Public Comment No. 16-NFPA 86-2021 [Section No. 1.2]

1.2 Purpose.

This standard provides the requirements to minimize the risks from fire and explosion hazards for equipment that falls under this standard.

Statement of Problem and Substantiation for Public Comment

You can't minimize hazards, only the "risks" can be minimized.

Related Item

- FR 24

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 21 13:37:28 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Accepted
Resolution: SR-3-NFPA 86-2021
Statement: Only the "risks" can be minimized and not "hazards"

Public Comment No. 7-NFPA 86-2021 [Section No. 1.3.3]

1.3.3

Chapter 7 shall apply to all operating furnaces regardless of the year installed .

Statement of Problem and Substantiation for Public Comment

Adding the proposed language makes it more clear that this item applies to all equipment installed and made to operate even prior to this documents adoption. It has been my experience that most owners and users do not understand that this is actually a retroactive requirement even though the language regarding retroactivity is not explicit.

Related Item

• PI 40.

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:16:36 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-4-NFPA 86-2021
Statement: The requirements of chapter 7, which are operating, maintenance, and commissioning, apply retroactively for all furnaces to maintain safe operating conditions.

Public Comment No. 15-NFPA 86-2021 [Section No. 1.3.4]

1.3.4

Section 6.2 shall apply to the following:

(1) Furnace heating systems fired with fuel gases, including the following:

(2) Natural gas

(3) Mixed gas

(4) Manufactured gas

(5) Liquefied petroleum gas (LP-Gas) in the vapor phase

(6) LP-Gas/air systems

(7)* ~~Hydrogen gas~~

(a)

(8) Gas-burning portions of dual-fuel or combination burners

Statement of Problem and Substantiation for Public Comment

NFPA 86 requires NFPA 54 for piping materials, which excludes hydrogen. Other concerns are listed safety devices used on hydrogen. ASME B31.12-2011 address handing of H2 gas. NFPA 2 excludes mixtures less than 95% H2.

Related Item

• FR 77

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 21 13:33:50 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-15-NFPA 86-2021

Statement: Piping materials and related equipment need to be compatible with the fluid and service intended. NFPA 54 does not apply to hydrogen used solely as a fuel gas and applicable design standards should be used when using hydrogen as a fuel gas.

Public Comment No. 24-NFPA 86-2021 [Section No. 2.3.4]

2.3.4 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D396, *Standard Specifications for Fuel Oils,* ~~2015b~~ 2021 .

ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C*, 2019a.

ASTM E2652, *Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C*, 2018.

Statement of Problem and Substantiation for Public Comment

date update

Related Item

• PI116

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Apr 26 13:59:37 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-1-NFPA 86-2021
Statement: Reference standards are updated to the latest edition year.

Public Comment No. 8-NFPA 86-2021 [Section No. 3.3.14]

3.3.14* Cut-Away Damper.

A restricting airflow device that, when placed in the maximum closed position, still allows the required flow for safety ventilation, exhaust, or combustion air .

Statement of Problem and Substantiation for Public Comment

The definition, as it stands after first draft, implies that cut away dampers are only relevant or apply to safety ventilation (i.e. class A furnace atmosphere dilution). Users of the document need to understand that at any time dampers are trimmed or (cut away), so as not to make for complete shut off, they still must pass the minimum required air flow.

Related Item

• PI 42

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:22:10 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected
Resolution: The term cut-away damper only refers to safety ventilation at the moment and not combustion air or exhaust.

Public Comment No. 10-NFPA 86-2021 [Section No. 5.1.1.3]

5.1.1.3

Furnaces shall be located so as to make maximum use of natural ventilation, to minimize restrictions to adequate explosion relief, and to provide sufficient air supply for personnel.

Additional Proposed Changes

File Name	Description	Approved
5.1.1.3_annex_proposed.docx	proposed annex material	

Statement of Problem and Substantiation for Public Comment

I believe that the attached annex material helps the user of this document to effectively consider some of the most important issues for compliance with this item

Related Item

• PI 48

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:43:37 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected
Resolution: The material is inappropriate for this location.

5.1.1.3*

Consideration should be given for ambient temperatures that might occur in the area of the furnace that could be detrimental to components and personnel. Room or space volume, ceiling or roof heights, location of general ventilation fans, outside wall openings and other criteria should be considered when locating furnaces. Heat stress could be an important factor for worker health and safety when considering seasonal temperatures in operating areas and the need for wearing FRC clothing.

Public Comment No. 9-NFPA 86-2021 [Section No. 5.1.1.3]

5.1.1.3

Furnaces shall be located so as to make maximum use of natural ~~ventilation, to minimize restrictions to adequate explosion relief, and to~~ ventilation and to provide sufficient air supply for personnel.

Statement of Problem and Substantiation for Public Comment

It makes no sense to address explosion relief in this item since it is more fully and completely addressed in section 5.3

Related Item

• PI 49

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:35:54 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected

Resolution: Obstructions to explosion relief need to be considered when locating a furnace and additional language would not provide clarity in the to the requirements for locating a furnace.

Public Comment No. 11-NFPA 86-2021 [Section No. 5.1.3.1]

5.1.3.1

Furnaces shall be located so as to minimize exposure to power equipment, process equipment, and sprinkler risers.

Additional Proposed Changes

File Name	Description	Approved
5.1.3.1_annex_proposed.docx	5.1.3.1 proposed annex material	

Statement of Problem and Substantiation for Public Comment

The attached annex material is proposed to provide more clarity to how the document user could more effectively comply with this item and understand some of the more important considerations and intent

Related Item

• PI 51

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:51:12 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-6-NFPA 86-2021
Statement: The annex material is to provide more clarity to how the document user could more effectively comply with this item and understand some of the more important considerations.

5.1.3.1*

Consideration should be given to not create ambient temperatures from convective or radiant heat transfer that is in excess of manufacturers recommended ambient temperatures for unrelated equipment or sprinkler systems that are in the area of the new fired equipment to be installed. The new equipment or systems should also not limit access for regular maintenance or operation of other systems or equipment in the area.

Public Comment No. 17-NFPA 86-2021 [Section No. 5.3.1]

5.3.1*

Fuel-fired furnaces and furnaces that contain flammable liquids, gases, or combustible dusts shall be equipped with unobstructed explosion relief for freely relieving internal explosion pressures except in the following cases:

(1) Explosion relief shall not be required on furnaces with shell construction having 3⁄16 in. (4.8 mm) or heavier steel plate or equivalent strength construction shells reinforced with structural steel beams and buckstays that support and retain refractory or insulating materials that are required for temperature endurance, which makes them unsuitable for the installation of explosion relief.

(2) Explosion relief shall not be required for low-oxygen atmosphere ovens designed and protected in accordance with Section 11.7.

(3) The requirements for explosion relief shall not apply to thermal oxidizers.

(4) The requirements for explosion relief shall not apply to Class D furnaces.

(5) Explosion relief shall not be required in the heating chamber of indirect-fired ovens where it is demonstrated by calculation that the combustible concentration in the heating chamber cannot exceed 25 percent of the lower flammable limit (LFL) under any operating conditions.

(6) * Explosion relief shall not be required in the heating chamber of direct-fired ovens where all of the following conditions are met:

(7) It is demonstrated by calculation that the combustible concentration in the heating chamber cannot exceed 25 percent of the LFL under any operating conditions.

(8) LFL aspirating detection is provided to monitor flammable concentrations in each direct-fired combustion chamber and interlocked to prevent start-up or initiate a safety shutdown upon detecting a concentration greater than 10 percent of the LFL.

(9) Where recirculating direct-fired systems are implemented, the LFL aspirating detection system is calibrated for all possible flammable gases that could be present as a result of the process or incomplete combustion.

(10 LFL aspirating detection sensing intake ports are located in the region of each combustion chamber that is most likely to accumulate flammable gases as a result of a gas leak or incomplete combustion.

(11 Documentation of LFL aspirating detection system calibration is maintained and posted at each system.

(12 LFL aspirating detection systems are calibrated at least annually or more often if recommended by the manufacturer for intended service.

(13) Explosion relief shall not be required for the combustion chamber of an indirect-fired oven that incorporates a single combustion airflow path through the heat exchanger and does not recirculate the products of combustion.

Statement of Problem and Substantiation for Public Comment

The language is design restrictive, because you can achieved equivalent safety if you use aluminum plates or a different technology. How do you prove equivalent construction?The annex that we proposed in PI 30 provided a means on how to prove equivalent construction

e.g.. Furnace users who want their equipment to qualify for this exception should analyze the stress at the center of each unreinforced plate (i.e., at the farthest point from buckstays or reinforcing beams) and ensure the maximum bending stress is less than the yield stress for the plate material at normal operating conditions. To qualify for “containment” (see A.5.3(1)), the furnace shell must be designed and stamped as a code vessel.

Related Item

• FR-69

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 21 13:39:58 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7-NFPA 86-2021
Statement: This paragraph has been revised to recognize that explosion relief is not required on the heating chamber (work chamber) of indirect-fired ovens or direct-fired Class B furnaces where other requirements of this standards provide controls to avoid an explosive fuel-air mixture inside the equipment. In addition, this paragraph has been revised to recognize that explosion relief is not required on ovens processing ordinary combustibles such as wood, paper, or plastic. Finally, this paragraph has been revised to clarify that the explosion relief requirements of this standard is not required on Class C or D furnaces as this standard provides other requirements to avoid explosive mixtures of flammable gases and air inside this equipment.

Public Comment No. 12-NFPA 86-2021 [Section No. 7.3.4]

7.3.4*

When the original equipment manufacturer's instructions or set point information for devices are no longer available, the ~~user shall~~ owner shall develop or procure operating, inspection, testing, and maintenance procedures.

Statement of Problem and Substantiation for Public Comment

This proposed modification does 2 things. It provides an awareness that its not only manufacturers instructions that might not be available but also set points of devices and it also establishes that its the owner, not the user who must secure this information. Making this an owner responsibility is more relevant than the user.

Related Item

• PI 71.1.

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 11:57:24 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-9-NFPA 86-2021
Statement: Where the original equipment manufacturer's instructions are not available it is the responsibility of the user to develop those procedures.

Public Comment No. 18-NFPA 86-2021 [Section No. 8.4.1.9]

8.4.1.9*

Repeating the preignition purge shall not be required where any one of the following conditions is satisfied:

(1) The temperature of the chamber where combustion takes place is proved to be above 1400°F (760°C).

(2) * For a multiburner fuel-fired system not proved to be above 1400°F (760°C) and with each burner system equipped with two safety shutoff valves that close between each burner that is not operating and the fuel supply, at least one burner remains operating in the common combustion chamber of the burner to be reignited.

(3) For a fuel-fired system not proved to be above 1400°F (760°C), all of the following conditions are satisfied (does not apply to fuel oil systems):

(4) The number of safety shutoff valves required to close in 8.7.1.12 and 8.7.2.1 will close between the burner system and the fuel gas supply when that burner system is off.

(5) The burner system uses natural gas, butane, or propane fuel gas.

(6)* It can be demonstrated, based on the leakage rate, that the combustible concentration in the chamber and all other passages that handle the recirculation and exhaust of products of combustion cannot exceed 25 percent of the LFL.

(7) The minimum airflow used in the LFL calculation in 8.4.1.9(3)(c) is proved and maintained during the period the burner(s) is off.

(8) * For fuel gas–fired burner systems, and assuming that all safety shutoff valves fail in the full open position, it can be demonstrated that the combustible concentration in the chamber and all other passages that handle the recirculation and exhaust of products of combustion cannot exceed 25 percent of the LFL.

(9) * For fuel gas–fired burner systems, it can be demonstrated that the combustible concentration in the chamber and all other passages that handle the recirculation and exhaust of products of combustion is not in exceedance of 25 percent of the LFL by means of a continuous vapor concentration high limits controller used in accordance with 11.6.10 and having been tested at least monthly for this function as per 7.4.8.

Statement of Problem and Substantiation for Public Comment

AND is missing.

Related Item

• FR 77

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:

City:
State:
Zip:
Submittal Date: Wed Apr 21 13:45:09 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-10-NFPA 86-2021
Statement: "And" is missing in (2) and is being corrected.

Public Comment No. 13-NFPA 86-2021 [Section No. 8.5.1.2]

8.5.1.2

Air pressure switches shall not be used to prove airflow where vslves or dampers downstream of the pressure switch can be closed to the point of reducing airflow below the minimum required.

Statement of Problem and Substantiation for Public Comment

make this consistent with 8.5.1.3

Related Item

• PI 127

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 12:08:26 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-11-NFPA 86-2021
Statement: Valves is being added to make this consistent with 8.5.1.3.

Public Comment No. 27-NFPA 86-2021 [New Section after 8.6.1]

8.6.1.1 * Electrical interlocks and flow switches shall be arranged in the safety control circuit so that loss of ventilation or airflow shuts down the heating system of the affected section ~~, or, if necessary, loss of ventilation shall shut down the entire heating system as well as the conveyor~~ .

*A.8.6.1.1 For Class A ovens, see Chapter 11 for requirements about when and how the conveying system should or should not be de-energized.

Statement of Problem and Substantiation for Public Comment

Tied to Class A Task Group on FR-17: This was a compound requirement, so separation into two separate requirements was needed, but the task group also felt that shutting down the conveyor was only applicable to Class A ovens (i.e., it's probably never required to shut down the conveyor for a Class B furnace and it's usually a good idea to continue introducing cold feed material to help the furnace cool down faster).

Related Item

• FR-17 • FR-77 8.5

Submitter Information Verification

Submitter Full Name: Thomas George
Organization: Tokio Marine America, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 09 21:44:00 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-12-NFPA 86-2021
Statement: Class A ovens will have different requirements for when to shutdown the conveyor and the reader should see the applicable chapter 11 for those requirements

Public Comment No. 14-NFPA 86-2021 [Section No. 8.7.2.2.1]

8.7.2.2.1

A proved closed condition shall be accomplished by either of the following means:

(1) A proof-of-closure switch incorporated in a listed safety shutoff valve assembly in accordance with the terms of the listing

(2) A valve proving system that is listed or meets the requirements of Section 8.3

Statement of Problem and Substantiation for Public Comment

I tried to delete the part that says, "or meets the requirements of section 8.3". I wonder if this is in error? How does a valve proving system meet the requirements of the PLC section of this document?

Related Item

• PI 130

Submitter Information Verification

Submitter Full Name: John Puskar
Organization: Prescient Technical Services L
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 13 12:16:05 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected
Resolution: Valve proving logic can be implemented through a safety PLCs and as such needs to be kept.

Public Comment No. 28-NFPA 86-2021 [New Section after 8.18.1]

8.18.1.3 * ~~Shutdown of the heating power source~~ De-energizing the electrical heating system shall not affect the operation of ~~equipment such as conveyors,~~ ventilation or recirculation fans ~~, cooling components, and other auxiliary equipment, unless specifically designed to do so~~ .

*A.8.18.1.3. For Class A ovens, see Chapter 11 for requirements about shutting down conveying or other auxiliary systems.

8.18.1.4 <renumber below>. Shutdown of ventilation or recirculation fans shall be permitted if the applicable shutdown sequence requires them to be stopped.

Statement of Problem and Substantiation for Public Comment

Class A Task Group Related to FR-17: This was a compound requirement, so separation into two separate requirements was needed. The task group also felt that shutting down the conveyor was only applicable to Class A ovens. The wisdom of shutting down ventilation or recirculation fans depends on what type of shutdown is being performed – normal, emergency, or power failure.

Related Item

• FR-17 • FR-77 8.5.1.1 & 8.17.1.3

Submitter Information Verification

Submitter Full Name: Thomas George
Organization: Tokio Marine America, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 09 21:50:00 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-13-NFPA 86-2021
Statement: Shutting down the conveyor is only applicable to Class A ovens. Shutting down ventilation or recirculation fans depends on what type of shutdown is being performed – normal, emergency, or power failure.

Public Comment No. 19-NFPA 86-2021 [Section No. 10.5.1]

10.5.1* Fume Source Fire Protection System Interlocks.

~~An interlock shall be provided so that activation of the source automatic fire protection system initiates an interruption of the source of fumes to the oxidizer system.~~

Statement of Problem and Substantiation for Public Comment

This is redundant to the Class A requirement 11.5.1, which applies to Chapter 10 Thermal Oxidizers by 10.2.1.

Related Item

• FR 3

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 21 13:47:05 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected
Resolution: This requirement is not redundant to 11.5.1 as chapter 11 does not apply to thermal oxidizers.

Public Comment No. 1-NFPA 86-2021 [Section No. 11.4.1.1]

11.4.1.1 Solvent Atmosphere Ovens.

The safety design data form or nameplate for solvent atmosphere ovens shall include all of the following design data:

(1) Solvent used

(2) ~~Number of~~ Quantity in gallons (liters) ~~per~~ or pounds (kg) per batch or per hour of solvent and volatiles entering the oven

(3) Required purge time

(4) Oven operating temperature

(5) Exhaust blower rating for the number of gallons (liters) of solvent per hour or batch at the maximum operating temperature

Statement of Problem and Substantiation for Public Comment

In many industrial facilities, solvents are added on a weight basis, not a volumetric basis. This permits the facility flexibility in reporting units that are consistent with the method of batch preparation. Explanatory material A1.11.4.1(a) and (b) should also be revised accordingly.

Related Item

•

Submitter Information Verification

Submitter Full Name: Chris Pilko
Organization: Coorstek
Street Address:
City:
State:
Zip:
Submittal Date: Mon Mar 08 17:19:55 EST 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but held

Resolution: These Public Comments could not be considered by the work of the task group and also were not based on any action in the First Draft report in these sections. The committee will review these comments during the next revision cycle.

Public Comment No. 2-NFPA 86-2021 [Section No. 11.6.1.3]

11.6.1.3

The determination of safety ventilation shall be based on all of the following:

(1) Volume of products of combustion entering the oven heating chamber

(2) Weight or volume of flammable or combustible constituents released during the heating process, based on maximum loading

(3) ~~Solvent that requires the greatest amount of ventilation air per gallon (liter) when a combination of solvents is used~~

(4) Design of the oven heating and ventilation system with regard to all of the following:

(5) Materials to be processed

(6) Temperature to which processed materials are raised

(7) Method of heating with regard to direct or indirect venting of combustion products versus alternative use of steam or electrical energy

(8) General design of the oven with regard to continuous or batch-type operation

(9) Type of fuel and chemicals to be used and any by-products generated in the heating chamber

Statement of Problem and Substantiation for Public Comment

The code does not explain how this point should be used in the calculation of the safety ventilation volume. Delete for clarity. Alternatively, provide an explanation for how an oven processing multiple solvents should be used.

Related Item

•

Submitter Information Verification

Submitter Full Name: Chris Pilko
Organization: Coorstek
Street Address:
City:
State:
Zip:
Submittal Date: Mon Mar 08 17:26:54 EST 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but held

Resolution:	These Public Comments could not be considered by the work of the task group and also were not based on any action in the First Draft report in these sections. The committee will review these comments during the next revision cycle.

Public Comment No. 20-NFPA 86-2021 [Section No. 11.6.2.2]

11.6.2.2*

~~Proof of motor operation for exhaust and recirculation fans shall be interlocked into the burner management system~~ .

Statement of Problem and Substantiation for Public Comment

Why do we need 11.6.2.2 since that same requirement is in 8.6.1 and 8.6.3?

Related Item

• FR 9

Submitter Information Verification

Submitter Full Name: Kevin Carlisle
Organization: Karl Dungs, Inc.
Affiliation: Industrial Heating Equipment Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 21 13:48:48 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-25-NFPA 86-2021
Statement: This requirement is needed because these fans may not be the same as those covered in Sections 8.5 and 8.6.

Public Comment No. 29-NFPA 86-2021 [Section No. 11.6.2.3]

11.6.2.3

~~Conveyors or sources~~
An interlock shall be provided to discontinue the introduction of flammable or combustible material.

11.6.2.4 <renumber below> The introduction of flammable or combustible material shall be

~~interlocked to shut down~~
discontinued upon the occurrence of

~~excess temperature or if either the exhaust system or the recirculation system fails~~
any of the following:

(1) Operation of the excess temperature interlock.

(2) Loss of ventilation.

(3) Loss of circulation fans.

(4) Activation of the oven's fire protection system .

Statement of Problem and Substantiation for Public Comment

Class A Task Group work related to FR-17: The task group preferred the phrase "discontinue the introduction of flammable or combustible materials" to any other language involving conveyors. Using a list format is more appropriate than using too many "or" conjunctions.

Related Item

• FR-17

Submitter Information Verification

Submitter Full Name: Thomas George
Organization: Tokio Marine America, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 09 21:52:27 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-20-NFPA 86-2021
Statement: Class A Task Group work related to FR-17: The task group preferred the phrase "discontinue the introduction of flammable or combustible materials" to any other language involving conveyors. Using a list format is more appropriate than using too many "or" conjunctions.

Public Comment No. 3-NFPA 86-2021 [Section No. 11.6.6.1]

11.6.6.1

The method for calculating the ventilation rate for products of combustion shall be as follows:

(1) The minimum oven exhaust volume for safety ventilation in continuous process ovens, including powder coating ovens, where a direct-fired combustion system (within or remote from the oven chamber) is used shall include the volume of combustion products from burners.

(2) The value used for the products of combustion shall be 183 scfm (5.18 standard m^3/min) per 1,000,000 Btu/hr (293.1 kW) burner rating.

(3) The products of combustion shall be adjusted for the oven operating temperature and the altitude as described in section 11 .6.6.2.

(4) The adjusted value shall be added to the value determined from 11.6.8.4.

Statement of Problem and Substantiation for Public Comment

Revising for clarity.

Related Item

•

Submitter Information Verification

Submitter Full Name: Chris Pilko
Organization: Coorstek
Street Address:
City:
State:
Zip:
Submittal Date: Mon Mar 08 17:32:35 EST 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but held

Resolution: These Public Comments could not be considered by the work of the task group and also were not based on any action in the First Draft report in these sections. The committee will review these comments during the next revision cycle.

Public Comment No. 30-NFPA 86-2021 [Section No. 11.6.8.2]

11.6.8.2– *

Where a continuous solvent vapor indicator and controller is provided, it shall be arranged to do one of the following to prevent the vapor concentration in the oven exhaust from exceeding 50 percent of the LFL:

(1) Alarm and shut down the oven heating systems

(2) Alarm and operate additional exhaust fans

(3) Alarm and shut down the solvent input to the oven

*A.11.6.8.2 <Pointer needed to preexisting annex material.>

Statement of Problem and Substantiation for Public Comment

Class A Task Group work related to FR-17: Restoring link to existing Annex Material

Related Item

• FR-17

Submitter Information Verification

Submitter Full Name: Thomas George
Organization: Tokio Marine America, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Sun May 09 21:54:47 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected

Resolution: There is no annex 11.6.8.2 and the task group was unable to determine which existing annex is related to this section.

Public Comment No. 25-NFPA 86-2021 [Section No. 14.2.2.1.1]

14.2.2.1.1

Piping and piping components for ~~vacuum, pressure, coolant, and quench service~~ flammable atmospheres and quench supply shall be in accordance with ASME B31.3, *Process Piping*.

Statement of Problem and Substantiation for Public Comment

Adding the reference to ASME B31.3 Process Piping is a major new requirement for Class D furnaces. ASME B31.3 compliant piping is required for Class C furnaces, in Section 13.5.5.1.1 under the heading of "Bulk Storage and Generated Supply Systems for Special Atmospheres." Extending this requirement to all vacuum furnace piping is not necessary, especially for Class D-1 and D-2 furnaces where flammable special atmospheres are not used.

Per the ASME, “ASME B31.3 contains requirements for piping typically found in petroleum refineries; chemical, pharmaceutical, textile, paper, semiconductor, and cryogenic plants; and related processing plants and terminals. It covers materials and components, design, fabrication, assembly, erection, examination, inspection, and testing of piping.”

The requirements are written for safety in piping systems that are at high pressure, where there is a lot of stored energy, and where small breeches can create high velocity gas hazards. Vacuum furnaces are designed for minimal positive pressure and therefore do not have those same hazards. Furthermore, many parts that are designed for vacuum like KF style fittings and gaskets are not ASME listed and therefore create an even greater burden as they require a separate approval of unlisted components. The burden of ASME B31.3 is high compared to the benefit.

Related Item

• Global FR 64

Submitter Information Verification

Submitter Full Name: Craig Miller
Organization: Consarc Corporation
Street Address:
City:
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Submittal Date: Mon May 03 10:26:33 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-8-NFPA 86-2021
Statement: Chapter 14 has been revised to clarify the different operating modes of a Class D furnace. Additionally when hazardous gases are released from an operating furnace the venting of said gas should be to an approved location.

Public Comment No. 26-NFPA 86-2021 [Section No. 14.5.3.15.2 [Excluding any Sub-Sections]]

~~The purge gas supply shall be connected to the vacuum chamber through a normally open valve.~~

Statement of Problem and Substantiation for Public Comment

The most commonly used inert gas, argon, is an asphyxiant. Other inert gasses may pose similar hazards. The hazards of accidental release of argon or other inert gas also must be considered. A manual bypass valve is already required in Section 14.5.3.10.2.3 which can be used in the event of automatic valve failure.

Related Item

• FR-64

Submitter Information Verification

Submitter Full Name: Craig Miller
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Submittal Date: Fri May 07 11:53:57 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected

Resolution: In the case of flammable atmospheres the hazard assessment requires that a normally open valve is in use and measures have to be taken to deal with the resulting asphyxiation hazards with appropriate measures. A normally open valve will create additional hazards that would have to be addressed.

Public Comment No. 21-NFPA 86-2021 [Section No. A.10.5.1]

A.10.5.1

The fume source could no longer be in a safe nonexplosive range in the event of a fire. Upset conditions can include flammable releases, or accumulations of CO and other potentially explosive gases. Bypassing the fume source involved in a fire to atmosphere is the most conservative approach.

Processes with toxicity in the source air could require that exhaust be discontinued or redirected to an alternate oxidizer system if multiple systems are interconnected. In this case, use of fire- and explosion-rated isolation dampers combined with explosion venting can be considered.

In systems with long duct runs from process(es) to the oxidizing system, an indeterminate atmosphere (possibly flammable) could exist in the duct at the time of interruption. Minimizing the volume of isolated duct leading to the oxidizing system reduces the severity of this hazard.

Consideration for purging the trapped volumes of isolated duct sections prior to releasing them into a running oxidizing system is necessary (see 10.6.2).

Statement of Problem and Substantiation for Public Comment

Editorial change for clarity.

Related Item

• FR3

Submitter Information Verification

Submitter Full Name: Thomas George
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Submittal Date: Fri Apr 23 16:04:07 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Accepted
Resolution: SR-14-NFPA 86-2021
Statement: Editorial change for clarity.

Public Comment No. 23-NFPA 86-2021 [New Section after A.11.5.1(3)(a)]

A.11.5.1

If the oven system is complex with multiple zones, duct runs and fire protection systems a PHA might be helpful to determine risks that aid in determining appropriate fire protection and ventilation system design approach.

Statement of Problem and Substantiation for Public Comment

While the focus of 11.5.1 and the annex material is good for simple oven installations, interactions of complex systems (ovens interconnected to other equipment such as flash zones, paint booth, oxidizers, etc.) can require a PHA to identify associated hazards and inform the designer and user that the appropriate response procedures and protection system logic is being applied.

Related Item

• FR-16

Submitter Information Verification

Submitter Full Name: Thomas George
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Submittal Date: Fri Apr 23 16:30:09 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-23-NFPA 86-2021
Statement: While the focus of 11.5.1 and the annex material is good for simple oven installations, interactions of complex systems (ovens interconnected to other equipment such as flash zones, paint booth, oxidizers, etc.) can require a PHA to identify associated hazards and inform the designer and user that the appropriate response procedures and protection system logic is being applied.

Public Comment No. 22-NFPA 86-2021 [Section No. A.11.5.1(3)(a)]

A.11.5.1(3)(a)

If demonstrating by calculation, the premise is that the oven is fully loaded, the conveyor (or equivalent) is stopped during the fire emergency, and ventilation is less than maximum available due to damper position or reduced/stopped fan operation. Flammable vapors will continue to be released during this scenario. The calculation under these conditions should demonstrate that the maximum concentration will not exceed 25 percent of the LFL in any credible subvolume of the oven (zone, for example),

Credible subvolumes are determined by evaluating the specific design. For this determination, the designer and AHJ should consider the oven volumes in which the maximum rate of flammable vapors are released and the likelihood of significant pocket for flammable vapor collecting at or above the 100 percent LFL while the total volume used in the calculation results in a ≤ 25 percent LFL result.

See Section 11.6 for examples of calculation methodology.

Statement of Problem and Substantiation for Public Comment

The clarification of limiting the flammable vapor concentration to less than or equal to 25 percent of the LFL is a critical distinction for safety. As previously written, a 25% concentration of Flammable Vapors would be permissible, which in most cases is above the Lower Flammable Limit and presents a severe explosion hazard.

Related Item

• FR-16

Submitter Information Verification

Submitter Full Name: Thomas George
Organization: Tokio Marine America, Inc.
Street Address:
City:
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Zip:
Submittal Date: Fri Apr 23 16:24:30 EDT 2021
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-21-NFPA 86-2021

Statement: The clarification of limiting the flammable vapor concentration to less than or equal to 25 percent LFL is a critical distinction for safety. As previously written, a 25% concentration of Flammable Vapors would be permissible, which in most cases is above the Lower Flammable Limit and presents a severe explosion hazard.