

Food Service Technology Center Appliance Test Summary Report

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Manufacturer	Winston
Model	C-VAP SAH0P3GR
Appliance	Single Compartment 3-Pan Steamer - Electric

Report Number	5012.09.51
Test Date	November, 2009
Tested By	A.Spitz

Purpose of Testing

This testing determined the energy input rate, preheat time and energy, idle energy rate, uniformity and heavy/light-load cooking-energy efficiency of the steamer by applying ASTM F1484-05.

Energy Input Rate

Test Voltage (V)	208
Rated Energy Input Rate (kW)	4.8
Measured Energy Input Rate (kW)	4.9
Difference (%)	2.0

Preheat to 210°F

Duration (min)	15.3
Energy Consumption (kWh)	1.24

Idle at 212°F

Average Cavity Temperature (°F)	174
Idle Energy Rate (kW)	0.23



Red Potato Cooking Energy Efficiency and Production Capacity Test Results

Load ^a	Heavy Load	Light Load
Number of Pans	3	1
Cook Time (min)	24.17	20.28
Total Energy Consumed (kWh)	1.96	1.62
Energy to Food (Btu/lb)	106	106
Energy to Steamer (Btu/lb)	278	690
Cooking Energy Rate (kW)	4.87	4.79
Cooking Energy Efficiency (%)	39.5 ± 1.1	16.0 ± 0.5
Production Capacity (lb/h)	59.6 ± 1.9	23.7 ± 0.6
Water Consumption Rate (gph)	< 3	< 3

^a Each Load is based on a minimum average of three test replicates.

Winston Industries, Inc.

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Frozen Green Pea Cooking Energy Efficiency and Production Capacity Test Results

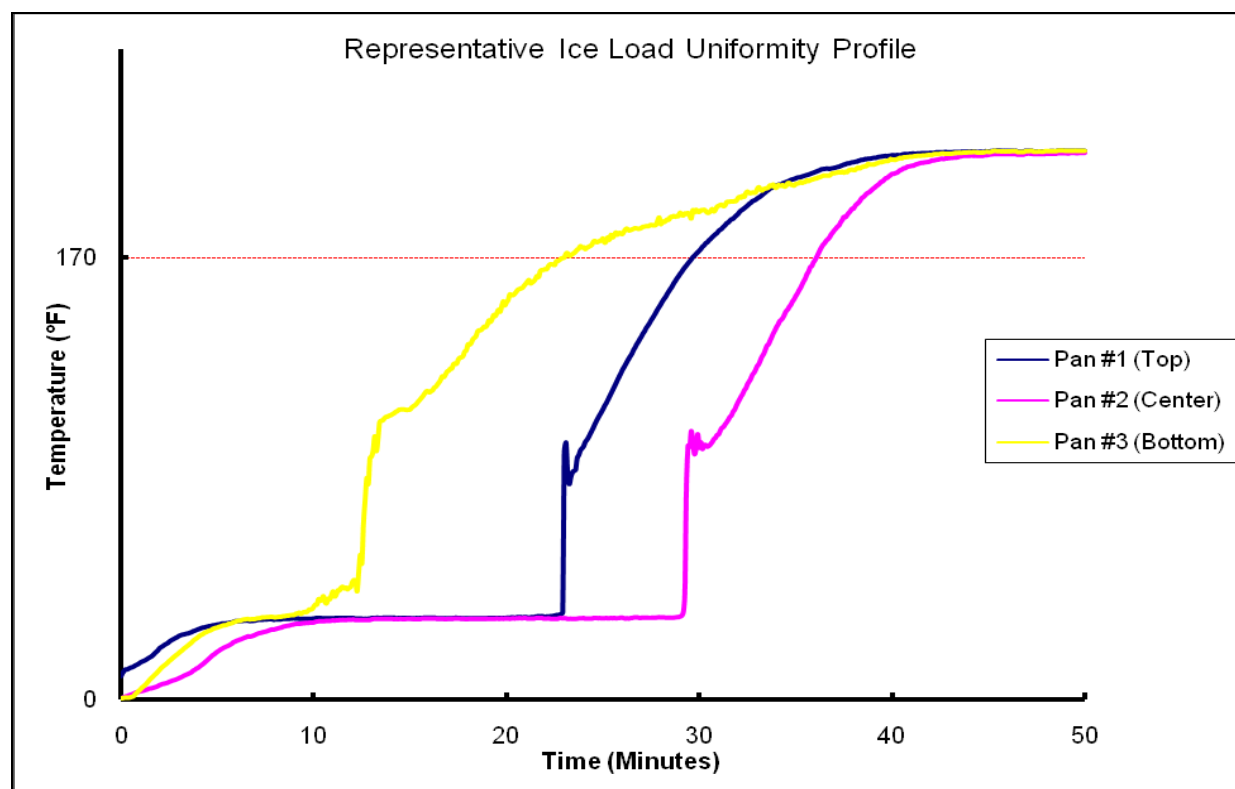
Load ^a	Heavy Load	Light Load
Number of Pans	3	1
Cook Time (min)	28.00	11.86
Total Energy Consumed (kWh)	2.20	0.95
Energy to Food (Btu/lb)	259	259
Energy to Steamer (Btu/lb)	313	404
Cooking Energy Rate (kW)	4.71	4.79
Cooking Energy Efficiency (%)	85.0 ± 1.4	65.7 ± 3.5
Production Capacity (lb/h)	51.4 ± 0.0	40.47 ± 1.1
Water Consumption Rate (gph)	< 3	< 3

^a Each Load is based on a minimum average of three test replicates.

Ice Load Uniformity Test Results

Load ^a	Heavy Load
Number of Pans	3
Cook Time (min)	36.1
Average Initial Ice-Load Temperature (°F)	0.5
Average Final Ice Load Temperatures (°F)	190.5
Pan #1 (Top)	200.0
Pan #2 (Middle)	170.8
Pan #3 (Bottom)	200.8

^a Each Load is based on a minimum average of three test replicates.



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Heavy-Load Red Potato Data

	Run #1	Run #2	Run #3
Measured Values			
Number of Pans	3	3	3
Cook Time (min)	23.83	24.33	24.33
Electric Energy Consumed (kWh)	1.94	1.96	1.98
Temperature of Uncooked Potatoes (°F)	76.1	72.3	73.4
Temperature of Cooked Potatoes (°F)	195.1	195.0	195.1
Weight of Stainless Steel Pans (lbs)	8.024	8.024	8.024
Weight of Potatoes (lbs)	24.032	24.032	23.995
Total Potato Count	150	150	150
Moisture Content (%)	84.07	84.07	84.07
Condensate Temperature (°F)	n/a	n/a	n/a
Water Consumption (gal)	< 3	< 3	< 3
Calculated Values			
Moisture Weight in Potatoes (lbs)	20.19	20.19	20.16
Average Weight of Each Potato (lbs)	0.16	0.16	0.16
Energy Consumed by Potatoes (Btu)	2,488	2,565	2,543
Energy to Food (Btu/lb)	104	107	106
Energy Consumed by Pans (Btu)	105	108	108
Energy of Boiler re-init (Btu)	n/a	n/a	n/a
Energy Consumed by the Steamer (Btu)	6,620	6,688	6,756
Energy to Steamer (Btu/lb of food cooked)	104	107	106
Cooking Energy Rate (kW)	4.88	4.83	4.88
Production Capacity (lb/h)	60.5	59.3	59.2
Energy Efficiency (%)	39.2	40.0	39.2

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Light-Load Red Potato Data

	Run #1	Run #2	Run #3
Measured Values			
Number of Pans	1	1	1
Cook Time (min)	20.08	20.25	20.50
Electric Energy Consumed (kWh)	1.62	1.60	1.64
Temperature of Uncooked Potatoes (°F)	73.6	73.9	74.0
Temperature of Cooked Potatoes (°F)	195.1	195.2	195.2
Weight of Stainless Steel Pans (lbs)	2.809	2.809	2.786
Weight of Potatoes (lbs)	8.037	7.999	8.017
Total Potato Count	50	50	50
Moisture Content (%)	84.01	84.01	84.01
Condensate Temperature (°F)	n/a	n/a	n/a
Water Consumption (gal)	< 3	< 3	< 3
Calculated Values			
Moisture Weight in Potatoes (lbs)	6.75	6.72	6.73
Average Weight of Each Potato (lbs)	0.16	0.16	0.16
Energy Consumed by Potatoes (Btu)	850	844	845
Energy to Food (Btu/lb)	106	106	105
Energy Consumed by Pans (Btu)	38	38	37
Energy of Boiler re-init (Btu)	n/a	n/a	n/a
Energy Consumed by the Steamer (Btu)	5,528	5,459	5,596
Energy to Steamer (Btu/lb of food cooked)	106	106	105
Cooking Energy Rate (kW)	4.84	4.74	4.80
Production Rate (lb/h)	24.0	23.7	23.5
Energy Efficiency (%)	16.1	16.1	15.8

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Heavy-Load Frozen Green Peas Data

	Run #1	Run #2	Run #3
Measured Values			
Number of Pans	3	3	3
Cook Time (min)	28.00	28.00	28.00
Electric Energy Consumed (kWh)	2.20	2.22	2.18
Initial Water Temperature (°F)	68.1	67.4	68.8
Final Water Temperature (°F)	113.7	113.6	114.2
Frozen Food Temperature (°F)	-1.1	-2.5	-0.3
Weight of Empty Calorimeter (lbs)	40.80	40.80	40.80
Weight of Full Calorimeter (lbs)	95.48	95.39	95.47
Weight of Calorimeter Water (lbs)	30.00	30.00	30.00
Weight of Cooked Food (lbs)	24.68	24.59	24.67
Weight of Frozen Food (lbs)	24.00	24.00	24.00
Weight of Stainless Steel Pans (lbs)	8.02	8.02	8.02
Moisture Content (%)	81	81	81
Condensation Temperature (°F)	n/a	n/a	n/a
Water Consumption (gal)	< 3	< 3	< 3
Calculated Values			
Moisture Weight in Green Peas (lbs)	19.44	19.44	19.44
Final Food Temp (°F)	179.7	180.7	179.9
Energy Consumed by Green Peas (Btu)	6,211	6,235	6,206
Energy to Food (Btu/lb)	259	260	259
Energy Consumed by Pans (Btu)	160	162	159
Energy of Boiler re-init (Btu)	n/a	n/a	n/a
Energy Consumed by the Steamer (Btu)	7,506	7,575	7,438
Energy to Steamer (Btu/lb of food cooked)	313	316	310
Cooking Energy Rate (kW)	4.71	4.76	4.67
Productivity (lb/h)	51.4	51.4	51.4
Energy Efficiency (%)	84.9	84.5	85.6

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Light-Load Frozen Green Peas Data

	Run #1	Run #2	Run #3
Measured Values			
Number of Pans	1	1	1
Cook Time (min)	12.00	11.83	11.75
Electric Energy Consumed (kWh)	0.96	0.96	0.92
Initial Water Temperature (°F)	71.0	69.5	72.4
Final Water Temperature (°F)	116.7	115.0	116.5
Frozen Food Temperature (°F)	-0.9	-0.3	-0.9
Weight of Empty Calorimeter (lbs)	40.80	40.80	40.80
Weight of Full Calorimeter (lbs)	58.94	58.94	58.90
Weight of Calorimeter Water (lbs)	10.00	10.00	10.00
Weight of Cooked Food (lbs)	8.14	8.14	8.10
Weight of Frozen Food (lbs)	8.00	8.00	8.00
Weight of Stainless Steel Pans (lbs)	2.41	2.41	2.41
Moisture Content (%)	81	81	81
Condensation Temperature (°F)	n/a	n/a	n/a
Water Consumption (gal)	< 3	< 3	< 3
Calculated Values			
Moisture Weight in Green Peas (lbs)	6.48	6.48	6.48
Final Food Temp (°F)	183.57	181.57	181.33
Energy Consumed by Green Peas (Btu)	2,085	2,069	2,065
Energy to Food (Btu/lb)	261	259	258
Energy Consumed by Pans (Btu)	49	48	48
Energy of Boiler re-init (Btu)	n/a	n/a	n/a
Energy Consumed by the Steamer (Btu)	3,276	3,276	3,140
Energy to Steamer (Btu/lb of food cooked)	410	410	393
Cooking Energy Rate (kW)	4.80	4.87	4.70
Production Rate (lb/h)	40.0	40.6	40.9
Energy Efficiency (%)	65.1	64.6	67.3

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