

TECH TIP #60



One of a series of dealer contractor technical advisories prepared by HARDI wholesalers as a customer service.

Ordinances, Codes & Standards

As with most products that affect the health and safety of the user, heating equipment and heating installations are governed by various ordinances, codes and standards. Let's define these terms by starting with an ordinance.

An **ordinance** is a law or regulation enacted by local, state or federal government bodies to protect public safety and health. An ordinance against smoking in elevators is a classic example.

Another fairly common ordinance for heating installers is a licensing ordinance. This would mean no person or perhaps no firm in a community can install, erect, alter or repair heating systems unless that person or employee of a firm is a license holder. Many times an examination is required before a license is issued. (*See Notable Note on Licensing.*)

A **code** is a system of principles and rules that relate to one subject with the objective to control quality and performance. Size, illumination and placement of exit signs is an example of a code --- probably part of the larger building code.

Codes can be mandatory --- incorporated into government ordinances, or simply a voluntary industry code for which participation is not a requirement. However, if someone states conformance to a voluntary code, the code authority may be able to demand proof of conformance to the published code.

A **standard** is a level of competence established by a recognized group against which a given design, quality or performance can be measured. Duct fabrication materials, assembly and erection details established by the Sheet Metal and Air-Conditioning Contractors Association is one example. This standard as well as others may be incorporated into a particular **model** mechanical code. A model code is simply a code prepared by a knowledgeable group which is presented as a useful example for others to adopt.

History

Fire has always been the most common form of disaster. Fire safety, together with structural reliability and the protection of human health are the three fundamental objectives behind the origin of building codes and the institution of fire ordinances.

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Perhaps the simplest code governing structural reliability was the Hammurabi Code in Babylonia more than 2000 years before the birth of Christ. It simply stated that the builder would be put to death if any of his buildings fell down due to faulty construction.

One of the first efforts to achieve fire safety was the set of ordinances to prevent the spread of fire between buildings laid down by England's King John after the great London fire in 1212.

In the United States, the Common Council was formed in the New York port area in 1675 to take up the already developing health problem regarding sewage and refuse disposal which led eventually into the plumbing codes.

In the specific area of fire safety, little in truly scientific terms was accomplished until modern times. The Cleveland City code of 1834 simply stated each building owner must provide at least one leather fire bucket -- a form of fire fighting preparedness but surely not fire prevention.

But after the disastrous Chicago fire in 1871 and later the Baltimore (1904) and San Francisco (1906) fires, more emphasis began to be placed on fire prevention rather than just fire fighting. Both fire testing, research and code development accelerated.

About halfway through the 19th century, insurance companies --- interested in both fire prevention and in minimizing financial loss from fires -- began forming service organizations. Factory Mutual (FM) formed in 1835 and the Board of Fire Underwriters started in 1866 (later the American Insurance Association) are two examples. Their job: to gather and disseminate fire statistics and engineering data for policy holders. Much of what these groups learn and suggest becomes helpful to the public at large.

<p>Notable Note: Licensing</p> <p><i>Licensing</i> is a process by which an agency of government grants permission to an individual to engage in a given occupation – heating service, for example – upon determining that the applicant has attained the minimal degree of competency required to ensure that the public health, safety and welfare will be reasonably well protected.</p> <p>Two regulatory approaches less restrictive are <i>registration</i> and <i>certification</i>. Registration may be invoked when the threat to life, health, safety and economic well being is relatively small and other forms of legal redress may be available to the public. Registration requires a person to file his or her name and address</p>	<p>with a designated agency. This provides the public with a roster of practitioners.</p> <p>Certification is a form of regulation that grants recognition to individuals who have met predetermined qualifications by a state agency. However, non certified individuals may in some instances offer similar services to the public as long as they do not describe themselves as being certified.</p> <p>All three terms may present confusion as implemented by local laws. (A registered nurse for example is really a licensed nurse.) And non-government bodies also offer certification to practitioners who meet predetermined qualifications.</p>
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Underwriters Laboratories (UL), one of several important safety and testing laboratories in the United States, came into being when insurance underwriters in Chicago asked a young electrical expert to stay on after he had been helpful in stopping the many fires started by the Palace of Electricity display at the 1898 Columbian Exposition.

By 1896, the National Fire Protection Association (NFPA) was organized to promote the science and improve the methods of fire protection and prevention. Organizations such as insurance groups, engineering societies and trade associations plus individuals such as consulting engineers, fire chiefs, arson inspectors and really anyone interested in fire safety make up NFPA's membership.

Notable Note: Fire Hazard Vs Fire Resistance	(A sample that generates half the smoke of red oak would have a smoke developed rating of 50.)
<p>Underwriters Laboratories (UL), a laboratory engaged in testing for public safety is one of several agencies that publishes results of fire tests. UL's regularly published Building Materials List identifies products that have passed certain fire tests. Listing signifies that samples of the product have been found acceptable by UL based on UL's established requirements. The value of a UL listing is dependent upon the confidence placed in UL by code authorities.</p>	<p>Fire <i>resistance</i> classification applies to <i>structures</i> — columns, floors, walls, floor-ceiling assemblies — that are exposed during testing to a fire of controlled and repeatable intensity. Ratings are given in terms of hours of test endurance — 4 hr, 2 hr, 1 hr — until the collapse of the loaded structure or until the temperature rise across the structure exceeds an average of 250°F. (Limiting temperature rise is to prevent fire spread by heat conduction through the structure to combustible materials in contact on the other side.)</p>
<p>Building materials are classified in two ways — by fire hazard and by fire resistance (retarding) characteristics.</p>	<p>Thus, a particular ceiling tile material may have a fire hazard classification as follows: flame spread – 1; smoke developed – 10; and fuel contribution – 15. When that tile is used in a complete assembly such as part of a T-bar ceiling, the entire assembly might have a 1 hr fire resistance rating.</p>
<p>Fire <i>hazard</i> classification refers to the burning characteristics of <i>materials</i> — flame spread, fuel contributed and smoke developed. The comparative scale is based on the burning characteristics of red oak, which has been assigned an arbitrary value of 100 for all three characteristics, and asbestos cement board which has a value of 0 in all three categories.</p>	<p>Building codes make frequent reference to specific fire hazard and fire resistance requirements.</p>

NFPA publishes material for public education and a professional Journal for its members. NFPA is best known for its National Fire Codes including the National Electrical Code. The multi-volume codes cover fire safety, standards on subjects ranging from the handling of flammable liquids to marinas and commercial and residential heating installations. Building Construction and Facilities is of particular interest to HVAC contractors.

A number of laboratories conduct fire testing research to provide the various fire protection interest groups --- such as model code groups, associations and consultants --- with the necessary engineering data on fires. UL and FM, mentioned previously, are two well known examples, and there are government laboratories and universities engaged in fire testing and research as well.

Code Groups

BOCA

*Building Officials & Code Administrators
4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
708-799-2300, fax 708-799-4981
www.bocai.org*

ICBO

*International Conference of Building Officials
5360 South Workman Mill Road
Whittier, CA 90601
562-699-0541, fax 562-692-2845
www.icbo.org*

SBCCI

*Southern Building Code Congress
International, Inc.
900 Montclair Road
Birmingham, AL 35213-1206
205-591-1853, fax 205-599-9893
www.sbcci.org*

ICC

*International Code Council
www.intlcode.org*

CABO

*Council of American Building Officials
5203 Leesburg Pike, Suite 708
Falls Church, VA 22041
703-931-4533
www.cabo.org*

NFPA

*National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
800-344-3555, fax 617-984-7057
www.nfpa.org*

Who's The Boss

Most states have a state fire marshal operating out of either a district department, or as a division of the state's department of public safety, police or insurance.

The state fire marshal enforces the state's fire protection code --- covering the prevention of fires, storage and sale of explosives, alarm system, fire escapes and conducts arson investigations. The state fire marshal is the primary fire law enforcement officer. He is usually assisted by regional deputy marshals, as well as any local fire prevention bureaus that are established. The state fire marshal's office of California even has its own research laboratory.

On the local level, a municipality's building department and fire department share the responsibility of enforcing fire safety to the extent delegated by the state's fire marshal. Areas of responsibility very often overlap with final jurisdiction being established by convenience.

Generally a building department will be concerned with such things as lighting and ventilation, establishing fire zones, types of construction, loads and stress, chimneys and heating appliances, fire resistance requirements, plumbing and the selection of fire extinguishing equipment.

A fire department will normally be concerned with the transportation of flammables, fireworks safety in lumber yards, dry cleaning establishments and the maintenance of fire extinguishing equipment and exits.

As a general rule, building code changes are seldom made retroactive, whereas a new fire protection code can be made to apply to existing as well as new facilities. Smoke alarms, for example could be made a requirement for all buildings.

Notable Note:
Get To Know These NFPA Standards

HVAC practitioners will find it convenient to have quick access to the following NFPA standards:

- 31 – Installation of Oil Burning Equipment
- 54 – National Fuel Gas Code
- 58 – Storage and Handling LP Gases
- 70 – National Electrical Code
- 70A – Electrical Code for One & Two Family Dwellings & Mobile Homes
- 90A – Installation of Air Conditioning and Ventilation Systems (non-residential)
- 90B – Installation of Warm Air Heating and Air Conditioning
- 96 – Ventilation of Commercial Cooking Equipment
- 97 – Standard Glossary of Terms Relating to Chimneys, Vents and Heat Producing Appliances
- 211 – Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances Systems

Model Codes Become One

Most existing building codes have been adaptations of one of three model codes. Model building codes include the *Basic Building Code*, prepared by the Building Officials Conference of America and widely adopted in the west; *Uniform Building Code*, prepared by the International Conference of Building Officials for the mid-west and east;

and the *Standard Building Code* prepared by Southern Standard Building Code Congress International.

These model code groups are made up of governmental officials, such as fire marshals, building department staff, etc. --- all with voting rights, plus non voting members, including architects, engineers, trade associations and manufacturers of code affected products.

In 1994, these building code organizations responded to a changing construction industry environment and formed the *International Code Council (ICC)* to write a unified set of regulatory documents for the U.S. and North America -- a building code, mechanical code, plumbing code, and several others.

The jointly developed *CABO One and Two Family Dwelling Code* and *Model Energy Code* prepared by the Council of American Building Officials in 1986 is also included in the ICC effort.

Individuals involved in the heating and cooling industry should have access to their local building, mechanical and energy codes. “*Install according to local code requirements*” is an all too familiar statement in manufacturer installation instructions. It is up to the designer to be sure it is!