Food Service
Technology Center

Turbocoil TCGT-ID-M Electric Refrigerated Prep Table Test Report

FSTC Report # 501311249-R0

Application of ASTM
Standard Test Method F2143-04 (Reapproved 2010)

October 2013

Prepared by:
Denis Livchak
Fisher-Nickel, Inc.

Contributors:
Trey Young

Fisher-Nickel, Inc.

Prepared for:
Pacific Gas and Electric Company
Customer Energy Efficiency Programs
PO Box 770000
San Francisco, California 94177

Food Service Technology Center Background

The information in this report is based on data generated at the Pacific Gas and Electric Company (PG&E) Food Service Technology Center (FSTC). Dedicated to the advancement of the foodservice industry, The FSTC has focused on the development of standard test methods for commercial foodservice equipment since 1987. The primary component of the FSTC is a 10,000 square-foot laboratory equipped with energy monitoring and data acquisition hardware, 60 linear feet of canopy exhaust hoods integrated with utility distribution systems, equipment setup and storage areas, and a state-of-the-art demonstration and training facility.

The FSTC Energy Efficiency for Foodservice Program is funded by California utility customers and administered by PG&E under the auspices of the California Public Utilities Commission (CPUC). California customers are not obligated to purchase any additional services offered by the contractor.

Policy on the Use of Food Service Technology Center Test Results and Other Related Information

- Fisher-Nickel, Inc. and the FSTC do not endorse particular products or services from any specific manufacturer or service provider.
- The FSTC is *strongly* committed to testing foodservice equipment using the best available scientific techniques and instrumentation.
- The FSTC is neutral as to fuel and energy source. It does not, in any way, encourage or promote the use of any fuel or energy source nor does it endorse any of the equipment tested at the FSTC.
- FSTC test results are made available to the general public through technical research reports and publications and are protected under U.S. and international copyright laws.

Disclaimer

 Results relate only to the item(s) tested. Neither, Fisher-Nickel, Inc., PG&E nor any of their employees, or the FSTC, make any warranty, expressed or implied, or assume any legal liability of responsibility for the accuracy, completeness, or usefulness of any data, information, method, product or process disclosed in this document, or represents that its use will not infringe any privately-owned rights, including but not limited to, patents, trademarks, or copyrights.

Reference to specific products or manufacturers is not an endorsement of that product or manufacturer by Fisher-Nickel, Inc., the FSTC, or PG&E. In no event will Fisher-Nickel, Inc. or PG&E be liable for any special, incidental, consequential, indirect, or similar damages, including but not limited to lost profits, lost market share, lost savings, lost data, increased cost of production, or any other damages arising out of the use of the data or the interpretation of the data presented in this report.

Retention of this consulting firm by PG&E to develop this report does not constitute endorsement by PG&E for any work performed other than that specified in the scope of this project.

Legal Notice

This report was prepared as a result of work sponsored by the California Public Utilities Commission (CPUC). It does not necessarily represent the views of the CPUC, its employees, or the State of California. The CPUC, the State of California, its employees, contractors, and subcontractors make no warranty, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the CPUC nor has the CPUC passed upon the accuracy or adequacy of the information in this report.

Revision History

Revision num.	Date	Description	Author(s)
0	October 2013	Initial Release	D. Livchak

Contents

Equipment Description

Test Work Order Number (TWO)	501311249
Manufacturer	Turbocoil
Model	TCGT-ID-M
Serial Number	1001
Generic Equipment Type	Refrigerated Preparation Table
Rated Input	900 W
Construction	Stainless Steel
Controls	Glycol Loop Temperature Setpoint, Fridge Base Temperature Setpoint, Defrost Timer / Duration, delta T
External Dimensions (W x D x H)	48" x 32" x 43"
Custom Settings (if any)	Insulated Lid,Vertical Glycol Loop dividers
20°F and 2°F delta T glycol loop setpoint for open lid test	
26°F and 2°F delta T glycol loop setpoint for closed lid test	

Test Location

All testing was performed under controlled conditions in the FSTC laboratory facilities at 12949 Alcosta Blvd., Suite 101, San Ramon, CA 94583.

Ventilation

FSTC researchers installed the equipment on a tiled floor in a temperature controlled room, while maintaining 86 ± 2°F average ambient temperature during testing. The temperature stratification was less than 1.5°F per vertical foot. Room relative humidity was less than 50%. The prep table was at least 6 inches away from any wall for the compressor to have sufficient ventilation. Air flow rates inside the room were minimized to less than 50 ft/min.

Test Instrumentation Inventory

Description (ID)	Manufacturer	Model	Measurement Range	Resolution	Calibration Date	Next Calibration
Electric Meter (ALC305)	Radian Research	RM-10	0.2-50A	0.00001 wh	12/12/12	12/12/13

Turbocoil Pan Thermocouple Placement

FSTC Test Report: Results

Purpose of Testing

This testing determined the energy input rate, lid up energy rate, lid down energy rate, holding capacity and compressor run time by applying ASTM F2143-04 (Reapproved 2010).

Appliance Description

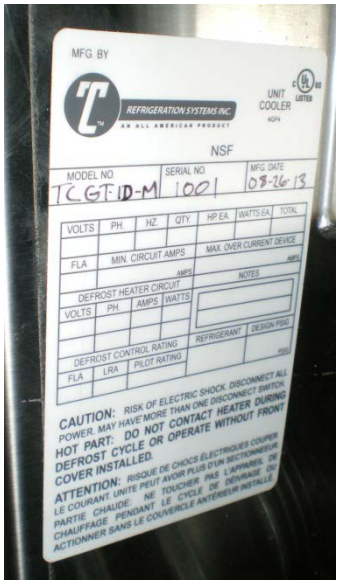
1/6 pan holding capacity	18
Under-counter Refrigerator Internal Dimensions	29"x 23.5"x 27.8"
System Refrigerant	R404A
Countertop Heat Exchanger Fluid	Propylene Glycol
Compressor Input Rating	600 W
Adjustable Thermostat	Glycol Loop Setpoint / Fridge Base Setpoint

Turbocoil TCGT-ID-M Refrigerated Prep Table

Energy Input Rate

Test Voltage (V)	120
Rated Energy Input Rate (W)	900
Measured Energy Input Rate (kW)	890
Difference (%)	1.1

Nameplate Information:



Holding Energy Rate

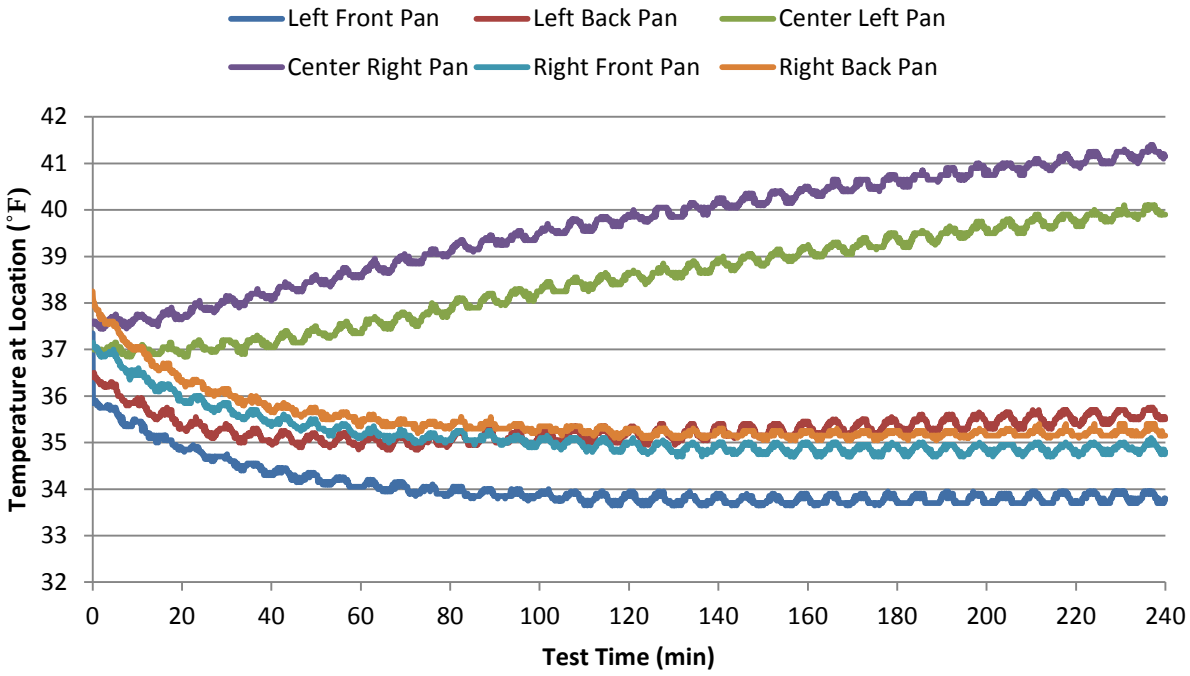
	Lid Up	Lid Down
Product	Gelatin	Gelatin
Tested Total Product Weight (lb)	37	37
Tested Total Product Volume (qt)	18	18
Test Duration (hrs)	4	8
Average Ambient Temperature (°F)	87.3	86.9
Average Pan Temperature (°F)	36.3	35.7
Average pan Temperature Stratification (°F)	3.7	0.9
Average Cabinet Temperature (°F)	36.5	37.7
Average Cabinet Temperature Stratification (°F)	0.8	0.2
Compressor Run Time (%)	52	43
Glycol Pump Run Time (%)	81	80
Production Capacity (ft^3)	1.203	1.203
Holding Energy Rate (W)	318	310

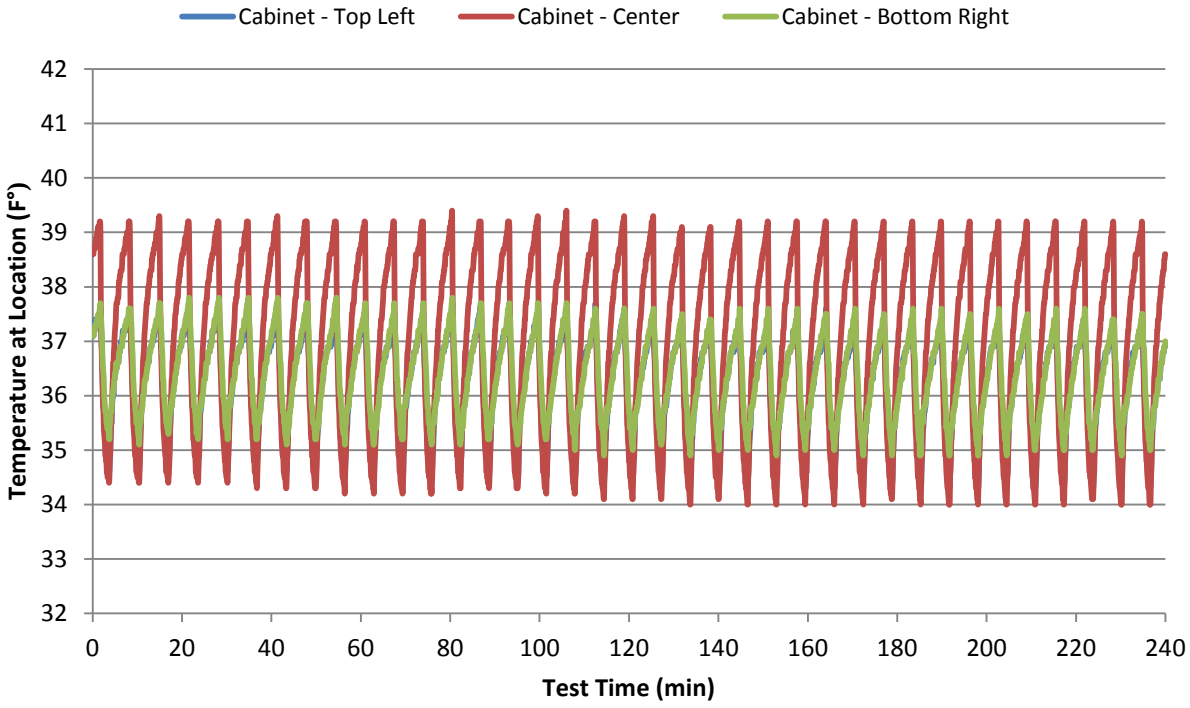
	Lid Up	Lid Down
Average Top Pan Initial Temperature (°F)	37.6	37.9
Average Bottom Pan Initial Temperature (°F)	37.0	38.2
Average Top Pan Final Temperature (°F)	38.9	35.2
Average Bottom Pan Final Temperature (°F)	34.6	34.2

Turbo Coil Refrigeration System

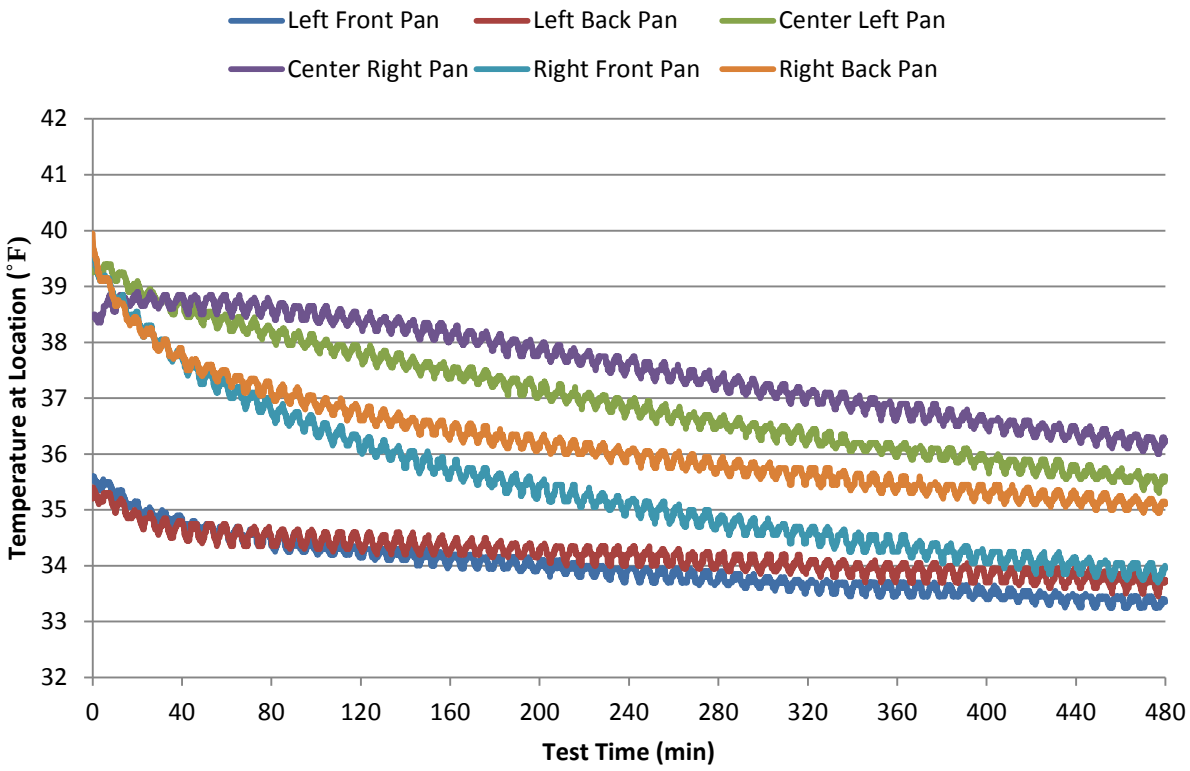
1835 Business Center Dr.
Duarte, CA. 91010

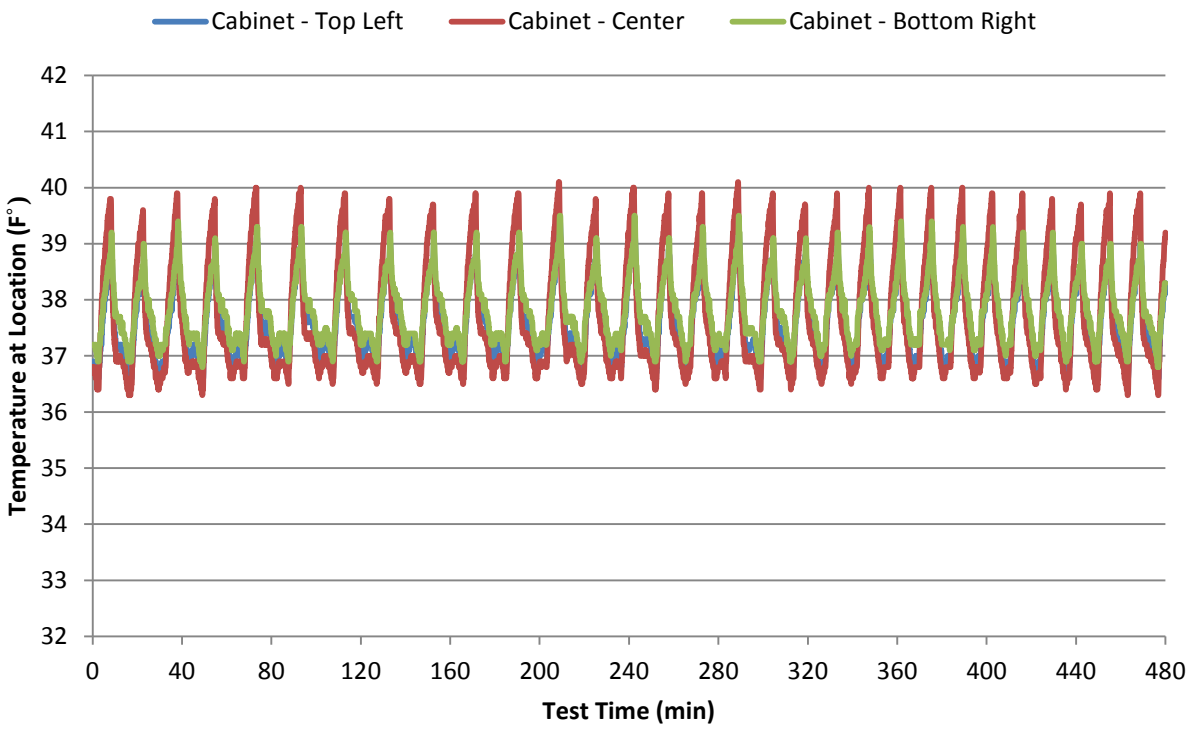
Lid Up Test Temperature Profile





Lid Down Test Temperature Profile





Additions, Deviations, & Exclusions

Additions:

Additional pan was thermocoupled, having two pans in the center of the prep table with thermocouple measurements instead of one

Deviations:

5 second temperature data was used to calculate the average for each location rather than taking the 5 minute box car average temperatures

The starting temperature for the Lid Up Test ranged between 35°F and 39°F and Lid Down Test ranged between 35°F and 41°F instead of 37°F and 41°F as specified in the test method.

During the Lid Up test, the upper temperatures located in the center exceeded 41°F and lower temperatures in the corners dropped below 33°F

Exclusions:

None

Manufacturer Specifications Sheet

TURBO COIL
REFRIGERATION SYSTEMS INC.

MODEL NO.
TCGT-1D-M

These US-made Glycol Prep Tables offer the highest construction quality while remaining extremely affordable. They feature durable stainless steel front, sides, top and interior. The deep stainless top work area is ideal for preparing pizzas and is deeper than many competitive models.

MODEL No. TCGPT-1D-M

DIMENSION DATA

NET CAPACITY.....12 CUBIC FEET
WIDTH OVERALL.....48" INCHES
DEPTH OVERALL.....32" INCHES
HEIGHT OVERALL.....43" INCHES

ELECTRICAL DATA

VOLTAGE (60z., 1-PHASE).....120
EVAPORATIVE BLOWER COIL.....1/50 HP

REFRIGERATION DATA

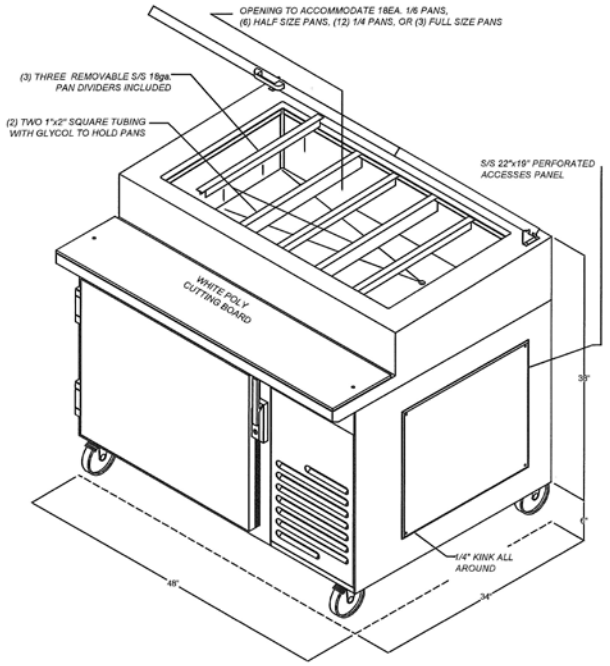
EVAPORATIVE BLOWER COIL.....TC-17-FP
BTU'S RATING.....1700 EACH
ALL COILS SUPPLIED AND INTALLED WITH A EXPANSION VALVE. "MASTER" COIL SUPPLIED AND INSTALLED WITH A THERMOSTAT CONTROL AND SOLENOID VALVE.

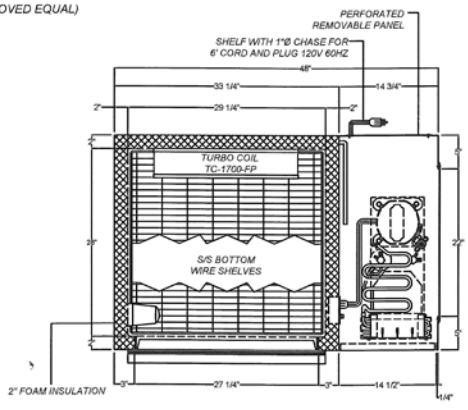
PLUMBING DATA

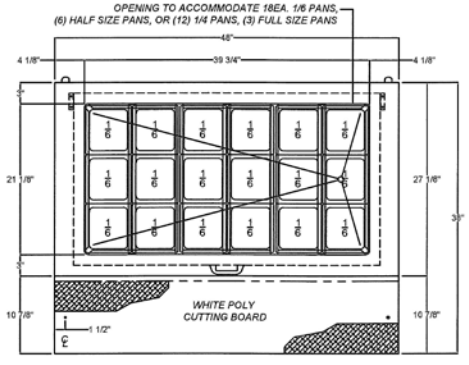
DRAIN SIZE.....1/2 INCH
INDIRECT WASTE LINE TO FLOOR SINK

SPECIFICATIONS

-ETL SANITATION LISTED UNDER #82832. CONFORMS TO UL 471 AND NSF 7.
-CABINET INTERIOR IS 22 GAUGE S/S #2B FINISH. FRONT FACE IS 20 GAUGE (#304 18-8) S/S #4 FINISH. BALANCE OF UNIT IS GALVANIZED STEEL. (UNLESS NOTED OTHERWISE)
-BREAKER STRIPS ARE HIGH-DENSITY PHENOLIC, SECURED IN PLACE WITHOUT THE USE OF ANY VISIBLE FASTENERS.
-INSULATION IS SHOT-IN-PLACE, 100% POLYURETHAN FOAM WITH A RATING OF R-14.5.
-COMPLETE WITH A DIAL THERMOMETER.
-HEAVY DUTY VINYL LATEX COMPRESSION GASKET FRAME
-EACH DOOR SUPPLIED AND INSTALLED WITH KASON EDGEMOUNT HARDWARE-#171c LATCH AND #220 SELF-CLOSING HINGES (OR APPROVED EQUAL)







3

Food Service Technology Center

Addendum: Report Certification

EPA Organization ID: 1113443

This certifies that the undersigned has performed equipment testing according to the methodology outlined in the report described below, and verifies that the results recorded in that report were the actual results observed.

Report: Turbocoil TCGT-ID-M Electric Refrigerated Prep Table (1001)

Report #: 501311249-R0 Date published: October 2013

File name: 13_10_23_501311249_R0.PDF

Date sent for authorization: 10/23/2013

Tested by: [signature] (signature) Date signed: 10/25/13

Denis Livchak (print name) Research Enginer (title)

FNi Authorization: [signature] (signature) Date signed: 11/1/2013

David Zabrowski (print name) Director of Engineering (title)

PG&E Authorization: [signature] (signature) Date signed: 11/4/13

Charlene Spoor (print name) Senior Program Engineer (title)