

# ACEEE Hot Water Forum

## Halton Heat Reclaim Back-Shelf Hood

Fuoad Parvin, P.E., LEED AP  
Halton Company  
Session 1B  
February 23, 2015  
Nashville, TN

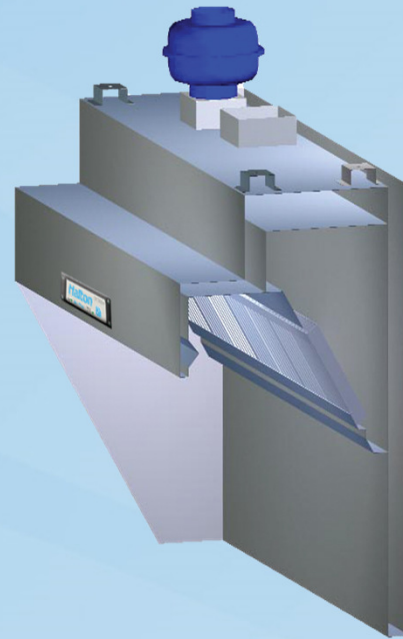
# HALTON Company

*Halton is the world's leading manufacturer and technology innovator for Sustainable Commercial Kitchen Ventilation Systems*

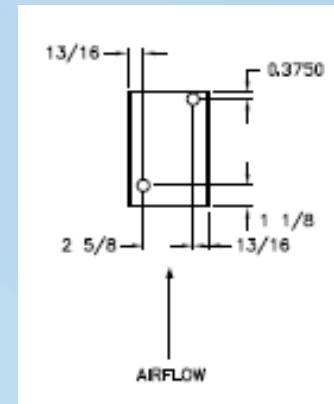
# Halton Heat Reclaim Hood System



Gas powered fryers  
or flat-top grills

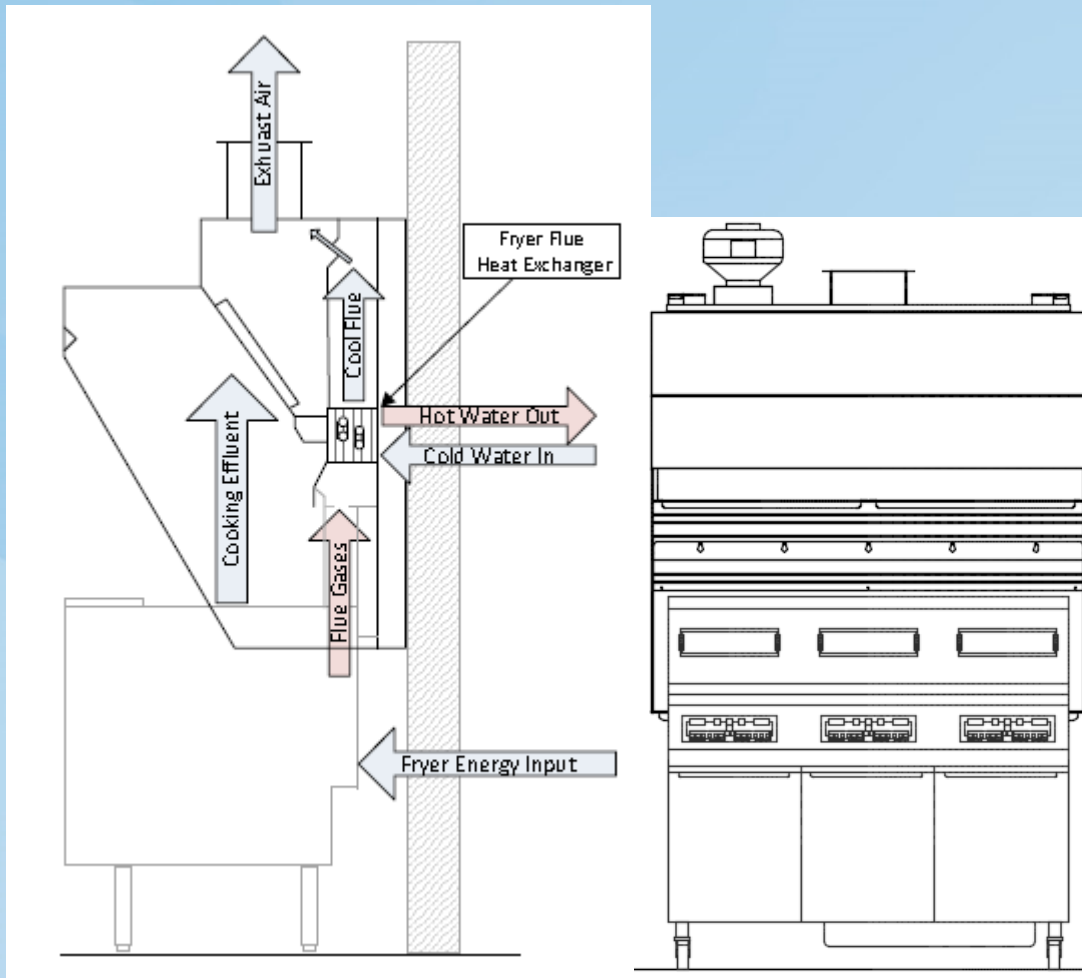


KVL Back-shelf  
hood



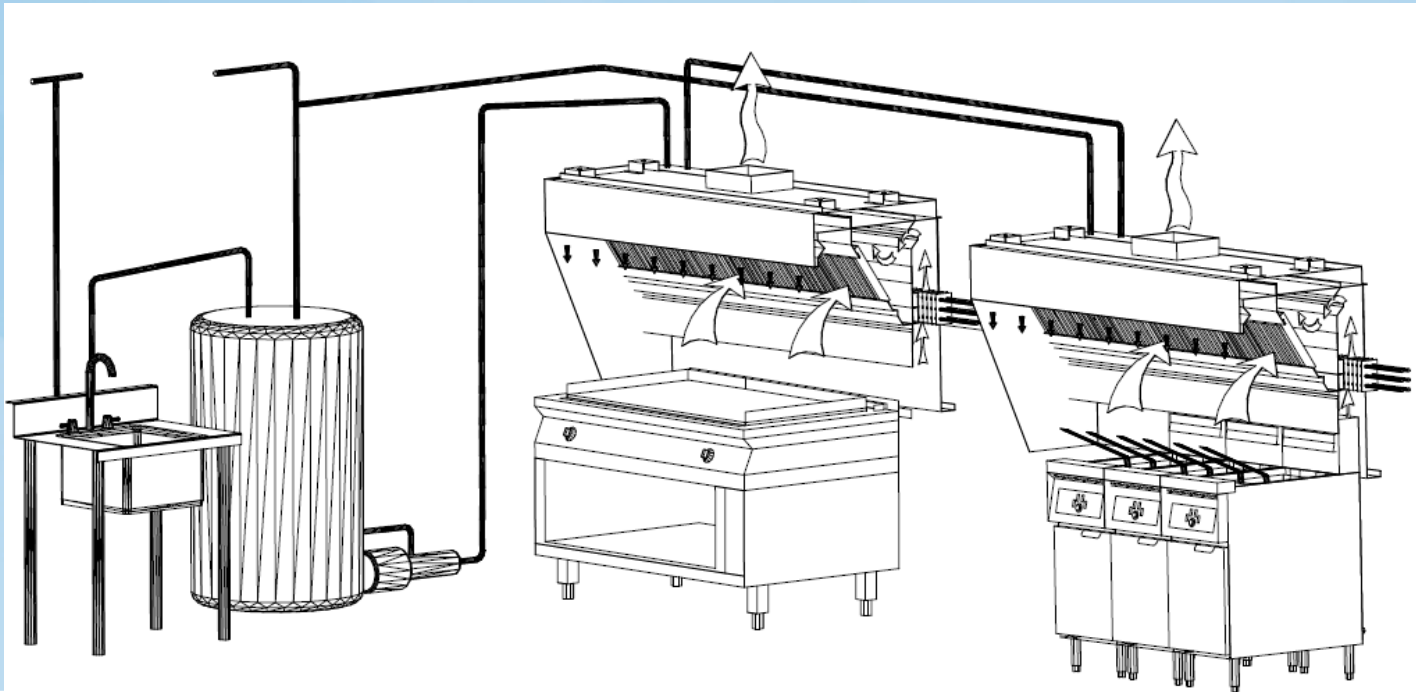
Integrated  
Heat  
Exchanger

# Heat Recovery Schematic

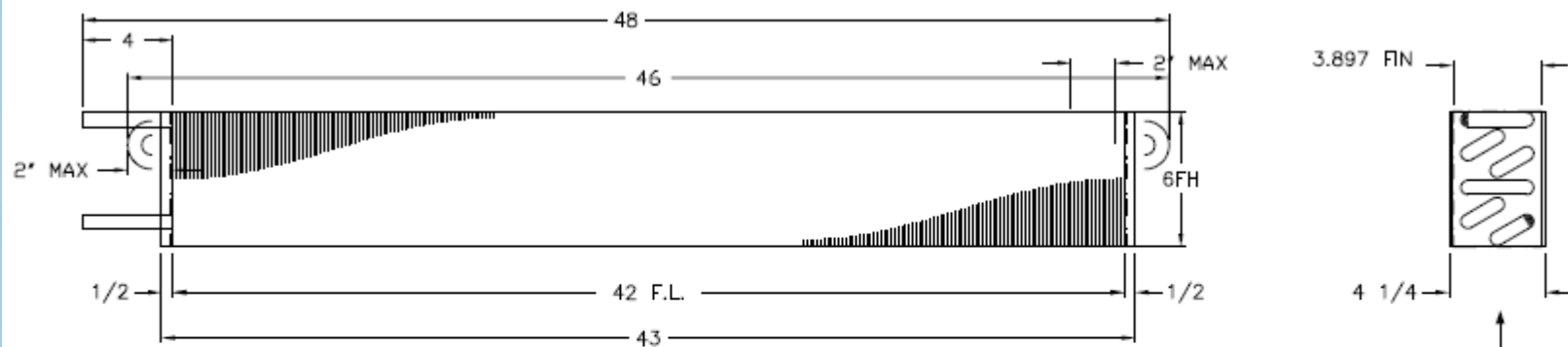


# Daisy Chain Heat Reclaim Water Loop for Multiple Cooking Stations

- UL Listed hood design
- AHRI Certified heat exchanger
- Exclusive to Halton Back-shelf Hoods
- Designed for any foodservice establishment that employs gas powered fryers or flat top grills.



# Coil Specifications



Flns: 0.01-inch AL, 7 fins per inch

Tubing: Type L Copper 1/2" nominal Dia (5/8" OD), on 1.5"x1.3" centers

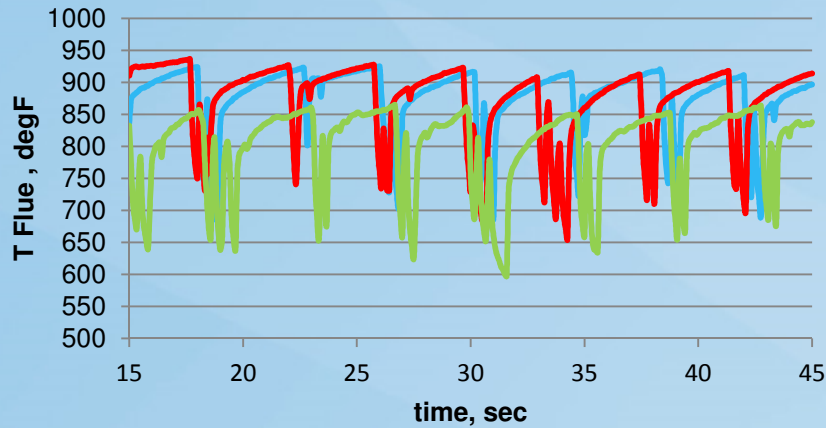
End plates: Galv 16 gage, top and bottom 1" external flanges required (not shown)

Circuit: Single feed

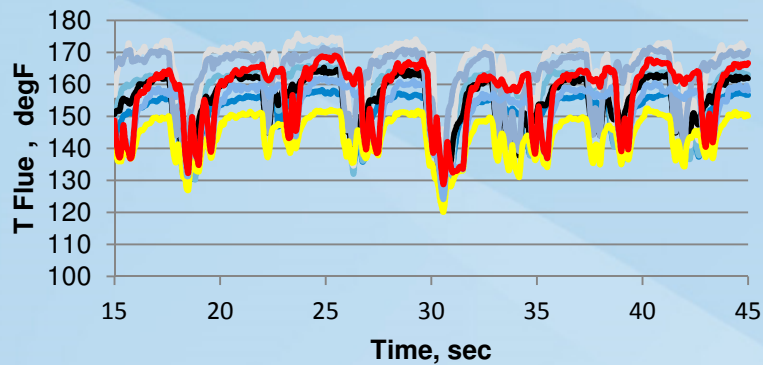
Brazing: 15% Silver Solder

# Air-to-Water Temperatures Heat Exchange Performance

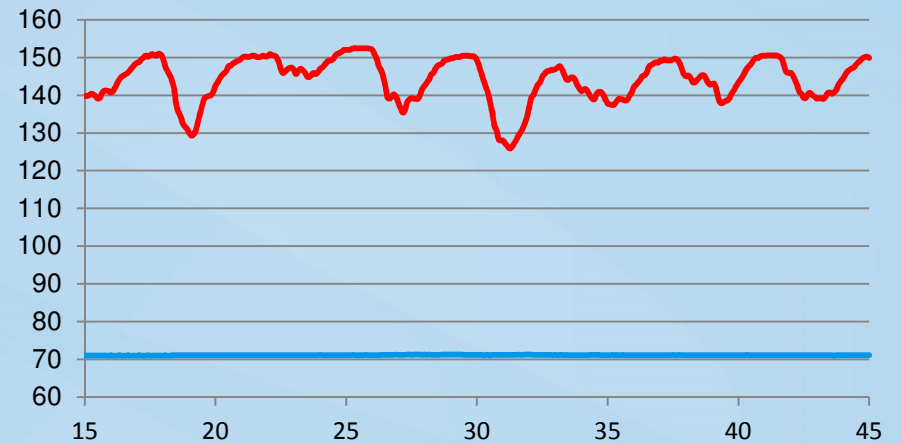
## Entering Flue Temperatures



## Leaving Flue Temperature

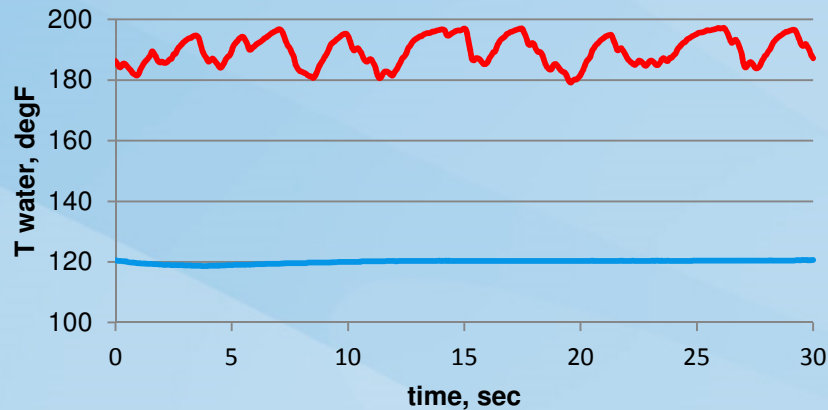


## Incoming vs Outgoing Water Temperature at one GPM

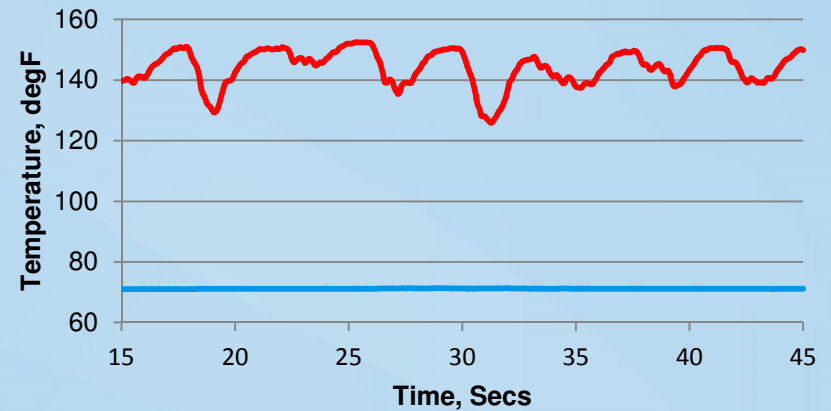


# Heat Recovery for Hot and Cold water Feeds

## Incoming vs Outgoing Water Temperature



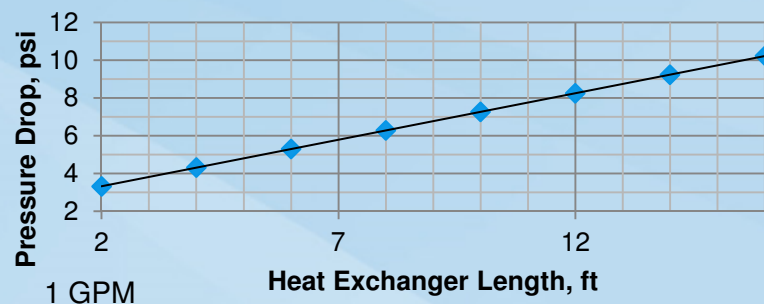
## Incoming vs Outgoing Water Temperature



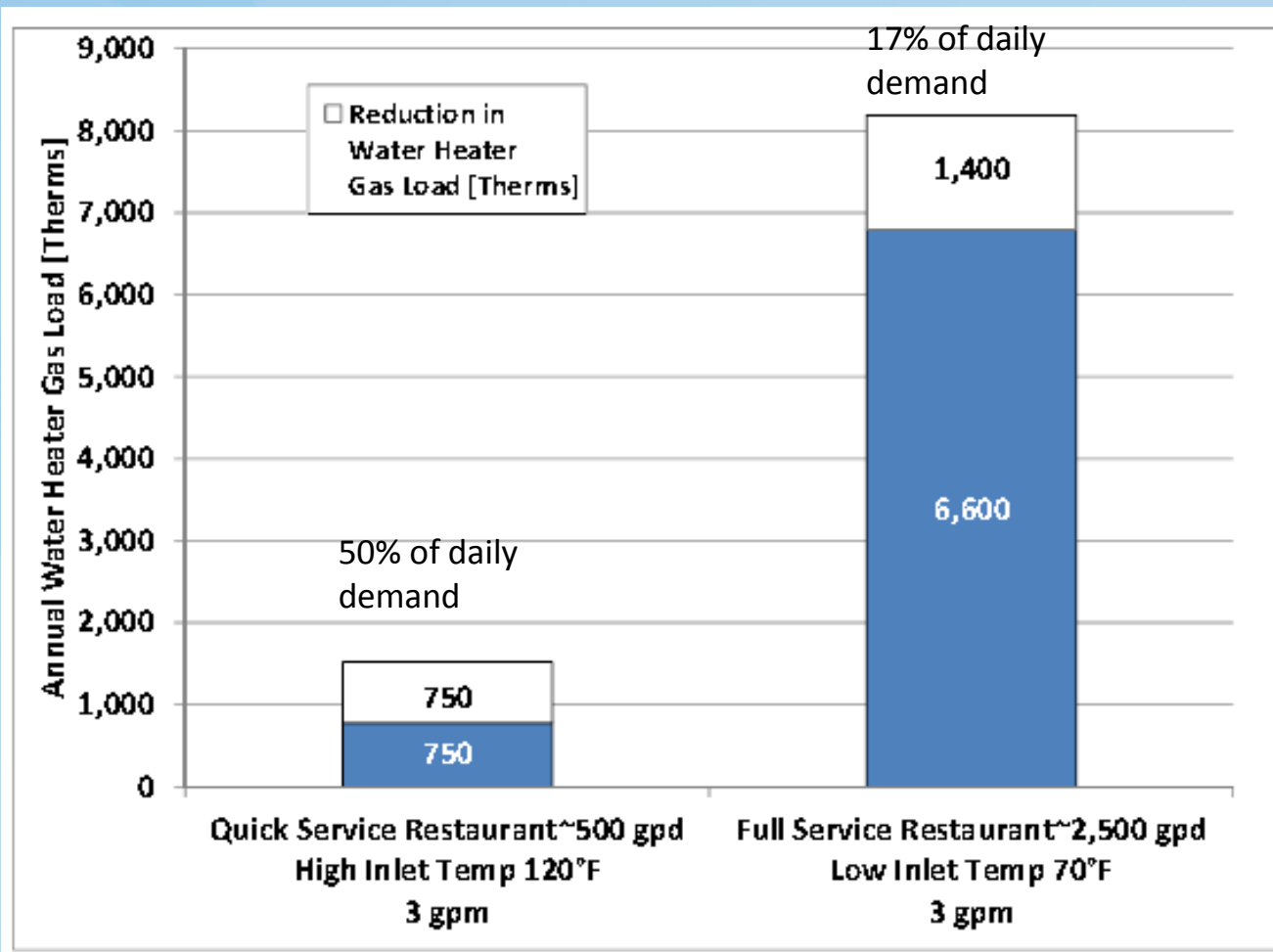


# Certified Heat Recovery Performance

Test Condition	Average Flue Gas Temp [°F]	Water Flow Rate [GPM]	Water Inlet Temp [°F]	Water Outlet Temp [°F]	Water Temp Rise [°F]	Appliance Energy Consumption [Btu/h]	Energy Recovered [Btu/h]	Heat Exchanger Effectiveness
Cooking	850	1.1	71	144	73	181,200	38,500	0.71
Cooking	838	3.1	70	102	32	186,400	49,200	0.76
Cooking	860	1.1	120	190	70	185,200	37,100	0.75
Cooking	855	3.0	121	145	25	182,900	37,800	0.81
Idle (Ready-to-Cook)	348	1.0	71	84	14	17,200	7,000	N/A
Idle (Ready-to-Cook)	349	3.0	70	75	5	16,100	7,800	N/A
Idle (Ready-to-Cook)	343	1.0	120	126	6	18,200	2,900	N/A
Idle (Ready-to-Cook)	343	3.0	121	123	2	15,100	2,300	N/A



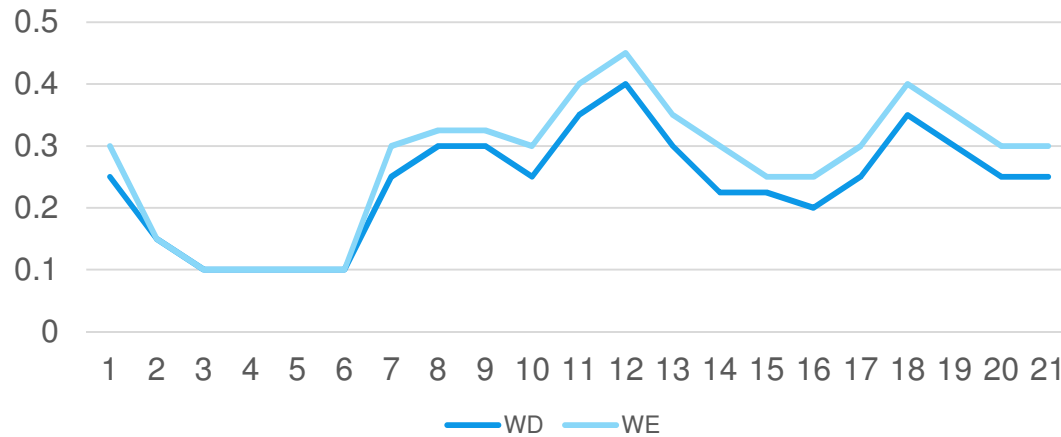
# Estimated Annual Energy Saving for Heating Hot Water in Restaurants



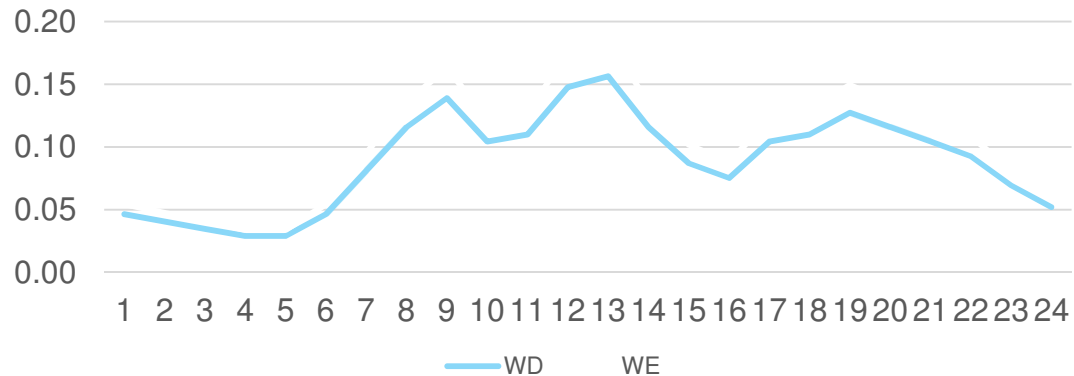
- Three fryers lineup.
- 3 hrs of full load cooking cycles per 16 hour day
- 3 GPM water feed

# Simulated Field Data for a Major QSR

## Service HW Heater Profile



## Gas Fryers Cooking Profile



- System provides 100% of daily service hot water demand at average of 725 gallons per Day
- Annual Savings of 1496 Therms
- Payback less than one year

# Benefits and Gains

- Improves energy utilization and reduces wasted energy
- On-site energy recovery
- Qualify for utility rebate in some jurisdictions
- Integral to the hood , contained and serviceable
- Payback for the add-on heat exchanger option to hood design is less than two years.

## ...Continue Benefits

- Contributes to fire safety in CKV grease ducts
- Fire and fail safe
- Optional remote monitoring and control with MODBUS communication.

# Service Access and Maintenance

- Burners performance is not affected from the system
- Slide Damper access from hood exhaust plenum behind grease filters.
- Access cover for water line service
- Heat exchanger can be removed if necessary for maintenance

Thank you!

Fuoad.parvin@halton.com

[www.halton.com](http://www.halton.com)