TurboChef Technologies Inc.

# HhC 1618 Ventless Submittal Information

TURBOCHEF

Project _____

Item No. _____

Quantity _____



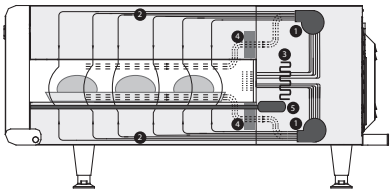
# HIGH h CONVEYOR 1618

**PERFORMANCE**

- The High h Conveyor 1618 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: <1.12 mg/m$^3$
    Ventless Requirement: <5.00 mg/m$^3$
- Internal catalytic filtration to limit smoke, grease, and odor emissions.



1. Blower Motors
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

- All stainless steel interior construction
- 16-inch cook chamber opening

## STANDARD FEATURES

- 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-inch conveyor extensions
- 36-inch conveyor belt assembly
- Warranty – one year parts and labor
- Smart voltage sensor technology (U.S. only)

## OPTIONAL FEATURES

- 48-inch conveyor belt assembly
- 12 or 16-inch conveyor extensions
- Dual catalytic converters for ventless operation

c UL US

TÜV PRODUCT SERVICE Production monitored Safety tested

CE

CLASSIFIED UL EPH ANSI/NSF #4 81Y5

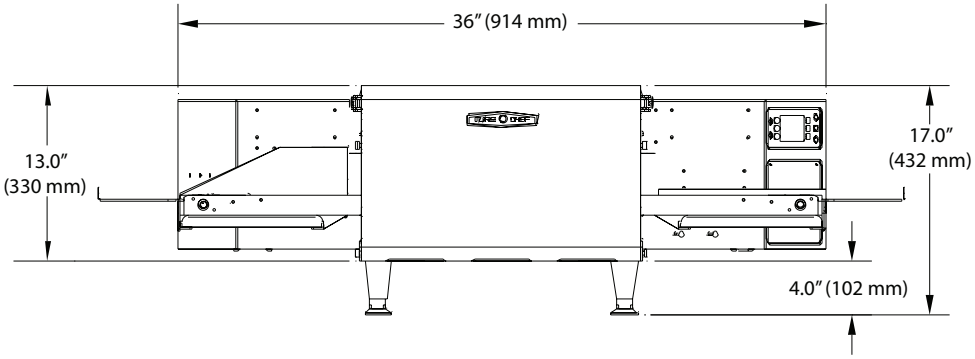
This product conforms to the ventilation recommendations set forth by NFPA96 using EPA202 test method.

† 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.

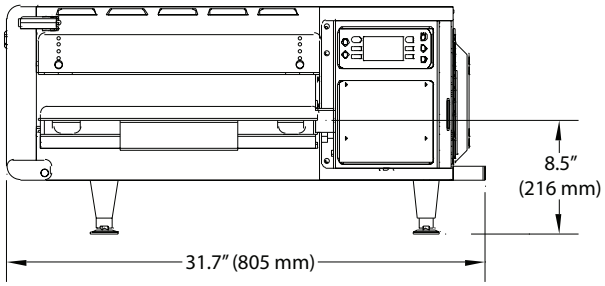
Ultimate ventless allowance is dependent upon AHJ approval, as some jurisdictions may not recognize the UL certification or application. If you have questions regarding ventless certifications or local codes please email ventless.help@turbochef.com

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

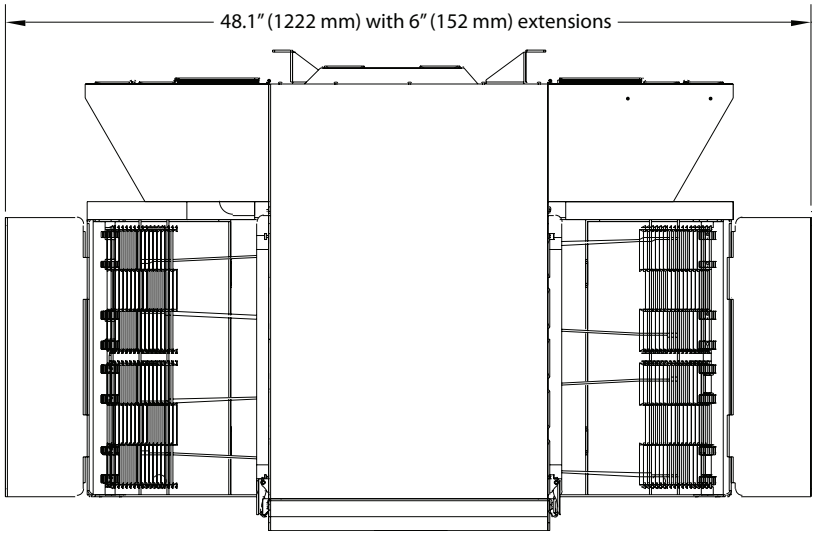
## Front View



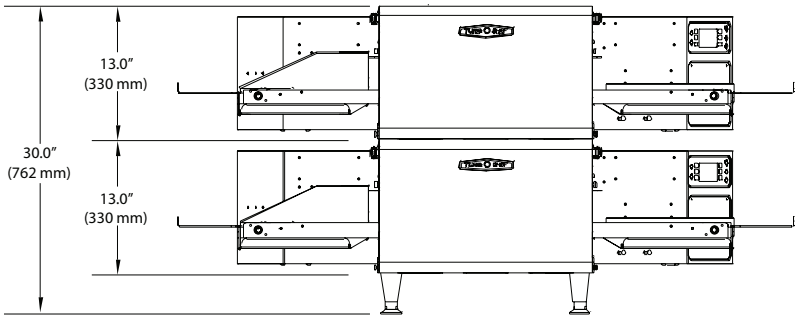

## Side View

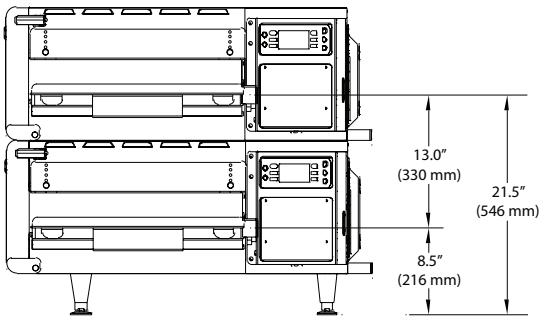


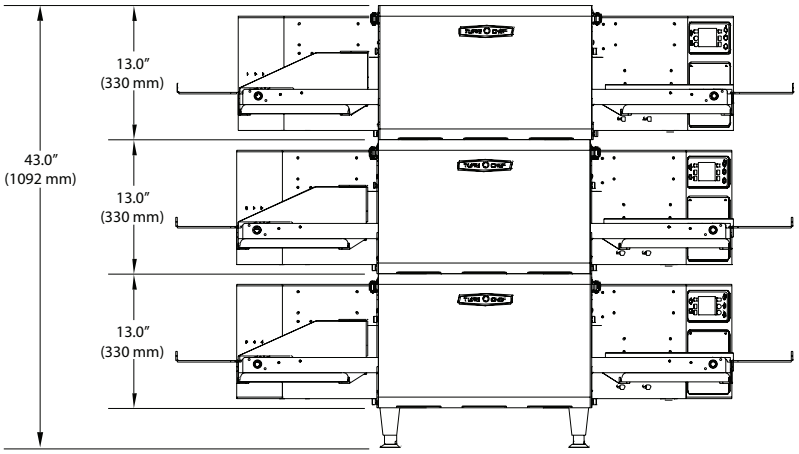

## Top View (standard 36")

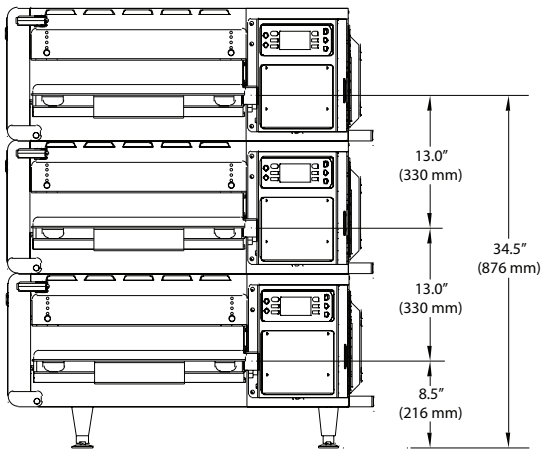


# Stacked Views

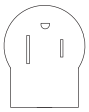
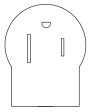


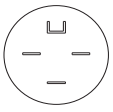



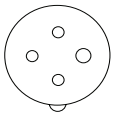
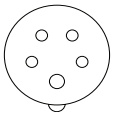
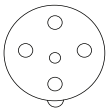



| DIMENSIONS | | |
|---|---|---|
| **SINGLE UNITS** | | |
| Height | 17.0″ | 432 mm |
| Width | 36″ or 48″ | 914 mm or 1219 mm |
| Depth | 31.7″ | 805 mm |
| Weight (36″ / 48″) | 195 lb. / 200 lb. | 88.5 kg / 91 kg |
| **Cook Chamber** | | |
| Baking Area | 2 $ft^2$ | 0.15 $m^2$ |
| Belt Length | 36″ or 48″ | 914 mm or 1219 mm |
| Belt Width | 16″ | 406 mm |
| Adjustable Opening (Min/Max) | 1″ / 3″ | 25 mm / 76 mm |
| Max Operating Temp | 600°F | 316°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 - SINGLE PHASE | | |
|---|---|---|
| HCS-9500-1 (36-inch) – USA<br>HCS-9500-6 (48-inch) | |  <br>NEMA 6-50P |
| Phase | 1 Phase | |
| Voltage | 208/240 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 37 Amp | |
| Max Input | 7.4 kW | |
| Supply | 3 Wire | |
| Breakers | 50 Amp | |
| HCS-9500-2C (36-inch) – Canada<br>HCS-9500-7C (48-inch) | |  <br>NEMA 6-50P |
| Phase | 1 Phase | |
| Voltage | 208/240 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 37 Amp | |
| Max Input | 7.4 kW | |
| Supply | 3 Wire | |
| Breakers | 50/60 Amp | |

| ELECTRICAL SPECIFICATIONS - MULTIPHASE | | |
|---|---|---|
| HCS-9500-11 (36-inch) – USA<br>HCS-9500-12 (48-inch) | |  <br>NEMA 15-30P |
| Phase | 3 Phase | |
| Voltage | 208/240 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 23 Amp | |
| Max Input | 7.4 kW | |
| Supply | 4 Wire | |
| Breakers | 30 Amp | |

| HCS-9500-3D (36-inch) - Europe/Asia Delta<br>HCS-9500-8D (48-inch) | |  <br>UL 4 Pin, 32 Amp |
|---|---|---|
| Phase | 3 Phase | |
| Voltage | 220/240 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 23 Amp | |
| Max Input | 7.4 kW | |
| Supply | 4 Wire | |
| Breakers | 30 Amp | |
| HCS-9500-4W (36-inch) – Europe/Asia (WYE)<br>HCS-9500-9W (48-inch) | |  <br>IEC 5 Pin, 20 Amp |
| Phase | 3 Phase | |
| Voltage | 380/415 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 12 Amp | |
| Max Input | 7.4 kW | |
| Supply | 5 Wire | |
| Breakers | 20 Amp | |
| HCS-9500-5W (36-inch) – Australia<br>HCS-9500-10W (48-inch) | |  <br>IEC 5 Pin, 20 Amp |
| Phase | 3 Phase | |
| Voltage | 380/415 VAC | |
| Frequency | 50/60 Hz | |
| Current Draw | 12 Amp | |
| Max Input | 7.4 kW | |
| Supply | 5 Wire | |
| Breakers | 20 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.<br>**International:** All International ovens shipped via Air or Less than Container Loads are packaged in wooden crates. |
| **36” conveyor belt:**<br>Box size: 36” (mm) x 41.8” (mm) x 17” (591 mm)<br>Crate size: 44.5” (1130 mm) x 41” (1041 mm) x 23.25” (mm)<br><br>**48” conveyor belt:**<br>Box size: 41.7” (mm) x 53” (mm) x 17” (mm)<br>Crate size: 58” (1473 mm) x 46” (1168 mm) x 28” (711 mm)<br><br>**Item class:** 110 NMFC #26710 HS code 8419.81 |
| **Approximate boxed weight (36” / 48”):** 235 lb. (107 kg) / 255 lb. (116 kg)<br>**Approximate crated weight (36” / 48”):** 310 lb. (141 kg) / 365 lb. (166 kg) |
| **Minimum entry clearance required for box:**<br>36” conveyor belt: 38.5” (978 mm)<br>48” conveyor belt: 42” (1067 mm)<br><br>**Minimum entry clearance required for crate:**<br>36” conveyor belt: 41” (1041 mm)<br>48” conveyor belt: 44.5” (1130 mm) |

Note: To specify a ventless model on an oven order, add a “-V” to the end of the applicable part numbers listed above.

**SEE OPPOSITE SIDE FOR ILLUSTRATIONS**

**TurboChef Global Operations**
2801 Trade Center Drive
Carrollton, Texas 75007 USA
US: 800.90TURBO (800.908.8726)
International: +1 214.379.6000
Fax: +1 214.379.6073
turbochef.com

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

10/04/2013

Turbochef Technologies Inc
Mr. DAVID CASTILLO
Suite 110
2801 Trade Center Dr
Carrollton Tx 75007, Us

| | | | |
|---|---|---|---|
| Our Reference: | File E151487, Vol. TO BE DETERMINED | Project Number | 13NK07789 |
| Your Reference: | CASTILLO, DAVID 06-06-13 | | |
| Project Scope: | ADD NEW OVEN MODEL HCS1618 TO FILE E151487 (SAFETY AND GREASE EMISSION) | | |

Dear Mr. DAVID CASTILLO:

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. TO BE DETERMINED.

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

RTPC8AE-426B90

2013-09-30

Mr. David Castillo
Turbochef Technologies Inc.
2801 Trade Center Dr., Suite 110
Carrollton, TX 75007
United States

E-mail: David.Castillo@turbochef.com

Our Reference: File E151487, Project 13NK07789

Subject: E151487 – EPA 202 EVALUATION OF CONVEYOR OVEN MODEL HCS1618.

Mr. Castillo:

Per your request, Project 13NK07789 was opened for the evaluation of grease-laden vapors produced by the Model HCS1618. The model HCS1618 was used for test purposes, and considered representative of all other models.

The scope of the project was to test this model in accordance with EPA Method 202 test guidelines to demonstrate compliance with NFPA96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, paragraph 4.1.1.2 conducted in accordance with UL710B, the Standard for Recirculating Systems, Sec. 17 for Complimentary Listing under UL's KNLZ category. The test was conducted at our facility in Northbrook, IL on September 19th, 2013. This letter will report the results of the EPA202 test.

For the record, the test was conducted on the Model HCS1618 conveyor oven cooking 12 in. pepperoni pizzas (Tombstone, with 19 pepperonis per pizza) as specified in Appendix A. Please see the attached page (Appendix A) for the test method and results of the tests. The results are considered to comply with UL710B, Section 17 and NFPA96, paragraph 4.1.1.2 since the measured values were less than the 5-mg/$m^3$ limit.

Due to the Safety evaluation (13NK07789) not being completed, this letter will serve to report that all tests on the subject product have been completed with acceptable results. After the successful completion of the safety project 13NK07789, a Service Request will be opened to add the Complementary Listing to the Model HCS1618 conveyor oven. All information generated will be retained for future use. This concludes all work associated with project 13NK07789 and we are therefore closing this project. Our Accounting Department has been instructed to bill you for all charges incurred.

Should you have any questions or comments concerning the above, please feel free to contact the undersigned.

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

Sincerely,

William G. Morler

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

Reviewed by:

Fred Zaplatosch

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

A P P E N D I X: A

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR:

The Turbochef Technologies Inc. Model HCS1618 conveyor oven was tested using the method derived from EPA Method 202.

A 12 in. by 6 in. rectangular, 108 in. tall sheet metal stack was constructed on top of a sheet metal hood and mounted above the exhaust vent of the induction cooker. A sampling port was located approximately 80 in. downstream from the hood exhaust, at which point it was determined there was laminar flow. The hood exhaust was maintained at 500 CFM throughout the duration of testing. 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 done at 8 traverse points.

The oven with integral system was operated normally by cooking the following foods:

12 in. pepperoni pizza (Tombstone, with 19 pepperonis per pizza), each cooked for 1:30 minutes with 0 seconds between loads for 8 hours (total of 311 pizzas). Oven was set to maintain 550 ℉

| Temp | Event # | % Time. | % Top Fan | % Bottom Fan | % Microwave Energy |
|---|---|---|---|---|---|
| 550℉ | 1 | 100 | 100 | 80 | n/a |

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.

After being allowed to cool, the sampling equipment was disassembled; the filter was removed, and placed into a sample container labeled No. 1. The liquid in impingers Nos. 1, 2, and 3 were volumetrically measured and transferred to sample container No. 3. The silica gel and impinger No. 4 was transferred to sample container No. 5. The nozzle, probe and impingers were rinsed three times with water and the rinse was added to container No. 3. These parts were also rinsed three times with acetone and transferred to container No. 4. All additional inter surfaces of the sampling terrain glassware were rinsed with methylene chloride three times; the rinse was transferred to container No. 6. A blank of acetone approximately equivalent to the amount used for rinses was aliquoted into container No. 2, the same was done for the distilled de-ionized water and methylene chloride except that these were aliquoted into their own individual containers labeled No. 7 and 8 respectively. All containers were properly labeled and sealed, then the liquid levels in all the containers were marked.

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

RESULTS:

There was no visible smoke emitted from the exhaust of the hood during the normal cooking operation of the Model HCS1618. There was no noticeable amount 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 for the Model HCS1618 was found to be 1.12 mg/m³, which is less than 5 mg/m³ limit.

UL LLC
333 Pfingsten Road, Northbrook, IL 60062-2096 USA
T: 847.272.8800 / F: 847.272.8129 / W: UL.com

ONLINE CERTIFICATIONS DIRECTORY

# TSQT.E151488
# Commercial Cooking, Rethermalization and Powered Hot-food-holding and -Transport Equipment

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## Commercial Cooking, Rethermalization and Powered Hot-food-holding and -Transport Equipment

See General Information for Commercial Cooking, Rethermalization and Powered Hot-food-holding and -Transport Equipment

**TURBOCHEF TECHNOLOGIES INC** E151488
SUITE 110
2801 TRADE CENTER DR
CARROLLTON, TX 75007 USA

**Commercial microwave/convection ovens**, Model(s) Encore, G5, i3, i5, NGC, NGO

**Conveyor ovens**, Model(s) HCS1618, HCW2620, HHC2020

**Gas-fired conveyor ovens**, Model(s) HHC3240

Some models may also have Safety Certification.

Last Updated on 2013-09-26

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ONLINE CERTIFICATIONS DIRECTORY

# TSQT.GuideInfo
# Commercial Cooking, Rethermalization and Powered Hot-food-holding and -Transport Equipment

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## [Sanitation, Food Service Equipment] Commercial Cooking, Rethermalization and Powered Hot-food-holding and -Transport Equipment

See General Information for Sanitation, Food Service Equipment

### USE

This category covers cooking and hot-food-holding equipment, including brewers, steam tables, griddles, broilers, ovens, fryers, food warmers, and similar equipment intended for commercial use.

### PRODUCT MARKINGS

Equipment may be marked with use limitations or may provide guidance on intended application.

Rethermalization equipment is provided with a marking that specifies the maximum capacity of the unit.

Equipment provided with a security package for installation in areas where security may be a concern is marked "Intended for use only in environments where security is a concern, such as correctional facilities, mental health facilities, or some schools."

### PRODUCT IDENTITY

One of the following product identities appears on the product:

Cooking Equipment

Hot-food-storage Equipment

Other product identities may be used as shown in the individual certifications.

### RELATED PRODUCTS

Electric equipment and warming and serving equipment intended for commercial use and investigated to UL Safety Standards is covered under Commercial Cooking Appliances (KNGT) and Custom-built Food-service Equipment (KNNS).

Gas-fired food service equipment is covered under Gas-fired Food Service Equipment (LGQX).

See Lead Content Verification of Products in Contact with Potable Water (QNVB).

### ADDITIONAL INFORMATION

For additional information, see Food Safety and Quality, Products and Equipment (AAFS).

### REQUIREMENTS

The basic standard used to investigate products in this category is NSF/ANSI 4, "Commercial Cooking, Rethermalization and Hot Food Holding and Transport Equipment."

### UL MARK

The Certification Mark of UL on the product is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SANITATION," the geographic identifier(s), and a file number.

### Additional Certification Markings

Products covered under this category are additionally marked with the following information:

#### NSF/ANSI 4

For those products which are also certified by UL under another category, the statement "NSF/ANSI 4" is included on the product.

**Alternate UL Mark**

The Classification Mark of UL on the product is the only method provided by UL to identify products manufactured under its Classification and Follow-Up Service. The Classification Mark for these products includes the EPH Mark (as illustrated in the Introduction of this Directory) and the following additional information:

**[PRODUCT IDENTITY*]**
**NSF/ANSI 4**
**Control No.**

* **COOKING EQUIPMENT** or **HOT FOOD STORAGE EQUIPMENT**, or other appropriate product name as shown in the individual Classifications

For those products which are also Listed or Classified by UL under another category, the marking includes the appropriate Listing or Classification Mark, the EPH Mark, and the text "NSF/ANSI 4" below the EPH Mark.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * *

UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental or consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Guide Information.

Last Updated on 2013-05-16

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When the UL Leaf Mark is on the product, or when the word "Environment" is included in the UL Mark, please search the UL Environment database for additional information regarding this product's certification.

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

# CERTIFICATE OF COMPLIANCE

| | |
|---|---|
| **Certificate Number** | 20130926-E151488 |
| **Report Reference** | E151488-20080617 |
| **Issue Date** | 2013-SEPTEMBER-26 |

**Issued to:** TURBOCHEF TECHNOLOGIES INC
SUITE 105
4240 INTERNATIONAL PKY
CARROLLTON TX 75007

**This is to certify that representative samples of** COMMERCIAL COOKING, RETHERMALIZATION AND POWERED HOT FOOD HOLDING AND TRANSPORT EQUIPMENT

Conveyor Ovens, Models HHC2020, HCS1618 and HCW2620

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate

**Standard(s) for Safety:** NSF 4 - Commercial Cooking, Rethermalization, and Powered Hot Food Holding and Transport Equipment

**Additional Information:** See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Classification Mark should be considered as being covered by UL's Classification and Follow-Up Service

The UL Classification Mark includes: UL in a circle: with the word "CLASSIFIED" (as shown); a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and the product category name (product identity) as indicated in the appropriate UL Directory

Look for the UL Classification Mark on the product

William R Carney

William R Carney, Director North American Certification Programs
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus

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<br>208/240 VAC | 40 amp<br>30 amp | 1 Ph<br>3 Ph |
| i5 | 208/240 VAC<br>208/240 VAC | 50 amp<br>30 amp | 1 Ph<br>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<br>208/240 VAC | 30 amp<br>50 amp | 3 Ph<br>1 Ph |
| HhB 2 | 208/240 VAC | 30 amp | 1 Ph |
| Double Batch | 208/240 VAC<br>208/240 VAC | 50 amp<br>30 amp | 1 Ph<br>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

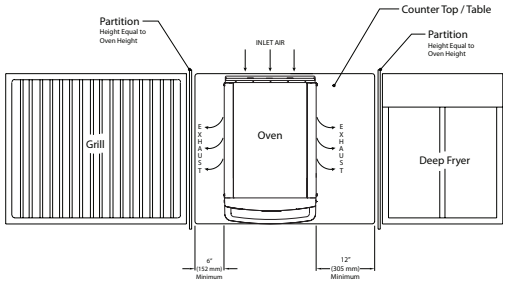
To ensure continued compliance with all health, building, and fire codes, users are required to:

- ☐ 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.

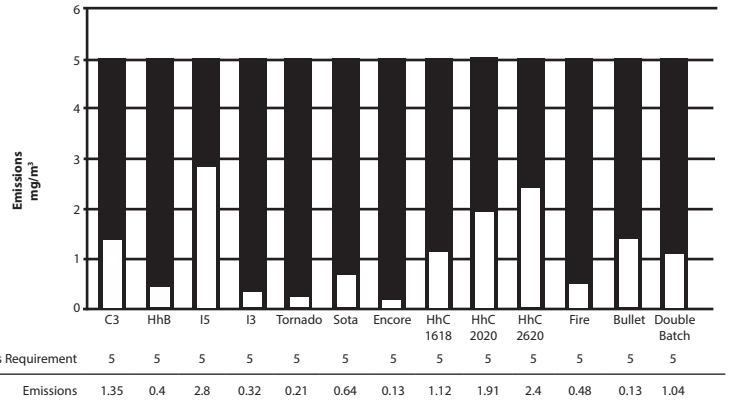
The heat load from TurboChef ovens is mostly sensible. The only latent heat present is due to evaporation during the cooking process. When installing a TurboChef oven, the space must have the following tons of AC per oven installed.

| 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.



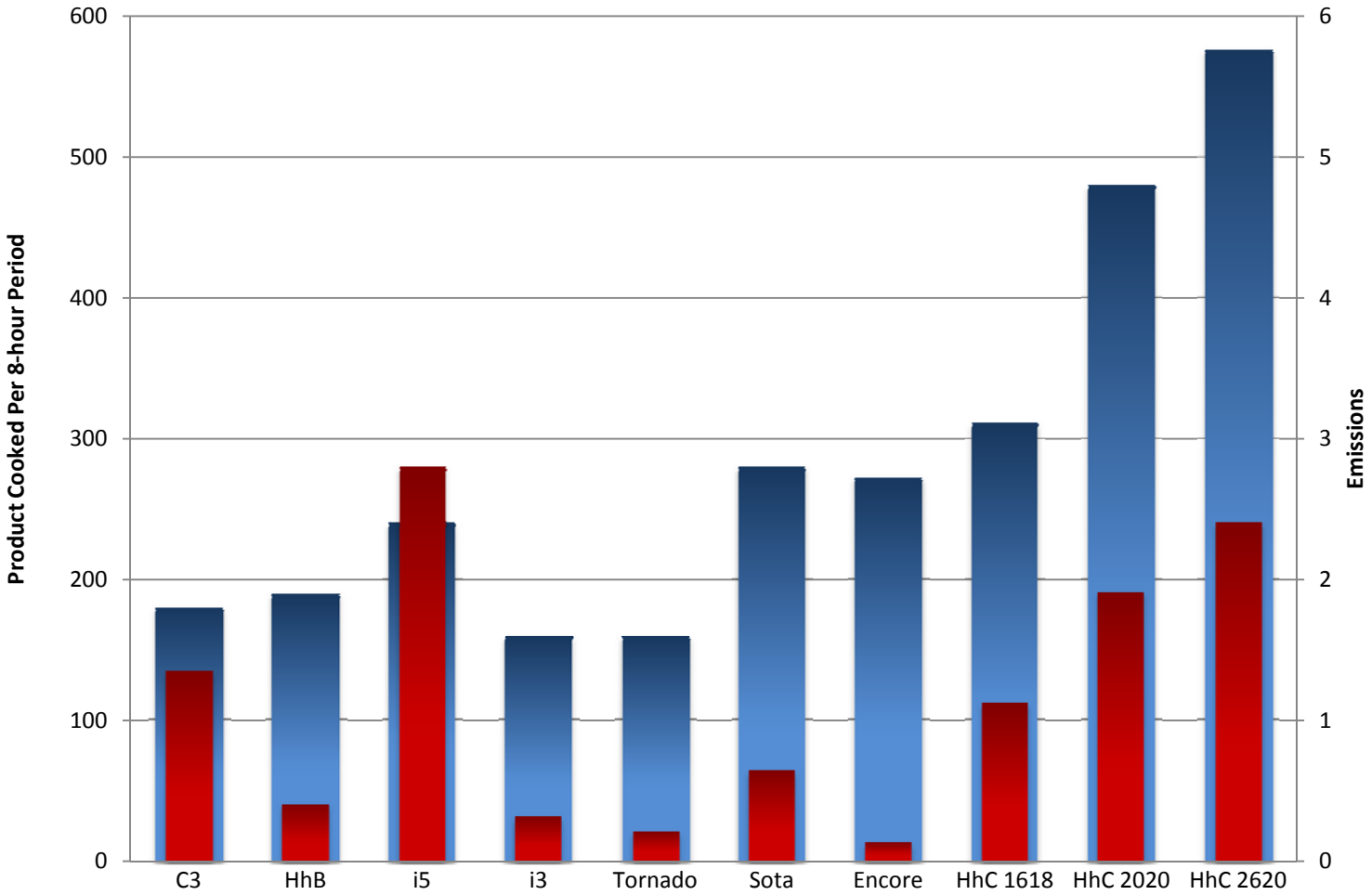

| | C3 | HhB | I5 | I3 | Tornado | Sota | Encore | HhC 1618 | HhC 2020 | HhC 2620 | Fire | Bullet | Double Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ventless Requirement | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Emissions | 1.35 | 0.4 | 2.8 | 0.32 | 0.21 | 0.64 | 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 1618

| 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 | 6850 | $0.13 | 11.83 |
| **Cooking** | 180 | 6850 | $2.26 | 8.83 |
| **Snooze** | 245 | 2120 | $0.95 | 4.75 |
| **Idle** | 285 | 4340 | $2.27 | 0 |
| **Total/Day** | | | $5.61 | **Yearly** |
| **Total/Month** | | | $168.20 | **$2,018.44** |

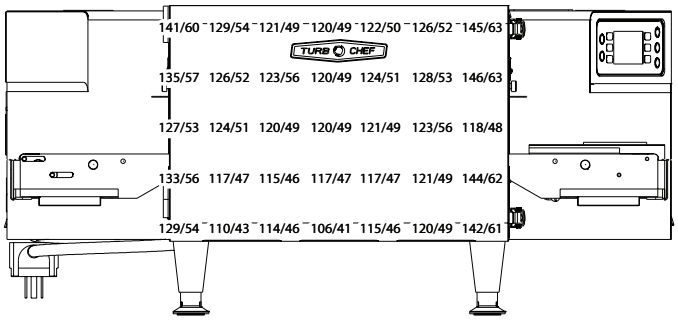
| HVAC Requirements Per Operating Time -- Note: Approximations Only | | | | | |
|---|---|---|---|---|---|
| **Average Energy Cooking And Idle (J)** | **Warmup Energy (J)** | **Total Energy (J)** | **Total average Power (W)** | **Total Environmental Load kBtu/hr** | **Average Cooling Requirement (ton of AC)** |
| 148,246,080.00 | 4,110,000.00 | 152,356,080.00 | 3,526.76 | 12.03 | 1.003 |

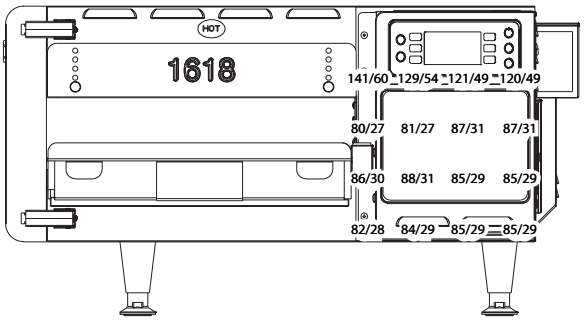
TURBOCHEF TECHNOLOGIES, INC.

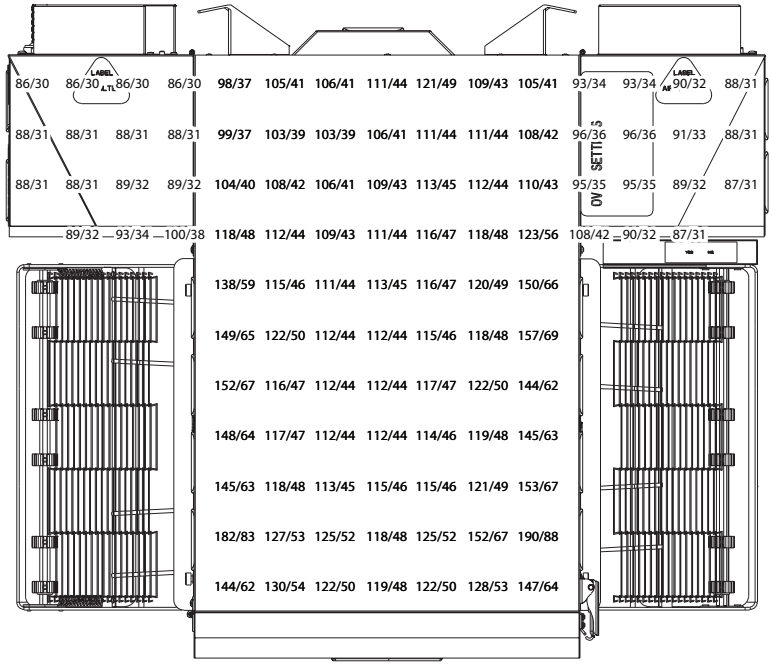
# HhC 1618 Oven Surface Temperatures

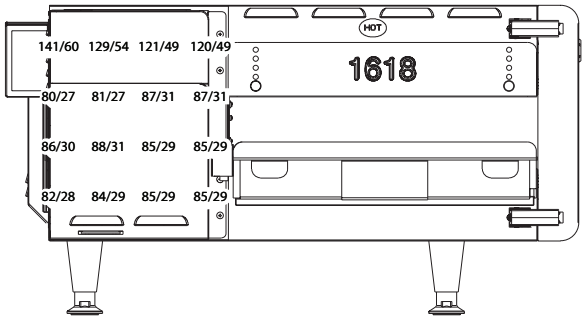
This document illustrates the surface temperature testing data reported for the TurboChef High h Conveyor 1618 oven. Measurements were recorded after four hours of idle. The oven temperature was set to 550°F (288°C) for the duration of the test.

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



COUNTY OF LOS ANGELES
**Public Health**

**CYNTHIA A. HARDING, M.P.H.**
Interim Director

**JEFFREY D. GUNZENHAUSER, M.D., M.P.H.**
Interim Health Officer

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

**TERRI S. WILLIAMS, REHS**
Assistant Director of Environmental Health

**Brenda J. Lopez, REHS**
**Director, Bureau of Specialized Surveillance and Enforcement**

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

www.publichealth.lacounty.gov



April 17, 2015

David Castillo
VP of Engineering
TurboChef Technologies, Inc.
2801 Trade Center
Carrollton, TX 75007

| | |
|---|---|
| Ventilation Exemption Plan Check No. | ME-2015-003 |
| Application Type: | Equipment specific – Model – HHC 1618 208/240 V, 7.4-9.9 KW |
| Effective Date: | 4-17-2015 |
| Expiration Date: | 4-17-2020 |
| Telephone: | (214) 379-6023 |
| Email: | david.castillo@turbochef.com |

Dear Mr. Castillo:

**RE: EXEMPTION FROM MECHANICAL EXHAUST VENTILATION FOR TURBOCHEF ELECTRIC OVEN MODEL HHC 1618**

The County of Los Angeles Department of Public Health, Environmental Health, Plan Check Program, has completed a review of the TurboChef HHC 1618 oven 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 1618.

The test results indicate that the total amount of grease-laden effluents collected was 1.12 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, provided the following contingencies are met:

1. There shall be no more than two unventilated TurboChef HHC 1618 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 TurboChef HHC 1618 oven shall be used for the cooking or warming of pizza, bread, bakery products, sandwiches containing ready to eat fillings, 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 TurboChef HHC 1618 oven. Pre-cooked foods such as animal, fish or skinless poultry protein products may be reheated in the TurboChef HHC 1618.

7. The TurboChef HHC 1618 oven(s) 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 HHC 1618 code requirements pertaining to mechanical, electrical and/or HHC 1618 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 TurboChef HHC 1618 oven(s) at a specific location results in a sanitation or safety violation.

This letter may be used as evidence of the evaluation of the TurboChef HHC 1618 oven. 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, M. S., R.E.H.S.
Chief Environmental Health Specialist
Plan Check Program
5050 Commerce Drive
Baldwin Park, CA 91706