



2020-03-26

Ms. Christa Pieper  
W164 N9221 Water Street  
P.O. Box 450  
Menomonee Falls, WI 53052

Reference: Project 4787543823

Product: EPA 202 TEST METHOD: USING COMMERCIAL COOKING APPLIANCE CONVECTION  
OVEN MODEL PLEXR BOLT-321 (CURRENT MODEL VMC-H3)

Dear Christa,

Project 4787543823 was opened for the evaluation of grease-laden vapors produced from cooking below listed produce using the commercial oven Model Plexr Bolt-321, rated 208/240 V, 38/43 A.

The scope of this project was to determine the total grease emissions from cooking the specified food load as noted in Appendix A. Testing was conducted in accordance with EPA Method 202 test guidelines to determine ultimate results. Results are used to determine compliance with Section 59 of UL710B, Second Edition, the Standard for Recirculating Systems; formerly Section 17 of UL 710B, First Edition (also formerly Section 14 of UL197, 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 November 16th, 2016. This letter will report the results of the EPA 202 Emission test.

The cook cycles and settings were as shown in Appendix A. The results are considered to comply with UL710B, Second Edition, Section 59 and NFPA96, paragraph 4.1.1.2.

The total amount of grease-laden effluents collected was 2.39 mg/m<sup>3</sup>, which is less than 5 mg/m<sup>3</sup> limit.

No evaluation was conducted in regards to fire protection. In addition, no evaluation of the cooking equipment itself was conducted.

The total test time for each test was eight hours. The unit was energized as depicted under the Capture Test on the following pages.



The model numbers have changed since testing was conducted as the models were transferred from Appliance Innovation to Alto-Shaam.

For reference, the table below shows the correlation between the old and new model numbers. The models are identical, except model designations have changed.

Old Model Number	New Model Number
Plexr Bolt-221	VMC-H2
Plexr Bolt-221H	VMC-H2H
Plexr Bolt-321	VMC-H3
Plexr Bolt-321H	VMC-H3H
Plexr Bolt-421	VMC-H4
Plexr Bolt-421H	VMC-H4H

The test result obtained by testing Model Plexr Bolt-321 (new model designation VMC-H3) is representative and covers all other models depicted in the table. No testing was considered necessary on Model Plexr Bolt-421 (new model designation VMC-H4) due to low grease-laden air emission results of testing Model Plexr Bolt-321. Model Plexr Bolt-321 has a three pan capacity while Model Plexr Bolt-421 has a four pan capacity. Based on this difference in conjunction with 2.39 mg/m<sup>3</sup> test results on Model Plexr Bolt-321, no additional testing was considered necessary.



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 4787543823 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:

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*Fred Zaplatosch*

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CLIENT INFORMATION	
Company Name	APPLIANCE INNOVATION
Address	10500 Metric Dr, Suite 128 Dallas, TX 75243 United States

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UL 197	Edition/Revision Date	10 <sup>th</sup> 9/17/2014
		CSA C22.2 No. 109-M1981		2 <sup>nd</sup> 4/1989 (R2013)
		UL 710B		2 <sup>nd</sup> 8/14/2014
<input checked="" type="checkbox"/> Tests Conducted by <sup>1</sup> Leo Carrillo				
<input type="checkbox"/> UL Staff conducting or witnessing testing (WTDP, TMP, WMT only) <input type="checkbox"/> UL Staff supervising UL Staff in training				
<input type="checkbox"/> Authorized Signatory (CTDP, TPTDP, TCP, PPP, SMT)				
			Printed Name	Signature. Include date for CTDP, TPTDP, TCP, PPP, WMT, TMP, SMT

TESTS TO BE CONDUCTED:				
Test No.	Start	Done	Test Name	<input type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by <sup>2</sup> <input type="checkbox"/> Link to separate data files <sup>4</sup>
1	2016-11-14	2016-11-23	CAPTURE TEST:	
2	2016-11-16	2016-11-23	EMISSION TEST:	

Instructions -

- 1 - When all tests are conducted by one person, name can be inserted here instead of including name on each page containing data.
- 2 - When test conducted by more than one person, name of person conducting the test can be inserted next to the test name instead of including name on each page containing data. Test dates may be recorded here instead of entering test dates on the individual datasheet pages.
- 3 - Use of this field is optional and may be employed differently. If used to include a date instead of entering the testing date on the individual datasheet pages, the date shall be the date the test was conducted.
- 4 - Link to separate data files for a test can be inserted here. The link must be to a server that is accessible to UL staff, that provides for backup, required retention periods and a path, including file name, that does not change and result in a broken link. Not applicable to DAP.



GENERAL TEST CONSIDERATIONS - ALL TESTS:

[Power Supply Connections]

Unless otherwise specified in the individual test methods, the appliance was connected to a 240 volt source of supply 60 Hz.

This supply connection was based on

- The marked voltage rating
- The highest voltage of the applicable range of voltages

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.

Inst. ID No.	Instrument Type	Test Number +, Test Title or Conditioning	Function /Range	Last Cal. Date	Next Cal. Date

+ - If Test Number is used, the Test Number must be identified on the data sheet pages or on the Data Sheet Package cover page.

The following additional information is required when using clients or rented equipment, or when a UL ID Number for an instrument number is not used. The Inst. ID No. below corresponds to the Inst. ID No. above.

Inst. ID No.	Make/Model/Serial Number/Asset No.

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	<input type="checkbox"/> Test No.+	Sample No.	Manufacturer, Product Identification and Ratings
493891	2016-10-11	ALL	1	Appliance Innovation, Model Plexr Bolt-321 oven, rated 208/240 V, 60 Hz, 38/43 A, 1 phase, 10300 W.

+ - If Test Number is used, the Test Number or Numbers the sample was used in must be identified on the data sheet pages or on the Data Sheet Package cover page.



CAPTURE TEST:

UL 710B Sec. 58

UL 710 Sec. 31

#### METHOD

The appliance was energized as follows:

The c-UL increased test voltage of 250 volts [or the voltage necessary to cause the appliance to draw the c-UL increased test power of 10730 W] whichever caused the higher input to the appliance.

The Model Plexr Bolt-321 oven 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, roasters and similar appliances are to be tested using 2-1/2 to 3-1/2 lb skin-on and bone-in roasting chickens or quartered chicken pieces, loaded per the cooking appliance manufacturer's instructions; Three half size sheet pans are to be used.

#### RESULTS

There ~~[was]~~ **[was not]** any 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.

Note: 18 loads total cooked.

Cooking settings were as follow:

Fan speed: Cavity 1 (100%)

Cavity 2 (100%)

Cavity 3 (100%)

Temperature: 500 degrees F for all cavities

Time: 24 minutes

Trays: 3 half sheet pans

Load: 3 chickens per tray



EMISSION TEST:

UL 710B Sec. 59

METHOD

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR (500°F):

The Model Plexr Bolt-321 oven cooking appliance was placed under a hood operating at 500 CFM, and was tested using a method derived from EPA Method 202.

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, roasters and similar appliances are to be tested using raw quartered chicken pieces, loaded per the cooking appliance manufacturer's instructions;

Three half size sheet pans are to be used.

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 ft<sup>3</sup>/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 ( $\text{MeCl}_2$ ). 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  $\text{MeCl}_2$  approximately equivalent to the volume of  $\text{MeCl}_2$  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.





EMISSION TEST (CONT'D):

UL 710B Sec. 59

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 2.39 mg/m<sup>3</sup>, which is **[less]** ~~[more]~~ than 5 mg/m<sup>3</sup>.

The total grease emissions (per clause 78.2 of 710B) in pounds per hour per linear food of hood was 0.001346 lb/hr/ft.



EMISSION TEST (CONT'D) :

UL 710B Sec. 59

CONDENSIBLE MATTER  
(Lab Analysis)

Sample Bottle No.	Description	Volume, ml	Final Wt, mg
1	Filter Paper	-	597.1
2	Acetone (Blank)	77.0	2.7
3	Acetone (Wash)	85.0	3.8
4&5	Solvent Phase (Wash)	500.0	7.0
4&5	Water Phase (Wash)	760.0	9.0
6&7	Solvent Phase (Blank)	528.0	0.2
6&7	Water Phase (Blank)	415.0	1.0

Filter paper weight before test - 590.5 mg

Filter paper weight after test - 596.6 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  $\text{MeCl}_2$  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.