NFPA 96

Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

Tentative Interim Amendment Request

By, Tom Johnson, tomj@jdpinc.com 651-686-8499x101

Background

- NFPA 96 Chapt. 13 establishes criteria for systems designed to reduce smoke and grease vapor to the extent that there is no need for direct exhaust (listed recirculating systems)
- The method of test (MOT) used to determine the effectiveness of these systems (each of which is designed for specific ranges of use) establishes a measurable limit for smoke and grease vapor emissions discharged into the kitchen space

Situation

- Local fire AHJ writes to Mr. Jim Lake, NFPA staff liaison, and asks if “what is smoke and grease vapor”, and what is an acceptable amount?
- Mr. Lake responds that there is no threshold limit value in NFPA 96…creating a totally subjective, zero tolerance potential to all food heating processes. Claims all such processes in scope of NFPA 96

Mechanical Codes blindly lump all “commercial food heat processing equipment” into one category

- Hot food wells rated as cook and hold are rated as “commercial food heat processing equipment”; code says all commercial food heat processing must be protected by Type I or II hoods. Also, if a Type I is required (because of smoke or grease vapor) then a UL300 fire system is required.
- Hot dog roller grills?
- Countertop cookie ovens/par baked pizza ovens?
- Baking bread only in electric convection oven?
- Other warming processes (food + Eq) that do not produce much smoke, grease vapor or latent heat (moisture)?
- AHJ’s constantly misinterpret intent of this code section due to sloppy, inaccurate code language

Primary beneficiaries:

NATIONAL RESTAURANT ASSOCIATION

REPRESENTING THE RESTAURANT INDUSTRY

The Cornerstone of the Economy, Career Opportunities and Community Involvement

December 6, 2005

NFPA
Secretary, Standard Council
Codes and Standards Administration
One Batterymarch Park
Quincy, MA 02169-7471

Reference: **NFPA 96-2004, TIA Log 825**

Subject: **Ventilation of Commercial Cooking Operations**

The referenced Tentative Interim Amendment (TIA) incorporates language which would provide a more uniform interpretation of when a commercial cooking appliance is required to have a ventilation hood.

The National Restaurant Association was founded in 1919, and is the leading trade association for the restaurant industry. Representing more than 60,000 members and over 300,000 restaurant outlets in 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands, the National Restaurant Association has always supported government enhancement to the environment. The restaurant industry has been and continues to be committed to protecting the environment by how it designs, constructs and operates the restaurants across the nation. As such, we need to assure standards set for the restaurant industry are clear and provide science based requirements and not ambiguous language which allows for subjective interpretations that can unnecessarily provide an economic burden to restaurant operators nationwide.

Unfortunately, this has been the case when looking at section 4.1.1. Due to the ambiguity, some AHJ's are requiring ventilation hoods for commercial appliances where particulate emissions are at such a low level, grease and condensate build-up is not an issue.

As such, by recognizing the test for less than 5 mg/m^3 particulate emissions will provide verification for when a cooking appliance will not require a vent hood.

In working for the restaurant industry, it has been brought to my attention that inconsistency in the implementation of codes and standards provides confusion for the restaurant operator, encourages an adversarial relationship between the AHJ and the operator and more often than not, neglects to meet the intention of the code or standard that is being interpreted. As such, we encourage providing detail and information in the language itself to provide the most science based, uniform standard that meets its true intentions.

As such, we support this tentative interim amendment and believe that incorporation of such language will further strengthen the intention of the standard. Thank you again for giving the National Restaurant Association an opportunity to comment.

Sincerely,

Christine M. Andrews
Director, Health and Safety Regulatory Affairs

Secondary beneficiaries…

HOBART

701 S. Ridge Avenue Troy, Ohio 45374-0001 937-332-2836

November 15, 2005

NFPA
Secretary, Standards Council
Codes and Standards Administration
One Batterymarch Park
Quincy, MA 02169-7471

Reference: NFPA 96-2004, TIA Log No. 825

Subject: Ventilation of Commercial Cooking Operations

The referenced Tentative Interim Amendment (TIA) includes wording which will allow a more uniform interpretation of the age-old question of whether or not a commercial cooking appliance requires a vent hood.

Hobart manufactures commercial cooking appliances. One of my responsibilities is to see that our products are capable of complying with local and national codes. When the wording of a code requirement is as ambiguous as 4.1.1, I have no choice but to warn our customers that only the AHJ can determine whether or not a vent hood is required. Even though common sense suggests otherwise, the AHJ can, and often does, require a hood over a baking oven or other similar device where the particulate emissions are clearly at such a low level, grease and condensate build-up will not be an issue.

As an American Society for Quality (ASQ) Certified Quality Auditor (CQA), I have been trained to search for *objective evidence* that a requirement is being met or is not being met. The test for less than 5 mg/m^3 particulate emissions will provide objective evidence that an appliance and a "worst case" cooking process will be acceptable without a hood.

As a Quality Engineer, I routinely search for the "root cause" of a systemic problem. Treating the symptoms never cures the problem. The problem in this case appears to be that some AHJ's require vent hoods over small, light duty cooking appliances when they are not necessary. The root cause of this situation is that the NFPA 96 requirements are not detailed enough for consistent, uniform interpretations. The proponent's language appears to be a logical step towards a more rational method of determining whether or not an installation requires a hood.

Please consider accepting this tentative interim amendment so that inspectors, owners, installers and all others with a vested interest can benefit by the simplification of the decision making process. Thank you for the opportunity to comment.

Sincerely,

Copies to:
File (2) NFPA-TIA no-825

Joel F. Hipp, CQA
Foodservice Agency Approval
Engineer
(937) 332-2836 fax 332-2624

December 5, 2005

NFPA
Secretary, Standards Council
Codes and Standards Administration
One Batterymarch Park
Quincy, MA 02169-7471

Reference: NFPA 96-2004, TIA LOG No. 825

Subject: Ventless operation of light-medium duty commercial products with Integral Systems for Limiting the Emissions of Grease Laden Air.

TurboChef Technologies is in support of the amendment to add definitive non-subjective language to NFPA 96 as it relates to Particulate Matter emissions from Recognized or Listed cooking equipment. The proposed threshold, 5mg/m^3 is acceptable and is supported by UL KNLZ, EPA 202, and UL 710B. In addition, such states as Minnesota, Michigan (MMC R408.30935a) and California (CURFFL section 114140) have recognized the 5.0mg/m^3 standard through their acceptance of UL standards or other such language.

TurboChef Technologies designs and manufactures impingement microwave and non-microwave ovens that conform to the standards derived from UL 197SB. With field installations now approaching 30,000 units, TurboChef has hired outside professionals to respond to the volume of questions that are generated during the installation of our products designed for the rethermalization of ready-to-eat food products such as par-baked pizza, sandwiches, etc. This increase in support volume stems from ambiguity in the model Building Codes and Fire Code – specifically as to when a hood is or is not required. While we continue to invest in education and proprietary testing data to reduce consumer confusion, we feel it will be far more efficient for all parties involved if the code(s) were to evolve with today's technology, allowing tested processes and proven equipment that have demonstrated limited emissions to be installed without requiring secondary localized exhaust.

In summary, we strongly recommend adopting clear and concise standards for limited emission "ventless" processes (including recirculating hood systems). This will eliminate confusion and free up local AHJ's to contribute to public health and safety efficiently and effectively.

Respectfully submitted,

James K. Pool III

James Kelly Pool III
VP of Engineering
TurboChef Technologies, Inc.

Glossary

- UL710 is the Standard for commercial kitchen ventilation systems
- UL710B is the sub category that deals with systems designed to operate without requiring exhaust to outside; reference EPA202
- Sub category MOT's exist, each for different system applications
  - KNLZ, Integral grease removal system
    - Eg., catalytic systems designed to reduce emissions
  - YYKZ, Recirculating systems
    - Eg., Giles, Wells Mfg, Autofry and others…multi-stage filter systems to reduce smoke and grease emissions form fryers, griddles, etc, with on-board fire suppression and safety interlocks

Mr. Lakes comment to local fire AHJ:

Tracy Kilmer

From: "Lake, Jim" <jlake@NFPA.org>
To: "Tracy Kilmer" <tkilmer@boroughofpalmyra.com>
Cc: "Caron, Maureen" <mcaron@NFPA.org>
Sent: Thursday, February 17, 2005 11:37 AM
Subject: RE: NFPA 96

You are correct, NFPA 96 does not establish any threshold on the amount of grease laden vapor produced. Therefore any appliance that produces grease laden vapor would fall under the scope of NFPA 96. The EPA standard is an environmental standard not a fire safety standard. Allowable grease laden vapor production under the EPA standard has no bearing on NFPA 96.

Best Regards
James D. Lake
Senior Fire Protection Specialist
NFPA

Yet, “appliances” do NOT produce smoke and grease vapor…thermal processing of animal proteins and plant foods do – it’s the **processes** that must be tested…

Mr. Johnson,
I agree with your comments as they apply to recirculating hoods, however, my answer to Mr. Kilmer was correct though may have been too abbreviated as it did not mention the requirements regarding recirculating hoods. You are correct that recirculating appliances that have been listed to UL197 and meet the requirements of Chapter 13 could be used without the extra protection of a Type 1 hood. The standard is clear on that and I did not intend to imply otherwise.

However, these systems have undergone specific testing and measurable results have been attained at their outlets in order to achieve this listing and Section 4.1.1.1 and 4.1.1.2 clearly only apply to these systems. The same cannot be said for other appliances that are not listed to UL197.

I do not agree with your assessment that the standard can be interpreted to apply the $5mg/m^3$ threshold to all processes that produce grease laden vapors. Sections 4.1.1.1 and 4.1.1.2 clearly apply only to recirculating systems. If it were the intent of the committee to apply this threshold to all process I believe the language would not have been so limited. In fact during the development of the 2001 edition of the standard the committee rejected a Public Proposal to apply the $5mg/m^3$ threshold to all appliances.

This remains the call of the authority having jurisdiction. If the appliance is specifically listed to UL 197 then the standard gives specific guidance. If the appliance is not listed to UL 197 then the standard contains no threshold and it is the decision of the AHJ whether or not to require a hood in accordance with NFPA 96.

Finally, I believe that your labeling of this issue as zero-tolerance is incorrect. I have never stated that there is a zero-tolerance threshold in NFPA 96. The fact is that these pieces of equipment are considered commercial cooking appliances and as such they are automatically within the scope of NFPA 96 (1.1.1 and 1.1.2) because the scope makes no mention of the production of grease laden vapor as a limiting factor in the application of the standard.
It then becomes incumbent upon the AHJ to decide to what extent to apply the requirements of the standard, specifically using 1.3.2, 1.5, 4.1.1 and 10.2.1. I believe the sections provide the same flexibility that was indicated in the IAPMO response.

Best Regards
James D. Lake
Senior Fire Protection Specialist
NFPA

The Issues

- Heat is treated as a hazard that requires an exhaust system
- Systems that pass the UL 710B (formerly in UL 197SB) test method and successfully reduce smoke and grease vapor emissions below the published limit (5mg/m^3-EPA202/UL710B)for specific items and loading are not required to have exhaust systems that discharge process air outdoors.
- If a process (eg., finishing ready to eat foods) is tested against **the same test limits** and passes, exhaust to the outside ought not be required (no hood) UNLESS HVAC system is not adequate to maintain acceptable indoor air quality.
- Fire systems should only be required for untested processes that produce (or are likely to produce) more smoke and grease vapor than test limit allows
- Some inspectors argue that operators cannot be trusted and will use equipment in a manner that emits more smoke and grease vapor than the test limit value.
- Operators, contractors, professional designers and manufacturers (industry) face strict liability; due diligence can only reduce damage awards – its their responsibility to know the hazards associated with their operations
- AHJ's have discretionary (inspectors) immunity

Training and education

- Most inspectors lack knowledge of the physics of heat transfer and effluent emission characteristics of warming animal and plant foods – not familiar with AHSRAE research… Few are PE's
- Training is focused on adopted rules, not published data and statistics that correlate risk with reasonable intervention
- Inspectors have discretionary immunity and cannot be held liable for bad interpretations that cause injury or property loss
- Industry has failed to communicate effectively with model code writing groups to educate and inform them as to nuance of industry technology and innovation
- Model code groups restrict voting to AHJ leaving industry trade associations with no real influence over minimum safety criteria
- Cooking is defined only in FDA Food Code; no definition exists in building, fire or mechanical codes

Reality

- Processes (equipment+food+average loading) that are tested and proven to meet limits WITHOUT secondary grease removal devices (multi-stage filters with fire systems) are inherently safer as their safety does not rely upon a secondary system
- Large national chains find it easier to defend as they have signature processes and control of their product/process
- Poorly written model codes restrain trade and inhibit regulated industries profitability and competitiveness

Excerpts from tentative interim amendment request

When specific "signature" processes are tested by a recognized third- party testing laboratory (such as the Foodservice Technology Center at PGE in San Ramon, CA) using EPA 202 protocol and the **TOTAL** particulate measured is reported as less than the TLV for condensable particulate in EPA 202, then equivalency has been met and fire extinguishment equipment should not be required.

These are my comments to Jim Lake; if a tested process meets TLV of EPA 202, then FIRE SYSTEMS should not be required

NFPA 96 TIA 04-01 revised it to read:

4.1.1.1* Cooking equipment that has been listed in accordance with UL 197 or an equivalent standard for reduced emissions is not required to be provided with an exhaust system.

NFPA says no exhaust system req'd for listed recirc systems; no limit given for latent or sensible heat…just carte blanch

I recommend the following:

4.1.1.1* Cooking and food heat treatment processes that have been tested by recognized third part testing laboratories and found to produce less total particulate emissions than allowed in referenced test methods found in UL 710 B or an equivalent standards for processes that generate reduced grease emissions are not required to be provided with an exhaust system.

4.1.1.2 The evaluation of cooking processes covered by 4.1.1.1 shall demonstrate that the grease discharge at the exhaust duct of a test hood placed over the appliance shall not exceed 5 mg/m^3 when operated with a total airflow of 0.236 cubic meters per second (500 cfm).

Burger King also agree's with TIA request

-----Original Message-----
From: Finck, Mark [mailto:MFinck@whopper.com]
Sent: Tuesday, October 18, 2005 5:22 PM
To: Fred Kahn; Deputy44@aol.com; DDemers917@aol.com; dfoster@iso.com; garyhopson@ars.aon.com; lcapalbo@taylorfreezers.com; mohara@mtstar.com; packland@shaw.ca; philm@gaylordusa.com; rleicht@state.de.us; rodg@getzfire.com; Steven.Levin@CNA.com; valentineinc@snip.net; bpbl@bellsouth.net; firepe@cox.net; KKLWCJR@verizon.ne; rusty@dhdsi.com; Delorenzo, Mark; ldevito@fireproincorporated.co; vfloyd@thermalceramics.com; dlg@together.net; eddiehard@hotmail.com; bklingenmaier@tycoint.com; frank.kohout@mcd.com; jlaudun@dps.state.la.us; roy.a.meacham@us.ul.com; dmirza@ducts.com; doc@nfs-fire.com; john.richards@hq.med.va.gov; rogerrot@tmail.com; jrudd@state.de.us; hschildkraut@s3consultants.net; vpstack@theramp.net; emmanuel.a.sopeju@ca.ul.com
Subject: RE: my response to recent TIA

My comments are that heath safety standards by EPA have establish test methods - 202 which states limits to allowable emissions in a kitchen of 5 mg/m3 suitable for any cooking process. This test has been the protocol that third party laborites test and have listed recirculation hoods. What NFPA-96 needs to determine is that these levels of emissions are a fire risk, from what I understand in section 13.2.12.2 that these systems are not a risk based on the test methods. It also states these hoods are to be listed with testing laboratory 13.2.4. If I understand the TIA - equipment that has been laboratory tested to the emission test EPA 202 method and found that the emissions from the cooking process meets the 5 mg/m3 or less why require a fire rated hood system. ASHRAE has been evaluating cooking equipment emissions for along time - TC510 cooking ventilation section has listed equipment in categories of emissions and I would recommend that NFPA-96 evaluate this data and this help to classify the needs for hoods over small appliances.

Lets face the fact the local AHJ will have the final responsibility for approve of equipment installation or procedure 3.2.2, but if we don not allow for reasonable judgments the AHJ to determine what grease laden vapors limits are (4.1.1) we will end up with hoods over every food process equipment, as each food service equipment produces heat,vapors and emissions.

Mark Finck
Equipment Development Engineer
Burger King Brands

To Do

- Support the tentative interim amendment request by sending a public comment to NFPA 96 committee BEFORE DEC 7th
- Go to NFPA website to read TIA request: http://www.nfpa.org/assets/files/PDF/NFPA%20News/nfpanews1005.pdf
- Deadline for Public comments is Dec. 7th.