

Wsa/Wca multi parameter and multi functional standard

Calibration standard for the parameters according to SEP1941 and JIS B 0610 and additional features to control the measuring instrument.

Features of the standard piece

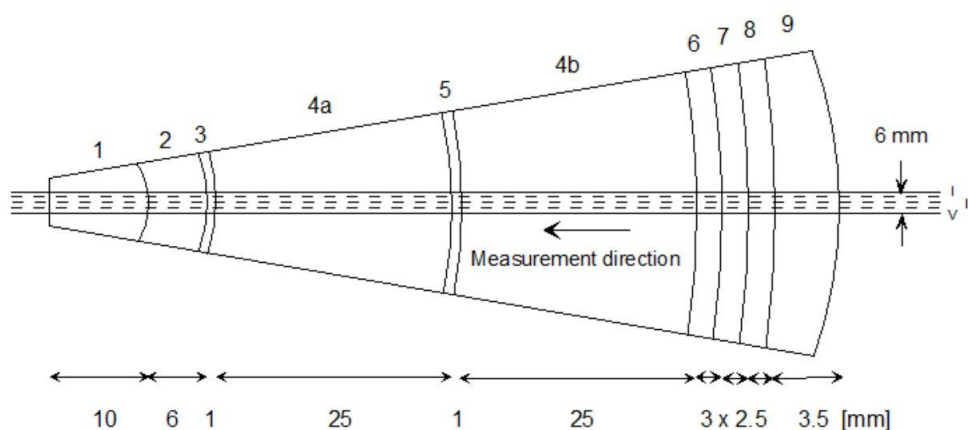
This standard piece was designed based on real surface profiles of differently manufactured sheet metal surfaces. The overall length of the waviness profile amounts to 50 mm. The device is made from steel coated with a hardened nickel layer which carries the surface structure.

The following surface profiles are available on this standard piece

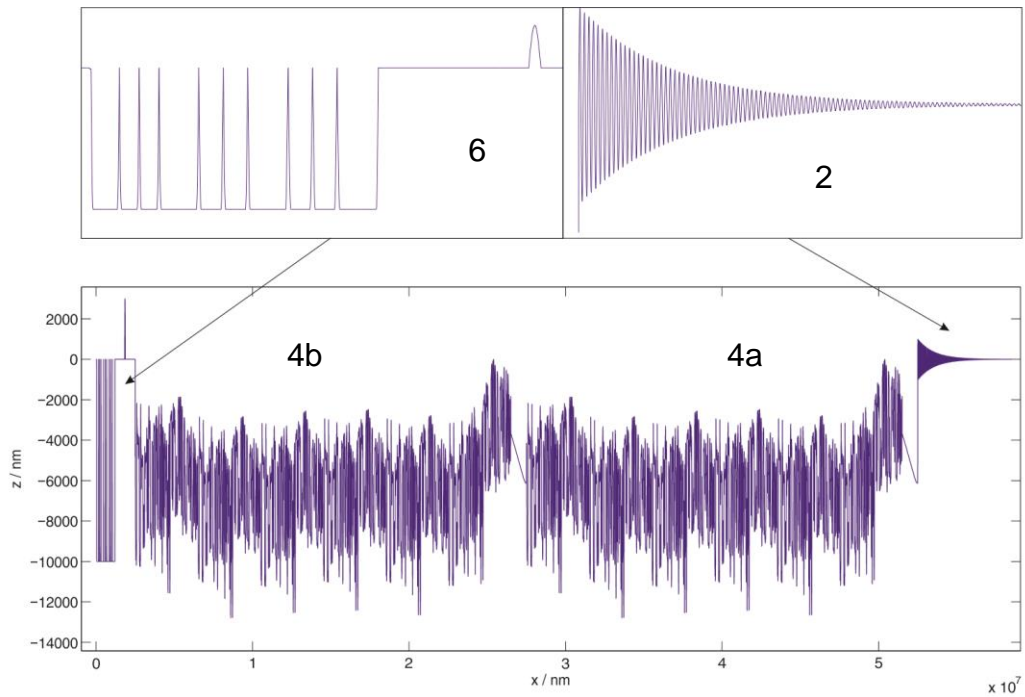
- Ramp with a slope of 20% and a stroke of 1.2 mm to check the linearity of the measuring device/pick-up. The ramp is divided into two sections.
- Sinusoidal profile with decreasing amplitude and constant wavelength of 50 μm to check the amplitude transfer or device bandwidth, respectively. The largest amplitude is 1 μm . Altogether there are 120 sine waves whereby the amplitude values decrease by a factor of 1.05.
- 3 areas, each having 3 identical sharp profile edges to check the stylus tip. The edges are 10 μm high and have cone angles of 70°, 90° and 120°, respectively.
- Waviness structure for the calibration of the Wsa parameter (target value 0.3 μm) according to SEP 1941 and Wca (according to JIS B0610) and Wa0.8 and at last parameters of the dominant waviness (according to VDA 2007). Further target values: $R_a = 2 \mu\text{m}$, $R_z = 7.6 \mu\text{m}$, $L_{\text{dom}} = 3.5 \text{ mm}$.

Application

For the calibration control the entire evaluation length can be used or a part of it. This standard piece lends itself for stylus based or optical measurement procedures. The target values are stable in the marked area and have a standard deviation of approx. 1%.



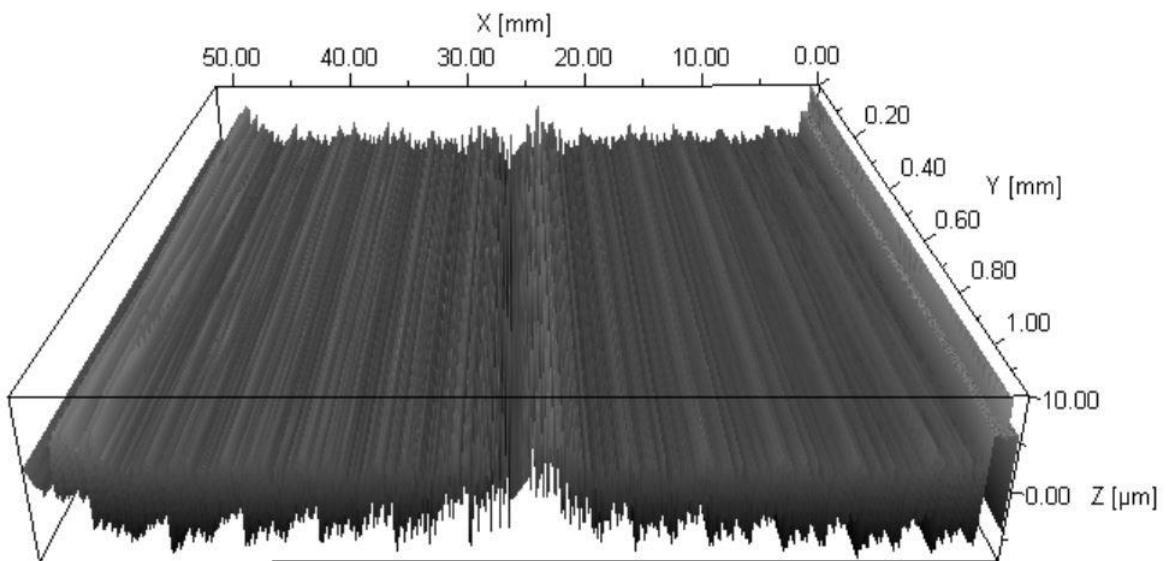
Overall profile:



Area 2: chirp profile ; Area 6: profile edges; Area 8: profile ramp

Areas 1, 3, 5, 7, 9: separating sections without function

Areas 4a, 4b: Waviness structure for Wsa(1-5), Wa0.8, Wca parameters



The waviness profile exists twice with evaluation lengths of 25 mm each. This serves to evaluate the W_{sa} parameter according to SEP1941.

To calculate the parameter W_{ca} according to JIS B 0610 the full waviness profile length of 50 mm is used. Also the $W_{a0.8}$ parameter can be evaluated.

Superimposed onto the evaluation length of 2x 25 mm is a roughness profile which repeats itself periodically every 4 mm. Therefore there is only a waviness profile between 24 and 25 mm and 49 and 50 mm, respectively.

Besides the waviness profile also the roughness parameters R_a and R_z are calibrated as well as the dominant waviness.

More detailed information is given in the calibration certificate.



Optionally a software module is available in order to compare the original calibration profiles with those the user has measured using his instrument. To this end the user profiles are transferred to this program in the ASCII format. This program enables an easy analysis of the condition of the stylus tip.

In addition one can check the linearity of the instrument characteristic as well as dynamic properties of the device.