

Appliance Test Report SCGAT252603A

Migali C-HP-4B-24-NG-IB Gas Counter Range Top Performance Test Revision 2



A Sempra Energy utility

Southern California Gas Company

Customer Programs Department

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Food Service Testing Laboratory (FSTL)

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Revision History

Revision No.	Date	Description	Author
0	January 3, 2017	Initial Release	Rick Vargas
1	December 28, 2018	Food Samples/Address Added to Report	David Avila
2	May 20, 2019	IAS Accreditation Implemented	Ahmed Sallam

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Executive Summary

The “Migali” Model C-HP-4B-24-NG-IB, a counter range top (Figure 1), was evaluated for energy performance at the Southern California Gas Company’s (SCG) Commercial Food Service Testing Laboratory (FSTL). The counter range top was tested according to the specifications of The American Society for Testing and Materials’ (ASTM) standard test method F 1521-22. The test results for the Migali C-HP-4B-24-NG-IB (S/N 2404080009) are as follows:



Figure 1
“Migali”
C-HP-4B-24-NG-IB
gas counter-top range

Table ES-1. Summary of ASTM Range Top Performance Results

Heavy-load water boil-energy efficiency (%)	45.76
Production Capacity water boil (lb/h)	72.34

The heavy-load cooking-energy efficiency test consisted of boiling room temperature water, 75 ± 5°F, to just below boiling point, 200°F. As specified by the ASTM test method, cooking-energy efficiency is a measure of how much energy that an appliance consumes is actually delivered to the food product during the cooking process. Cooking-energy efficiency is therefore defined by the following relationship:

$$\text{Cooking Energy Efficiency} = \frac{\text{Energy to Food}}{\text{Energy to Appliance}}$$

Mission Statement - Commercial Food Service Equipment Testing

Recent advances in equipment design have produced commercial foodservice equipment that operates more efficiently, quickly, safely and conveniently. An energy efficient commercial equipment reduces energy consumption primarily through advanced technology and design.

The purpose of Southern California Gas Company's Energy Efficiency Commercial Food Service Equipment Testing Program is to provide energy efficiency measurement for cost effectiveness modeling in order to establish energy efficiency standards and ratings for commercial food service equipment. This measurement data is then utilized and integrated with typical equipment usage profiles for California Utility Customers participating in the Food Service Equipment Rebate Program.

The equipment performance is determined by applying the American Society for Testing and Materials (ASTM) standard test method for performance. The ASTM standard test method is considered the industry standard for quantifying the efficiency and performance for cooking equipment.

Scope

The scope of this test is to evaluate the performance of the “Migali” C-HP-4B-24-NG-IB gas-fired counter range top, by using ASTM F 1521-22 “*Standard Test Method for Performance of Range Tops*” for the test procedure and evaluation criteria.

In order to evaluate the counter range’s energy consumption and cooking performance, the following were performed:

- Verify energy rating ¹
- Verify thermostat calibration ²
- Determine energy input rate, preheat energy consumption and time ³
- Determine pilot energy consumption ⁴
- Determine cooking rate uncertainty
- Determine production rate uncertainty
- Report findings

Appliance and test overview

The “Migali” C-HP-4B-24-NG-IB is a natural gas-fired, counter range top rated at 24,500 Btu/h per burner. The counter range is equipped with four burners.

The test consisted of taking fresh water with an initial temperature of $75 \pm 5^\circ\text{F}$ and heating until the internal temperature reached 200°F .

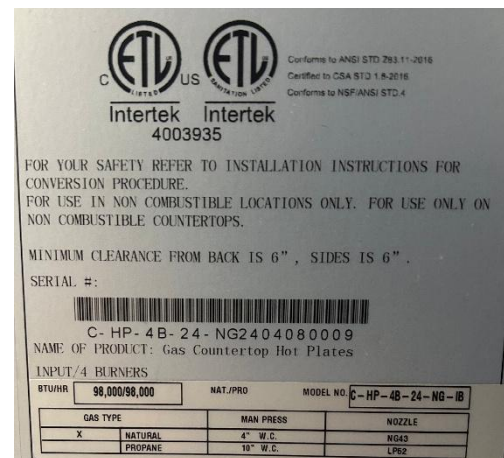


Figure 2
“Migali”
C-HP-4B-24-NG-IB
nameplate

The gas volume, pressure and temperature were monitored and recorded as well as the ambient air temperature and pressure. Type K thermocouples were used to monitor the ambient temperature. Electrical power measurements were not monitored and recorded. A National Instruments acquisition system was used to monitor and record all data. See section “Testing Equipment Inventory” for more detail regarding the testing equipment.

Comments, Deviations and Exceptions

Comments:

Test results only apply to the specified appliance tested in the Executive Summary section.

The heating values for each test were obtained from the SCG’s MCS Gas Analysis daily reports.

Deviations:

Testing procedures and results are limited to the heavy-load cooking scenario.

The determination of Pass/Fail is based on set requirements in which a decision is reported upon the test results lying within set parameters. Reported uncertainties in the cooking energy efficiency and production rate must be no greater than $\pm 10\%$.

Accounting for the uncertainty interval will be taken to mean that at a 95% confidence level, the measurement results plus and minus the expanded uncertainty ($k=2$) shall be within the specification limits.

Exceptions:

None

Testing equipment inventory

Energy efficiency testing is conducted at SCG’s Commercial Food Service Testing Laboratory located at the Energy Resource Center (ERC) in Downey California. The laboratory can provide utility services such as natural gas, water, electricity, sewer and fume exhaust for a variety of tests.

The testing equipment is mounted onto a mobile test bench providing the flexibility of movement within the test lab or for in the field use. The mobile test bench holds a data acquisition system, transducers, and various meters that allow to capture and record data. The cDAQ acquisition system delivers the capability to run seven hardware-timed channels simultaneously, provide four built in 32-bit counters/timers, and continually stream waveform measurements. The bench mounted pressure transducers monitor barometric ambient pressure and natural gas pressure after the gas meter. The electrical transducers are capable of measuring kW consumption. A flowmeter allows measurement of water flow. An analog gas meter is fitted with an electronic counter is used to measure gas consumption. See Tables TEI 1-1 for inventory and specifications on testing equipment.

Table TEI 1-1. Testing Equipment Inventory					
ECN	Description	Manufacturer	Model	Date Calibrated	Calibration due date
129	Data Acquisition	National Instruments	cDAQ-9178	1/16/2025	1/16/2026
101b	Gas Meter	Elster	DTM 200A	6/13/2024	6/13/2025
102e	Barometric Pressure Transducer	Omega	EWS-BP-A	6/17/2024	6/17/2025
103b	Differential Pressure Transmitter	Dwyer	607-9	6/17/2024	6/17/2025
104a	Temperature Data Logger	Omega	OM-23	6/17/2024	6/17/2025
108	Bench scale	A&D	FG-60KAL	6/12/2024	6/12/2025
120	Thermocouples	Omega	Type-K	6/12/2024	6/12/2025
125	Gas Pressure Regulator Acquisition	National Instruments	cDAQ-9178	1/16/2025	1/16/2026

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**Performance of Range Tops
RESULTS SUMMARY
ASTM F 1521-22 (10)**

Manufacturer	Migali
Model	C-HP-4B-24-NG-IB
Date	3/28/25
Range serial number	2404080009
1. Appliance Type – Counter Range Top (10.1)	
Fuel type:	Natural gas
Counter Range Top rating:	24,500 Btu/h burners
Physical dimensions	
Size of grate:	12 in x 12 in.
Distance from grate to burner:	0.75 in.

2. Apparatus (9.1)

 √ Check if testing apparatus conformed to specifications in Section 6.

3. Energy Input Rate (10.2)

Test voltage (V)	N/A
Heating value of natural gas (Btu/ft ³)	1030
Measured gas input rate (Btu/h)	23,323
Rated (Btu/h)	24,500

4. Pilot Energy Rate (if applicable) (10.4)

See Comments, Deviations and Exceptions

Gas heating value (Btu/ft ³)	1016
Pilot energy rate (Btu/h)	1,176

5. Cooking Energy Efficiency, Cooking Energy Rate, and Production Rate (10.6) ⁵

Water Boil Heavy-Load:

Test voltage (V)	N/A
Heating value of natural gas (Btu/ft ³)	1016
Cooking time (min)	16.59
Production rate (lb/h)	75.75
Energy to product (Btu)	2,781
Cooking energy (Btu)	6,078
Electric cooking energy rate (kWh)	N/A
Cooking energy efficiency (%)	45.76

⁵ Test results based on the average of three (3) iterations

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**Performance of Range Gas Tops
UNCERTAINTY RESULTS FOR COOKING ENERGY EFFICIENCY
Annex A1.**

Make:	Migali
Model:	C-HP-4B-24-NG-IB
Equipment Type:	Counter Range Top
Calculations from:	ASTM F 1521-22
Results Evaluated:	Cooking Energy Efficiency (%)

A. Iteration results

1. Iteration 1	$X_1 =$	45.54
2. Iteration 2	$X_2 =$	44.88
3. Iteration 3	$X_3 =$	46.86
4. Iteration 4	$X_4 =$	
5. Iteration 5	$X_5 =$	

B. Uncertainty results

Average

$X_{a_n} =$	45.76
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Standard deviation

$S_n =$	1.01
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Absolute Uncertainty

$U_n =$	2.50
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Uncertainty Percent

$\%U_n =$	5.46
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**Performance of Range Gas Tops
UNCERTAINTY RESULTS FOR PRODUCTION RATE
Annex A1.**

Make:	Migali
Model:	C-HP-4B-24-NG-IB
Equipment Type:	Counter Range Top
Calculations from:	ASTM F 1521-22
Results Evaluated:	Production Rate (lb/h)

C. Iteration results

1. Iteration 1	$X_1 =$	72.70
2. Iteration 2	$X_2 =$	71.26
3. Iteration 3	$X_3 =$	73.07
4. Iteration 4	$X_4 =$	
5. Iteration 5	$X_5 =$	

D. Uncertainty results

Average

$X_{a_n} =$	72.34
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Standard deviation

$S_n =$	0.96
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Absolute Uncertainty


$U_n =$	2.38
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% Uncertainty

$\%U_n =$	3.29
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Signatures: The undersigned has performed stated tests and has verified that the results recorded were the actual results observed.

SCG's Tester:



(signature)

April 7, 2025

(date)

Ahmed Sallam

(print name)