TurboChef Technologies Inc.

HhC 2620 Ventless Submittal Information

TURBOCHEF

Project _____

Item No. _____

Quantity _____

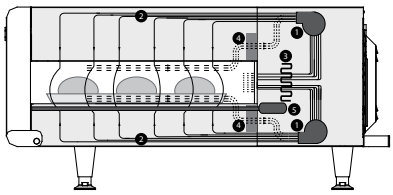
HIGH h CONVEYOR 2620™

PERFORMANCE

- The High h Conveyor 2620 offers high-heat transfer rates for accelerated cooking, a small enough footprint to fit virtually any application, and does not require the energy consumption and higher HVAC needs of larger ovens.

VENTILATION

- UL (KNLZ) listed for ventless operation.†
- EPA 202 test (8 hr):
  - Product: Pepperoni Pizza
    Results: 2.4 mg/m^3
- Internal catalytic filtration to limit smoke, grease, and odor emissions.



1. Blower Motor
2. Impinged Air
3. Impingement Heater
4. Catalytic Converters (optional)
5. Conveyor Motor

EXTERIOR CONSTRUCTION

- 430 stainless steel front, top, sides and back
- Cool to touch covers and panels

INTERIOR CONSTRUCTION

- Stainless steel interior
- 26-inch cook chamber

STANDARD FEATURES

- Small footprint with even more throughput than the HhC 2020
- Independently-controlled top and bottom air impingement
- Variable-speed High h recirculating impingement airflow system
- Stackable design up to 3 high (requires stacking kits)
- Variable-speed blower motors
- Easy to clean mono-finger design
- Idle mode for energy conservation
- Built-in self diagnostics for monitoring oven components
- Left or right feed conveyor belt direction via software
- Includes plug and cord (6 ft. nominal)
- Includes two 6" conveyor extensions
- Warranty – one year parts and labor
- Smart voltage sensor technology (U.S. only)

OPTIONAL FEATURES

- Split belt with individually-adjustable speed settings (split 50/50 or 70/30)
- Dual catalytic converters for ventless operation.†

CERTIFICATIONS

c UL US

TÜV PRODUCT SERVICE Production monitored Safety tested

CE

CLASSIFIED UL EPH ANSI/NSF #4 81Y5

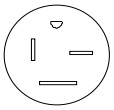
This product conforms to the ventilation recommendations set forth by NFPA96 using EPA202 test method.

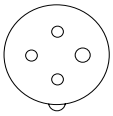
† Ventless certification is for all food items except for foods classified as "fatty raw proteins." Such foods include bone-in, skin-on chicken, raw hamburger meat, raw bacon, raw sausage, steaks, etc. If cooking these types of foods, consult local HVAC codes and authorities to ensure compliance with ventilation requirements. Oven is not certified for ventless operation if triple stacked.

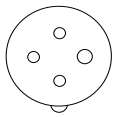
Ultimate ventless allowance is dependent upon AHJ approval, as some jurisdictions may not recognize the UL certification or application. If you have questions regarding ventless certifications or local codes please email ventless.help@turbochef.com

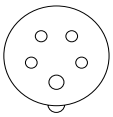
TurboChef reserves the right to make substitutions of components or change specifications without prior notice.

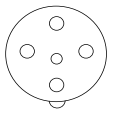
DIMENSIONS		
SINGLE UNITS		
Height	17.0″	432 mm
Width	48.3″	1227 mm
Depth	41.7″	1059 mm
Weight	260 lb.	118 kg
Cook Chamber		
Baking Area	3.6 ft^2	0.33 m^2
Belt Length	48.3″	1227 mm
Belt Width (Single)	26″	660 mm
Belt Width (50/50 Split)	12.5″ / 12.5″	318 mm / 318 mm
Belt Width (70/30 Split)	17″ / 8″	431 mm / 203 mm
Adjustable Opening (Min/Max)	1″ / 3″	25 mm / 76 mm
Max Operating Temp	550°F	288°C
Bake Time Range	30 seconds to 15 minutes	
Wall Clearance		
Top	10″	254 mm
Sides	0″	0 mm
Back	0″	0 mm

ELECTRICAL SPECIFICATIONS - USA	
HCW-9500-1 (Single Belt) HCW-9500-6 (50 / 50 Split Belt) HCW-9500-11 (70/30 Split Belt)	 NEMA 15-50P
Phase	3 Phase
Voltage	208/240 VAC
Frequency	50/60 Hz
Current Draw	40 Amp
Supply	4 Wire
Breakers	50 Amp

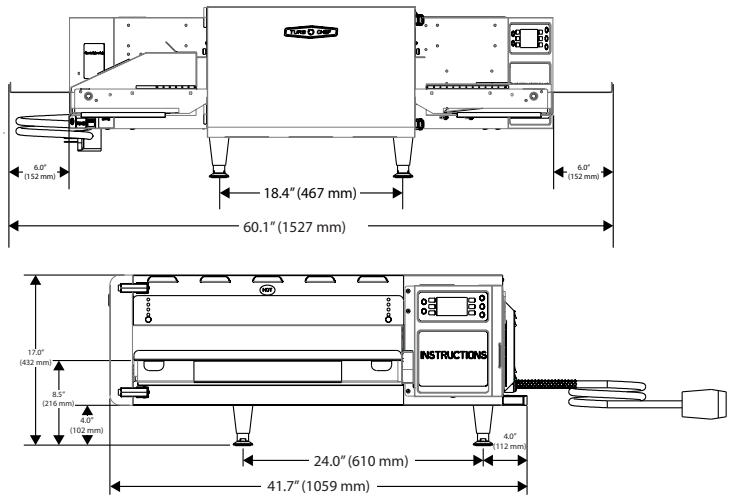
ELECTRICAL SPECIFICATIONS - CANADA	
HCW-9500-2C (Single Belt) HCW-9500-7C (50 / 50 Split Belt) HCW-9500-12C (70/30 Split Belt)	 UL 4 Pin, 60 Amp
Phase	3 Phase
Voltage	208/240 VAC
Frequency	50/60 Hz
Current Draw	40/46 Amp
Supply	4 Wire
Breakers	50 Amp

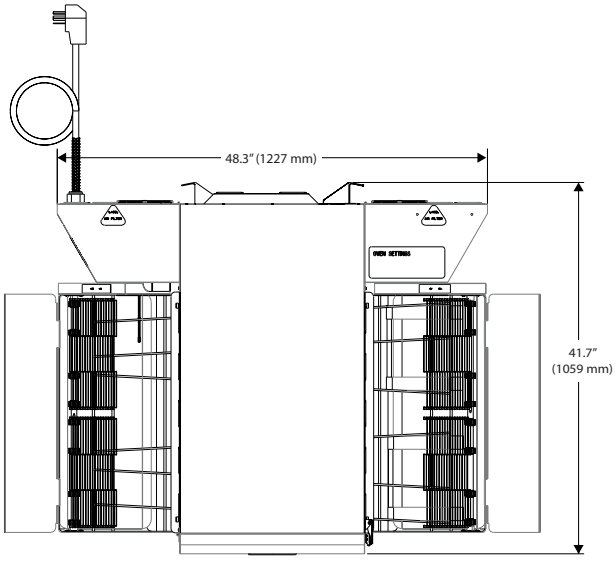
ELECTRICAL SPECIFICATIONS - EUROPE/ASIA (DELTA)	
HCW-9500-3D (Single Belt) HCW-9500-8D (50 / 50 Split Belt) HCW-9500-13D (70/30 Split Belt)	 IEC 4 Pin, 63 Amp
Phase	3 Phase
Voltage	220 - 240 VAC
Frequency	50/60 Hz
Current Draw	40 Amp
Supply	4 Wire
Breakers	50 Amp

ELECTRICAL SPECIFICATIONS - EUROPE/ASIA (WYE)	
HCW-9500-4W (Single Belt) HCW-9500-9W (50 / 50 Split Belt) HCW-9500-14W (70/30 Split Belt)	 IEC 5 Pin, 32 Amp
Phase	3 Phase
Voltage	380 - 415 VAC
Frequency	50/60 Hz
Current Draw	20 Amp
Supply	5 Wire
Breakers	32 Amp

ELECTRICAL SPECIFICATIONS - AUSTRALIA	
HCW-9500-5W (Single Belt) HCW-9500-10W (50/50 Split Belt) HCW-9500-15W (70/30 Split Belt)	 IEC 5 Pin, 32 Amp
Phase	3 Phase
Voltage	380 - 415 VAC
Frequency	50/60 Hz
Current Draw	20 Amp
Supply	5 Wire
Breakers	32 Amp

SHIPPING INFORMATION
U.S.: All ovens shipped within the U.S. are packaged in a double-wall corrugated box banded to a wooden skid. **International:** All International ovens shipped via Air or Less than Container Loads are packaged in wooden crates.
Box size: 54" (1,372 mm) x 48" (1,219 mm) x 26" (660 mm) **Crate size:** 57" (1,449 mm) x 51" (1,295 mm) x 27" (686 mm) **Item class:** 85 NMFC #26770 HS code 8419.81
Approximate boxed weight: 345 lb. (156 kg) **Approximate crated weight:** 450 lb. (204 kg)
Minimum entry clearance required for box: 26.5" (673 mm) **Minimum entry clearance required for crate:** 27.5" (699 mm)





C UL US 3RUB

LISTED

Commercial Conveyor Oven with Integral Systems for Limiting the Emissions of Grease Laden Air

This Product Conforms to the Ventilation Recommendations Set Forth by NFPA96 Using EPA202 Test Method

HCT-4181 / Rev B / Nov 08

NOTICE OF COMPLETION
AND
AUTHORIZATION TO APPLY THE UL MARK

11/19/2012

Turbochef Technologies Inc
Mr. DAVID ROBILLARD
Suite 105
4240 International Pky
Carrollton Tx 75007, Us

Our Reference:	File E151487, Vol. 1	Project Number	12NK11491
Your Reference:	David Robillard 8/28/12		
Project Scope:	E151487: ALT CONST OF 2020 OVEN IN V1 S11		

Dear Mr. DAVID ROBILLARD:

Congratulations! UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements. This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark at authorized factories under UL's Follow-Up Service Program. To provide your manufacturer(s) with the intended authorization to use the UL Mark, you must send a copy of this notice to each manufacturing location currently authorized under File E151487, Vol. 1.

Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent in the near future. Until then, this letter authorizes application of the UL Mark for 90 days from the date indicated above.

Additional requirements related to your responsibilities as the Applicant can be found in the document “Applicant responsibilities related to Early Authorizations” that can be found at the following web-site:
http://www.ul.com/EAResponsibilities

Any information and documentation provided to you involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

We are excited you are now able to apply the UL Mark to your products and appreciate your business. Feel free to contact me or any of our Customer Service representatives if you have any questions.

Very truly yours,

Kenneth Shepherd
972-509-1283
Staff Engineer
Kenneth.Shepherd@ul.com

Reviewed by:

William R. Carney
847/664-1088
Chief Engineer Director I
William.R.Carney@ul.com

SCLC3A5-195212

CERTIFICATE OF COMPLIANCE

Certificate Number	20121119-E151487
Report Reference	E151487-20080725
Issue Date	2012-NOVEMBER-19
Issued to:	TURBOCHEF TECHNOLOGIES INC SUITE 105 4240 INTERNATIONAL PKY CARROLLTON TX 75007
This is to certify that representative samples of	MICROWAVE COOKING APPLIANCES;COMMERCIAL COOKING APPLIANCES WITH INTEGRAL SYSTEMS FOR LIMITING THE EMISSION OF GREASE-LADEN AIR Conveyor Ovens, Models HHC2020 and HCW2620
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	Standard for Commercial Electric Cooking Appliances, UL 197 Recirculating Systems, UL710B Standard for Commercial Cooking Appliances, CSA C22.2 No. 109-M1981
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.
The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with “C” and “US” identifiers: c UL us the word “LISTED”; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs

UL LLC

Project No. 12NK11491 File E151487 Page 1

Tested by: _____ Date _____
Printed Name Signature

Number of pages in this package ____ [including additional pages ____]
(Fill in when using printed copy as record)

TEST LOCATION:					
[X]UL or Affiliate	[]WTDP	[]CTDP	[]TPTDP	[]TCP	[]PPP
	[]WMT	[]TMP	[]SMT		
Company Name	UL/NBK				
Address					

CLIENT INFORMATION	
Company Name	TurboChef Technologies
Address	4240 International Pky Carrollton, TX 75007 Suite 105

AUDIT INFORMATION:				
Description of Tests	Per Standard No.	UL 197 CSA C22.2 No. 109 UL 710B	Edition/ Revision Date	10TH June 24, 2011 M1981 R2009 2nd September 2, 2011

[X] Tests Conducted by + Ken Kingsbury/D.DeFord
Printed Name Signature

[] UL Staff supervising
UL Staff in training Printed Name Signature

Reviewed and accepted by qualified Project Handler: William G. Morler
Printed Name Signature

TESTS TO BE CONDUCTED:

Test No.	Start	Done+++	Test Name	[] Comments/Parameters []Tests Conducted by ++
1	2012/10/25	2012/10/29	POWER INPUT TEST (THREE PHASE): RATING (CSA 22.2 109-M1981):	
2	2012/11/7	2012/11/14	EMISSION TEST (UL 710B)	++Shane M. Keller

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 at 60 Hz.

This supply connection was based on
[X] The marked voltage rating
[ ] The highest voltage of the applicable range of voltages

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Tested by: _____ Date _____

Printed Name Signature

TEST EQUIPMENT INFORMATION

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 client's 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.

[X]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 provide 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
1489401	2012/10/19	ALL	1	TurboChef Technologies, Conveyor Oven, Model HWC2620, rated 240 V, 14400 W, 3ph.

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Tested by: _____ Date _____

Printed Name Signature

POWER INPUT TEST (THREE PHASE RATED OVER 120V): UL 197 Sec. 47 (6.2)

RATING (CSA 22.2 109-M1981):

METHOD

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

~~**[ ]** The supply voltage was adjusted to the **[**rated voltage**]** **[**mean of the rated voltage range**]** at rated frequency, **[**___ V**]**, **[**___ Hz**]**.~~

The power input was measured with the appliance at the intended operating temperature under full-load conditions.

[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**]** **[**and**]** **[**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): $I_r(V_t/V_r)$ = _____ A

Increased Test Power (W_t): $W_r(V_t/V_r)^2$ = __15625_ (W)~~(kW)~~

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: __40__ A; Power: ___14400___ (W)~~(kW)~~

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Tested by: _____ Date _____
Printed Name Signature

POWER INPUT TEST (THREE PHASE RATED OVER 120V): (CONT'D) UL 197 Sec. 47
RATING (CSA 22.2 109-M1981): (6.2)

RESULTS

Operating Conditions	Specified					Measured						
		Amps			Power,	Volts			Amps			Power,
	Volts	L1	L2	L3	(W)(kW)	L1~~-L2~~	L2~~-L3~~	~~L1-~~L3	L1	L2	L3	(W)~~(kW)~~
Full power operation, rated voltage	240	---	---	---	---	241	240	246	38.9	35.9	33.6	13372
[ ] Full power operation, rated current	---				---							
[X] Full power operation, rated power	---	---	---	---	14400	251	250	257	39.9	38.3	34.2	14427
[ ] Full power operation, ____V		---	---	---	---							
C-UL Operating Conditions												
Full power operation, increased test voltage	250	---	---	---	---	251	250	257	39.8	38.2	34.1	14384
[ ] Full power operation, increased test current	---				---							
[X] Full power operation, increased test power	---	---	---	---	15625	258	258	264	42.1	39.0	36.6	15626

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

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

~~**[ ]** The input current **[**was**]** **[**was not**]** over ____ A when the appliance was energized at _____ V. (Note: see paragraph 47.3 of UL 197)~~

~~**[ ]** The input current **[**was**]** **[**was not**]** over ____ A when the appliance was energized at rated wattage. (Note: see paragraph 47.3 of UL 197)~~

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Tested by: _____ Date _____

Printed Name Signature

EMISSION TEST: UL 710B Sec. 59

METHOD

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR (_550_°F):

The Model HWC2620 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 and mounted above the exhaust vent of the appliance. 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:

~~[Griddles] [Broiler]~~
~~Meat cakes, 5 minutes per side, ____ per load. Each load took 10 minutes.~~
~~[Fryer]~~
~~The fryer was operated normally by cooking the following foods at a temperature of ____°F with Clear Frying Oil (Soybean w/ additives): French Fries were used, ___ baskets with ___ lbs. per basket. Each load took ___ minutes to cook with a ___ minute recovery time.~~

Conveyor Oven - 12 in. pepperoni pizza (Tombstone, with 19 pepperonis per pizza), each cooked for _3_ minutes with _0_ seconds between loads for 8 hours (total of _576_ pizzas). Oven was set to maintain _550_°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 ft^3/min.

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Tested by: _____ Date _____

Printed Name Signature

EMISSION TEST: 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 _2.40_ mg/m³, which is [less] ~~[more]~~ than 5 mg/m³.

Reported Grease Emission 0.00063 lb/hr/ft

Note: Additional spreadsheet is to be used when conducting the Emission Test. This spreadsheet (EPA 202) can be found in the Lab Equipment Management System (LEM) under global ID 58255.

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Tested by: _____ Date _____

Printed Name Signature

EMISSION TEST: UL 710B Sec. 59

CONDENSIBLE MATTER
(Lab Analysis)

Sample Bottle No.	Description	Volume, ml	Final Wt, mg
1	Filter Paper	-	652.3
2	Acetone (Blank)	45	0.1
3	Acetone (Wash)	40	0.4
4&5	Solvent Phase(Wash)	150	4.3
4&5	Water Phase (Wash)	530	10.2
6&7	Solvent Phase (Blank)	80	0.5
6&7	Water Phase (Blank)	520	0.5

Filter paper weight before test- _ 644.7 _ 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.

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Tested by: _____ Date _____

Printed Name Signature

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ONLINE CERTIFICATIONS DIRECTORY

KNLZ.E151487
Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air

Page Bottom

Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air

See General Information for Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air

TURBOCHEF TECHNOLOGIES INC E151487
SUITE 105
4240 INTERNATIONAL PKY
CARROLLTON, TX 75007 USA

Commercial microwave/convection ovens, Models *C3/C, HHB, HHB2, *NGC, NGO, *i3, *i5, "Encore".

Model "Encore 2".

Conveyor ovens, Models HHC2020, HCW2620.

"*" - Indicated complimentary Listed Models.

Last Updated on 2012-11-21

Questions? Print this page Terms of Use Page Top

ONLINE CERTIFICATIONS DIRECTORY

KNLZ.GuideInfo
Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air

View Listings Page Bottom

[Heaters and Heating Equipment] (Heaters, Cooking Appliances) Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air

See General Information for Heaters, Cooking Appliances

This category covers cooking equipment intended for commercial use, such as pressurized deep fat fryers and other appliances for use in commercial kitchens, restaurants or other business establishments where food is prepared. Each appliance covered in this category is manufactured with an integral system feature to limit the emission of grease-laden air from the cooking process to the room ambient.

These appliances have been evaluated for the limit of 5 mg/m^3 for the emission of grease-laden air to the room ambient in accordance with the recommendations of the National Fire Protection Association Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96, using the EPA-202 test method prescribed for cooking appliances provided with integral recirculating air systems.

These products are not intended for connection to a ducted exhaust system.

Appliances in this category are not provided with an integral fire extinguishing system. Authorities having jurisdiction should be consulted as to the requirements for this equipment with respect to fire extinguishing systems, such as the need for field installed systems in accordance with NFPA 96.

For products with integral recirculating systems including fire extinguishing systems, refer to Commercial, with Integral Recirculating Systems (KNKG).

In cases where the nature or construction of equipment is such that special precautions beyond the requirements of the National Electrical Code must be observed in installations or use, suitable warning or special instructions are marked on the equipment.

Appliances Listed in this category are suitable for wiring with either copper or aluminum power supply conductors unless marked "Use Copper Wire Only For Power Supply Connections" .

Commercial cooking appliances of certain types are designed for permanent connections to water supply and sewer lines at the point of installation. Authorities having jurisdiction should be consulted as to the requirements for this equipment with respect to sanitation and connection to water supply and waste disposal lines.

Neither the toxicity of coatings nor the physiological effects on persons consuming food products prepared by use of these appliances has been investigated.

For cooking oil filters that are not an integral part of another appliance, see Commercial Filters for Cooking Oil (KNRF).

For additional information, see Electrical Equipment for Use in Ordinary Locations (AALZ) and Heating, Cooling, Ventilating and Cooking Equipment (AAHC).

The basic standard used to investigate products in this category is ANSI/UL 197, "Commercial Electric Cooking Appliances".

Appliances Listed in this category with an integral cooking oil filter have been additionally investigated to the requirements in the standard "Commercial Filters for Cooking Oil", ANSI/UL 1889.

The Listing Mark of Underwriters Laboratories Inc. on the product is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. The Listing Mark for these products includes the name and/or symbol of Underwriters Laboratories Inc. (as illustrated in the Introduction of this Directory) together with the word "LISTED," a control number and one of the following product names as appropriate: "Commercial Cooking Appliance," "Cooking Appliance," or other appropriate product identity specified in the individual Listing, along with the words "with integral system for limiting the emission of grease-laden air. "

Last Updated on 1999-02-19

Questions? Notice of Disclaimer Page Top

TURBOCHEF TECHNOLOGIES, INC.

Installation Recommendations

TurboChef ventless ovens have internal systems for destroying grease laden vapor prior to the grease escaping the oven; therefore, the ovens are certified as non-grease emitting appliances. When following our recommendations, TurboChef ovens can be installed without the aid of a Type I or Type II hood per International Mechanical Code (2006, 2009, and 2012), NFPA 96, NFPA 101 (Life Safety Code), EPA 202, and Underwriter's Laboratory (UL KNLZ).

The following guide is intended to give relevant information for the ventless installation, operation, and maintenance of TurboChef ovens. It is important that these guidelines are followed and that the oven and surrounding areas be maintained regularly for optimal performance.

Certifications

Safety – cULus, TUV (CE)
Sanitation – NSF*, UL EPH*
Ventless – UL (KNLZ)

Electrical Requirements

TurboChef ovens must be installed on a circuit equal to the ratings listed below, per NEC sec 210.23, permissable loads.

Oven	Voltage	Current	Phase
Sōta (i1)	208/240 VAC	30 amp	1 Ph
Sōta Single Mag (i1)	208/240 VAC	20 amp	1 Ph
i3	208/240 VAC 208/240 VAC	40 amp 30 amp	1 Ph 3 Ph
i5	208/240 VAC 208/240 VAC	50 amp 30 amp	1 Ph 3 Ph
Encore/Encore 2	208/240 VAC	30 amp	1 Ph
Tornado	208/240 VAC	30 amp	1 Ph
C3	208/240 VAC	50 amp	1 Ph
HhC 2620	208/240 VAC	50 amp	3 Ph
HhC 2020	208/240 VAC	50 amp	3 Ph
HhC 1618	208/240 VAC 208/240 VAC	30 amp 50 amp	3 Ph 1 Ph
HhB 2	208/240 VAC	30 amp	1 Ph
Double Batch	208/240 VAC 208/240 VAC	50 amp 30 amp	1 Ph 3 Ph
Waterless Steamer (i1)	208/240 VAC	30 amp	1 Ph
Panini (i1)	208/240 VAC	30 amp	1 Ph
Fire	208/240 VAC	30 amp	1 Ph
Bullet	208/240 VAC	30 amp	1 Ph

* NSF certification applies to the Tornado, C3, and HhB 2 ovens only. UL EPH certification applies to all ovens except the C3.

Menu Requirements

TurboChef ovens have been approved by Underwriter's Laboratory for ventless operation (UL KNLZ listing) for all food items EXCEPT for foods classified as "fatty raw proteins." Such foods include bone-in, skin-on chicken, raw hamburger meat, raw bacon, raw sausage, steaks, etc.

The TurboChef certification includes precooked food items such as pizza toppings, sandwich meats, frozen appetizers, and cheeses. Additionally, raw, lean meats such as boneless, skinless chicken breasts and fish fall within the certification.

Cleaning Requirements

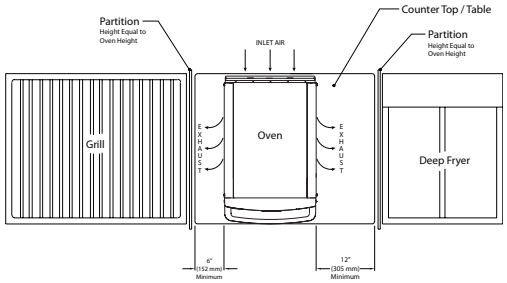
To ensure continued compliance with all health, building, and fire codes, users are required to:

- ☐ Use only TurboChef-approved cleaning chemicals.
- ☐ Follow monthly and quarterly cleaning instructions provided in the manual. Post cleaning instructions near the oven.
- ☐ Ventless installation requires that the areas around the oven (walls, ceilings, kitchen equipment, etc.) be cleaned as needed but no less than once every other month.

Installation Near Open Heat Source

When placing a TurboChef oven near an open heat source (see illustration below), strictly adhere to the following:

- If the oven is being placed near a grill or stove, a divider must exist between the oven and the open heat source, with a minimum of 6" (152 mm) between the oven and the divider.
- If the oven is being placed near a fryer, a divider must exist between the oven and fryer, with a minimum of 12" (305 mm) between the oven and the divider.
- The height of the divider must be greater than or equal to the height of the oven.



Oven Clearances

Verify the oven location has the following clearances on the top and each side. TurboChef ovens have built-in back bumpers that allow for the necessary spacing from the oven to the back wall.

Oven	Top	Sides
Sŏta / Sŏta Single Mag (i1)	5" (127 mm)	2" (51 mm)
i3	19" (483 mm)	2" (51 mm)
i5	19" (483 mm)	2" (51 mm)
Encore/Encore 2	5" (127 mm)	2" (51 mm)
Tornado	4" (102 mm)	2" (51 mm)
C3	4" (102 mm)	2" (51 mm)
HhC 2620	10" (254 mm)	0" (0 mm)
HhC 2020	10" (254 mm)	0" (0 mm)
HhC 1618	10" (254 mm)	0" (0 mm)
HhB 2	2" (51 mm)	2" (51 mm)
Double Batch	2" (51 mm)	2" (51 mm)
Waterless Steamer (i1)	5" (127 mm)	2" (51 mm)
Panini (i1)	5" (127 mm)	2" (51 mm)
Fire	2" (51 mm)	2" (51 mm)
Bullet	5" (127 mm)	2" (51 mm)

Ventilation

TurboChef ovens must be installed in a well-ventilated space. The space should have an exhaust rate of .70 cfm per square foot of kitchen space and an additional 100 sq. ft. (9.3 m^2) of virtual space per ventless cooking appliance (TurboChef or any other).

If the air inlet is for general exhaust, pursuant to requirements for 507.2.2, paragraph 2, locate the air inlet above the center point of each oven.

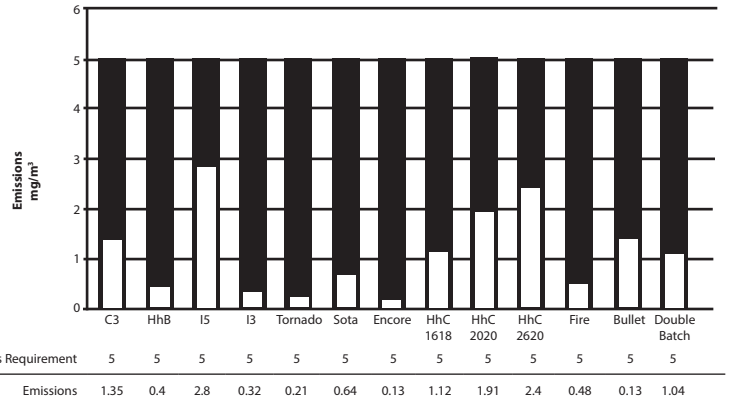
The heat load from TurboChef ovens is mostly sensible. The only latent heat present is due to evaporation during the cooking process. When installing a TurboChef oven, the space must have the following tons of AC per oven installed.

Oven	Tons of AC
Sŏta (i1)	0.29
Sŏta Single Mag (i1)	0.29
i3	0.94
i5	1.31
Encore/Encore 2	0.45
Tornado	0.58
C3	0.63
HhC 2620	1.82
HhC 2020	1.47
HhC 1618	1.00
HhB 2	0.84
Double Batch	1.04
Waterless Steamer (i1)	0.29
Panini (i1)	0.29
Fire	0.50
Bullet	0.13

How the Ovens are Tested

TurboChef ovens are evaluated according to UL. The evaluation entails placing the test oven in an environmental chamber built to capture all emissions escaping during idle, cooking, and door-open conditions. During the eight-hour test period, a typical worst-case food item is cooked continuously, and 100% of condensable and non-condensable emissions from the product are collected and analyzed according to the EPA 202 Test Method. At the conclusion of the test, the total concentration of particulate matter (emissions) must be less than 5.0 mg/m^3 for the oven to be certified for ventless operation. Cooking devices that measure above the 5.0 mg/m^3 threshold are considered to produce grease and must be installed under Type I ventilation, according to International Mechanical Code.

TurboChef ovens are well below the 5.0 mg/m^3 threshold as shown below.



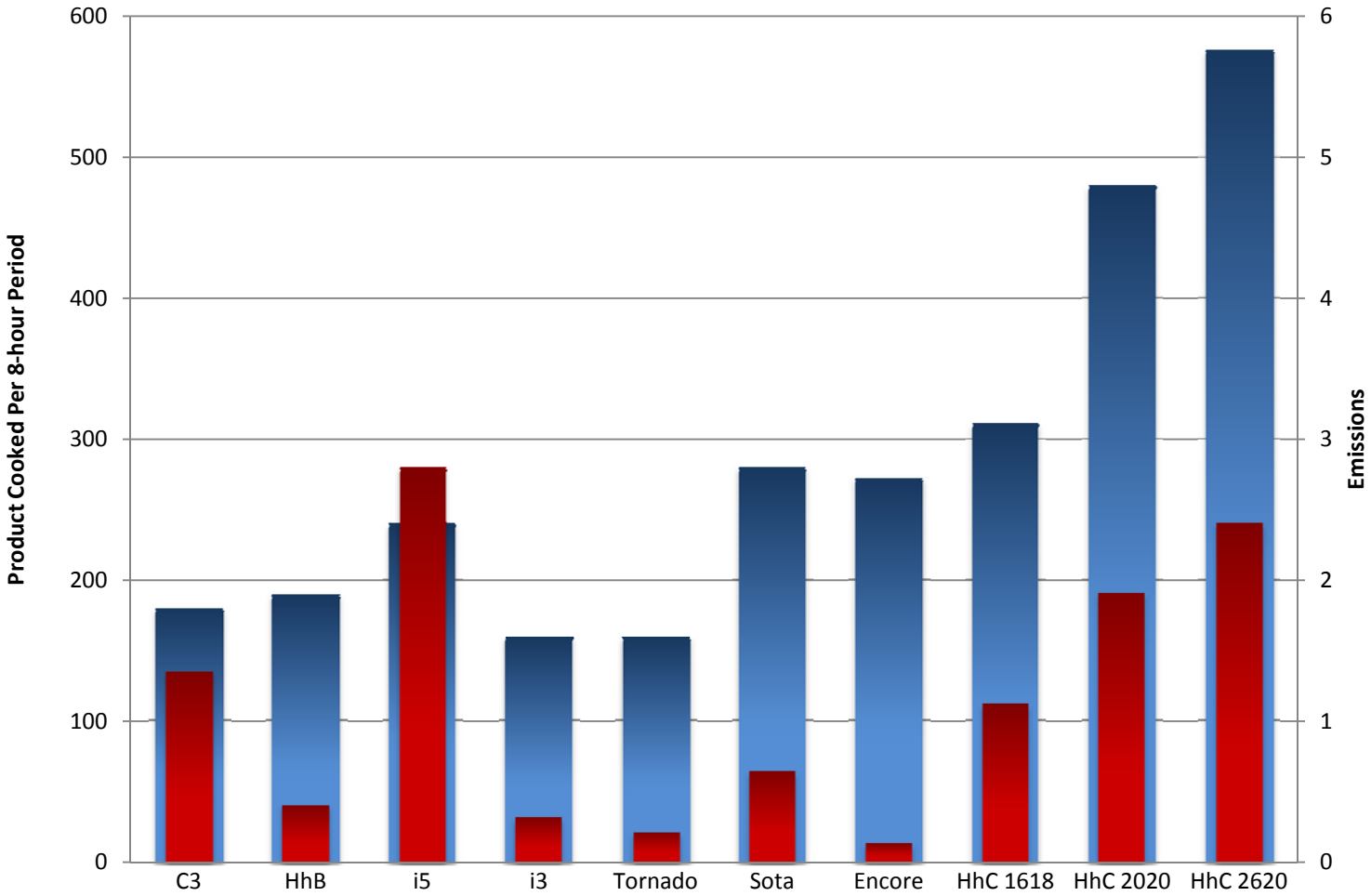
	C3	HhB	I5	I3	Tornado	Sota	Encore	HhC 1618	HhC 2020	HhC 2620	Fire	Bullet	Double Batch
Ventless Requirement	5	5	5	5	5	5	5	5	5	5	5	5	5
Emissions	1.35	0.4	2.8	0.32	0.21	0.64	0.13	1.12	1.91	2.4	0.48	0.13	1.04

NOTE: Certain configurations of TurboChef ovens, such as a triple stacked HhC 2620, may cause emissions to be greater than 5.0 mg/m^3. In these situations, TurboChef recommends that the ovens be installed under a Type I or Type II hood.

Contact Information

For questions regarding a ventless installation, email ventless.help@turbochef.com. For questions or concerns regarding an existing installation, contact Customer Service at 1.800.908.8726, Option 1.

UL® (KNLZ)
Emissions by Product
Ventless Requirement: <5.00 mg/m³



	C3	HhB	i5	i3	Tornado	Sota	Encore	HhC 1618	HhC 2020	HhC 2620
Product Cooked Per 8-hour Period	180	190	240	160	160	280	272	311	480	576
Emissions	1.35	0.4	2.8	0.32	0.21	0.64	0.13	1.12	1.91	2.4

HhC-2620

Changeable Parameters		
Operating Time	12	Hours
Energy Costs	$0.11	kWHr
% of Day in Snooze Mode	34%	Percent
% of Day Cooking (Moderate/heavy)	25%	Percent
	OK	

Do Not Change the following values

	Time (min)	Power (Watts)	Cost/Day	Balance of Time (hrs)
Warm up	10	14000	$0.26	11.83
Cooking	180	11500	$3.80	8.83
Snooze	245	5600	$2.51	4.75
Idle	285	8400	$4.39	0
Total/Day			$10.96	**Yearly**
Total/Month			$328.71	**$3,944.53**

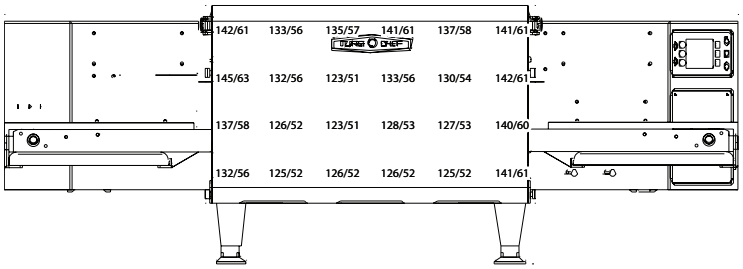
HVAC Requirements Per Operating Time -- Note: Approximations Only					
Average Energy Cooking And Idle (J)	**Warmup Energy (J)**	**Total Energy (J)**	**Total average Power (W)**	**Total Environmental Load kBtu/hr**	**Average Cooling Requirement (ton of AC)**
267,940,800.00	8,400,000.00	276,340,800.00	6,396.78	21.83	1.819

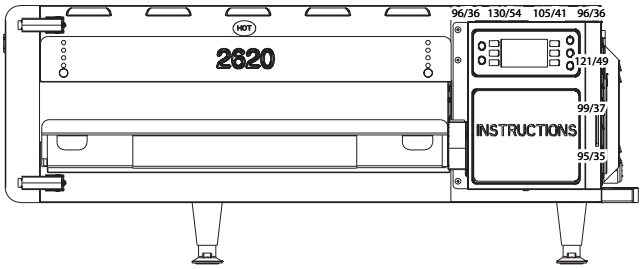
TURBOCHEF TECHNOLOGIES, INC.

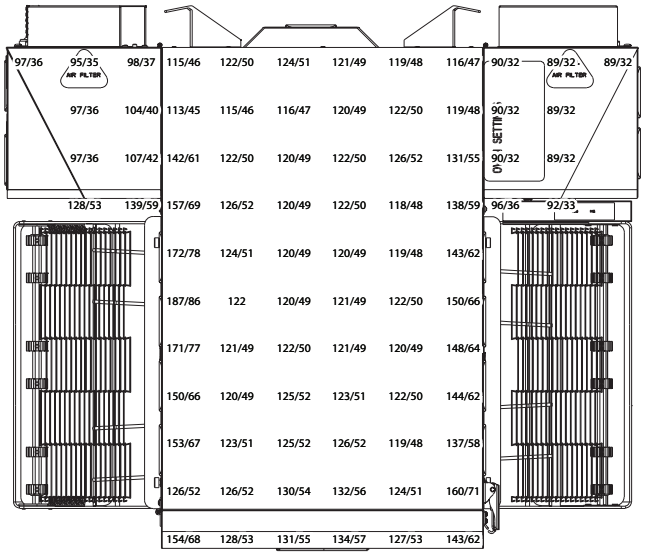
HhC 2620 Oven Surface Temperatures

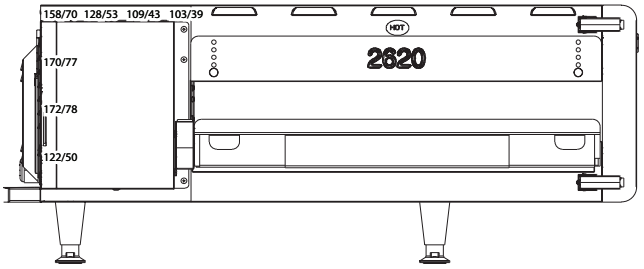
This document illustrates the surface temperature testing data reported for the TurboChef High h Conveyor 2620 oven. Measurements were recorded after four hours of idle. The oven temperature was set to 550°F (288°C) for the duration of the test.

After 4-hour Idle at 550°F/288°C (Values in °F/°C)









COUNTY OF LOS ANGELES
Public Health

JONATHAN E. FIELDING, M.D., M.P.H.
Director and Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

ANGELO J. BELLOMO, REHS, QEP
Director of Environmental Health

TERRI S. WILLIAMS, REHS
Assistant Director of Environmental Health

BRENDA J. LOPEZ, REHS
Acting Director, Bureau of Specialized Surveillance and Enforcement

PLAN CHECK PROGRAM

5050 Commerce Drive
Baldwin Park, California 91706
TEL (626) 430-5100 • FAX (626) 813-3000

March 24, 2014

Tom Yingst
Vice President of Engineering
Turbo Chef Technologies, Inc.
2801 Trade Center Drive
Suite 110
Carrollton, TX 75007

Ventilation Exemption Plan Check No.	ME-2013-005
Application Type:	Equipment specific 240 V; 14,400 W
Effective Date:	3/24/2014
Expiration Date:	3/24/2019
Telephone:	(214)-354-4140
Email:	Tom.yingst@turbochef.com

Dear Mr. Yingst:

RE: EXEMPTION FROM MECHANICAL EXHAUST VENTILATION FOR TURBOCHEF ELECTRIC CONVEYOR OVEN HHC 2620

The County of Los Angeles Department of Public Health, Environmental Health, Plan Check Program, has completed a review of Turbo Chef Oven HHC 2620 for exemption from the mechanical exhaust ventilation requirements of Section 114149.1(a) of the California Retail Food Code.

You have provided documentation that this oven has Underwriter's Laboratory (UL) certification for safety and sanitation, and also provided the UL results of the eight-hour cooking emissions test conducted on the model HHC 2620 conveyor oven. The test results indicate that the total amount of grease-laden effluents collected was 2.40 mg/m^3, which is below the limit of 5 mg/m^3 to be considered a low grease emission appliance.

Therefore, additional mechanical ventilation in the form of a Type I or Type II hood is not required by the County of Los Angeles Department of Public Health for the aforementioned oven models, provided the following contingencies are met:

1. There shall be no more than two unventilated Turbo Chef HHC 2620 ovens per food facility. If the ovens are double stacked, then this is considered two ovens.

2. No other heat producing food related equipment requiring ventilation shall be permitted in a food facility without the addition of mechanical ventilation.

3. The equipment must be installed, serviced, and maintained according to the manufacturer's specifications.

4. Any modification or alteration of the equipment, including any component of the integral air filtration system voids both the ANSI certification of the equipment and this limited exemption.

5. The Turbo Chef HHC 2620 oven shall be used for the cooking or warming of pizza, bread, bakery products, and sandwiches containing ready to eat fillings, vegetables, or similar items only. No raw animal protein products shall be cooked in the equipment unless mechanical ventilation is provided.

6. No items that generate grease-laden vapors shall be prepared or cooked in the unventilated oven(s). Pre-cooked foods such as animal, fish or skinless poultry protein products may be reheated in the Turbo Chef HHC 2620 oven.

7. The Turbo Chef HHC 2620 oven must be operated in a well-ventilated area approved for food preparation.

8. If a food facility that is operating this exempt equipment changes ownership, then the new owner/ operator shall comply under the same operating conditions.

9. This exemption from mechanical exhaust ventilation shall not be deemed to supersede any local building and fire code requirements pertaining to mechanical, electrical and/or fire safety.

This exemption shall be in effect for a period of five years from the date of this letter, or until revoked. Further, this exemption shall not preclude this Department from requiring the installation of mechanical exhaust ventilation when operation of the Turbo Chef HHC 2620 oven at a specific location results in a sanitation or safety violation.

This letter may be used as evidence of the evaluation of the Turbo Chef HHC 2620. However, it is not to be construed as an endorsement of the subject items and may not be used for advertising or promotional services.

If you have any questions, please contact the Plan Check Program at (626) 430-5560.

Sincerely,

Swati Bhatt, R.E.H.S.
Chief Environmental Health Specialist
Plan Check Program

Marco Espinoza, R.E.H.S.
Environmental Health Specialist IV
Plan Check Program