Brief Overview of the ASME B89 Dimensional Metrology Committee

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So what is dimensional metrology?

Metrology is simply “the science of measurement” (Metron + logos – measurement study)

Dimensional includes size, shape, and form but not finish, and associated principles
B89 Structure

• B89 Committee Charter is:

The calibration, performance evaluation, uncertainty evaluation, and specification of dimensional measuring instruments and gages and the methods of their use for measuring various geometrical characteristics such as lengths, plane surfaces, angles, circles, cylinders, cones, spheres, and tori, as well as profiles.

• B89 Committee is comprised of seven Divisions:

  ASME B89.1 – Length
  ASME B89.2 – Angles (dormant)
  ASME B89.3 – Geometry
  ASME B89.4 – Coordinate Measuring Technology
  ASME B89.5 – General Principles and Definitions
  ASME B89.6 – Environment
  ASME B89.7 – Measurement Uncertainty
B89 Activities

• Produce voluntary documentary standards and technical reports within our scope
• Review and maintain published documents
• Monitor technology developments to identify new standardization needs
• Support related work in ASME joint committee collaborations
• Represent US interests in related ISO activities
B89 Operations

• Actual work produced by task-specific Project Teams within the appropriate Division

• Project team members are all volunteers representing industry, academia, government, military and consultants

• B89 Committee meets semi-annually, but much of the Project Teams’ work is done via teleconference

• All published documents are reviewed every five years and reaffirmed, revised or withdrawn
B89 Project Teams

B89 Division 1 *Length* has Project Teams:

1.6/1.5 Diameter Measurements
1.7 Surveying Tapes
1.8 Laser Interferometers
1.9/1.2 Gage Blocks
1.10 Dial Indicators
1.13 Micrometers
1.14 Calipers
1.17 Thread Wires
1.18 Height Gages (dormant)
1.19 Measurement of Master Spheres (dormant)
1.20 Gages, General Purpose (Feeler Gages)
1.21 Bore Gages (dormant)
B89 Project Teams

B89 Division 3 *Geometry* has Project Teams:

3.1 Roundness
3.4 Axes of Rotation
3.7/3.8 Surface Plates - Granite and Cast Iron
3.9 Specifications of Geometric Measurands*

*B89.3.9 has been consolidated into a collaborative committee project H213 Joint Advisory Committee (JAC) 1, incorporating members from ASME B89, Y14.5 and B46.*
B89 Project Teams

B89 Division 4 *Coordinate Measuring Technology* has Project Teams:

4.10 Software Evaluation
4.11 Probes and Probe Changers
4.14 Non Contact Scanning Probes
4.15 Dynamic Performance of CMMs
4.18 Video Systems, Comparator Evaluation
4.19 Evaluation of Laser Based Spherical CMS
4.21 Environmental Effects on CMM
4.22 Evaluation of Articulated Arm CMMs
4.23 Computed Tomography (CT) Measuring Machines
4.24 Software Requirements for Tolerance Evaluations

While no longer assigned to a specific Project Team, Division 4 also maintains ASME B89.4.10360.2, an “Americanized” version of ISO 10360.2 (with additional content.) Other “Americanized” ISO 10360 series documents are in process.
B89 Project Teams

B89 Division 5 *General Principles and Definitions* has no Project Teams, but works as a “Project Team of the Whole.”

This Division developed a “Compendium of Definitions for Dimensional Metrology from ASME Codes and Standards Documents”, which is published on the ASME Web Site as an aid or guide to Standards writers, rather than a standard in its own right.

Likewise, B89 Division 6 *Environment* currently works as a Project Team of the Whole.

This Division produced the foundational B89.6.2 Standard “Temperature and Humidity Environment for Dimensional Measurement”, which led directly to ISO 16015.

The Division also has an early draft of a standard for environments in metrology laboratories.
B89 Project Teams

B89 Division 7 Measurement Uncertainty has Project Teams:

7.1 Guidelines For B89.7 Documents
7.2 Dimensional Measurement Planning
7.3 Decision Rules (Uncertainty in Conformance Testing)
7.4 General Principles for Measurement System Uncertainty
7.5 Traceability
7.6 Measurement Uncertainty Associated with Testing Indicating Instruments
B89 Collaborations

Special Committee H213 Harmonization of Dimensional and Geometrical Product Specifications and Verification

Joint Advisory Committee (JAC) 1 Y15/B89 Joint Working Group - established to resolve issues between Y14.5 specification of tolerances and B89 measurement practices

Joint Advisory Committee (JAC) 2 Tri-Harmonization Group - established to develop improved methods for providing more detailed specifications of functional requirements
B89 Collaborations

ISO Technical Committee (TC) 213 Geometrical Product Specifications (GPS)

Provide members for the US Technical Advisory Group (TAG) to ISO TC 213, as well as numerous Subject Matter Experts (SMEs) to Working Groups within TC 213.

B89 Divisions 4, 6 and 7 have been especially successful in advancing US viewpoints and approaches in the development and revision of ISO documents.