Mobile Food Preparation Vehicles

Tom Jenson & Jake Lindquist

MINNESOTA STATE FIRE MARSHAL DIVISION
445 Minnesota Street; Suite 145 Saint Paul, MN 55101
Why it Matters
Lakeville May, 2015
NFPA 96 technical committee
NFPA 96 2017 edition
  - Annex B
NFPA 96 2021 edition
  - Annex B language moved into body of the standard
IFC 2018 edition
  - Section 319
  - No changes in 2021 IFC
  - Changes could occur in the 2024 IFC
City to City Inspections

• Are you issuing operational permits?
  - Section 105.6.30
• Do you have a city ordinance?
  - More or less restrictive than MSFC?
• No SFMD approval process
• Should one city’s approval apply to the next city?
• Vehicles that contain cooking equipment that produce smoke or grease-laden vapors for the purpose of preparing and serving food to the public.

• Private recreation vehicles are not considered mobile food preparation vehicles.
A Kitchen Exhaust hood is required where the cooking appliances or operation create grease laden vapors.

The kitchen exhaust hood must meet the requirements of MSCF Section 607.
Commercial kitchen exhaust hoods shall comply with the requirements of the International Mechanical Code.

- Type I Hood
- Type II Hood
Cooking Operations

Class 1 Cooking Operation
- Commercial Operation
- Type I hoods are required for cooking operations that produce grease laden vapors

- Ranges
- Stoves
- Induction cookers
- Hot plates
- Electric frying pans
- Conveyor ovens when used for meat
- Braising pans
- Char broilers
- Woks
- Griddles
- Deep fat fryers
- Broilers
- Pan frying
- barbeque
- Rotisseries
- Equipment designed my the manufacture to produce grease
Class 2 Cooking Operations
• Equipment or process that produces significant steam or heat but does not produce grease-laden vapors.
  • Type II Hood

Class 3 Cooking Operations
• Equipment or process that is equivalent to residential cooking

Class 4 Cooking Operations
• Enclosed equipment - own grease filtering and suppression

Class 5 Cooking Operations
• Room Ventilation is adequate
The ventilation system in connection with hoods shall be operated at the required rate of air movement, and grease filters listed and labeled in accordance with UL 1046 shall be in place where equipment under a kitchen grease hood is used.

MSFC SECTION 607.3.1
Where grease extractors are installed, they shall be operated when the commercial-type cooking equipment is used.
Cooking equipment shall be protected by automatic fire extinguishing systems in accordance with Section 904.12
Fire Protection

The automatic fire extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected.

- Known as Pre-engineered systems
- UL 300 for modern kitchens
- Wet Chemical is most common
- Per MSFC 904.5 Installed per the 2017 edition of NFPA 17A
- Installed per manufacturers installation manual
A manual activation device is required near the means of egress.

In a Mobile food preparation vehicle it should be placed on the door exiting the cooking area to the outside of the vehicle.

- Not less than 10 feet and not more than 20 feet from the hood.
- 42” to 48” mounting height.
- Clearly identify the protected hazard.
- 40 maximum pull pressure.
The actuation of the fire extinguishing system must automatically shut down the fuel or electrical power supply to the cooking equipment.

- Manual fuel and electrical supply reset required
Portable fire extinguishers shall be provided in accordance with Section 906.4
Fire extinguishers provided for the protection of cooking equipment shall be of an approved type compatible with the automatic fire-extinguishing system agent.

Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K-rated portable extinguisher.
Solid fuel cooking whether or not under a hood with a fire box 5 Cubic Feet or less require a single 2.5 or two 1.5 gallon class K extinguishers.

Deep fat frying
- Up to 4 fryers (80 lb. max capacity) require One 1.5 gallon class K extinguisher
- Each additional 4 fryers (80 lb. max capacity) require an additional 1.5 gallon extinguisher
- Individual fryers exceeding 6 square feet must be installed per the manufactures recommendations
Fuel Supply Piping - General

• Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16

ANSI Z21.69/CSA 6.16
(Connectors for movable gas appliances)
• Connector construction and materials
• Markings
• Performance
• Durability

Photo: All Points Food Service

MSFC SECTION 319.5
Fuel Supply Piping

- The connector installation shall be configured in accordance with the manufacturer’s installation instructions.
- Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturers’ instructions.

Photo: All Points Food Service
Cooking Oil Storage

Containers for cooking oil storage cannot exceed 120 gallons and need to be stored securely during transport.

Tanks for cooking oil storage must comply with sections 319.7.1 through 319.7.5.2
Cooking Oil Storage

Nonmetallic Storage Tanks
- Max capacity of 200 gallons
- Listed for high heat
- Installed per manufactures instructions

Metallic Oil Storage Tanks
- No limit
- Listed UL 80 or UL 142
Cooking Oil Storage

Oil transfer System Components
• Include but not limited to piping connections, fittings, valves, tubing, hoses, pumps, vents, and other components used in the transfer of cooking oil.

Design, fabrication, and assembly of system components
Suitable for:
• Working pressures
• Temperatures
• Structural stresses
Both normal and emergency vents must be installed on cooking oil storage tanks.
Normal vents

- Located above the normal fill line
- Must be as large as the largest filling or withdrawal connection
- Not required to vent to the exterior
  - 5704.2.7.3.3 vent must be a normally closed type

MSFC SECTION 319.7.5.1
Emergency vents

- Located above the normal fill line
- Designed to relieve excess internal pressure
- Not required to vent to the exterior
- Non Metallic Tanks are allowed to use the tank construction in creating a relief vent.
LP Gas

Cooking Fuel - LP Gas

LP Gas Must comply with:

- MSFC sections 319.8.1 through 319.8.5
- NFPA 58
- Chapter 61

- Total aggregate volume
- Container protection
- Container construction
- System Piping
- Alarms
Cooking Fuel – LP Gas

Maximum aggregate volume
The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances.

- cannot exceed 200 pounds propane capacity.

Approximate Dimensions 48” - 50” high x 15”-18” diameter
Cooking Fuel – LP Gas

Protection of container
LP-gas containers installed on the vehicle must be:
• Securely mounted
• Restrained to prevent movement
LP-gas container construction
LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

- Chapter 9 Vehicular Transportation of LP Gas
Cooking Fuel – LP Gas

Protection of system piping

LP-gas system piping, including valves and fittings:

- Adequately protected to prevent tampering,
- Impact damage
- Damage from vibration.
LP-gas alarms

- Listed
- Installed within the vehicle in the vicinity of LP-gas system components,
- Installed in accordance with the manufacturer’s instructions.

A UL 2075 (Standard for Safety Gas and Vapor Detectors and Sensors) Listed device is advised
CNG Gas Vs. Propane

- Slightly Safer because it is lighter than air and dissipates quicker
- Propane delivers higher BTU’s for the money
- Propane is readily available
- Both are considered clean burning fuels
- Using propane appliances requires a conversion or special regulator
Compressed Natural Gas (CNG) applications must comply with section 319.9.1 through 319.9.4

- CNG Containers
- Maximum Volume
- Container Protection
- Container Construction
- CNG for cooking and vehicle power
- System Piping
- Alarms
Cooking Fuel – CNG Gas

• Maximum volume CNG allowed on a vehicle is 1300 pounds

• CNG containers must be securely mounted and restrained to prevent movement.

• Containers shall not be installed in locations subject to a direct vehicle impact.
Cooking Fuel – CNG Gas

• CNG Tank must be an NVG-2 type cylinder
  • Must meet 49 CFR 571.304 (requirements for CNG Fuel container integrity)
• Type 1-4 Metallic and Composite
• Subject to a burst test
• Subject to a Bonfire test
• Requires Labeling
• Hydrostatically tested to 125% of service pressure
Cooking Fuel – CNG Gas

CNG Containers that supply both vehicle fuel and cooking fuel must be installed per the 2016 edition of NFPA 52 (Vehicular Natural Gas Fuel Systems)

- Piping system design, materials, and components
- Piping inspection, testing, system leak check, and purging
- Minimum safe performance criteria, general requirements, and specifications for venting combustion products.
CNG Gas system piping including valves and fittings must be protected against tampering and damage and vibration.
Cooking Fuel – CNG Gas

A listed methane gas alarm shall be installed within the vehicle in accordance with manufacturer’s instructions.

A UL 2075 (Standard for Safety Gas and Vapor Detectors and Sensors)
Listed device is advised

Macurco Series GD-6 Gas Detector
General Maintenance

Maintenance on systems in mobile food preparation vehicles must be in accordance with sections 319.10.1 through 319.10.3

Includes:

- Hood maintenance requirements from Section 607
- Fire suppression system maintenance from Section 901
- Annual inspections of fuel gas piping systems
Exhaust System– Maintenance

Maintenance on Exhaust System

The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 607.3.
Ventilation System The ventilation system in connection with hoods shall be operated at the required rate of air movement, and grease filters listed and labeled in accordance with UL 1046 shall be in place where equipment under a kitchen grease hood is used.
Ventilation System Inspection and Cleaning

Inspections are required based on the volume of cooking being performed.

<table>
<thead>
<tr>
<th>Type of Cooking Operations</th>
<th>Frequency of Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-volume cooking operations such as 24- hour cooking, charbroiling or wok cooking</td>
<td>3 Months</td>
</tr>
<tr>
<td>Low-volume cooking operations such as places of religious worship, seasonal businesses</td>
<td>12 Months</td>
</tr>
<tr>
<td>and senior centers</td>
<td></td>
</tr>
<tr>
<td>Cooking operations utilizing solid fuel-burning cooking appliances</td>
<td>1 Month</td>
</tr>
<tr>
<td>All other cooking operations</td>
<td>6 Months</td>
</tr>
</tbody>
</table>
Exhaust System – Maintenance

50 Microns (.001 inches) - Acceptable
2000 Microns (.078 inches) - Cleaning is required
3175 Microns (1.25 inches) - Critical grease depth
Exhaust System – Maintenance

Acceptable 50 microns or less

Cleaning Depth 2000 microns or less

Critical Depth 3175 Microns or more
Exhaust System– Maintenance

MSFC 607.3.3.2 Grease Accumulation

If during the inspection it is found that hoods, grease-removal devices, fans, ducts or other appurtenances have an accumulation of grease, such components shall be cleaned in accordance with ANSI/IKECA C10.
Tags. When a commercial kitchen hood or duct system is inspected, a tag provided in a conspicuous location containing the:

- service provider name
- address
- telephone number
- date of service

Prior tags shall be covered or removed.
Fire protection systems and devices shall be maintained in accordance with Section 901.6.

901.6 Fire Protection must be maintained in an operable condition at all times.

- Wet Chemical cylinders outside when cold
### NFPA 17A Section 7

#### Fire Protection System Maintenance Standards

<table>
<thead>
<tr>
<th>System</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable fire extinguishers</td>
<td>NFPA 10</td>
</tr>
<tr>
<td>Carbon dioxide fire-extinguishing system</td>
<td>NFPA 12</td>
</tr>
<tr>
<td>Halon 1301 fire-extinguishing systems</td>
<td>NFPA 12A</td>
</tr>
<tr>
<td>Dry-chemical extinguishing systems</td>
<td>NFPA 17</td>
</tr>
<tr>
<td>Wet-chemical extinguishing systems</td>
<td>NFPA 17A</td>
</tr>
</tbody>
</table>
Technicians that perform testing, inspections, and maintenance are to:

- Be trained and certified including passing a written or online test (typically by the manufacturer) that is acceptable by the AHJ
- Possess a document confirming certification
- Have availability to applicable manufacturer installation and service manuals as well as relevant technical bulletins
• Inspections and maintenance is the responsibility of the system owner and monthly the owner must do a visual inspection.

• At least semiannually and after any system activation maintenance shall be conducted in accordance with the manufacturer's design, installation, and maintenance manual.
Fire Protection Systems– Inspection Requirements

1. Check to see that the hazard has not changed
2. An examination of all detectors, the expellant gas container(s), the agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, all auxiliary equipment, and the liquid level of all non-pressurized wet chemical containers
3. Verification that the agent distribution piping is not obstructed
During inspection the technician looks for corrosion and pitting in the cylinders as well as structural damage and fire damage where these are found the cylinder or component is considered compromised or deficient.

• If deficiencies are found in the tank then it must be hydro-tested or replaced.

• If deficiencies are found in the system components then they need to be replaced.
Fixed temperature-sensing elements of the fusible metal alloy–type or glass bulb–type shall be replaced at least semiannually from the date of installation or more frequently, if necessary, and shall be destroyed when removed.

Replacement date must be put on the service tag
Inspection reports including recommendations must be:

- Provided to the owner or owners representative
- Kept for the period of one year

Inspection Tags or Labels must:

- Indicate the month and year the maintenance is performed and identifying the person performing the service.
- Be firmly affixed or in a location it will remain until next service
- Only the current tag or label shall remain in place
NFPA 17A has many more sections applicable to maintenance including sections:

- 7.3.4 fixed temperature sensing elements
- 7.4 Recharging
- 7.5 Hydrostatic testing
- 7.6 Cylinder collars

Typical Service Collar
Cooking Fuel – Maintenance

LP Fuel Gas Systems

LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually:

• By an approved inspection agency or a company that is registered with the U.S. Department of Transportation to requalify LP-gas cylinders to ensure:
  • It is free from damage
  • Suitable for service
  • Not leaking
CNG Gas Systems

- CNG containers shall be inspected every 3 years in a qualified service facility to ensure:
  - containers are not used past their expiration date listed on the manufacturers label
- Upon approval the inspection agency must place a tag or sticker on the fuel gas system indicating its name and the date of the inspection.
Additional Information

Barbecues and Open Flames on Balconies and Patios

Background
Barbecues and open flames are common around Minnesota and pose safety risks for multi-family buildings. The Minnesota State Fire Code requires that all open flames are prohibited on balconies and patios. The Fire Marshal Division is responsible for enforcing these regulations.

Minnesota State Fire Code Appendix O
This appendix contains the rules for balconies and patios, including:

- 1.1 Open Flame Prohibited
- 1.2 Fuel Storage Prohibited
- Exception: Retired or pre-fab barbecues

Additional Information
- To ensure compliance, all balconies and patios must be free from open flames.

SHEET PHOTO TO BE UPDATED BEFORE APRIL PRESENTATION