



ZEISS ACADEMY
METROLOGY

SENSOR COOKBOOK

Qualifying ZEISS Sensors

Reading Sample

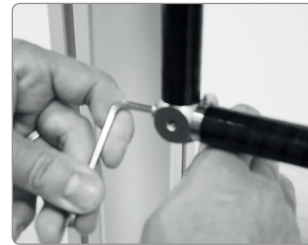


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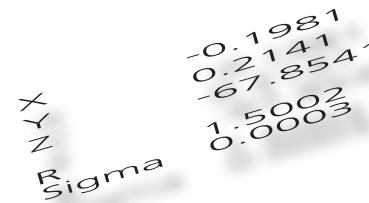


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General information about this cookbook

This version of the cookbook also uses videos to illustrate the process for the most common recipes and procedures.

The QR codes in the cookbook provide easy access to these videos. Alternatively you can watch these videos directly on the ZEISS Academy Metrology YouTube channel at: <https://www.youtube.com/c/ZeissAcademyMetrology>.

QR codes can be scanned with the camera on all common mobile devices (e.g. smartphones and tablets). This requires an app that can process QR codes. Most of these apps are available for free at the particular app store for your device.

Example of a QR code:



Note concerning the video content: The videos are for illustrative purposes only and must always be used in combination with the particular cookbook recipe.

The content shown uses coordinate measuring machines and software with standard configurations from ZEISS. Should a customized configuration be used at your company, the content shown in the video may differ from your company-specific procedure. Regarding liability, please refer to the cookbook's legal notice.

Reference sphere

Determining the position of the reference sphere, all ZEISS measuring systems



1 Preparation

Switch on and reference the coordinate measuring system. Acclimate and insert the master probe. With RDS, qualify fitting position. Select stylus 1. (With RDS, rotate to angular position A/B: 0°/0°; with VAST XTR, rotate to angular position "0").

2 Position the reference sphere

Position the reference sphere on the fixture. The reference sphere must be positioned in such a way that it can be used with the stylus system to be qualified without causing a collision.

3 Specifying the shaft direction of the reference sphere (image 1)

a: active sensor mode: tensor
 p: passive sensor mode: qualify passive stylus
 Touch-trigger sensor mode: 6 points

Qualify or assign the tilt and rotation angle of the reference sphere shaft via the "Qualify stylus system" and "Reference sphere position" functions.

Sphere	Method
Traditional sphere	Method 1 (see following page)
RSH sphere	Method 2 (see following page)

4 Specify the probing force and probing dynamics (image 2)

Input the probing force and probing dynamics used for the qualification.

Sensor	Probing force	Probing dynamics
a: active sensor	200 mN (standard)	100 %
p: passive sensor	Standard	100 %

5 Probe the reference sphere in the direction of the shaft

When prompted, the reference sphere is probed at the highest point in the direction of the shaft. The qualification is performed automatically.

Image 1

Qualifying the stylus system.

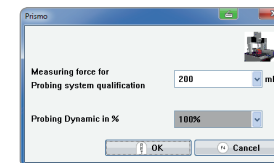


Reference sphere position.

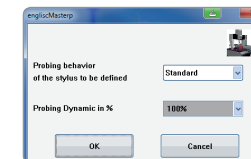


Image 2

a: active sensor



p: passive sensor



Reference sphere

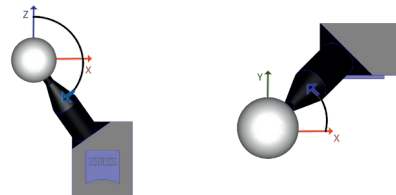
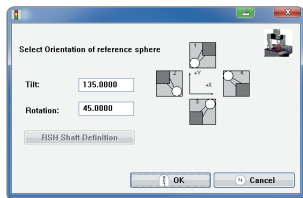
Determining position of the reference sphere, all ZEISS measuring systems



Method 1

Traditional sphere

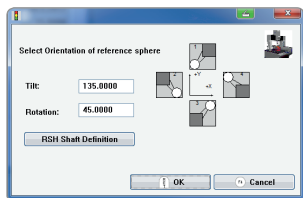
The direction of the reference sphere shaft must be input manually via the elevation angle (angle between the Z axis of the measuring system and the reference sphere shaft) and manually via the rotation angle (angle between the X axis of the measuring system and the reference sphere shaft) or by clicking on the symbols.



Method 2

RSH sphere

The direction of the reference sphere shaft must be qualified via the RSH shaft definition. The sphere on the sphere holder and the reference sphere itself are probed using one point each on a free spherical section as instructed.



<http://www.youtube.com/c/ZeissAcademyMetrology>

Measuring System VAST® / VAST® gold / VAST® XT / VAST® XT gold

Qualifying the first stylus



1 Preparation

The reference sphere position is defined.
The stylus system used is configured, acclimated and cleaned.

2 Load the stylus system

Load the stylus system.
Stipulate the mode to be used for the qualification.

Mode	Application
Dyn. tensor	With Vast Navigator option. After qualifying the stylus, the radius, the position of the stylus tip and the dynamic bending properties of the stylus are identified.
Tensor	Standard method. After qualifying the stylus, the radius, the position of the stylus tip and the bending properties of the stylus are identified.
Six points	Fast method. For measurements with lower accuracy requirements. After qualifying the stylus, the radius and position of the stylus tip are identified.
Manual	Method for manually capturing the qualification points. Generally used for disks, cylinders and temperature probes. After qualifying the stylus, the radius and position of the stylus tip are identified.

3 Geometry of the stylus tip

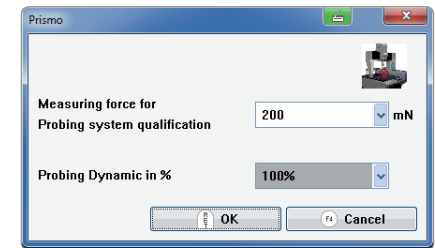
Stipulate the geometry of the stylus tip to be used for the qualification. See following page.

4 Specify the probing force and probing dynamics

Use the "Qualify stylus" function.
Input the probing force and probing dynamics used for the qualification.

Mode	Probing force	Dynamics
Standard	200 mN	100 %
Soft/unstable workpieces or long stylus shafts < 1 mm diameter	100 mN	50 %
Quick external scanning	> 200 mN	100 %

These values are recommendations and must be modified to accommodate the particular situation!



5 Probe the reference sphere in the direction of the shaft

When prompted, the reference sphere is probed at the highest point in the direction of the shaft. With styli that are arranged diagonally to the measuring system axes, the calculated angles must be approved by clicking on "OK." The qualification is performed automatically.

6 Result

The result of the qualification is logged and should be checked.

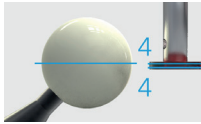
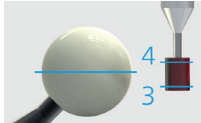


<http://www.youtube.com/c/ZeissAcademyMetrology>

Measuring System VAST® / VAST® gold / VAST® XT / VAST® XT gold Tables



Mode	Geometry	Procedure
Dyn. tensor	Sphere	Probe in the shaft direction. In the dyn. tensor mode, 15 points are automatically measured twice with different probing forces. Then a scan is performed at 2 different speeds across the pole and the equator of the sphere.
Tensor	Sphere	Probe in the shaft direction. In the tensor mode, 15 points are automatically measured twice with different probing forces.
Six points	Sphere	Probe in the shaft direction. In the 6-point mode, 6 probing points are automatically measured for the geometry specification.
Manual	Sphere	Probe the first point in the direction of the shaft in order to specify this. Probe at least 6 additional points distributed over the half sphere.
Manual	Temperature probe VAST® gold	Probe the highest point of the reference sphere in the direction of the shaft.

Mode	Geometry	Procedure
Manual	Disk 	Probe the first point in the direction of the shaft in order to specify this. Probe 4 additional points at 2 different heights near the equator twice. Stylus correction, see QT930.
Manual	Cylinder 	Probe the first point in the direction of the shaft in order to specify this. Probe 3 points once, then 4 additional points at 2 different heights at the equator. Stylus correction, see QT940.

SENSOR COOKBOOK

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