

Encore/Bullet Ventless Submittal Information

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ENCORE™



PERFORMANCE

The TurboChef Encore oven uses radiant heat, high-speed air impingement, and side-launched microwave to cook food rapidly without compromising quality.

VENTILATION

- UL (KNLZ) listed for ventless operation.†
- EPA 202 test (8 hr):
 - Product: Pepperoni Pizzas
 - Results: 0.13 mg/m³
 - Ventless Requirement: <5.00 mg/m³
- Internal catalytic filtration to limit smoke, grease, and odor emissions.

Project _____

Item No. _____

Quantity _____

EXTERIOR CONSTRUCTION

- Powder coated, corrosion-resistant steel outer wrap
- Powder coated, corrosion-resistant aluminum front panels and door
- Cool-to-touch exterior; all surfaces below 122°F (50°C)
- Ergonomic door handle

INTERIOR CONSTRUCTION

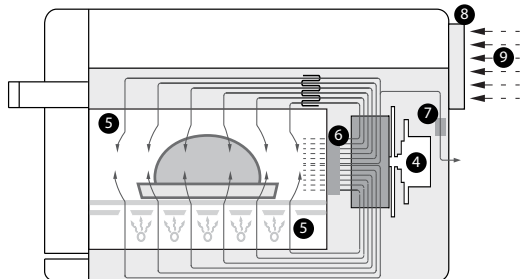
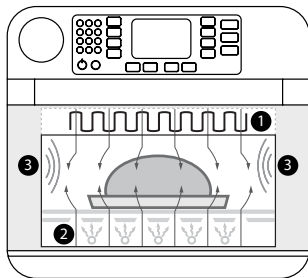
- 201 stainless steel
- Fully welded and insulated cook chamber
- Removable rack and lower jetplate

FEATURES

- Easy to clean
- Integral recirculating catalytic converter for UL (KNLZ) listed ventless operation
- Variable-speed High h recirculating impingement airflow
- Independent bottom temperature offset
- Smart menu system capable of storing up to 256 recipes
- Light ring provides visual cues for cooking
- Built-in self-diagnostics for monitoring oven components and performance
- Stackable design (requires stacking kit)
- USB and Smart card compatible
- Smart Voltage Sensor Technology* (U.S. only)
- Includes plug and cord (6 ft. nominal)
- Warranty – 1 year parts and labor

STANDARD ACCESSORIES

- 1 Baking Stone (ENC-3012)
- 1 Oven Rack (ENC-1279)
- 1 Aluminum Paddle (NGC-1478)
- 1 Bottle Oven Cleaner (103180)
- 1 Bottle Oven Guard (103181)
- 2 Trigger Sprayers (103182)
- 2 PTFE Baskets (NGC-1331)



- | | |
|----------------------------|--------------------------|
| 1. Impingement Heater | 6. Catalytic Converter |
| 2. Bottom Browning Element | 7. Vent Catalyst |
| 3. Side-Launched Microwave | 8. Air Filter |
| 4. Blower Motor | 9. Inlet Air for Cooling |
| 5. Impinged Air | Electrical Components |



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

* Smart Voltage Sensor Technology does not compensate for lack of or over voltage situations. It is the responsibility of the owner to supply voltage to the unit according to the specifications on the back of this sheet.

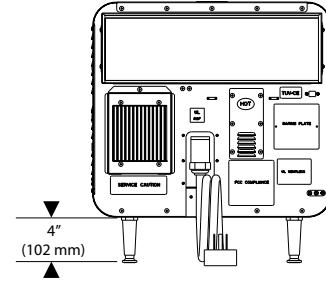
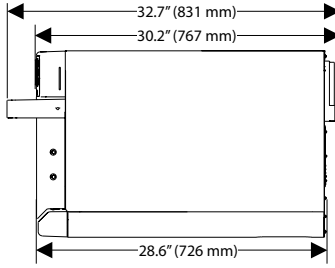
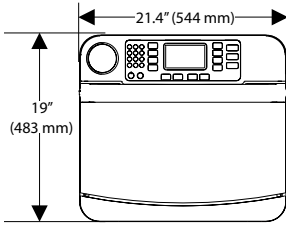
† Ventless certification is for all food items except for foods classified as "fatty raw proteins." Such foods include bone-in, skin-on chicken, raw hamburger meat, raw bacon, raw sausage, steaks, etc. If cooking these types of foods, consult local HVAC codes and authorities to ensure compliance with 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.



ENCORE™



DIMENSIONS		
Single Units		
Height	19"	483 mm
with legs	23"	584 mm
Width	21.4"	544 mm
Depth (footprint)	28.6"	726 mm
with door closed	32.7"	831 mm
with door open	39.4"	1000 mm
Weight	185 lb	84 kg
Stacked Units (Stacking Kit Required)		
Height	38.5"	978 mm
with legs (bottom oven)	42.5"	1080 mm
Width	21.4"	544 mm
Depth (footprint)	28.6"	726 mm
with door closed	32.7"	831 mm
with door open	39.4"	1000 mm
Weight	370 lb	168 kg
Cook Chamber		
Height	6"	152 mm
Width	15.5"	394 mm
Depth	14.5"	368 mm
Volume	0.78 cu.ft.	22.1 liters
Wall Clearance (Oven not intended for built-in installation)		
Top	5"	127 mm
Sides	2"	51 mm
ELECTRICAL SPECIFICATIONS-SINGLE PHASE		
Encore US Model (ENC-9500-1) - North America		
Voltage	208/240 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	208: 5.99 kW (3.5 kW) 240: 6.675 kW (3.5 kW)	
Encore UK Model (ENC-9500-2-UK) - Europe/Asia		
Voltage	230 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore BK Model (ENC-9500-6-BK) - Brazil		
Voltage	220 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore LA Model (ENC-9500-7-LA) - Latin America		
Voltage	220 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	

Encore JK Model 50 Hz (ENC-9500-8-JK) - Japan JK Model 60 Hz (ENC-9500-10-JK) - Japan		
Voltage	220 VAC	
Frequency	50 or 60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
ELECTRICAL SPECIFICATIONS-MULTI PHASE		
Encore ED Model (ENC-9500-3-ED) - Europe/Asia Delta		
Voltage	230 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore EW Model (ENC-9500-4-EW) - Europe/Asia Wye		
Voltage	400 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore AU Model (ENC-9500-5-AU) - Australia/New Zealand Wye		
Voltage	400 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore JD Model 50 Hz (ENC-9500-9-JD) - Japan Delta JD Model 60 Hz (ENC-9500-11-JD) - Japan Delta		
Voltage	200 VAC	
Frequency	50 or 60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore KW Model (ENC-9500-12-KW) - Korea/Middle East Wye		
Voltage	400 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Encore SD Model (ENC-9500-13-SD) - Korea/Middle East Delta		
Voltage	230 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
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: 35.8" x 26.4" x 26.3" (909 mm x 671 mm x 668 mm) Crate size: 40" x 36" x 35" (1016 mm x 914 mm x 889 mm) Item class: 85 NMFC #26770 HS code 8419.81		
Approximate boxed weight: 235 lb. (106.6 kg) Approximate crated weight: 310 lb. (140.6 kg)		
Minimum entry clearance required for box: 26.8" (681 mm) Minimum entry clearance required for crate: 35.5" (902 mm)		

TurboChef Global Operations
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US: 800.90TURBO (800.908.8726) / International: +1 214.379.6000
Fax: +1 214.379.6073 / www.turbochef.com

⚠ TurboChef requires installing a type D circuit breaker for all installations.



BULLET™



PERFORMANCE

The TurboChef Bullet oven uses radiant heat, high-speed air impingement, and side-launched microwave to cook food rapidly without compromising quality.

VENTILATION

- UL (KNLZ) listed for ventless operation.†
- EPA 202 test (8 hr):
 - Product: Pepperoni Pizzas
 - Results: 0.13 mg/m³
 - Ventless Requirement: <5.00 mg/m³
- Internal catalytic filtration to limit smoke, grease, and odor emissions.

Project _____

Item No. _____

Quantity _____

EXTERIOR CONSTRUCTION

- Stainless steel front, top, and sides
- Stainless steel removable grease collection pan
- Cool-to-touch exterior; all surfaces below 131°F (55°C)
- Ergonomic door handle
- 7-inch capacitive touch screen with tempered glass cover

INTERIOR CONSTRUCTION

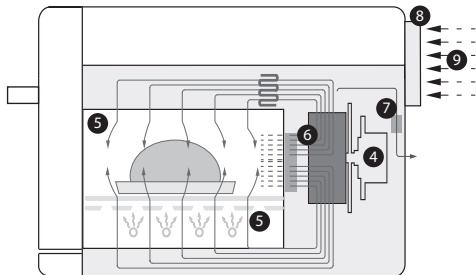
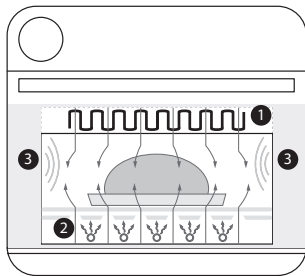
- 201 stainless steel
- Fully welded and insulated cook chamber
- Removable rack and lower jetplate

FEATURES

- Simple and intuitive touch controls
- Easy to clean
- Integral recirculating catalytic converter for UL (KNLZ) listed ventless operation
- Variable-speed High h recirculating impingement airflow
- Independent bottom temperature offset
- Smart menu system capable of storing up to 256 recipes
- Light ring provides visual cues for cooking
- Built-in self-diagnostics for monitoring oven components and performance
- Stackable design (requires stacking kit)
- USB compatible
- Ethernet and Wi-Fi compatible
- Smart voltage sensor technology* (U.S. only)
- Includes plug and cord (6 ft. nominal)
- Warranty – 1 year parts and labor

STANDARD ACCESSORIES

- 1 Baking Stone (ENC-3012)
- 1 Oven Rack (ENC-1279)
- 1 Aluminum Paddle (NGC-1478)
- 1 Bottle Oven Cleaner (103180)
- 1 Bottle Oven Guard (103181)
- 2 Trigger Sprayers (103182)
- 2 Non-stick Baskets (NGC-1331)



- | | |
|----------------------------|--------------------------|
| 1. Impingement Heater | 6. Catalytic Converter |
| 2. Bottom Browning Element | 7. Vent Catalyst |
| 3. Side-Launched Microwave | 8. Air Filter |
| 4. Blower Motor | 9. Inlet Air for Cooling |
| 5. Impinged Air | Electrical Components |



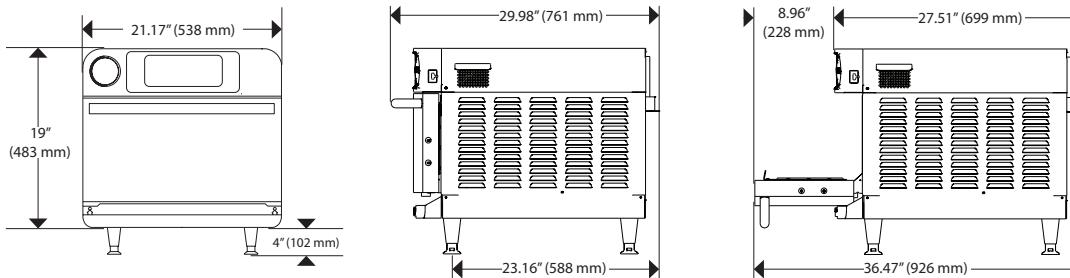
This product conforms to the ventilation recommendations set forth by NFPA96 using EPA202 test method.

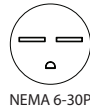




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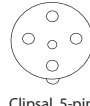

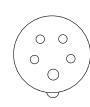
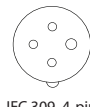

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TurboChef reserves the right to make substitutions of components or change specifications without prior notice.



DIMENSIONS		
Single Units		
Height	19"	483 mm
with legs	23"	584 mm
Width	21.17"	538 mm
Depth (footprint)	27.51"	699 mm
with door closed	29.98"	761 mm
with door open	36.47"	926 mm
Weight	185 lb.	84 kg
Stacked Units (Stacking Kit Required)		
Height	38"	965 mm
with legs (bottom oven)	42"	1067 mm
Width	21.17"	538 mm
Depth (footprint)	27.51"	699 mm
with door closed	29.98"	761 mm
with door open	36.47"	926 mm
Weight	370 lb.	168 kg
Cook Chamber		
Height	6"	152 mm
Width	15.5"	394 mm
Depth	14.5"	368 mm
Volume	0.78 cu.ft.	22.1 liters
Wall Clearance (Oven not intended for built-in installation)		
Top	5"	127 mm
Sides	2"	51 mm
ELECTRICAL SPECIFICATIONS-SINGLE PHASE		
Bullet US Model (ENC-9600-601) - North America		
Voltage	208/240 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	208: 5.99 kW (3.5 kW) 240: 6.675 kW (3.5 kW)	
Bullet UK Model (ENC-9600-602-UK) - Europe/Asia		
Voltage	230 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet BK Model (ENC-9600-606-BK) - Brazil		
Voltage	220 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet LA Model (ENC-9600-607-LA) - Latin America		
Voltage	220 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet JK Model 50 Hz (ENC-9600-608-JK) - Japan JK Model 60 Hz (ENC-9600-610-JK) - Japan		
Voltage	220 VAC	
Frequency	50 or 60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	

Bullet SK Model (ENC-9600-615-SK) - Middle East		
Voltage	230 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
ELECTRICAL SPECIFICATIONS-MULTI PHASE		
Bullet ED Model (ENC-9600-603-ED) - Europe/Asia Delta		
Voltage	230 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet EW Model (ENC-9600-604-EW) - Europe/Asia Wye		
Voltage	400 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet AU Model (ENC-9600-605-AU) - Australia/New Zealand Wye		
Voltage	400 VAC	
Frequency	50 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet JD Model 50 Hz (ENC-9600-609-JD) - Japan Delta JD Model 60 Hz (ENC-9600-611-JD) - Japan Delta		
Voltage	200 VAC	
Frequency	50 or 60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet KW Model (ENC-9600-612-KW) - Korea Wye SW Model (ENC-9600-616-SW) - Middle East Wye		
Voltage	400 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	16 amps (20 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet SD Model (ENC-9600-613-SD) - Middle East Delta		
Voltage	230 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
Bullet BD Model (ENC-9600-614-BD) - Brazil Delta		
Voltage	220 VAC	
Frequency	60 Hz	
Current (Max Circuit Requirement)	30 amps (30 amps)	
Max Input (MW Input)	6.7 kW (3.5 kW)	
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: 33.8" x 26.3" x 26.3" (859 mm x 668 mm x 668 mm) Crate size: 40" x 36" x 35" (1016 mm x 914 mm x 889 mm) Item class: 85 NMFC #26770 HS code 8419.81		
Approximate boxed weight: 226 lb. (103 kg) Approximate crated weight: 301 lb. (137 kg)		
Minimum entry clearance required for box: 26.3" (668 mm) Minimum entry clearance required for crate: 35.5" (902 mm)		

TurboChef Global Operations

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 Fax: +1 214.379.6073 / www.turbochef.com

⚠ TurboChef requires installing a type D circuit breaker for all installations.



Page 2.1

LISTED
81Y5

Commercial Microwave/Convection 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



the standard in safety

Underwriters
Laboratories

NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

10/26/2011

Turbochef Technologies Inc
Mr. David Castillo
Suite 105
4240 International Pky
Carrollton Tx 75007, Us

Our Reference:	File E151487, Vol. 1	Project Number	11NK09045
Your Reference:	david castillo 6/9/11		
Project Scope:	USL/CNL		

Dear Mr. David Castillo:

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 only at authorized factories under UL's Follow-Up Service Program.

To provide the manufacturer with the intended authorization to use the UL Mark, the addressee must send a copy of this notice to each manufacturing location currently authorized in File E151487, Vol. 1.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. 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 of this letter.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn. UL may elect to withdraw use of the UL Mark if the Applicant or Manufacturer fails to comply with UL's requirements including ongoing compliance of the product, under UL's Follow-Up Service.



Notice of Authorization - 11NK09045

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

The contents of this Letter are intended solely for the use of UL and the Applicant. The opinions and findings of UL represent its judgment given with due consideration to the necessary limitations of practical operation in accordance with UL's objectives and purposes. UL shall not otherwise be responsible for the use of or reliance upon the contents of this letter by anyone. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages, arising out of or in connection with the use or reliance upon the contents of this letter to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

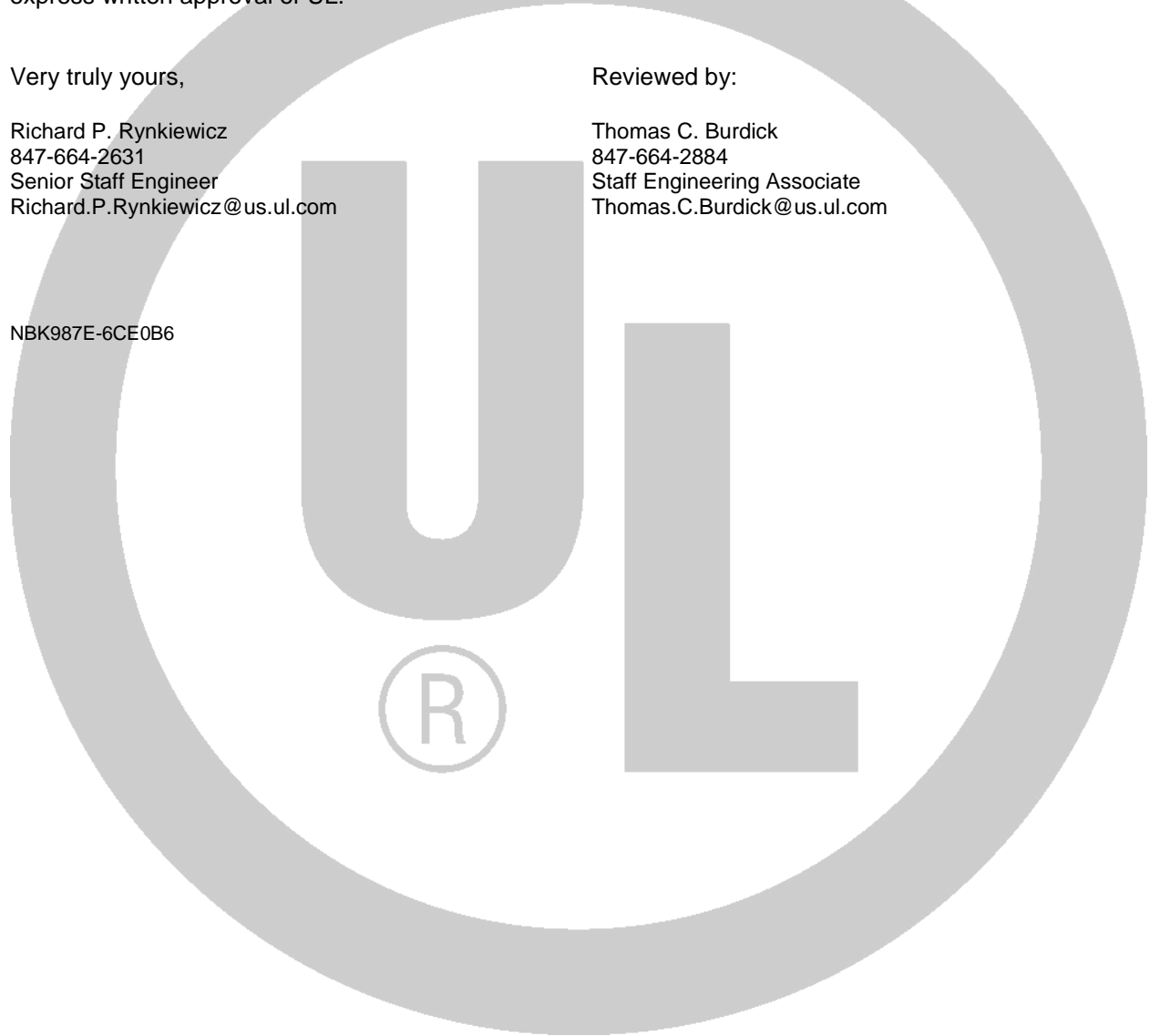
Very truly yours,

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Senior Staff Engineer
Richard.P.Rynkiewicz@us.ul.com

Reviewed by:

Thomas C. Burdick
847-664-2884
Staff Engineering Associate
Thomas.C.Burdick@us.ul.com

NBK987E-6CE0B6





KQSQ.E151487 Microwave Cooking Appliances

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Microwave Cooking Appliances

[See General Information for Microwave Cooking Appliances](#)

TURBOCHEF TECHNOLOGIES INC

E151487

2801 Trade Center Dr
Carrollton, TX 75007 USA

Commercial microwave/convection ovens, Model(s) C-1, C3/C (a), C3/D, CUB-D*, CUB-EC*, D1, D1 Max, D1A, D1B, D1B-EC, D2, D2 Max, D2B, D2B-EC, D3-A, D3-E, D3-J, D3-S, Encore, Encore 2, G5, i3 (a), i3DL, i5 (a), i5DL, NGC (a), NGO

Commercial ovens, Model(s) HHB, HHB2

Conveyor ovens, Model(s) HCW2620, HHC2020

(a) - Indicates complementary listed models.

* - May be followed by suffixes.

[Last Updated](#) on 2015-06-01

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KNLZ7.E151487 Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air Certified for Canada

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

[See General Information for Commercial Cooking Appliances with Integral Systems for Limiting the Emission of Grease-laden Air Certified for Canada](#)

TURBOCHEF TECHNOLOGIES INC

E151487

2801 Trade Center Dr
Carrollton, TX 75007 USA

Commercial microwave/convection ovens, Model(s) C3/C*, Encore 2, Encore*, i3*, i5*, NGC*, NGO*

Commercial ovens, Model(s) HHB, HHB2

Conveyor Ovens, Model(s) HHC1618, HHC2020, HHC2620

* - Indicated complementary listed models.

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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/m³ 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 (KNRE).

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 UL 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."

* * * * *

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the standard in safety

Underwriters
Laboratories

9/9/2011

Mr. David Castillo
Turbochef Technologies Inc
Suite 105 4240 International Pky
Carrollton, TX 75007
United States

Reference: File E151487 Project 11NK09045 Volume: 1

Subject: CLOSING LETTER FOR EPA 202 TESTING ON THE MODEL ENCORE MICROWAVE
HIGH SPEED CONVECTION OVEN FILE E151487

Dear Mr. Castillo,

Per your request, project 11NK09045 was opened for the evaluation of grease-laden vapors produced by the Model ENCORE microwave oven. The scope of the project was to complementary List these Models in accordance with EPA Method 202 test guidelines to demonstrate compliance with UL710B, the Standard for Recirculating Systems, Sec. 17 and NFPA96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, paragraph 4.1.1.2. The tests were conducted at our facility in Northbrook, IL on August 24th. This letter will report the results of the EPA202 test.

For the record, the test was conducted on the Model ENCORE microwave 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/m³ limit.

Due to the Safety evaluation (11NK09045) not being completed, this letter will serve to report that all tests on the subject product have been completed with acceptable results as they relate to UL710B. After the successful completion of the safety project 11NK09045, a Service Request will be opened to add the Complementary Listing to the Model ENCORE. All information generated will be retained for future use. This concludes all work associated with project 11NK09045 and we are therefore closing this project. Our Accounting Department has been instructed to bill you for all charges incurred.

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

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

Sincerely,

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

Reviewed by:

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

APPENDIX: A

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR:

The Turbochef Model ENCORE microwave oven was tested using the method derived from EPA Method 202. Employing the VOC reducing catalytic converter, constructed of corrugated stainless steel with a ceramic washcoat, manufactured by Engelhard Emission Control Products.

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 oven. 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 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 minute and 32 seconds with 0 seconds between loads for 8 hours (total of 272 pizzas). Oven was set at the following duty:

Temp	Event #	% Time.	% Top Fan	IR	% Microwave Energy
600°F	1	20	50	50	100
	2	80	100	50	100

During the cooking operation, it was noted whether or not visible effluents evolved from the air exhaust of the hood. Gauge, meter and temperature readings were taken and recorded every 10 min. After cooking, the condition of the duct was noted and a post-leak check was conducted and determined to be < 0.02 ft³/min.

After being allowed to cool, the sampling equipment was disassembled; the 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.

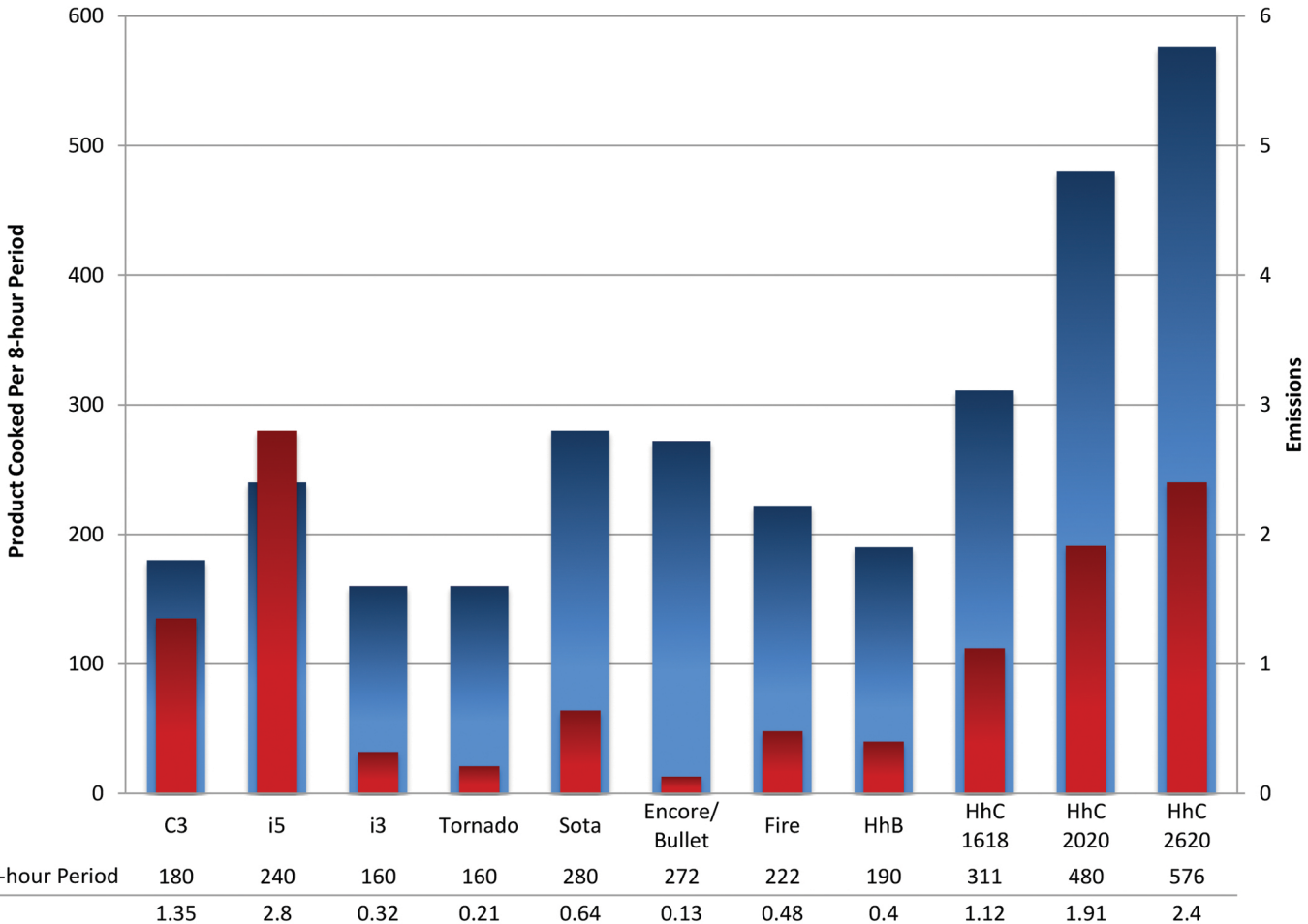
RESULTS:

There was no visible smoke emitted from the exhaust of the hood during the normal cooking operation of the Models ENCORE. 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 ENCORE was found to be 0.13 mg/m³, which is less than 5 mg/m³.

UL® (KNLZ) Emissions by Product

Ventless Requirement: <math><5.00 \text{ mg/m}^3</math>





October 18, 2004

Mr. Mike Denny
 Building Services,
 224 West Knight St.
 City of Sioux Falls,
 South Dakota, 57102
 Ph: 605-367-8252

Re: Fire and smoke containment

Dear Mr. Denny:

The TurboChef ovens have been extensively tested and conform to UL 923 and UL KNLZ standards. The UL 923 standard is the electrical/product safety standard and the KNLZ is the low particulate matter emissions standard to which we conform. While both standards address different aspects of the oven, they both have inherent overlap as it relates to grease/smoke/fire handling.

As it relates specifically to fire safety, UL 923 specifies:

Section 57 Cavity Fire Containment Test:

The performance of an appliance subjected to this test shall be considered acceptable if all of the following conditions are met:

- a) There is no emission of fire, flame, or molten metal outside the appliance nor glowing or ignition of the cheesecloth, tissue paper, or wood surface;*
- b) The fuse rated 3 A does not open;*
- c) Following the test, the appliance complies with the requirements of Leakage Current, Section 33, and Dielectric Voltage-Withstand Test, Section 39, as applicable to primary circuits; and*
- d) Following the test and following 10 c of operation (opening and closing the door), the appliance complies with the requirements in 57.12. The radiation emission shall not exceed 5mW/cm².*

Test Method:

Section 57.2 requires that 4 potatoes each weighing between 150g and 200g be placed inside the oven under test and cooked using full microwave power and hot air (if applicable) until the potatoes catch fire. Note: The test must be repeated until it catches fire. During this test, pieces of tissue paper and cheesecloth are placed above, below and around the product to ensure that the fire and/or excessive heat generated is safely contained within the confines of the appliance.

As it relates to grease handling, UL KNLZ specifies:

UL KNLZ Guide Information Excerpt:

"These appliances have been evaluated for the limit of 5 mg/m³ 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."

Test Method:

The UL KNLZ category requires that products must have less than 5.0 mg/m³ of particulate matter emissions during 8 continuous hours of cooking a "worst case" food product as measured by EPA 202. Note: Our products were tested using full-fat pepperoni pizzas.

As it pertains specifically to smoke: Smoke typically consists of visible grease particulate that escapes from a product during operation. Our ovens utilize a recirculating airpath that is catalytic scrubbed, thus the airborne grease is combusted as it crosses our catalyst. Given this, under typical/normal operating conditions, our product does not emit smoke.

If you have any issues or specific questions regarding the above, please contact me directly.

Best regards,

James K. Pool III

James K. Pool III
Vice President Engineering,
TurboChef Technologies, Inc.,
Ph: 214.379.6020
Email: james.pool@turbochef.com

ENCORE/BULLET ENERGY ESTIMATE ASTM METHOD



Changeable Parameters		
Operating Time	12	Hours
Energy Costs	\$0.11	kWhr
Snooze Mode	0.00	Hours
Cook Cycles/Day	100	Cooks/Day
Typical Cook Time	60	Seconds

Do Not Change the following values

	Time (min)	Power (Watts)	Cost/Day	Balance of Time (hrs)
Warm up	15	2700	\$0.07	11.75
Cooking	100	4300	\$0.79	10.08
Snooze Idle	0	0	\$0.00	10.08
Idle	605	1100	\$1.22	0
Total/Day			\$2.08	Yearly
Total/Month			\$62.48	\$749.76

HVAC Requirements Per Operating Time -- Note: Approximations Only

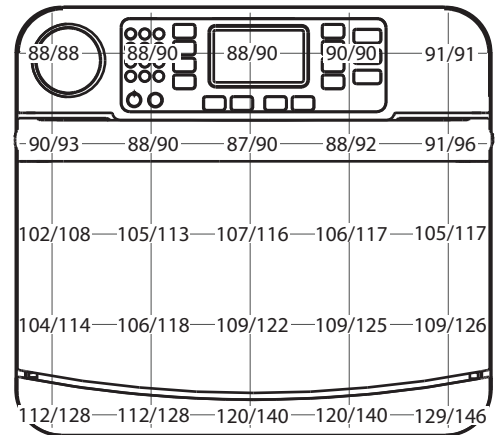
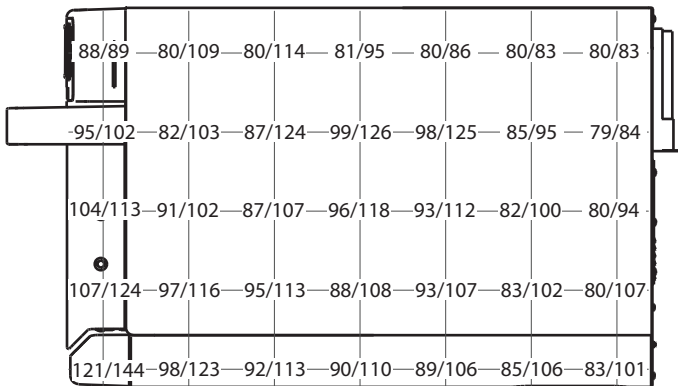
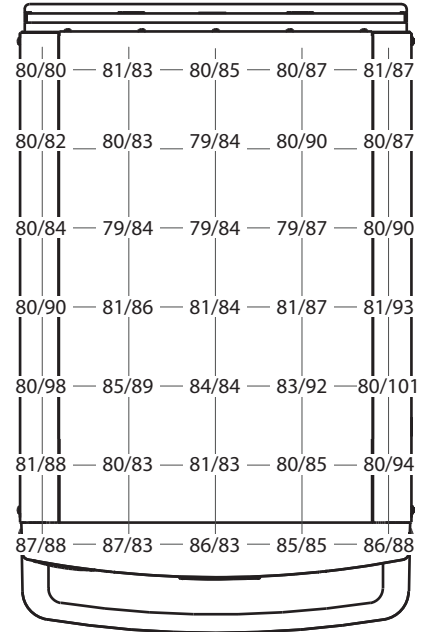
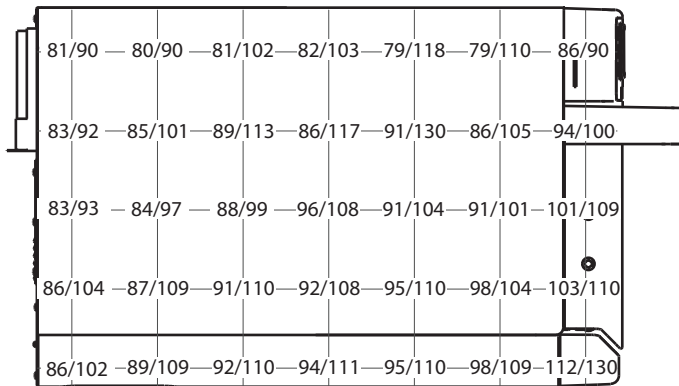
	Warmup Energy (J)	Total Energy (J)	Total average Power (W)	Total Environmental Load kBtu/hr	Average Cooling Requirement (ton of AC)
Average Energy Cooking And Idle (J)	2,430,000	68,160,000	1,578	5.38	0.45



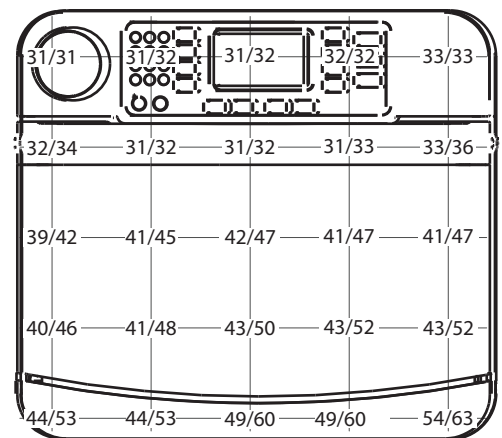
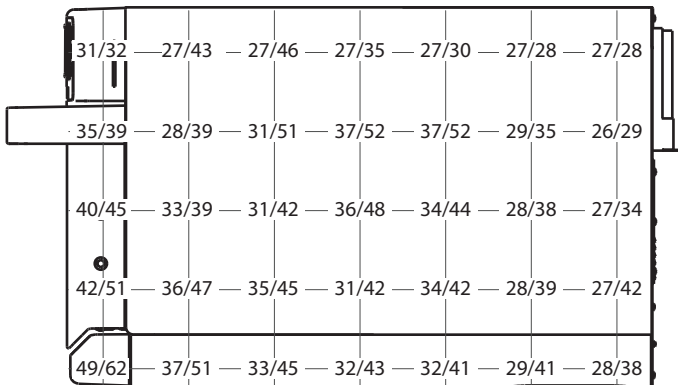
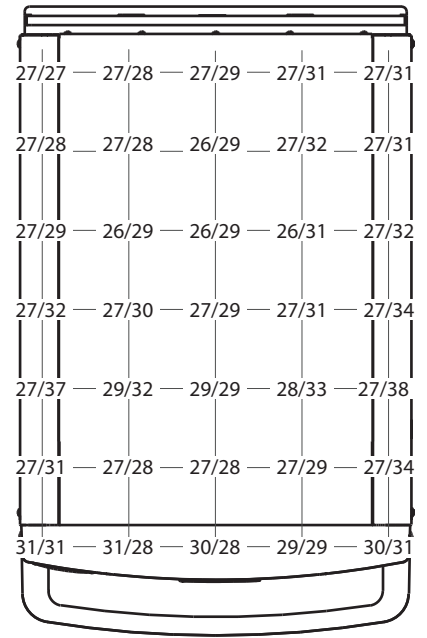
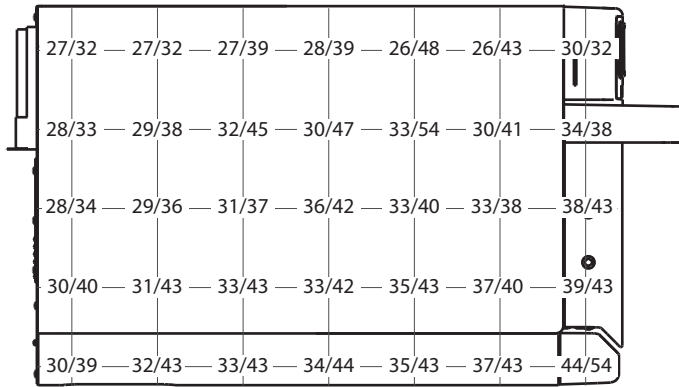
Encore Oven Surface Temperatures

The illustrations in this document represent the surface testing data reported for the TurboChef oven model Encore during idle and during cooking after two and half hours of idle at 500°F (260°C), simulating the highest temperature condition.

Fahrenheit Measurements (Idle/Cooking)



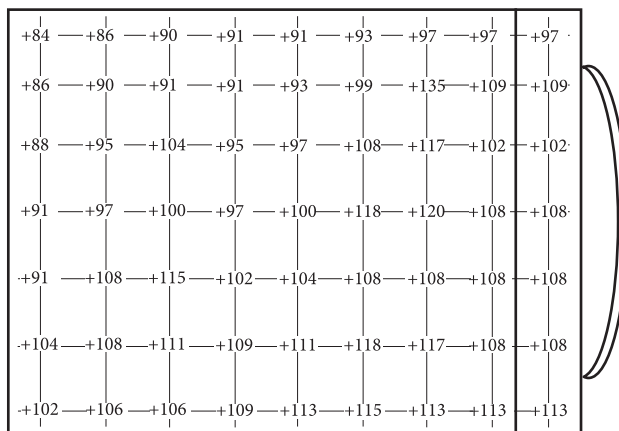
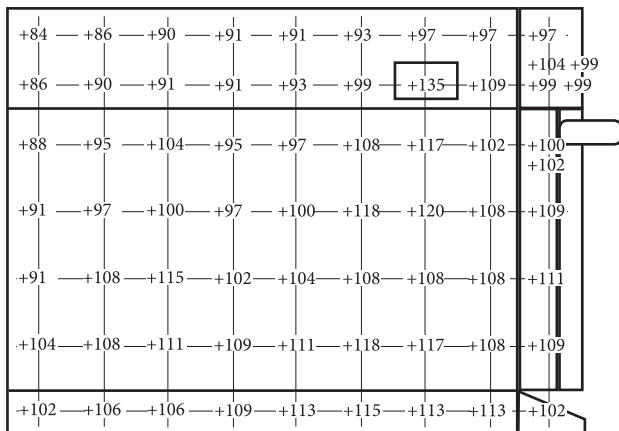
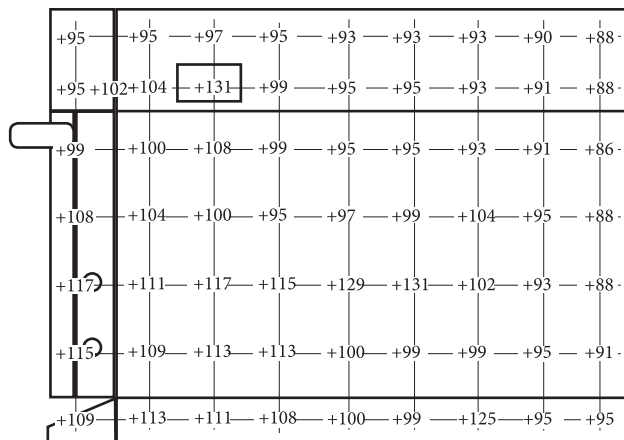
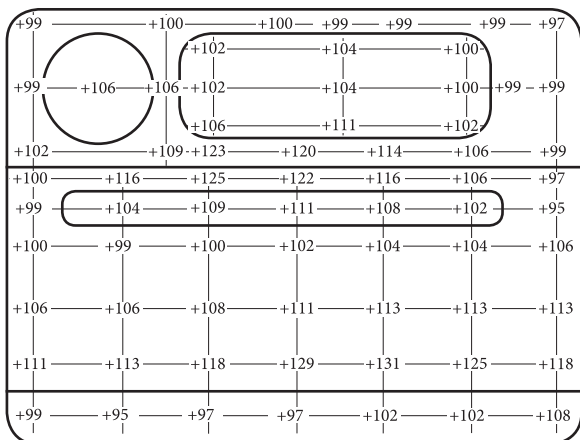
Celsius Measurements (Idle/Cooking)



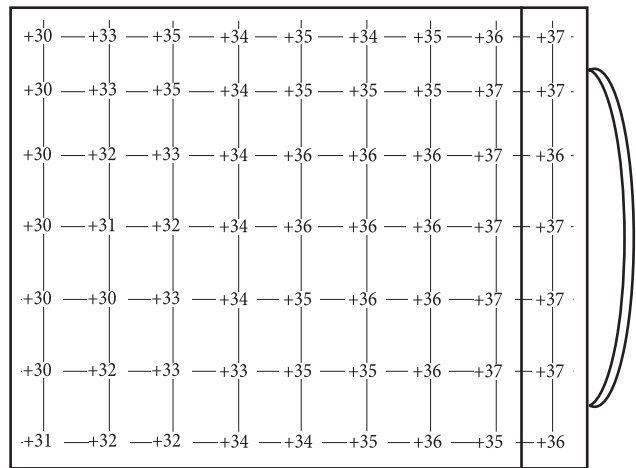
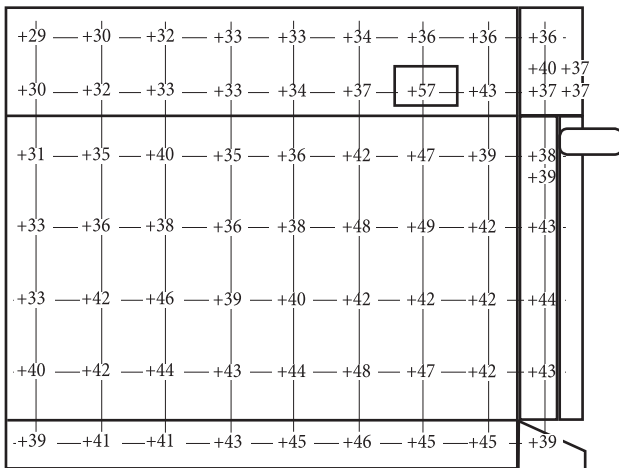
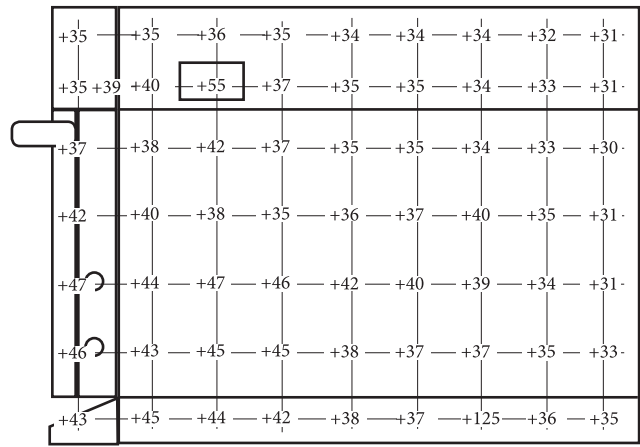
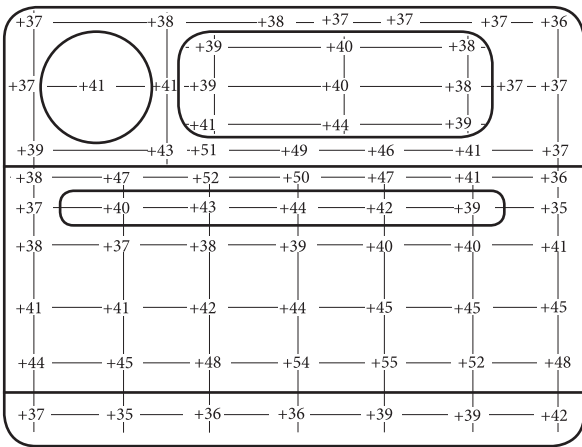
Bullet Oven Surface Temperatures

The illustrations in this document represent the surface testing data reported for the TurboChef oven model Bullet during idle and during cooking after two and a half hours idle at 520°F (271°C), simulating the highest temperature condition.

Fahrenheit Measurements (Idle/Cooking)



Celsius Measurements (Idle/Cooking)





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

JONATHAN E. FREEDMAN
Chief Deputy Director

ANGELO BELLOMO, R.E.H.S., Director
Environmental Health

TERRI S. WILLIAMS, REHS
Assistant Director of Environmental Health

VERONICA BAUCHMAN, R.E.H.S.
Director, Bureau of District Surveillance and Enforcement, Rgn 2

PLAN CHECK PROGRAM
12440 E. Imperial HWY., RM # 515
Norwalk, CA 90650
Tel: (562) 345-6840 Fax: (562)465-0582

www.publichealth.lacounty.gov/eh/

April 4, 2012

James K. Pool, III
President
Turbochef Technologies INC.
4240 International Parkway
Carrollton, TX 75007

Ventilation Exemption Plan Check No.
Application Type:
Effective Date:
Expiration Date:
Telephone:
Email:

ME-2012- 001
Equipment specific 208 / 240 V; 3.5KW
04/04/2012
04/05/2017
(214) 402-4526
James.pool@turbochef.com

**RE: EXEMPTION FROM MECHANICAL EXHAUST VENTILATION FOR
TURBOCHEF ELECTRIC CONVECTION OVEN MODEL: ENCORE.**

Dear Mr. Pool:

The County of Los Angeles Department of Public Health, Environmental Health, Plan Check Program has completed a review of the Turbochef Model: Encore electric convection 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) KNLZ approval for safety and Sanitation Certifications under NSF / ANSI 4 for commercial food equipment. Also, you provided the results of the eight-hour cooking emissions test conducted on the Turbochef Model: Encore electric convection oven. The test result indicates that the particulate matter concentration produced by Encore was found to be 0.13 mg/m³ which are below the limit of 5 mg/ m³ considered as a low grease emission appliance.



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PLAN CHECK NUMBER: MB-2012-001

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, permissible loads.

Oven	Voltage	Current	Phase
Söta (i1)	208/240 VAC	30 amp	1 Ph
Söta Single Mag (i1)	208/240 VAC	20 amp	1 Ph
i3	208/240 VAC	40 amp	1 Ph
	208/240 VAC	30 amp	3 Ph
i5	208/240 VAC	50 amp	1 Ph
	208/240 VAC	30 amp	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	30 amp	3 Ph
	208/240 VAC	50 amp	1 Ph
HhB 2	208/240 VAC	30 amp	1 Ph
Double Batch	208/240 VAC	50 amp	1 Ph
	208/240 VAC	30 amp	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

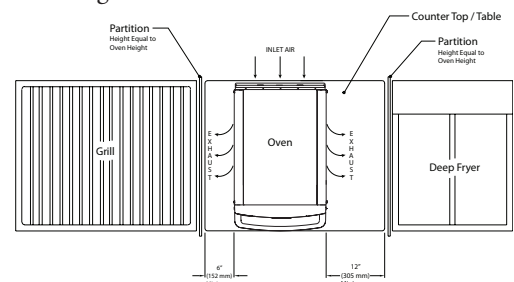
To ensure continued compliance with all health, building, and fire codes, users are required to:

- 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
Sóta / Sóta 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 m²) 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.

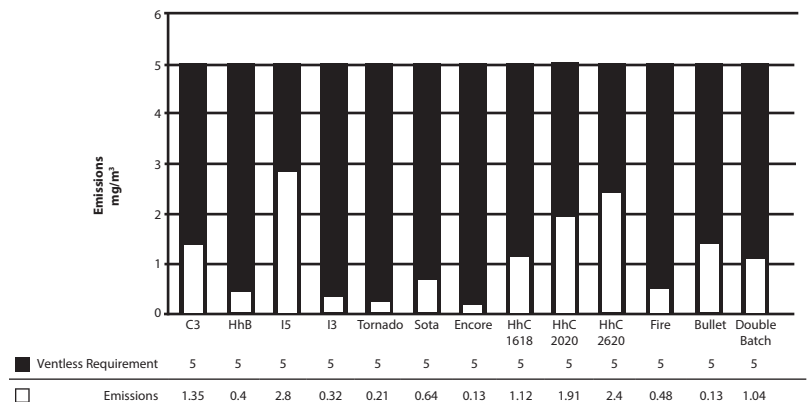
The heat load from TurboChef ovens is mostly sensible. The only latent heat present is due to evaporation during the cooking process. When installing a TurboChef oven, the space must have the following tons of AC per oven installed.

Oven	Tons of AC
Sóta (i1)	0.29
Sóta 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/m³ for the oven to be certified for ventless operation. Cooking devices that measure above the 5.0 mg/m³ 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/m³ threshold as shown below.



NOTE: Certain configurations of TurboChef ovens, such as a triple stacked HhC 2620, may cause emissions to be greater than 5.0 mg/m³. 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.