

A new standard for line-scale calibrations in the Netherlands

Extremely accurate calibration of (line) scales requires dedicated equipment and measurement conditions that are usually only implemented at the national metrology institutes. The Dutch metrology institute VSL has several facilities to calibrate scales from small micrometer scales up to leveling rods and tape measures with lengths over tens of meters to high accuracy. In order to ensure that VSL can continue to provide services for the ever increasing demand for higher accuracies, these facilities are continuously improved. This paper describes the efforts that have been undertaken recently to improve VSL's capabilities for the calibration of high-precision line scales as well as the motivation for the choices that have been made during this process.

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Line scales are important physical standards of length, used for accurate positioning or measurement in one, two or three dimensions. Depending on the application, line scales can have dimensions from fractions of a millimeter to several tens of meters. For example, small scales are used to calibrate the field of view of optical microscopes. Scales with dimensions in the meter range are used to read out the position of machine tools and measuring machines, while leveling rods find their use in geodetic surveying.

Calibration of high-precision line scales

Until recently, precision line scales were calibrated manually at VSL using a 400 mm SIP measuring machine,

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