

2018-03-20



Mr. Christer Andersson
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Reference: Project : 4787127575 P.O. Number: 1101032190

EPA 202 TEST METHOD: USING THE SVENSKA MODEL PM933ED OVEN COOKING THE BELOW FOOD PRODUCTS AS MEDIA. REPRESENTS THE MODELS PM 351ED, PM 351ED-1, PM 352ED, PM 352ED-1, PM 352ED-2, PM 401ED, PM 401ED-1, PM 402ED, PM 402ED-1, PM 402ED-2, PM 451ED, PM 451ED-1, PM 452ED, PM 452ED-1, PM 452ED-2, PM 551ED, PM 551ED-1, PM 552ED, PM 552ED-1, PM 552ED-2, PM 351ED-DW, PM 351ED-1DW, PM 352ED-DW, PM 352ED-1DW, PM 352ED-2DW, PM 401ED-DW, PM 401ED-1DW, PM 402ED-DW, PM 402ED-1DW, PM 402ED-2DW, PM 451ED-DW, PM 451ED-1DW, PM 452ED-DW, PM 452ED-1DW, PM 452ED-2DW, PM 721ED, PM 722ED, PM 723ED, PM 724ED, PM 725ED, PM 731ED, PM 732ED, PM 733ED, PM 734ED, PM 735ED, PM 741ED, PM 742ED, PM 743ED, PM 744ED, PM 745ED, PM 821ED, PM 822ED, PM 823ED, PM 824ED, PM 825ED, PM 831ED, PM 832ED, PM 833ED, PM 834ED, PM 835ED, PM 841ED, PM 842ED, PM 843ED, PM 844ED, PM 911ED, PM 912ED, PM 913ED, PM 914ED, PM 915ED, PM 921ED, PM 922ED, PM 923ED, PM 924ED, PM 925ED, PM 931ED, PM 932ED, PM 933ED, PM 934ED, PM 941ED, PM 942ED, and PM 943ED.

Dear Mr. Andersson,

This letter will update our letter dated April 13, 2016 outlining the results of the EPA202 test conducted on model PM933ED ovens.

Per your request, project 4787127575 was opened for the evaluation of grease-laden vapors produced cooking 12 in. pepperoni pizzas (Tombstone, with 19 pepperonis per pizza) as specified in Appendix A on the model PM933ED.

The scope of this project was to determine the total grease emissions from cooking 12 in. pepperoni pizzas (Tombstone, with 19 pepperonis per pizza) as the specified food load as noted in Appendix A. Testing is conducted in accordance with EPA Method 202 test guidelines to determine ultimate results. Results are used to determine compliance with Section 59 of UL710B, the Standard for Recirculating Systems, formerly Section 14 of UL 197, Eighth Edition, Supplement SB, and paragraph 4.1.1.2 of NFPA96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. The test was conducted at our facility in Northbrook, IL on March 30th, 2016. This letter will report the results of the EPA202 test.

For the record, the test was conducted using a Svenska Bakepartner Model PM933ED, rated 208 V, 50 A per deck. The test media as shown in Appendix A was specified by Svenska Bakepartner. The number of cycles was determined by Svenska Bakepartner as the worst case. The results are considered to comply with UL710B, Section 59, formerly Section 14 of UL 197, Eighth Edition, Supplement SB, and NFPA96, paragraph 4.1.1.2 when tested with your specified food load and requested cook times since the total amount of grease-laden effluents collected was 3.64 mg/m³, which is less than 5 mg/m³ limit. No evaluation was conducted in regards to fire protection. In addition, no evaluation of the Svenska Bakepartner Model PM933ED itself was conducted in respects to safety and sanitation.



Based on the size of the Svenska model PM933ED oven tested, the results of the EPA202 test can be used to represent the subject models shown at the front of this letter. While some of these ovens can cook more pizzas than the tested PM933ED, the theoretical results would be less than the 5 mg/m³ limit when calculated using the applicable pizza load for each oven.

UL LLC did not select the samples, determine whether the samples were representative of production samples or witness the production of the test samples, nor were we provided with information relative to the formulation or identification of component materials used in the test samples. The test results apply only to the actual samples tested.

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This letter will serve to report that all tests on the subject product have been completed. All information generated will be retained for future use. This concludes all work associated with Project 4786302400 and we are therefore closing this project. Our Accounting Department has been instructed to bill you for all charges incurred.

Thank you for the opportunity to provide your company with these services. Please do not hesitate to contact us if you should have any questions or comments.

Very truly yours,

Reviewed by:

A handwritten signature in black ink that reads "William G. Morler".

A handwritten signature in black ink that reads "Fred Zaplatosch".

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APPENDIX: A



CLIENT INFORMATION	
Company Name	SVENSKA BACKEPARTER AB
Address	Odegardsgatan 5 Boras, SE-504-94 SE

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UL 710B CSA C22.2 No. 109	Edition/ Revision Date	2 nd 2011-09-02 M1981 R2013
[X] Tests Conducted by <u>Leo Carrillo</u>				
+	Printed Name	Signature		
[] UL Staff supervising _____				
UL Staff in training	Printed Name	Signature		

TESTS TO BE CONDUCTED:				
Test No.	Start	Done	Test Name	Comments/Parameters
1	2016-03-29	2016-04-04	POWER INPUT TEST: RATING (CSA 22.2 109-M1981):	
2	2016-03-29	2016-04-11	CAPTURE TEST:	
3	2016-03-30	2016-04-11	EMISSION TEST:	

Special Instructions -

[X] Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be recorded at the time the test is conducted.

Ambient Temperature, C 25±5 Relative Humidity, % N/A Barometric Pressure, mBar N/A

[] No general environmental conditions are specified in the Standard(s) or have been identified that could affect the test results or measurements.



RISK ANALYSIS RELATED TO TESTING PERFORMANCE:

The following types of risks have been identified. Take necessary precautions. This list is not all inclusive.

<input checked="" type="checkbox"/> Electric shock	<input type="checkbox"/> Radiation
<input type="checkbox"/> Energy related hazards	<input type="checkbox"/> Chemical hazards
<input type="checkbox"/> Fire	<input type="checkbox"/> Noise
<input type="checkbox"/> Heat related hazards	<input type="checkbox"/> Vibration
<input checked="" type="checkbox"/> Mechanical	<input type="checkbox"/> Other (Specify)___

TEST LOCATION: (To be completed by Staff Conducting the Testing)					
<input checked="" type="checkbox"/> UL or Affiliate	<input type="checkbox"/> WTDP	<input type="checkbox"/> CTDP	<input type="checkbox"/> TPTDP	<input type="checkbox"/> TCP	<input type="checkbox"/> PPP
	<input type="checkbox"/> WMT	<input type="checkbox"/> TMP	<input type="checkbox"/> SMT		
Company Name: UL LLC					
Address: 333 Pfingsten Rd. Northbrook, IL, 60062					

TEST EQUIPMENT INFORMATION

UL test equipment information is recorded on Meter Use in UL's Laboratory Project Management (LPM) database.

TEST SAMPLE IDENTIFICATION:

The table below is provided to establish correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Sample Card No.	Date Received	Test No.+	Sample No.	Manufacturer, Product Identification and Ratings
2297314	2016-02-03	ALL	1	SVENSKA, Model PM 933 ED , rated 208 V, 50 A per deck. Three deck oven



POWER INPUT TEST:
RATING (CSA 22.2 109-M1981):

UL 710B Sec. 44
(6.2)

METHOD

[X] The supply voltage was adjusted to voltage and frequency as noted in "General Test Considerations", 208 V, 60 Hz.

Test to determine proper test voltage for c-UL testing

[X] The supply voltage was adjusted to the increased test voltage as noted below. Following the test at increased test voltage, the supply voltage was adjusted to the value necessary to cause the appliance to draw the increased test power, calculated as specified below.

Increased Test Voltage (V_t): 250 V for appliances rated between 220V-240V.

Increased Test Current (I_t): $I_R(V_t/V_R) = \text{_____ A}$

Increased Test Power (W_t): $W_R(V_t/V_R)^2 = \underline{17,204}$ (W)

Where V_R , I_R , and W_R , are the rated voltage, current, and power of the appliance, respectively. Note: when the appliance is rated for a range of voltages, the mean of the range is to be used as V_R .

PARAMETERS

Appliance Ratings:

Volts: 208; Current: 50 A; Power: 15,954 (W)



POWER INPUT TEST:
RATING (CSA 22.2 109-M1981):

UL 710B Sec. 44
(6.2)

RESULTS

Operating Conditions	Rated			Measured						
	Volts	Amps	Power, (W)	L1	L2	L3	A L1	A L2	A L3	Power, (W)
Full power operation, rated voltage	208	---	---	208. 0	206 .9	207 .6	44.4	44.2	44. 6	15954.0
[X] Full power operation, rated current	---	50	---	235. 5	235 .2	235 .3	50.0	49.9	50. 4	20420.0
[X] Full power operation, rated power	---	---	15954	208. 0	206 .9	207 .6	44.4	44.2	44. 6	15954.0
c-UL Operating Conditions:	Increased Test			Measured						
	Volts	Amps	Power, (W)	L1	L2	L3	A L1	A L2	A L3	Power, (W)
Full power operation, increased test voltage	216	---	---	216. 1	215 .5	216 .0	45.8	45.6	46. 0	17130.0
[X] Full power operation, increased test current	---	51.9	---	245. 6	245 .1	245 .7	51.9	51.7	52. 1	22072.0
[X] Full power operation, increased test power	---	---	17,204	216. 4	216 .0	216 .5	45.9	45.7	46. 2	17204.0

The input power **[was]** ~~[was not]~~ between 90% and 105% of the rated input power when the appliance was energized at rated voltage.



CAPTURE TEST:

UL 710B Sec. 58
Also reference UL 710 Sec. 31

METHOD

The model PM 933 ED triple stack oven was placed under a hood located in a draft free room and is operated at the lower air flow limit. Food product as specified below was then used for testing, see Emission Testing for specific details. The cooking area is to be observed for the presence of visible smoke and grease-laden air, and the hood assembly shall completely capture all of the emission as determined by observation.

The test shall be conducted by loading the maximum amount of the food products noted below, on or in the cooking appliance and cooking the food product until it is overcooked (very well done) as follows. The cooking cycle is to be repeated at least once.

- a. Deep fat fryers are to be tested with fries,
- b. Pressure deep fat fryers are to be tested with chicken pieces,
- c. Griddles, broilers and similar appliances are to be tested with meat cakes,
- d. Ovens, roasters and similar appliances are to be tested roasting chickens, and
- e. Other appliances are to be tested using the food product(s) for which they are designed.

When one of the appliances specified in (a) - (d) is not intended for cooking the specified food (for example, donut fryers), the appliance is to be tested using the food product for which the appliance is designed.

When the device and cooking process do not produce visible cooking smoke and grease laden air, a smoke generator is to be used and positioned in the cooking area to establish a more visible means for conducting this test.

COOKING PRODUCT

[X] Oven - 12 in. pepperoni pizza (Tombstone, with 19 pepperonis per pizza), each cooked for 6 minutes with 0 seconds between loads for 8 hours (total of 2088 pizzas). Oven was set to maintain 485°F.

All Three Oven Decks were settings as follows:

Oven temperature: 485F
Top oven setting: 10
Bottom oven setting: 8

RESULTS

Their ~~was~~ **[was not]** the presence of visible smoke and grease-laden air from the appliance during testing.

The sample **[did]** ~~[did not]~~ capture all of the emissions from the cooking appliance. The appliance is to be observed for the presence of visible smoke and grease laden air escaping from the hood assembly through the discharge port or through external seams, joints, penetrations, and that portion of the hood that captures grease laden vapors.



EMISSION TEST:

UL 710B Sec. 59

METHOD

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR (485°F):

The model PM 933 ED Oven was placed under a hood operating at the lower airflow limit, and is tested using a method derived from EPA Method 202. UL also provided the 12 in. pepperoni pizza (Tombstone, with 19 pepperonis per pizza) for the test.

A 12 in. by 6 in. rectangular, 108 in. tall sheet metal stack was constructed on top of the hood and mounted above the exhaust vent of the hood. A sampling port was located approximately 80 in. downstream from the hood exhaust, at which point it was determined there was laminar flow. The sampler was assembled and an out of stack filter was used. A pre-leak check was conducted and determined to be < 0.02 ft/min. Sampling was determined to be done at 8 traverse points.

The oven was operated normally by cooking the following foods:

Oven - 12 in. pepperoni pizza (Tombstone, with 19 pepperonis per pizza), each cooked for 6 minutes with 0 seconds between loads for 8 hours (total of 2088 pizzas). Oven was set to maintain 485°F.

The cooking cycle was repeated for 8 hours of continuous cooking.

During the cooking operation, it was noted whether or not visible effluents evolved from the air exhaust of the hood. Gauge, meter and temperature readings were taken and recorded every 10 min. After cooking, the condition of the duct was noted and a post-leak check was conducted and determined to be < 0.02 ft³/min.

After being allowed to cool, the sampling equipment was disassembled. The glass-filter is to be removed using a pair of forceps and placed in a clean petri dish. The dish is to be sealed and labeled "sample 1".

A sample of the acetone of the same volume that will be used to rinse-out the nozzle and probe is to be placed into a clean sample bottle, sealed, and labeled "sample 2". The level of the liquid in the sample bottle is to be recorded.

The inside of the nozzle and probe is to be rinsed with acetone taking care to collect all the rinse material in a clean sample bottle. The sample bottle is to be sealed, labeled "sample 3", and the level of the liquid in the bottle is to be recorded.

The liquid in the first three impingers is to be measured and the total volume is to be recorded which will be compared to the original volume. The liquid is to be quantitatively transferred to a clean sample bottle. Each impinger and the connecting glassware including the probe extension are to be rinsed twice with water. The rinse water is to be collected and added to the same sample bottle. The sample bottle is to be sealed, labeled "sample 4" and the level of the liquid in the bottle is to be recorded.



This rinse process is to be repeated with two rinses of methylene chloride (MeCl_2). The rinses are to be recovered in a clean sample bottle. The sample bottle is to be sealed, labeled "sample 5" and the level of the liquid in the bottle is to be recorded.

A volume of water approximately equivalent to the volume of water used to rinse and a volume of MeCl_2 approximately equivalent to the volume of MeCl_2 used to rinse is to be placed in two clean sample bottles. The sample bottles are to be sealed, labeled "sample 6" and "sample 7" respectively, and the level of the liquid in the bottles is to be recorded.

The weight of the fourth impinger containing the silica gel is to be recorded and then the silica gel can be discarded.

The analysis phase was done in accordance with EPA Method 202, using the out of stack filter.

RESULTS

The results **[are]** ~~[are not]~~ considered acceptable because there ~~[was]~~ **[was no]** visible smoke emitted from the exhaust of the hood during the normal cooking operation. There ~~[was]~~ **[was no]** noticeable amounts of smoke accumulated in the test room after 8 hours of continuous cooking.

The total amount of grease-laden effluents collected by the sampling equipment was found to be 3.64 mg/m^3 , which is **[less]** ~~[more]~~ than $5 \text{ mg}/\text{m}^3$.

The average room humidity was 22.5 %RH, with an average stack humidity of 27.1 %RH and with an average stack temperature of 28.2°C throughout the 8 hrs. of testing.

The total grease emissions (per clause 78.2 of 710B) in pounds per hour per linear food of hood was 0.001139 $\text{lb}/\text{hr}/\text{ft}$.

CONDENSIBLE MATTER
(Lab Analysis)

Sample Bottle No.	Description	Volume, ml	Final Wt, mg
2	Acetone (Blank)	15.0	0.1
3	Acetone (Wash)	24.0	1.0
4&5	Solvent Phase(Wash)	415.0	15.0
4&5	Water Phase (Wash)	590.0	16.0
6&7	Solvent Phase (Blank)	430.0	0.2
6&7	Water Phase (Blank)	590.0	0.4

Filter paper weight before test- 589.0 mg

Filter paper weight after test- 592.5 mg

Analysis

1. The liquid level of all the sample bottles is to be measured.
2. The filter from sample one is to be removed and dried to constant weight by means of a desiccator or an oven. The weight of the filter is to be recorded.
3. The volume of sample two is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.
4. The volume of sample three is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.
5. The volumes of sample four and five are to be measured.
6. Samples four and five are to be combined. The solvent phase is to be mixed, separated, and then repeated with two MeCl_2 washes.
7. The solvent extracts obtained from the procedure in 6 are to be placed in a beaker and evaporated to a constant weight. The final weight is to be recorded.
8. The water phase is to be placed in a beaker and evaporated to dryness. The final weight is to be recorded.
9. The volumes of samples six and seven are to be determined. Sample bottles six and seven are to be analyzed according to procedures 8 and 7 respectively.