



Food Service Technology Center Appliance Test Summary Report

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This program is funded by the California utility rate payers under the auspices of the California Public Utilities Commission.

Manufacturer	Middleby Marshall
Model	PS670 WOW
Appliance	Conveyor Oven - Gas

Report Number	5012.09.01 - 2 nd Ed
Report Date	October, 2009
Tested By	G. Sorensen

Purpose of Testing

This testing determined the energy input rate, preheat time and energy, idle energy rate and heavy-load cooking-energy efficiency of the oven by applying ASTM F1817.

NOTE: The heavy load pizza testing incorporated a staggered loading scenario that increased the number of test pizzas by 50%, per the proposed revision to F1817-97.

Energy Input Rate

Rated Energy Input Rate (Btu/h)	175,000
Measured Energy Input Rate (Btu/h)	175,470
Difference (%)	0.3
Electric Energy Rate (kW)	1.31

Preheat to 465°F

Duration (min)	8.0
Gas Energy Consumption (Btu)	23,070
Electric Energy Consumption (kWh)	0.16
Preheat Rate (°F/min)	49.1

Idle at 475°F ^a

Idle Energy Rate (Btu/h)	37,465
Electric Energy Rate (kW)	0.64

^a idle mode automatically switches fan to low speed until product is loaded.

Heavy-Load Cooking Energy Efficiency ^b

Food Product	12" Cheese Pizza
Cook Time (min)	3.83
Test Time (min)	7.43
Cooking Energy Rate (Btu/h)	98,280
Electric Energy Rate (kW)	1.24
Energy to Food (Btu/lb)	136
Energy to Appliance (Btu/lb)	286
Cooking-Energy Efficiency (%)	47.8 ± 3.9
Production Capacity (pizzas/hr)	242.3 ± 18.3

^b based on a minimum of three test replicates.



Middleby Marshall
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Elgin, IL 60120

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Light-Load Cooking Energy Efficiency^b

Food Product	12" Cheese Pizza
Cook Time (min)	3.83
Test Time (min)	9.00
Cooking Energy Rate (Btu/h)	59,314
Electric Energy Rate (kW)	1.27
Energy to Food (Btu/lb)	140
Energy to Appliance (Btu/lb)	1,615
Cooking-Energy Efficiency (%)	8.7 ± 0.2
Production Rate (pizzas/hr)	26.7 ± 0.25

^b based on a minimum of three test replicates.

Energy-Saving Idle Modes

Idle Mode 2^c	
Idle Energy Rate (Btu/h)	29,775
Electric Energy Rate (kW)	0.60
Idle Mode 3^d	
Idle Energy Rate (Btu/h)	0.0
Electric Energy Rate (kW)	0.03

^c idle mode 2 reduces the oven temperature and stops the conveyor until product is loaded.

^d idle mode 3 turns the oven off until product is loaded.

Heavy-Load Pizza Test Data

	Test #1	Test #2	Test #3
Measured Values			
Number of Pizzas	30	30	30
Cook Time (min)	3.83	3.83	3.83
Test Time (min)	7.70	7.30	7.30
Gas Energy to Oven (Btu)	11,883	12,047	12,559
Electric Energy to Oven (Btu)	546	546	478
Initial Weight of Pizza (lb)	44.375	44.440	44.360
Final Weight of Pizza (lb)	42.325	42.515	42.410
Initial Temperature of Pizza (°F)	40	40	40
Final Temperature of Pizza (°F)	196.5	196.5	196.2
Calculated Values			
Sensible Heat (Btu)	4,118	4,124	4,109
Latent - Heat of Vaporization (Btu)	2,013	1,890	1,915
Total Energy to Food (Btu)	6,131	6,015	6,024
Energy to Food (Btu/lb)	138	135	136
Total Energy to Oven (Btu)	12,429	12,593	13,037
Energy per Pound of Food Cooked (Btu/lb)	280	283	294
Cooking-Energy Efficiency (%)	49.3	47.8	46.2
Cooking Energy Rate (Btu/h)	92,596	99,017	103,228
Cooking-Energy Rate (kW)	1.25	1.32	1.15
Production Capacity (lb/h)	233.8	246.6	246.6

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Light-Load Pizza Test Data

	Test #1	Test #2	Test #3
Measured Values			
Number of Pizzas	4	4	4
Cook Time (min)	3.83	3.83	3.83
Test Time (min)	9.00	9.00	9.00
Gas Energy to Oven (Btu)	8,903	8,900	8,888
Electric Energy to Oven (Btu)	642	652	659
Initial Weight of Pizza (lb)	5.900	5.930	5.910
Final Weight of Pizza (lb)	5.605	5.645	5.625
Initial Temperature of Pizza (°F)	40	40	40
Final Temperature of Pizza (°F)	195.0	197.4	194.0
Calculated Values			
Sensible Heat (Btu)	542	553	540
Latent - Heat of Vaporization (Btu)	290	280	280
Total Energy to Food (Btu)	832	833	820
Energy to Food (Btu/lb)	141	141	139
Total Energy to Oven (Btu)	9,545	9,552	9,547
Energy per Pound of Food Cooked (Btu/lb)	1,618	1,611	1,615
Cooking-Energy Efficiency (%)	8.7	8.7	8.6
Cooking Energy Rate (Btu/h)	59,353	59,333	59,255
Cooking-Energy Rate (kW)	1.25	1.27	1.29
Production Capacity (lb/h)	26.7	26.7	26.7

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