{c2} mm	Dimensions, mm								Grade
				r_ε ±0,01	l_2	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	l_{21}	l_{22}	D_{c3}	1610
Cylindrical	z_n = 2		1	R216.62-01030-AO20G	0,5	75	2	6	19-21°	5,6	1,5	20	–	☆
			2	02030-AO30G	1	75	3	6	19-21°	11,2	1,5	20	1,7	☆
			3	03030-AO04G	1,5	80	4	6	19-21°	16	1,5	30	2,5	☆
			4	04030-AO05G	2	80	5	6	13-15°	22,4	1,5	30	3,3	☆
			5	05030-AO07G	2,5	80	7	6	13-15°	28	2	43	4,1	☆
			6	06030-AO07G	3	100	7	6	13-15°	35,5	2	30	4,7	☆
			8	08030-AO09G	4	100	9	8	13-15°	45	3	36	6,5	☆
			10	10030-AO11G	5	100	11	10	11-13°	56	3	43	8,2	☆
			12	12030-AO13G	6	100	13	12	11-13°	71	3	52	9,8	☆
			16	16030-AO15G	8	150	15	16	11-13°	90	3	61	13,4	☆
	z_n = 4		5	R216.64-05030-AO07G	2,5	80	7	6	13-15°	28	2	43	4,1	☆
			6	06030-AO07G	3	100	7	6	13-15°	35,5	2	30	4,7	☆
			8	08030-AO09G	4	100	9	8	13-15°	45	3	36	6,5	☆
			10	10030-AO11G	5	100	11	10	11-13°	56	3	43	8,2	☆
			12	12030-AO13G	6	100	13	12	11-13°	71	3	52	9,8	☆
			16	16030-AO15G	8	150	15	16	11-13°	90	3	61	13,4	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.62-01030-AO20G 1610

Ballnose, ISO-P, H

For profiling applications in warm work steels ≥43 HRc.
For profiling applications in cold work steels ≥52HRc.

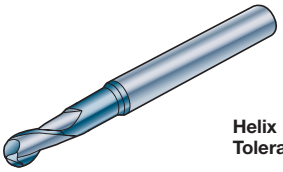
Always use the shortest possible tool protrusion.
When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry, page A 169.
In semi-finishing/finishing applications better productivity is possible with a ball nose with four cutting edges.

For better stability use tools with shorter tool protrusion, page A 169. When better accessability is needed, page A 171.

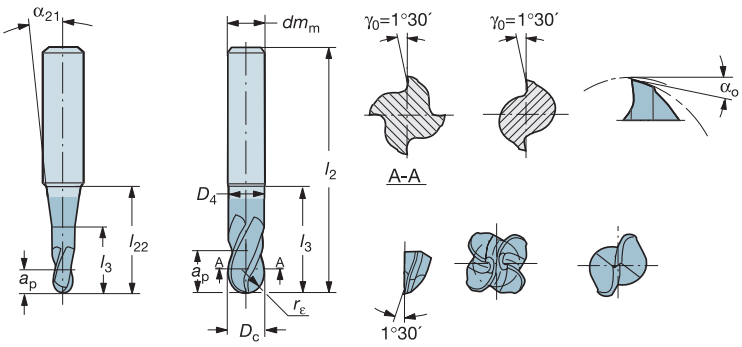
Ball nose endmill

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6 (D_{c2}≤8~h5)



Shank type	Front type	D_{c2} mm	Ordering code	r_ε ±0,01	l_2	D_4	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	l_3	l_{22}	α_{21}	Grade 1610
Cylindrical	 z_n = 2	1	**R216.42-01030-AI10G**	0,5	57	–	1	6	20°	5,6	2	20	4°	☆
		1,5	**01530-AI15G**	0,75	57	–	1,5	6	20°	9	3	20	4°	☆
		2	**02030-AI20G**	1	57	–	2	6	20°	11,2	4	20	4°	☆
		2,5	**02530-AI25G**	1,25	57	–	2,5	6	20°	14	4	20	4°	☆
		3	**03030-AI03G**	1,5	57	–	3	6	20°	16	5	20	4°	☆
		4	**04030-AI04G**	2	57	–	4	6	14°	22,4	6	20	4°	☆
		5	**05030-AI05G**	2,5	57	4,7	5	6	14°	28	20	–	4°	☆
		6	**06030-AI06G**	3	57	5,7	6	6	14°	35,5	21	–	4°	☆
		8	**08030-AI08G**	4	63	7,7	8	8	14°	45	27	–	4°	☆
		10	**10030-AI10G**	5	72	9,7	10	10	12°	56	32	–	4°	☆
		12	**12030-AI12G**	6	83	11,7	12	12	12°	71	36	–	4°	☆
			Extra long											
		1	**R216.42-01030-AP10G**	0,5	80	–	1	6	20°	5,6	2	36,5	2,5°	☆
		2	**02030-AP20G**	1	80	–	2	6	20°	11,2	3	40	2,5°	☆
		3	**03030-AP03G**	1,5	80	–	3	6	20°	18	4	38,5	2,5°	☆
		4	**04030-AP04G**	2	90	–	4	8	14°	22,4	5	51	2,5°	☆
		5	**05030-AP05G**	2,5	100	–	5	8	14°	28	6	40,5	2,5°	☆
		6	**06030-AP06G**	3	100	–	6	10	14°	35,5	7	53	2,5°	☆
		8	**08030-AP08G**	4	100	–	8	12	14°	45	10	53	2,5°	☆
		10	**10030-AP10G**	5	125	–	10	14	12°	56	12	58	2,5°	☆
		12	**12030-AP12G**	6	140	–	12	16	12°	71	14	60	2,5°	☆
	 z_n = 4	6	**R216.44-06030-AI06G**	3	57	–	6	6	14°	35,5	20	5,7	4°	☆
		8	**08030-AI08G**	4	63	–	8	8	14°	45	26	7,7	4°	☆
		10	**10030-AI10G**	5	72	–	10	10	12°	56	30	9,7	4°	☆
		12	**12030-AI12G**	6	83	–	12	12	12°	71	36	11,7	4°	☆
		16	**16030-AI16G**	8	92	–	16	16	12°	90	42	15,5	4°	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-01030-AI10G 1610

Ball nose, ISO-P, H

For profiling applications in warm work steels ≥ 43 HRc.
For profiling applications in cold work steels≥52HRc.

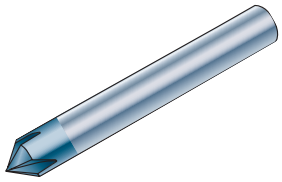
Always use the shortest possible tool protrusion.
First choice is G-geometry. When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry, page A 169. In semi-finishing/ finishing applications better productivity is possible with a ballnose with four cutting edges.

When working along steep walls the spherical design ballnose will have shorter contact length, page A 170.
For better stability use a tool with shorter tool protrusion, page A 169.

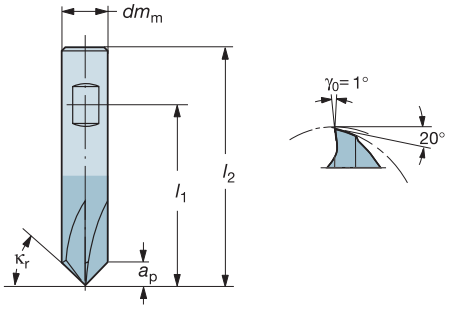
Chamfering endmill

Hardness <63HRc

P M K N S H



Helix angle: 0
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	Ordering code	Dimensions, mm K_r	l_1	l_2	Max a_p[1]	dm_m	Grade 1620
Cylindrical		4	**R215.94-01500-AC74G**	60°	–	100	7,35	10	☆
		4	**R215.84-01000-AC25G**	45°	–	57	2,5	6	☆
		4	**R215.84-01500-AC43G**	45°	–	100	4,25	10	☆
		5	**R215.85-02000-AC30G**	45°	–	80	3	8	☆
		6	**R215.86-03000-AC05G**	45°	–	83	4,5	12	☆
Weldon		4	**R215.94-01500-BC74G**	60°	80	100	7,35	10	☆
		4	**R215.84-01500-BC43G**	45°	80	100	4,25	10	☆
		6	**R215.86-03000-BC05G**	45°	60,5	83	4,5	12	☆

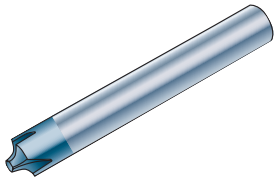
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.94-01500-AC74G 1620

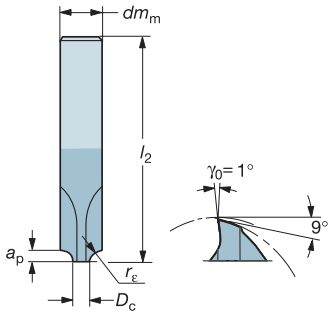
Chamfering radius endmill

Hardness <63HRc

P M K N S H



Helix angle: 0
Tolerances: dm_m — h6



Shank type	Front type	z_n	Ordering code	Dimensions, mm r_ε	D_c	l_2	Max a_p[1]	dm_m	Grade 1620
Cylindrical		3	**R215.03-04000BAC01G**	0,5	4	57	0,5	6	☆
		3	**R215.03-04000CAC01G**	0,75	4	57	0,75	6	☆
		4	**R215.04-04000CAC01G**	1	4	63	1,0	8	☆
		4	**R215.04-04000DAC02G**	1,5	4	63	1,5	8	☆
		4	**R215.04-05000EAC02G**	2	5	72	2,0	10	☆
		4	**R215.04-05000FAC03G**	2,5	5	72	2,5	10	☆
		4	**R215.04-05000GAC03G**	3	5	83	3,0	12	☆
		4	**R215.04-06000IAC04G**	4	6	83	4,0	14	☆
		4	**R215.04-06000KAC05G**	5	6	92	5,0	16	☆
		4	**R215.04-08000MAC06G**	6	8	104	6,0	20	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.03-04000BAC01G 1620

Chamfering, ISO-P, M, K, N, S, H

Endmill designed for chamfering

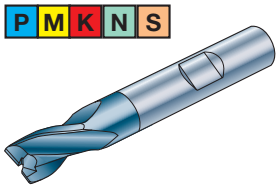
For 30° and 45° chamfer.
For 0,5-6 mm radius.

Slotting endmill

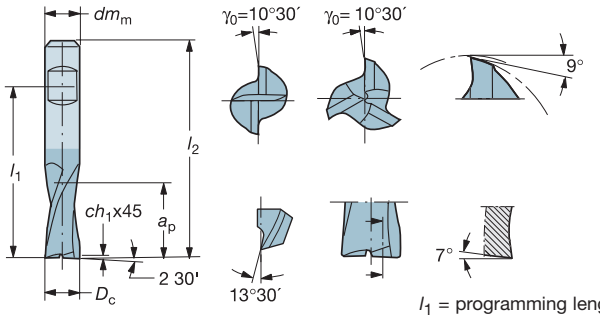
Key slot

Hardness <48HRc

P M K N S



Helix angle: ~30°
Tolerances: D_c — h10/e8
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	l_1	l_2	Max a_p [1]	dm_m	Helix l_{sh} [2] mm	ch_1	Tol. D_c	Grade 1630
Weldon	z_n = 2	R216.12- 02030-BS30P	2,0	32	50	3	6	11,2	0,10	e8	☆
		02530-BS30P	2,5	32	50	3	6	14	0,10	e8	☆
		02830-BS40P	2,8	32	50	4	6	16	0,10	h10	☆
		03030-BS04P	3,0	32	50	4	6	16	0,10	e8	☆
		03530-BS04P	3,5	32	50	4	6	20	0,10	e8	☆
		03830-BS05P	3,8	36	54	5	6	22,4	0,10	h10	☆
		04030-BS05P	4,0	36	54	5	6	22,4	0,10	e8	☆
		04830-BS06P	4,8	36	54	6	6	28	0,15	h10	☆
		05030-BS06P	5,0	36	54	6	6	28	0,15	e8	☆
		05830-BS07P	5,75	36	54	7	6	35,5	0,15	h10	☆
		06030-BS07P	6,0	36	54	7	6	35,5	0,15	e8	☆
		06830-BS08P	6,75	40	58	8	8	40,0	0,15	h10	☆
		07030-BS08P	7,0	40	58	8	8	40,0	0,15	e8	☆
		07830-BS09P	7,75	40	58	9	8	45,0	0,15	h10	☆
		08030-BS09P	8,0	40	58	9	8	45,0	0,15	e8	☆
		09030-BS10P	9,0	46	66	10	10	50,0	0,25	e8	☆
		09730-BS11P	9,7	46	66	11	10	56,0	0,25	h10	☆
		10030-BS11P	10,0	46	66	11	10	56,0	0,25	e8	☆
		11730-BS12P	11,7	50,5	73	12	12	71,0	0,25	h10	☆
		12030-BS12P	12,0	50,5	73	12	12	71,0	0,25	e8	☆
		13730-BS14P	13,7	52,5	75	14	14	80,0	0,25	h10	☆
		14030-BS14P	14,0	52,5	75	14	14	80,0	0,25	e8	☆
		15730-BS16P	15,7	58	82	16	16	90,0	0,25	h10	☆
		16030-BS16P	16,0	58	82	16	16	90,0	0,25	e8	☆
		17730-BS18P	17,7	60	84	18	18	100	0,25	h10	☆
		18030-BS18P	18,0	60	84	18	18	100	0,25	e8	☆
		19730-BS20P	19,7	67	92	20	20	112	0,35	h10	☆
		20030-BS20P	20,0	67	92	20	20	112	0,35	e8	☆
	z_n = 3	R216.13- 01830-BS30P	1,8	32	50	3	6	10	0,10	h10	☆
		02030-BS30P	2,0	32	50	3	6	11,2	0,10	e8	☆
		02830-BS40P	2,8	32	50	4	6	16	0,10	h10	☆
		03030-BS04P	3,0	32	50	4	6	16	0,10	e8	☆
		03830-BS05P	3,8	36	54	5	6	22,4	0,10	h10	☆
		04030-BS05P	4,0	36	54	5	6	22,4	0,10	e8	☆
		04830-BS06P	4,8	36	54	6	6	28	0,15	h10	☆
		05030-BS06P	5,0	36	54	6	6	28	0,15	e8	☆
		05830-BS07P	5,75	36	54	7	6	35,5	0,15	h10	☆
		06030-BS07P	6,0	36	54	7	6	35,5	0,15	e8	☆
		06830-BS08P	6,75	40	58	8	8	40,0	0,15	h10	☆
		07030-BS08P	7,0	40	58	8	8	40,0	0,15	e8	☆
		07830-BS09P	7,75	40	58	9	8	45,0	0,15	h10	☆
		08030-BS09P	8,0	40	58	9	8	45,0	0,15	e8	☆
		09030-BS10P	9,0	46	66	10	10	50,0	0,25	e8	☆
		09730-BS11P	9,7	46	66	11	10	56,0	0,25	h10	☆
		10030-BS11P	10,0	46	66	11	10	56,0	0,25	e8	☆
		11730-BS12P	11,7	50,5	73	12	12	71,0	0,25	h10	☆
		12030-BS12P	12,0	50,5	73	12	12	71,0	0,25	e8	☆
		13730-BS14P	13,7	52,5	75	14	14	80,0	0,25	h10	☆
		14030-BS14P	14,0	52,5	75	14	14	80,0	0,25	e8	☆
		15730-BS16P	15,7	58	82	16	16	90,0	0,25	h10	☆
		16030-BS16P	16,0	58	82	16	16	90,0	0,25	e8	☆
		17730-BS18P	17,7	60	84	18	18	100	0,25	h10	☆
		18030-BS18P	18,0	60	84	18	18	100	0,25	e8	☆
		19730-BS20P	19,7	67	92	20	20	112	0,35	h10	☆
		20030-BS20P	20,0	67	92	20	20	112	0,35	e8	☆

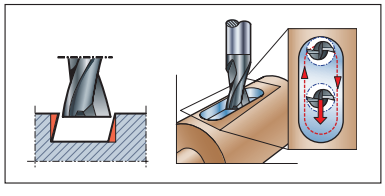
Cutting data

First choice:
Use Plura Guide.
Order number C-2948-036

Second choice:
Use tables on pages A 238 – A 240.

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.12-02030-BS30P 1630



Key slotting, ISO-P, M, K, N, S

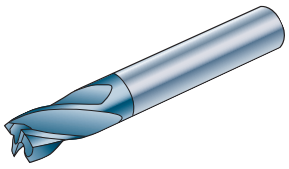
Endmill designed for key slot milling.

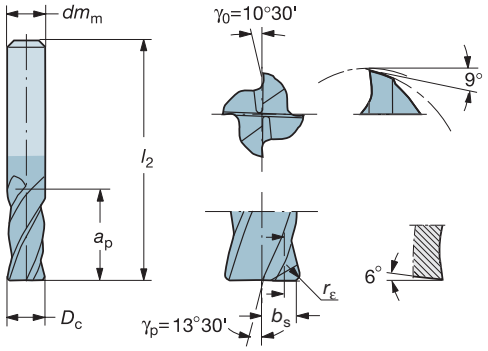
These endmills are shorter and therefore more stable than our normal endmills with two and three cutting edges.
All these endmills have a relatively large corner chamfer. The standard sizes tools have tighter tolerances on cutting edges. When you want an endmill with two or three edges and can work with a tool with a corner chamfer, this should be your first choice. In almost all applications you will achieve the highest productivity with three cutting edges compared to two.

Endmills for Turn-Milling

Hardness <48HRc

P M K N S H





Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6

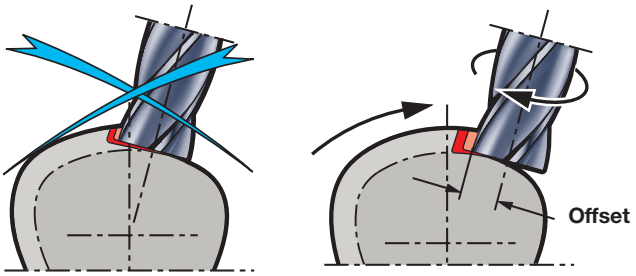
Shank type	Front type	Ordering code D_c mm		Dimensions, mm l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	r_ε	Grade 1620
Cylindrical	z_n = 4	6	**R216.T4-06030BAS10N**	54	10	6	35,5	0,5	☆
		8	**R216.T4-08030BAS12N**	58	12	8	45	0,5	☆
		10	**R216.T4-10030CAS14N**	66	14	10	56	1,0	☆
		12	**R216.T4-12030CAS16N**	73	16	12	71	1,0	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

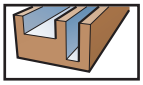
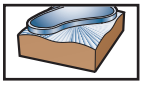
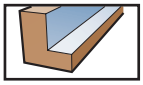
Ordering example: 10 pieces R216.T4-06030BAS10N 1620

Turn-Milling, ISO P, M, K, N, S, H

A specialised CoroMill Plura endmill with a cutting geometry designed for use in Turn-Mill operations. Two of the four cutting edges cut in both radial and axial directions, while the remaining two cut mainly in the radial direction.
For best performance, the endmill's axis of rotation should ***not*** align exactly with the workpiece's central axis. Instead the endmill should be offset, and sit further round in the workpiece's rotational cycle.



0,25 × D_c ≤ offset ≤ 0,45 × D_c

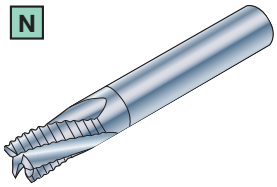




High performance ISO N endmill

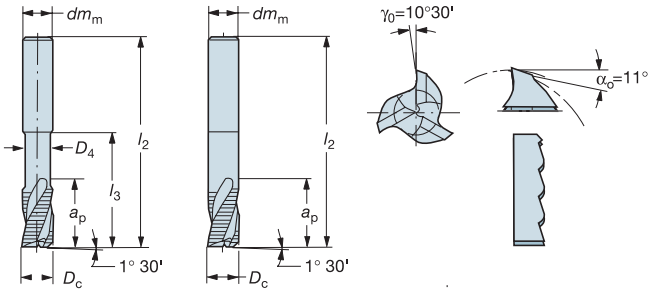
Roughing

Kordell design

N



Material: Aluminium and copper
Helix angle: ~40°
Tolerances: D_c — h14
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	Max a_p [1]	dm_m	l_3	D_4	Grade H10F
Cylindrical	z_n = 3	Long							
		R216.33- 06040-AC13U	6	57	13	6	–	–	☆
		08040-AC19U	8	63	19	8	–	–	☆
		10040-AC22U	10	72	22	10	–	–	☆
		12040-AC26U	12	83	26	12	–	–	☆
		14040-AC26U	14	83	26	14	–	–	☆
		16040-AC32U	16	92	32	16	–	–	☆
		18040-AC32U	18	92	32	18	–	–	☆
		20040-AC38U	20	104	38	20	–	–	☆
		Extra long							
		R216.33- 06040-AJ10U	6	63	10	8	24	5.6	☆
		08040-AJ12U	8	72	12	10	29	7.5	☆
		10040-AJ14U	10	83	14	12	35	9.3	☆
		12040-AJ16U	12	100	16	12	50	11.5	☆
		16040-AJ20U	16	115	20	16	63	15.5	☆
		20040-AJ20U	20	125	20	20	70	19.5	☆
		25040-AJ25U	25	135	25	25	75	24.0	☆

[1] Maximum cutting edge length.

Ordering example: 10 pieces R216.33-06040-AC13U H10F

Aluminum, Kordel, ISO-N

FIRST CHOICE for roughing of Aluminum and copper.

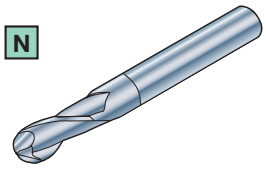
Kordel-geometry for reduced cutting forces and improved chip-evacuation.
Always use the shortest possible tool protrusion.

When the rough finish produced by Kordel-geometry is not acceptable try the straight cutting edge, page A 176.
For Aluminum with a higher Si-content a coated Kordel endmill could be more productive, page A 152.

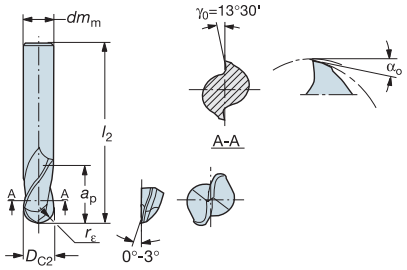
High performance ISO N endmill

Ball nose

N



Material: Aluminium and copper
Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6



Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0.01	l_2	Max a_p [1]	dm_m	α_o	Grade H10F
Cylindrical	z_n = 2	R216.42- 02030-AK60A	2	1	57	6	6	19-21°	☆
		03030-AK07A	3	1.5	80	7	6	19-21°	☆
		04030-AK08A	4	2	80	8	6	13-15°	☆
		05030-AK10A	5	2.5	80	10	6	13-15°	☆
		06030-AK10A	6	3	80	10	6	13-15°	☆
		08030-AK16A	8	4	100	16	8	13-15°	☆
		10030-AK19A	10	5	100	19	10	11-13°	☆
		12030-AK22A	12	6	100	22	12	11-13°	☆
		16030-AK26A	16	8	100	26	16	11-13°	☆

[1] Maximum cutting edge length.

Ordering example: 10 pieces R216.42-02030-AK60A H10F

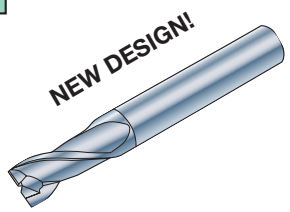
Aluminum, Ballnose, ISO-N

For profiling of Aluminum.

- For Aluminum with a higher Si-content a coated ballnose could be more productive, page A 168.

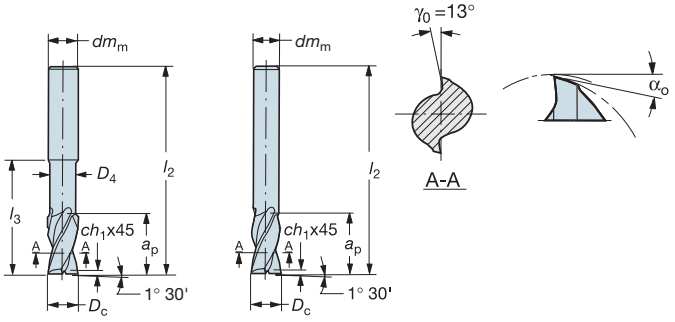
High performance ISO N endmill

N



This cutter has a new design improving drilling capability.

Material: Aluminium and copper
Helix angle: ~30°, ~25°, ~25°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	D_c mm	Ordering code	l_2	Max a_p[1]	dm_m	D_4	l_3	ch_1	Grade H10F
Cylindrical	z_n = 2		**Normal**							
		2	**R216.32- 02030-AC60A**	57	6	6	–	9,5	–	☆
		3	**03030-AC07A**	57	7	6	–	10,4	–	☆
		4	**04030-AC08A**	57	8	6	–	15,3	–	☆
		5	**05030-AC10A**	57	10	6	–	16,1	–	☆
		6	**06030-AC10A**	57	10	6	–	–	–	☆
		8	**08030-AC16A**	63	16	8	–	–	–	☆
		10	**10030-AC19A**	72	19	10	–	–	0,10	☆
		12	**12030-AC22A**	83	22	12	–	–	0,10	☆
			Long							
		2	**R216.32- 02025-AK80A**	57	8	6	–	10,0	–	☆
		3	**03025-AK12A**	57	12	6	–	14,9	–	☆
		4	**04025-AK14A**	57	14	6	–	18,0	–	☆
		5	**05025-AK16A**	57	16	6	–	19,1	–	☆
		6	**06025-AK22A**	65	22	6	–	–	–	☆
		8	**08025-AK28A**	80	28	8	–	–	–	☆
		10	**10025-AK32A**	90	32	10	–	–	0,10	☆
		12	**12025-AK38A**	100	38	12	–	–	0,10	☆
			Extra long							
		2	**R216.32- 02025-AP30A**	57	3	6	1,9	6	–	☆
		3	**03025-AP04A**	57	4	6	2,9	7	–	☆
		4	**04025-AP06A**	57	6	6	3,8	10	–	☆
		5	**05025-AP08A**	57	8	6	4,8	16	–	☆
		6	**06025-AP10A**	65	10	6	5,7	28	–	☆
		8	**08025-AP12A**	80	12	8	7,7	35	–	☆
		10	**10025-AP14A**	90	14	10	9,7	45	0,10	☆
		12	**12025-AP16A**	100	16	12	11,7	50	0,10	☆
		16	**16025-AP20A**	115	20	16	15,5	63	0,15	☆
		20	**20025-AP20A**	125	20	20	19,5	70	0,15	☆

[1] Maximum cutting edge length.

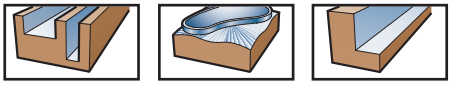
Ordering example: 10 pieces R216.32-02030-AC60A H10F

General, ISO-N (Aluminium, Copper)

For general machining/finishing of aluminum.

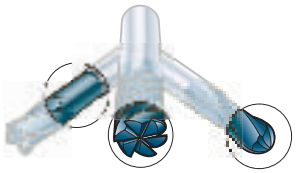
Always use the shortest possible tool protrusion.

For aluminum with a higher Si-content a coated endmill could be more productive.



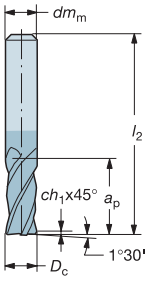
ENGINEERED SOLUTIONS — CoroMill® Plura

For quotation please contact your nearest Sandvik Coromant representative.



❷ Type of cutter

10



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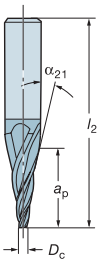

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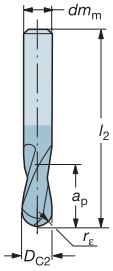

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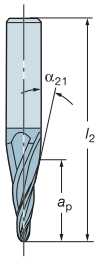
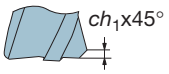


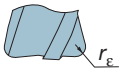
❸ Corner design

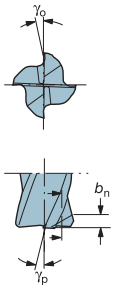
Sharp

Chamfer



Radius





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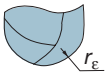
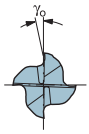
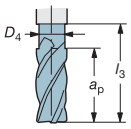
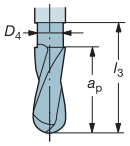




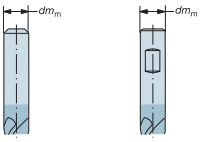
❹ Cutter with recess



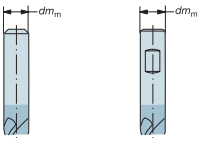


❺ Shank type

Cylindrical **Weldon**



Cylindrical **Weldon**



Options

System of measurement	metric
Material to machine	ISO-P, ISO-H, ISO-M, ISO-K, ISO-S, ISO-N
D_c or D_{c2}	2-32 mm
Endmill types	10 = square endmills 20 = ballnose endmills 40 = conical endmills 50 = conical ball nose endmills
Alternative grades	GC1610, GC1620, GC1630, H10F, Special: Substrate: H10F, 10EF; Coating: TiCN, Futura, Extreme, X.CEED
Rake angle γ_o	-20° - +15°
Drilling	**YES** or **NO**
Helix angle	0° - 60°
Helix reduction	**YES** or **NO**
α_{21}	**No, 0°30' – 10°**

Helix red. angle γ_p	-10° - +20°
Helix red. width b_n	0-1 mm
Tolerances on D_c or D_{c2}	h9, h10 or e8
z_c	(number of teeth) 1 - (=D_c)
l_2	< 180 mm
a_p	< 5 × D_c
l_3	< 140 mm
Recess	**YES** (state D_4) or **NO**
Recess diameter D_4	Min D_4 = (D_c or D_{c2}) - 2 mm
dm_m	6; 6,35; 8; 9,525; 10; 12; 12,7; 14; 15,875; 16; 18; 19,05; 20; 25; 32 mm
Corner mod.	**YES** (state radius or chamfer) or **NO**
ch_1	45° × 0,1 - 2 mm
r_ε	< D_c/2
Shank type	Cylindrical shank - **CYL** and Weldon shank - **W**

Code key for solid carbide endmills

Metric tools

R215.3A-10030-AC22H													
1	3	4		5	6		7	8	9	10	11	12	13

Inch tools

RA215.3A-1030AAC22H													
1	2	3	4		5	6		7	8	9	10	11	12	13

1 Direction of rotation

R	Right hand
L	Left hand

2 System of measurement

A	Inch version

3 Type of tool

21	Endmill

4 Drilling function

5	Non drilling
6	Drilling

5 Basic design of endmill

0	Concave chamfer endmill
1	Square form with/without corner chamfer, tight tolerance at D_c
2	Square form with corner radius
3	Square form with or without corner chamfer
4	Full radius (ball nose) form (6 or less teeth)
5	Conical full radius (ball nose) form (6 or less teeth)
6	Full radius (ball nose) with spherical form
7	Conical straight form
8	45° chamfer endmill
9	30° chamfer endmill
T	Turn-mill endmill

6 Number of teeth

1 - 9	1 to 9 teeth
A -Z	10 to 32 teeth

7 Cutting diameter

Metric tools

Cutting diameter D_c or D_3 in 1/10 mm.
Example: **100** = 10.0 mm

Inch Tools

Cutting diameter D_c or D_3 in 1/64 inch.
Example: **10** = 5/32 inch

8 Helix angle

Degree of helix rounded to nearest 5 degree

9 Corner radius

Metric tools

–	No radius	C	1,0 mm
A	<0,5 mm	D	1,5 mm
B	0,5 mm	E	2,0 mm
		F	2,5 mm
		Etc.	Etc.

Inch tools

–	No radius	D	1/16 inch
A	1/64 inch	E	5/64 inch
B	1/32 inch	F	3/32 inch
C	3/64 mm	Etc.	Etc.

10 Shank type

A	Cylindrical
B	Weldon

11 Length of shank

S	Short shank length	**E**	Short l_2 and l_3 or l_{22}
C	Long shank length	**I**	Medium l_2 medium l_3 or l_{22}
K	Shank length > "C"	**J**	Medium l_2, long l_3 or l_{22}
L	Shank length > "K"	**O**	Long l_2, medium l_3 or l_{22}
X	Shank length > "L"	**P**	Long l_2, long l_3 or l_{22}

12 Max. cutting depth, a_p

Metric tools

Cutting length in mm
If D_c or D_{c2} < 3mm in 1/10 mm
Example: **07** = 7 mm for D_c 6 mm
70 = 7 mm for D_c 2,5 mm

Inch tools

Cutting length in 1/16 inch
If D_c or D_{c2} < 1/8 in 1/64 inch
Example: **09** = 9/16 inch for D_c 3/16 inch

13 Geometry type

	Cutting edge	TW % of D_c or D_{c2}	Rake angle γ°		Cutting edge	TW % of D_c or D_{c2}	γ°
K	Kordell	50–60	9°–12°	**N**	Straight	56–65	9°–12°
B	Chip breaker	60	4°–7°	**L**	Straight	66–75	4°–12°
U	Kordell	<50	9°–12°	**G**	Straight	50–75	–3°–3°
A	Straight	<45	12°–15°	**H**	Straight	>75	<–3°
P	Straight	45–55	9°–12°				

TW = Core diameter