

Acoustic Testing of Roller Bearings

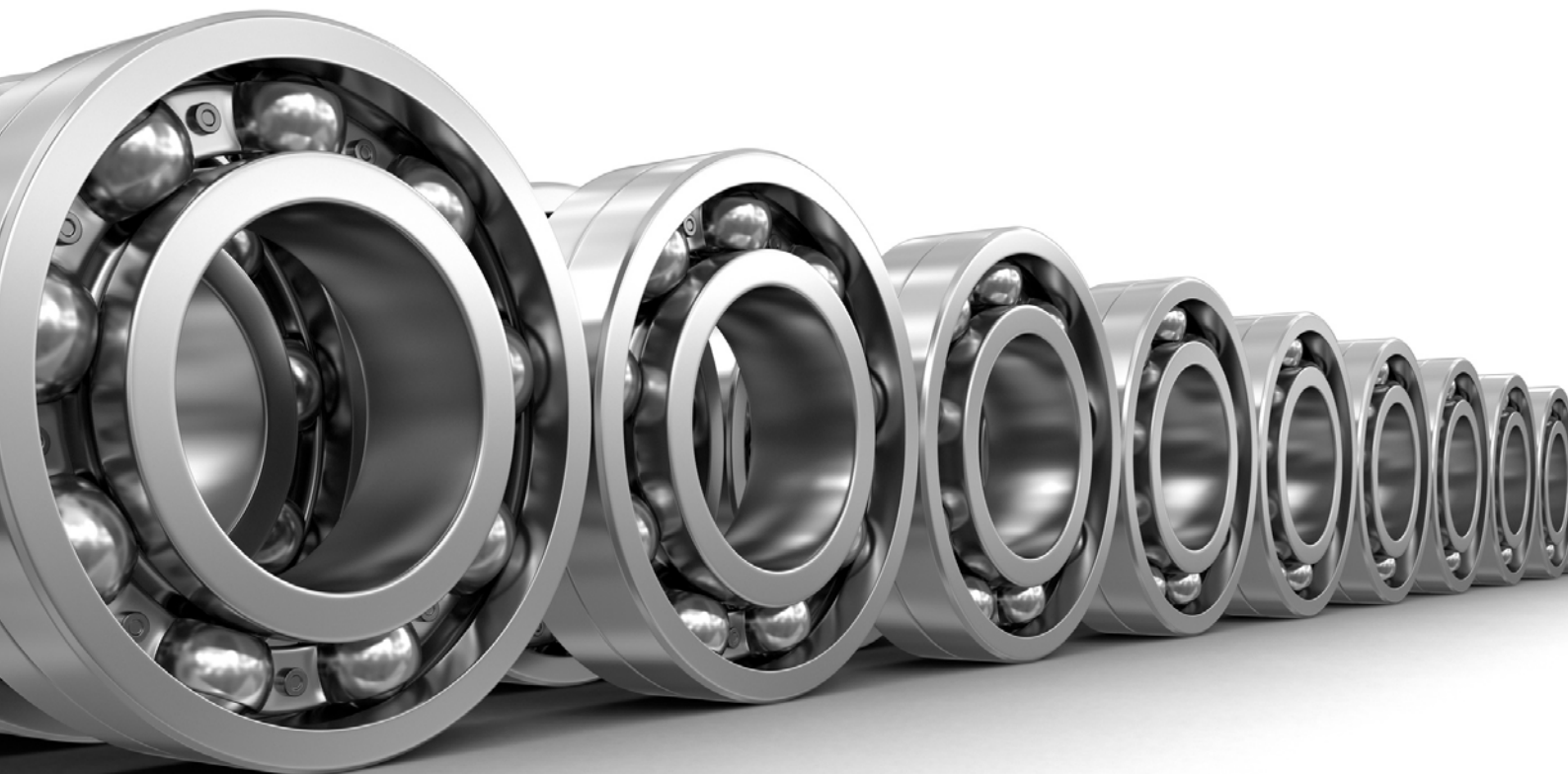
Noise Testing and Condition Monitoring
with Laser Precision
Application Note



Roller bearings are high precision mechanical components produced in very high quantities. SKF is the world leader in the bearing industry and continues to extend its lead in process development and quality technology.



1
*Inline noise
tester for car
wheel bearings
(hub units)*



Noise Testing and Condition Monitoring of Roller Bearings at World Leading Manufacturer SKF

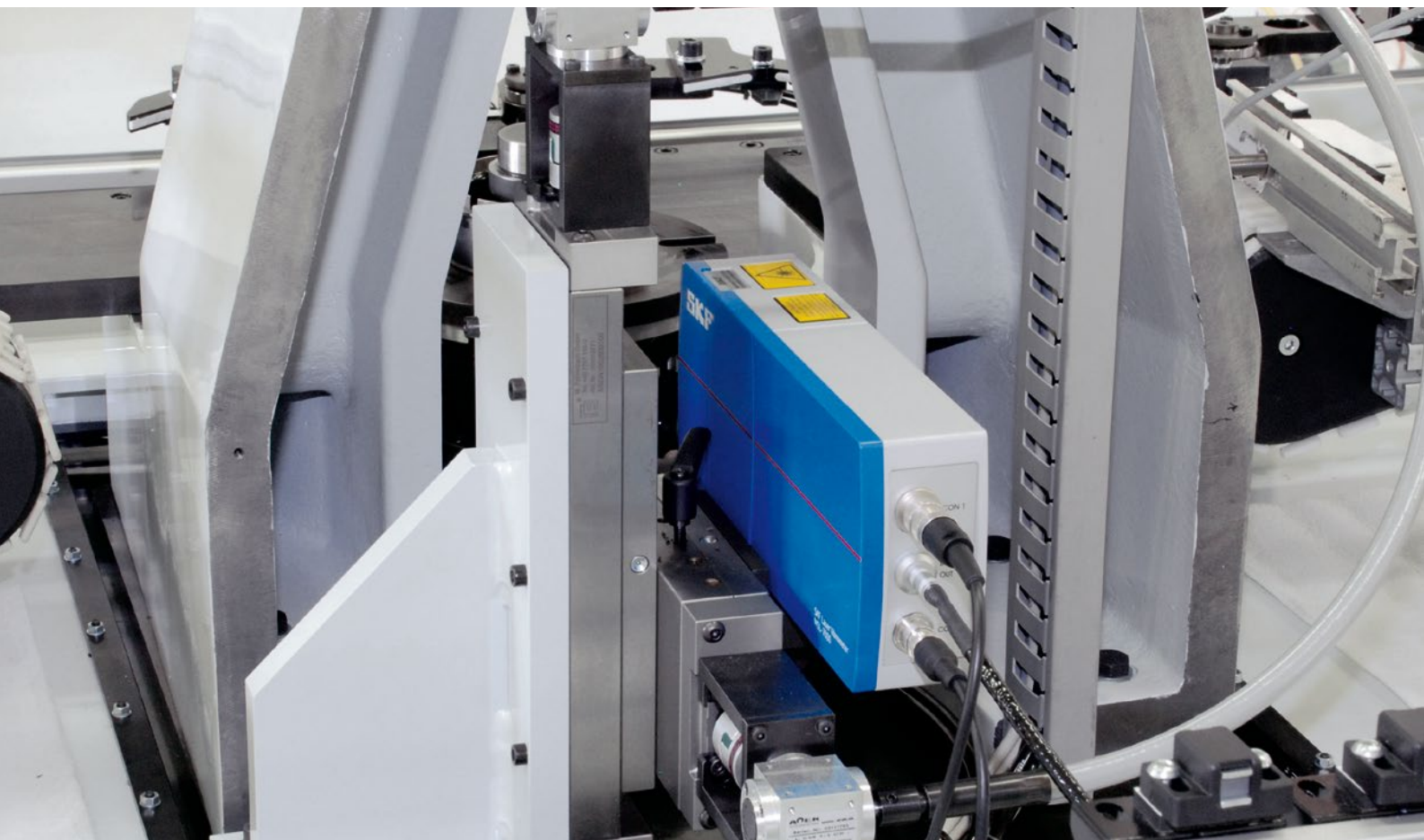
Dimensional tolerances of bearings are on the order of a few micrometers and special attention is paid to achieving low running noise. In addition, SKF is dedicated to a Zero Defect policy, despite making thousands of products every day. As a consequence, SKF applies 100% noise testing at the end of its production lines that requires highly sophisticated testing systems.

A Center of Excellence for Bearing Noise

SKF has established a Quality Technology Centre (QTC), which is located at SKF Österreich AG in Steyr, Austria. QTC develops, manufactures and sells high precision measuring equipment to support quality control and

process improvements for the automotive-bearing and grease industry. QTC is the center of excellence for bearing noise, roundness and waviness as well as form measurement and non-destructive testing.

QTC has delivered more than 500 noise testing machines (figure 1) worldwide for continuous operation. In 2010 QTC started a joint project with Polytec in order to replace commonly used inductive body vibration sensors by the Polytec IVS Industrial Vibration Sensor (figure 2).



2

SKF laser vibrometer applied in noise testing machine

This new technology offers a number of advantages for SKF factories:

- Contactless measurement
- Flexible use
- Accurate and constant signal
- Lower operating expenses through quick resetting and simplified calibration
- Lower cost for sensor repair
- Easy upgrade for existing machinery

The use of industrial laser vibrometer also allows the simplification of layout and equipment design. In addition it is possible that other machines such as life test rigs or run-in stations can be easily complemented with noise testing sensors and electronics.

Flexible Measurement System Covers Many Applications

There was another strong synergy that could be achieved with SKF's "Condition Monitoring" business. SKF is the leading company for condition monitoring systems and offers a wide range of portable instruments and on-line systems using piezo vibration sensors. By continuing the active cooperation between SKF and Polytec, the IVS Industrial Vibration Sensor was further developed in order to be used together with SKF condition monitoring products. The SKF Laser Vibrometer MSL-7000 and MSL-7100 can be combined for example with SKF Microlog (figure 3), thus offering additional value to all our customers.

3

Mobile vibration analysis kit with SKF laser vibrometer and SKF Microlog



On the one hand this opens up more potential applications with SKF portable instruments or in-line systems. On the other hand it gives SKF service engineers an advanced and flexible tool for a large number of different applications in the field.

- Mobile use for many different applications
- Measuring over large distances
- Measurement on hot surfaces and rotating parts
- Consistent signal, no influence of force applied to the piezo
- Offers measurements in hazardous zones or areas that are difficult to reach
- Measurements through glass



Quality Control Technology for Customers

SKF is now also capable of supporting its customers in quality control. The new SKF MSL-7000 Laser Vibrometer can be connected with the QTC noise testing technology for advanced end-of-line testing installations for electric motors, pumps, compressors and many more. This means that SKF offers their own in-house noise testing standards to outside customers as well, for final quality inspection and continuous manufacturing process improvements, following SKF's vision "To equip the world with SKF knowledge".

Author

Werner Palmethofer
SKF Österreich AG
Quality Technology Centre
www.skf.com

Source: Polytec InFocus

Bearing test stand
with a Polytec
IVS Industrial
Vibration Sensor
for fast and clear
pass-fail decisions



Industrial Vibrometers by Polytec - Reliable Production Testing Even Under Harsh Conditions

The IVS-500 Industrial Vibration Sensor is a single-box digital vibrometer for non-contact vibration measurement, ideal for process integrated production testing. It features a robust and compact design, sealed (IP-64 standard) to cope with the challenges of harsh industrial areas. With auto and remote focus it elegantly adapts to large and varying working distances. The sensor ensures accurate and repeatable measurements even from uncooperative surfaces on a large frequency bandwidth from 0 Hz to 100 kHz.

The CLV-2534 Compact Laser Vibrometer comprises a 19" rack-mountable controller supplying laser power to the very compact sensor head via a fiber-optical cable so it stays flexible in application. Measure the true surface vibration with high precision and low noise over a bandwidth of 3.2 MHz at up to 10 m/s velocity. A wide range of options such as an integrated video camera

and microscope objectives make the CLV-2534 an ideal tool for industrial and lab measurements on structures varying from macro- to microscopic size



More Info:
www.industrial-vibrometer.com



 **Polytec GmbH
(Germany)**
Polytec-Platz 1-7
76337 Waldbronn
Tel. +49 7243 604-0
info@polytec.de

**Polytec GmbH
(Germany)**
**Vertriebs- und
Beratungsbüro**
Schwarzschildstraße 1
12489 Berlin
Tel. +49 30 6392-5140

 **Polytec, Inc.
(USA)**
North American
Headquarters
16400 Bake Parkway
Suites 150 & 200
Irvine, CA 92618
Tel. +1 949 943-3033
info@polytec.com

Central Office
1046 Baker Road
Dexter, MI 48130
Tel. +1 734 253-9428

East Coast Office
1 Cabot Road
Suites 101 & 102
Hudson, MA 01749
Tel. +1 508 417-1040

 **Polytec Ltd.
(Great Britain)**
Lambda House
Batford Mill
Harpenden, Herts AL5 5BZ
Tel. +44 1582 711670
info@polytec-ltd.co.uk

 **Polytec France S.A.S.**
Technosud II
Bâtiment A
99, Rue Pierre Semard
92320 Châtillon
Tel. +33 1 496569-00
info@polytec.fr

 **Polytec Japan**
Arena Tower, 13th floor
3-1-9, Shinyokohama
Kohoku-ku, Yokohama-shi
Kanagawa 222-0033
Tel. +81 45 478-6980
info@polytec.co.jp

 **Polytec South-East Asia
Pte Ltd**
Blk 4010 Ang Mo Kio Ave 10
#06-06 TechPlace 1
Singapore 569626
Tel. +65 64510886
info@polytec-sea.com

 **Polytec China Ltd.**
Room 402, Tower B
Minmetals Plaza
No. 5 Chaoyang North Ave
Dongcheng District
100010 Beijing
Tel. +86 10 65682591
info-cn@polytec.com