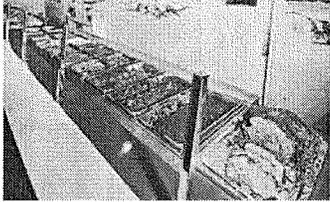


**THE
SMORGASBORD**



November 2013

Public Act 11-54
Effective July 1, 2011
Department of Construction Services

- OSFM
- OSBI
- OEDM
- Codes & Standards
- (DPW) Building Design & Construction
- (DOE) School Facilities
 - Project Review & Grants

Public Act 13-247
Effective July 1, 2013

**DEPARTMENT OF
ADMINISTRATIVE SERVICES**
Commissioner Donald J DeFronzo

**DIVISION OF
CONSTRUCTION SERVICES**
Deputy Commissioner Pasquale J Salemi

**DIVISION OF
CONSTRUCTION SERVICES**

Regulatory & Technical Compliance	School & State Construction Support Services		
Joseph V. Cassidy, PE ~ Director	Craig Russell ~ Director		
William Abbott SFM	Joseph Cassidy PE Acting SBI	Office of School Facilities	Office of Education & Data Mgmt

Public Act 11-54
Effective July 1, 2011
Department of Consumer Protection
CGS Chapter 532 Section 29-129 ~ 29-143b

- Amusement Parks
- Carnivals
- Tents & Circuses
- CGS 29-143a ~ Fire protection at places of public amusement or exhibition

Public Act 11-54
Effective July 1, 2011
Department of Consumer Protection

License Services Division
165 Capitol Avenue
Hartford, CT 06106
(860) 713-6000
FAX: (860) 713-7229

Email: dcp.licenseservices@ct.gov

**Connecticut State Police
Fire & Explosion
Investigation Unit**



West Squad East Squad

Sgt Mark Grasso Sgt William Bundy

Public Act 13-256

Effective October 1, 2013

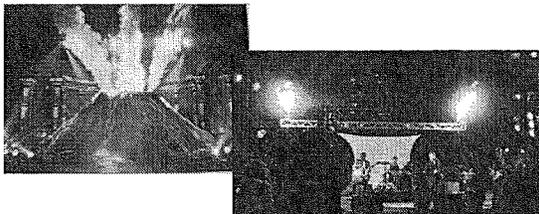
**Dept of Emergency Services &
Public Protection**

- Fireworks & Pyrotechnic Permits/Investigations
- Explosive Permits/Investigations
- Explosive Transportation/Storage Regulations



SPECIAL EFFECTS

Public Act 13-256



LEGISLATIVE INITIATIVE ~ 2013 Session

SPECIAL EFFECTS

CGS 29-357 Fireworks

Allows for regulation of indoor use of pyrotechnics, sparklers and fountains for special effects

New Legislation Addressed

Flame effects using propane and flammable liquids which has increased since 2003 Station Night Club fire

Licensing of operators & Permits for events

SPECIAL EFFECTS

to be exempt





CSP Fire & Explosion Investigation Unit

Mail:

1111 Country Club Road
Middletown CT 06457

Tel: 860-706-5600 ~ Fax: 860-706-5619
24 Hr Emergency = 800-842-0200

E-Mail: despp.feiu@ct.gov

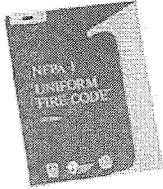
2005
CT State Fire Safety Code
 Part V ~ Operational & Maintenance Issues
Effective September 2012

New & Existing



CT State Fire Prevention Code
 Effective July 1, 2010

New & Existing

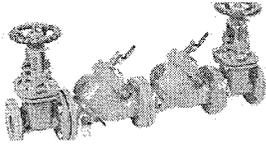


Reading Codes & Standards

<u>Codes</u>	<u>Standards</u>
<ul style="list-style-type: none"> • Building, fire, mechanical • Mandatory language • Minimum performance requirements • Understand context 	<ul style="list-style-type: none"> • NFPA 13, A117.1 • Explain how to achieve what must be done • <u>Only to the extent called for by the code</u>

Reading Codes & Standards

Backflow Prevention Assembly



Code

Requires the installation

Standard

Describes how it should be installed

Reading Codes & Standards

- Remember the adage:
✓ *"What the Code giveth, the Exceptions taketh away."*
- Check for "and/or" details
- Understand the difference between "general" and "specific" requirements
✓ Specific take precedence and maybe less restrictive

Manufacturing Premises

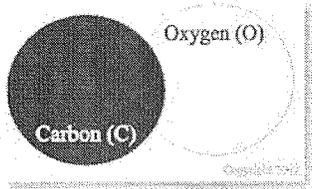
CGS 29-292 amended by PA 09-35

- Fire Safety Code Sec. 29-292-1e(b) exempts premises used for manufacturing
- Fire Prevention Code Sec. 29-291a-2 ~ can't supersede requirements of Fire Safety Code
- FMs still out of them

Carbon Monoxide Detectors in Schools

PA 11-248

effective July 1, 2011 for new schools



Carbon Monoxide Detectors in NEW Schools

- > Detectors meet UL 2034 or UL 2075
- > No battery or plug-in equipment
- > Located within any room containing permanently installed heating equipment
- > System CO detector connected to building fire alarm system as supervisory alarm
- > Sign at the entrance(s) to space containing detection

Carbon Monoxide Detectors in EXISTING Schools

▪ No enforcement action until incorporated into State Building & Fire Safety Codes

▪ GUIDANCE

- Detectors meet UL 2034 or UL 2075
- Battery operated or plug-in equipment maybe used
- Located within any room containing permanently installed heating equipment
- If connected to building fire alarm system, only as supervisory alarm
- Sign at the entrance(s) to space containing detection

**Carbon Monoxide Detectors
in Schools**

Clarifications

- Spaces containing fuel-fired heating equipment (HVAC), not Kitchens, Science labs, Home Ec rooms, etc.
- Buildings used primarily for educational purposes but necessarily include building supporting the educational process such as Vo-Ag buildings
- Does not apply to "Renovate as New" per CGS Chapter 173
- Signage is a **Warning** to be careful entering

**School Buildings
"Renovate as New"**

- Term used in CGS Chapter 173 for funding purposes
- Anticipated life expectancy of building
- Do not apply all code provisions for new

**School Safety Infrastructure
Council**

Public Act 13-3

- Develop standards for schools receiving grant money
- FM/BO Issues
 - Fire Exit & Crisis Response Drills
 - Securing School Buildings

Fire Exit & Special Drills

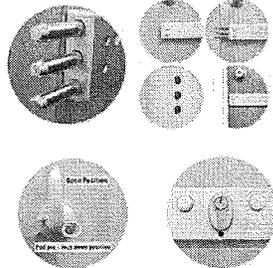
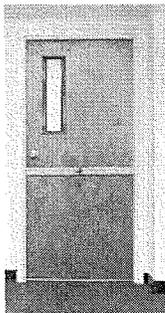
CGS 10-231

- One each month
- Crisis Drill every 3rd month

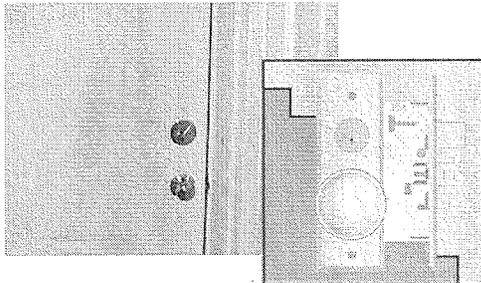
CSFPC

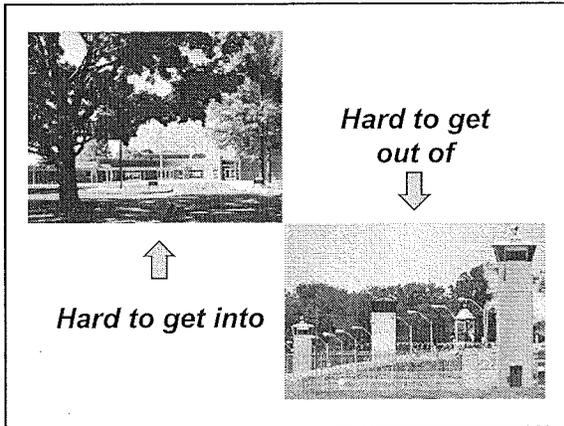
- One each month
- Weather options
- Additional drill within first 30 days days

School Safety ~ Locking Doors



Hotel Style Door Locks





**BUILDING PERMITS
CERTIFICATES OF OCCUPANCY**

Building Permit
CSFSC 29-292-5e ~ CSBC 105.3.1.2

Certificate of Occupancy
CSFSC 29-292-9e / CSBC 110.1.3

CSFSC Abatement Work
CSBC 105.1.3

Work in an Existing Building

Fire Marshal Abatement Work

(Add) 105.1.3 Connecticut State Fire Safety Code abatement. Where conflicts exist between the requirements of this code and the requirements of Connecticut State Fire Safety Code abatement orders issued in writing by the local fire marshal with respect to existing buildings, the requirements of that portion of the Connecticut State Fire Safety Code that regulates existing buildings shall take precedence.

Exceptions:

1. New fire protection systems shall meet the requirements of Chapter 9 of this code.
2. Electrical work shall meet the requirements of the 2005 NFPA 70 National Electrical Code.
3. Structural, plumbing and mechanical work shall conform to the requirements of this code.

Work in an Existing Building

When does it become new?

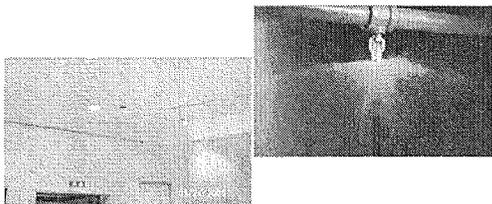
- **Additions, Alterations, Repairs**
SBC 3403 ~ What you touch has to comply
- **Change of Use**
SBC 3406 ~ Meet new occupancy requirements

**BUILDING PERMITS
CERTIFICATES OF OCCUPANCY**



CSFSC Part IV Compliance

ELEVATORS



**STATE ELEVATOR INSPECTORS
860-685-8340**

Sprinklers & Elevators

- Bottom of hoistway within 2 feet of floor
Exception ~ no hydraulic fluids in pit
- Top of hoistway ~ requires shunt trip
*Exception ~ **passenger** elevators where cars meet ASME A17.1 (all new cars do)*
> We will look at a modification for retrofits
- Machine room ~ requires shunt trip
Especially important in retrofit of sprinklers

Cargo Tank Inspections

CGS 29-322

Effective January 1, 2013

Via PA 09-177 & PA 10-54



Cargo Tank Inspections

CGS 29-322

Effective January 1, 2013

Via PA 09-177 & PA 10-54

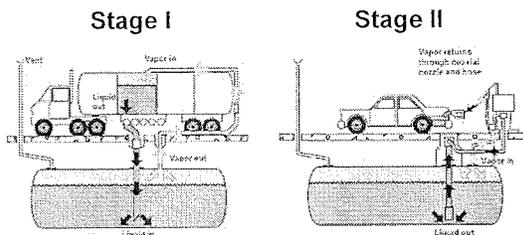
City, town or borough *may, by ordinance*, require LFM to inspect cargo tank motor vehicles registered by DMV in their jurisdiction.

LP Gas Tank Exchanges

1997 CT LPG & LNG Code

- Section 4-2.2 Cylinders or Tanks to be Filled, Evacuated, Disconnected or Transported and Disconnecting Regulator(s)
- Only by the Tank Owner unless:
 - > Four business day notice
 - > Removal of tank within 15 days
 - > Responsibility = Person, Firm, Corporation or LP-Gas Supplier *requesting* disconnection

Vapor Recovery Gasoline Dispensing Facilities



Stage II Vapor Recovery

- Been a fixture on gasoline pumps since 1992
- Vehicles manufactured since 1998 have built-in gasoline vapor recovery systems
- Decreasing need for pumps to be equipped as newer vehicles replace older

**Vapor Recovery
Gasoline Dispensing Facilities**

Public Act 13-120
effective June 18, 2013

- Decommissioning Stage II by July 1, 2015
- Search for Vapor Recovery on DEEP web site

**Gasoline Nozzle
Latch-Open Devices**

**1997 Connecticut
Flammable & Combustible Liquids Code**

- Integral part of the nozzle
- Not permitted at marine service stations

**Removal of Standpipe
Hoses**

- Class I ~ Fire Department use only
(2½" outlet – no hose)
- Class II ~ Use by Building Occupants
(1½" hose stations)
- Class III ~ Use by Building Occupants & FD
(1½" hose stations with 2½" outlets)

**Removal of Standpipe
Hoses**

- IBC/IFC 905.3 requires Class III where highest/lowest story more than 30 feet above lowest level of FD vehicle access
- Class I where protected by automatic fire sprinklers and most open parking structures
- Existing buildings ~ Consult Building Code applicable at time of construction & Part IV of Fire Safety Code

**Removal of Standpipe
Hoses**

- Essentially a change in Class of Standpipe
- Building Code & Fire Prevention Codes concerned with maintenance of system
- No modification necessary provided Code Enforcement Officials consulted

Standpipes at Stages

SBC 410.2 ~ STAGE: A space with a building utilized for entertainment or presentations, which includes overhead hanging curtains, drops, scenery or stage effects other than lighting and sound

SBC/IFC 905.3.4 ~ Class III Standpipes at each side of stages greater than 1,000 sf

Standpipes at Stages

- Fire Prevention Code Sec. 20.1.4.3.8

(Add) **20.1.4.3.8 Stage standpipe system.** When the AHJ determines that material such as scenery, props and temporary fixtures are present on a stage equipped with hose connections create an extraordinary fire load, a fire watch equipped with fire hoses attached to the hose outlets on the stage for first aid firefighting shall be provided whenever an audience is present.

Existing Lodging & Rooming Houses

- Sprinkler protection first introduced in 1999 CSFSC
- In 2005, PT IV Sec. 26.3.5.1 applied only to "new"
- Lost sprinkler protection for those new after 1999
- In 2009 Amendment ~ we screwed up AGAIN by deleting "new"

Existing Places of Assembly

- TIA 03-3 to 2003 NFPA 101 effective August 14, 2003
- Lowered threshold for automatic fire sprinklers in existing nightclubs and similar occupancies from 300 persons to 100 persons
- Not part of the 2003 NFPA 101 adopted as Part IV for existing buildings
- TIAs are effective only between editions of the NFPA codes but are not considered part of the standard.

Existing Places of Assembly

Protection from Hazards

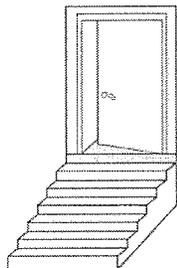
13.3.2.1.1 Explosion hazard ~ Rooms containing:

- High-pressure boilers
 - > >15 psi steam or 160 psi water
 - > State Boiler Inspector Certificate

- Refrigerating equipment other than domestic type
 - > Bigger systems that vaporize and liquefy fluids during the refrigeration process
 - > Utilize highly flammable refrigerants
 - > Not an integral part of appliance ~ remotely located

Doors at the Top of A Stair

CSFSC Part IV Sec. 7.2.1.3.6



In-Home Group B Occupancies

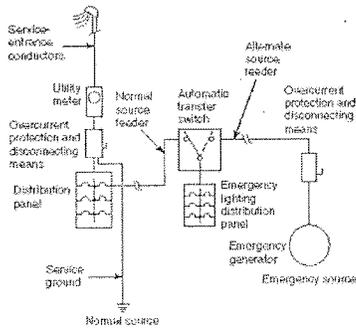
- Customary home business providing professional services
- Within a single family dwelling unit
- One outside employee beside residents
- In a mixed occupancy building = R-3
- If One- / Two-family detached dwelling or Townhouse = IRC

Fire Pumps ~ Standby Power

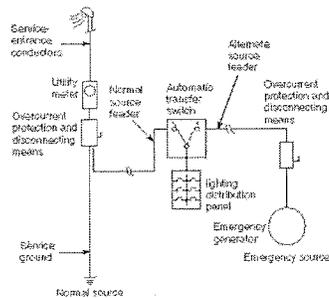
2005 STATE BUILDING CODE ~ 2009 Amendment

(NEW) (Add) 2702.2.20 Electric fire pumps. Buildings provided with standby electrical power for the purpose of continuing operations or occupancy shall provide Type 60 standby power for any electric fire pump installed to provide an adequate water supply or minimum operating pressure to a required automatic sprinkler system.

Emergency Generator



Standby Generator



**Restaurants ~ Group A-2
Fire Sprinklers**



Restaurants used to be Group A-3 ~ Now A-2

**Restaurants ~ Group A-2
Fire Sprinklers**

- Threshold for sprinklers in A-3 = 12,000 sf fire area
- Threshold for sprinklers in A-2 = 5,000 sf fire area
- 2009 Amendment ~ Exception for addition to existing Restaurant previously designated as Group A-3 under previous edition of SBC ~ keeps at 12,000 sf

***New Construction
Residential Occupancies***

IBC/IFC 903.2.7

Sprinklers Required

- Newly constructed

- Existing building having a Group R newly introduced by change of occupancy or addition

New Construction
Mixed Residential Occupancies
IBC/IFC 903.2.7 ~ R-3 Modification
✓ Single dwelling unit
✓ 1 hour fire resistive separation from other occupancy
✓ Separated independent means of egress
✓ Fire alarm & detection system throughout non-residential occupancy with notification in residential

Existing Residential Units
Mixed Occupancies
Single Dwelling Unit
• Applying Chapter 24 One- & Two-Family Dwellings
• Sole means of egress can't be through another dwelling unit or occupancy
• Primary Means of Escape ~ **Not an Exit**
• If interior Stair ~ Separation by ½ hour

Existing Residential Units
Mixed Occupancies
Multiple Dwelling Units
• If 2 ~ Applying Chapter 24 One- & Two-Family Dwellings
• 3 or More ~ Applying Chapter 31 Apartment Buildings
We have found a problem that needs to be re-evaluated !!

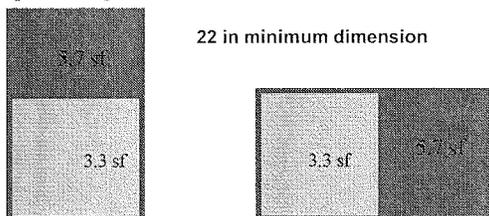
**Existing Residential Units
Mixed Occupancies**

Multiple Dwelling Units

*Requirements are the same
for 2 or 32 Dwelling Units*

- 1-hour separation
- Sprinkler system in non-residential occupancy
- Fire Alarm & Detection system in non-residential occupancy

**CSFSC – Pt IV
Openings for Ventilation/Rescue**



**EXISTING RESIDENTIAL
Undersized or no Window**

- Complaint window in common space or second primary means of escape
 - > Interconnected AC/DC smoke alarms throughout dwelling unit located in living room and sleeping rooms
- Deficient or No window from Common Space
 - > Interconnected smoke alarms AC/DC throughout dwelling unit located in living room and sleeping rooms
 - AND**
 - > Building Corridor Smoke Detection & Alarm

Lockups

*Bridge between Defend-in Place
I-3 Housing Units & I-2 Sleeping Areas*

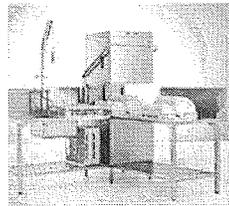
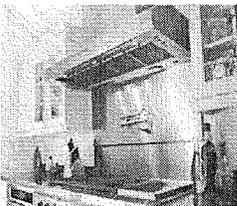
- *Border Crossings*
- *Customs Facilities at Airports*
- *Courthouses*
- *Police Holding/Processing Areas*
- *Security offices*
 - *Sports Stadia*
 - *Shopping Malls*

Lockups 2012 NFPA 101

- *In other than Detention & Correction (I-3) and Health Care (I-2)*
- *Not more than 50 detainees*
- *No detainee held for more than 24 hours*

- *NFPA 101 Sections 22/23.4.5*
 - *Locking requirements*
 - *Smoke Detection & Alarm System*
 - *Staff Interaction*

Type I or II Kitchen Hoods



New Installation = IMC, not NFPA 96

Type I or II Kitchen Hoods

Type I

Appliances produce grease or smoke laden vapors

(fire hazard)

Type II

Removal of heat or steam

(control waste)

IMC classifies Cooking Appliances as:

- Light-Duty
- Medium-Duty
- Heavy-Duty
- Extra-Heavy Duty

Type I or II Kitchen Hood or Residential Hood

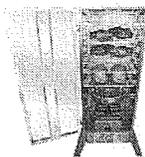
"deemed hazardous by AHJ"

Evaluate frequency, duration and nature of cooking

Churches, fire stations, school educational programs (life skills vs culinary arts), lunch rooms, community

Commentary for 2012 IMC 507.2.1 at end of handout

Meat Smokers



Are we looking at Type I or Type II Hoods????

Meat Smokers

- Evaluating on a case-by-case basis
- Considerations:
 - Manufacturers Instructions
 - Location inside or outside building
 - How do you provide fire protection

Smoke Alarms

- | | |
|---|---|
| <p><u>Single Family</u></p> <ul style="list-style-type: none"> • After October 1, 1978 | <p><u>Two or more Families</u></p> <ul style="list-style-type: none"> • After October 1, 1976 • Retroactive to all by July Spec. Sess PA 87-2 |
|---|---|

Power Source

- AC/DC after October 1, 2005
- AC after October 1 1976
- DC acceptable prior to October 1, 1976

SMOKE ALARMS & CARBON MONOXIDE DETECTORS

Public Act 13-272
effective January 1, 2014

One- or Two-Family Homes

- Requires the installation at the time of title transfer
 - Part of Real Estate Transfer ~ Not FM/BO issue
- \$250 Penalty at closing
- Several exceptions ~ within family, re-finance, etc.

**Codes & Standards
Committee Membership
Public Act 13-146**
effective October 1, 2013

- Increase from 18 ~ 21 Members
- Adds Electrical, Plumbing & HVAC Contractors
- Result of concern on adoption of codes

Enhanced 13D System
**Group R-4 &
Small Group I-2 Alternative**

- 30 minute water supply
- Protection of all storage, habitable & occupiable rooms, kitchens and closets
- Sprinkler valves electrically supervised

**IFC Part III & IBC
Chapter 3 Definitions**
Group R-4
Residential Care / Assisted Living
Facilities

The occupants are capable of responding to an emergency situation without physical assistance from staff.

Enhanced 13D System
R-4
903.2.7 Ex 3
• 6 or less clients
• Two story height limit
(SBC Table 503 Type VB)

Enhanced 13D System
Small I-2 Group Home
SBC 407.12_{ients}
• 6 or less clients
• 1 Story height limit (SBC Table 503)
• Type VA construction with sheathing
• Sleeping room separation with door directly to outside from each room
• Fire alarm & detection

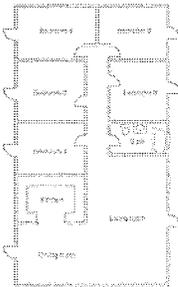
Enhanced 13D System
Small I-2 Group Home
SBC 407.12
• Type VA construction with sheathing
• Sleeping room separation with door directly to outside from each room

Enhanced 13D System

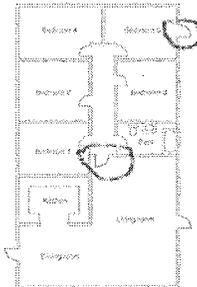
Small I-2 Group Home SBC 407.12

- 6 or less clients & 1 Story height limit
- Exterior door from each room
 - NEW = Sleeping room separation with secondary primary means of escape to exterior from corridor
- Construction type
 - NEW = Fire alarm & detection with heat detection in attic space

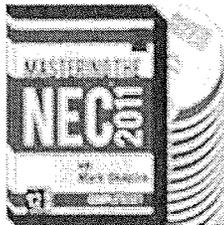
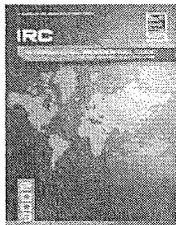
Current Alternative



Proposed Alternative

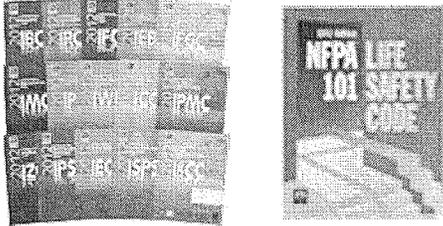


2013 SBC Amendment



Anticipated ~ December 31, 2013

CT Fire Safety & Building Codes



2012 ICC & 2012 NFPA 101

CT Fire Prevention Code



2012 NFPA 1

CT Hazmat Codes

- Flammable & Combustible Liquids Code
- Oil Burning Equipment Code
- Liquefied Petroleum Gas and Liquefied Natural Gas Code
- Gas Equipment and Piping Code

Sunset January 1, 2015



Dry Cleaning

- SBC & CSFSC Part III ~ New Construction
- CSFSC Part IV ~ Existing Installations
- Fire Prevention Code ~ Operation & Maintenance

Thank-You!



CT DAS Division of Construction Services

- Office of the State Building Inspector
– (860) 685 - 8310
- Office of the State Fire Marshal
– (860) 685 - 8380
- Office of Education and Data Management
– (860) 685 - 8330



STATE OF CONNECTICUT
DAS ~ Division of Construction Services
OFFICE OF STATE FIRE MARSHAL

Terry A. Brouwer

1111 Country Club Road
Middletown CT 06457
Phone: 860.685.8350
Terry.brouwer@ct.gov

Find us on the web at www.Ct.gov/dcs

IMC 507.2.1

agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s) in accordance with Section 17 of UL 710B

- ❖ This section requires Type I hoods for cooking appliances that produce grease or smoke as a result of the cooking process (see definition of "Hood, Type I"). The term "grease" refers to animal and vegetable fats and oils that are used to cook foods or that are a byproduct of cooking foods. Cooking appliances are used for commercial purposes when the appliance is primarily used for the preparation of food for compensation, trade or services rendered. When the nature of the cooking produces grease or smoke then a Type I hood is required. A Type I hood is required where smoke is produced as part of the cooking process. The intent is not to require a Type I hood where there is a possibility of food being burned and producing smoke. For example, smoke that is produced when toast is burned does not mean that a Type I hood is required over a toaster. This section makes it clear that a Type I hood is required over medium-duty, heavy-duty and extra-heavy-duty cooking appliances. If there exists a light-duty cooking appliance that produces grease or smoke, a Type I hood is required for that appliance.

Cooking appliances installed in cafeterias, restaurants, dormitory kitchens, hotels, motels, schools and

institutional occupancies are examples of appliances that typically require Type I exhaust hood systems. Some examples of commercial cooking appliances that require a commercial kitchen exhaust system are: deep fat fryers; griddles (flat or grooved); tilting skillets or woks; braising and frying pans; charbroilers; salamander and upright broilers; infrared broilers; open burner stoves and ranges; and barbecue equipment.

A common question that is asked is, what type of hood is required for conveyor and deck-style pizza ovens? Conveyor-type pizza ovens are listed in the definition of "Medium-duty cooking appliances." Type I hoods are required to be installed over medium-duty cooking appliances. Deck-type ovens are listed in the definition of "Light-duty cooking appliances." A Type I hood is required over a light-duty cooking appliance that produces grease or smoke. There is no longer a specific reference to deck-style pizza ovens, just the reference to deck-type ovens. Considering that a deck pizza oven is an enclosed oven and that the primary byproducts given off are heat and moisture, deck pizza ovens have commonly been approved for use under a Type II hood.

Unusual circumstances sometimes arise that may warrant a close evaluation of a cooking appliance or a cooking appliance installation before determining whether a Type I hood is required. For example,

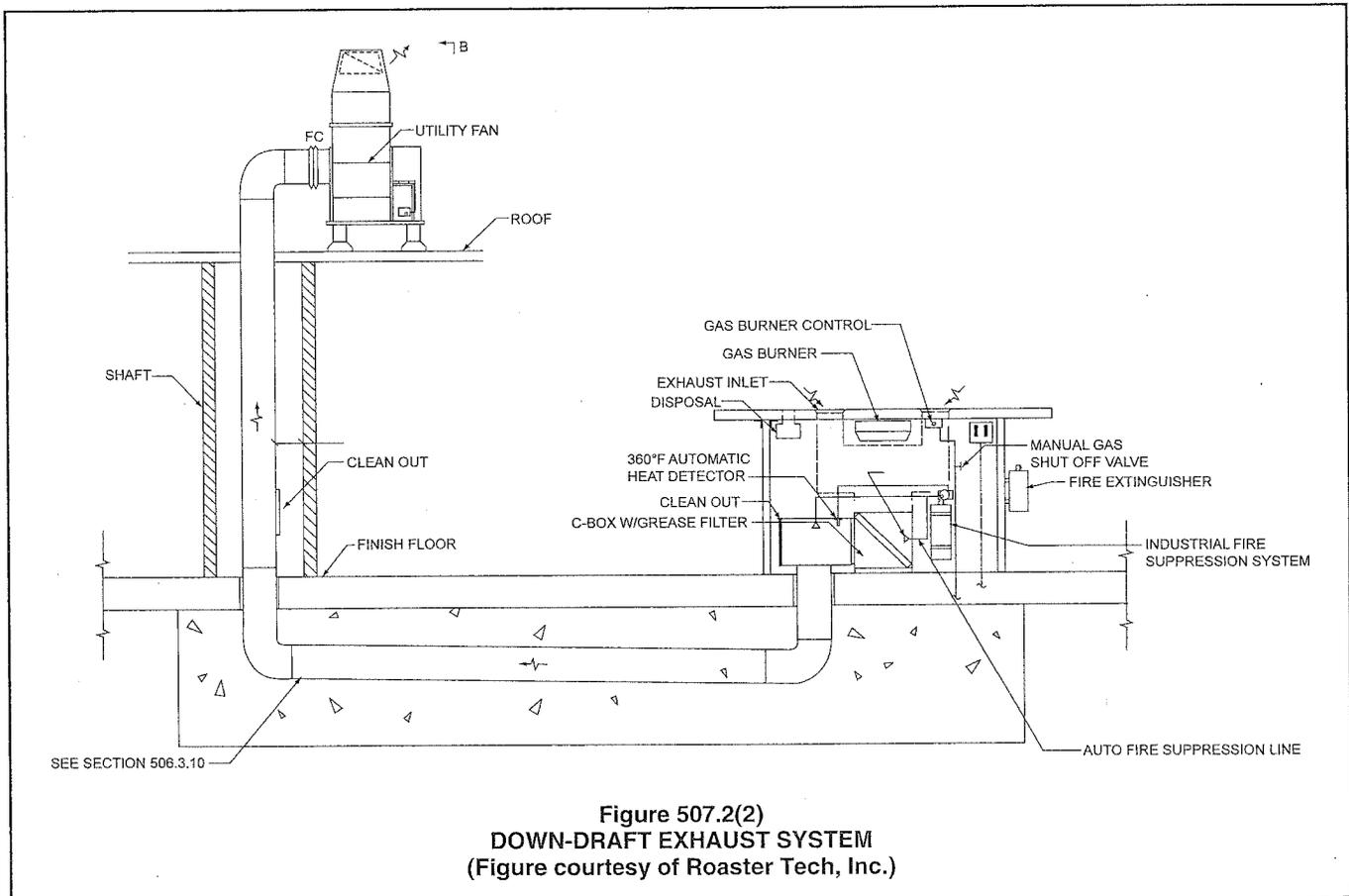


Figure 507.2(2)
DOWN-DRAFT EXHAUST SYSTEM
(Figure courtesy of Roaster Tech, Inc.)

cooking appliances used in a way that does not produce grease or smoke may need to be equipped only with a Type II hood or, depending on the occupancy where the cooking appliance is located, a residential hood or no hood at all. The key issues in making such determinations are the frequency of use and whether grease or smoke is produced by the cooking appliance and the cooking operation. The following are examples of kitchens serving occupancies that, depending on the nature of the cooking and the code official's interpretation of this section, might require only a Type II hood, a residential-type hood or no hood at all for the cooking appliances: church assembly halls; child care facilities; office or factory lunch rooms; employee break rooms; police and fire stations; bed-and-breakfast lodgings; VFW and similar halls; domestic-type kitchens in institutional occupancies; classrooms used to teach cooking; cooking demonstration displays and charity soup kitchens.

The code official should examine the nature of cooking operations before determining whether a Type I or II hood is required for a particular cooking appliance or a cooking appliance installation. Note that this section has been tightened up by stating that a Type I hood must be installed over medium-, heavy- and extra-heavy-duty cooking appliances. Bear in mind the primary purpose of a Type I hood is to control a potential fire hazard associated with grease and the purpose of a Type II hood is to control waste heat and moisture that burden HVAC systems and promote an unhealthy workplace. Excess moisture can deteriorate building components, promote the growth of mold and fungi, and create unhealthy and uncomfortable working conditions for employees.

Some common scenarios that come up are the type of hoods that are required in a life science classroom in a high school (i.e., a classroom used to teach, among other things, cooking to students) and the type of hood required over a cooking appliance(s) in a fire station. In both cases, the type of cooking is the deciding factor on the type of hood required.

Typically, students in a life science class are learning to prepare meals that are the same as those that are prepared for a family in a residential dwelling unit. In most cases, residential-type range/ovens are installed in the classroom. As such, the same byproducts that are produced in a kitchen in a dwelling unit would be produced in the classroom. Based on the residential style of cooking that is being taught, it would seem appropriate that the same type of hood installed in a residential dwelling could be installed over the residential range/ovens used in a classroom. Therefore, a Type I or II hood would not be required and residential kitchen hoods that are ducted to the outdoors could be installed.

Note that if the high school offers a culinary arts class and uses commercial cooking appliances to teach students how to prepare meals that are normally prepared in a restaurant, then the appropriate Type I or II hood could be required based on the type

of cooking operations that are performed under the hood.

In the case of a kitchen located in a fire station, once again it depends on the type of cooking and the intended use of the facility. Meals prepared in a kitchen in a fire station that has a residential-type range/oven that is only intended to be used to prepare meals for the fire fighters on that particular shift is similar, if not the same, as those prepared in a home environment. As such, the same byproducts that are produced in a kitchen in a dwelling unit would be produced in the kitchen in the fire station. Based on the residential style of cooking that is being performed, it would seem appropriate that the same type of hood installed in a residential dwelling could be installed or, in a case where the space meets its ventilation requirements in Chapter 4 of the code, no hood at all.

It is not uncommon, however, for fire stations to have a community room with a kitchen used for preparing meals. The community room is often used to hold fund-raising events, such as spaghetti dinners, fish fries or pancake breakfasts, or used by members of the community for special events, such as parties or weddings. The kitchen may or may not have commercial cooking appliances installed. In this case, it would appear that such a situation is intended for the preparation of food for revenue generation. In this case, a Type I or II hood is required based on the cooking operations that are performed under the hood. This would also apply to VFW and other fraternal organizations, church assembly halls and other similar halls.

It is important to note that cooking appliances installed in commercial occupancies do not necessarily require the installation of a Type I or II hood. There are a number of installations in a commercial occupancy where residential-type cooking occurs that would not require a commercial kitchen hood (see the discussion above for school classrooms and fire stations). Lunchrooms and breakrooms in commercial businesses often have residential ranges/ovens installed. In addition, many multiple-family residential buildings (e.g., condominiums and townhomes) have a clubhouse or community room that the residents can reserve for special functions. Typically these are seldom used, and when they are, it is to warm food or bake frozen food like pizza, lasagna or premade appetizers. Based on the residential style of cooking that is performed on these appliances, it would seem appropriate that the same type of hood installed in a residential dwelling could be installed or there may be no hood at all.

If multiple cooking appliances are installed under a single hood and one or more of those appliances requires a Type I hood, a Type I hood would be required to serve the entire appliance line.

With the trend for larger kitchens in new dwelling units, kitchens designed with commercial-type cooking appliances have become more popular. Although

these installations would generally not require commercial exhaust hoods, commercial appliances should be carefully evaluated for use in dwellings. Commercial cooking appliances are typically not listed for domestic use and might lack certain safety features that would be required for domestic cooking appliances. Note that Sections 917.2 and 917.3 require appliances in dwelling units to be designed and listed for domestic use (see commentary, Sections 917.2 and 917.3).

This chapter does not require exhaust hoods for cooking equipment or appliances installed outdoors where the grease-laden vapors, etc., discharge directly to the outside atmosphere, nor does this chapter intend to regulate cooking appliances installed in vehicles or towed trailers (see definition of "Commercial cooking appliances"). Note that cooking appliances installed outdoors but located under a roof should be evaluated for installation under a Type I or II hood just as if they were located inside a building having enclosing walls.

The exception recognizes the growing use of small electrical appliances used for cooking, such as in small sandwich shops and convenience stores, where little or no grease is produced. The installation of a Type I hood in these small establishments creates the expense of the hood and the energy costs of running the fan and tempering the makeup air for the owner where grease emissions are minimal or nonexistent. The grease emission threshold requirement is consistent with NFPA 96 and the testing procedure is done in accordance with Section 17 of UL 710B. In order for an appliance to qualify for use without a Type I hood it must be tested by an approved agency and shown that the effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm. If the appliance is below the grease emission threshold, the provisions of Section 507.2.2 are still applicable and a Type II hood may still be required.

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

❖ This section and Section 507.1 state that the hood system must operate whenever cooking operations are taking place. In order to perform the intended function, a Type I hood is required to automatically operate when cooking operations occur or must be activated in an arrangement that prevents cooking without hood exhaust system operation. There are several methods indicated to achieve this and it is left up to the designer/installer/owner and code official to

determine what they all agree will be necessary to verify that fan operation will occur whenever cooking operations occur.

The activation of the exhaust fan must occur through an interlock with the appliances, by means of heat sensors or other approved methods. It should be noted that an interlock with the cooking appliances is one of the methods to accomplish this, but is not the only method. This text has been misinterpreted as meaning that all appliances must be fitted with controls that would start the hood system. This is not the case. In fact, tampering/altering with listed and labeled appliances may in itself create a code violation. However, if a cooking appliance has provisions incorporated into its listed and labeled design that included some type of interlock option, that would certainly meet the requirements of this text.

It should be pointed out that the text states that "hood systems shall be designed and installed..." and this means that the hood system needs the controls and not necessarily the actual cooking appliances. The hood system must cooperate with appliances by means of heat sensors or other approved methods. All this means is that something needs to activate the exhaust fan when a cooking operation takes place. This can be achieved through the use of controls such as heat sensors/infrared technology, light beam interference detection or through methods such as electric relays that control the branch circuit that the appliances are connected to or, in the case of gas appliances, a solenoid valve in the gas supply piping. This section does not prevent manual starting of the exhaust system, provided that there is a means to prevent cooking appliance operation when the exhaust system is not operating (e.g., hood and appliance interlock).

The part of this code text that says, "or by other approved methods" leaves the door open for many options. This leaves it up to the designer/installer/owner and code official to determine what will be necessary to verify that fan operation will occur whenever cooking operations take place. One way might be to tie the fan to the lighting control serving the kitchen area, assuming that the cooking would not be possible if the lights were off. This option may work very well because of the allowance that permits the use of variable speed exhaust fans (see commentary, Section 507.1). When the lights are turned on the fan might not even be running, but when cooking operations begin the heat created would cause the fan to begin to run on a light load condition. This variable speed technology already has the interlock incorporated into it, which is how the fan knows to automatically change speeds throughout the day. Another "approved" method may be one that some of the chain restaurants use in which the standard operating procedure is that the fan always runs when the building is occupied or upon startup of any cooking appliance. While not stating a specific method to