Metkon Application Note

SAMPLE : Cutting Operation of Hardened Bearing Steel

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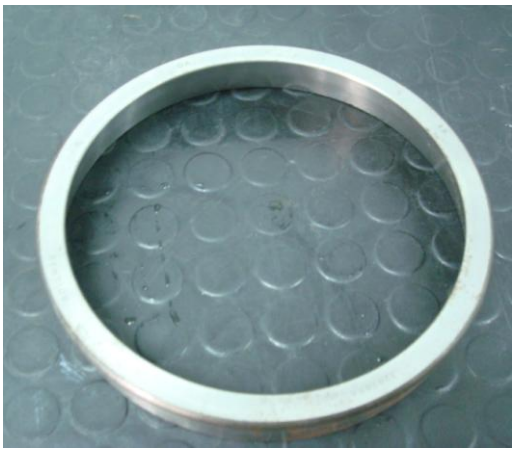
General information

Type 100Cr6 through hardening bearing steels intended for rolling contact and other
high fatigued applications. In the hardened condition the high hardness, high strength and high cleanliness provides the steel with the right properties to withstand high cycle, high stress fatigue. 100Cr6 is mainly used for small and medium sized bearing components. It is also regularly used for other machine components that require high tensile strength and high hardness. The hardenability approximately corresponds to a ring with max. 17 mm wall thickness. It is possible to get the steel in several different modifications. The most common are listed below.



Metkon Instruments Ltd.
Demirtas Organize Sanayi Bolgesi Ali Osman Sonmez Cd. No:14 BURSA / TURKEY
Tel: 0.224.261 18 40 **Fax:** 0.224.261 18 44
E-Mail: metkon@metkon.com **Web:** www.metkon.com

APPLICATION REQUIREMENTS

SERVOCUT is the perfect choice for a wide range of materials and for heavy duty cutting applications. It combines the two well proven cutting techniques into the same machine:
Chop cutting: The specimen is clamped and the cut-off wheel approaches the specimen via a rocker arm.
Table-feed cutting: Feeding the clamped specimen into a rotating cut-off wheel using a slotted feed table.

SERVOCUT 301 has X-Y-Z triple axes cutting capability:
Z-axis Chop cutting: The specimen is clamped and the cut-off wheel approaches the specimen.
Y-axis Table-feed cutting: Feeding the clamped specimen into a rotating cut-off wheel using a T-slotted feed table.
X-axis Parallel Cutting (optional): Parallel serial sectioning in the x-axis with optional movable x-bed

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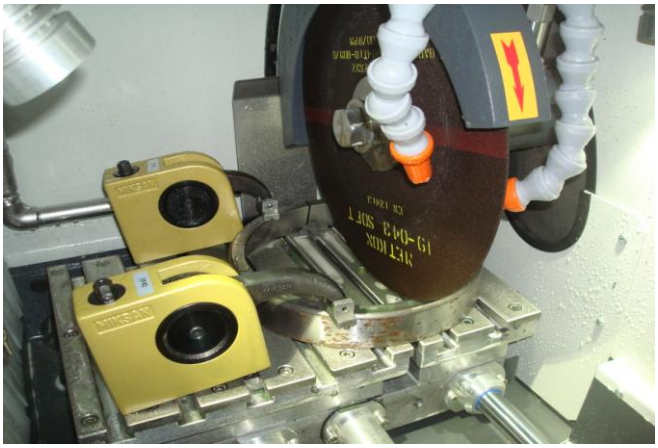
According to bearing dimensions Servocut 301 easily capable to cut this sample.

You can choose Servocut 301-MM for manual operation, Servocut 301-MA for both manual/automatic operation, Servocut 301-AA for all automatic operation.

We prefer to use Servocut 301-MA for this application.



As it is shown on the left sides photos we used Quick clamping Device with clamping shoe, 90mm.

We have cut the first side of the ring manually (chop cutting) by using handwheel .

After first cut, we have continued operation by using table feed cutting function and cut the second side.

SECTIONING

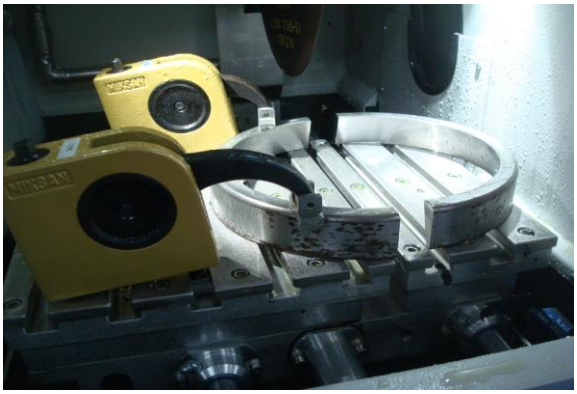
The bearing dimensions are 220 mm dia. and 35 mm height.

Equipment : 14 56, Servocut 301-MA , Automatic Abrasive Cutter
Clamping Devices : 15 01, MBU 1031 Quick clamping Device with clamping shoe, 90 mm.
Cutting Wheel : 19-043 TRENO-S, Ø 300 mm, for Hard Steels > 50-60 HRC <
Cutting Fluid : 19-902 METCOOL, Nature Friendly Soluble Oil, 5 lt.

Bearing is clamped by using quick clamping device and cut with the below parameters.

1st cut
Wheel Speed : 2850 rpm , manual operation

2nd Cut
Wheel Speed : 2850 rpm
Table Feed Rate : 400 µ/sec
Pulse : Every 4 mm



As a result we have the cut piece from our sample with a very smooth surface. During operation we have keeped the originality of the surface and do not let any overheating which can destroy the surface quality.

The adaptation of sample and cutting wheel is quite well. This harmony allows you to get proper cutting surface.

This smooth surface will reduce our grinding and polishing time.

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