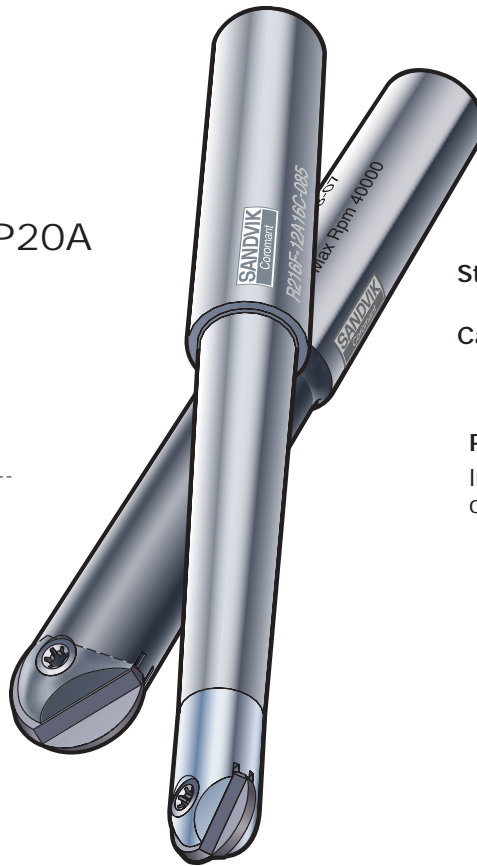
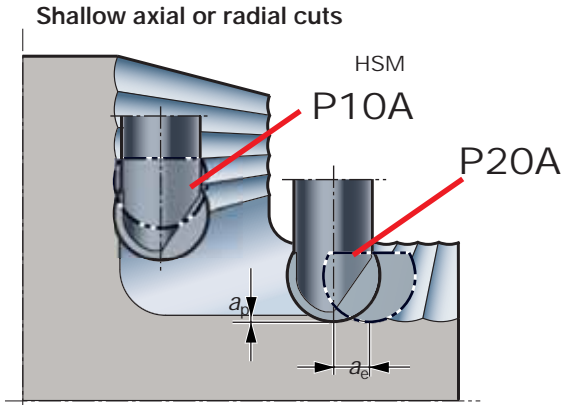


# CoroMill® Ball Nose Finishing endmill

## Shallow contouring and High Speed Machining

- for safe productivity



### Cylindrical shank

- Steel shank for general use.
- Carbide shank for highest precision.

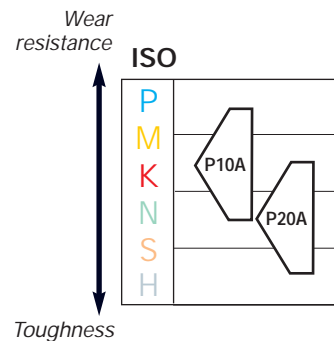
Steel shank —  $D_c = .3125-.750$  inch  
8–20 mm

Carbide shank —  $D_c = .3125-.625$  inch  
8–16 mm

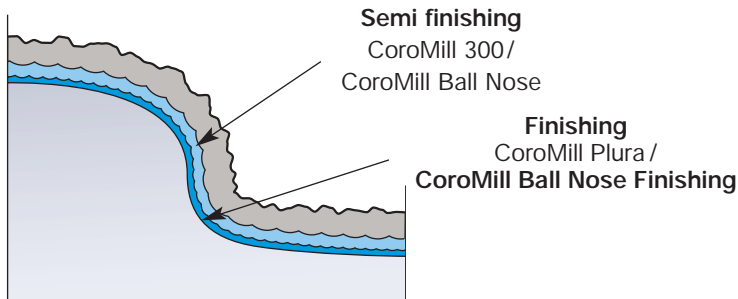
### Permanent marking

Important product information on insert and cutter body

### Grades for all materials



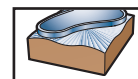
### Constant stock



CoroMill tools for rough to finish profiling

### Inserts for all materials

	ISO	Cemented carbide Geometry L
Steel	<b>P</b>	
Stainless steel	<b>M</b>	
Cast iron	<b>K</b>	
Non-ferrous material	<b>N</b>	
Heat resistant material	<b>S</b>	
Hardened material	<b>H</b>	



# CoroMill® Ball Nose Finishing

Diameter .3125 – .750 inch<sup>1)</sup>

Inch version



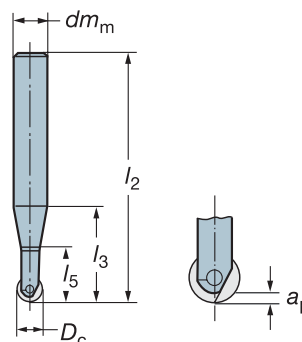
Machine tools: All types

Material:



Inclination angle: 0°

Diameter tolerance:  $D_c - h9$



Ordering code		Dimensions, inch							Insert size <sup>2)</sup>		
$D_c$ inch		Lbs	$l_2$	$l_3$	$l_5$	$dm_m$	Max $a_p$	$n_{max}^{3)}$	$iC$		
Cylindrical 	<b>Steel shank</b>										
	.3125	RA216F-08O13S-035	0.4	3.622	1.378	.748	.500	.047	40,000	.3125	
		08O13S-053	0.4	4.331	2.087	.748	.500	.047	33,100		
		08O13S-075	0.4	5.197	2.953	.748	.500	.047	16,500		
	.375	RA216F-10O13S-038	0.4	3.740	1.496	.866	.500	.056	40,000	.375	
		10O13S-053	0.4	4.331	2.087	.866	.500	.056	40,000		
		10O13S-075	0.4	5.197	2.953	.866	.500	.056	20,400		
	.500	RA216F-13O13S-026	0.4	3.268	1.023	-	.500	.075	40,000	.500	
		13O13S-053	0.4	4.331	2.087	-	.500	.075	40,000		
		13O16S-085	0.7	5.709	3.346	.906	.625	.075	19,800		
	.625	RA216F-16O16S-032	0.7	3.622	1.260	-	.625	.094	36,000	.625	
		16O16S-063	0.7	4.843	2.480	-	.625	.094	36,000		
		16O19S-100	0.9	6.535	3.937	1.142	.750	.094	20,000		
	.750	RA216F-19O19S-038	0.9	4.094	1.496	-	.750	.113	40,000	.750	
		19O19S-075	0.9	5.551	2.953	-	.750	.113	40,000		
	<b>Carbide shank</b>										
.3125	RA216F-08O13C-075	0.4	5.197	2.953	.748	.500	.047	40,000	.3125		
.375	RA216F-10O13C-075	0.4	5.197	2.953	.866	.500	.056	40,000	.375		
.500	RA216F-13O16C-085	0.7	5.709	3.346	.906	.625	.075	40,000	.500		
.625	RA216F-16O19C-100	1.1	6.535	3.937	1.142	.750	.094	36,000	.625		

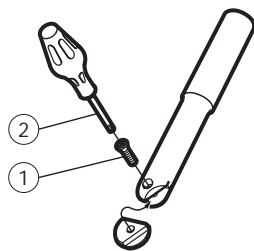
<sup>1)</sup> See main rotating tools catalog for larger sizes and complete CoroMill ball nose finishing assortment.

<sup>2)</sup> Inserts are ordered separately.

<sup>3)</sup>  $n_{max}$  (max.rev/min) for holders must also be considered.

Ordering example: 2 pieces RA216F-08O13S-035

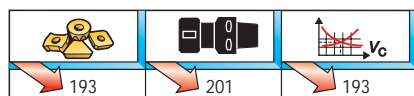
## Spare parts

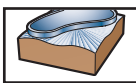


Cutter	1		2		Torque value in/lbs		
	Insert screw	Key (Torx Plus)					
RA216F-08	5513 040-01	5680 046-03 (7IP)			7	5683 010-01	5680 100-02
RA216F-10	5513 040-02	5680 046-01 (8IP)			10	5683 010-01	5680 100-03
RA216F-13	5513 040-03	5680 046-05 (10IP)			18	5683 010-01	5680 100-05
RA216F-16	5513 040-04	5680 046-02 (15IP)			26	5683 010-01	5680 100-06
RA216F-19	5513 040-05	5680 048-03 (20IP)			44	5683 010-01	-

<sup>1)</sup> Accessories, must be ordered separately.

Ordering example: 10 pieces 5513 040-01





### CoroMill® Ball Nose Finishing

Diameter 8 – 20 mm<sup>1)</sup>

Metric version



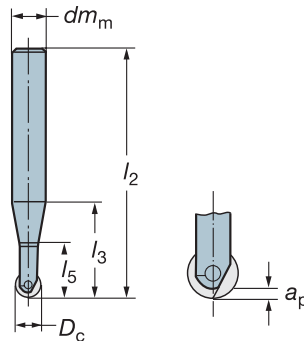
Machine tools: All types

Material:



Inclination angle: 0°

Diameter tolerance:  $D_c - h9$



Shank type	Ordering code	Dimensions, mm							$n_{max}^{3)}$	Insert size <sup>2)</sup>
		$D_c$ mm	$\rho_{KG}$	$l_2$	$l_3$	$l_5$	$dm_m$	Max $a_p$		
Cylindrical	<b>Steel shank</b>									
	8	R216F-08A12S-035	0.2	92	35	19	12.0	1.2	40,000	8
		08A12S-053	0.2	110	53	19	12.0	1.2	33,600	
		08A12S-075	0.2	132	75	19	12.0	1.2	16,800	
	10	R216F-10A12S-038	0.2	95	38	22	12.0	1.5	40,000	10
		10A12S-053	0.2	110	53	22	12.0	1.5	40,000	
		10A12S-075	0.2	132	75	22	12.0	1.5	20,300	
	12	R216F-12A12S-026	0.2	83	26	-	12.0	1.8	40,000	12
		12A12S-053	0.2	110	53	-	12.0	1.8	40,000	
		12A16S-085	0.3	145	85	23	16.0	1.8	19,800	
	16	R216F-16A16S-032	0.3	92	32	-	16.0	2.4	36,000	16
		16A16S-063	0.3	123	63	-	16.0	2.4	36,000	
		16A20S-100	0.4	166	100	30	20.0	2.4	20,000	
	20	R216F-20A20S-038	0.4	104	38	-	20.0	3.0	40,000	20
20A20S-075		0.4	141	75	-	20.0	3.0	40,000		
Cylindrical	<b>Carbide shank</b>									
	8	R216F-08A12C-035	0.1	92	35	19	12.0	1.2	40,000	8
		08A12C-053	0.1	110	53	19	12.0	1.2	40,000	
		08A12C-075	0.2	132	75	19	12.0	1.2	23,400	
	10	R216F-10A12C-053	0.1	110	53	22	12.0	1.5	40,000	10
		10A12C-075	0.2	132	75	22	12.0	1.5	23,400	
	12	R216F-12A12C-053	0.1	110	53	-	12.0	1.8	40,000	12
		12A16C-085	0.3	145	85	21.5	16.0	1.8	21,000	
	16	R216F-16A16C-063	0.3	123	63	-	16.0	2.4	43,000	16
		16A20C-100	0.5	166	100	28.5	20.0	2.4	25,500	

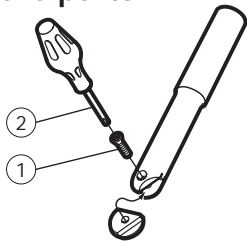
<sup>1)</sup> See main rotating tools catalog for larger sizes and complete CoroMill ball nose finishing assortment.

<sup>2)</sup> Inserts are ordered separately.

<sup>3)</sup>  $n_{max}$  (max.rev/min) for holders must also be considered.

Ordering example: 2 pieces R216F-08A12S-035

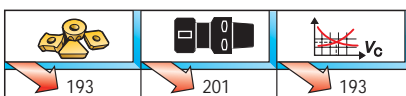
### Spare parts

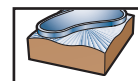


Cutter	1		2		Torque value Nm	Molykote	Torque wrench <sup>1)</sup>
	Insert screw	Key (Torx Plus)					
R216F-08...	5513 040-01	5680 046-03 (7IP)			0.9	5683 010-01	5680 100-02
R216F-10...	5513 040-02	5680 046-01 (8IP)			1.2	5683 010-01	5680 100-03
R216F-12...	5513 040-03	5680 046-05 (10IP)			2.0	5683 010-01	5680 100-05
R216F-16...	5513 040-04	5680 046-02 (15IP)			3.0	5683 010-01	5680 100-06
R216F-20...	5513 040-05	5680 048-03 (20IP)			5.0	5683 010-01	-

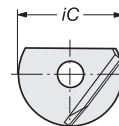
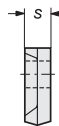
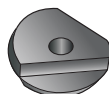
<sup>1)</sup> Accessories, must be ordered separately.

Ordering example: 10 pieces 5513 040-01





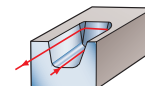
# Inserts for CoroMill® Ball Nose Finishing



Cutter $D_c$ inch/mm	Insert code	Coromant grades												GC = Coated carbide (ISO = HC)					
		P				M				K		N		S		H		Dimensions, inch/mm $iC$ $s$	
		GC	GC			GC	GC			GC	GC	GC	GC	GC	GC	GC	GC		
		P10A	P20A			P10A	P20A			P10A	P20A	P10A	P20A	P10A	P20A	P10A	P20A		
	<b>Inch inserts</b>																		
	.3125 RA216F-08 24 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	.3125	.094
	.375 RA216F-10 26 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	.375	.100
	.500 RA216F-13 30 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	.500	.118
	.625 RA216F-16 40 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	.625	.157
	.750 RA216F-19 50 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	.750	.197
	<b>Metric inserts</b>																		
	8 R216F-08 24 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	8	2.4
	10 R216F-10 26 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	10	2.6
	12 R216F-12 30 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	12	3.0
	16 R216F-16 40 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	16	4.0
	20 R216F-20 50 E-L	☆	☆			☆	☆			☆	☆	☆	☆	☆	☆	☆	☆	20	5.0

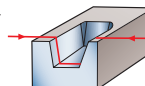
**P10A is first choice for:**

- high effective cutting speed (HSM) applications.
- contouring applications (not cutting with center point of insert).
- hardened steels and cast iron.



**P20A is first choice for:**

- copy milling applications or all applications where the center of the insert is cutting (zero  $v_c$ ).
- machines with limited rpm (non HSM).
- non hardened materials.
- semi-finishing applications.



Ordering example: 10 pieces R216F-08 24 E-L P10A

## Cutting data recommendations

	Material		Cutting speed $v_e$ ft/min		Cutting depth $a_p$ or $a_e$	Feed per tooth, $f_z$ (inch/z)				
	CMC No	HB	P10A	P20A		Insert diameter, inch (mm)				
						.3125, (8)	.375, (10)	.500, (12)	.625, (16)	.750, (20)
<b>P</b>	Unalloyed steel		760-1270	380-950	0.07x $D_c$	.006-.008	.006-.008	.006-.008	.008-.010	.008-.010
	01.1 125	01.2 150	635-1140	315-865						
	Low alloy steel		510-1015	254-760	0.05x $D_c$	.004-.006	.004-.006	.006-.008	.008-.010	.008-.010
02.1 175	02.0 330	455-840	205-510							
High alloy steel		510-840	255-760	0.05x $D_c$	.004-.006	.004-.006	.006-.008	.008-.010	.008-.010	
<b>M</b>	Stainless steel		380-510	255-510	0.05x $D_c$	.004-.006	.004-.006	.006-.008	.006-.008	.006-.008
	05.11 200	05.21 200	305-430	205-305						
<b>K</b>	Malleable cast iron		510-1145	330-840	0.10x $D_c$	.006-.008	.006-.008	.008-.010	.010-.012	.010-.012
	07.1 130	07.2 230	760-1145	255-840						
	Nodular cast iron		1015-1270	380-890	0.07x $D_c$	.006-.008	.006-.008	.008-.010	.010-.012	.010-.012
09.1 160	09.2 250	510-890	255-660							
Grey cast iron		510-1015	255-760	0.10x $D_c$	.006-.008	.006-.008	.008-.010	.010-.012	.010-.012	
<b>N</b>	Aluminum		2540	2540	0.15x $D_c$	.008-.010	.008-.010	.010-.012	.012-.014	.012-.014
	30.22 90									
<b>S</b>	Heat resistant alloys		100-205	125-380	0.03x $D_c$	.004-.006	.004-.006	.006-.008	.006-.008	.006-.008
	20.22 350									
Titanium alloys		175-305	90-230	0.03x $D_c$	.006-.008	.006-.008	.008-.010	.010-.012	.010-.012	
<b>H</b>	Hardened steel		380-635	190-480	0.03x $D_c$	.004-.006	.004-.006	.008-.010	.008-.010	.008-.010
	04 55 HRC	04 63 HRC	230-380	100-280						

- Note: 1.  $f_n = 2 \times f_z$   
 2. When using periphery of insert, reduce the feed by 50%.