Public Comment No. 4-NFPA 86-2025 [New Section after 5.2.6.2]

5.2.6.3 Means shall be provided to allow for the cleaning of oven and the removal of accumulated combustible debris or residues.

A.5.2.6.3 Examples of combustible debris or residues that can accumulate in ovens may include, but not limited to, drippings from painted metal parts, lint or oily residues from processed cloth, or organic material from food processing. Accumulations can be found in any section of an oven, including the heating chamber or ductwork. Workers need access to oven components so they can be cleaned to reduce the hazard. This should include all areas where combustible materials may accumulate.

Statement of Problem and Substantiation for Public Comment

This change specifically addresses the design of the furnace with regards to ability to clean surfaces and to remove accumulations. This is intended to convey that maintenance activities include cleaning.

Related Item

• CI-19

Submitter Information Verification

Submitter Full Name: Geoffrey Raifsnider
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Submittal Date: Wed May 21 11:51:14 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-14-NFPA 86-2025
Statement: This change specifically addresses the design of the furnace with regards to ability to clean surfaces and to remove accumulations. This is intended to convey that maintenance activities include cleaning.

Public Comment No. 8-NFPA 86-2025 [Section No. 6.2.4.2]

6.2.4.2* Piping and Fittings.

6.2.4.2.1*

Piping materials shall be compatible with the fluid and service conditions.

6.2.4.2.1.1

Natural gas, manufactured gas, or liquefied petroleum gas (LP-Gas in vapor phase) piping shall comply with NFPA 54 or ASME B31.3, *Process Piping*.

6.2.4.2.1.2

Hydrogen gas or hydrogen gas mixture piping shall comply with NFPA 2 or ASME B31.12, *Hydrogen Piping and Pipelines*.

6.2.4.2.1.3

Gas piping not addressed in 6.2.4.2.1.1 and 6.2.4.2.1.2 shall comply with the applicable requirements of ASME B31.3, *Process Piping*.

6.2.4.2.1.4

Where threaded fuel gas piping is used it shall be a minimum schedule 40.

6.2.4.2.2

Fuel gas piping shall be sized to provide flow rates and pressure to maintain a stable flame over the burner operating range.

6.2.4.2.3*

The interior of gas pipe, tubing, and fittings shall be free of debris before putting into service.

Flanged Connections

A w elded flange connection, where used, shall be have the same dimensional specification of the mating flange.

add Annex

Examples of dimensional specifications for welded connections are

(1) For Grey cast iron and white cast iron flange connections ,

(2) *Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250,* ASME B16.1

(3) *Metallic flanges — Part 2: Cast iron flanges, ISO 7005-2.*

(4) Copper flange.

(5) *ANSI/ASME B16.24, Cast Copper Allow Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500, and 2500*

(6) *ISO 7005-3 Metallic flanges - Part 3: Copper Alloy and Composite flanges.*

(7) For other flanged connections

(8) Standard *for Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24, Metric/Inch Standard, ASME* B16.5.

(9) *Metallic flanges — Part 1: Steel flanges for industrial and general service piping systems. ISO 7005-1*

Flange specifications o ther than these listed below exist. These are simply more common.

Statement of Problem and Substantiation for Public Comment

The proposed revision clarifies the flange specifications and allows for other specifications other than ASME B31 series.

Related Item

• FR 35

Submitter Information Verification

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Submittal Date: Fri May 23 10:30:54 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-16-NFPA 86-2025
Statement: This revision clarifies that the flanges need to mate correctly in accordance with their dimensional specifications and allows for other specifications other than NFPA 54 or ASME B31 series. There are instances where ISO flanges and ASME flanges have been incorrectly mated as they approximately fit but when bolted together the bolt is incorrectly inserted.

Public Comment No. 2-NFPA 86-2025 [Section No. 6.2.8]

6.2.8 Overpressure Protection.

6.2.8.1

Overpressure protection shall be provided in either of the following cases:

(1) Where the supply pressure exceeds the maximum operating pressure limitation of any downstream component

(2) Where the failure of a single upstream line regulator or service pressure regulator results in a supply pressure exceeding the maximum operating pressure of any downstream component

6.2.8.2

Overpressure protection shall be provided by any one of the following:

(1) A series regulator in combination with a line regulator or service pressure regulator

(2) A monitoring regulator installed in combination with a line regulator or service pressure regulator

(3) * A full-capacity pressure relief valve

(4) * An overpressure cutoff device

(5) A high-pressure switch in combination with a rated shutoff valve

6.2.8.3*

The overpressure protection device shall be set no higher than the maximum operating pressure of the downstream component having the lowest rated pressure.

Add annex

A.6.2.8.3* : Overpressure protection devices should be set to prevent a pressure that causes, leakage **to atmosphere, leakage to the burner,** or unsafe operation of the burner. This setting shall consider the operating pressure limitation or rating for safety shutoff valves, gas pressure switches / sensing devices, gas pressure regulators, and manual shutoff valves, and the setting of the OPD should additionally consider the burst pressure (pressure the causes loss of gas containment) for gages, fitting, test valves, flow control valves, and other components installed that don't provide proper operation of the burner, or devices, if they fail, don't cause an increase in hazardous conditions.

Sometimes the actual pressure downstream of an overpressure protection device can exceed its setting. This is due to the response time of the overpressure protection device and the failure mode of the upstream system. However, the system should be designed to minimize this delay in response time.

Statement of Problem and Substantiation for Public Comment

This is the work from the NFPA 86 Task Group on Overpressure Protection Device

Related Item

• See CI-42, FR-10, and CI-9.

Submitter Information Verification

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Submittal Date: Fri May 16 09:37:35 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-11-NFPA 86-2025
Statement:	There are many variations in how pressure ratings and limitations are marked and the change provides a performance approach rather than a prescriptive limitation for designers. There are too many variations in system design to provide a prescriptive number to design for. Annex material has been provided to explain the performance design approach.

Public Comment No. 5-NFPA 86-2025 [New Section after 7.4.3]

7.4.3.1 * User shall establish a cleaning/housekeeping schedule that mitigates combustible material accumulation in quantities sufficient to be ignited.

A.7.4.3.1 A PHA or material testing may be needed to determine cleaning frequency. See Annex N. Additional information to assist in determining the cleaning frequency can be found in FM Property Loss Prevention Data Sheet 6-9, "Industrial Ovens and Dryers".

Statement of Problem and Substantiation for Public Comment

This change specifically addresses the cleaning frequency to be established by the user based upon ignitible concentrations. This is intended to convey that maintenance activities include cleaning. Annex material provides guidance on how to establish the frequency and extent of cleaning. Includes pointers to Annex N and FM Data Sheet 6-9.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 6-NFPA 86-2025 [Section No. O.1.2.10]	

Related Item

- CI-19

Submitter Information Verification

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Submittal Date: Wed May 21 12:14:12 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-15-NFPA 86-2025

Statement: This change specifically addresses the cleaning frequency to be established by the user based upon ignitible concentrations. This is intended to convey that maintenance activities include cleaning. Annex material provides guidance on how to establish the frequency and extent of cleaning. Includes pointers to Annex N and FM Data Sheet 6-9.

Public Comment No. 3-NFPA 86-2025 [Section No. 8.2.7]

8.2.7

Safety devices shall not be bypassed electrically or mechanically.

8.2.7.1 _

The requirement in _ 8.2.7 _ shall _ not prohibit

~~safety device testing and maintenance~~

a time delay when used in accordance with all requirements in 8.2.

~~5. Where a system includes a "built-in" test mechanism that bypasses any safety device, it shall be interlocked to prevent operation of the system while the device is in the test mode, unless listed for that purpose.~~

7.1.1 through 8.2.7.

~~2. The requirement in~~

1.6.

8.2.7

~~shall not prohibit a time delay~~

.1.1*

Time delays shall only be applied to the action of pressure-proving, flow-proving, or proof-of-closure safety switch as used in accordance with _ 8.7.1.12.3(3)

~~, where the following conditions exist: There is an~~

A.8.2.7.1.1

No delay timers should be installed on devices that directly measure the flammability risk, such as continuous vapor concentration controllers or oxygen measurement systems on LOC equipment.

8.2.7.1.2

There shall be a documented operational need demonstrated for the time delay.

- ~~The use of a time delay is approved.~~
~~The time delay feature is not~~

8.2.7.1.3

The time delay shall be approved.

8.2.7.1.4

The time delay shall not be adjustable beyond 5 seconds.

8.2.7.1.5

A single time delay

~~does~~

shall not serve more than one pressure-proving or flow-proving safety device.

8.2.7.1.6

The time from an abnormal pressure or flow condition until the holding medium

~~is~~

shall be removed from the safety shutoff valves does not exceed 5 seconds.

8.2.7.2 *

The requirement in 8.2.7 shall not prohibit the installation of “built-in” test mechanisms that bypasses any safety device when used in accordance with all the requirements in 8.2.7.2.1 and 8.2.7.2.2.

A.8.2.7.2

A “built-in” test mechanisms may include electrical devices, logical programming, isolation valves, or test ports that may render a safety device ineffective if not returned to normal operation. The test mechanism could be integral to the safety device or a separate device as part of an assembly.

8.2.7.2.1

The test mechanism(s) shall be necessary to conduct documented safety device testing and documented maintenance in accordance with 8.2.5.

8.2.7.2.2

The test mechanism(s) shall be either interlocked in accordance with 8.2 to prevent operation of the system while the device is in the test mode or alterative protective measures implemented in accordance with 8.2.7.2.2.1 through 8.2.7.2.2.3

8.2.7.2.2.1*

Alterative protective measures shall be defined within a documented PHA.

A8.2.7.2.2.1*

Alterative protective measures could include administrative controls.

8.2.7.2.2.2

The defined alterative protective measures shall be implemented.

8.2.7.2.2.3

The documented PHA shall be Approved.

Additional Proposed Changes

File Name	Description	Approved
Draft_Language_8.2.7_-_final.docx		

Statement of Problem and Substantiation for Public Comment

Ovens often contain components or devices to enable testing or maintenance on the system that if left in the incorrect state would render safety system ineffective. The changes to section 8.2.7 adds additional requirements to ensure that systems are returned to normal operation so that the safety system will function when required. The requirements include either interlocking of the test mechanism to prevent system operation or through the implementation of alternative protective measures.

Related Item

• Committee Input No. 23-NFPA 86-2024

Submitter Information Verification

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Submittal Date:	Tue May 20 14:12:36 EDT 2025
Committee:	OVE-AAA

Committee Statement

Committee Action:	Rejected but see related SR

Resolution: SR-12-NFPA 86-2025

Statement: Ovens often contain components or devices to enable testing or maintenance on the system that if left in the incorrect state would render safety system ineffective. The changes to section 8.2.7 adds additional requirements to ensure that systems are returned to normal operation so that the safety system will function when required. The requirements include either interlocking of the test mechanism to prevent system operation or through the implementation of alternative protective measures.

8.2.7
Safety devices shall not be bypassed electrically or mechanically.

8.2.7.1
The requirement in 8.2.7 shall not prohibit shall not prohibit a time delay when used in accordance with all requirements in 8.2.7.1.1 through 8.2.7.1.6.

8.2.7.1.1*
Time delays shall only be applied to the action of pressure-proving, flow-proving, or proof-of-closure safety switch as used in accordance with 8.7.1.12.3(3)

A.8.2.7.1.1
No delay timers should be installed on devices that directly measure the flammability risk, such as continuous vapor concentration controllers or oxygen measurement systems on LOC equipment.

8.2.7.1.2
There shall be a documented operational need demonstrated for the time delay.

8.2.7.1.3
The time delay shall be approved.

8.2.7.1.4
The time delay shall not be adjustable beyond 5 seconds.

8.2.7.1.5
A single time delay shall not serve more than one pressure-proving or flow-proving safety device.

8.2.7.1.6
The time from an abnormal pressure or flow condition until the holding medium shall be removed from the safety shutoff valves does not exceed 5 seconds.

8.2.7.2 *
The requirement in 8.2.7 shall not prohibit the installation of “built-in” test mechanisms that bypasses any safety devices when used in accordance with all the requirements in 8.2.7.2.1 and 8.2.7.2.2

A8.2.7.2

A “built-in” test mechanisms may include electrical devices, logical programing, isolation valves, or test ports that may render a safety device ineffective if not returned to normal operation. The test mechanism could be integral to the safety device or a separate device as part of an assembly.

8.2.7.2.1
The test mechanism(s) shall be necessary to conduct documented safety device testing and documented maintenance in accordance with 8.2.5.

8.2.7.2.2
The test mechanism(s) shall be either interlocked in accordance with 8.2 to prevent operation of the system while the device is in the test mode or alterative protective measures implemented in accordance with 8.2.7.2.2.1 through 8.2.7.2.2.3

8.2.7.2.2.1*
Alterative protective measures shall be defined within a documented PHA.

A8.2.7.2.2.1*
Alterative protective measures could include administrative controls.

8.2.7.2.2.2
The defined alterative protective measures shall be implemented.

8.2.7.2.2.3
The documented PHA shall be Approved.

Substantiation:

Ovens often contain components or devices to enable testing or maintenance on the system that if left in the incorrect state would render safety system ineffective. The changes to section 8.2.7 adds additional requirements to ensure that systems are returned to normal operation so that the safety system will function when required. The requirements include either interlocking of the test mechanism to prevent system operation or through the implementation of alternative protective measures.

Public Comment No. 13-NFPA 86-2025 [Section No. 8.3.2]

8.3.2*

Where PLCs are not listed for combustion safety service or as combustion safeguard and where used for combustion safety service, the safety PLCs and its associated input and output (I/O) shall be as follows:

(1) PLCs and I/O shall be third-party certified to IEC 61508, *Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems*, safety integrity level (SIL) 2 or greater

(2) The processor and the I/O shall be listed for control reliable service and applied to achieve at least an SIL 2 capability per the manufacturer's safety manual

(3) Implemented such that access to safety functions shall be separate from access to nonsafety functions.

(4) Implemented such that access to PLC logic dedicated to safety functions shall be restricted to prevent unauthorized changes.

(5) Safety PLCs shall not replace the following devices:

(6)* Manual emergency switches

(7) ~~Continuous vapor concentration high-limit controllers~~

8.3.2.1 Software.

8.3.2.1.1

Access to the PLC and its logic shall be restricted to authorized personnel.

8.3.2.1.2

Software shall be documented as follows:

(1) Labeled to identify elements or a group of elements containing safety software

(2) Labeled to describe the function of each element containing safety software

(3) Be sufficient for users to perform periodic functional testing

8.3.2.1.3

A listing of the program with documentation shall be available.

8.3.2.1.4

Software shall be designed per the PLC manufacturer's instruction to achieve SIL 2 or greater capability and shall be validated by another qualified individual.

8.3.2.1.5

A safety requirements specification document, in accordance with ANSI/ISA 6151, *Functional Safety: Safety Instrumented Systems for the Process Industry Sector* , or equivalent, shall be developed and retained for the life of the installation.

8.3.2.1.6

Minimum functional testing requirements shall be consistent with maintaining the reliability in accordance with this chapter and with safety requirements specification documentation.

8.3.2.1.7

When supported by a documented hazard analysis, the functional testing requirements shall be permitted to be reduced for routine inspections and documented in the safety requirements specification document.

8.3.2.2

Class A or Class B circuits as described in *NPFA 72* shall be employed when the following components are connected to the control panel:

(1) Concentration measurement devices, and other initiating devices

(2) Concentration controlling valves

(3) Supervisory devices that monitor critical elements or functions such as low pressure switches, loss of ventiliation switches

(4) Notification appliances

(5) Signaling line circuits

8.3.2.3

A signaling line circuit used as part of a Safety PLC shall not be shared by other operating systems.

Statement of Problem and Substantiation for Public Comment

The requirements for safety control systems for Ovens and Furnaces should be updated to the modern standard. By following ANSI/ISA 61511, which the document does not call out but implies the usage through 8.3.2.1.4 "Software shall be designed per the PLC manufacturer's instruction to achieve SIL 2 or greater capability and shall be validated by another qualified individual." we can provide a framework for manufacturers and employers to meet required safety functionality through robust risk analyses.

This change brings NFPA 86 in line with other standards such as NFPA 69 which also deals with solvent vapor concentration monitoring and does not include any requirements such as a "Continuous Vapor High Limit Controller". As professionals in fire protection systems, we must provide clear, concise, and consistent fire protection requirements when dealing with near identical hazard mitigation.
With modern Safety Instrumented Systems, they can provide the same level of protection without the need for purchasing a specialty device. Certified gas monitoring devices, connected to the Safety PLC through the use of Class A or Class B circuits can provide the same level of protection.

Additionally, this change identifies more requirements in terms of inspection and testing in line with the safety requirements document that is generated as part of applying ANSI/ISA 61511. This key functional testing although partially detailed in Chapter 7, can be more fully defined through risk analysis and tailor to the application.

As Battery Cell manufacturing and Chip manufacturing is being installed in the US, ovens are key parts of the manufacturing process. Clarifying and updating specifications can only help foreign and US companies better adhere to fire protection standards, and allow AHJs to better understand and enforce the requirements of this document.

Related Item

• First Draft Report

Submitter Information Verification

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Submittal Date: Tue Jun 03 02:44:08 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes would make all unlisted PLC burner management systems required to be safety instrumented systems which is onerous, because the requirements of IEC 61511 would require a duplication and substantiation of requirements already in NFPA 86. It would unnecessarily add performance requirements on top of the prescriptive requirements of NFPA 86. For electro-mechanical components there is also a time element which is not addressed in burner management systems requirements in NFPA 86 and the committee does not see a need to address it at this time.

Public Comment No. 11-NFPA 86-2025 [Section No. 8.4.1.2.3]

8.4.1.2.3– _*

To begin the timed preignition purge interval, all of the following conditions shall be satisfied:

(1)* The minimum required preignition airflow is proved.

(2)* At least one safety shutoff valve is proved closed between all pilot burners and the fuel supply for ovens with total pilot capacity over 400,000 Btu/hr.

(3) At least one safety shutoff valve is proved closed between all main burners and the fuel supply for ovens with total capacity over 400,000 Btu/hr.

Additional Proposed Changes

File Name	Description	Approved
PC_for_CI-26_-_250602.docx		

Statement of Problem and Substantiation for Public Comment

This proposed change utilizes the correct figure fin the Annex for this section. Existing figure was edited and moved to another Annex.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 12-NFPA 86-2025 [Section No. A.8.7.1.12]	

Related Item

- CI-26

Submitter Information Verification

Submitter Full Name: Geoffrey Raifsnider
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Submittal Date: Mon Jun 02 09:40:20 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-20-NFPA 86-2025

Statement: The burner arraignment figure in A.8.4.1.2.3(2) is moving to A.8.7.1.12 as that figure is explaining multiple burner systems and the requirement text is on those multiple burner systems. Additionally the key in A.8.4.1.2.3(2), needs to be added to all the figures in order to explain the diagrams.

Proposed Change

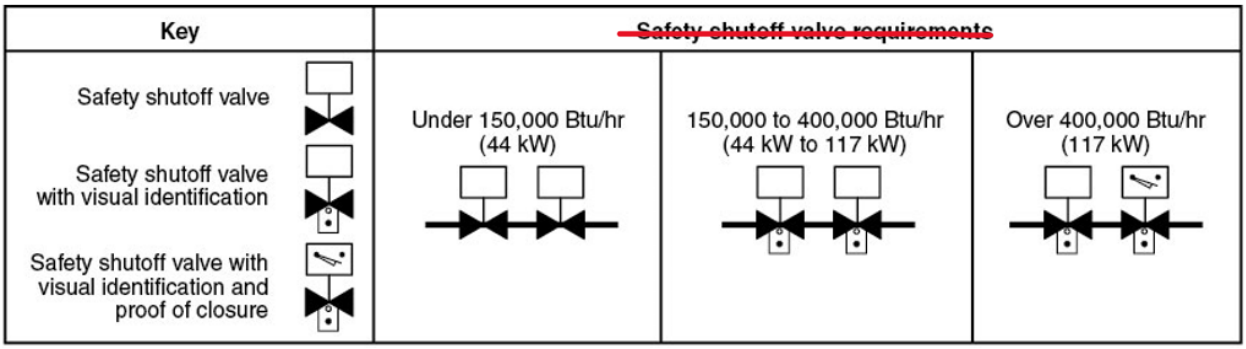
8.4.1.2.3* To begin the timed preignition purge interval, all of the following conditions shall be satisfied:

(2)* At least one safety shutoff valve is proved closed between all pilot burners and the fuel supply for ovens with total pilot capacity over 400,000 Btu/hr.

(3) At least one safety shutoff valve is proved closed between all main burners and the fuel supply for ovens with total capacity over 400,000 Btu/hr.

A.8.4.1.2.3 See figure A.8.4.1.2.3

A.8.4.1.2.3 Main burner or pilot safety shutoff valve requirements



8.7.1.12 * Multiple Burners.

A.8.7.1.12 ~~Paragraph~~ Section 8.7.1.12 addresses conditions under which only one safety shutoff valve is to close to isolate a burner from its fuel gas supply. See 8.4.1.8 and 8.4.1.9 for guidance regarding conditions that are needed to allow that burner to be placed back in service. The requirements of 8.4.1.9 might not allow a burner shut off by closing a single safety shutoff valve to be placed back in service without repeating a preignition purge.

The requirements of 8.7.1.12 do not preclude opening of the safety shutoff valve located upstream of the individual burners using single safety shutoff valves during the trial for ignition for the first burner being lighted.

See Figure A.8.7.1.12(A) and Figure A.8.7.1.12(B).

Figure A.8.7.1.12(A) Multiple Burner System Using Proof-of-Closure Switches.

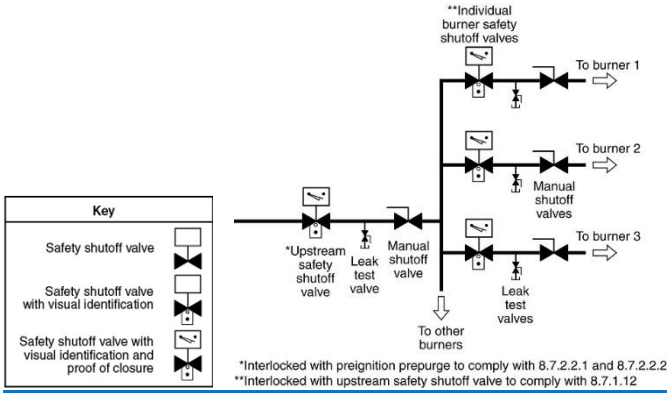
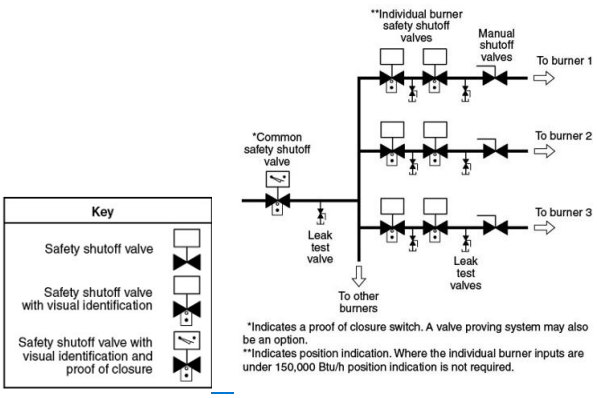


Figure ~~A.8.4.1.2.3(2)~~ A.8.7.1.12 (B) Example for Multiple Burner System with Independently Operated Burners Using a Common SSOV with Single Proved Closed Interlock for Pre-purge.



Public Comment: Revised and moved portions of figure to applicable sections. Kept “key” with each.

Public Comment No. 7-NFPA 86-2025 [Section No. 10.4.2]

10.4.2 Operations.

10.4.2.1

The oxidizer system shall be started and brought to operating temperature prior to introducing fume (dirty gas) flow.

10.4.2.2

The user shall be responsible for ensuring that the exhaust stream of the ~~volatile organic compound (VOC) source~~ flammables is not in the flammable range for the mixture of VOC being destroyed in the oxidizer system.

10.4.2.

~~3~~

~~Where it cannot be demonstrated that the exhaust stream of the VOC source cannot exceed 25 percent of the lower flammable limit (LFL), the owner or operator of the oxidizer system shall install both of the following:~~

(1) ~~At least one continuous vapor concentration high limit interlock in the duct that conveys the VOC and air mixture to the oxidizer system, in accordance with~~ ~~11.6.9.3.1~~ ~~.~~

(2) ~~A 3-way diverter valve that redirects the oven exhaust flow to an exhaust stack that leads directly to atmosphere.~~

~~10.~~

4

~~.2.4~~

The continuous vapor concentration high-limit interlock sensor shall be located as close as possible to the point where the

~~VOC~~

flammabes conveying duct leaves the source oven.

10.4.2.4.1

Redundant continuous vapor concentration high-limit interlock sensors shall be permitted to be installed downstream of the nearest upstream sensor by a distance greater than two duct diameters.

10.4.2.5

The location of the 3-way diverter valve shall be as close as possible to the tie-point for the downstream oxidizer system.

10.4.2.5.1

The 3-way diverter valve shall be located at least 200 ft (61 m) downstream of the primary continuous vapor concentration high-limit interlock sensor location.

10.4.2.6

All of the following automatic actions shall be taken when any continuous vapor concentration high limit interlock is tripped:

(1) The source oven's heating system shall be shut off.

(2) The introduction of new feed material into the source oven shall be halted.

(3)* The source of

~~VOC fumes~~

(1) flammabes shall be diverted to atmosphere until the vapor concentration limit interlock is clear and the fault has been reset by the operator.

10.4.2.7

The continuous vapor concentration controller shall be permitted to be used to initiate an additional dilution process that minimizes solvent reduction concentration before it reaches the high-limit threshold. (*See 11.6.10.9* .)

10.4.2.8

The operator shall ensure the

~~VOC~~

flammabes concentration is less than 25 percent of LFL before deactivating the 3-way diverter valve to reintroduce a VOC and air fume stream to an operating thermal oxidizer.

Statement of Problem and Substantiation for Public Comment

Delete 10.4.2.3. Ambiguous language with an annex to guide how this is to be demonstrated.
Requiring the addition of a vapor concentration high limit analyzer when it would already be required on the furnace

if you run over 25% of the LFL. Are we saying that you need two of them now?
Requiring the diverter valve to be 200 feet downstream of the analyzer. This feels somewhat arbitrary. Many afterburners are located right at or very close to the furnace.

Replace VOC with flammables: I'd like to have a discussion if VOC is the correct term. could it not be other gases?

Related Item

• FR-40

Submitter Information Verification

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Submittal Date: Fri May 23 09:50:10 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-21-NFPA 86-2025
Statement: Not all things that go into a thermal oxidizer are VOC and the term is broadened to specify what it applies to. Not all thermal oxidizers process flows that are outside the flammable range and some are designed to do it as a percentage of the flammable range. Regardless they need to operate in the range they were designed to. The deleted requirements and annex are redundant with chapter 11 requirements (e.g. 11.6.10.2) as 10.2.1 requires thermal oxidizers to follow the Class A requirements for construction and are not operating requirements. Additionally some of the requirements are also related to items required when doing a PHA (see annex e).

Public Comment No. 17-NFPA 86-2025 [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) Quantity ~~of solvent~~ shall be expressed in gallons (liters) or pounds (kg) ~~per batch or per hour entering the oven~~ per batch or in gallons (liters) or pounds (kg) per hour as applicable for the process batch or continuous

(3) Required purge time

(4) Oven operating temperature

(5) Exhaust blower rating for the quantity of solvent in gallons (liters) or pounds (kg) per batch or in gallons (liters) or pounds (kg) per hour at the maximum operating temperature, as applicable for the process batch or continuous

Statement of Problem and Substantiation for Public Comment

Editorial changes to provide greater clarity. Not a technical change.

Related Item

• FR 43 11.4.1.1

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Submittal Date: Tue Jun 03 05:40:53 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-5-NFPA 86-2025
Statement: The quantity of solvents either need to be in an amount if the process is batch or rate if the process is continuous. The rate information is being added to convey this information.

Public Comment No. 18-NFPA 86-2025 [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~~ When a combination of solvents is used, use either the constituent solvent that requires the greatest ~~amount of ventilation air per gallon (liter) when a combination of solvents is used~~ ventilation rate or a ventilation rate determined by testing of the mixture

(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 requirement in item (3) identifies the solvent with the greatest amount of ventilation air per gallon (or liters), where multiple solvents are present, to use in the calculation. The change also includes the option to determine by testing.

Related Item

• PI 68 11.6.1.3(3)

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Submittal Date: Tue Jun 03 05:46:17 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-6-NFPA 86-2025

Statement: There are cases in which the the calculation based on the worst case solvent scenario does not accurately predict the solvent characteristics (e.g. those mixtures that deviate from Raoult's Law) and testing the mixture is the most accurate way to determine the characteristics. Additionally if the solvent characteristics are unknown they need to be tested to determine their characteristics. The calculation methods are also being pointed to for ease of use.

Public Comment No. 9-NFPA 86-2025 [Section No. A.5.3]

A.5.3

Many ovens include an explosion hazard related to the fuels used for heating, flammable vapors released from the work in process, or the use of special atmospheres. To control these hazards, several methods from NFPA 69 can be applied, including the following:

(1) Avoiding combustion through the control of the following:

(2) Combustible concentration [i.e., keeping combustible material below its lower flammable limit (LFL)]

(3) Oxidant concentration (i.e., reducing oxygen below the level needed for ignition)

(4) Limiting damage by confining deflagration pressures.

Table A.5.3 identifies explosion controls in NFPA 86 that apply to different classes of oven.

Table A.5.3 Explosion Controls

Control Method	Oven Class				
	A	B	C	D	
Controlling Combustible Concentration					
Safety shutoff valves per Chapter 8	X	X	X	X	
Preignition purge per Chapter 8	X	X	X	X	
Trials-for-ignition per Chapter 8	X	X	X	X	
Flame supervision per Chapter 8	X	X	X	X	
Safety ventilation per Chapter 11	X	-	-	-	
Controlling Oxidant Concentration					
Low oxygen atmosphere oven per Chapter 11	X	-	-	-	
Special atmosphere control per Chapter 13	-			- X	
Special atmosphere control per Chapter 14				X	~~X~~
Confining Deflagration Pressure					
Pressure vessel design per Chapter 14	-	-	-		X

Beyond these explosion controls, Section 5.3 provides additional guidance on explosion control options for Class A ovens. Explosion hazards can be mitigated based on oven design considerations (such as the heat source or recirculation of the exhaust air), added controls (such as LFL monitoring), and the use of deflagration venting.

For additional information regarding deflagration venting see NFPA 68.

Statement of Problem and Substantiation for Public Comment

In the 2023 code cycle, the relevant portions of Chapter 13 were merged into Chapter 14 in order to make Chapter 14 independent of Chapter 13. Now all requirements regarding Oxidant Concentration for vacuum furnaces are found in Chapter 14.

Related Item

• PI 64, FR 1

Submitter Information Verification

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Submittal Date: Fri May 23 11:02:34 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-17-NFPA 86-2025

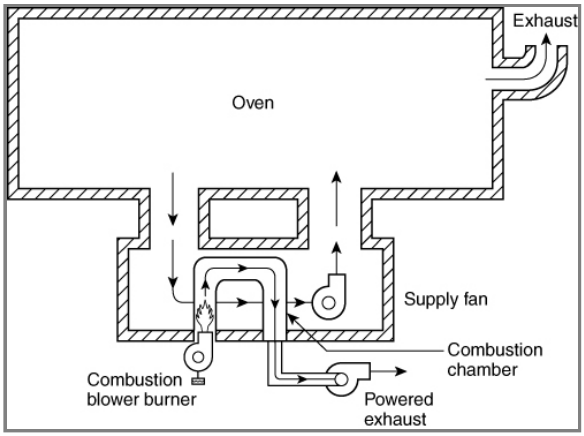
Statement: In the 2023 code cycle, the relevant portions of Chapter 13 were merged into Chapter 14 in order to make Chapter 14 independent of Chapter 13. Now all requirements regarding Oxidant Concentration for vacuum furnaces are found in Chapter 14.

Public Comment No. 15-NFPA 86-2025 [Section No. A.5.3.1(5)]

A.5.3.1(~~5~~ 2)

Because the combustion air has only one path from the combustion blower through the supervised powered exhaust, there is no buildup of products of combustion in the heat exchanger. The minimum exhaust rate for the heat exchanger should be determined using 11.6.6.1, which requires 183 scfm (5.18 standard m^3/min) per 1,000,000 Btu/hr (293.1 kW) burner rating. Refer to Figure A.5.3.1(~~5~~ 2).

Figure A.5.3.1(~~5~~ 2) Example of a Non-Recirculating, Indirect-Fired Oven.



Statement of Problem and Substantiation for Public Comment

A review of the current edition determined that the FD revised text in 5.3.1(2) was originally 5.3.1(5), so the annex material numbering and cross reference should be re-established to 5.3.1(2), Task Group recommendation,

Related Item

• 5.3.1(2)

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Submittal Date: Tue Jun 03 05:11:46 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7-NFPA 86-2025
Statement: This revision was made to correct an editorial issue by moving the asterisk to the appropriate item (2) of section as that annex material explains the requirement in 5.3.1(2) rather than 5.3.1(5).

Public Comment No. 16-NFPA 86-2025 [New Section after A.5.3.3]

A.5.3.3(1)

When reviewing furnace volumes for the intent purpose of considering damage-limiting construction it is important to include all locations and areas where recirculating combustible materials may be found. The volumes used for determining damage-limiting construction often includes the heating chamber, internal and external circulating ductwork, as well as external heaters. Once-though airflow passages that do not recirculate are often excluded from these calculations. Such areas may include fresh air intakes and fresh air supply ductwork as well as dedicated exhaust plenums, ductwork and stacks. here ...

Statement of Problem and Substantiation for Public Comment

Guidance on determining the protected volume when calculating the deflagration vent area is needed. This guidance is based on engineering practices commonly employed in oven design, and requires engineering judgement, subject to acceptance by AHJ. Adding this content as enforceable language is not advised as that could limit appropriate vent area determination.

Related Item

• 5.3.3(1)

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Submittal Date: Tue Jun 03 05:22:35 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-8-NFPA 86-2025
Statement: Annex material is being added to explain what is considered to be protected volume in the context of the calculation for deflagration venting.

Public Comment No. 12-NFPA 86-2025 [Section No. A.8.7.1.12]

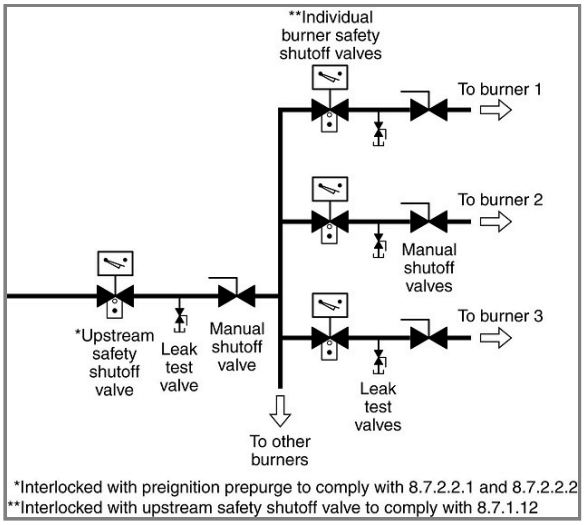
A.8.7.1.12

~~Paragraph~~ Section 8.7.1.12 addresses conditions under which only one safety shutoff valve is to close to isolate a burner from its fuel gas supply. See 8.4.1.8 and 8.4.1.9 for guidance regarding conditions that are needed to allow that burner to be placed back in service. The requirements of 8.4.1.9 might not allow a burner shut off by closing a single safety shutoff valve to be placed back in service without repeating a preignition purge.

The requirements of 8.7.1.12 do not preclude opening of the safety shutoff valve located upstream of the individual burners using single safety shutoff valves during the trial for ignition for the first burner being lighted.

See Figure A.8.7.1.12(A) and A . 8.7.1.12(B)

Figure A.8.7.1.~~12 Multiple~~ 12(A) Multiple Burner System Using Proof-of-Closure Switches.



Additional Proposed Changes

File Name	Description	Approved
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Statement of Problem and Substantiation for Public Comment

Relocated a portion of the figure from A.8.4.1.2.3 to this annex.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 11-NFPA 86-2025 [Section No. 8.4.1.2.3]	

Related Item

• CI-26

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Submittal Date: Mon Jun 02 09:46:02 EDT 2025

Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-20-NFPA 86-2025

Statement: The burner arraignment figure in A.8.4.1.2.3(2) is moving to A.8.7.1.12 as that figure is explaining multiple burner systems and the requirement text is on those multiple burner systems. Additionally the key in A.8.4.1.2.3(2), needs to be added to all the figures in order to explain the diagrams.

Proposed Change

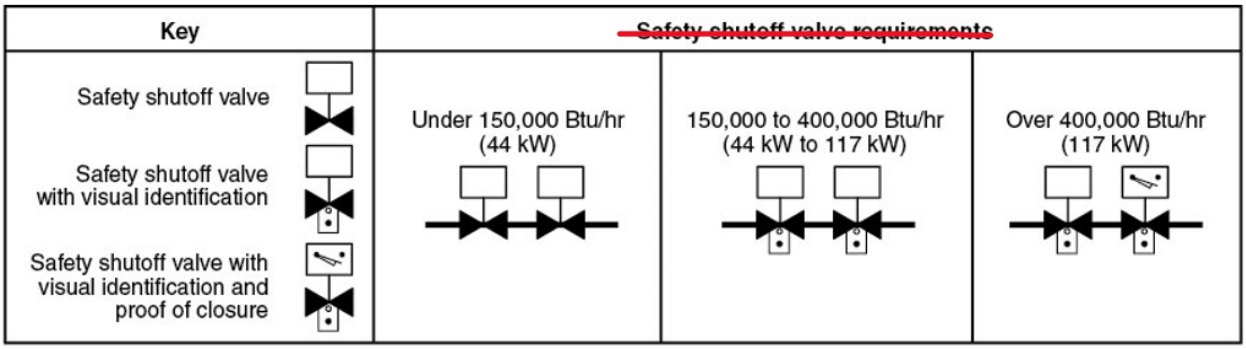
8.4.1.2.3* To begin the timed preignition purge interval, all of the following conditions shall be satisfied:

(2)* At least one safety shutoff valve is proved closed between all pilot burners and the fuel supply for ovens with total pilot capacity over 400,000 Btu/hr.

(3) At least one safety shutoff valve is proved closed between all main burners and the fuel supply for ovens with total capacity over 400,000 Btu/hr.

A.8.4.1.2.3 See figure A.8.4.1.2.3

A.8.4.1.2.3 Main burner or pilot safety shutoff valve requirements



8.7.1.12 * Multiple Burners.

A.8.7.1.12 Paragraph Section 8.7.1.12 addresses conditions under which only one safety shutoff valve is to close to isolate a burner from its fuel gas supply. See 8.4.1.8 and 8.4.1.9 for guidance regarding conditions that are needed to allow that burner to be placed back in service. The requirements of 8.4.1.9 might not allow a burner shut off by closing a single safety shutoff valve to be placed back in service without repeating a preignition purge.

The requirements of 8.7.1.12 do not preclude opening of the safety shutoff valve located upstream of the individual burners using single safety shutoff valves during the trial for ignition for the first burner being lighted.

See Figure A.8.7.1.12(A) and Figure A.8.7.1.12(B).

Figure A.8.7.1.12(A) Multiple Burner System Using Proof-of-Closure Switches.

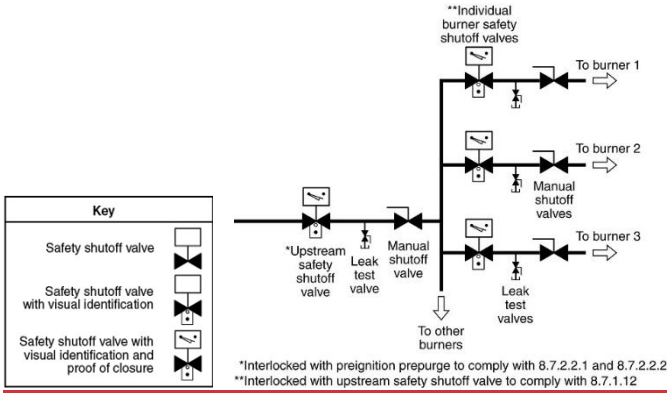
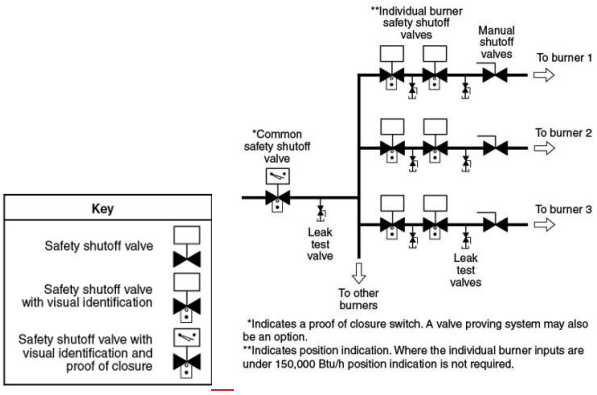


Figure A.8.4.1.2.3(2) A.8.7.1.12 (B) Example for Multiple Burner System with Independently Operated Burners Using a Common SSOV with Single Proved Closed Interlock for Pre-purge.



Public Comment: Revised and moved portions of figure to applicable sections. Kept “key” with each.

Public Comment No. 6-NFPA 86-2025 [Section No. O.1.2.10]

O.1.2.10 FM Publications.

FM, 270 Central Avenue, P.O. Box 7500, Johnston, RI 02919.

FM Approval 7400, *Approval Standard for Liquid and Gas Safety Shutoff Valves*, 2016.

FM Property Loss Prevention Data Sheet 1-44, “Damaged-Limiting Construction,” 2023.

FM Property Loss Prevention Data Sheet 6-9, "Ovens and Dryers", 2021

FM Property Loss Prevention Data Sheet 6- 11, “Thermal and Regenerative Catalytic Oxidizers,” 2018.

FM Property Loss Prevention Data Sheet 6-13, “Waste Fuel Fired Facilities,” updated January 2021.

FM Property Loss Prevention Data Sheet 6-17, “Rotary Kilns and Dryers,” updated July 2023.

Statement of Problem and Substantiation for Public Comment

Including FM datasheet that was referenced in new annex material

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 5-NFPA 86-2025 [New Section after 7.4.3]	New Informational Reference

Related Item

• CI-19

Submitter Information Verification

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Submittal Date: Wed May 21 12:19:16 EDT 2025
Committee: OVE-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-15-NFPA 86-2025

Statement: This change specifically addresses the cleaning frequency to be established by the user based upon ignitible concentrations. This is intended to convey that maintenance activities include cleaning. Annex material provides guidance on how to establish the frequency and extent of cleaning. Includes pointers to Annex N and FM Data Sheet 6-9.