



ETTER Engineering Company, Inc
NFPA 86 2015 Edition - Chapter 7.4 - Safety Report
Report Revision 7.03

Customer: Lavoie Powder Coating Date: 5/22/2015
Location: Hamden, CT Phone: _____
Contact: Paul Lavoie
Auditor/s: Jamie Feagain
Report Number: 9998 Revision: R0

Equipment: Despatch Powder Coating Oven
Model: PCO1001
Serial No: N/A

Testing Conditions: ☒ Full Test ☐ Partial Lockout ☐ Customer Lockout
Full testing Completed.

Burner Systems¹:

1

NFPA 86 Standards for Ovens and Furnaces 2015 Edition

Section 1.3.1

This entire standard shall apply to new installations or to alterations or extensions to existing equipment.

Section A.1.3.1

Because this standard is based on the state of the art, application to existing installations is not mandatory. Nevertheless, users are encouraged to adopt those features of this standard that are considered applicable and reasonable for existing installations.

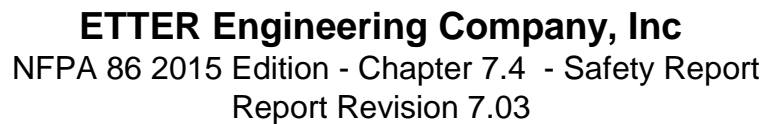
Section 3.3.65 Safety Shutdown

Stopping operations by means of a safety control or interlock that shuts off all fuel and ignition energy in a manner necessitating manual restart.

NOTE: This Audit is intended to cover NFPA 86 2015 Edition section 7.4 Inspection, Testing, and Maintenance only and ensure that the critical safety components are present and that these components have been tested for proper operation, no adjustments or repairs were made.

This Safety Audit does not include or cover all of the safety concerns as listed in NFPA 86 2015 Edition. Please refer to the complete Edition.

¹ A Burner System is one or more burners operated by a common valve train.



Burner Capacity:	<input type="checkbox"/> <150,000 <input type="checkbox"/> <400,000 <input checked="" type="checkbox"/> >400,000	
Flame Detection Type:	Two Safety Shutoff Valves piped in series with Visual Indication and one valve with Proof of Closure or Valve Proving.	
	<input type="checkbox"/> None <input type="checkbox"/> Flamerod <input checked="" type="checkbox"/> UV <input type="checkbox"/> Self-Check UV <input type="checkbox"/> Other	
Burner Type:	A.8.10.1 Ultraviolet detectors can fail in such a manner that the loss of flame is not detected. Where these detectors are placed in continuous service, failures can be detected by a self-checking ultraviolet detector or by periodic testing of the detector for proper operation.	
	<input type="checkbox"/> Direct Spark <input type="checkbox"/> Piloted Burner <input checked="" type="checkbox"/> Self-Piloted <input type="checkbox"/> Radiant Tube <input type="checkbox"/> Line Burner <input type="checkbox"/> Pilot <input type="checkbox"/> Other	
Pilot Type:	3.3.5.14: A burner in which the pilot fuel is issued from the same ports as the main flame or merges with the main flame to form a common flame envelope with a common flame base.	
	<input type="checkbox"/> N/A <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Interrupted <input type="checkbox"/> Burn Off <input type="checkbox"/> Continuous	
Pilot NFPA Compliant:	3.3.51.5: A pilot that is ignited and burns during light-off and is automatically shut off at the end of the trial-for-ignition period of the main burner(s).	
	<input checked="" type="checkbox"/> Yes 8.10.2.1 Each pilot and main burner flame shall be equipped with flame supervision in one of the following ways: <input type="checkbox"/> No (1) Main and pilot flames supervised with independent flame sensors (2) Main and interrupted pilot flames supervised with a single flame sensor <input type="checkbox"/> N/A (3) Self piloted burners supervised with a single flame sensor	
Purge Time as Configured:	4min	Confirmed?: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

<p>Pre-Ignition Purge Compliance:</p>	<div> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </div> <p>8.5.1.2: A timed pre-ignition purge shall be provided.</p> <p>(A) At least 4 system volumes of fresh air or inert gas shall be introduced during the purging cycle.</p> <p>(B) The system volume shall include the heating chambers and all other passages that handle the recirculation and exhaust of products of combustion.</p> <p>(C) To begin the timed pre-ignition purge interval, all of the following conditions shall be satisfied.</p> <div> <p>(1) The minimum required pre-ignition airflow is proved.</p> <p>(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.</p> <p>(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.</p> </div> <p>(D) The minimum required pre-ignition airflow shall be proved and maintained throughout the timed pre-ignition purge interval.</p> <p>(E) Failure to maintain the minimum required pre-ignition purge airflow shall stop the pre-ignition purge and reset the purge timer.</p> <p>8.5.1.7: Prior to the re-ignition of a burner after a burner shutdown or flame failure, a pre-ignition purge shall be accomplished. CAUTION: Repeated ignition attempts can result in a combustible concentration greater than 25 percent of the LFL. Liquid fuels can accumulate, causing additional fire hazards.</p>
<p>Oven Class:</p>	<div> <input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B <input type="checkbox"/> Class C <input type="checkbox"/> Class D </div> <p>3.3.27.4 Class B Furnace. An oven or furnace that has heat utilization equipment wherein there are no flammable volatiles or combustible materials being heated.</p>



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 Report Number: 9998R0
 Equipment: Despatch Powder Coating Oven

Date: 5/22/2015

	<u>Component</u>	<u>Manufacturer</u>	<u>Note/ Setting</u>	<u>Extra Note</u>	<u>Compliant</u>	<u>N/A</u>	
1.	Burner	Maxon 415		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
2.	Drip Leg			<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
3.	Filter/Strainer	Keckley 2"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
4.	Low Gas PS	Anutunes LGP-G	4"wc	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
5.	High Gas PS	Antunes HGP-G	20"wc	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
6.	Low Air PS	Antunes JD-2	.2"wc	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
7.	Proof of Purge			<input type="checkbox"/> Notes	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
8.	1st Main Safety Shut Off Valve	Maxon 808 1.5"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
9.	1st Visual Indication	Maxon 808 1.5"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
10.	Proof of Closure	Maxon 808 1.5"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
11.	2nd Main Safety Shut Off Valve	Maxon 808 1.5"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
12.	2nd Visual Indication	Maxon 808 1.5"		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
13.	Test Ready			<input type="checkbox"/> Notes	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
14.	1st Pilot Safety Shutoff Valve	Asco 8215		<input type="checkbox"/> Notes	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
15.	2nd Pilot Safety Shutoff Valve	Asco 8215		<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
16.	Pilot Test Ready			<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
17.	High Limit	Honeywell UDC	650 F	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
18.	Exhaust PS	Antunes JD-2	.2"wc	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
19.	Circulation PS	Antunes JD-2	.5"wc	<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
20.	Low Fire Start			<input checked="" type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
21.	Flame Safeguard	Honeywell 7800		<input checked="" type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
22.	Flame Detector Type	Honeywell UV		<input checked="" type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
23.	Emergency Stop			<input type="checkbox"/> Notes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A



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Additional Notes

Report Number: 9998R0

Date: 5/22/15

The following additional comments have been made by the auditor.

Item 1: Flame Safeguard

Component Description:	
Component Manufacturer: Honeywell 7800 Part Number:	
Notes:	RM7897A1002 Relay with ST7800A1088 4 min purge card and R7849A1023 UV Amp
Recommendation:	

Item 2: Flame Detector Type

Component Description:	
Component Manufacturer: Honeywell UV Part Number:	
Notes:	Honeywell C7027A1049 Mini Peeper UV Scanner
Recommendation:	



ETTER Engineering Company, Inc
 NFPA 86 Combustion Safety Audit
 Non-Compliance Report and Recommendation

Note: Every non-compliance listed below should be reviewed and then repaired, replaced, or added as appropriate. The repair of all non-compliance issues is required for safe operation per the NFPA standard.

Report Number:	9998R0	Date:	5/22/15
Component Description:	Component Description: Proof of Purge		
Component Manufacturer:		Part Number:	
Reason for Non-Compliance:	Component Missing		
Compliance Requirement per NFPA 86:	<p>8.5.1.2 A timed pre-ignition purge shall be provided.</p> <p>(A) At least four system volumes of fresh air or inert gas shall be introduced during the purging cycle.</p> <p>(B) The system volume shall include the heating chambers and all other passages that handle the recirculation and exhaust of products of combustion.</p> <p>(C) To begin the timed pre-ignition purge interval, all of the following conditions shall be satisfied:</p> <p style="padding-left: 40px;">(1) The minimum required pre-ignition airflow is proved</p> <p style="padding-left: 40px;">(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</p> <p style="padding-left: 40px;">(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</p> <p>(D) The minimum required preignition airflow shall be proved and maintained throughout the timed preignition purge interval.</p> <p>(E) Failure to maintain the minimum required pre-ignition purge airflow shall stop the pre-ignition purge and reset the purge timer.</p>		
Notes:			
Recommendation:	Action required during next available shutdown or downtime		



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Report Number:	9998R0	Date:	5/22/15
Component Description:	Component Description: Test Ready		
Component Manufacturer:		Part Number:	
Reason for Non-Compliance:	Component Missing		
Compliance Requirement per NFPA 86:	8.8.2.3 Means for testing all fuel gas safety shutoff valves for valve seat leakage shall be installed.		
Notes:	No downstream manual shutoff valve.		
Recommendation:	Action required during next available shutdown or downtime		



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Note: Every non-compliance listed below should be reviewed and then repaired, replaced, or added as appropriate. The repair of all non-compliance issues is required for safe operation per the NFPA standard.

Report Number:	9998R0	Date:	5/22/15
Component Description:	Component Description: 1st Pilot Safety Shut Off Valve		
Component Manufacturer:	Asco 8215	Part Number:	
Reason for Non-Compliance:	Not Operational		
Compliance Requirement per NFPA 86:	<p>8.8.2.1 Each main and pilot fuel gas burner system shall be separately equipped with either of the following:</p> <p>1: Two safety shutoff valves piped in series.</p> <p>2: For radiant tube-fired burners systems only, a single safety shutoff valve where either of the following conditions is satisfied:</p> <p style="padding-left: 40px;">a: The tubes are of metal construction and open at one or both ends with heat recovery systems, if used, that are of explosion-resistant construction.</p> <p style="padding-left: 40px;">b: The entire radiant tube heating system, including any associated heat recovery system, is of explosion-resistant construction.</p>		
Notes:	Valve seat leaks 15 bubbles in 1 min.		
Recommendation:	Immediate action is required		