Navigating The Product Certification Maze:

Understanding the Product Testing & Certification Process and Product Certification Marks

BBS2016-078

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March 7, 2016

CSA Group

OHIO BUILDING OFFICIALS ASSOCIATION · OBOA

Agenda

- **Section 1**: Building Codes and Product Standards
- **Section 2:** Third Party Product Testing & Certification
- **Section 3:** Product Testing & Certification Process – Stakeholders:
  1. Product Manufacturers
  2. Standards Development Organizations
  3. Nationally Recognized Testing Laboratories
  4. Authorities Having Jurisdiction
- **Section 4**: Counterfeit Certification Marks
- Discussion and Questions
- Quiz

CSA Group Introduction

CSA Group

- Independent, **not-for-profit,** membership association in business since **1919**.
- One of the largest **Standards Development Organizations** in North America.
- **Nationally Recognized Testing Laboratory** providing third party Certification & Testing, Field Evaluation, and Product Evaluation services
- **Global - 37** offices and laboratories in **14** countries.
- **U.S.** – **10** offices and laboratories in California, Connecticut, Georgia, Illinois, New Mexico, North Carolina, Ohio, Tennessee, Texas and Washington.

3,000+
Standards and Codes

8,200
Standards Committee Members

1,800
Highly Dedicated Staff

35,000
customers using CSA services

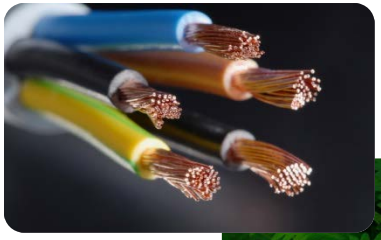
1 Billion
products bear CSA mark worldwide

Global Business Units

Hazardous Locations

Industrial Products

Product Evaluation



Lighting and wiring

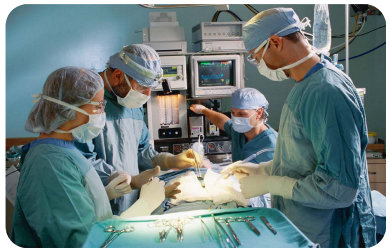
Transportation

Alternative Energy & Sustainability

Appliances & Gas

Plumbing & Construction

Medical, Safety & Technology



Accreditations and Recognitions

North America

OSHA®

ANSI
American National Standards Institute

Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 323

Conseil canadien des normes
Laboratoire accrédité
Portée d'accréditation 323

TM

IAS
INTERNATIONAL ACCREDITATION SERVICE
Leading Accreditors Since 1975

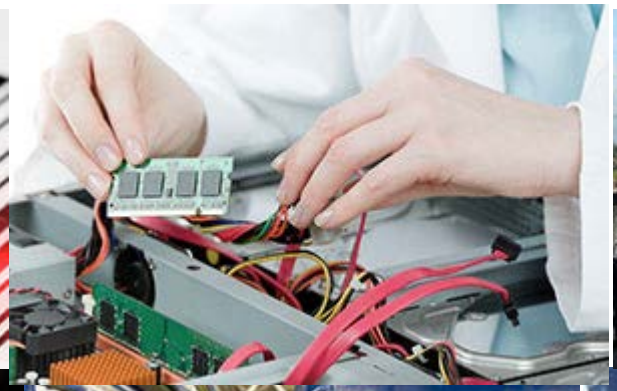
AMECA™

NVLAP®

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

CSA Group Website

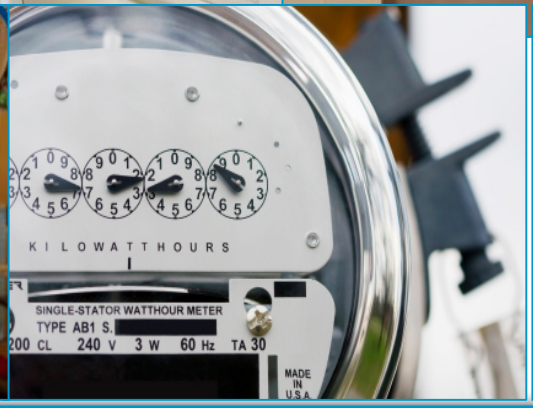
www.csagroup.org



Section 1: Building Codes and Product Standards

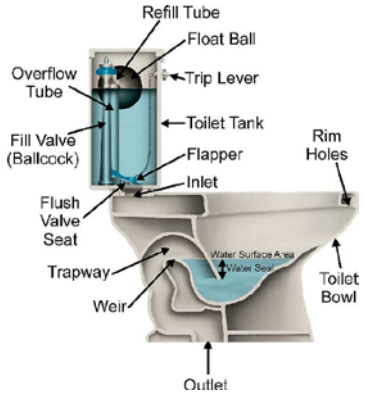
Codes and Standards are EVERYWHERE!



Building Codes and Product Standards

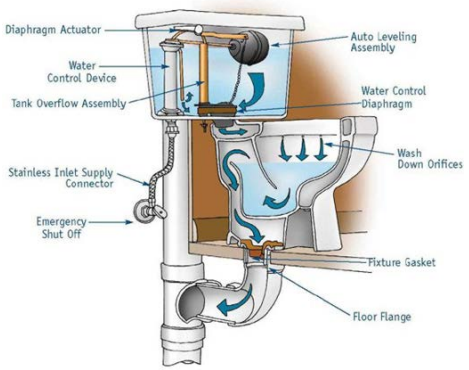
- Standards address the construction, safety and performance of a product or piece of equipment.

  Users:
  - Manufacturers
  - Design Engineers
  - Compliance Engineers
  - NRTLs



- Codes address how the products or equipment need to be installed in a residential, industrial or commercial building.

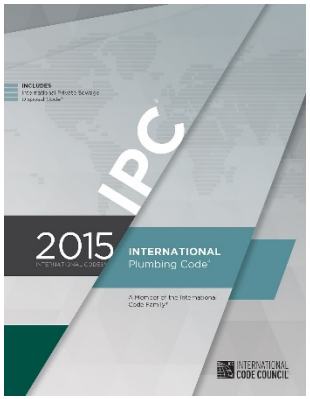
  Users:
  - Building & Fire Inspectors
  - Plans Reviewers
  - Contractors
  - Architects
  - Engineers

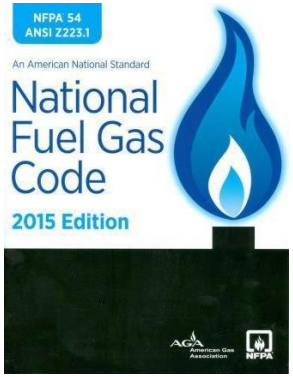


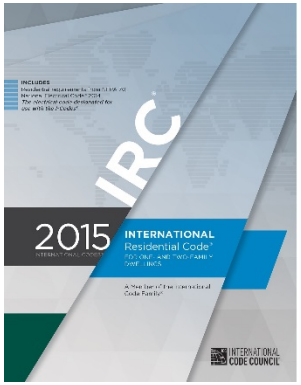
Codes and Standards

- **Codes*** provide the minimum safeguards for people with regard to building safety and fire protection.

- **Codes** assist in protecting health, safety and welfare as they relate to the residential and commercial built environment.







*** http://www.iccsafe.org/CS/Pages/default.aspx**

Building Codes

Commonly Used U.S. and International Codes

Electrical
NFPA 70 - National Electrical Code (NEC)
International Electrical Code (IEC)

Fuel Codes
ANSI Z.223.1/NFPA 54 – National Fuel Gas Code
International Fuel Gas Code (IFGC)*

Plumbing
International Plumbing Code (IPC)*
Uniform Plumbing Code (UPC) – IAPMO

Other ICC Model Codes*
Building (IBC)
Green Construction (IgCC)
Residential (IRC)
Mechanical (IMC)
Fire (IFC)

Recognized Ohio Codes:

- National Electrical Code (NEC) 2014

- Ohio Building Code (OBC)
- Ohio Plumbing Code (OPC)
- Ohio Mechanical Code (OMC)
- Residential Code of Ohio (RCO)

Note: Ohio's commercial and residential building codes are based on international model building codes and are adopted for use in Ohio through an open public process.

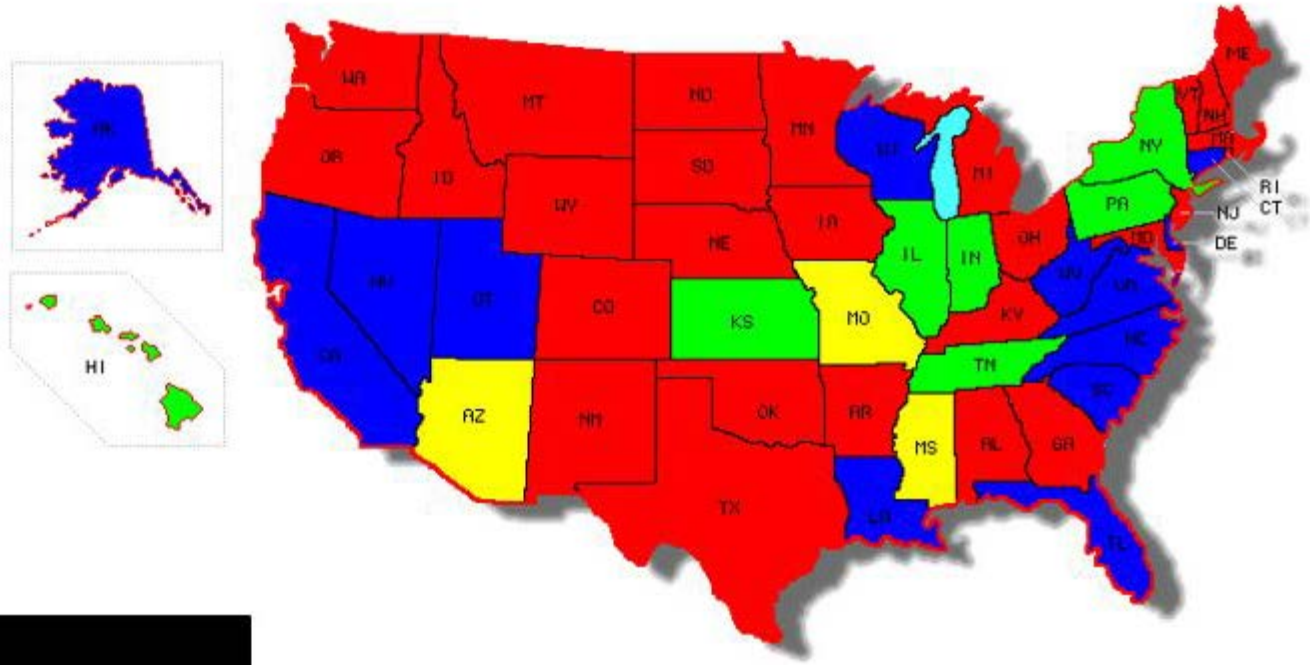
Codes and Standards

- Codes can be incorporated in the law of a particular jurisdiction when formally adopted by the appropriate governmental or private authority.

- Adopting codes helps to ensure consistency among jurisdictions while permitting states and local authorities to make adjustments based on specific conditions.

Codes and Standards

NEC® in Effect
1/1/2016



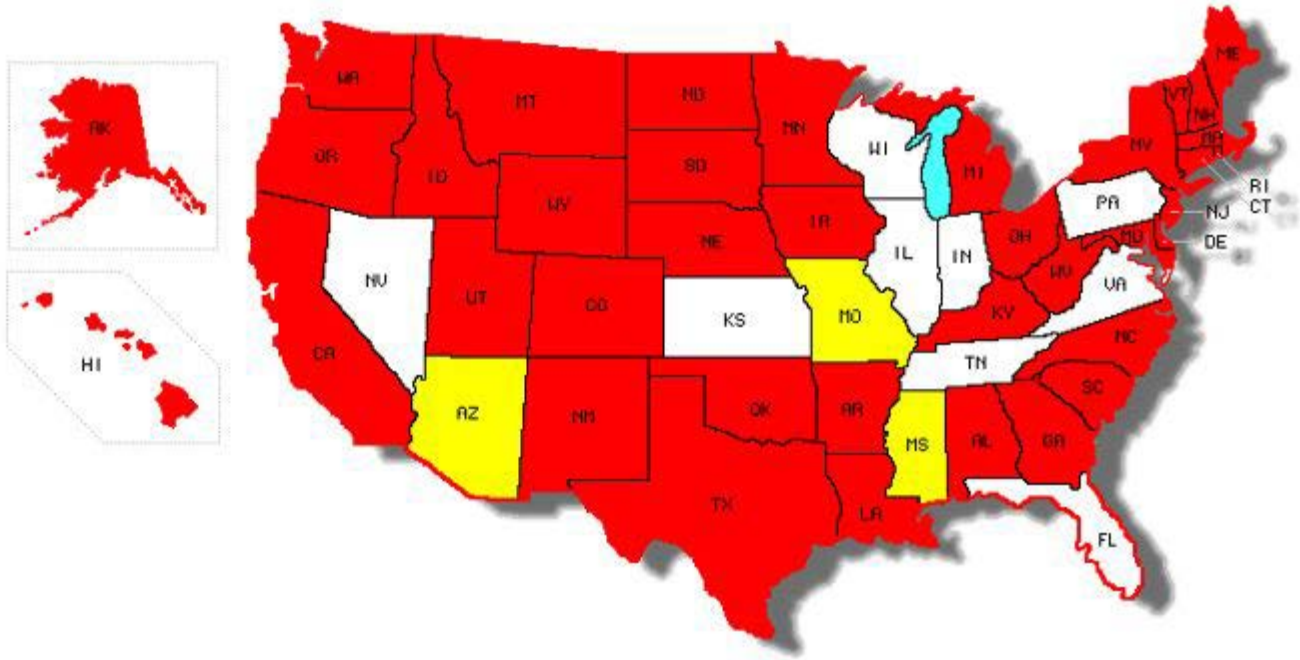
2014 NEC®
2011 NEC®
2008 NEC®
No Statewide NEC® Adoption

Source: diymaps.net (c)

Codes and Standards

2014 NEC® Adoption Process Completed/Underway

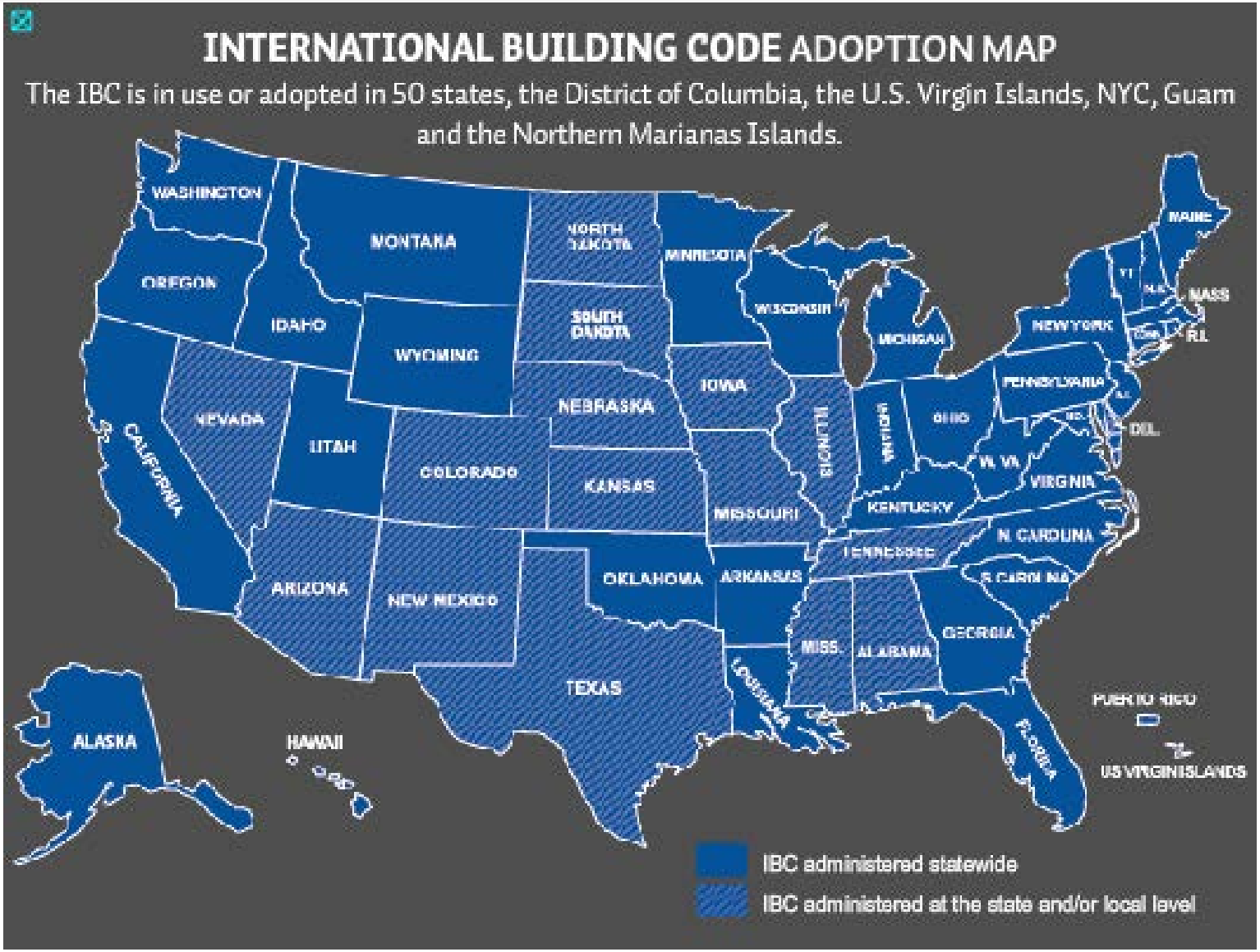
1/1/2016



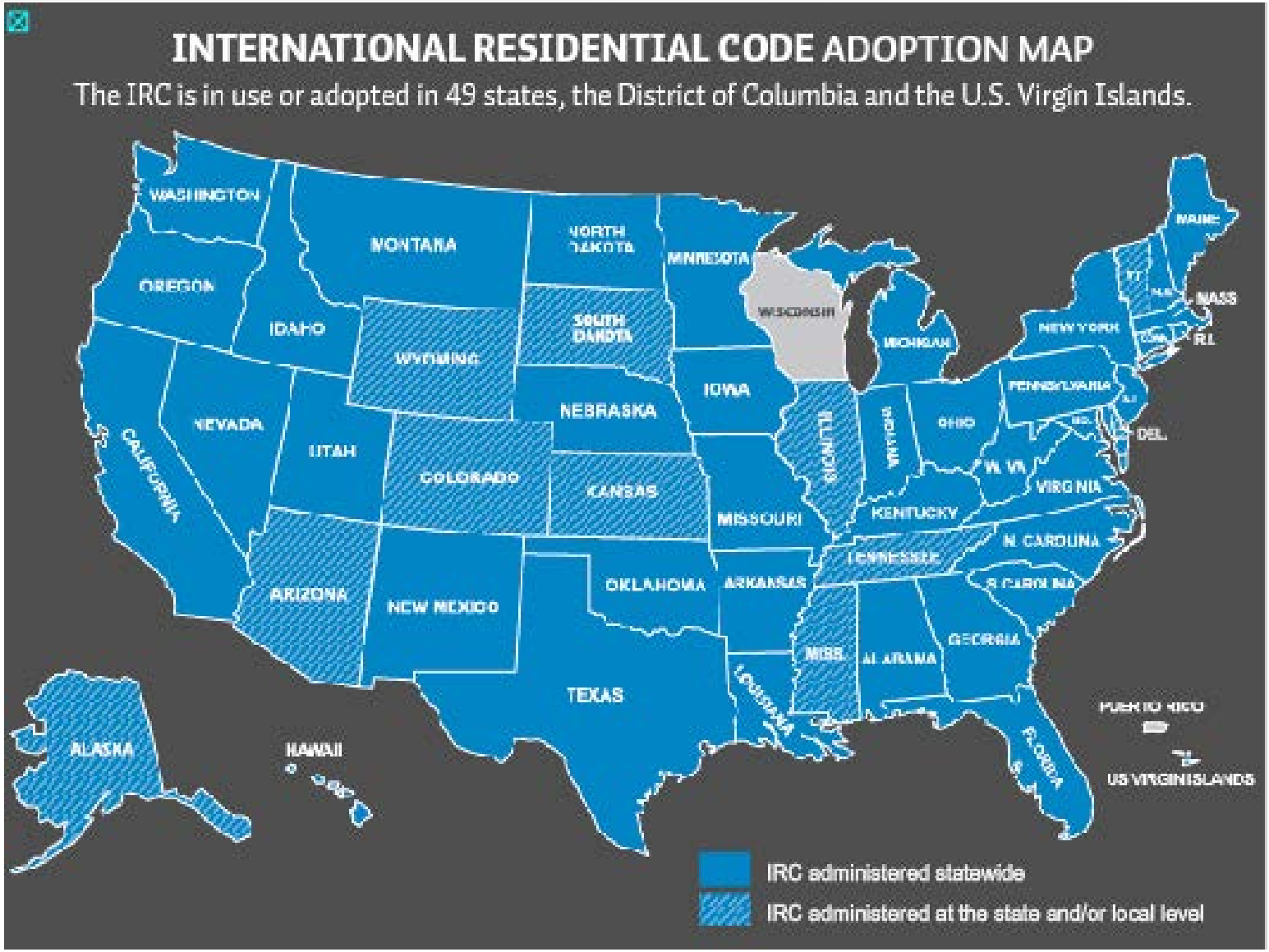
2014 NEC®
No Statewide NEC® Adoption

Source: diymaps.net (c)

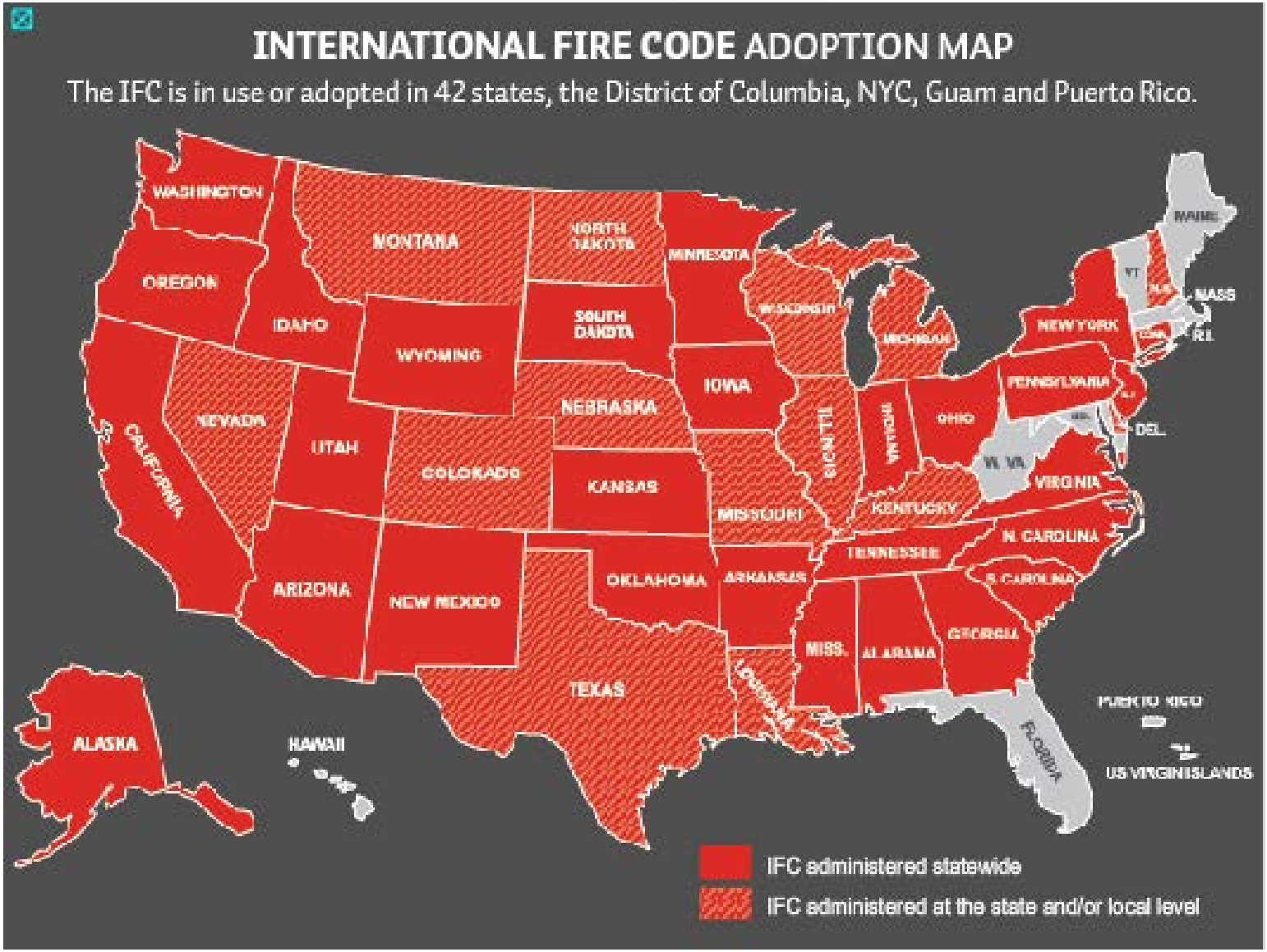
Codes and Standards



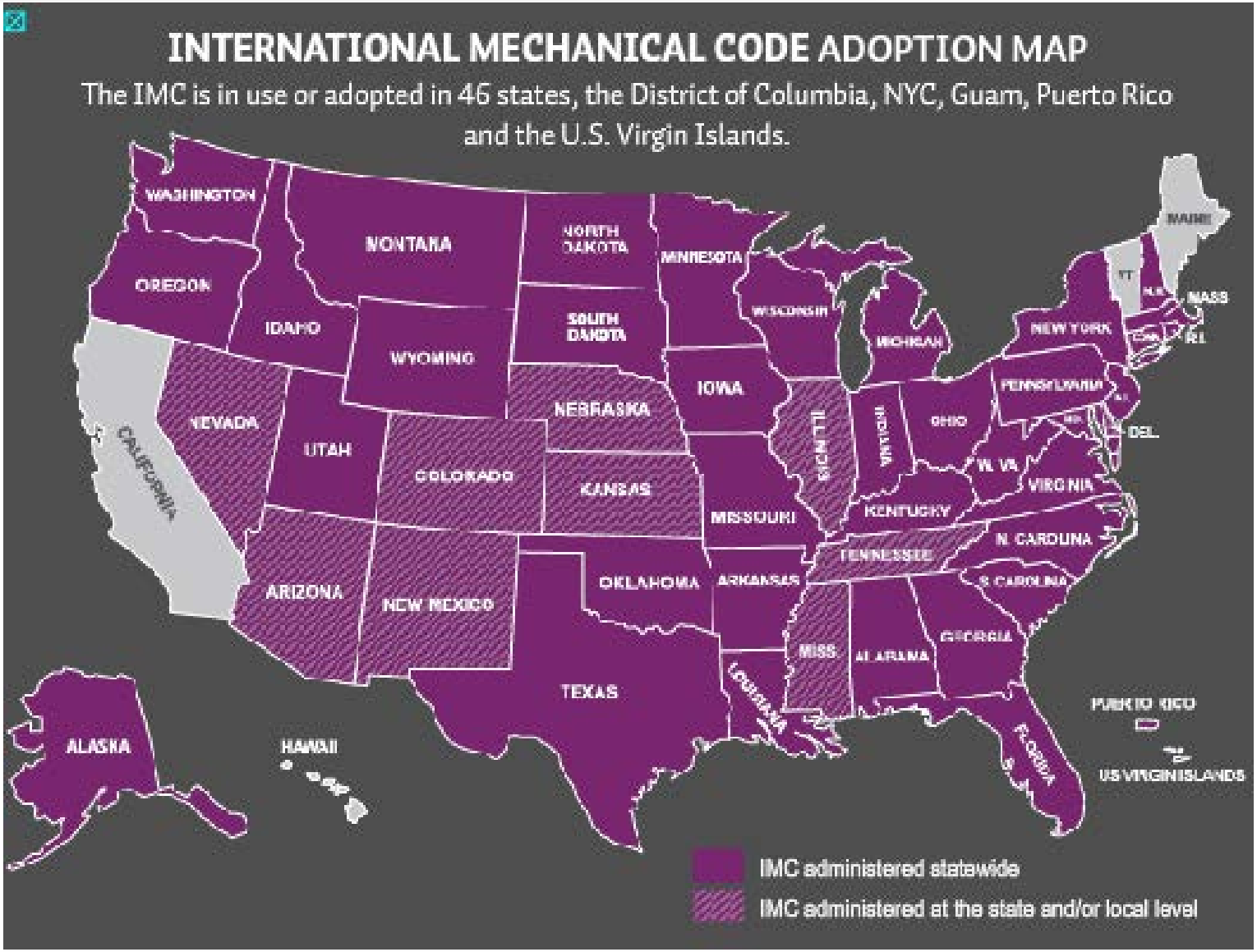
Codes and Standards



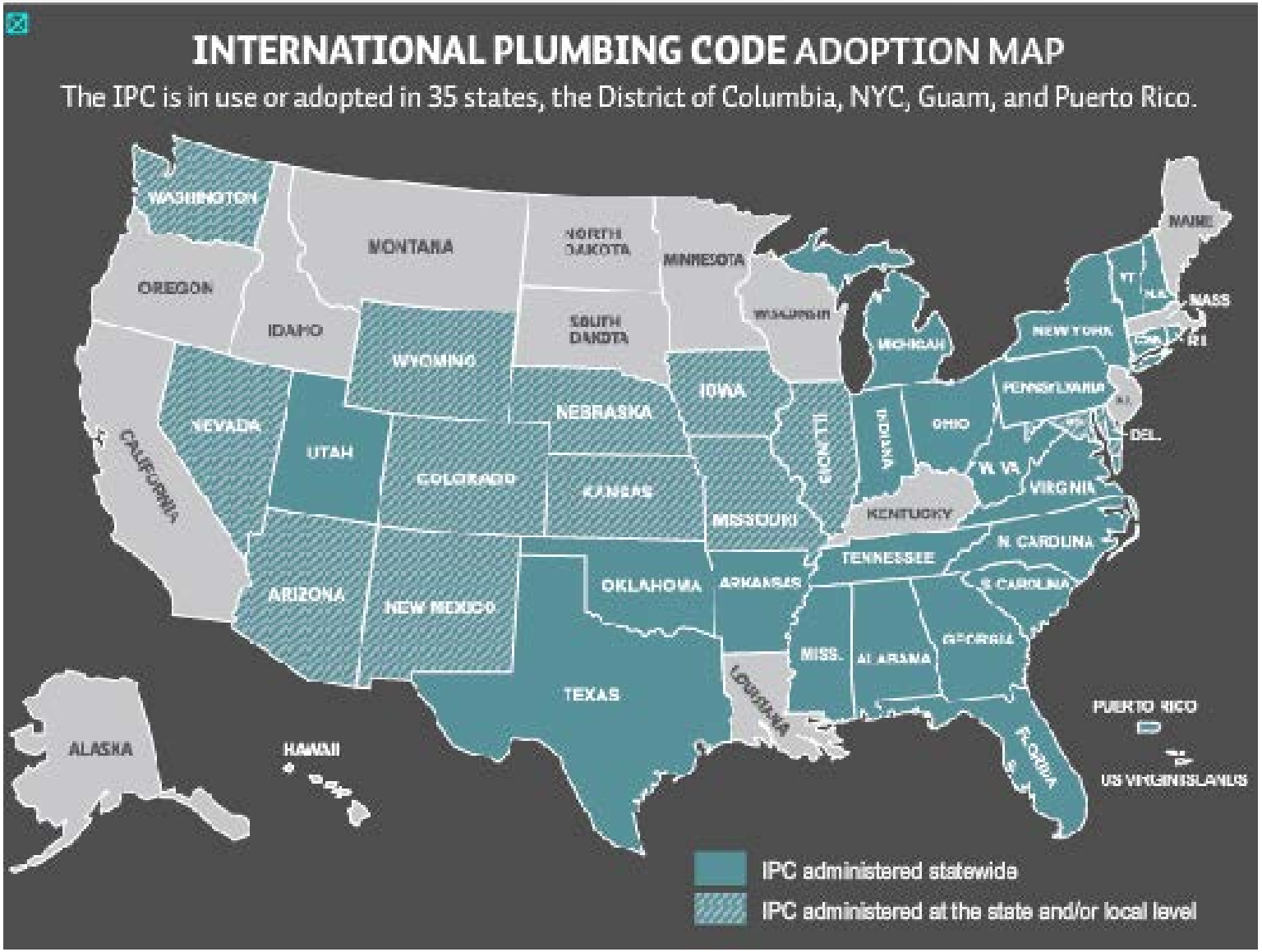
Codes and Standards



Codes and Standards

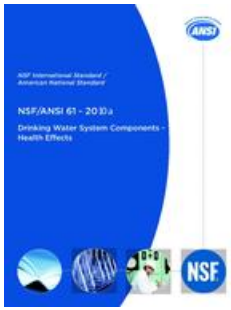


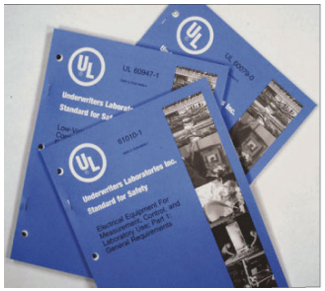
Codes and Standards

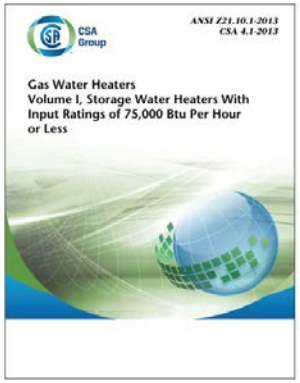


Codes and Standards

- A **Standard*** is a document, established by consensus that provides rules, guidelines or characteristics for activities or their results.
- **Standards**** are developed as an extension of code requirements and are written by technical experts.
- **Standards**** represent consensus on how a material, product or assembly is to be designed, manufactured, tested or installed to obtain a specific level of performance.
- **Standards** provide specific details for a given product so the code does not need to include them.







*** ISO/IEC Guide 2:2004**
*** http://www.iccsafe.org/CS/Pages/default.aspx**

Codes and Standards

- Most **codes** do not accommodate new technologies until such time there is a **standard** for the product and a **means of compliance to that standard**.

- Codes rely on the use of tested and certified products that **meet safety and performance standards**.

Examples: ICC International Residential Code (IRC) 2009

Section G2422 (411) APPLIANCE CONNECTIONS

*Listed and labeled outdoor appliance connectors in compliance with **ANSI Z21.75/CSA 6.27.***

Section G2422 (618) FORCED-AIR WARM-AIR FURNACES

*General forced-air warm-air furnaces shall be tested in accordance with **ANSI Z21.47/CSA 2.3** or **UL 795.***

Codes and Standards

Ohio Building Code
4101:11 Administration

102.5 Referenced codes and standards. *When a reference is made within the building, mechanical, or plumbing codes to a federal statutory provision,* ***an industry consensus standard****, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in Chapter 35 of the building code, Chapter 15 of the mechanical code, or Chapter 13 of the plumbing code.*

The codes and ***standards referenced*** *in the building, mechanical, and plumbing codes* ***shall be considered part of the requirements of these codes*** *as though the text were printed in this code, to the prescribed extent of each such reference. Where differences occur between provisions of these codes and the referenced standards, the provisions of these codes shall apply.*

Codes and Standards

Ohio Building Code

4101:1-35-01 Referenced standards.

3501.1 General. *This chapter lists the standards that are referenced in various sections of the building code. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title.*

The application of the referenced standards shall be as specified in Section 102.5.

http://publicecodes.cyberregs.com/st/oh/st/b2v11/st_oh_st_b2v11_35_sec003.htm?bu=OH-P-2011-000004

Codes and Standards

NEC 90.7 Examination of Equipment for Safety.

Informational Note No. 3: Informative Annex A

- provides list of product safety standards used for product listing where product listing for electrical equipment is required.

- recognizes that list is current at time of publication but that new standards or modifications to existing standards can occur at any time while edition is in effect.

Section 2:
Third Party Product Testing & Certification

Third Party Product Testing & Certification

"***Certified" or "Listed"*** means that:

- The product has been tested and certified ***to*** comply with a *product standard.*
- The product was tested and certified ***by*** an *accredited third-party certification agency*, also known as:

  Nationally Recognized Testing Laboratories (NRTLs)
- The product is *listed* in the NRTL's registry of certified products.
- The product manufacturer has license to *bear the NRTL's mark* on the certified product.
- Manufacturers can then *mass produce that certified product* for use in any geographical location.

"In compliance with ……"

- Not the same as "Certified" or "Listed".
- The manufacturer is stating that the product meets the requirements of a product standard or code.
- It does **not necessarily** mean that the product has been tested and certified by a third-party certification agency.
- Most likely, not certified, and should be checked with the manufacturer for clarification.

NEC - Article 110 - Listed

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material or service meets the appropriate designated standards or has been tested and found suitable for a specified purpose.

Extraction from NEC 2014 Edition

NEC - 90.7 Examination of Equipment for Safety

For specific items of equipment & materials referred to in this Code, examinations for safety made under standard conditions provide a basis for approval where the record is made generally available through promulgation by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service value determination through field inspections.

Extraction from NEC 2014 Edition

NEC - 90.7 Examination of Equipment for Safety continued……..

This avoids the necessity for repetition of examinations by different examiners, frequently with inadequate facilities for such work, and the confusion that would result from conflicting reports on the suitability of devices and materials examined for a given purpose.

Extraction from NEC 2014 Edition

NEC - 90.7 Examination of Equipment for Safety continued……..

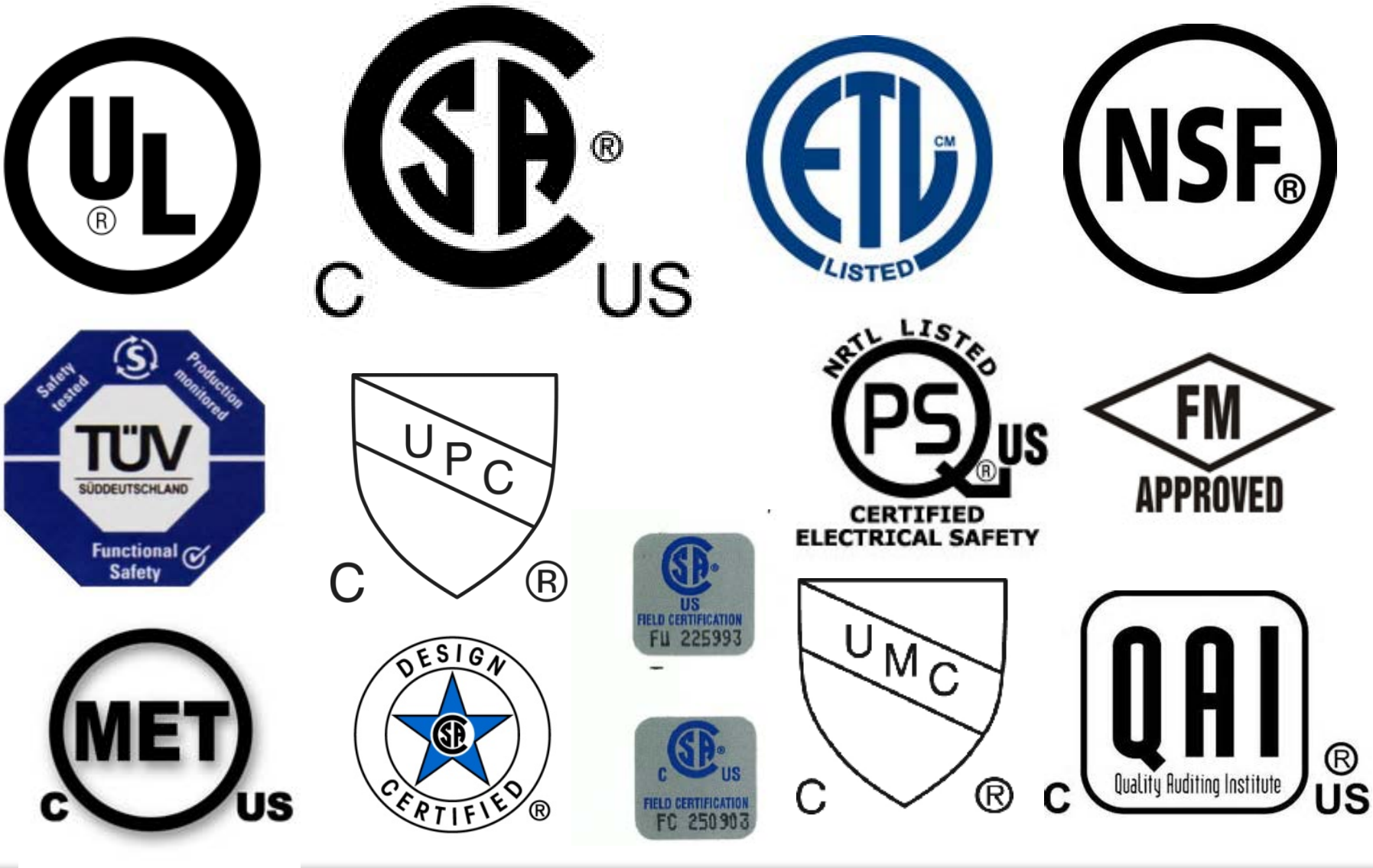
It is the intent of this Code that factory-installed internal wiring or the construction of equipment need not be inspected at the time of installation of the equipment, except to detect alterations or damage, if the equipment has been listed by a qualified electrical testing laboratory that is recognized as having the facilities described in the preceding paragraph and that requires suitability for installation in accordance with this Code.

Extraction from NEC 2014 Edition

Third Party Product Testing & Certification

- ***Manufacturers*** have their products certified voluntarily.
- ***Retailers*** are looking to see that products are certified before they put them on their shelves to protect public health and safe.
- ***Manufacturers*** will contact an NRTL when they have a new product to be certified.
- ***The NRTL*** will tell manufacturer:
  - which standards it will need to be tested to.
  - how long it will take to complete tests.
  - how much it will cost to complete tests.
  - how many samples and drawings will be needed.
- When the product ***passes*** all the necessary tests determined by the product standard, the manufacturer receives approval to put the certification mark of the NRTL on the product and/or packaging.

Third Party Product Testing & Certification



Third Party Product Testing & Certification

CE

- Not to be confused with an NRTL's certification mark.
- CE marking on a product is a ***manufacturer's self-declaration*** that the product complies with European Union (EU) health, safety and environmental protection legislation.
- Manufacturers must meet CE marking requirements in order to market products to EU member states and European Free Trade Association countries.
- It is the manufacturers' responsibility to:
  - determine if a product requires CE marking
  - carry out the conformity assessment
  - issue the Declaration of Conformity (DoC)
  - affix mark to product.
- CE marking indicates to governmental officials that a product may be legally placed on the market in their European country.

Third Party Product Testing & Certification

Model Certification	Witness Certification	Shared Certification	Category Certification	Field Evaluation
Products tested at NRTL's lab.	NRTL evaluates manufacturer's (or designated) lab to ISO/IEC 17025 requirements. Products tested at manufacturer's lab by manufacturer's staff.	NRTL evaluates manufacturer's (or designated) lab to ISO/IEC 17025 requirements. Products tested at manufacturer's lab by manufacturer's staff.	NRTL evaluates manufacturer's (or designated) lab to ISO/IEC 17025 requirements. Products tested at manufacturer's lab by manufacturer's staff.	Single product evaluated to the National Electrical Code (NEC) and portions of the appropriate standard (follow-up services do not apply)
Certification Specialist conducts testing.	NRTL sends Certification Specialist to witness testing.	NRTL may request partial witness testing (based on confidence level) and will review & validate test data.	NRTL will review and validate test data.	Field Evaluator will individually label product.
Reports are written by NRTL who issues CoC.	Reports are written by NRTL who issues CoC.	Draft reports written by manufacturer and sent to NRTL who issues CoC.	Draft reports written by manufacturer and sent to NRTL who issues CoC.	Reports are written by Field Evaluator

Field Certification

- A one-time certification for a specific number of units, without follow-up inspections.
  - NRTL conducts product testing on site.
  - If product complies to appropriate standard, NRTL can issue a Certificate of Compliance.
  - A controlled number of adhesive, serialized labels are then supplied to apply to products tested.

Field Evaluation

- Field Evaluators offer programs for non-certified products that are unique in nature or limited production.
- Normally site-specific.
- Field Evaluators may need to comply with NFPA 790 and 791 to offer field evaluations.
- Products are evaluated to nationally recognized standards with site specific variances accepted by AHJs by non-destructive test methods.
- Field Evaluation is a safety evaluation, NOT a certification program and product will not be listed.

Third Party Product Testing & Certification

- Products are eligible to display an applicable **Field Evaluation Label**, which is valid for a specific location only.

- The label indicates that the product was tested and has met the all requirements, including the **National Fire Protection Association (NFPA)**.

- This program helps AHJs to identify products that meet accepted safety criteria

Serialized →

NEC Article 110.3

Examination, Identification, Installation, and Use of Equipment

(A) **Examination**. In judging equipment, considerations such as the following shall be evaluated:

(1) Suitability for installation and use in conformity with the provisions of this Code.

(2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(3) Wire-bending and connection space.

(4) Electrical insulation.

(5) Heating effects under normal conditions of use and also under abnormal conditions likely to arise in service

(6) Arcing effects.

(7) Classification by type, size, voltage, current capacity, and specific use.

(8) Other factors that contribute to the practical safeguarding of persons using or likely to come into contact with the equipment.

Extraction from NEC 2014 Edition

Field Evaluation Process:

- AHJ refers equipment owner to a list of Field Evaluators and one is retained as needed.
- Letter of Retention submitted by Field Evaluator outlining the scope of the job and proposed standards to be utilized during field evaluation.
- Field Evaluator inspects equipment and its installation
- Safety and performance testing is conducted.

Field Evaluation Process/continued:

- Documentation is verified.
- Any non compliances are formalized and described, listing items that must be changed/fixed.
- Field Evaluation Label is then applied to the unit(s) after equipment has passed the evaluation.
- Test report is completed and provided to the contracted party for their use and review/approval by the local AHJ.
- The assigned Field Evaluator is available to the AHJ to discuss the process and/or findings.

Third Party Product Testing & Certification

- Once a product or a piece of equipment is refurbished or modified, it is no longer certified or listed.
- Such changes normally void the NRTL's approval and use of the equipment or product violates the OSHA standard requiring the approval.
- It will need to be evaluated by a Field Evaluator.
- Also applies to field evaluated equipment that has been moved from original field evaluation location.

Section 3:
Product Testing & Certification Process

Product Testing & Certification Process

Four stakeholder groups participate in the product certification process:

1. Product Manufacturers
2. Standards Development Organization (SDOs)
3. Nationally Recognized Testing Laboratories (NRTLs)
4. Authorities Having Jurisdiction (AHJs)

Product Manufacturers

What is a Product?

Ohio Building Code

114.1.1 Definitions. *The following words and terms shall, for the purposes of this section, have the meanings shown herein:*

- ***Product.*** *A material or device designed and manufactured to perform a predetermined function. Appliances, assemblies and equipment are also considered products.*

Product Manufacturers

Product Manufacturers produce a wide range of goods for use in both residential and commercial environments.

The products may be meant for consumer use or be installed by a professional contractor.

Product Manufacturers

- **Electric Appliances:** refrigerators, stoves, clothes dryers, air conditioners, ventilation systems.
- **Gas Appliances:** furnaces, water heaters, ranges, commercial ovens, etc.
- **Outdoor Gas:** gas grills, fireplaces, outdoor heaters, gas lamps.
- **Lighting:** indoor lighting fixtures, outdoor decorative lighting, emergency lighting.
- **Plumbing:** kitchen sinks & faucets, lavatory sinks & faucets, toilets, urinals, shower controls, spas/hot tubs, pumps.
- **Electrical Supplies:** wire, cable, electrical connectors, fuse boxes.
- **Plumbing Supplies:** ABS/PVC pipe, plumbing connectors, valves, backflow prevention assemblies.
- **Consumer Electronics:** computers, power supplies, cameras, radios, digital media, cell phones.
- **Medical Equipment:** x-ray equipment, life support machines.
- **Safety Equipment:** safety glasses, safety shoes, hockey helmets, ski helmets, bike helmets.

Product Manufacturers

When designing their products, manufacturers must be aware of **applicable U.S. standards** that apply to their type (or "family") of product/s so that:

- They choose the correct materials and components to use during the manufacturing process.
- They design the product to last as many cycles as required by the standards.
- The size of the product is such that it will be interchangeable with the same type of products designed by other manufacturers.
- A level of safety and performance is provided for the consumer when used per the manufacturer's instructions.

Standards Development Organizations (SDOs)

are accredited organizations that are responsible for creating or facilitating the development of product standards for given market sectors

Standards Development Organizations

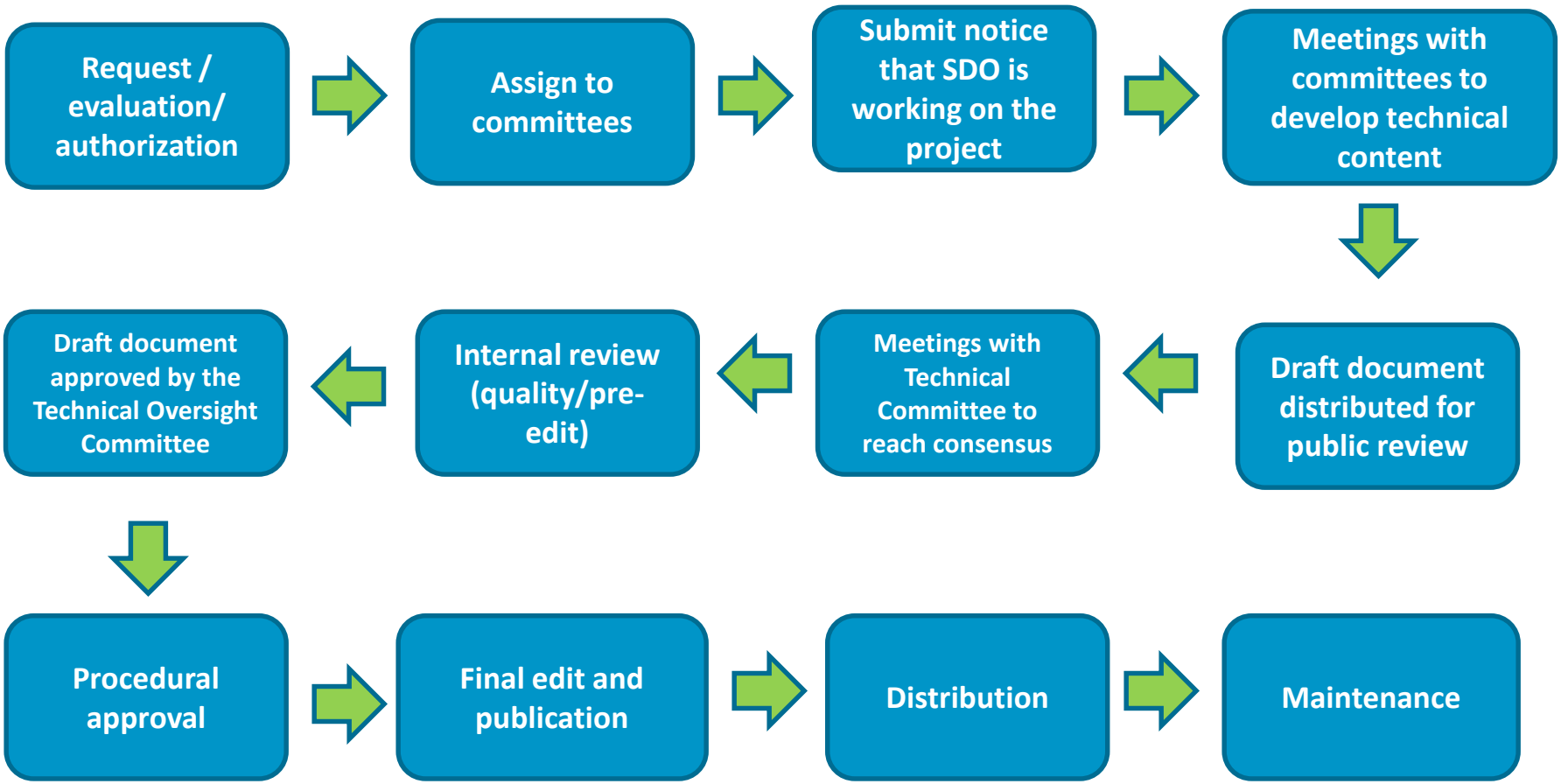
- ASME American Society of Mechanical Engineers
- ASSE American Society of Sanitary Engineers
- CGA Compressed Gas Association
- CSA CSA Group
- FM FM Approvals
- IAPMO International Association of Plumbing & Mechanical Officials
- IAS International Accreditation Services
- IEC International Electrotechnical Commission
- NFPA National Fire Protection Association
- NSF National Sanitary Foundation International
- UL Underwriters Laboratory

Standards Development Organizations

- SDOs facilitate the development of *consensus standards* which outline how a product needs to perform to:
  - meet minimum safety and performance requirements.
  - allow for interchangeability so that it can fit into another product or be replaced if necessary.

- Consensus means that the majority of stakeholder groups (including manufacturers, regulators, consumers, trade associations, utilities, etc.) represented during development of the standard are in agreement with the content of the standard.
- Standards **do not** determine which product works the best or lasts the longest.

Standards Development Organizations



Standards Development Organizations

In addition to writing their own standards, SDOs often work together to write a harmonized or “joint” standard that has contributions from multiple organizations.

For example:

- **ANSI Z21.47 • CSA 2.3**, Standard for Gas-Fired Central Furnaces

- **ASSE 1016-2011/ASME A112.1016-2011/CSA B125.16-11,** Performance requirements for automatic compensating valves for individual showers and tub/shower combinations.

- **ANSI Z21.20 • CSA C22.2 No. 60730-2-5 • UL 60730-2-5**, Standard for Automatic Electrical Controls For Household and Similar Use – Part 2-5: Particular Requirements for Automatic Electrical Burner Control Systems.

3. Nationally Recognized Testing Laboratories

- **Nationally Recognized Testing Laboratories** (NRTLs) are **independent, third-party** organizations accredited and recognized by various government or national organizations to provide testing to national and international standards.
- Examples of organizations that accredit and recognize NRTLs are **OSHA**, **ANSI** and **SCC**.
- NRTLs are contracted by manufacturers to test products and certify that they meet the applicable standards.
- NRTLs test to many different standards – UL, CSA, NSF, IAPMO, etc.
- NRTLs must be qualified, by location, to test and certify products based on the qualifications of their laboratories.

Nationally Recognized Testing Laboratories

- In the U.S., **the NRTL Program** is operated by **OSHA.**

- OSHA's recognition of an NRTL is an acknowledgement of the organization's ability to perform product safety and testing within its scope.

- For more information, check out the OSHA website:

http://www.osha.gov/dts/otpca/nrtl/

Nationally Recognized Testing Laboratories

In addition to OSHA, other bodies accredit laboratories as qualified to test electrical, gas, and other classes of products for the U.S. market.

These include:

- American National Standards Institute (ANSI)
- International Accreditation Service (IAS)
- International Code Council (ICC)
- National Voluntary Laboratory Accreditation Program (NVLAP)
- American Society of Safety Engineers (ASSE)

Nationally Recognized Testing Laboratories

Ohio Building Code

114.2.1 Research reports and listings.

Any material, product, assembly or method of construction not specifically provided for in this code, shall have a valid research report or ***listing from an evaluation service recognized by the board and published on a list titled "Approved National Evaluation and Accreditation Services"*** *found on the board's website.*

(formerly Appendix O – Approved Testing & Inspection Agencies)

http://com.ohio.gov/documents/dic_bbst_ApprovedTestingandInspectionAgencies.pdf

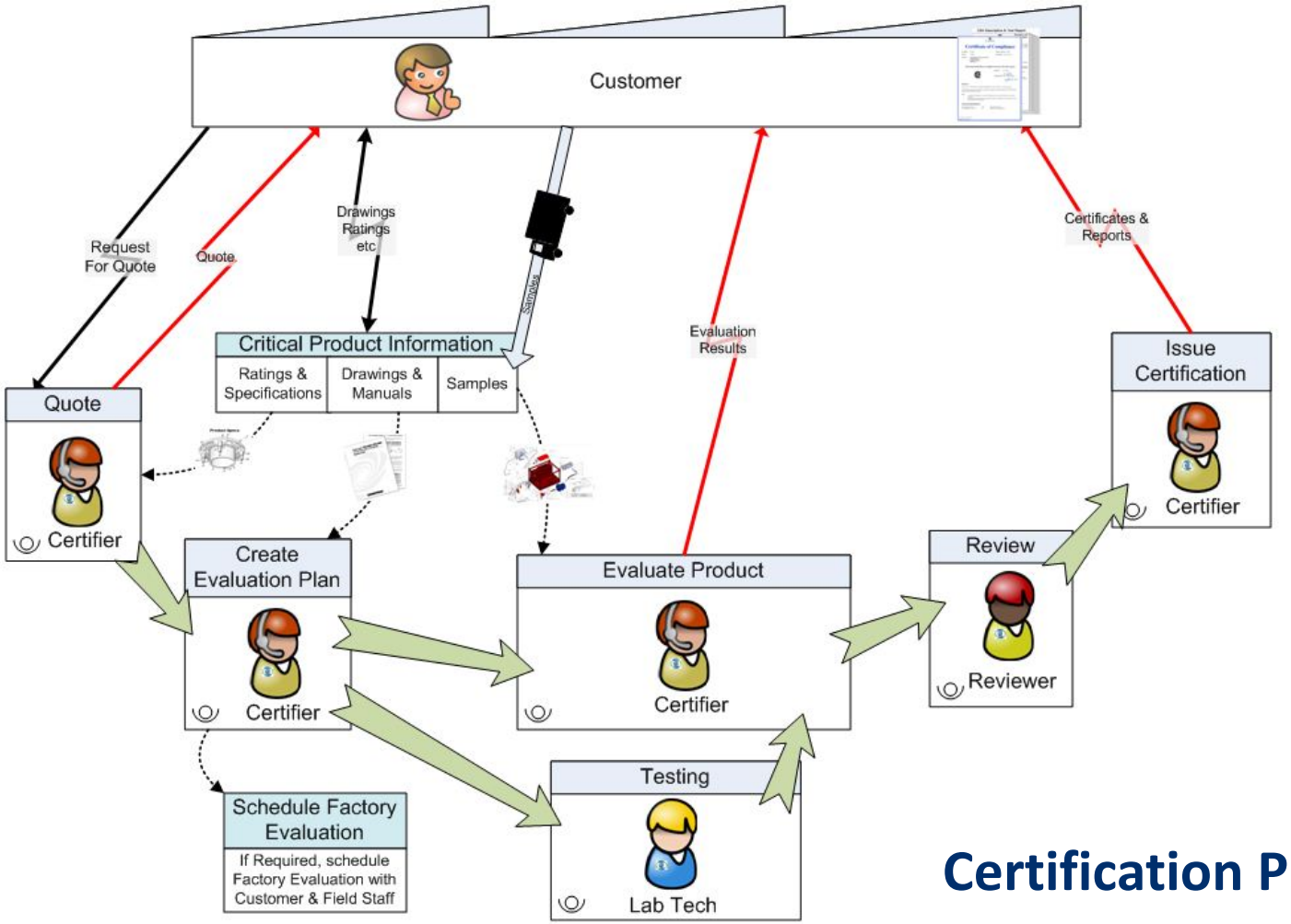
Nationally Recognized Testing Laboratories

- To begin the product testing and certification process, a product manufacturer requests a quote/project estimate from one or more NRTLs.

- Once the manufacturer receives the estimate, they choose an NRTL based on factors such as technical knowledge, cost, and delivery time.

- A manufacturer may choose to have more than one NRTL test a product so that both of the certification marks will appear on the product.

Nationally Recognized Testing Laboratories



Certification Process

Nationally Recognized Testing Laboratories

- The manufacturer then provides product samples and data, such as a materials list, schematic diagrams, and information about the components used in the product.
- The NRTL conducts an initial evaluation of the factory where the product is manufactured to determine if quality procedures and good manufacturing practices are being followed.
- This inspection provides evidence that, in the event of a quality or safety problem, the manufacturer has processes in place to issue a product recall.

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- Upon successful completion of product evaluation and testing, the manufacturer will receive certification confirmation from the NRTL.

- This is typically in the form of a test report, which specifies that the product does comply with the requirements of the applicable standards.

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- Once a product is certified, the manufacturer
  - Signs Product Service Agreement
  - Pays Annual Fee for licensing the use of the NRTL mark.
  - Understands that modified products need to be re-certified.

NOTE: The NRTL mark that appears on the product is the organization that completed the testing, not the organization that wrote the standard to which it was tested.

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- The product is then publicly listed by the NRTL.