

# Acoustic Testing of Roller Bearings

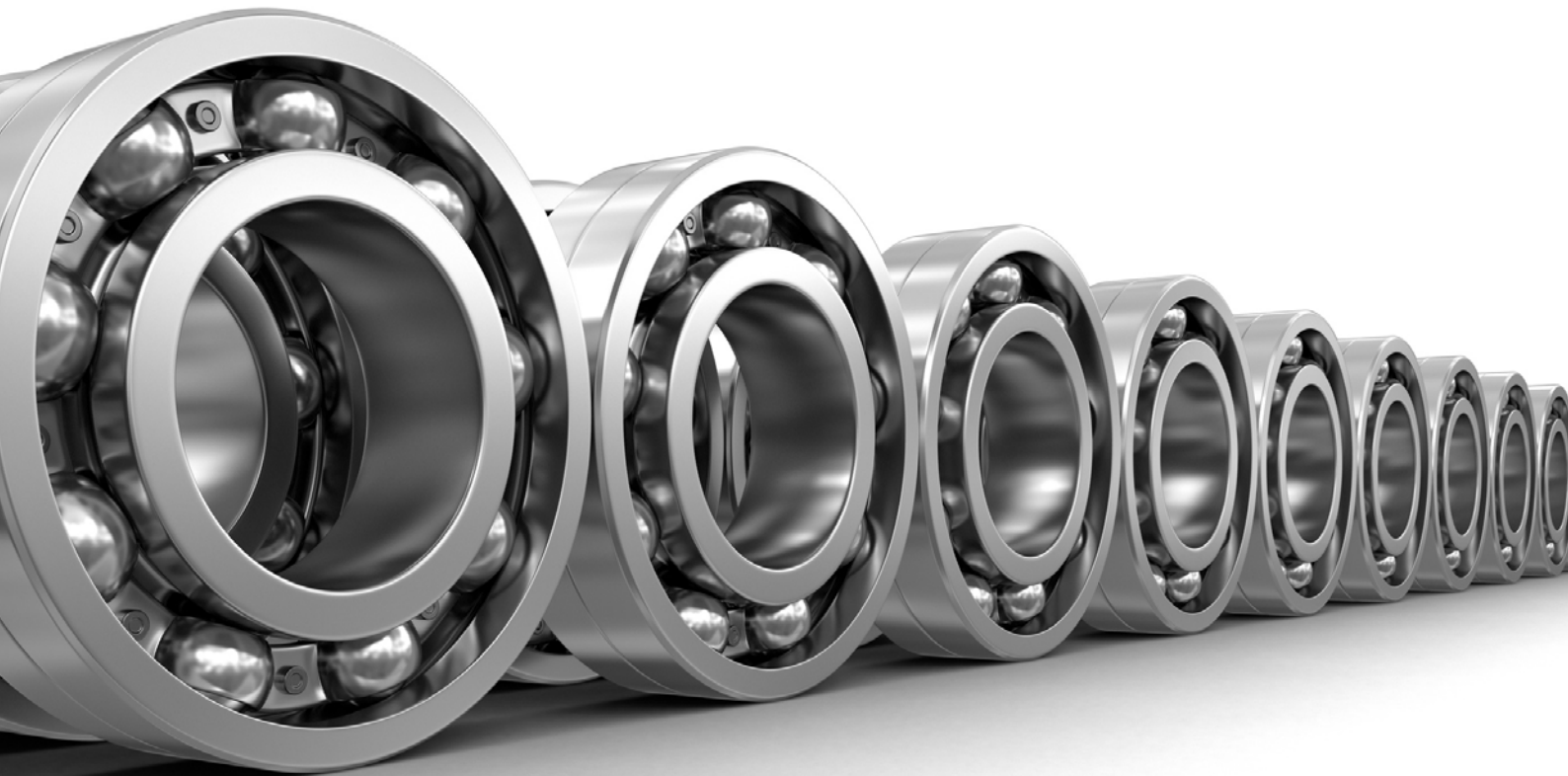
Noise Testing and Condition Monitoring  
with Laser Precision  
Application Note



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**

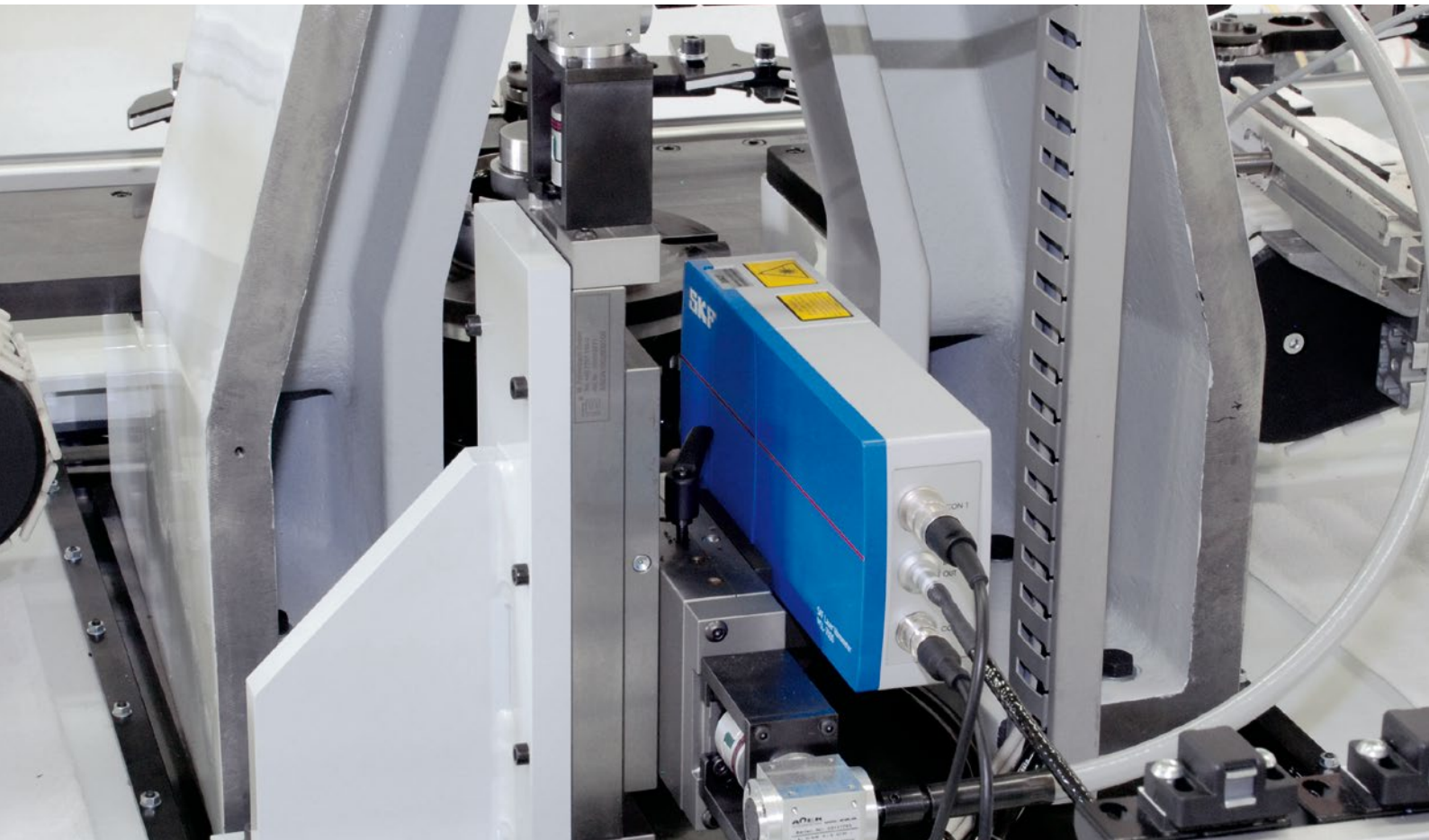
Dimensional tolerances of bearings are on the order of a few micrometers and special attention is paid to achieving low running noise. In addition, SKF is dedicated to a Zero Defect policy, despite making thousands of products every day. As a consequence, SKF applies 100% noise testing at the end of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

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Source: Polytec InFocus

**4**

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](http://www.industrial-vibrometer.com)



  
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