

Advances in medical manufacturing



The modern approach to turning hip joints with round inserts



Why round inserts?

Round inserts offer you all the best advantages for the machining of cobalt chromium and titanium implants.

These inserts, when used for internal turning of the spherical cup in a ball and socket hip joint, optimize the roughing process when machining direct from castings, and provide excellent balance of security and productivity. In short they do nothing less than double your productivity and reduce your tooling costs by a third.



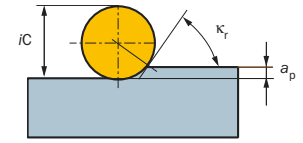
How?

Key Benefits

In roughing applications the round shape imparts a strong cutting edge and excellent resistance to excessive notch wear. Choosing round inserts has two clear advantages:

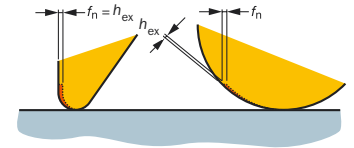
- **Secure, quality, reliable machining**

Applying a round insert with an approach angle of less than κ_r 45° significantly reduces notch wear, a common problem which leads to an inferior quality component and a reduction in productivity. Apply for reliability and durability, fewer tool changes and trouble free machining.



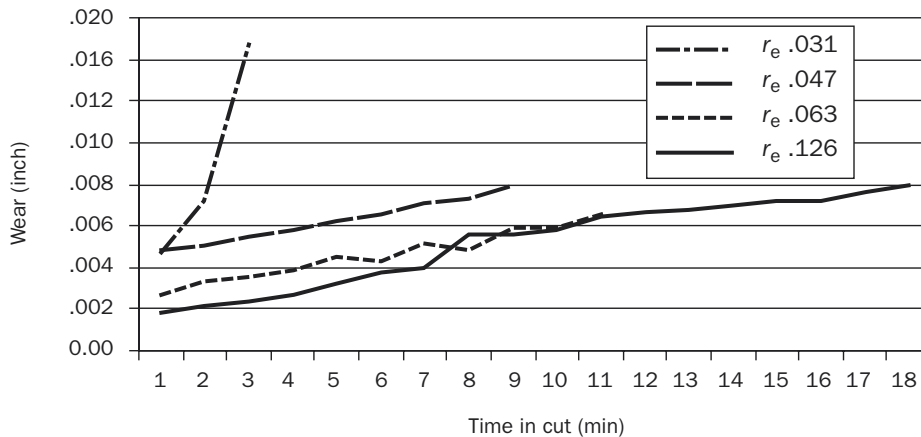
- **Increase feed and speed for maximum productivity**

By using a round insert with the depth of cut well below the radius, the chip thickness h_{ex} is reduced relative to feed and the cutting edge length increased. This results in lower temperatures being generated and the opportunity to increase both feed and speed for maximum production.

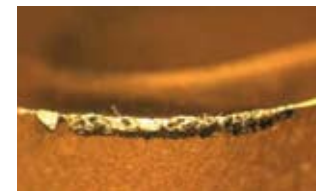


Effect of nose radius on wear mechanism

Cobalt chromium, $v_c = 165$ ft/min, $f_n = .006$ inch/rev, $a_p = .040$ inch



Tool life 3 min



Tool life 18 min

Outstanding performance

Machining specification

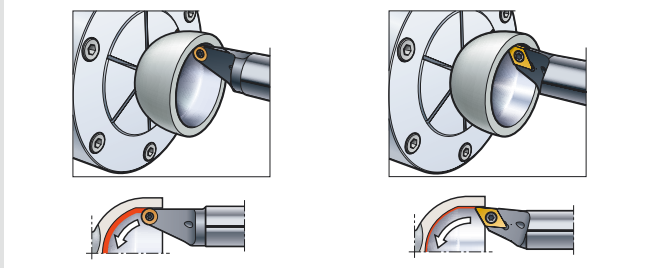
Operation:	Internal sphere turning, dia = 1.378 inch (35 mm)		
Material:	Cobalt chromium F75		
Machine:	CNC Turning lathe		
Cutting data:	Competitor	Sandvik Coromant	
Toolholder:		A20M-SRXDR 08-R	
Insert:	VBMT11T308	R300-0828E-PL	
Grade:		GC1030	
Cutting speed:	100	165	(ft/min)
Feed:	.003	.004	(inch/rev)
Depth of cut:	.020	.020	(inch)
Time in cut per comp:	9.29	4.46	(min)
Components:	3	10	(pcs)



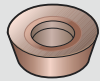
Result: Doubled productivity and reduction in tooling costs by a third

Sandvik Coromant solutions

Cups with small radius requirement and/or unstable fixturing (min. dia=1.339 inch)

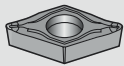


Roughing



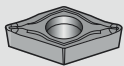
Holder: A20M-SRXDR 08-R
Insert: R300-0828E-PL, 1030
Cutting data: $v_c = 165-260$ ft/min,
 $f_n = .004-.006$ inch/rev, $a_p = \rightarrow .040$ inch

Semi finishing



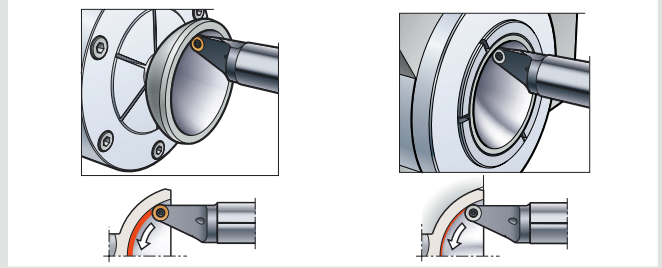
Holder: A20M-SDXCR 11-R
Insert: DCGT 3(2.5)2-UM 1105
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .003-.004$ inch/rev, $a_p = .004-.010$ inch

Finishing



Holder: A20M-SDXCR 11-R
Insert: DCGT 3(2.5)2-UM 1105
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .003-.004$ inch/rev, $a_p = .0020-.0060$ inch

Cups with no radii restrictions and/or stable fixture (min. dia=1.339 inch)



Roughing



Holder: A20M-SRXDR 08-R
Insert: R300-0828E-PL, 1030
Cutting data: $v_c = 165-260$ ft/min,
 $f_n = .004-.006$ inch/rev, $a_p = \rightarrow .040$ inch

Semi finishing



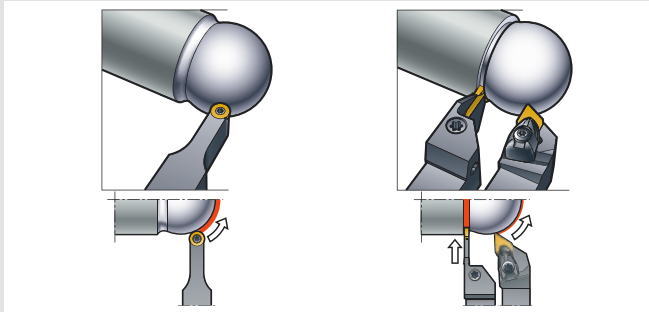
Holder: A20M-SRXDR 08-R
Insert: R300-0828E-PL, 1030
Cutting data: $v_c = 165-260$ ft/min,
 $f_n = .004-.006$ inch/rev, $a_p = .004-.010$ inch

Finishing

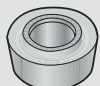


Holder: A20M-SRXDR 08-R
Insert: R300-0828E-PM, 530
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .003-.005$ inch/rev, $a_p = .002-.006$ inch

Producing heads from bar material

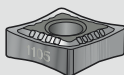


Roughing



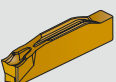
Holder: SRDCN 2020K 10-A
Insert: RCMT 10 T3 MO-SM, 1105
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .004-.006$ inch/rev, $a_p = \rightarrow .040$ inch

Finishing



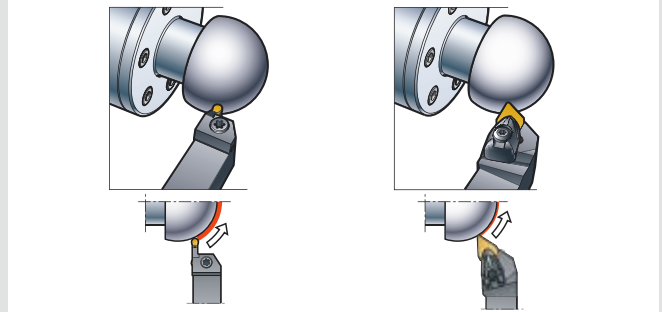
Holder: DDJNR 124B
Insert: DNGP 432 1105
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .003-.005$ inch/rev, $a_p = .002-.006$ inch

Parting off

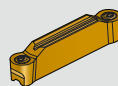


Holder: RF123F079-10B
Insert: N123F2-0250-0002-CM, 4125
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .002-.004$ inch/rev

Producing heads from forged material

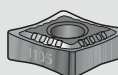


Roughing



Holder: RF123J051-16BM
Insert: N123J2-0600-R0,4125
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .004-.006$ inch/rev, $a_p = \rightarrow .040$ inch

Finishing



Holder: DDJNR 124B
Insert: DNGP 432 1105
Cutting data: $v_c = 130-200$ ft/min,
 $f_n = .003-.005$ inch/rev, $a_p = .002-.006$ inch

Tool holders

Use these round inserts together with our CoroTurn 107 boring bars and EasyFix™ - a simple and quick method to achieve the correct center height of the cutting edge. To complete the machining process Sandvik Coromant also offers you a range of tool holders especially for finishing (with positive D-style inserts), which can be used not only in spherical turning, but can even be a problem solver in other internal turning applications where accessibility is restricted.



Insert assortment

For round inserts geometries –PL and –KL are periphery ground and give excellent chip control and low cutting forces. For cobalt chromium we recommend grade GC1030 and for titanium H13A.

For D-style inserts we recommend the ground insert DCGT in geometry –UM. For cobalt chromium grade GC1105 is the first choice and for titanium H13A.

Contact your local Sandvik Coromant sales representative or authorized distributor for more information or call 1-800-SANDVIK (1-800-726-3845). Additional information is also available on our website at www.coromant.sandvik.com/us.

