

PIZZA CONVEYOR OVENS FOR FOOD SERVICE APPLICATIONS

ET10SCE1340 Report



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ABBREVIATIONS AND ACRONYMS

ASTM	American Society for Testing and Materials
Btu	British Thermal Unit
CFM	Cubic Feet Per Minute
CT	Current Transducer
DAS	Data Acquisition System
F	Fahrenheit
ft	Feet
FTC	Foodservice Technology Center
gal	gallons
Hz	Hertz
hr	Hour
in	Inches
kW	Kilowatts
kWh	Kilowatt-hours
lb	Pound
Min	Minutes
SCE	Southern California Edison
V	Volt
VAR	Volt-Ampere Reactive

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EXECUTIVE SUMMARY

Pizza conveyor ovens carry food product on a moving conveyor into and through a heated chamber. Gas or electric forced convection, radiants, or quartz tubes may heat the chamber. Top and bottom heat may be independently controlled. Conveyor ovens allow for the rapid cooking of food products with consistency and ease of operator use.

This project assesses the energy efficiency level of the Blodgett Model S1828E electric conveyor oven. The long-term goal is to determine an appliance baseline and a minimum energy efficiency level for conveyor ovens to qualify them for the food service qualifying product list.

This project examined the Blodgett Model S1828E oven, equipped with an 18-inch wide belt and 28-inch baking zone length, for various performance metrics. A test procedure was conducted to characterize the Blodgett conveyor oven's energy input rate, preheat energy, idle energy rate, cooking energy efficiency, and production capacity uniformity according to the American Society for Testing and Materials F1817-09 Standard Test Method for Performance of Conveyor Ovens.

Southern California Edison's Foodservice Technology Center in Irwindale, CA performed the testing. Cook time, oven temperature, oven power input, and the weight and temperature of the test food were carefully measured. The study used pizzas as the test food.

From the extensive measurements collected, oven efficiency and numerous heat rate and uniformity factors were calculated. The test data provides key information to help determine the operational costs and the percentage of total kitchen productivity a single appliance can deliver.

The following parameters of the Blodgett Model S1828E electric conveyor oven were determined during the test procedures:

- **Energy Input Rate:** The maximum energy input rate recorded during the test was 12.70 kilowatts (kW).
- **Preheat energy consumption:** The oven took 21.15 minutes to reach a temperature of 475°F, yielding a preheat energy consumption of 3.70 kWh.
- **Idle Energy Rate:** The idle energy rate, the amount of energy to maintain a 475°F setpoint, was recorded as 6.74 kW.
- **Cooking Energy Efficiency:** The average cooking energy efficiency as determined by three heavy-load tests was 20.27%.
- **Production Capacity:** The average measured production capacity was 26.74 pounds (lbs)/hour (hr).

INTRODUCTION

Pizza conveyor ovens carry food product on a moving conveyor into and through a heated chamber. Gas or electric forced convection, radiants, or quartz tubes may heat the chamber. Top and bottom heat may be independently controlled. Conveyor ovens allow for the rapid cooking of food products with consistency and ease of operator use.

This project examined the Blodgett Model S1828E oven, equipped with an 18-inch wide belt and 28-inch baking zone length, for various performance metrics. A test procedure was conducted to characterize the Blodgett conveyor oven's energy input rate, preheat energy, idle energy rate, cooking energy efficiency, and production capacity uniformity according to the American Society for Testing and Materials F1817-09¹.

Cook time, oven temperature, oven power input, and the weight and temperature of the test food were carefully measured. The study used pizzas as the test food. Oven efficiency and numerous heat rate and uniformity factors were calculated based on the collected measurements.

BACKGROUND

Southern California Edison (SCE) is committed to the advancement of the food service industry and is part of a statewide team offering a food service qualifying product list that identifies the most efficient commercial kitchen appliances within a specific appliance category. The qualifying appliances are eligible to receive incentives for their use. Currently, conveyor ovens are not listed as one of the appliance categories on the food service qualifying list. Testing is in progress to add conveyor ovens to the qualified equipment list.

GOALS OF THE STUDY

This project evaluates the operation and performance of the Blodgett S1828E conveyor oven using ASTM standard F1817-09 test methods. The testing seeks to determine the efficiency level of the appliance. Once a large enough sampling of ovens is tested, an appliance baseline and a minimum efficiency level for inclusion into the food service qualifying product list can be determined. The testing examines the following:

- **Energy Input Rate:** The peak rate at which a conveyor oven consumes energy, in kilowatts (kW).
- **Preheat energy consumption:** The amount of energy consumed, kilowatt-hours (kWh), by the conveyor oven while preheating its cavity from the ambient temperature to the specified thermostat setpoint.
- **Idle Energy Rate:** The conveyor oven's required rate of energy consumption (kW) when empty that is necessary to maintain its cavity temperature at a specified thermostat setpoint.
- **Cooking Energy Efficiency:** The quantity of energy imparted to a specific food product; this is expressed as a percentage of energy consumed by the conveyor oven during the cooking event.
- **Cooking Energy Rate:** The average rate of energy consumption (kW) during the heavy-load cooking test.
- **Production Capacity:** The rate pounds (lbs)/hour (hr) at which a conveyor oven brings the specified food product to a specified cooked condition. This does not necessarily refer to the maximum rate and production rate that varies based on the amount of food cooked.

APPLIANCE EVALUATED

The Blodgett Model S1828E electric conveyor oven, shown in Figure 1, has a stainless steel outer construction, full drop down front window, and a fully insulated bottom, top, front, and rear. The unit features an 18-inch wide stainless steel wire mesh conveyor belt, 28-inch long bake chamber, two single inlet blowers behind the heat source for forced air circulation, supplying top and bottom air flow, an electrical resistance heating element, and one blower cooling fan. In addition, the oven features a maximum setpoint temperature up to 550°F and is stackable up to three ovens high. Appliance specifications and the manufacturer's literature are included in Appendix A. The biggest market barriers of electric conveyor ovens are the lack of customer education on efficient ovens.

After testing, the manufacturer informed the FTC it had discontinued its entire line of conveyor oven products.



FIGURE 1. BLODGETT MODEL S1828E ELECTRIC CONVEYOR OVEN

TEST METHODOLOGY

Laboratory testing of this oven was performed according to the ASTM F 1817-09 test method for conveyor ovens. Testing methods are outlined to determine the energy consumption and cooking performance of gas and electric conveyor ovens. The testing provides information to determine:

- Energy Input Rate
- Preheat Energy Consumption
- Idle Energy Rate
- Cooking Energy Efficiency
- Cooking Energy Rate
- Production Capacity

LABORATORY AND INSTRUMENTATION DESCRIPTION

Testing was performed at the SCE Foodservice Technology Center (FTC), a 2,000 square-foot demonstration and equipment test center. The center is part of the Energy Education Center, located in Irwindale, CA and is a certified ASTM ^{testing} laboratory. The FTC is capable of maintaining voltage regulations to ± 1 volt (V) on 120V, 208V, and 240V single- and three-phase. Receptacle configurations range from 20 amperes (A)/120V single-phase to 100 A/208 V/240 V single- and three-phase. The FTC is also equipped with a Data Acquisition System (DAS), a National Instruments LabVIEW-based software (Figure 2), used to monitor power (kW), amperage, voltage, power factor, frequency, and volt-ampere reactive (VAR) from all receptacles, and displays the results in a real-time graph during testing. The electrical consumption of the ovens is logged in intervals of 1 second and the data from up to 36 thermocouples and 8 resistant temperature detection sensors is recorded. The interface also allows the user to configure the monitoring parameters and select specific monitoring hardware.



FIGURE 2. DAS INTERFACE WITH NATIONAL INSTRUMENTS LABVIEW

The DAS system is equipped with multi-functional digital transducers, integrated serial current transducers (CTs), and voltage leads. The multi-functional digital transducers create power readings from the CT and voltage inputs and have an accuracy of $\pm 0.5\%$ over the full-scale readings. The CTs used in this project are accurate to 10% FS or better, and have a frequency response ranging from 44 Hertz (Hz) to 3,000 kilohertz (kHz). The DAS system was calibrated in November 2009 and uses K type thermocouples and connectors. The K type thermocouples can read a temperature range of -328°F to $2,282^{\circ}\text{F}$ with accuracy of $\pm 2.2^{\circ}\text{F}$, or 0.75% of temperature reading above 32°F , and 2% of temperature reading below 32°F .² A fiberglass insulated 24-gauge thermocouple was used to determine the cavity temperature as well as the temperature of the pizzas. When determining the weight of the pizzas, a model A&D FG-60KAL digital scale that has a resolution of 0.01 pound (lb) and an uncertainty of 0.01 lb. was used.

TEST SITE SETUP

The test site setup refers to the installation of the conveyor oven, condition of the environment, and the setup of temperature measurements for the pizzas. At the test site, the conveyor oven was installed according to the manufacturer's instructions and placed under a deep canopy exhaust hood that was mounted against the wall. The lower edge of the hood was positioned 6 feet (ft.), 6 inches (in.) from the floor, with the front edge of the oven door inset 6 inches from the vertical plane of the front edge of the hood. Both sides of the conveyor oven were 3 feet away from any nearby walls. The exhaust ventilation rate was set to 300 cubic feet per minute (cfm) per linear foot of hood length. The ambient conditions were kept at a temperature of $75 \pm 5^{\circ}\text{F}$ during operation of the exhaust ventilation system. The oven was connected to a calibrated energy test meter, and supply voltage was maintained within 2.5% of the manufacturer's nameplate voltage.

A thermocouple probe, type K, measured the temperature of the test pizzas both before and after they were cooked. Before testing, a probe was placed in the center of the pizza, beneath the cheese and slightly into the crust to ensure the pizzas were stabilized at $39 \pm 1^{\circ}\text{F}$. After they were cooked, the final temperature of the pizza was determined by placing six thermocouple probes on the surface of the pizza. The probes were located 3-inches from the center of the pizza and spaced equidistant from each other. The probes penetrated the cheese to rest on the sauce-crust interface.

THERMOSTAT CALIBRATION

Thermostat calibration is verified by installing a thermocouple in the center of the oven cavity 2-inches above the conveyor belt; placing a thermocouple in the center of the cavity allows for consistent temperature measurement on all types of conveyor ovens. Calibration is necessary since the placement of the oven's temperature sensors can differ greatly between varying models and manufacturers. The conveyor oven display temperature typically differs from the reading taken by the cavity thermocouple. When performing a thermostat calibration, the oven is set to 475°F and allowed to stabilize for 1 hour before readings of the cavity thermocouple are taken. After the 1-hour idle period, oven temperatures are recorded at 1-second intervals for 30 minutes. If the thermocouple reads an average temperature of $475 \pm 5^{\circ}\text{F}$ for a 30-minute period, the oven's thermostat is calibrated.

ENERGY INPUT RATE AND PREHEAT ENERGY CONSUMPTION

Both the energy input and preheat energy consumption are used to confirm proper operation of the conveyor oven. The preheat test records the required amount of time and energy needed to raise the conveyor oven cavity temperature from an ambient of 75°F to a ready-to-cook-condition. In this test, the oven was considered to be in ready-to-cook-condition when the cavity reached 465°F. Temperature measurements were taken every second. Once the oven reached its setpoint of 475°F, it stabilized for 1 hour.

The energy input rate is the peak energy consumption of the oven while preheating the oven from ambient temperature to a setpoint of 475°F. The peak energy consumption, measured by an electrical meter, must be operating within 5% of the nameplate energy input rate.

IDLE ENERGY RATE

After stabilization, the idle energy rate was taken by monitoring the consumption of the conveyor oven for a 2-hour period, with the same setpoint of 475°F. The idle energy rate is the conveyor oven's required rate of energy consumption (kW) when empty, needed to maintain its cavity temperature at a specified thermostat setpoint.

COOK TIME DETERMINATION

The cook time is the time it takes for the entire pizza to pass completely through the oven cavity, starting from the point where the leading edge of the pizza enters the oven cavity until the point where the trailing edge of the pizza exits the oven cavity. Once the pizza exits the cavity, the temperature probes were placed on the pizza. After allowing 30 seconds to stabilize, temperature measurements were recorded at 30, 40, 50, and 60 seconds. The final pizza temperature was taken as the highest of these four averaged temperature readings. The cook time was adjusted until the final pizza temperature was $195 \pm 3^\circ\text{F}$.

COOKING ENERGY EFFICIENCY AND PRODUCTION CAPACITY

The cooking energy efficiency is the quantity of energy imparted to the specific food product, and is expressed as a percentage of energy consumed by the oven during the test. For conveyor ovens, pizzas were used for the cooking efficiency test and the test was run under a heavy-loading scenario. The heavy load testing required 16 pizzas for an 18-inch wide conveyor belt with a 28-inch cavity length. The heavy-load testing was run at least three times. These pizzas were specially made per the test protocol.

The test pizza consisted of a 12-inch diameter, prebaked crust, weighing 0.9 ± 0.2 lb and having a moisture content of $36 \pm 3\%$. The pizza sauce was a simple, tomato-based sauce with a moisture content of $90 \pm 2\%$ by weight. The pizza cheese was part skim, low moisture, and shredded mozzarella cheese with a moisture content of $50 \pm 2\%$ by weight. The pizzas were pre-made with 0.25 lb of sauce and 0.375 lb of cheese. The pizzas were refrigerated to an average temperature of $39 \pm 1^\circ\text{F}$.

After the 16 pizzas were prepared, they were divided into two equal parts. The first 8 pizzas were used to stabilize the oven, and the second half of the pizzas were used as the test pizzas. Each pizza was placed onto the conveyor so that the leading edge of the pizza was adjacent to the entrance to the oven cavity. The pizzas were placed

at the left, center, and right side of the conveyor belt in order to maximize belt coverage. As soon as each pizza passed completely through the oven cavity, the final temperature was collected and verified to be $195 \pm 3^\circ\text{F}$. Energy consumption and time were stopped as soon as the last pizza had moved completely through the oven cavity.

The weight of the cooked pizzas was measured and compared to the pre-cooked weight. Cooking energy efficiency is a precise indicator of oven energy performance when cooking a typical food product. Equation 1 calculates the cooking energy efficiency.

EQUATION 1. COOKING ENERGY EFFICIENCY

$$\eta_{\text{cook}} = \frac{E_{\text{food}}}{E_{\text{appliance}}} \times 100 = \frac{[W_{\text{uncooked}} \times C_p(F) \times (T_2 - T_1)] + [(W_{\text{uncooked}} - W_{\text{cooked}}) \times H_{\text{fgt2}}]}{E_{\text{appliance}}} \times 100$$

Where:

η_{cook}	=	Cooking energy efficiency (%)
E_{food}	=	Amount of energy into the food (British thermal unit (Btu))
W_{uncooked}	=	Total weight of test food before cooking (lbs)
W_{cooked}	=	Total weight of cooked test food (lbs)
$C_p(F)$	=	The specific heat of the food based on the specified food (0.84 Btu/lb °F)
H_{fgt2}	=	Heat of vaporization of water as found from a table of thermodynamic properties of water at saturation (982 Btu/lb)
T_2	=	Average final temperature of the food (°F)
T_1	=	Average initial temperature of the food (°F)
$E_{\text{appliance}}$	=	Amount of energy into the appliance (Btu)

The cooking energy rate is the average rate of energy consumption (kW) during the heavy load test. The cook energy rate is calculated using Equation 2.

EQUATION 2. COOKING ENERGY RATE

$$E_{\text{cookrate}} = \frac{E_{\text{oven}} \times 60}{t}$$

Where:

E_{cookrate}	=	Cooking energy rate (kW)
E_{oven}	=	Amount of energy consumed by an appliance during cook testing (kWh)
t	=	Cook test period (min.)

Production capacity is the production capability of a conveyor oven as it is used to cook a typical food product. This information can be used to determine the proper size and quantity needed to fit any user's needs. Equation 3 is used to calculate the production capacity.

EQUATION 3. PRODUCTION CAPACITY

$$PC = P_{num} \times \frac{60}{t}$$

Where:

PC	=	Production capacity of the conveyor oven (lb/hr)
P_{num}	=	Number of pizzas for a heavy load
t	=	Cook test period (min.)

For cooking energy efficiency and production capacity results, the percentage of uncertainty in each result is specified to be no greater than $\pm 10\%$ based on at least three test runs.

RESULTS AND DATA ANALYSIS

THERMOSTAT CALIBRATION

The oven's thermostat was calibrated by setting the oven temperature to 475°F and allowing the oven temperature to stabilize. After a 1-hour stabilization period, the thermocouple temperature readings were taken inside the oven cavity. Thirty minutes of data, sampled every second, was collected, and the resultant average temperature reading was 477°F. Because this result is within 5°F of 475°F, the oven's thermostat was deemed properly calibrated.

ENERGY INPUT RATE AND PREHEAT ENERGY CONSUMPTION

The energy input rate and preheat energy consumption are used to confirm proper operation of the conveyor oven.

During the test, the Blodgett Model S1828E electric conveyor oven took 21.15 minutes to reach a temperature of 465°F, yielding a preheat energy consumption of 3.70 kWh. Figure 3 shows a graph of the oven cavity temperature versus time.

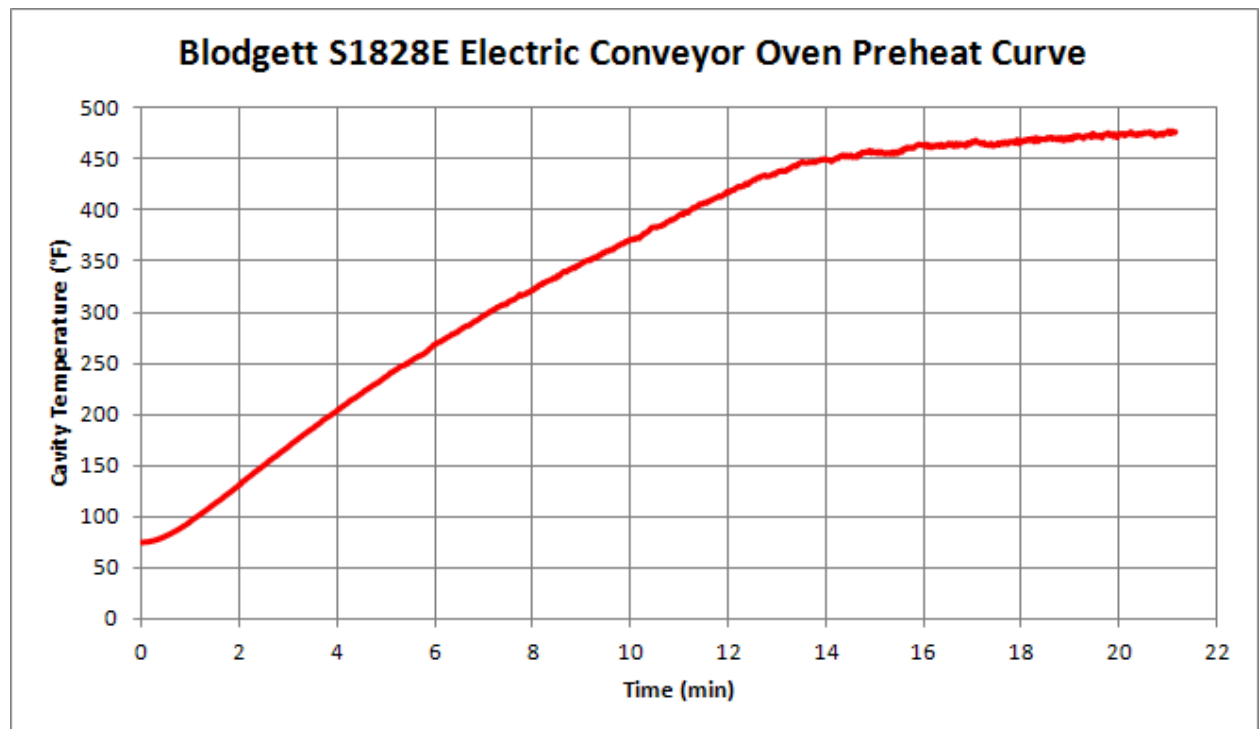


FIGURE 3. BLODGETT MODEL S1828E ELECTRIC CONVEYOR OVEN PREHEAT CURVE

The energy input rate is the peak energy consumption of the oven while preheating the oven from ambient temperature to a setpoint of 475°F. The maximum energy input rate recorded during the test was 12.70 kW.

IDLE ENERGY RATE

The idle energy rate is the conveyor oven's required rate of energy consumption (kW), when empty, needed to maintain its cavity temperature at a specified thermostat setpoint. In this test, the idle energy rate was taken after stabilization by monitoring the consumption of the conveyor oven for a 2-hour period, with the same setpoint of 475°F. The idle energy rate was calculated to be 6.74 kW.

COOKING ENERGY EFFICIENCY, ENERGY RATE, AND PRODUCTION CAPACITY

The cooking energy efficiency is the quantity of energy imparted to the specific food product, and is expressed as a percentage of energy consumed by the oven during the test. Cooking energy efficiency is a precise indicator of oven energy performance when cooking a typical food product. Results of three heavy load cooking energy efficiency tests are shown in Table 1.

TABLE 1. COOKING ENERGY EFFICIENCY RESULTS

TEST RUN	W UNCOOKED [LBS]	CP [BTU/LB-°F]	T1 [°F]	T2 [°F]	E FOOD [BTU]	W COOKED [LBS]	Δ WEIGHT [LBS]	HFGT2 [BTU/LB]	E OVEN [BTU]	N COOK EFFICIENCY [%]
Heavy load 1	11.78	0.593	39.91	198.1	1,704	11.17	0.61	982	8,544	19.94%
Heavy load 2	11.78	0.593	38.71	198.6	1,735	11.15	0.63	982	8,777	19.77%
Heavy load 3	11.83	0.593	40.06	196.3	1,744	11.17	0.66	982	8,272	21.09%

The average efficiency and uncertainty results display in Table 2.

TABLE 2. COOKING EFFICIENCY AND UNCERTAINTY RESULTS

N, EFFICIENCY AVERAGE	STANDARD DEVIATION	ABSOLUTE UNCERTAINTY	UNCERTAINTY PERCENT
20.27%	0.007	0.018	8.74%

The cooking energy rate is the average rate of energy consumption (kW) during the heavy load test. The results of the Cooking Energy Rate test display in Table 3.

TABLE 3. COOKING ENERGY RATE RESULTS

TEST RUN	E APPLIANCE [kWh]	T [MINUTES]	E COOKRATE [kW]
Heavy load 1	2.50	17.87	8.41
Heavy load 2	2.57	18.40	8.39
Heavy load 3	2.42	17.60	8.26

Production capacity information is the production capability of a conveyor oven as it is used to cook a typical food product. This information can be used to determine the proper size and the quantity needed to fit any user's needs. The results of the Production Capacity Test are shown in Table 4.

TABLE 4. PRODUCTION CAPACITY TEST RESULTS

TEST RUN	P NUM, INITIAL [PIZZAS]	T [MIN]	PC [PIZZAS/HR]	PC, AVG PROD. CAPACITY	STANDARD DEVIATION	ABSOLUTE UNCERTAINTY	UNCERTAINTY PERCENT
Heavy load 1	8	17.87	26.87	26.74	0.60	1.49	5.59%
Heavy load 2	8	18.40	26.09				
Heavy load 3	8	17.60	27.27				

CONCLUSION

The following parameters of the Blodgett Model S1828E electric conveyor oven were determined during the testing procedure:

- **Energy Input Rate:** The maximum energy input rate recorded during the test was 12.70 kilowatts (kW).
- **Preheat energy consumption:** The oven took 21.15 minutes to reach a temperature of 475°F, yielding a preheat energy consumption of 3.70 kWh.
- **Idle Energy Rate:** The idle energy rate, the amount of energy to maintain a 475°F setpoint, was recorded as 6.74 kW.
- **Cooking Energy Efficiency:** The average cooking energy efficiency as determined by three heavy-load tests was 20.27%.
- **Production Capacity:** The average measured production capacity was 26.74 pounds (lbs)/hour (hr).

Despite the discontinuation of Blodgett's conveyor oven product line, the results can still be used as a data point in determining the appropriate minimum efficiency level for the foodservice qualifying product list.

APPENDIX A – BLODGETT S1828E

SPECIFICATIONS



MODEL S1828E

Electric Conveyor Oven



OPTIONS AND ACCESSORIES

(AT ADDITIONAL CHARGE)

- Stainless steel legs with casters, two with brakes
 - ☐ 25" (635) tall with stainless steel undershelf for single and double stack
 - ☐ 12" (305) tall for triple stack
- ☐ Turnkey installation
- ☐ 6' cord with NEMA 15-50P plug for 208V or 240V, 3 phase ovens
- ☐ One year additional extended warranty*

STANDARD FEATURES

- Energy efficient heating system that improves cooking results and saves energy
- Solid state controls out of the heat zone
- Temperature controller's built in auto tune feature improves overall conveyor oven performance
- Microprocessor-controlled conveyor speed with motor feedback
- Stackable to three high
- Removable conveyor frame and belt assembly
- 4" (102mm) legs for counter top units
- Removable 6" (152mm) and 12" (305mm) stainless steel extension
- Adjustable conveyor belt tension
- Field reversible conveyor belt direction
- One year parts and labor warranty
- Start Up by our Authorized Service Provider to activate the warranty (USA and Canada only)*

* For all international markets, contact your local distributor.

Project _____

Item No. _____

Quantity _____

S1828E

All data is shown per oven section, unless otherwise indicated.

Blodgett electric conveyor oven with 18" (457mm) wide belt and 28" (711mm) baking zone length. Single, double, or triple stack models are available.

EXTERIOR CONSTRUCTION

- Stainless steel front, sides, top and interior
- Easy serviceable access to all components
- Exterior top and front surfaces are cool to the touch
- Full drop down front window
- Fully insulated on bottom, top, front and rear.

INTERIOR CONSTRUCTION

- Stainless steel outer (finger) plates
- 18" (457mm) wide stainless steel wire mesh conveyor belt
- 28" (711mm) long bake chamber
- Two single inlet blowers behind the heat source for forced air circulation, supplying top and bottom air flow
- Standard or Customer specific finger set that allows control of 8 heat zones inside the bake chamber. Finger set consists of manifolds, inner plates, outer plates and blank plate(s)

OPERATION

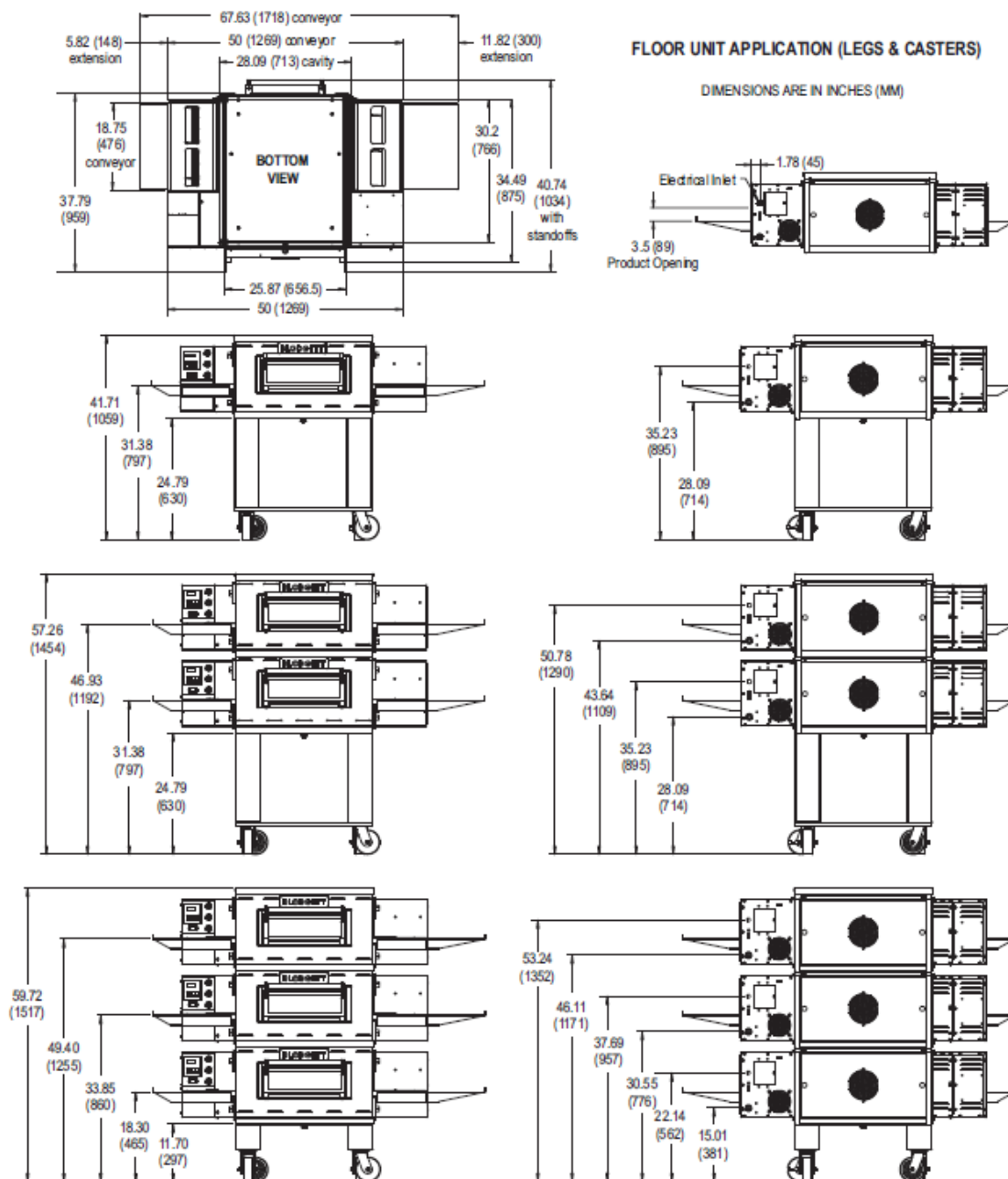
- Solid state digital controls to display set point and actual bake chamber temperature(s) as well as bake time.
- Maximum Temperature is 550 degrees F (one degree increment)
- 1:00 - 30:00 minute bake time (one second increment)
- Two blower motors with thermal overload protectors
- Product clearance 3 1/2" (889mm)
- Heat transferred through forced directed hot air impingement
- Open vented baking chamber
- Electrical resistance heating element
- One blower cooling fan
- Easy to clean – no tools required



BLODGETT OVEN COMPANY

www.blodgett.com

1400 Toastmaster Drive, Elgin, IL USA 60120
Phone: (847) 741-3300 • Fax: (847) 741-0015

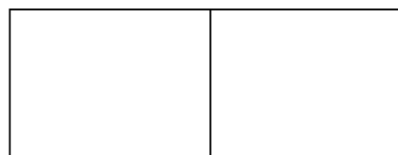
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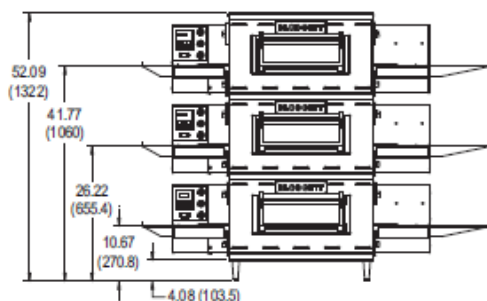
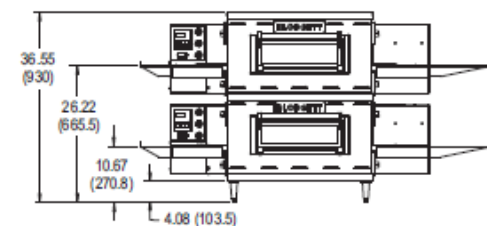


MODEL S1828E

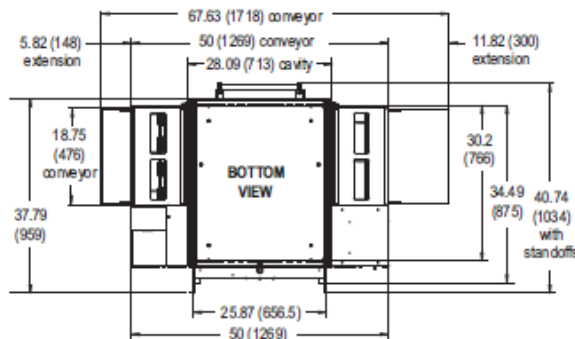
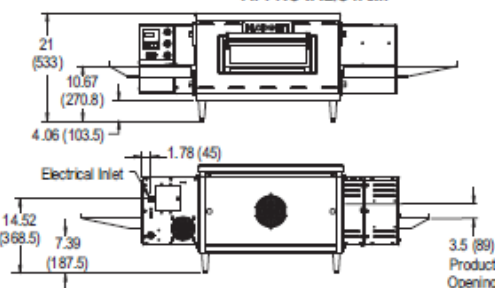


COUNTERTOP APPLICATION

DIMENSIONS ARE IN INCHES (MM)



APPROVAL/STAMP



SHORT FORM SPECIFICATIONS

Provide Blodgett model S1828E conveyor oven. Unit shall be electrically heated and shall cook by means of forced, heated air. Unit shall be (single/double/triple) deck supported by (specify stand type from options list). Each deck shall be fully independent, of stainless steel construction, and fully insulated on bottom, top, front and rear. Provide with electrically heated baking compartment with two blowers to evenly distribute heat across baking zone. Conveyor belt shall be 18" (457mm) wide and constructed of stainless steel wire mesh; baking zone length shall be 28" (711mm). Side mounted control panel shall be solid state with 550°F (288°C) maximum thermostat and digital display of adjustable belt speed. Provide options and accessories as indicated.

DIMENSIONS:

Floor space	40.74" (1034mm) W x 50" (1269mm) L
Product clearance	3-1/2" (89mm)
Recommended minimum wall clearance	0" (0mm) left side, right side and rear
Belt width	18" (455mm)
Baking zone length	28" (711mm)

POWER SUPPLY: (must have dedicated ground)

V.A.C.	3 phase models	1 phase models
DOMESTIC		
208 (4 wires)	50/60 Hz, 12.0KW, 35.3 amp	50/60 Hz, 10.0KW, 48.1 amp
240 (4 wires)	50/60 Hz, 12.0KW, 28.8 amp	50/60 Hz, 10.0KW, 41.7 amp
480 (5 wires*)	50/60 Hz, 12.0KW, 14.4 amp	n/a
* Neutral required		
CE MODEL		
230/240	Contact factory	
230/400	Contact factory	
380	Contact factory	

MAXIMUM INPUT:

Single	12.0 KW, 3 Phase	10.0 KW, 1 Phase
Double	24.0 KW, 3 Phase	20.0 KW, 1 Phase
Triple	36.0 KW, 3 Phase	30.0 KW, 1 Phase

MINIMUM ENTRY CLEARANCE:

Uncrated 18" (457mm)

SHIPPING INFORMATION:

Approx. Weight:

Single counter top:	425 lbs. (204 kg)
Double counter top:	825 lbs. (408 kg)
Triple counter top:	1225 lbs. (612 kg)
Single floor model:	473 lbs. (215 kg)
Double floor model:	893 lbs. (405 kg)
Triple floor model:	1419 lbs. (644 kg)

Crate sizes:

Contact factory

NOTE: Blodgett Oven, in accord with its policy to continually improve its products, reserves the right to change materials or specifications without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions, or replacements for previously purchased equipment.

BLODGETT OVEN COMPANY

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NOTE: FOR COMMERCIAL USE ONLY

PIN M10993 Rev C (3/10)

REFERENCES

¹ American Society for Testing and Materials, 2009. Standard Test Method for Performance of Conveyor Ovens. ASTM Designation F1817-09. In Annual Book of ASTM Standards, West Conshohocken, PA.

² <http://www.omega.com/temperature/z/pdf/z204-206.pdf>