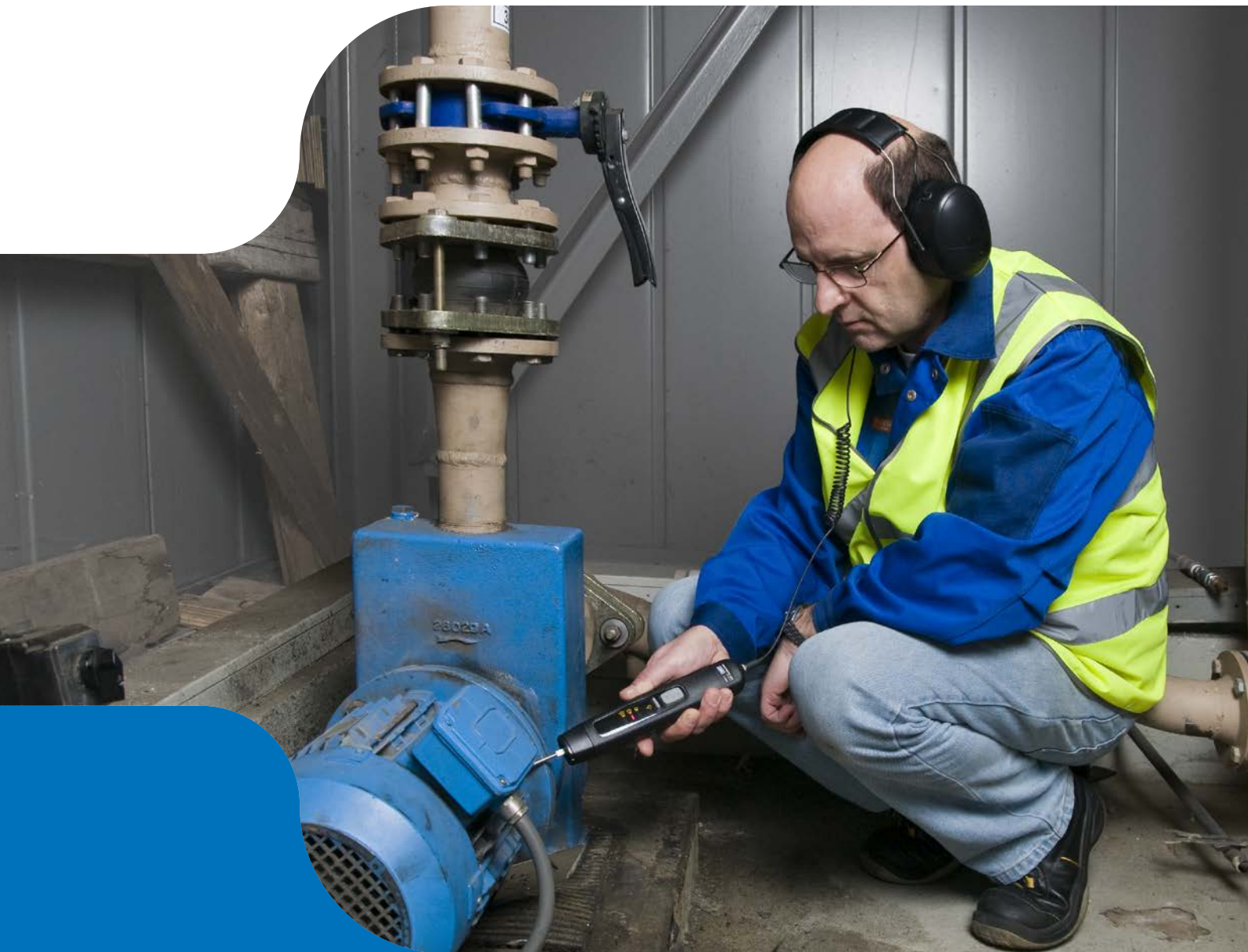


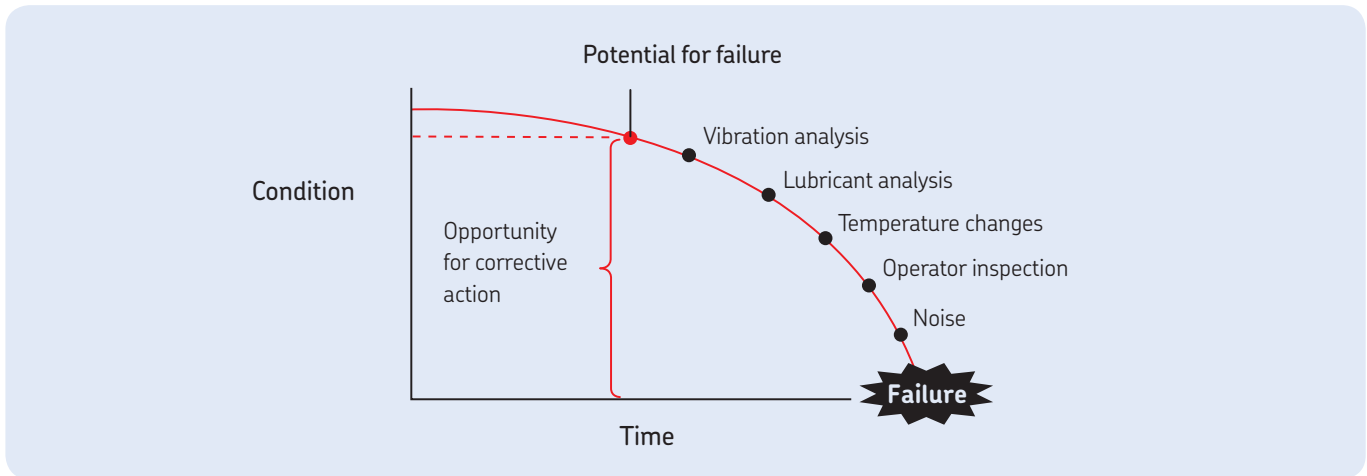
# Basic condition monitoring

Essential for achieving maximum bearing service life



## Basic condition monitoring instruments

Predictive maintenance is the process of determining the condition of machinery while in operation. This enables the repair of problem components prior to failure. Basic condition monitoring instruments not only help plant personnel reduce the possibility of catastrophic failure, but also allow them to order parts in advance, schedule manpower, and plan other repairs during the downtime.



SKF basic condition monitoring tools can be used to check a number of properties:

- Temperature
- Speed
- Visual
- Sound
- Electrical discharge currents
- Vibration
- Lubricant condition



### Temperature

Since the dawn of the industrial age, operators and technicians know that abnormal temperatures often indicate that something is wrong with the machine. Such instruments as contact and infrared thermometers can help find and then measure these hotspots, allowing further analysis to be conducted.



### SKF General-purpose Thermometer Pen TMTP 200

Accurate contact temperature measurement of general equipment

- Wide measurement range, from  $-40$  to  $+200$  °C ( $-40$  to  $+392$  °F)
- Temperature reading selection in °C or °F



## SKF Basic Condition Monitoring Kit CMAK 400-ML

Check bearing and machine condition quickly and easily.

This kit includes the SKF Machine Condition Advisor and sensor kit, which features a magnet to help users measure hard-to-reach surfaces. The kit also includes the heavy duty SKF Infrared Thermometer – a long range, dual laser non-contact device that reads temperatures in less than a second, as well as the SKF Inspector 400 Ultrasonic probe, which senses high-frequency sounds such as pressure or vacuum leaks and electrical discharges, making them audible even in noisy environments.



## Lubricant condition

To maintain the optimum condition of rolling element bearings, it is essential that the lubricant is in good condition. Checking the oil or grease condition at regular intervals can reduce downtime and greatly prolong the life of rolling element bearings.



## SKF Grease Test Kit TKGT 1

Portable grease analysis kit for field use

- Helps in the prevention of damage due to underperforming lubricant greases
- Allows adjustment of grease relubrication intervals according to real conditions
- Allows verification of the suitability of certain greases in specific applications



## SKF Oil Check Monitor TMEH 1

The TMEH 1 measures the changes in dielectric constant of an oil sample. By comparing measurements obtained from used and fresh samples of the same oil, the degree of change in the condition of the oil is established.

Shows changes in oil condition affected by such things as:

- Water content
- Fuel contamination
- Metallic content
- Oxidation



## Visual

Visual inspection of a machine's condition can sometimes be difficult when it's running or when there is a need to inspect the machine internally. A stroboscope can be used to visually freeze the motion of a machine to allow such things as fan blades, couplings and belt drives to be inspected while running. To inspect the internal parts of a machine often requires disassembly. By using an endoscope, it is possible to access the area of interest with minimal disassembly, saving time and money.

### SKF Stroboscopes TKRS series

Phase shift mode enables the viewing of the object of interest to be rotated to the correct position for viewing; especially useful for gear wheels and fan blade inspection



#### TKRS 10

- Flash rates of up to 12 500 flashes per minute cover a wide range of applications
- Xenon flashtube source lasts for at least 100 million flashes



#### TKRS 20

- Flash rates of up to 300 000 flashes per minute cover most high speed applications.
- A remote laser sensor is included enabling the flash rate to be easily triggered, and also enables the stroboscope to be used as a tachometer.
- Bright and powerful flash gives a good target illumination at a distance, with a focused viewing area, and is ideal for outdoor use

### SKF Endoscope TKES 10 series

The compact display unit, with 3.5 inch backlit screen, allows images and video to be saved and recalled, or to be downloaded and shared with others.



- High resolution miniature camera, with up to 2x digital zoom, gives a clear and sharp full screen image
- Small tip diameter of 5,5 mm (0.22 in), with a wide field of view, allows easy access to most applications
- Built-in step-less adjustable LED lighting helps prevent under and over illumination of target

Three different models cater for most needs:

- TKES 10F with a 1 metre flexible insertion tube
- TKES 10S with a 1 metre semi-rigid insertion tube
- TKES 10A with a 1 metre articulated insertion tube



## Sound

Abnormal sounds from machines often indicate that something is wrong. A stethoscope can be used to help pinpoint the source of the sound and can aid the technician in identifying the problem. Leaks in compressed air systems are costly, not only in energy costs but also due to extra costs in air compressor maintenance. Ultrasonic leak detectors can help detect leaks efficiently, allowing the necessary repairs to be made. Excessive noise can cause worker fatigue, increased accidents and loss of hearing. A sound pressure meter can measure the sound level, allowing corrective measures to be made.



### SKF Electronic Stethoscope TMST 3

Easily pinpoints bearing and machine noise

- Excellent sound quality helps to reliably identify the possible cause of the noise
- Excellent quality headset for optimum sound quality even in very high-noise environments



### SKF Sound Pressure Meter TMSP 1

A high quality, handheld instrument for measuring the sound level

- dBA and dBC scale weightings for both general sound level and low frequency noise measurements
- Fast and slow time weighting enables either normal measurements or the average level of fluctuating noise



### SKF Ultrasonic Leak Detector TMSU 1

Quick and easy detection of air leaks by means of ultrasound

- By identifying air leaks and fixing them, energy consumption is significantly reduced
- The flexible tube allows access to confined spaces





## Electrical discharge currents

Electrical discharges are a result of motor shaft voltages discharging to earth through the bearing, causing electrical erosion, lubricant degradation and ultimately bearing failure. An electrical discharge detector can help detect the presence of electrical discharge currents, allowing remedial action to be taken.



### SKF Electrical Discharge Detector Pen TKED 1

Electric motors are more vulnerable to suffer electrical erosion in bearings when controlled by a Variable Frequency Drive. When incorporated into a predictive maintenance programme, the TKED 1 can help detect bearings more susceptible to failure, and to a significant degree, prevent unplanned machine downtime.

- Unique remote solution allows operation at a distance from the motors. This helps protect the user from touching machinery in motion



## Vibration

Abnormal vibrations are often the first indication of a potential machine failure. These vibrations can be caused by such conditions as unbalance, misalignment, looseness of parts, rolling element bearing and gear damage. Vibration analysis instruments can help detect many serious problems at an early stage, allowing remedial work to be undertaken in a timely manner.

### SKF Machine Condition Advisor CMAS 100-SL

The CMAS 100-SL provides an overall “velocity” vibration reading that measures vibration signals from the machine caused by rotational and structural problems such as unbalance, misalignment and looseness and automatically compares them to pre-programmed ISO guidelines.



- Measuring velocity, enveloped acceleration, and temperature simultaneously saves time
- Assess vibration in industrial non-reciprocating machinery


## SKF Infrared thermometers

D:S = 16:1  
  
 $\epsilon = 0,95$



D:S = 16:1  
  
 $\epsilon = 0,1-1,0$



D:S = 50:1  
  
 $\epsilon = 0,1-1,0$



### TKTL 10

An infrared thermometer that is an essential tool for every technician

- Wide temperature measurement range from  $-60$  to  $+625$  °C ( $-76$  to  $+1\ 157$  °F)
- Distance-to-spot ratio of 16:1
- Fixed emissivity of 0,95

### TKTL 20

An infrared and contact thermometer offering versatile temperature measurement options

- Infrared temperature measurement range from  $-60$  to  $+625$  °C ( $-76$  to  $+1\ 157$  °F)
- Contact temperature measurement range from  $-64$  to  $+1\ 400$  °C ( $-83$  to  $+1\ 999$  °F)
- Distance-to-spot ratio of 16:1
- User selectable variable emissivity between 0,1 and 1,0

### TKTL 30

An infrared and contact temperature thermometer with a wide measurement range and dual laser sighting

- Infrared temperature measurement range from  $-60$  to  $+1\ 000$  °C ( $-76$  to  $+1\ 832$  °F)
- Contact temperature measurement range from  $-64$  to  $+1\ 400$  °C ( $-83$  to  $+1\ 999$  °F)
- Dual laser sighting feature helps to precisely pin-point the temperature measurement area
- Distance-to-spot ratio of 50:1
- User selectable variable emissivity between 0,1 and 1,0



### Speed

Machines are usually designed to run at a given speed. If the speed is too slow or too fast, then the overall process can be compromised. Using a hand-held tachometer enables a quick and easy assessment of the machine's running speed.



### SKF Multi-functional Laser / Contact Tachometer TMRT 1

Pinpoint accuracy combined with measurement versatility

- Measures rpm, rps, m, ft or yds per minute or second, length or revolution counting, or time interval
- Large angular range of  $\pm 80^\circ$  to target facilitates easy measuring in areas where straight-line access is difficult

## Other useful tools from SKF



### SKF Belt Alignment Tool TMEB 2

Quick and accurate belt alignment

- Powerful magnets allow fast and easy attachment
- No trial and error: the laser position indicates the nature of misalignment allowing easy and accurate adjustment
- Three-dimensional target area simplifies the alignment process
- V-guides facilitate the alignment of a wide range of V-belt pulleys



### SKF Machinery Shims TMAS series

For accurate vertical machinery alignment

- Made of high quality stainless steel, allowing re-use
- Close tolerances for accurate alignment
- Thickness clearly marked on each shim
- Available in five dimensions and 10 thicknesses, in packs of 10 pieces and as complete kits



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