

# SKF Shaft Alignment Tools

Accurate shaft alignment really matters

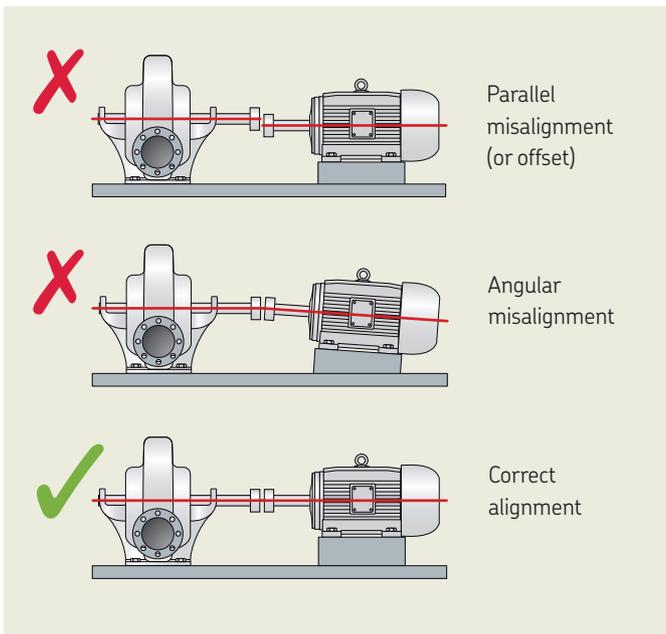




Accurate shaft alignment really matters

## Reduce machinery breakdowns and increase your uptime

It's a fact. Shaft misalignment is a major contributor to rotating machinery breakdowns. Accurately aligning shafts can prevent a large number of machinery breakdowns and reduce unplanned downtime that results in a loss of production. In today's challenging environment of reducing costs and optimising assets, the necessity of accurate shaft alignment is now greater than ever.



### What is shaft misalignment?

Machines need to be aligned in both the horizontal and vertical plane. The misalignment can be caused by both parallel or angular misalignment. The possible consequences of shaft misalignment are serious to any company's bottom line and include:

- Increased friction and thereby energy consumption
- Premature bearing and seal failure
- Premature shaft and coupling failure
- Excessive seal lubricant leakage
- Failure of coupling and foundation bolts
- Increased vibration and noise



## What methods can be used to align shafts?

In general, it's clear that laser alignment systems are quicker and easier to use than dial indicators, have better accuracy and don't require special skills to get accurate results virtually every time.

### Which type of laser alignment system should be considered?

Before purchasing a system, identify the applications where it is to be used and make a list of requirements. Buying an expensive system that can accommodate virtually every need can be a costly mistake, as the technicians need to be skilled in using it.

The majority of alignment tasks consist of such things as a horizontally placed electric motor with a pump or fan with a single coupling. For such tasks, the technician needs a system that is quick and easy to use and doesn't need a long set up time.

### What can SKF offer?

SKF has developed, after extensive consultation with users, a range of affordable, easy to use shaft alignment tools that are suitable for a majority of alignment tasks.

	Straight edge	Dial indicators	Laser shaft alignment
Accuracy	--	++	++
Speed	++	--	+
Ease of use	++	--	+

New technology makes shaft alignment easier and more affordable

## SKF Shaft Alignment Tool TKSA 11



The SKF TKSA 11 is an innovative shaft alignment tool that uses smartphones and tablets and intuitively guides the user through the shaft alignment process. With a focus on the core alignment tasks, the TKSA 11 is designed to be a very easy-to-use instrument that is especially suitable for alignment learners and compact applications. The SKF TKSA 11 is the first instrument on the market that uses inductive proximity sensors, enabling accurate and reliable shaft alignment to be affordable for every budget.

- Live view of the instrument and motor position makes the measurement and horizontal alignment intuitive and easy.
- The TKSA 11 app offers a fully functional demonstration mode allowing the complete alignment process to be experienced without the need to purchase the TKSA 11.
- The TKSA 11 is designed to give a fast return on its investment and is also affordable for almost every budget.
- By using inductive proximity sensors, the measurement is no longer affected by bright sunlight, the influence of backlash is reduced and the instrument becomes more robust. All enabling the TKSA 11 to deliver accurate and reliable shaft alignments.
- Automatic alignment reports give a complete overview of the alignment process and results. Reports can easily be shared via email or cloud services.



The intuitive and affordable laser shaft alignment system

## SKF Shaft Alignment Tool TKSA 31

The TKSA 31 is SKF's most affordable solution for easy laser shaft alignment. The ergonomic display unit with touch screen makes the instrument very easy to use and the built-in machine library helps storing alignment reports for multiple machines. Large sized laser detectors in the measuring heads reduce the need for pre-alignments and the embedded soft foot tool helps establish the foundation for a successful alignment. Additional functions such as live view and automatic measurement support fast and effective alignment tasks and make the TKSA 31 an innovative laser shaft alignment tool that is affordable for almost every budget.

- Easy measurements can be performed by using the well-known three position measurement (9-12-3 o'clock) with additional positioning flexibility of 40° around each measurement position.
- High affordability is achieved by focussing on the standard shaft alignment process and essential functions to allow quick and effective shaft alignments.
- "Automatic measurement" enables hands-free measurements by detecting the position of the heads and only taking a measurement when the heads are in the right position.
- Automatic reports are generated after each alignment and can be customised with notes about the application. All reports can be exported as pdf files.
- The machine library gives an overview of all machines and alignment reports. It simplifies the machine identification and improves the alignment workflow.



Live view supports intuitive measurements and facilitates horizontal and vertical machine position corrections.



The advanced laser shaft alignment system with enhanced measuring and reporting capabilities  
**SKF Shaft Alignment Tool TKSA 41**



Free measurement allows alignment measurements to start at any angle and finish with an angular sweep of just 90°.



Machine library gives an overview of all machines and alignment reports.

The TKSA 41 is an advanced laser alignment solution for achieving accurate shaft alignments. With two wireless measurement units, large sized detectors and powerful lasers, the instrument performs precise measurements in even the most challenging conditions.

The ergonomic display unit with intuitive touch screen navigation makes your alignments fast and easy, whilst innovative features, like the “free measurement”, increase the alignment performance. With the focus on improving alignment practices, the SKF Shaft Alignment Tool, TKSA 41, is one of the industry’s best value alignment solutions.

- Wireless communication improves instrument handling and allows alignments of difficult to reach applications from a safe position.
- Automatic measurement enables hands-free measurements by detecting the head position and taking a measurement when the heads are rotated into the right position.
- Automatic reports are generated after each alignment. The reports can be customised with notes and pictures from the built-in camera for the most comprehensive overview. All reports can be exported as pdf files.
- Live view supports intuitive measurements and facilitates horizontal and vertical alignments.
- The simplicity of the TKSA 41 provides greater confidence for the performance of alignment tasks on all types of horizontal rotating machines.
- QR codes can be used to further simplify machine identification and improve the alignment workflow.

Comprehensive and intuitive shaft alignment utilising tablets and smart phones

## SKF Shaft Alignment Tool TKSA 51



The TKSA 51 shaft alignment tool provides high measurement flexibility and performance suitable for entry-level to expert alignment jobs. Designed to work with the SKF shaft alignment apps on a tablet or smart phone, this intuitive tool is easy to use and requires no special training.

The included accessories enable use of the TKSA 51 for a wide range of alignment applications with horizontal and vertical shafts, such as motors, drives, fans, pumps, gearboxes and more. The apps include tutorial videos to show operators how to perform accurate measurements.

- **Measurement flexibility** - The well-known, three-position measurement gains additional flexibility as measurements can start at any angle and require a total minimal rotation of only 40 degrees. This enables operators to perform alignments of applications with limited space.
- **Automatic reports** - Alignment reports are generated automatically and can be customised with notes, a machine picture and a signature via touchscreen. The reports can be easily exported as PDF files and shared with other mobile apps.
- **Comprehensive and compact** - A range of included components, such as magnetic mounting brackets and extension rods and chains, increase the TKSA 51's versatility, yet it remains compact, lightweight and easy to carry.
- **3-D live view** - This feature enables intuitive positioning of the heads for quick alignment measurements and displays the horizontal and vertical alignment correction live. The apps enable 3-D rotation of the virtual motor to correspond with the actual machine position view.
- **Disturbance compensation** - Measurement values are averaged over time to provide greater accuracy in presence of external disturbances.

### Alignment applications

The TKSA 51 uses dedicated apps for alignments of horizontal and vertical shaft and the correction of soft foot. The apps are icon-driven and very easy to use. All apps are free of charge and feature a fully functional demonstration mode that allows the alignment process to be experienced before purchasing the instrument.



Shaft alignment



Vertical shaft alignment



Soft foot

Versatility and performance for professional alignment  
**SKF Shaft Alignment Tool TKSA 71**



**TKSA 71 delivers precision and durability**

Designed for professional alignment in harsh industrial environments, the TKSA 71 complements SKF's offering with a high-end shaft alignment tool. The instrument is very versatile with ultra-compact measuring units for use in extremely narrow spaces. Its dedicated software applications enable different types of alignments, including horizontal and vertical shafts, spacer shafts and machine trains.

Superior alignment performance and long-term industrial durability are achieved with an innovative instrument design that offers high measurement accuracy and excellent protection against dust and water in harsh environments.

- **Easy-to-use** - Intuitive software applications, guided alignment processes and explanatory videos
- **Wide range of applications** - Comprehensive accessories and dedicated software applications
- **Superior alignment performance** - Up to 10 m measurement distance, disturbance compensation, measurement flexibility, only 40° total rotation, automatic measurement and customised alignments with target values
- **Protection against harsh environments** - Completely sealed measuring units (IP67) to withstand dust and water
- **Ultra-compact measuring units** - Use in extremely narrow spaces
- **Robust carrying case** - Excellent protection, convenient transport and wireless in-case charging

**Complete system for your alignment needs**

The TKSA 71 base model includes standard accessories for most alignment tasks. It is supplied in a rugged case that meets most airline requirements for cabin luggage.

The TKSA 71/PRO model includes additional accessories such as sliding brackets, magnetic bases and offset brackets that are useful for more demanding alignment jobs.

This model is supplied in a larger, rugged trolley case.



Measuring device: (1) Measuring units (M & S) with standard V-bracket, (2) Wireless charging pods with USB cable, (3) Tape measure  
 Standard accessories: (4) Extension chains, (5) Extension rods, (6) Mounting magnets  
 Advanced accessories: (7) Sliding brackets, (8) Offset brackets, (9) Additional extension rods, (10) Magnetic bases

# Alignment applications

The TKSA 71 functions quickly and intuitively using six software apps tailored for different alignment jobs. Designed for use without prior training, these simple-to-use apps are available free of charge for both Android and iOS platforms. Common features include comprehensive, automatic reports, export and sharing options, machine library with QR code identification, instructional videos within the app, built-in tolerance guidelines, 3-D live view, disturbance compensation and a fully functional demonstration mode.



## Shaft alignment

Easy and intuitive alignments of horizontal shafts with additional features including automatic measurement, minimal 40° total rotation, 9-12-3 guidance and alignment customisation with target values<sup>1)</sup>.



## Spacer shaft alignment

Accommodates special requirements of spacer shafts and facilitates the alignment process<sup>2)</sup>.



## Vertical shaft alignment

Easy and intuitive alignment of vertical shaft machines with shimming support for different bolt configurations<sup>1)</sup>.



## Values

Allows the shaft alignment tool to be used as digital dial gauges; operators can record absolute, zeroed and halved readings to perform customised alignments with manual calculations<sup>2)</sup>.



## Machine train shaft alignment

Enables operator to align three connected machines, giving a complete overview of machine train alignment and allowing the operator to select stationary feet<sup>2)</sup>.



## Soft foot

Assists technician in verifying that machine is standing evenly on all four feet. The app supports the operator identifying and correcting a soft foot<sup>1)</sup>.



<sup>1)</sup>Compatible with: TKSA 51, TKSA 71, TKSA 71/PRO. <sup>2)</sup>Compatible with: TKSA 71, TKSA 71/PRO.

Selection chart						
	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
<b>User interface</b> Type of display device	phone, tablet (iOS & Android)	touch screen display device	touch screen display device	phone, tablet (iOS & Android)	phone, tablet (iOS & Android)	phone, tablet (iOS & Android)
<b>Display device included</b>	no	yes	yes	no	no	no
<b>Measurement positions</b> The "9-12-3" measurement directs the user to three pre-defined measurement positions. The "free" measurement allows the user to freely select the measurement positions. All measurements are guided.	9-12-3	9-12-3	free	free	free	free
<b>Wireless measuring heads</b>	●	—	●	●	●	●
<b>Measurement distance</b> Maximum possible distance between the brackets of the measuring heads.	18,5 cm	2 m <sup>2)</sup>	4 m	5 m	10 m	10 m
<b>Minimal shaft rotation</b> Describes the minimal required total shaft rotation angle to perform alignment measurements.	180°	140°	90°	40°	40°	40°
<b>Camera</b> Machine picture(s) can be taken and added to alignment reports.	●	—	●	●	●	●
<b>Machine library</b> Overview of all registered machines and previous alignment reports.	—	●	●	●	●	●
<b>QR code recognition</b> QR labels can be used to simplify the machine identification and increase the usage convenience.	—	—	●	●	●	●
<b>Machine view</b> The machine view describes how the machine is shown on the display. The free 3D rotation allows to view the machine from all directions.	fixed 2D view	fixed 3D view	fixed 3D view	free 3D rotation	free 3D rotation	free 3D rotation
<b>Target values</b> Using target values for alignment, it is possible to compensate for thermal expansion or similar adjustments.	—	—	—	●	●	●
<b>Disturbance compensation</b> Measurement values are averaged over time, allowing accurate measurements in the presence of laser distortions from air temperature gradients or similar disturbances.	—	—	—	●	●	●

Supported alignment applications	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
Horizontal shaft alignment	●	●	●	●	●	●
Soft foot correction	—	●	●	●	●	●
Vertical shaft alignment	—	—	—	●	●	●
Spacer shaft	—	—	—	—	●	●
Machine train	—	—	—	—	●	●
Digital dial gauge mode	—	—	—	—	●	●

Alignment accessories	TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA 71	TKSA 71/PRO
Extension chains	optional	optional	optional	included	included	included
Extension rods	optional	optional	included	included	included	included
Magnetic V-brackets	optional	optional	optional	included	included	included
Offset brackets	optional	optional	optional	optional	optional	included
Sliding brackets	optional	optional	optional	optional	optional	included
Magnetic base	—	optional	optional	optional	optional	included
Spindle bracket	optional	—	—	optional	optional	optional

<sup>1)</sup> With supplied USB cables

Accessories		Compatible				
		TKSA 11	TKSA 31	TKSA 41	TKSA 51	TKSA71/(PRO)
Ordering designations	Content and description					
<b>Extension chains</b>						
TKSA 41-EXTCH	2 × Extension chains of 500 mm (19.7 in.) for shaft diameters up to 300 mm (11.8 in.)	–	●	●	–	–
TKSA 51-EXTCH	2 × Extension chains of 1 m (3.3 ft.) for shaft diameters up to 450 mm (17.7 in.)	●	–	–	●	●
<b>Rods</b>						
TKSA ROD90	4 × threaded rods of 90 mm (3.5 in.)	–	●	●	–	–
TKSA ROD150	4 × threaded rods of 150 mm (5.9 in.)	–	●	●	–	–
TKSA 51-ROD80	4 × threaded rods of 80 mm (3.1 in.)	●	–	–	●	●
TKSA 51-ROD120	4 × threaded rods of 120 mm (4.7 in.)	●	–	–	●	●
<b>Magnetic V-brackets</b>						
TKSA MAGVBK	2 × Magnetic V-brackets, supplied without rods or chains	–	●	●	–	–
TKSA 51-VBK	1 × Standard V-bracket, supplied with 2 × threaded rods of 80 mm (3.2 in.), 1 × standard chain of 480 mm (18.9 in.) and 4 × magnets	●	–	–	●	●
<b>Spindle brackets Rods</b>						
TKSA 51-SPDBK	1 × Spindle bracket, supplied with 2 × threaded rods of 80 mm (3.2 in.)	●	–	–	●	●
<b>Sliding brackets</b>						
TKSA 51-SLDBK	1 × Adjustable sliding bracket for use with shaft diameters >30 mm (1.2 in.) or bore diameters >120 mm (4.7 in.), supplied without rods	●	–	–	●	●
TKSA SLDBK	2 × Wheels to be used with standard V-Bracket (TKSA VBK), supplied without V-bracket	–	●	●	–	–
<b>Offset brackets</b>						
TKSA EXT50	2 × Offset brackets of 50 mm (2 in.) compatible with standard (TKSA VBK) and magnetic V-brackets (TKSA MAGVBK) and magnetic base (TKSA MAGBASE)	–	●	●	–	–
TKSA EXT100	2 × Offset brackets of 100 mm (3.9 in.) compatible with standard (TKSA VBK) and magnetic V-brackets (TKSA MAGVBK) and magnetic base (TKSA MAGBASE)	–	●	●	–	–
TKSA 51-EXT50	1 × Offset bracket 50 mm (2 in.), supplied with 2 × rods 80 mm (3.2 in.)	●	–	–	●	●
<b>Magnetic base</b>						
TKSA MAGBASE	2 × Magnetic bases, supplied with 2 × fixation screws M8 × 20 mm	–	● <sup>1)</sup>	● <sup>1)</sup>	●	●
<b>Other accessories</b>						
TKSA 11-EBK	2 × Extendable V-brackets, supplied with 4 × threaded rods of 120 mm (4.7 in.) and 4 × threaded rods of 80 mm (3.1 in.), supplied without chains	●	–	–	–	–
TKSA VBK	2 × Standard V-brackets, supplied without rods or chains	–	●	●	–	–
TKSA 41-QR	5 × A5 sheets with 6 × QR code stickers per sheet (total of 30 × stickers)	–	–	●	●	●

<sup>1)</sup> Requires offset brackets TKSA EXT50 or TKSA EXT100 for usage with TKSA 31 and TKSA 41.

Technical data			
Designation	TKSA 11	TKSA 31	TKSA 41
Sensors and communication	2× Inductive proximity sensors Inclinometer ±0.5°, Bluetooth 4.0 LE	29 mm (1.1 in.) CCD with red line laser Class 2 Inclinometer ±0.5°, Wired, USB cables	29 mm (1.1 in.) CCD with line laser Class 2 Inclinometer ±0.5°; Bluetooth 4.0 LE and wired, USB cables
System measuring distance	0 to 185 mm (0 to 7.3 in.) between brackets 3 × reference bars included up to 200 mm (7.9 in.)	0,07 to 4 m (0.23 to 13.1 ft) (up to 2 m (6.6 ft) with cables supplied)	0,07 to 4 m (0.23 to 13.1 ft)
Measuring errors	<2%	<0,5% ±5 µm	< 0,5% ±5 µm
Housing material	PC/ABS plastic	20% Glass filled Polycarbonate	20% Glass filled Polycarbonate
Operating time	Up to 18 hours, rechargeable LiPo battery	N/A	Up to 16 hours Rechargeable LiPo battery
Dimensions	105 × 55 × 55 mm (4.1 × 2.2 × 2.2 in.)	120 × 90 × 36 mm (4.7 × 3.5 × 1.4 in.)	120 × 90 × 36 mm (4.7 × 3.5 × 1.4 in.)
Weight	155 g (0.34 lb)	180 g (0.4 lb)	220 g (0.5 lb)
Operating device	Samsung Galaxy Tab Active 2 and iPad Mini recommended iPad, iPod Touch iPhone SE, Galaxy S6 or above (all not included)	5.6" colour resistive touchscreen LCD display. High Impact PC/ABS with overmould	5.6" colour resistive touchscreen LCD display. High Impact PC/ABS with overmould
Software/App update	Apple AppStore or on Google Play Store	via USB stick	via USB stick
Operating system requirements	Apple iOS 9 or Android 9 (and above)	N/A	N/A
DU Operating time	N/A	Up to 7 hours (100% backlight)	Up to 8 hours (100% backlight)
Dimensions	N/A	205 × 140 × 60 mm (8.1 × 5.5 × 2.4 in.)	205 × 140 × 60 mm (8.1 × 5.5 × 2.4 in.)
Weight	N/A	420 g (0.9 lb)	640 g (1.4 lb)
Alignment method	Alignment of horizontal shafts 3 position measurement 9–12–3	Alignment of horizontal shafts, 3 position measurement 9 -12 -3 (with min. 140° rotation), automatic measurement, soft foot	Alignment of horizontal shafts, 3 position measurement 9 -12 -3, automatic measurement, measurement (with min. 90° rotation), soft foot
Live correction values	Only for horizontal	Vertical and horizontal	Vertical and horizontal
Extra features	Automatic .pdf report	Machine library, screen orientation flip, automatic .pdf report	Machine library, QR code reading, screen orientation flip, automatic .pdf report
Fixture	2× V-brackets with chains, width 15 mm (0.6 in.)	2× V-brackets with chains, width 21 mm (0.8 in.)	2 × V-brackets with chains, width 21 mm (0.8 in.)
Shaft diameters	20 to 160 mm (0.8 to 6.3 in.)	20 to 150 mm (0.8 to 5.9 in.) 300 mm (11.8 in.) with optional extension chains (not included)	20 to 150 mm (0.8 to 5.9 in.) 300 mm (11.8 in.) with optional extension chains (not included)
Max. coupling height <sup>1)</sup>	55 mm (2.2 in.) with standard 80 mm rods (Unit should be mounted on the coupling when possible)	105 mm (4.2 in.) with standard rods 195 mm (7.7 in.) with optional extension rods (not included)	105 mm (4.2 in.) with standard rods 195 mm (7.7 in.) with extension rods (included)
Power adapter	Charging via micro USB port (5V) Micro USB to USB charging cable supplied Compatible with 5V USB chargers (not included)	Input: 100 V–240 V 50/60 Hz AC power supplier Output: DC 12V 3A with EU, US, UK, AUS adapters	Input: 100 V–240 V 50/60 Hz AC power supplier Output: DC 12V 3A with EU, US, UK, AUS adapters
Operating temperature	0 to 45 °C (32 to 113 °F)	0 to 45 °C (32 to 113 °F)	0 to 45 °C (32 to 113 °F)
IP rating	IP 54	IP 54	IP 54
Carrying case dimensions	355 × 250 × 110 mm (14 × 9.8 × 4.3 in.)	530 × 110 × 360 mm (20.9 × 4.3 × 14.2 in.)	530 × 110 × 360 mm (20.9 × 4.3 × 14.2 in.)
Total weight (incl. case)	2,1 kg (4.6 lb)	4,75 kg (10.5 lb)	4.75 kg (10.5 lb)
Calibration certificate	Supplied with 2 years validity	Supplied with 2 years validity	Supplied with 2 years validity
Case content	Measuring unit; 3 reference bars; 2 shaft brackets with chains 480 mm (18.9 in.) and rods 80 mm (3.1 in.); micro USB to USB charging cable; measuring tape 2 m (6.6 ft.); printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case	2 measuring units (M&S); display unit; 2 shaft brackets with chains 400 mm (15.8 in.) and threaded rods 150 mm (5.9 in.); chain tightening rod; power supply with country adapters; 2 USB cables; measuring tape; printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case	2 measuring units (M&S); display unit; 2 shaft brackets with chains 400 mm (15.8 in.) and threaded rods 150 mm (5.9 in.); chain tightening rod; 4 threaded extension rods 90 mm (3.5 in.); power supply with country adapters; 2 USB cables; measuring tape; printed certificate of calibration and conformance; printed quick start guide (EN); SKF carrying case; 2 × A5 sheets with 6 × QR code stickers per sheet

<sup>1)</sup> Depending on the coupling, the brackets can be mounted on the coupling, reducing the coupling height limitation.

**TKSA 51**

20 mm (0.8 in.) PSD with line laser Class 2  
Inclinometer  $\pm 0.1^\circ$ ; Bluetooth 4.0 LE

0,07 to 5 m (0.23 to 16.4 ft)

<1%  $\pm 10 \mu\text{m}$

Anodized Aluminum front and PC/ABS plastic back cover

Up to 8 hours, rechargeable Li-ion battery  
fast charging: 10 min. charging for 1h usage

52 x 64 x 50 mm (2.1 x 2.5 x 2 in.)

190 g (0.4 lb)

Samsung Galaxy Tab Active 2 and iPad Mini recommended  
iPad, iPod Touch  
iPhone SE, Galaxy S6 or above (all not included)

Apple AppStore or on Google Play Store

Apple iOS 9 or Android 9 (and above)

N/A

N/A

N/A

Alignment of horizontal and vertical shafts,  
3 position measurement 9 -12 -3, automatic measurement,  
measurement (with min. 40° rotation), soft foot

Vertical and horizontal

Machine library, QR code reading, target values, disturbance compensation,  
3D machine free view, screen rotation on tablets, automatic .pdf report

2 x V-brackets with chains,  
width 15 mm (0.6 in.)

20 to 150 mm (0.8 to 5.9 in.)

450 mm (17.7 in.) with extension chains (included)

45 mm (1.8 in.) with standard rods

plus 170 mm (6.7 in.) per set of extension rods

Charging via micro USB port (5V)

Micro USB to USB split charging cable supplied  
Compatible with 5V USB chargers (not included)

0 to 45 °C (32 to 113 °F)

IP 54

355 x 250 x 110 mm (14 x 9.8 x 4.3 in.)

2,9 kg (6.4 lb)

Supplied with 2 years validity

2 measuring units (M&S); 2 shaft brackets with chains 480 mm (18.9 in.),  
threaded rods 80 mm (3.2 in.) and magnets; 4 threaded extension rods  
120 mm (4.7 in.); 2 extension chains 980 mm (38.6 in.); micro USB to USB  
split charging cable; measuring tape; printed certificate of calibration and  
conformance; quick start guide (EN); SKF carrying case; 2x A5 sheets with  
6x QR code stickers per sheet

**TKSA 71, TKSA 71/PRO**

20 mm (0.8 in) 2nd gen. PSD with line laser Class 2  
inclinometer  $\pm 0.1^\circ$ ; Bluetooth 4.0 LE

0,04 to 10 m (0.13 to 32.8 ft)

<1%  $\pm 10 \mu\text{m}$

Anodized aluminum front and PC/ABS plastic back cover

Up to 8 hours, rechargeable Li-ion battery, wireless fast charging  
10 min. charging for 1h usage

52 x 64 x 33 mm (2.1 x 2.5 x 1.3 in.)

130 g (0.3 lbs)

Samsung Galaxy Tab Active 2 and iPad Mini recommended  
iPad, iPod Touch  
iPhone SE, Galaxy S6 or above (all not included)

Apple AppStore or on Google Play store

Apple iOS 9 or Android 9 (and above)

N/A

N/A

N/A

Alignment of horizontal and vertical shafts,  
3 position measurement 9 -12 -3, automatic measurement,  
measurement (with min. 40° rotation), soft foot,  
machine trains, values, spacer shafts

Vertical and horizontal

Machine library, QR code reading, target values, disturbance compensation,  
3D machine free view, screen rotation on tablets, automatic .pdf report

2 x V-brackets with chains,  
width 15 mm (0.6 in.)

20 to 150 mm diameter (0.8 to 5.9 in.),

450 mm (17.7 in.) with extension chains (included)

45 mm (1.8 in.) with standard rods

plus 120 mm (4.7 in.) per set of extension rods

Wireless charging via supplied charging pods

micro USB to USB split charging cable supplied

0 to 45 °C (32 to 113 °F)

IP67 for measuring units and carrying case

TKSA 71 carrying case: 365 x 295 x 170 mm (14.4 x 11.6 x 6.7 in.)

TKSA 71/PRO trolley case: 610 x 430 x 265 mm (24 x 16.9 x 10.4 in.)

TKSA 71: 3,9 kg (8.6 lb)

TKSA 71/PRO: 12,5 kg (27.6 lb)

Supplied with 2 years validity

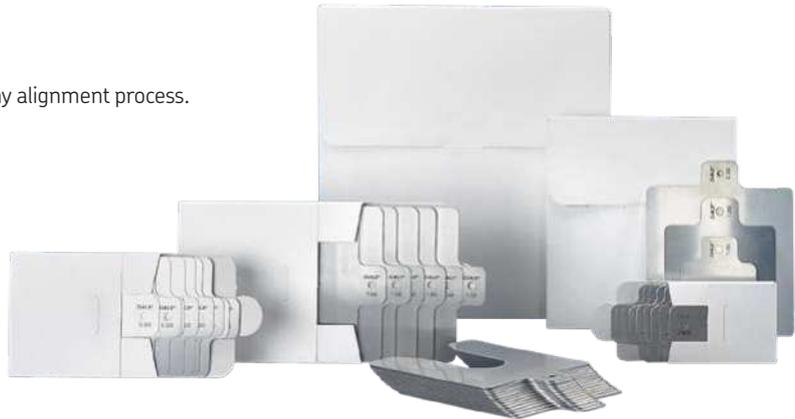
2 measuring units (M&S); 2 shaft brackets with chains 480 mm (18.9 in.),  
threaded rods 80 mm (3.1 in.) and magnets; 4 threaded extension rods 120 mm  
(4.7 in.); 2 extension chains 980 mm (38.6 in.); micro USB to USB split charging  
cable; 2 wireless charging pods; measuring tape; printed certificate of calibration  
and conformance; quick start guide (EN); industrial rugged case (IP 67); 2x A5  
sheets with 6x QR code stickers per sheet  
Additionally with TKSA 71/PRO: 4 threaded extension rods 120 mm (4.7 in.); 2  
offset brackets 50 mm (2 in.); 2 sliding brackets; 2 magnetic bases

For accurate vertical machinery alignment

## Machinery shims TMAS series

Accurate machine adjustment is an essential element of any alignment process.

- Made of high quality stainless steel, allowing re-use
- Easy to fit and to remove
- Close tolerances for accurate alignment
- Thickness clearly marked on each shim
- Fully de-burred
- Pre-cut shims are supplied in packs of 10 and complete kits are also available



TMAS 340



TMAS 380



TMAS 100/KIT

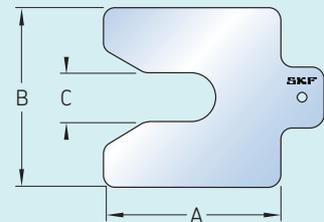
A 50 mm	B 50 mm	C 13 mm
Pack designation	Thickness (mm)	
TMAS 50-005	0,05	
TMAS 50-010	0,10	
TMAS 50-020	0,20	
TMAS 50-025	0,25	
TMAS 50-040	0,40	
TMAS 50-050	0,50	
TMAS 50-070	0,70	
TMAS 50-100	1,00	
TMAS 50-200	2,00	
TMAS 50-300	3,00	

A 75 mm	B 75 mm	C 21 mm
Pack designation	Thickness (mm)	
TMAS 75-005	0,05	
TMAS 75-010	0,10	
TMAS 75-020	0,20	
TMAS 75-025	0,25	
TMAS 75-040	0,40	
TMAS 75-050	0,50	
TMAS 75-070	0,70	
TMAS 75-100	1,00	
TMAS 75-200	2,00	
TMAS 75-300	3,00	

A 100 mm	B 100 mm	C 32 mm
Pack designation	Thickness (mm)	
TMAS 100-005	0,05	
TMAS 100-010	0,10	
TMAS 100-020	0,20	
TMAS 100-025	0,25	
TMAS 100-040	0,40	
TMAS 100-050	0,50	
TMAS 100-070	0,70	
TMAS 100-100	1,00	
TMAS 100-200	2,00	
TMAS 100-300	3,00	

A 125 mm	B 125 mm	C 45 mm
Pack designation	Thickness (mm)	
TMAS 125-005	0,05	
TMAS 125-010	0,10	
TMAS 125-020	0,20	
TMAS 125-025	0,25	
TMAS 125-040	0,40	
TMAS 125-050	0,50	
TMAS 125-070	0,70	
TMAS 125-100	1,00	
TMAS 125-200	2,00	
TMAS 125-300	3,00	

A 200 mm	B 200 mm	C 55 mm
Pack designation	Thickness (mm)	
TMAS 200-005	0,05	
TMAS 200-010	0,10	
TMAS 200-020	0,20	
TMAS 200-025	0,25	
TMAS 200-040	0,40	
TMAS 200-050	0,50	
TMAS 200-070	0,70	
TMAS 200-100	1,00	
TMAS 200-200	2,00	
TMAS 200-300	3,00	



Each pack designation consists of 10 shims.

Shim kits	Designation	Size (mm)	Thickness (mm)								
			0,05	0,10	0,20	0,25	0,40	0,50	0,70	1,00	2,00
			Quantities								
	TMAS 50/KIT	50 × 50	20	20	20	20	20	20	20	20	10
	TMAS 75/KIT	75 × 75	20	20	20	20	20	20	20	20	10
	TMAS 100/KIT	100 × 100	20	20	20	20	20	20	20	20	10
	TMAS 340	100 × 100	20	20	20	20	20	20	20	20	10
		125 × 125	20	20	20	20	20	20	20	20	10
	TMAS 360	50 × 50	20	20	–	20	–	20	–	20	20
		75 × 75	20	20	–	20	–	20	–	20	20
		100 × 100	20	20	–	20	–	20	–	20	20
	TMAS 380	50 × 50	20	20	20	20	20	20	20	20	20
		75 × 75	20	20	20	20	20	20	20	20	20
	TMAS 510	50 × 50	20	20	20	20	20	20	20	20	10
		75 × 75	20	20	20	20	20	20	20	20	10
		100 × 100	20	20	20	20	20	20	20	20	10
	TMAS 720 <sup>1)</sup>	50 × 50	20	20	20	20	20	20	20	20	20
		75 × 75	20	20	20	20	20	20	20	20	20
		100 × 100	20	20	20	20	20	20	20	20	10
	<sup>1)</sup> Consists of TMAS 340 + TMAS 380	125 × 125	20	20	20	20	20	20	20	20	10



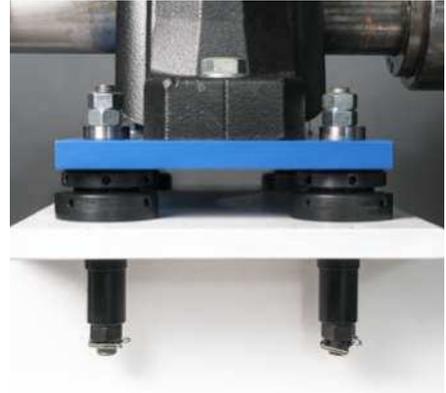
## The chocking solution for rotating equipment

### SKF Vibracon

SKF Vibracon chocks are self-leveling and provide the option to reduce profile height. They allow easy, accurate mounting of all types of rotating equipment to base frames and either steel or concrete foundations. They accommodate the angular difference (up to 4°) between machine and mounting base without the need to machine the base or install epoxy resin chocks. The chocks eliminate soft foot- and can lower the cost of equipment foundations – whether they are designed-in or retrofitted.

#### SKF Vibracon chocking solutions offer you the advantages of:

- A high load capacity
- A broad adjustment range
- An optimized load path through the product
- An optimized bolt/Vibracon combination
- Reduced chock height across the entire range



#### Carbon steel chocks (E-CS)

SKF Vibracon adjustable chocks can satisfy a range of technical concerns, as they are available in a number of configurations and materials. Chocks made of carbon steel are recommended for indoor use. They provide a cost-effective solution for standard applications, while offering reliable performance in environments such as on the factory floor. Applying additives at the mating surfaces provides initial protection – both before and during installation – and prevents parts from seizing when they are adjusted

#### Surface treated chocks (E-CSTR)

Chocks are often installed in demanding environments, including humid and salty climates – where enhanced corrosion protection is recommended. (SKF Vibracon chocks were originally developed for marine applications.) To satisfy this need, SKF has tested a range of protective solutions, resulting in its surface-treated chocks. Each part is individually surface treated, which helps to give the chocks a consistent quality and extended performance against corrosion.

#### Stainless-steel chocks (E-SS)

For the most demanding environments where carbon steel surface-treated chocks will not suffice, SKF has developed a range of stainless-steel chocks. Mating surfaces are treated with additives to prevent parts from seizing when adjusted. Coupled with recent performance improvements, such as increased load capacity, they are suitable but not limited to be used in industries such as oil & gas or offshore.

#### Low profile chocks (ELP-ASTR)

These surface treated alloy steel low profile chocks are aimed at applications with limited available chocking heights. Low profile chocks offer an economic alternative to the expensive milled chocks, shims or epoxy resins typically used for re-chocking projects or previously designed solutions. Each part is individually surface treated, which helps to give the chocks a consistent quality and extended performance against corrosion. They can be fitted easily and cost-effectively, which helps machine owners who are on a tight installation schedule.

#### Typical applications

- Food & beverage
- Pulp & paper
- Oil & gas
- Marine & offshore
- Railways
- Power generation – incl. renewable energy
- Agriculture
- Clean room applications



## SKF Vibracon adjustment tools

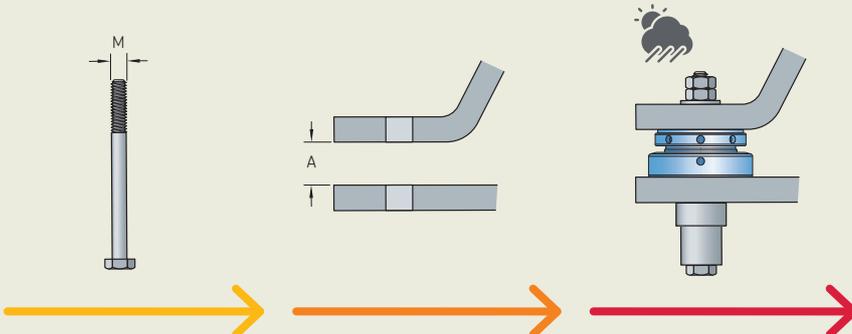
The SKF Vibracon adjustment tools are especially designed for safe height alteration of the SKF Vibracon chocks with comfort.



### Technical data

Designation	SKF Vibracon Type range
SMAT 006	SM 12 E – SM 16 E
SMAT 008	SM 20 E – SM 36 E
SMAT 010	SM 42 E – SM 64 E
SMAT 006 LP-3	SM 16 ELP – SM 20 ELP
SMAT 006 LP-4	SM 24 ELP – SM 42 ELP

## How to select the appropriate SKF Vibracon chock



### Step 1

Diameter of the foundation bolt (M)

### Step 2

Available chocking height (A)

### Step 3

Check environmental conditions



### Vibracon selection tool

[skf.com/vibraconselector](http://skf.com/vibraconselector)

The SKF Vibracon selection tool provides a calculation tool to determine the most suitable SKF Vibracon chock for your application.

### Technical data

Bolt size range		Bolt hole diameter $d_2$		Maximum height A		Minimum height A		Minimum reduced height <sup>1)</sup>		Outer diameter $D_1$		Proof load <sup>2)</sup>		Designation			
Metric	Imperial	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	kN	kip.	Suffixes			
M12-M16	1/2"-5/8"	18	0.71	40	1.57	30	1.18	24	0.94	65	2.56	90	20	SM 12 E	-CSTR	-SS	-CS
M16-M20	5/8"-3/4"	22	0.87	48	1.89	35	1.38	26	1.02	80	3.15	140	31	SM 16 E	-CSTR	-SS	-CS
M20-M24	3/4"-1"	27	1.06	54	2.13	40	1.57	30	1.18	100	3.94	200	45	SM 20 E	-CSTR	-SS	-CS
M24-M30	1"-1 1/4"	33	1.30	60	2.36	45	1.77	35	1.38	120	4.72	325	73	SM 24 E	-CSTR	-SS	-CS
M30-M36	1 1/4"-1 1/2"	39	1.54	65	2.56	50	1.97	40	1.57	140	5.51	475	107	SM 30 E	-CSTR	-SS	-CS
M36-M42	1 1/2"-1 3/4"	45	1.77	70	2.76	55	2.17	45	1.77	160	6.30	650	146	SM 36 E	-CSTR	-SS	-CS
M42-M48	1 3/4"-2"	52	2.05	75	2.95	60	2.36	50	1.97	190	7.48	850	191	SM 42 E	-CSTR	-SS	-CS
M48-M56	2"-2 1/4"	60	2.36	89	3.50	70	2.76	59	2.32	210	8.27	1150	259	SM 48 E	-CSTR	-SS	-CS
M56-M64	2 1/4"-2 1/2"	68	2.68	94	3.70	75	2.95	64	2.52	230	9.06	1500	337	SM 56 E	-CSTR	-SS	-CS
M64-M68	2 1/2"-2 3/4"	76	2.99	99	3.90	80	3.15	69	2.72	260	10.24	2000	450	SM 64 E	-CSTR	-SS	-CS

### SKF Vibracon low profile

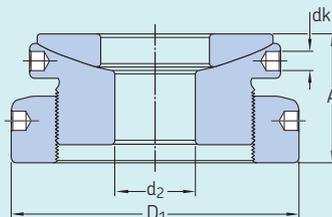
M16-M20	5/8"-3/4"	22	0.87	37	1.46	25	0.98	17	0.67	80	3.15	140	31	SM 16 ELP	-ASTR
M20-M24	3/4"-1"	27	1.06	37	1.46	25	0.98	17	0.67	100	3.94	200	45	SM 20 ELP	-ASTR
M24-M30	1"-1 1/4"	33	1.30	37	1.46	25	0.98	17	0.67	120	4.72	325	73	SM 24 ELP	-ASTR
M30-M36	1 1/4"-1 1/2"	39	1.54	37	1.46	25	0.98	17	0.67	140	5.51	475	107	SM 30 ELP	-ASTR
M36-M42	1 1/2"-1 3/4"	45	1.77	42	1.65	30	1.18	22	0.87	160	6.30	650	146	SM 36 ELP	-ASTR
M42-M48	1 3/4"-2"	52	2.05	47	1.85	35	1.38	27	1.06	190	7.48	850	191	SM 42 ELP	-ASTR

<sup>1)</sup> The minimum height of the product can be reduced on a lathe if required.

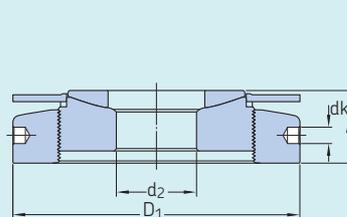
<sup>2)</sup> Recommended maximum load on the SKF Vibracon corresponding with the proof load of the recommended maximum metric bolt size.

More detailed technical specifications can be found in the Vibracon selection tool on [skf.com/vibraconselector](http://skf.com/vibraconselector)

Technical data can be subject to changes without prior notice



SKF Vibracon



SKF Vibracon low profile



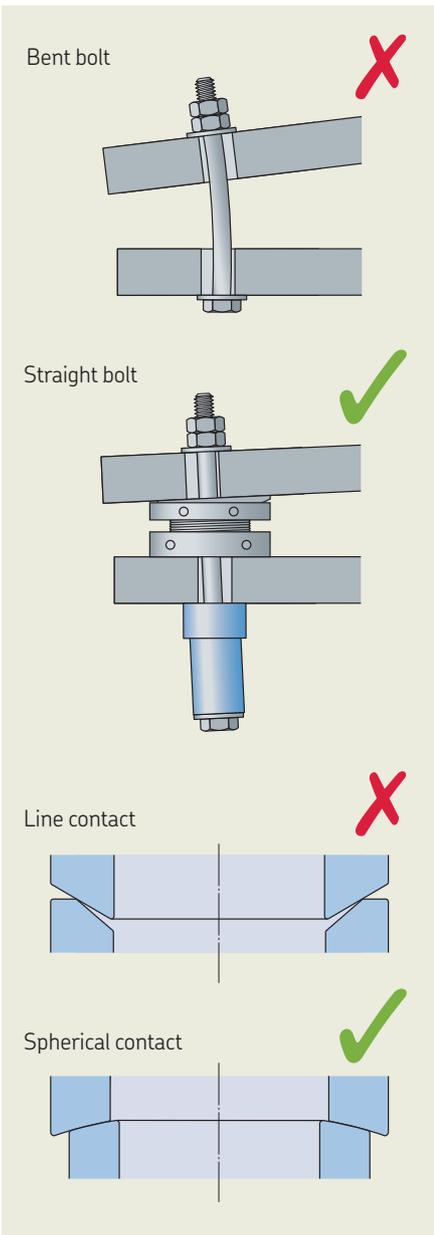
Straight bolt tensioning for longer endurance

## Spherical washers

Spherical washers are designed to create an exact, parallel plane between the bolt head and the face of the nut. SKF spherical washers automatically adjust and compensate for the angular deviation between the planes and prevent the bolt from bending.

### Product characteristics:

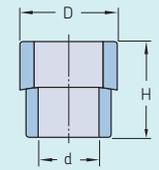
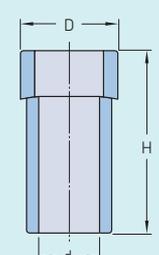
- Automatically compensates for angular errors
- Evenly distributed bolt tension
- Reduces bolt fatigue from bending bolts
- Improved bolt stretch possible due to increased clamping length
- Surface treated for protection in humid and harsh environments
- Available in standard and low-profile (LP) versions



Dimensions - standard (mm)			
Designation	D	d	H
SMSW 16 -ASTR	33	17	60
SMSW 20 -ASTR	42	23	60
SMSW 24 -ASTR	47	27	60
SMSW 27 -ASTR	52	30	60
SMSW 30 -ASTR	56	34	60
SMSW 36 -ASTR	67	40	60
SMSW 42 -ASTR	82	46	60
SMSW 48 -ASTR	92	52	60

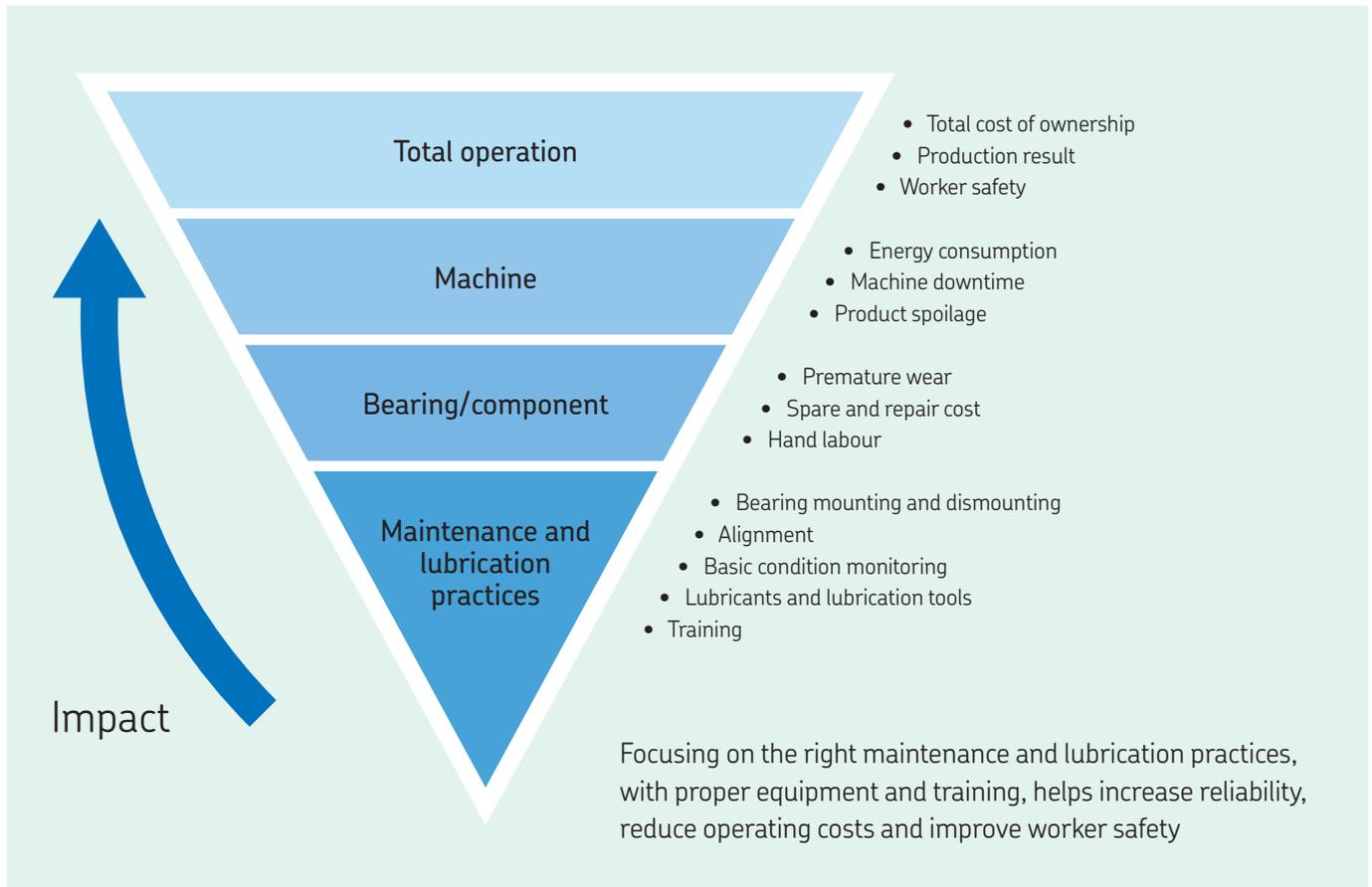
  

low-profile (mm)			
Designation	D	d	H
SMSW 16LPAST	33	17	20
SMSW 20LPAST	42	23	22
SMSW 24LPAST	47	27	24
SMSW 27LPAST	52	30	26
SMSW 30LPAST	56	34	28
SMSW 36LPAST	67	40	30
SMSW 42LPAST	82	46	34



Please contact your local SKF Authorised Distributor or SKF sales representative for support, customization or more information about spherical washers from SKF.

The importance of maintenance and lubrication on the total cost of ownership is often underestimated



Thanks to SKF's unique knowledge of machinery operation and maintenance, we understand the issues that operators and maintenance personnel have to deal with every day.

With a focus on the bearing life cycle and machine operations, we develop and maintain a comprehensive product range to support you. Safety, ease of use, affordability and effectiveness are key product characteristics and drivers of our daily activities.

Continuous development and improvement of our products is made in cooperation with users and naturally we take account of regulatory bodies and applicable international standards to improve reliable rotating equipment performance and safety.



## Contact and support

SKF offers comprehensive support for the complete range of TKSA shaft alignment instruments. The support includes software updates, warranty, calibration services, training, repair, technical support and an online self help portal. Additional offers and services might be available from our partners.

Latest news and product information about the SKF alignment range can be found on [www.skf.com/alignment](http://www.skf.com/alignment)

Please contact your local SKF distributor for more information.

All SKF Authorise Distributors can be found on [www.skf.com/group/our-company/find-a-distributor/index.html](http://www.skf.com/group/our-company/find-a-distributor/index.html)

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