

Connecting the Benefits: Conformity Assessment's ability to reduce risk and enable trade

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Connecting Metrology, Standards, and Conformity Assessment
at NIST and Beyond

Standard

- A set of characteristics
- Or quantities
 - That describe features of
 - A product
 - A process
 - A service
 - An interface, or
 - A material



Dilbert by Scott Adams



Test Method

- Approved procedure for
 - Measuring the presence and concentration of matter and substance
 - Evaluating properties of ingredients and materials
 - Quantifying the performance and effects under various conditions of the object under test
 - Test result is the product of the procedure (can be qualitative-yes/no—pass/fail)

Examples: EPA, DOE, NIOSH, CPSC, ASTM, AATCC, California Air Resources Board

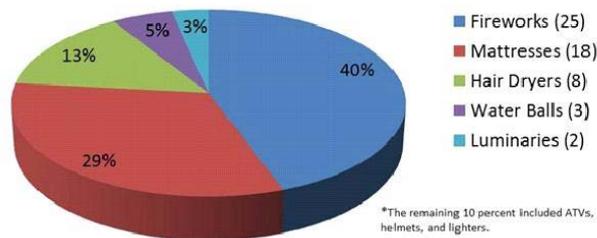
Standards development

- Consensus and cooperation
 - Consortia approach
- Mandated-Regulatory
 - Federal Government examples
 - EPA, OSHA, CPSC, and FDA

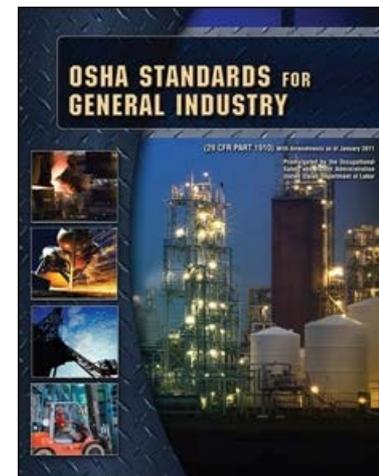


Non-Children's Products Stopped by Primary Violation/Defect

Total units stopped – 57,613 (16%)

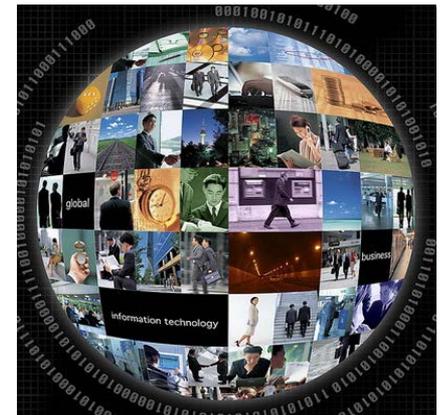


*The remaining 10 percent included ATVs, bicycles, bicycle helmets, and lighters.



A sampling: Standards developers and publishers

- American Gas Association
- American National Standards Institute
- American Petroleum Institute
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- ASTM International
- British Standards Institution



The Seven Purposes of Standards

- Commercial communication
 - Buyer/seller, procurement specifications
- Technology Diffusion
 - Enables adoption and leveraging of best industrial practice instead of costly reinventing (examples: composite materials, computer architectures, ceramics, and-emerging nanomaterials)
- Production Efficiency
 - Parts, processes, and products to allow economies of scale in production: food, automotive, telecommunications

The Seven Purposes of Standards

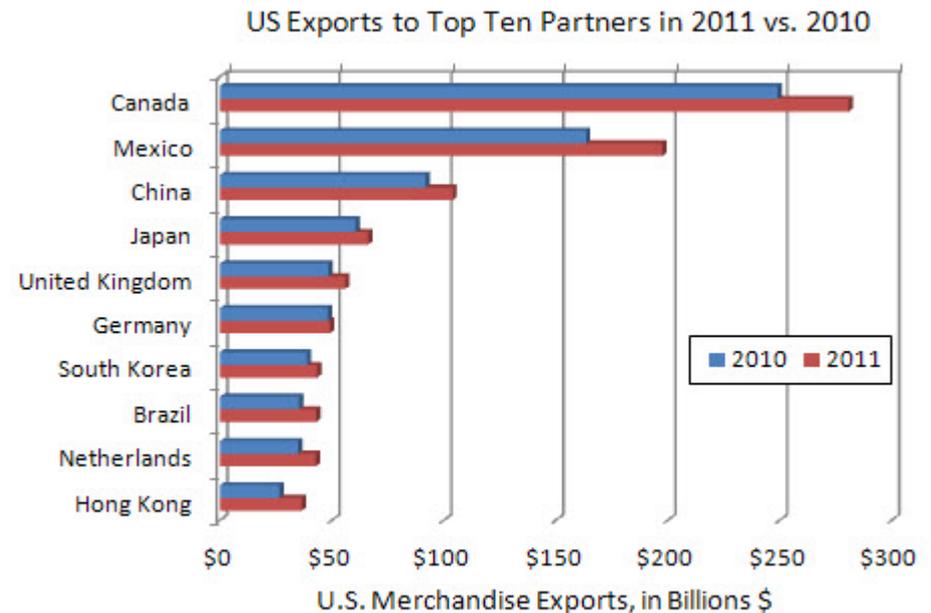
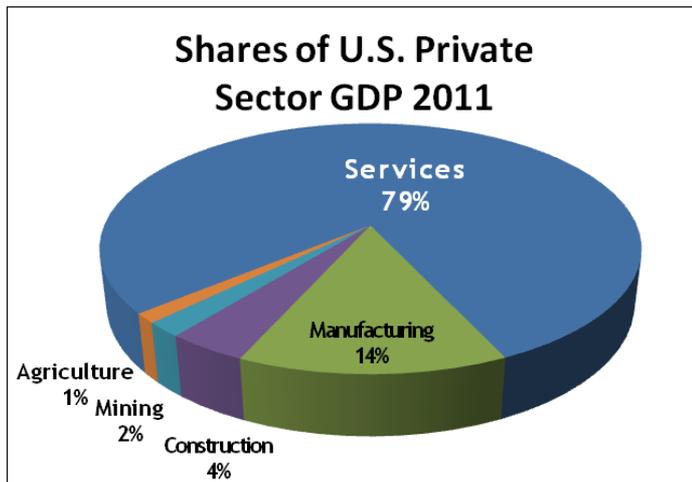
- Enhanced Competition
 - Ease of use, expectations of reliable performance, cost variables become neutral: personal electronics, mobile communications market
- Compatibility
 - Interface, connectivity, interoperability: wireless and consumer electronics
- Process Management
 - Organized manufacturing processes and inventory control: lean systems and ISO 9000-based quality management systems
- Public Welfare
 - Health, safety, and security: health, building, and electrical codes, automobile equipment and ratings, water and air quality

Conformity to standards

- Without confidence that claims of performance and conformance to standards are correct and true
 - The purpose of standards would be unfulfilled
 - *Conformity assessment enhances the value of standards by increasing the confidence of buyers, users, and regulators that products and services actually conform to claimed standards.*

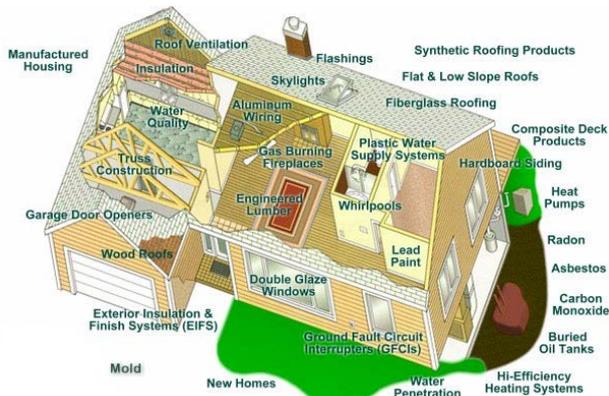
Conformity assessment

- Procedure for evaluating products, services, and processes
 - Determines their conformance to a particular standard
 - Enables trade



Types of Conformity Assessment

- Inspection
- Product Testing and Compliance
- Product Certification
- Quality System Registration



Types of Conformity Assessment

- OIML Basic Certificate System
 - OIML Type Evaluation of Measuring Instruments



A voluntary system to harmonize the work to approve types of measuring instruments that are subject to legal control.



International Acceptance

- International Accreditation Forum (IAF)
 - Multilateral Recognition Arrangement
 - Accredited Certification (QMS, EMS, Product)
- International Laboratory Accreditation Cooperation (ILAC)
 - Mutual Recognition Arrangement (Circa 2000)
 - Testing
 - Calibration
 - Inspection



Types of Conformity Assessment

- 1st party
 - Manufacturer's declaration of conformance



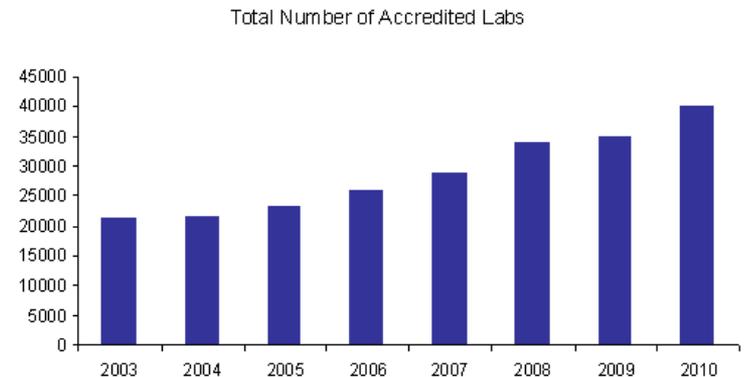
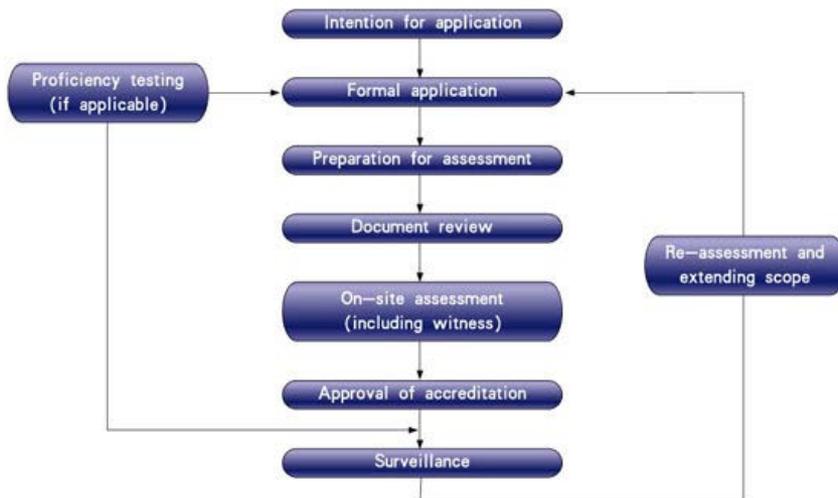
- 2nd party
 - Customer or regulator

- 3rd party
 - Neutral, independent, review
 - Formal recognition by a Conformity Assessment Body



Types of Conformity Assessment

- Accreditation
 - Testing and Calibration Laboratories



International cooperation: Making the world of metrology more connected

- Memoranda of Understanding
 - OIML/IEC, OIML/ISO, UNIDO-BIPM-OIML, ILAC-IAF-OIML

OIML is developing a scheme to set up a quality mark for pre-packaged products. Relying on common interpretation of the ISO/IEC Guide 65, ISO/IEC 17020, ISO/IEC 17021, and ISO 9001. Involves Product Certification Bodies, QMS Certification Bodies, and Inspection Bodies.



International cooperation: Making the world of metrology more connected

- Mutual Recognition Arrangement
– CIPM MRA

Reconnaissance mutuelle
des étalons nationaux de mesure
et des certificats d'étalonnage et de mesurage
émis par les laboratoires nationaux de métrologie
Paris, le 14 octobre 1999



Mutual recognition
of national measurement standards
and of calibration and measurement certificates
issued by national metrology institutes

Paris, 14 October 1999

Comité international des poids et mesures

Bureau
international
des poids
et mesures

Organisation
internationale
de la Convention
du Mètre

In October 1999, the directors of the national metrology institutes (NMIs) of thirty-eight Member States of the Metre Convention signed a Mutual Recognition Arrangement (MRA) for national measurement standards and for calibration and measurement certificates issued by national metrology institutes

CIPM Mutual Recognition Arrangement

- to establish the *degree of equivalence* of national measurement standards maintained by NMIs;
- to provide for the *mutual recognition* of calibration and measurement certificates issued by NMIs;
- **thereby to provide governments and other parties with a *secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs.***
 - **Assure that measurements traceable to different NMIs can be accepted across borders**



Joint Declaration of BIPM, OIML, ILAC, and ISO Signed last November

International consistency and comparability of results through traceability of measurement results

Traceability must be established through internationally recognized references to the SI, unless not yet feasible

Commit to Collaboration on the GUM (JCGM 100:2008) and the VIM (JCGM 200:2012)



Recommendations from the Quadpartite Declaration: of BIPM, OIML, ILAC, and ISO *Signed last November*

- For International Acceptability, calibrations should be performed by:
 - NMI who is signatory to the CIPM MRA and have CMCs published in the relevant areas of the KCDB, or
 - Laboratory accredited by accreditation bodies which are signatories to the ILAC arrangement.
- Measurement uncertainty should follow principles of the GUM.
- Results of measurements made by accredited laboratory should be traceable to SI.
- NMIs providing traceability for accredited laboratories should normally be signatories to the CIPM MRA with CMCs published in the relevant areas of the KCDB.
- For OIML's MAA, accreditation should be by bodies that are signatories to the ILAC MRA with policies on traceability to the SI.



Closing thoughts

Timing of the MRAs and the correlation to the
Importance of metrology, standards, and conformity
assessment

Enabling trade while reducing risks in the markets

