

## Navigating The Product Certification Maze:

Understanding the Product Testing & Certification Process and Certification Marks

BSC Course No. 49-6664

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

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## Building Codes and Product Standards



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- **Codes\*** provide the **minimum** safeguards for people with regard to building safety and fire protection.
- Codes assist in protecting:
  - health
  - safety
  - welfare



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

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### **Electrical**

National Electrical Code (NEC)  
International Electrical Code (IEC)

### **Gas**

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

### **Plumbing**

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

### **Buildings/Construction**

International Building Code (IBC)  
International Residential Code (IRC)  
International Green Construction Code (IgCC)

NFPA 5000 Building Construction and Safety Code



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- Codes can be incorporated in the law of a jurisdiction when formally adopted by the appropriate governmental or private authority.
- Adopting codes:
  - consistency among jurisdictions.
  - allows for adjustments.



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### NEC® in Effect 1/1/2015



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

Source: [www.nec.org](http://www.nec.org)

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- 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.



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

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- New technologies/products need a **standard** and a **means of compliance**.
- Reliance on use of tested and certified products that **meet safety standards**.

**Examples: ICC International Residential Code (IRC)**

#### 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.*

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## Third Party Product Testing & Certification

“**Certified**” or “**Listed**” means that:

- Product has been tested and certified:
  - **to** comply with a *product standard*.
  - **by** an *accredited third-party certification agency*.
  - *also known as a.....*
- **Nationally Recognized Testing Laboratory (NRTL)**
- *Product is listed* in the NRTL’s certified product list.
- Manufacturer is licensed to *use the NRTL’s mark*.
- Certified products can be mass produced.

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**Example: NEC 90.7  
Examination of Equipment for Safety**

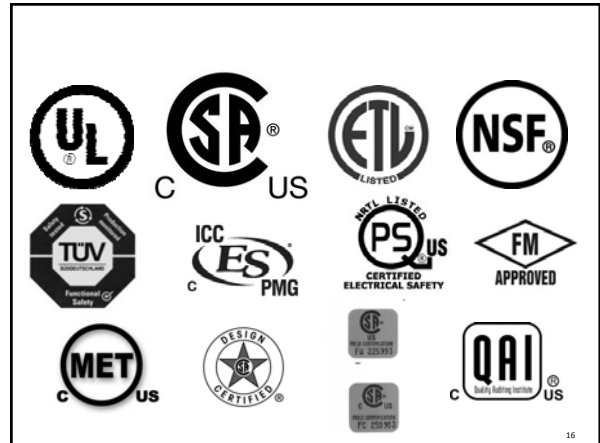
For specific items of equipment & materials referred to in this Code, examinations for safety made under standard conditions provide a basis for approval where the record is made generally available through promulgation by organizations properly equipped and qualified for experimental testing, inspections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

**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.

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.

- **Manufacturers** have products certified voluntarily.
- Exception – electrical equipment in workplace.
- **Retailers** want certified products to protect public health & safety.
- **Manufacturers** contact NRTL when they have new product.
- **The Certifier** will advise manufacturer of:
  - relevant product standards.
  - number of samples and drawings.
  - cost and timeframe.
- When product **passes** tests, manufacturer can use certification mark on product and/or packaging.



- Not to be confused with an NRTL's certification mark.
- CE marking is a **self-declaration program** for manufacturers marketing products in:
  - European Union member states
  - European Free Trade Association countries.
- CE marking has no relevance in the U.S.



- Unique or limited quantity products.
- Field Evaluators typically comply with NFPA 790 and 791.
- Safety Evaluation only, **NOT** a certification program.
- Evaluated to standards with site specific variances accepted by AHJs.
- **Field Evaluation Label** displayed - valid for a specific location.
- Indicates product was tested and has met the all requirements, including the **National Fire Protection Association (NFPA)** and the **National Electric Code (NEC)**, for installation and use.

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

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- Refurbished/modified equipment or product no longer certified or listed.
- Such changes normally void NRTL's approval.
- Use of equipment or product violates OSHA standard.
- Must be re-evaluated by a Field Evaluator.
- Also applies to field evaluated equipment moved from original field evaluation location.



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## 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)

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**Product Manufacturers** make products for use in both residential and commercial environments.

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



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During design, manufacturers must be aware of **applicable U.S. standards** that apply to their type of product/s so that:

- Correct materials and components are used during manufacturing.
- Product lasts as many cycles as required by the standards.
- Size of product is such that it will be interchangeable with similar products designed by other manufacturers.
- Consumer is provided with level of safety and performance when product used per the manufacturer's instructions.

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## Standards Development Organizations (SDOs)

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



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- AGA American Gas Association
- 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 Sanitation Foundation
- UL Underwriters Laboratory

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- SDOs facilitate development of *consensus standards* that outline how a product needs to perform to:
  - meet minimum safety requirements.
  - allow for interchangeability so that it can fit into another product or be replaced.
- Consensus - majority of stakeholder groups (i.e. manufacturers, regulators, consumers, trade associations, utilities, etc.) represented during development of standard are in agreement.
- Standards **do not** determine which product works the best or lasts the longest.

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SDOs sometimes work together to write harmonized or “joint” standards that have 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

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- **Nationally Recognized Testing Laboratories (NRTLs)** independent, third-party organizations accredited and recognized to provide testing to national and international standards.
- NRTLs test to many different standards – UL, ANSI, ASME, CSA, NSF, IAPMO, etc.
- NRTLs are qualified, by location, to test and certify products based on qualifications of their laboratories.

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- In the U.S., the **NRTL Program** is operated by **OSHA**.
- OSHA's recognition is acknowledgement of NRTL'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/>



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- ICC Evaluation Services (ICC-ES) PMG Listing Program for Plumbing, Mechanical and Fuel Gas products.
- Recognition through ICC membership in North America.
- ICC-ES is not an OSHA Nationally Recognized Testing Laboratory.
- Accepts test reports from other recognized testing agencies.
- ICC-ES has its own marks.



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In addition to OSHA, other bodies accredit laboratories as qualified to test electrical, gas, and other products for 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)



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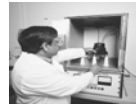
- Project estimate from one or more NRTLs.
  - Technical knowledge.
  - Cost.
  - Delivery time.
- May choose more than one NRTL.
- Submit product samples and data:
  - Materials list.
  - Schematic diagrams.
  - Component information.
- Initial factory evaluation
  - Quality procedures.
  - Good manufacturing processes.
- Processes in place to issue product recall.



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- Testing and product evaluation completed by NRTL.
- NRTL issues certification confirmation/test report.
- Manufacturer receives permission to use certification mark.
- Product publicly listed by the NRTL.

Note: The NRTL's 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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### • NRTL Post Certification Activities

- Periodic follow-up inspections.
- Factory audits.
- Re-examination testing.
- Marketplace surveillance.
- Advertising claims reviews.



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NRTLs currently recognized by OSHA are:

- CSA Group (CSA)
- Communication Certification Laboratory, Inc. (CCL)
- Curtis-Straus LLC (CSL)
- FM Approvals LLC (FM)
- Intertek Testing Services NA, Inc. (ITSNA)
- MET Laboratories, Inc. (MET)
- NSF International (NSF)
- QPS Evaluation Services Inc. (QPS)
- SGS U.S. Testing Company, Inc. (SGSUS)
- Southwest Research Institute (SWRI)
- TÜV Rheinland PTL, LLC (TUVPTL)
- TÜV SÜD America, Inc. (TUVAM)
- TÜV SÜD Product Services GmbH (TUVPSG)
- TÜV Rheinland of North America, Inc. (TUV)
- Underwriters Laboratories Inc. (UL)

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- **Authority Having Jurisdiction (AHJ)** - governmental agency or sub-agency that regulates the safety of residential or commercial buildings.
- Typically, building inspector or fire official in municipality where building is located.
- AHJs present at the city, county and state levels.
- 44,000+ jurisdictions in the U.S. decide on acceptance of a certification mark.



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- The AHJ interprets locally adopted codes to determine if the certification mark on a product is acceptable per the codes.
- AHJs want peace of mind knowing that a product has been tested and meets applicable codes and standards.



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- Many believe that there is only one certification mark in the U.S. and only one in Canada.
- Some do not understand difference between being "listed **to** XYZ standard" and "listed **by** XYZ"

**Note:** No code should ever state that a product has to be listed by a specific organization. It should state "listed by an accredited third-party testing & certification agency".

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## Anti-Counterfeiting and Mark Protection

- Counterfeiters infiltrate the global supply chain with components products integral to manufacturers and end users.
- Examples:
  - Electrical – light bulbs, holiday lights, circuit breakers, power bars.
  - Commercial electrical and gas equipment.
  - Lighting and ceiling fans.
  - Plumbing products.
  - Water purification units.
  - HVAC.
  - .....to name but a few!

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## Economic Consequences



- Global trade in counterfeit goods increased from \$5.5 billion to approx. \$600 billion annually over past 30 years.
- In 2013 Dept. of Homeland Security seized counterfeit goods valued at over \$1.7 billion at U.S. borders.
- Costs U.S. businesses \$200 - \$250 billion annually.
- Directly responsible for loss of 750,000+ American jobs.
- Approx. 5-7% of all global trade is in counterfeit goods.
- Annual growth rate of 20-25%.

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- Certification marks of NRTLs are often copied.
- Undermines North American system of standards, testing & certification.
- Enables unsafe or deficient products to gain widespread access to North American market.
- Places consumers at risk of exposure and jeopardize public confidence in legitimate products.

**Counterfeit certification marks deceive buyers into purchasing untested products that could cause serious injury, illness or death.**

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- Most NRTLs:

- conduct counterfeit investigations.
- issue product recalls and safety notices.
- work with law enforcement and customs.
- issues warnings.
- Take legal action.

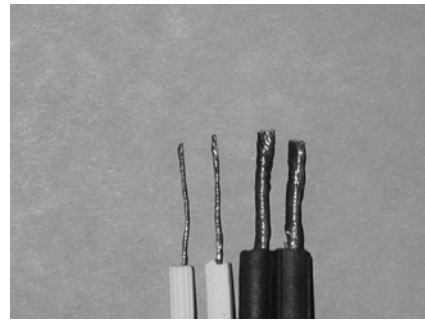
“Zero Tolerance Policy”



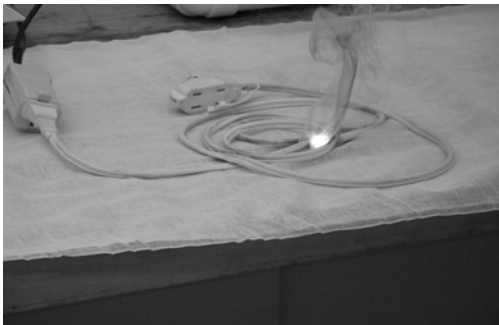
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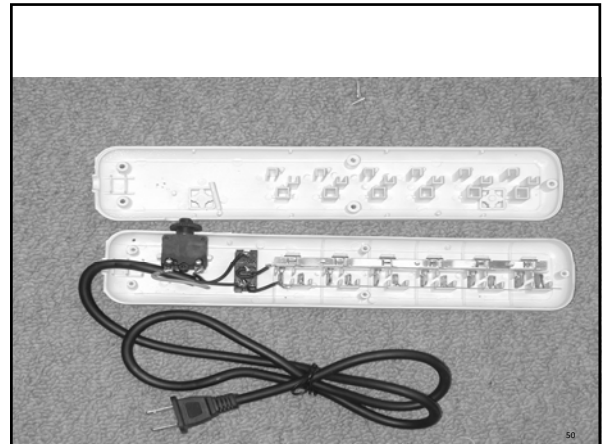
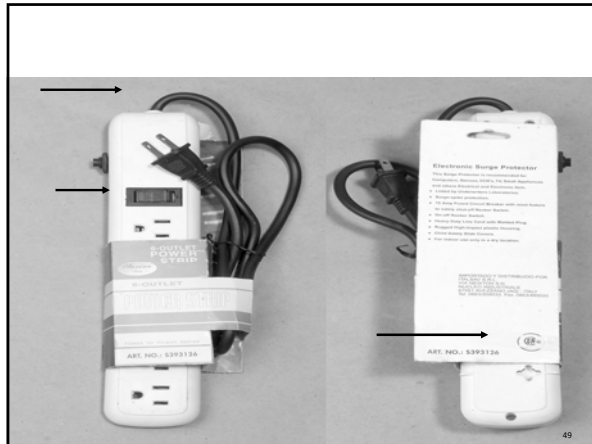


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How to determine if a product may be counterfeit.

- Certification marks that "don't look right" or have typos.
- Use of non-standard color coding.
- Unclear printing and typos on packaging and/or instruction manuals.
- Missing items - discrepancy between contents of product package and description on package.
- If in doubt, report it to the NRTL.



## Questions



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