



2015-09-28

Mr. Rob Henry
Thermodyne Foodservice Products Inc.
4418 New Haven Ave
Fort Wayne IN, 46803
United States

E-mail: rob.henry@vptag.com

Reference: Project : 4786998914 P.O. Number: 30150

Product: EPA 202 TEST METHOD: USING THE THERMODYNE FOODSERVICE MODEL 2100-DW COOKING THE BELOW FOOD PRODUCT AS MEDIA.

Dear Mr. Henry,

Per your request, project 4786998914 was opened for the evaluation of grease-laden vapors produced from the Model 2100-DW.

The scope of this project was to determine the total grease emissions from cooking quartered roasting chickens, weighing 2-1/2 to 3-1/2 lb. skin-on and bone-in 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 September 10th, 2015. This letter will report the results of the EPA202 test.

For the record, the test was conducted using the Thermodyne Foodservice, Model 2100-DW, rated 240 V, 3ph, 26 A. The model 2100-DW was used for testing purposes and considered representative of the Counter Top models 200NDNL, 200CT, 250PNDT, BW3/BW4, 300NDNL, 300CT, 700NDNL, 700CT, 742HW, 744HW, 950NDNL, 300OC, 250OC*, 1250OC* and the Full size models 550CT, 1200G, 1200DW, 1300G, 1600NDNL, 1900G, 1900DW, 1900DWDT. The test media, food load and oven settings as shown in Appendix A was specified by Thermodyne Foodservice 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 0.30 mg/m³, which is less than 5 mg/m³ limit. No evaluation was conducted in regards to fire protection.



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 4786584994 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:

Sean Drobinski

William G. Morler

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APPENDIX: A

CLIENT INFORMATION	
Company Name	Thermodyne Foodservice Products
Address	4418 New Haven Ave Fort Wayne, IN 46803

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UL 197	Edition/ Revision Date	10 TH June 24, 2011
		CSA C22.2 No. 109		M1981 R2014
		UL 710B		2 nd September 2 nd 2011
<input checked="" type="checkbox"/> Tests Conducted by ¹ Leo Carrillo				
<input type="checkbox"/> UL Staff supervising UL Staff in training				

TESTS TO BE CONDUCTED:				
Test No.	Start	Done	Test Name	<input type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by ² <input type="checkbox"/> Link to separate data files ⁴
1	2015-09-09	2015-09-09	POWER INPUT TEST (THREE PHASE): RATING (CSA 22.2 109-M1981):	
2	2015-09-08	2015-09-18	CAPTURE TEST:	
3	2015-09-11	2015-09-18	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 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
2176841	7/30/15	ALL	1	Thermodyne Foodservice, Model 2100-DW, rated 240 V, 26 A, 3ph
2176842	7/30/15	ALL	2	Doors
2176843	7/30/15	ALL	2a	Doors
2176844	7/30/15	ALL	2b	Doors
2176845	7/30/15	ALL	2c	Doors
2192092	2015-08-21	All	3	Qty.15 Pans
2192093	2015-08-21	All	4	Qty.15 pans



POWER INPUT TEST (THREE PHASE):
 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.

(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 power, 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): $I_r(V_t/V_r) = \underline{27.08}$ A

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: 240; Current: 26.0 A; Power: (kW)

RESULTS

Operating Conditions	Specified					Measured						
	Volts	Amps			Power, (kW)	Volts			Amps			Power, (kW)
		L1	L2	L3		L1-L2	L2-L3	L1-L3	L1	L2	L3	
Full power operation, rated voltage	240	---	---	---	---	241.6	240.1	240.2	26.0	25.2	25.5	10.70
[X] Full power operation, rated power	---	---	26.0	---	---	251	248.5	249.0	26.9	26.0	26.3	11.45
C-UL Operating Conditions												
Full power operation, increased test voltage	250	--	---	---	---	252.3	250.1	250.6	27.0 4	26.1	26.6	11.61
[X] Full power operation, increased test power	---	--	27.08	---	---	261.5	259.5	260	28.1	27.1	27.3	12.51

[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 A

The model 2100-DW 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

Ovens - Quartered chickens weighing 3.05 lbs. The oven was filled to the maximum capacity of 3 chickens per pan with 30 pans per load, and was cooked at the manufactures specifications of 230°F for 127 minutes. This is considered one cycle.

COOKING METHOD

Oven Settings for chicken:

- Oven Temperature: 230°F
- Fan: N/A
- Cook time: 127 minutes

RESULTS A

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 A

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR (230 °F):

The model 2100-DW 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 quartered chickens 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:

Ovens - Quartered chickens weighing 3.05 lbs. The oven was filled to the maximum capacity of 3 chickens per pan with 30 pans per load, and was cooked at the manufactures specifications of 230°F for 127 minutes. This is considered one cycle.

The cooking cycle was repeated for 8 hours of continuous cooking. This resulted in a total of 4 loads of chicken being cooked with 3 chickens per pan for 30 pans.

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.



EMISSION TEST (CONT'D):

UL 710B Sec. 59

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 0.30 mg/m³, which is [less] [~~more~~] than 5 mg/m³.

The total grease emissions (per clause 78.2 of 710B) in pounds per hour per linear food of hood was 0.000150 lb/hr/ft.

Note:

Total avg. Humidity: 50.0%
Avg. Stack Temp: 24.8°C

CONDENSIBLE MATTER

(Lab Analysis)

Sample Bottle No.	Description	Volume, ml	Final Wt, mg
2	Acetone (Blank)	80.0	0.0
3	Acetone (Wash)	75.0	0.1
4&5	Solvent Phase (Wash)	480.0	1.1
4&5	Water Phase (Wash)	565.0	1.9
6&7	Solvent Phase (Blank)	495.0	0.3
6&7	Water Phase (Blank)	570.0	0.1

Filter paper weight before test- 590.2 mg

Filter paper weight after test- 590.3 mg