STEAMER/KETTLE FOR FOODSERVICE APPLICATIONS

ET10SCE1440 Report

Prepared by:

Design & Engineering Services
Customer Service Business Unit
Southern California Edison

September 2011

What's Inside...

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Southern California Edison's Design & Engineering Services (DES) group is responsible for this project. It was developed as part of Southern California Edison's Emerging Technologies Program under internal project number ET10SCE1440. DES project manager Brian James and Carlos Haiad conducted this technology evaluation with overall guidance and management from Paul Delaney. For more information on this project, contact brian.james@sce.com.

Disclaimer

ABBREVIATIONS AND ACRONYMS

DES	Design and Engineering Services
FTC	Foodservice Technology Center
kW	Kilowatt
kWh	Kilowatt-hour

INTRODUCTION

The Foodservice Technology Center (FTC) and Design & Engineering Services (DES) performed a series of field tests on El Pollo Loco current steam kettles and new microwave steamers. Field studies were used to determine potential energy savings for deployment within El Pollo Loco restaurants throughout the country.

Currently, El Pollo Loco uses two electric steam kettle units per restaurant. The kettles come in two configurations: 20 kilowatts (kW) or 40 kW. The higher volume restaurants -carry one 20 kW and one 40 kW steam kettle unit, while the lower volume restaurants carry two 20 kW steam kettle units. The new microwave steamers, rated at approximately 3 kW, were assessed for potential replacement of the old steam kettles in either or both low-volume and high-volume restaurants.

ASSESSMENT OBJECTIVES

This field study assessed new microwave steamers for potential replacement of the existing steam kettles in either or both low- and high-volume El Pollo Loco restaurants.

PRODUCTS ASSESSED

This field study tested two different manufacturer's microwave steamers: Panasonic and Amana. Figure 1 and Figure 2 contain pictures of a steam kettle and two microwave steamers, respectively. The Panasonic Sonic Steamer® NE-3280 and the Amana RC30S were the specific models tested. The Panasonic and Amana microwave steamers have a nominal power rating of 3.2 kilowatts (kW) and 3.0 kW, respectively. Therefore, the microwave steamers have a nominal demand reduction of approximately 54 kW and 34 kW per high-volume and low-volume restaurants, respectively. Additional product information is available in the appendix.

FIGURE 1. STEAM KETTLE

FIGURE 2. MICROWAVE STEAMERS

TEST METHODOLOGY

Field tests were performed to evaluate and compare the performance of the two steam kettle configurations and two microwave steamers. The low-volume baseline was two 20 kW kettles. The high-volume baseline was one 20 kW kettle and one 40 kW kettle. Two microwave steamers replaced each -baseline technology. The two El Pollo Loco test sites chosen for this evaluation are located in San Dimas and Pasadena, California. The San Dimas site is considered a high-volume restaurant, while the Pasadena restaurant is considered low-volume.

Power monitoring equipment was installed at each test site for a period of two months. The steam kettle baselines and microwave steamers were each monitored for one-month intervals at each test site. This data collection window was deemed sufficient to account for any abnormalities in restaurant operations.

All operations and food products cooked with the steam kettles were transitioned to the microwave steamers. This provided comparable usage patterns between the baseline and the new technology.

RESULTS

The annual energy consumption for the steam kettles and microwave steamers and the resultant energy savings is displayed in Table 1 and Table 2 for the high-volume San Dimas site and the low-volume Pasadena site, respectively.

TABLE 1. HIGH-VOLUME SAN DIMAS RESTAURANT ANNUAL ENERGY CONSUMPTION AND SAVINGS

SYSTEM TYPE	TOTAL ANNUAL ENERGY CONSUMPTION (KWH/YR)	ANNUAL ENERGY SAVINGS (KWH/YR)
20 kW and 40 kW Steam Kettles	13,705	1,978
Panasonic Microwave Steamer	11,728	

TABLE 2. LOW-VOLUME PASADENA RESTAURANT ANNUAL ENERGY CONSUMPTION AND SAVINGS

SYSTEM TYPE	TOTAL ANNUAL ENERGY CONSUMPTION (KWH/YR)	ANNUAL ENERGY SAVINGS (KWH/YR)
Two 20 kW Steam Kettles	31,536	19,392
Amana Microwave Steamer	12,144	

From the data in Table 1 and Table 2, the Panasonic and Amana microwave steamers provide an annual energy savings of approximately 2,000 to 20,000 kWh/yr, depending on the restaurant's baseline configuration. The annual energy consumption of the two manufacturer's microwave steamers can be considered approximately the same.

The primary source of energy savings is due to the minimal stand-by energy consumed by the microwave steamers. The microwave steamers are used on an as-needed basis. Conversely, the steam kettles were rarely turned off, causing the heating element to cycle on and off throughout the day.

Additionally, the results indicate the two 20 kW baseline steam kettles in the low-volume restaurant consume more energy than the 20 kW and 40 kW baseline steam kettles in the high-volume restaurant. This is explained by the high-volume restaurant rarely needing the extra capacity of the additional 20 kW kettle, whereas the low-volume restaurant runs both 20 kW units continuously.

CONCLUSION

The use of microwave steamers over conventional steam kettles at El Pollo Loco restaurants nationwide has the potential to drastically reduce energy consumption and power demand. The new microwave steamers have the potential to reduce power demand by as much as 54 kW and 34 kW in high-volume and low-volume restaurants, respectively. Additionally, the microwave steamers have the potential to save between 2,000 kWh and 20,000 kWh annually.

RECOMMENDATION

Based on the results of this assessment, DES and FTC recommend El Pollo Loco install the new microwave steamers. However, economic restrictions on El Pollo Loco restaurants may be a market barrier.

APPENDIX – MANUFACTURER SPECIFICATIONS

AMANA COMMERCIAL MICROWAVE OVEN RC30S SPECIFICATION SHEET

Quality Food, Fast.

RC30S
3000 Watts

COMMERCIAL MICROWAVE OVEN

The Amana® RC30S

In the foodservice business time is money. Make the most of your time by utilizing one of the most powerful commercial ovens you can buy — the Amana RC30S. It's a dependable and durable oven that provides fast, even-heating and superior food quality.

Key Features

- 3000 Watts of power for fast heating.
- 1.0 cubic foot capacity easily accommodates two 4-inch half-pans.
- Up to 100 programmable menu items simplifies cooking and ensures consistent results.
- Four Stage Cooking Option for one-touch cooking. Reduces prep time, labor and food waste while providing consistent results.
- 11 power levels for consistent, delicious results for frozen and fresh foods. Food can go from freezer to table in minutes.
- Multiple quantity pad calculates the proper cook times for up to eight items.
- User-friendly controls are easy to use and require minimal user training.
- Unique double stirrer distribution system eliminates hot and cold spots.
- Pause setting reminds user to stir or inspect food before heating further.
- Durable stainless steel exterior and interior for years of commercial foodservice use.
- Nationwide service keeps any downtime to an absolute minimum.
- Full 3-year warranty.

A Powerful & Cost-Effective Way to . . .

- Serve quality food, quickly
- Increase food sales and profits
- Cook fresher, hotter foods on demand

Maximize Your Profits

The powerful Amana RC30S is built to handle the fast pace and grueling demands of the busiest kitchens. It's a high-performing, heavy-duty unit that's ideal for rethermalizing, boost-heating and steaming. Perfect for use in:

High-Volume Chains	Family Restaurants	Casual Dining
Cafeterias	Institution Kitchens	and More!

Form #ACRR0118

For more information about any of our fine commercial microwave ovens, contact your Amana distributor, call us direct at **888.262.6271** or visit our web site: www.amanacommercial.com.

Amana
HIGH PERFORMANCE HAS A NAME™
www.amanacommercial.com

RC30S
3000 Watts

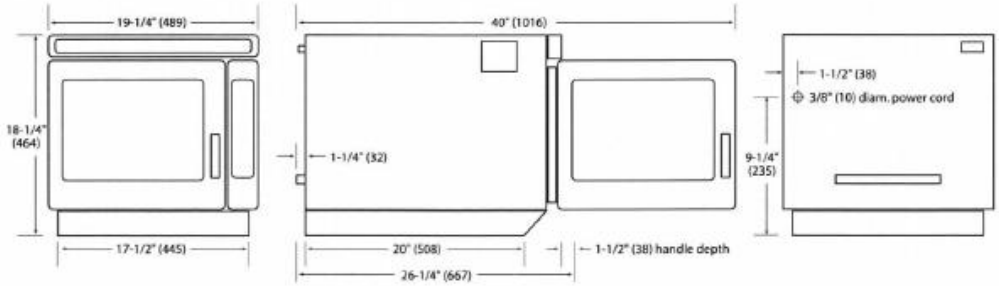
COMMERCIAL MICROWAVE OVEN

SPECIFICATIONS

MODEL	RC30S
UPC Code	042159061198
Configuration	Countertop
Control System	Touch
Programmable Control Pads	10
Total Programmable Settings	100
Cooking Timer	60:00, Countdown
Power Levels	11
Defrost	Yes, 20% Power
Time Entry Option	Yes
Microwave Distribution System	Rotating Antenna
Magnetron(s)	3
Display	VFD
Stackable	No
Stage Cooking	4 stages
Interior Light	Yes
Door Opening System	Lift and Pull Handle
Pause Setting	Yes
Signal	Adjustable end of cycle
Removable Filter	Yes
Automatic Voltage Sensor	Yes
Multiple Quantity Setting	Yes, up to 8 items
Warranty	Full 3-Year

Cabinet	Exterior Dimensions		Usable Interior Dimensions	
Height	18-1/4"	(464 mm)	8-1/2"	(216 mm)
Width	19-1/4"	(489 mm)	13"	(330 mm)
Depth (overall with handle)	26-1/4"	(667 mm)	15"	(381 mm)
Depth (door open 90°)	40" (1016 mm)			
Usable Cavity Space	1.0 cubic ft. (28 L)			
Outercase Material	Stainless Steel			
Cavity Interior Finish	Stainless Steel with Sealed-in Ceramic Shelf			
Electrical Characteristics				
Power Consumption	4400 W, 22.5 A			
Power Output	3000 W*			
Power Source	208 V - 240 V, 60 Hz, 30 A single phase			
Plug Configuration	NEMA 6-30			
Frequency	2450 MHz			
Power Cord Length	5' (1.5 m)			
Weight/Shipping Information				
Net Weight	115 lbs. (52 kg)			
Approximate Shipping	123 lbs. (56 kg)			
Shipping Box Size	28-1/4" L x 21-3/4" W x 21-1/2" H (718 mm x 553 mm x 546 mm)			

Amana's continuing commitment to quality products may mean a change in specification without notice. *Microwave output ratings based on IEC 705 test.



Form #ACRR0118

For more information about any of our fine commercial microwave ovens, contact your Amana distributor, call us direct at **888.262.6271** or visit our web site: www.amanacommercial.com.

NSF UL CSA

Amana
HIGH PERFORMANCE HAS A NAME™
www.amanacommercial.com

PANASONIC SONIC STEAMER NE-3280 COMMERCIAL MICROWAVE OVEN SPECIFICATION SHEET

Panasonic Model: NE-3280 Item#: 1

Pro


NE-1021


NE-1051


NE-1056

ProI


NE-1257/NE-1258


NE-1757


NE-2157

SONIC STEAMER


NE-2180


NE-3280

NE-3280

3200 Watt* Commercial Microwave Oven

- 3200 Watts* of power
- 4 magnetrons (heating elements)
- Top and bottom energy feed
- Large oven capacity: 1.6 ft³
- Holds two 4" tall, full-size steam table pans with covers
- Chef technical support
- 8 programmable memory pads
- 16 memory capability
- Shift key (AM-PM)
- Programmable or dial timer
- 3-stage cooking
- 5 power levels
- Drop down counter style door
- Self diagnostics
- Digital display
- Program list/Cycle counter
- Removable center shelf
- Tone control
- Stainless steel cabinet & cavity
- Easy to clean air filters
- See-through oven door
- Easy to change interior oven light

Technical Specifications

Power source: 208/230-240 V, 60 Hz, Single phase

Receptacle required: 30 Amp, NEMA 6-30R

Frequency: 2,450MHz

Required power: 208V (28.0A) 230-240V (25.1A)

Output*: 3200 Watts

Outer dimensions: 25 ⅜"w x 20 ⅛"d x 18 ⅜"h

Cavity dimensions: 21 ¾"w x 13"d x 9 ¼"h

Net weight: 137 lbs.

Shipping weight: 148 lbs.

Shipping box size: 29 ½"w x 26 ¼"d x 22 ½"h, 5.9 ft³

Timer: Maximum times for each stage of cooking — Hi and Mod. power=15 minutes, Low, Def. and Hold power=60 minutes

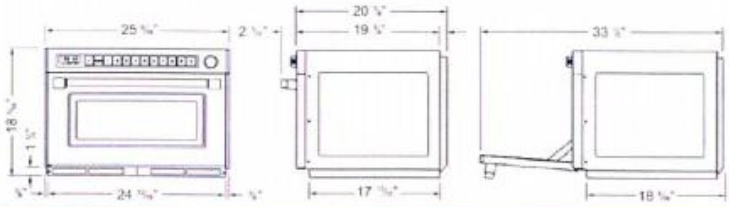
Memory capability: 16 programs

To specify a Panasonic Connectionless Steamer:

The NE-3280 Commercial Microwave Oven meets or exceeds all safety performance and sanitation standards set for commercial food service microwave ovens by UL, HHS, FCC and NSF.

Plus, oven shall have output power 3200 Watts*, equipped with four magnetrons, top and bottom energy feed, able to accommodate two 4" tall full-size pans, drop down counter style door, Grab & Go door handle, removable center shelf, 8 programmable pads, 16 memory, shift key (AM-PM), 3-stage cooking, 5 power levels (HI, MED., LOW, DEF., HOLD), programmable lock, cycle counter, tone control, self diagnostics, dial timer to select cooking time, video training and Chef/Test kitchen technical support.

*I.E.C. 705-88 Test Procedure. Specifications subject to change without notice.



Panasonic

Panasonic Home and Commercial Products Company
Commercial Foodservice Division
One Panasonic Way, Panasp 4A-4, Secaucus, NJ 07094
TEL: (201) 348-5377 FAX: (800) 553-0384
http://www.panasonic.com/cmo

2008 EL POLLO LOCO PANASONIC MASTER KLH Marketing- Anaheim Page: 1-2