AFSA presents

Cooking With Fire

Fixed Fire Suppression & Exhaust Systems for Cooking Environments

Monday, 17 June, 13
Who is the AFSA?
Alberta Fire Safety Association

Fire industry members working together to improve the industry.

Disseminate information and ideas.

Improve fire protection in the province.

Increase the competence of the fire protection industry.
We have 4 separate groups.

- Fire Alarm
- Portable Fire Extinguishers
- Special Hazards (Kitchen Suppression)
- Kitchen & Exhaust Cleaners
Alberta Fire Safety Association

This presentation is brought you by....

Special Hazards & Kitchen Suppression Group

By the end you should have a great overview of kitchen suppression systems & kitchen duct cleaning.
Kitchen Appliances
Kitchen Appliances
Protected Appliances
Protected Appliances
Protected Appliances UL197
Protected Appliances?
Two Appliances
Codes & Standards
Fixed Fire Suppression and Exhaust

- System Manufacturers
- Engineers & Architects
- Safety Code’s Officers
- Food Service Equipment Suppliers
- General or Mechanical Contractor
- Restaurant Owner / Chef / Customer
SCO Disciplines

- Building
- HVAC
- Gas

- Electrical
- Fire
- Health
Alberta Building Code 2006

Site: Ric's Grill & Mimi's Lounge
501 - 2 Ave SW
Calgary, AB

Fire Safety Services (Calgary) Ltd
3313 2nd Street NE
Calgary, Alberta T1Y 1C8
Ph: 403 682-4326 Fax: 403 682-4327
Email: robbin@firesafetyserivces.ca

Design by: Robbin Foxcroft
Scale: NTS

A Range Guard 6 & 4 gallon system allows for 30 flow points. The current system utilizes 29 flow points.

Design Standards:
- NFPA 17A - 2002
  Standard for Wet Chemical
  Extinguishing Systems
- NFPA 96, 2004
  Standard for Ventilation Control
  and Fire Protection of Commercial
  Cooking Operations
- ULC/ORD C1254.6-1995
  Fire Testing of Restaurant
  Cooking Area Fire Extinguishing
  Systems
- Range Guard Restaurant Fire
  Suppression System - Standard
  UL 300 Listed - P1912710008

Permit # MP2013-01386 Date: 05/02/13
Alberta Building Code 2006
Alberta Building Code 2006
3.3.1.2. Hazardous Substances, Equipment and Processes

2) Cooking equipment, not within a dwelling unit, used in processes producing grease-laden vapours shall be designed and installed in conformance with Part 6. (See Appendix A.)
If the equipment is to be used in a manner that will produce grease-laden vapours that are substantially more than would be produced in a normal household environment, then it would be appropriate to apply the requirements of NFPA 96.
6.2.2.6. Commercial Cooking Equipment

1) Systems for the ventilation of commercial cooking equipment shall be designed, constructed and installed to conform to NFPA 96, “Ventilation Control and Fire Protection of Commercial Cooking Operations,” except as required by Sentence 3.6.3.1.(1) and Article 3.6.4.2.
## Alberta Building Code 2006

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<tr>
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<tbody>
<tr>
<td><strong>2.2.1.1</strong></td>
<td><strong>2-2 Hood Size</strong></td>
</tr>
<tr>
<td>The overhead canopy-type shall be sized to completely cover the equipment it is designed to ventilate plus an overhang of at least six (6) inches on all sides of equipment not immediately adjacent to walls or other construction extending above the cooking surface.</td>
<td>Hoods shall be sized and configured to provide for the capture and removal of grease-laden vapors. (See 5-2.2)</td>
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6.2.2.6. Commercial Cooking Equipment

2) Fire protection systems for commercial cooking equipment referred to in Sentence (1) using vegetable oil or animal fat shall conform to

a) UL-300, “Fire Extinguishing Systems for Protection of Commercial Cooking Equipment,” or

b) ULC/ORD-C1254.6, “Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units.”
6.2.2.6. Commercial Cooking Equipment

5) Canopies, hoods and ductwork for a ventilation system exposed within a food establishment shall be constructed of stainless steel.

6) A food establishment in which food is prepared and the process generates odours, smoke, steam or heat shall have a mechanical ventilation system that includes canopies, ductwork and fans to remove odours, smoke, steam or heat to the exterior of the building.

However, the deciding factor as to whether or not NFPA 96 applies is the potential for production of grease-laden vapours and smoke, rather than the type of equipment used.
While NFPA 96 does not apply to domestic equipment for normal residential family use, it should apply to domestic equipment used in commercial, industrial, institutional and similar cooking applications where the potential for the production of smoke and grease-laden vapours exceeds that for normal residential family use.
10.6.4.3. Exception for Existing Modules

1) A canopy or hood installed before June 30, 1985, is permitted to have other than welded joints and seams.

2) In modules constructed before June 30, 1985, the kitchen mechanical exhaust and fire suppression system is considered acceptable provided
   a) the canopy completely covers all commercial cooking appliances and is complete with filters,
   b) an automatic fire suppression system is located in the canopy, [System must be Certified], and
   c) the system provides mechanical exhaust sufficient to remove grease-laden vapours.
2.6.1.9. Commercial Cooking Equipment

1) Commercial cooking equipment exhaust and fire protection systems shall be designed and installed in conformance with the Alberta Building Code 2006.
2.6.1.9. Commercial Cooking Equipment

2) Except as required in Sentences (3) to (5), the use, inspection and maintenance of commercial cooking equipment exhaust and fire protection systems shall be in conformance with NFPA 96, “Ventilation Control and Fire Protection of Commercial Cooking Operations.”
2.6.1.9. Commercial Cooking Equipment

3) Hoods, grease removal devices, fans, ducts, and other appurtenances shall be cleaned at frequent intervals to prevent surfaces from becoming heavily contaminated with grease or other residues. (See Appendix A.)

4) Flammable cleaning materials or solvents shall not be used for the cleaning of exhaust systems.
Standard for Ventilation Control & Fire Protection of Commercial Operations

1.1 Scope.

1.1.1 * This standard shall provide the minimum fire safety requirements (preventative and operative) related to the design, installation, operation, inspection, and maintenance of all public and private cooking operations.

1.1.2 This standard shall apply to residential cooking equipment used for commercial cooking operations.

1.1.3 This standard shall not apply to cooking equipment located in a single dwelling unit.
Standard for Ventilation Control & Fire Protection of Commercial Operations

4.1.3 The following equipment shall be kept in good working condition:

(1) Cooking equipment
(2) Hoods
(3) Ducts (if applicable)
(4) Fans
(5) Fire-extinguishing systems
(6) Special effluent or energy control equipment
Standard for Ventilation Control & Fire Protection of Commercial Operations

4.1.8 All interior surfaces of the exhaust system shall be accessible for cleaning and inspection purposes.

Access Doors:

- Horizontal Ducts @ 12 foot intervals
- At each change of direction
- Hoods with dampers within 18 inches of damper
Standard for Ventilation Control & Fire Protection of Commercial Operations

Ducts:

- Must be constructed of Carbon Steel, (Black Iron) or Stainless Steel
- Shall not be interconnected with any other ventilation or exhaust system.
- All Penetrations only with Listed Grease Tight Fittings.
- Duct to hood connections shall not be with self tapping screws and caulking.
Standard for Ventilation Control & Fire Protection of Commercial Operations

9.1 Dampers

9.1.2 Where specifically listed for such use or where required as part of a listed device or system, dampers in exhaust ducts or exhaust duct systems shall be permitted.

Duct dampers must open and close as required.

It is very common to find the black iron prevents this from happening.
9.3.3 Any equipment, listed or otherwise, that provides secondary filtration or air pollution control and that is installed in the path of travel of exhaust products shall be provided with an approved automatic fire-extinguishing system for the protection of the component sections of the equipment and shall include protection of the ductwork downstream of the equipment, whether or not the equipment is provided with a damper.
Standard for Ventilation Control & Fire Protection of Commercial Operations

10.2.6 Automatic fire-extinguishing systems shall be installed in accordance with the terms of their listing, the manufacturer’s instructions, and the following standards where applicable.

1. NFPA 12 – (None tested to ULC/ORD 1254.6)
2. NFPA 13 – (None tested to ULC/ORD 1254.6)
3. NFPA 17 – (None tested to ULC/ORD 1254.6)
4. NFPA 17A
Standard for Ventilation Control & Fire Protection of Commercial Operations

10.3 Simultaneous Operation.

10.3.1 Fixed pipe extinguishing systems in a single hazard area (see Section 3.3 for the definition of Single Hazard Area) shall be arranged for simultaneous automatic operation upon actuation of any one of the systems.

3.3.41 Single Hazard Area. Where two or more hazards can be simultaneously involved in fire by reason of their proximity, as determined by the authority having jurisdiction.
Standard for Ventilation Control & Fire Protection of Commercial Operations

10.4 Fuel Shutoff.

10.4.1 Upon activation of any fire-extinguishing system for a cooking operation, all sources of fuel and electric power that produce heat to all equipment requiring protection by that system shall automatically shut off.

10.4.4 Shutoff devices shall require manual reset. [Electrical or mechanical]
10.9.1 Where required, complete drawings of the system installation, including the hood(s), exhaust duct(s), and appliances, along with the interface of the fire-extinguishing system detectors, piping, nozzles, fuel shutoff devices, agent storage container(s), and manual actuation device(s), shall be submitted to the authority having jurisdiction.
NFPA 96 - 2004 Edition

Standard for Ventilation Control & Fire Protection of Commercial Operations

14.3.3 All solid fuel cooking equipment served by hoods and duct systems shall be separate from all other exhaust systems.

14.1.6 Solid fuel cooking operations shall have spark arresters to minimize the passage of airborne sparks and embers into plenums and ducts.
1.1 * Scope.
The provisions of this standard apply to the design, installation, operation, testing, and maintenance of pre engineered wet chemical fire extinguishing systems that discharge wet chemical from fixed nozzles and piping by means of expellant gas. It contains only the essential requirements and recommendations needed to make the standard workable in the hands of those skilled in this field.
5.1.2 Use. Hazards and equipment that can be protected using wet chemical extinguishing systems include the following:

(1) Restaurant, commercial, and institutional hoods

(2) Plenums, ducts, and filters with their associated cooking appliances

(3) Special grease removal devices

(4) Odor control devices

(5) Energy recovery devices installed in the exhaust system
5.1.4 Each protected cooking appliance, individual hood, and branch exhaust duct directly connected to the hood shall be protected by a system or systems designed for simultaneous operation.
5.1.5 Where two or more hazards can be simultaneously involved in fire by reason of their proximity, the hazards shall be protected by either of the following:

(1) Individual systems installed to operate simultaneously

(2) A single system designed to protect all hazards that can be simultaneously involved

5.1.5.1 Any hazard that will allow fire propagation from one area to another shall constitute a single fire hazard.
5.6.1 Systems protecting two or more hoods or plenums, or both, that meet the requirements of 5.1.5 shall be installed to ensure the simultaneous operation of all systems protecting the hoods, plenums, and associated cooking appliances located below the hoods.

5.6.1.1 The building owner(s) shall be responsible for the protection of a common exhaust duct(s) used by more than one tenant.
5.6.1.6 A fusible link or heat detector shall be provided above each protected cooking appliance and in accordance with the extinguishing system manufacturer’s listing.

5.6.1.6.1 Fusible links or heat detectors located at or within 12 in. (305 mm) into the exhaust duct opening and above the protected appliance shall be permitted to meet the requirements of 5.6.1.6.
5.6.2.1 Common exhaust ducts shall be protected by one of the following methods:

(1)* Simultaneous operation of all independent hood, duct, and appliance protection systems

(2)* Simultaneous operation of any hood, duct, and appliance protection system and the system(s) protecting the entire common exhaust duct
5.6.2.1.1 A fusible link or heat detector shall be located at each branch duct-to-common duct connection.

5.6.2.2 All sources of fuel or heat to appliances served by the common exhaust duct shall be shut down upon actuation of any protection system in accordance with 4.4.3.
Maintenance
In general, exhaust systems should be cleaned at intervals not greater than 12 months, but in the case of deep fat cooking, char broiling or similar cooking operations, the systems should be cleaned at intervals not greater than 3 months.
## Alberta Fire Code 2006 Maintenance

<table>
<thead>
<tr>
<th>Type or Volume of Cooking</th>
<th>Frequency</th>
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<tbody>
<tr>
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<td>Quarterly</td>
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<td>Semiannually</td>
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<td>Systems serving low-volume cooking operations, such as churches, day camps, seasonal businesses, or senior centers</td>
<td>Annually</td>
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</table>
Alberta Fire Code 2006 Maintenance
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ASSA-ROOTER Ltd.
PLUMBING & GASFITTING
SEWER & DRAIN SERVICES
KITCHEN EXHAUST CLEANING

CERTIFICATE OF PERFORMANCE
AREAS NOT CLEANED:
CHECK SERVICE REPORT

(403) 256-6525
www.assarooter.com

DO NOT REMOVE
Alberta Fire Code 2006 Maintenance
Division C 2.2.4.1. Qualifications

1) Only qualified persons shall install, test or perform maintenance on

a) a special fire suppression system (see Appendix A),

2) Only qualified persons shall perform maintenance on commercial cooking equipment exhaust systems. (See Appendix A.)
A-2.2.4.1.[1](a) Persons are considered qualified in the maintenance of special fire suppression systems when

(a) they have acquired a certificate of training from a public post-secondary educational institution,

(b) they comply with the ULC “Certificate Service for the Installation and Servicing of Fire Suppression Systems,” [1] or

(c) they have acquired a certificate of training from a manufacturer.
DATE: May 2, 2003

TO: All Kidde® Pre-Engineered Distributors

FROM: David Van Zandt
Product Manager, Pre-Engineered Systems

SUBJECT: Aqua-Blue Phase Out

This is confirmation that the Aqua-Blue product line is being phased out at the end of the third quarter of this year..... As you know, the pre-UL300 Aqua-Blue system (WHDR-250 and WHDR-500) has not been supported for over two years....
No Longer Serviceable or Certifiable

Some service parts will remain available until September 30, 2008..... Included is a list of items affected by this phase out.

87 87-100005-000 4-1/2 Gallon Aqua-Blue Wet Agent Recharge Container
*Spare part until Sept. 30, 2008

- This is common to all systems, parts are no longer available and haven’t been for some time!
- Pre UL300 parts not available since 2001.
No Longer Serviceable or Certifiable

- Dry Chemical parts have not been available since approximately 1998!
- 12 year Hydrotest requires suppression agent, (dry or wet chemical) disposal and replacement.
- Therefore, for sure no dry chemical systems can be certified and any pre UL300 wet chemical system due for hydro-test soon will have to be replaced!
No Longer Serviceable or Certifiable

- Kidde HDR & WHDR Dry & Wet Chem
- Ansul R101 Dry Chem
- Pyro Chem Dry Chem
- Safety 1st Dry Chem
- Others
- No TC Stamp – cannot be tested/transported
- Ansul Red Cylinders shall/must be replaced at next hydro-test with Stainless Steel Cylinders
1. The extinguishing system is in its proper location.
2. The manual actuators are unobstructed.
3. The tamper indicators and seals are intact.
4. The maintenance tag or certificate is in place.
5. No obvious physical damage or condition exists that might prevent operation.
6. The pressure gauge(s), if provided, is in operable range.
7. The nozzle blow off caps are intact and undamaged.
8. The hood, duct, and protected cooking appliances have not been replaced, modified, or relocated.
7.3.2* At least semiannually, maintenance shall be conducted in accordance with the manufacturer’s listed installation and maintenance manual.

7.3.2.1 Maintenance shall include the following:

(1) A check to see that the hazard has not changed
7.3.2.5 The maintenance report, with recommendations, if any, shall be filed with the owner or with the designated party responsible for the system.
7.3.2.6* Each wet chemical system shall have a tag or label securely attached, indicating the month and year the maintenance is performed and identifying the person performing the service. Only the current tag or label shall remain in place.
7.3.3.1 The year of manufacture and the date of installation of the fixed temperature-sensing element shall be marked on the system inspection tag. The tag shall be signed or initialed by the installer.

See AFC Tag and Technician Certification Requirements
NFPA 17A - Maintenance
## NFPA 17A - Maintenance

### Inspection Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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<tbody>
<tr>
<td>1. System is connected to fire alarm system</td>
<td>☐ ☐ ☐</td>
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<tr>
<td>2. System is connected to monitoring system</td>
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<tr>
<td>3. Wash down / fire cycle</td>
<td>☐ ☐ ☐</td>
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<tr>
<td>4. Insert safety pin in system control head</td>
<td>☐ ☐ ☐</td>
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<td>5. Is system visible, free from all obstructions?</td>
<td>☐ ☐ ☐</td>
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<td>6. Check system against original equipment layout</td>
<td>☐ ☐ ☐</td>
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<td>7. Pressure gauge is in operable range?</td>
<td>☐ ☐ ☐</td>
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<td>8. Any visible signs of tampering?</td>
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<td>9. Correct nozzle positioning?</td>
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<tr>
<td>10. Complete hazard coverage</td>
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<tr>
<td>11. Inspect local and remote manual releases</td>
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<tr>
<td>12. Check all piping and conduit</td>
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<tr>
<td>13. Inspect actuation cable for fraying or weak spots</td>
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</table>

### Next Inspection Due:

<table>
<thead>
<tr>
<th>System Type</th>
<th>Manufacturer</th>
<th>Max Flow Points</th>
<th>Installation Date</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>System #</th>
<th>OF</th>
<th>Cylinder Size</th>
<th>Serial #</th>
<th>Last H - Test</th>
<th>Due H - Test</th>
<th>Due 6 - year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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### NFPA 17A - Maintenance

<table>
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<tr>
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<tbody>
<tr>
<td>13.</td>
<td>Inspect actuation cable for fraying or weak spots</td>
</tr>
<tr>
<td>14.</td>
<td>Inspect hood and fillers for condition / approvals</td>
</tr>
<tr>
<td>15.</td>
<td>Inspect for grease build up in exhaust system</td>
</tr>
<tr>
<td>28.</td>
<td>System tagged with technician signature and dated</td>
</tr>
<tr>
<td>29.</td>
<td>System reactivated/safety pin removed/tension reset</td>
</tr>
<tr>
<td>30.</td>
<td>Maintain type K extinguisher</td>
</tr>
</tbody>
</table>

**SYSTEM LAYOUT / COMMENTS:**

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**TECHNICIAN'S NAME**

**SYSTEM CERTIFIED**

**CUSTOMER'S SIGNATURE**

**TECHNICIAN'S NAME**

**SYSTEM NOT CERTIFIED**

THE ALBERTA FIRE CODE REQUIRES UNCERTIFIED SYSTEMS BE REPORTED TO THE AUTHORITY HAVING JURISDICTION.

PLEASE PRINT

WHITE COPY - OFFICE, YELLOW COPY - CUSTOMER, PINK COPY - FIRE AUTHORITY

Page ___ of ___
11.3* Inspection for Grease Buildup.

The entire exhaust system shall be inspected for grease buildup by a properly trained, qualified, and certified company or person(s) acceptable to the authority having jurisdiction in accordance with Table 11.3.
# Table 11.3

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<tr>
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</table>
11.4.6 Flammable solvents or other flammable cleaning aids shall not be used.

11.4.7 Cleaning chemicals shall not be applied on fusible links or other detection devices of the automatic extinguishing system.

11.4.8 After the exhaust system is cleaned, it shall not be coated with powder or other substance.
11.4.12 When a vent cleaning service is used, a certificate showing date of inspection or cleaning shall be maintained on the premises.

11.4.13 After cleaning is completed, the vent cleaning contractor shall place or display within the kitchen area a label indicating the date cleaned, the name of the servicing company, and areas not cleaned. [On the Hood]
Thank You

Alberta Fire Safety Association

www.albertafire.com