



2021-01-12

Ms. Christa Pieper
Alto-Shaam Inc.
W164 N9221 Water St
Menomonee Falls, WI, 53052
United States

E-mail: ChristaP@Alto-shaam.com

Reference: Project : 4787420532

Product: EPA 202 TEST METHOD: USING THE ALTO-SHAAM MODEL 1200-SK/III COOKING
THE BELOW FOOD PRODUCT AS MEDIA.

Dear Ms. Pieper,

Per your request, project 4787420532 was opened for the evaluation of grease-laden vapors produced from the Model 1200-SK/III. This letter was updated from a previous letter from 2016.

The scope of this project was to determine the total grease emissions from cooking halved roasting chickens weighing 2-1/2 to 3-1/2 lb. skin-on and bone-in, 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 June 21st, 2016. This letter will report the results of the EPA202 test.

Per the request of Alto-Shaam, a representative Model 1200-SK/III, rated 208-240 V, 36.3 A, 1ph was used for testing purposes. The model 1200-SK/III was used for testing purposes and considered representative of the Models 300, 500, 750, 767, 1000, 1200, 1750, 1767 with or without suffix TH, SK, and/or I, II, III (Touch), PT, (M) Cook, Hold and Cook, Hold, Smoke Ovens.

The test media, food load and oven programming as shown in Appendix A were specified by Alto-Shaam Inc. 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 0.55 mg/m³, for the halved roasting, which is less than 5 mg/m³ limit. No evaluation was conducted in regards to fire protection.



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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 4787420532 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".

Bill Morler
Sr. Project Engineer
Department: 3015GNBK
Tel: 847-664-1852
E-mail: William.Morler@ul.com

Fred Zaplatosch
Sr. Staff Engineer
Department: 3015GNBK
E-mail: fred.zaplatosch@ul.com



APPENDIX: A

CLIENT INFORMATION	
Company Name	Alto-Shaam Inc
Address	W164 N9221 Water St Po Box 450 Menomonee Falls, WI 53051

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UL 197	Edition/Revision Date	10 th 9/17/2014
		CSA C22.2 No. 109-M1981		2 nd 4/1989 (R2013)
		UL 710B		2 nd 8/14/2014
<input checked="" type="checkbox"/> Tests Conducted by ¹ Dennis DeFord				
<input type="checkbox"/> UL Staff supervising UL Staff in training				

TESTS TO BE CONDUCTED:			
Test No.	Done ³	Test Name	<input type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by ² <input type="checkbox"/> Link to separate data files ⁴
1	2016-06-16	POWER INPUT TEST (SINGLE PHASE RATED OVER 120V): RATING (CSA 22.2 109-M1981):	
2	2016-06-23	CAPTURE TEST:	
3	2016-06-23	EMISSION TEST:	



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.

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
268588		ALL	1	Alto-shaam, Model 1200-SK/III, rated 208-240 V, 36.3 A, 1ph, Oven, cooking at 325°F



POWER INPUT TEST (SINGLE PHASE RATED OVER 120V):
RATING (CSA 22.2 109-M1981):

UL 197 Sec. 47
(6.2)

METHOD

[X] The supply voltage was adjusted to voltage and frequency as noted in "General Test Considerations", 240 V, 60 Hz.

[X] (c-UL) To determine the proper test voltage for the Temperature (Normal) and Temperature (Abnormal) tests, 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 current, calculated as specified below.

Increased Test Voltage (V_t): 216V for appliances rated 208V.
250V for appliances rated between 220V-250V.

Increased Test Current (I_t): $I_r(V_t/V_r) = \underline{36.3}$ A

Increased Test Power (W_t): $W_r(V_t/V_r)^2 = \underline{9453}$ (W)

PARAMETERS

Appliance Ratings:

Volts: 240; Current: 36.3 A; Power: _____ (W) (kW)



POWER INPUT TEST (SINGLE PHASE RATED OVER 120V):
 RATING (CSA 22.2 109-M1981):

UL 197 Sec. 47
 (6.2)

RESULTS

Operating Conditions	Specified			Measured				
	Volts , L1-L2	Amps		Power, (W) (kW)	Volts L1-L2	Amps		Power , (W)
		L1	L2			L1	L2	
Full power operation, rated voltage	240	---		---	240	23.3		5456
[X] Full power operation, rated current*	---	36.3*		---	n/a*	n/a*		n/a*
Max current attained*	n/a	n/a		n/a	238*	26.0*		6027* *
[X] Full power operation, rated power*	---	---		8712*	n/a*	n/a*		n/a*
Max Power attained*	n/a	n/a		n/a	238*	26.0*		6027*
c-UL Test Conditions								
Full power operation, increased test voltage	250	---		---	250	21.6		5314
[] Full power operation, increased test current	---	37.8		---	n/a*	n/a*		n/a*
[] Full power operation, increased test power	---	---		9453	n/a*	n/a*		n/a*

*Full power and current were not attainable. The oven went into alarm at 250V. The highest values recorded during tested are reported as Max attained. DLD 2016-06-30

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



CAPTURE TEST:

UL 710B Sec. 58
UL 710 Sec. 31

METHOD

The model 1200-SK/III cooking appliance was placed under a hood operating at 500 CFM. 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.

COOKING PRODUCT

[X] Chicken - Half chickens weighing 1.61 lbs. The oven was filled to the maximum capacity of 140 half chickens per load, and was cooked at the manufactures specifications of 325°F for 2 hrs. 40 minutes.

COOKING METHOD

The model 1200-SK/III has two cavities; each cavity was filled with half chickens weighing 1.61 lbs. Each oven cavity was filled to the maximum capacity of 70 half chickens, and was cooked at the manufactures specifications of 325°F for 2 hrs. 40 minutes. During the cooking process the chickens were smoked for 60 minutes.

This is considered one cycle

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.



EMISSION TEST:

UL 710B Sec. 59

METHOD

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR (325°F):

The model 1200-SK/III cooking appliance was placed under a hood operating at 500 CFM, and was tested using a method derived from EPA Method 202. Underwriters Laboratories also provided the chicken for the test.

A 12 in. by 6 in. rectangular, 108 in. tall sheet metal stack was constructed on top 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:

The model 1200-SK/III has two cavities; each cavity was filled with half chickens weighing 1.61 lbs. Each oven cavity was filled to the maximum capacity of 70 half chickens, and was cooked at the manufactures specifications of 325°F for 2 hrs. 40 minutes. During the cooking process the chickens were smoked for 60 minutes.

This is considered one cycle.

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.

*NOTE: 140 HALF CHICKENS WERE USED PER LOAD

Each oven has 7 shelves so 7 trays were filled with to capacity with half chickens 10 pcs per tray = 70 chicken halves (DLD 2016-06-22)



EMISSION TEST (CONT'D):

UL 710B Sec. 59

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 0.55 mg/m^3 , which is [less] [~~more~~] than $5 \text{ mg}/\text{m}^3$.

The total grease emissions (per clause 78.2 of 710B) in pounds per hour per linear food of hood was 0.000307 $\text{lb}/\text{hr}/\text{ft}$.

Note: The average Relative Humidity in the STACK during the test was 45.4%

CONDENSIBLE MATTER
(Lab Analysis)

Sample Bottle No.	Description	Volume, ml	Final Wt, mg
2	Acetone (Blank)	26.0	1,0838
3	Acetone (Wash)	34.0	1,0990
4&5	Solvent Phase (Wash)	170.0	1,0935
4&5	Water Phase (Wash)	610.0	1,0953
6&7	Solvent Phase (Blank)	160.0	1,0795
6&7	Water Phase (Blank)	280.0	1,0629

Filter paper weight before test- 0.5939 mgFilter paper weight after test- 0.5937 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.