

Recent activities, and the evolution of CMS standards in ISO TC 213 / WG10

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ISO technical committee TC213 – "Dimensional and geometrical product specifications and verification" – produces standards that cover aspects of tolerancing and metrology. Working group WG10 "Coordinate Measuring Machines" has broadened its scope from Cartesian measuring machines to include a larger range of instruments used in coordinate metrology. These Coordinate Measuring Systems (CMS) cover a variety of technologies, and traditional concepts are being re-examined by the working group.

The role of uncertainty and the decision rule^[1] used for performance verification to the standards had prompted work within WG10 to characterize the appropriate uncertainty of the test values in a way that is distinct from the CMS measuring errors determined^[2] through testing. This problem can be generalized to other measuring instruments and, as such, the main idea has been handed off to WG4 (uncertainty)^[3]. CMS seem to require more detailed understanding of this concept, and WG10 is considering further work in this area.

The different ways in which measuring systems collect coordinate data from the workpiece surface had caused WG10 to examine different ways in which comparability between instrument specifications may be maintained. An example of this challenge is in comparing a sphere measured by 25 points with a CMM to the same sphere measured with 100,000 points using a non-contact scanning system. What is an appropriate metric to evaluate the 'quality' of the data collected by the systems?

The final topic discussed will be how WG10 is considering the proliferation of different sensors that may be used with a given measuring system structure. For example, if a CMM can measure with both an optical distance sensor and a stylus system, is it required that the entire standard set of 105 length measurement tests be performed with each sensor?

- [1] ISO 14253-1: 2017 Decision rules for verifying conformity or nonconformity with specifications
- [2] ISO/TS 23165: 2006 Guidelines for the evaluation of coordinate measuring machine (CMM) test uncertainty
- [3] ISO 14253-5:2015 Uncertainty in verification testing of indicating measuring instruments