# v|tome|x m metrology 2.0 upgrade

You can now retrofit your v|tome|x m CT system with the latest metrology 2.0 upgrade package. This upgrade complies with the VDI 2630 standard and enables you to fully benefit from the advantages of CT based metrology. The metrology 2.0 upgrade package comes with the new true|position and ruby|plate technologies to grant high accuracy measurements within the sample travel length.

New ruby|plate design

## The upgrade package consists of:

- **ruby|plate**
  our patented design of a new calibration phantom with ruby spheres on a ceramic plate for VDI 2630 verification and voxel-size calibration

- **true|position**
  this laser-based compensation method for residual mechanical uncertainties of the sytem manipulator expands the measurement positions with specified accuracy

- **voxel|calib**
  automatic calibration for exact measurement of Focal-Object-Distance (FOD) and Focal-Detector-Distance (FDD) including automated easy|calib at any position

- Temperature sensor to compensate thermal drift

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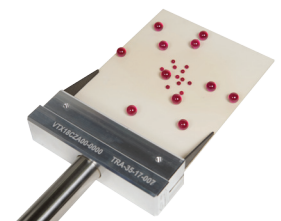
Innovative ruby|plate technology

- New calibration phantom for VDI 2630 verification and voxel-size calibration
- Patented design: ruby spheres on ceramic plate
  - full VDI 2630 compliance covering 3 directions (horizontal, vertical, diagonal) with one scan
  - 3x faster verification compared to current metrology 1.0 technology
- Maximum probing length of 130 mm
- Accurate calibration uncertainty of the phantom: < 1 μm
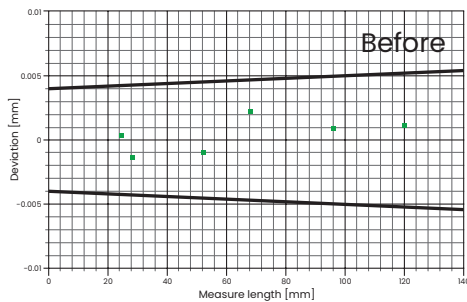
metrology|edition 1.0 with ball|bar technology
- 6 measurements per scan, all in one direction
- More deviation > (4.0 + L/100 mm) μm
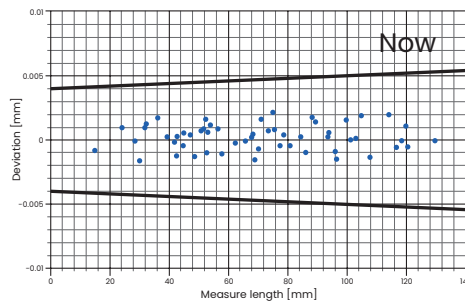
metrology|edition 2.0 with true|position technology
- 55 measurements per scan, in all directions
- Less deviation > (3.8 + L/100 mm) μm

true|position

- Advanced method for compensation of residual system mechanical uncertainties based on laser-scan data once generated at system calibration. This allows measurement with specified accuracy at all positions.
- Expands the measurement positions with specified accuracy to all positions which allows a faster setup of CT scans with high measurement accuracy.
- New VDI 2630 specification: $SD = (3.8 + L/100\ mm)\ μm$ (2 positions per standard)
- Specification for any other position: $SD = (5.5 + L/50\ mm)\ μm$ (which can be verified with the ruby|plate)
- Accuracy of true|position spec can be increased to VDI spec by simple and fast automated easy|calib (<10 min effort).

Improved measurement accuracy with true|position
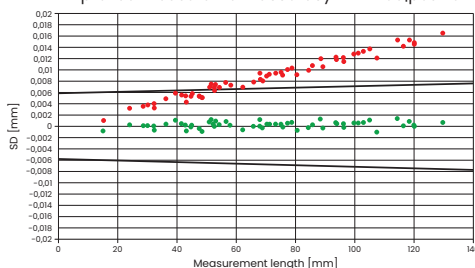
Without true|position
- Specification only available at predefined position
- Up to 15 μm length measurement error at other positions

With true|position
- Specification available at all positions
- Length measurement error < (5.5+ L/50 mm) μm

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