



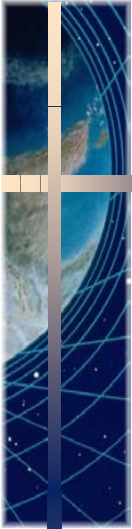
Standards in Engineering Education

Integrating Standards into Engineering Education

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National Institute of Standards and Technology



“Roughly 80 percent of global merchandise trade is affected by standards and by regulations that embody standards.”

(Source:
National Institute of Standards and Technology
Testimony before the House Committee on Science, Subcommittee on
Technology, September 13, 2000.)



What are standards?

- Design, product, system and/or process specifications
- Management system standards (quality and environment)
- Standards for health, safety, and protection of the environment
- Marks (labels)
- Test methods, inspection and certification procedures, etc.

Reasons for Standards in Engineering Education

- Standards form the bedrock of trade and commerce – interoperability, safety, performance
- Product design is a core function of engineers
- Compliance with standards and technical regulations from markets around the world is critical for product acceptance in the global marketplace
- Integrating these technical requirements into the product design process is a key to success





Industry needs

- **Efficient development of products that meet global requirements**
- **Technical requirements included as design input in product development process**
- **Effective participation in key standards development activities to facilitate inclusion and acceptance of technologies**
- **Understanding of conformity assessment processes and requirements**

Related manufacturer's perspective

- **A medical device manufacturer's product development process has 6 phases**
- **Each time a technical regulatory requirement is not addressed in an earlier phase the “cost of compliance” increases by an order of magnitude**
- **A \$1 compliance issue in phase 1 can cost \$100,000 in phase 6**



Engineers that are prepared for standards

Will:

- anticipate the needed standards, technical requirements and conformity assessment early in the product development process and save their companies money, time, resources and reduce customer disappointment
- be able to effectively represent their companies/industries needs in standards development activities
- be able to effectively interface with regulators and conformity assessment organizations to facilitate their product's market access and acceptance



My Introduction to Standards

- Undergraduate courses in physical metallurgy – steel standards
- Graduate courses - use of standardized test methods, use of reference materials and Standard Reference Materials for instrument calibration
- Opportunities to participate in round-robin tests that led to standards development activities
- Collaborations with international colleagues – the need to agree upon test methods