

The Next Frontier for Savings: Pre-Rinse Operations in Large Dishrooms



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Project Engineer
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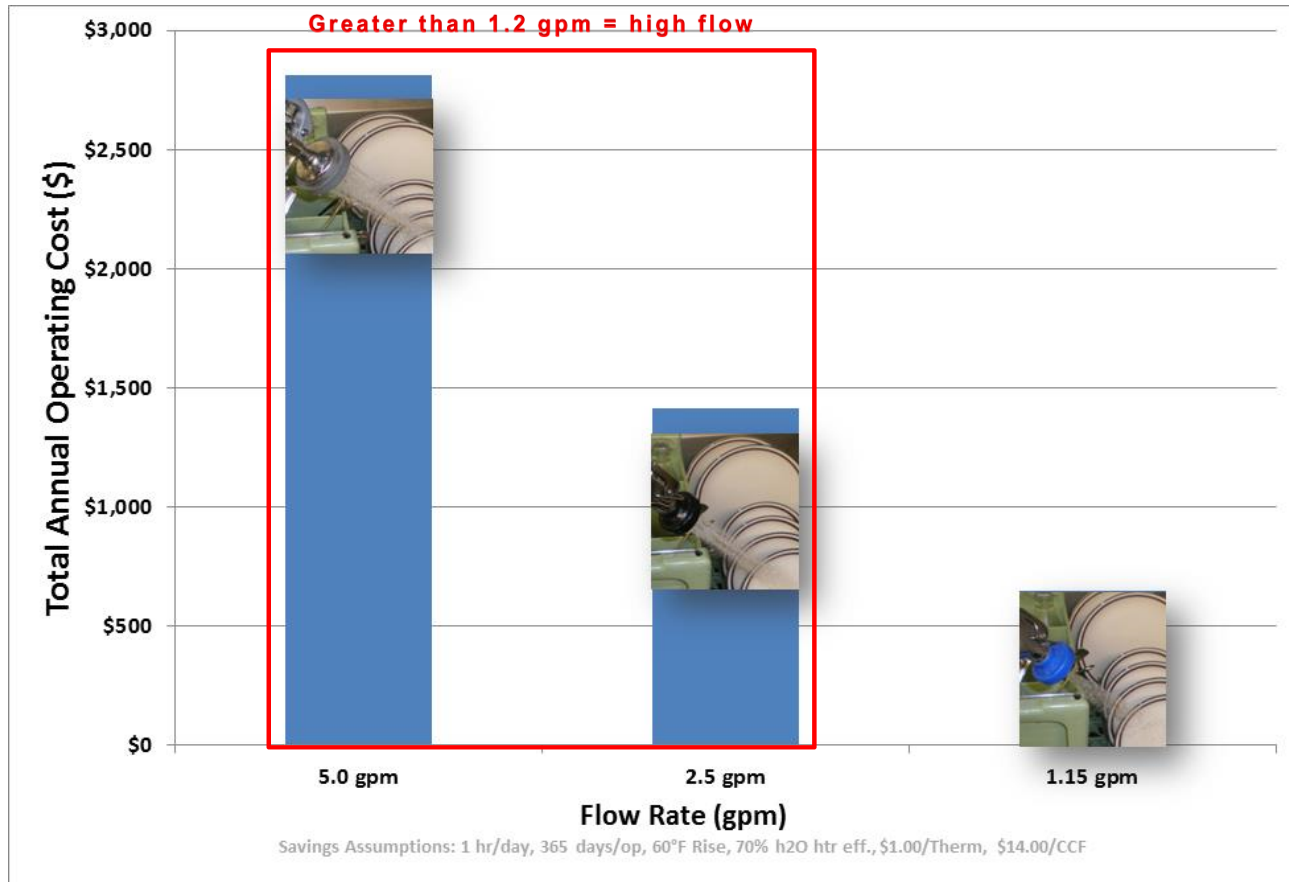


Pre-Rinse Sprayers

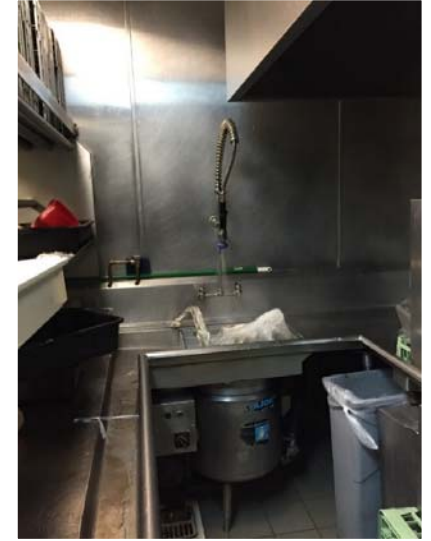


The real workhorse of the dish room!

And a \$40 part that can deliver big savings!



Pre-Rinse Sink ≠ Pre-Rinse Operation



- Pre-rinse sink is used in most dishrooms
- Using a pre-rinse spray valve (PRSV) is the most common way that wares are rinsed prior to placement on racks or directly into dishmachine

- Pre-Rinse Operation (PRO) is a combination of multiple practices including:
- Pre-rinse sinks, dry scrapping
 - Food waste collectors
 - Disposers, scrapping troughs



Common Types of Cafeteria Style PRO



Scrap Collector:

- 1 - 2 gpm of fresh water
- 8-30 gpm recirculated
- Typically cold water
- Sometimes tempered
- Alternative to disposers
- Can be on timer



Disposers:

- 3 - 10 gpm of fresh water
- Low duration operation
- Typically cold water
- Water flow modulation based on waste load
- Can be on timer



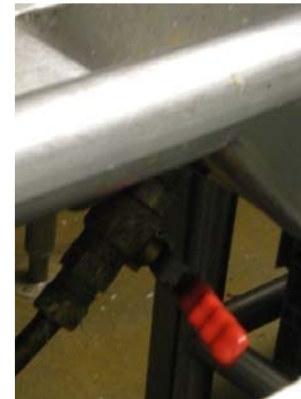
Trough to Disposer or Scrapper:

- 5 - 15 gpm fresh
- 2 - 3 gpm recirculated
- Typically tempered water

First Line of Conservation



Replace damaged equipment



Enable and train control

Franklin Elementary School



Just started monitoring!
(1-Day of data currently)

- PRSV 2.5 gpm: 164 gal, 94°F
- Disposer: 65 gal
- Total 229 gal
- 1.8 h of rinse (44" conveyor)
- 127 gal/h of rinse

Pre-rinse Operations at 2 Café's on Google Campus

Are they using a high-pressure low flow spray valve or not?
How about that scrapper, how is that being operated?

Big difference in water use

- **Masa Café** used only 1.15 gpm PRSV, not using scrapper
 - Using **99 gal/d**, 90 hot, 9 cold
 - 5.4 h of rinse operation (86"-conveyor)
 - **18 gal/h** of rinse
- **Site 2** used 2.5 gpm PRSV with scrapper (2 gpm fresh) and degreaser hot water solution running continuously
 - Using **3,167 gal/d**, 2501 hot, 666 cold
 - 8.3 h of rinse operation (86"-conveyor)
 - **841 gal/h** of rinse



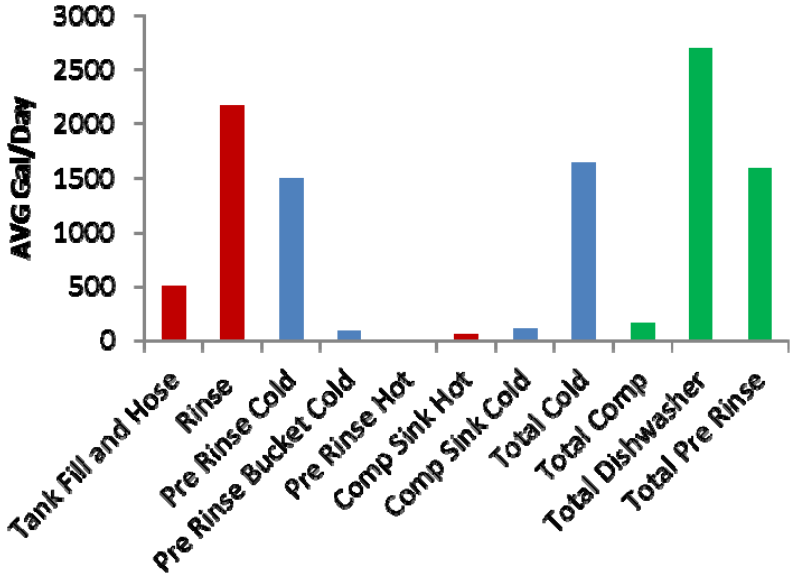
Original Pre-Rinse Operations was Abandoned

- Original Pre-Rinse Operations was Abandoned
- The trough system was no longer operational
- No pre-rinse spray valve assembly, thus staff was dragging over industrial hoses used for floor cleaning, high flow rate of 5 to 7 gpm
- 3 Hoses, total use of 1,282 gal/d, 2.1 h of rinse time (86" conveyor)
- 623 gal/h rinse



Belas Hall Daily Dishroom Water Consumption

	Temperature During Flow (°F)	NSF Hot Water Sanitizing Temp (°F)
Hot Rinse	169	180
Hot Fill	144	140
Cold Scrapper	64	N/A
Rinse Tank	152	160
Wash Tank	139	150
Prewash Tank	123	N/A
Drain	142	<140



Belas Hall Daily Dishroom Water Consumption



PreRinse Practices (Scrap Only)



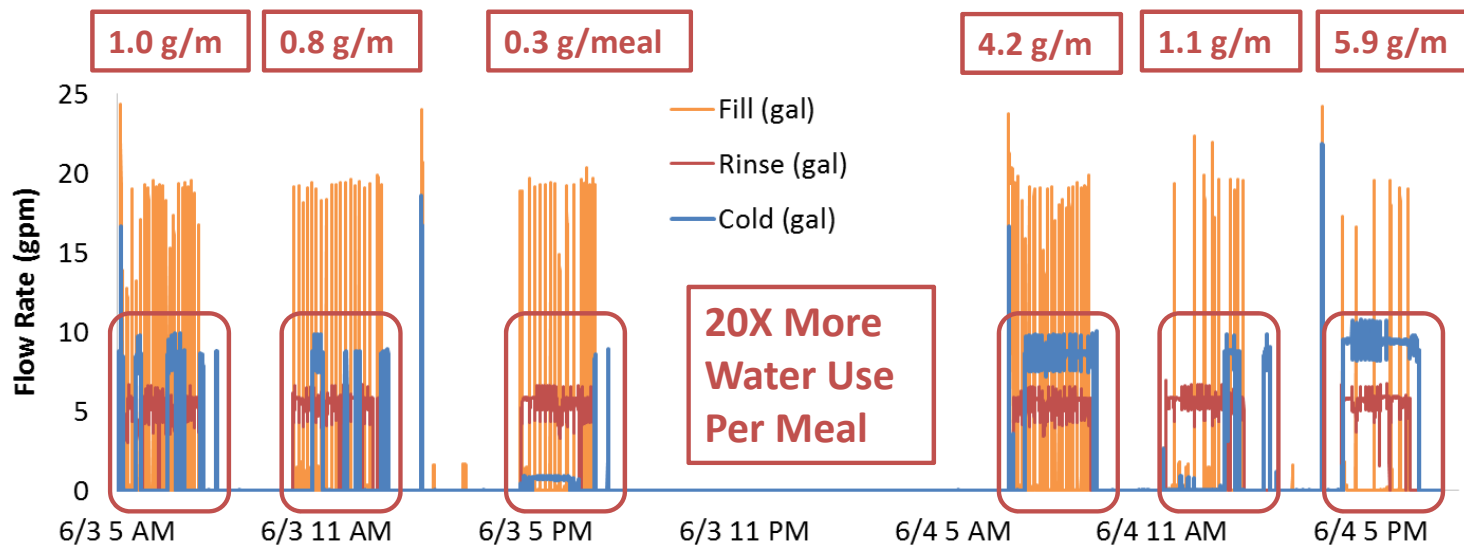
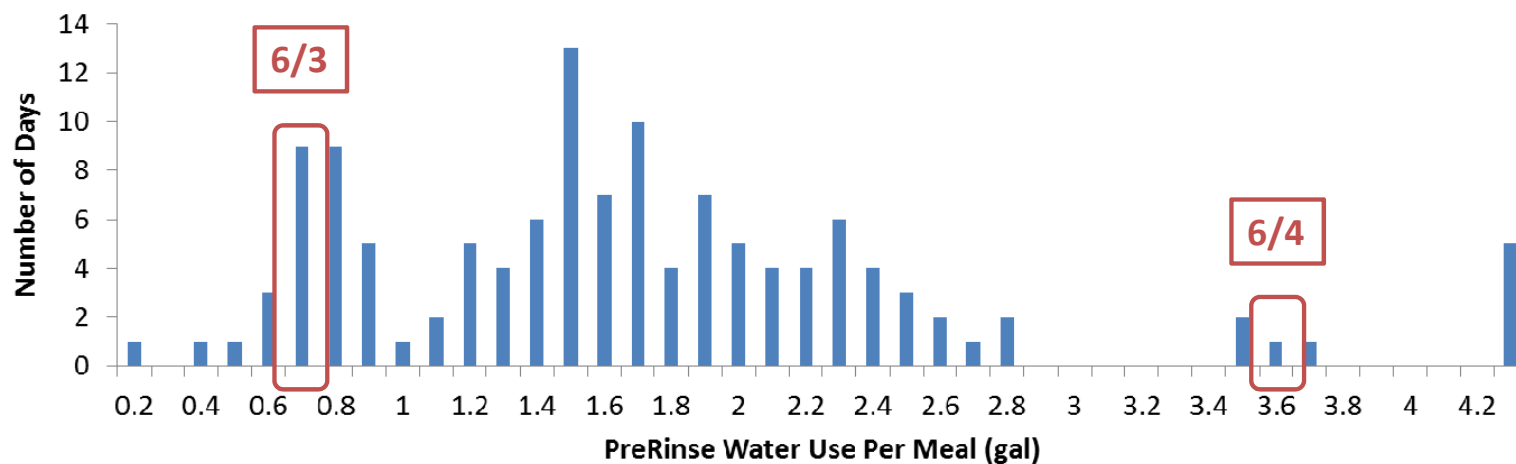
PreRinse Practices (Scrap & Bucket)



PreRinse Practices (Cold Water Hose)



PreRinse Water Use Per Meal



Summary of Pre-Rinse Operations

PRO Method	Pre-Rinse Use (gal/d)	Pre-Rinse Use Per Hour of Rinse Operation (gal/h)	Dishwasher and Pre-Rinse Use Per Hour of Rinse Operation (gal/h)	Pre-Rinse as Percentage of Total
Scrapper with Pre-Rinse Sprayer	99	18	262	7%
Pre-Rinse Sprayer with Disposer	229	127	292	44%
Cold Water Hose with No Valve	1586	248	680	37%
3 Industrial Pre-Rinse Hoses and Rinse Valves	1282	623	1289	48%
Scrapper with Pre-Rinse Sprayer	3167	841	1208	70%

- Interim Results: Data is all over the place, operating practices have a huge impact
- Starting a research project to document 12 PRO operations and normalize to dishwasher sanitizing rinse time
- 2 best in class (dry scrapping, PRSV)
- 10 conventional PRO in cafeterias
- Estimate Savings from changing from conventional to best-in-class

Smart metering available

Current utility water metering practice

- Water use data is typically provided in one or two month intervals
- This is too low of a resolution

Low cost (\$350) smart metering is available!

- 5-min interval metering using 3G cellular
- 10-year plan
- Data stored on server for easy download
- Leak detection



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