ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

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Memo

to:	Department of Energy	*via email:*	expartecommunications@hq.doe.gov
from:	Jennifer Cleary		
date:	July 31, 2015		
subject:	Ex parte Communication, NOPR for Energy Conservation Standards for Residential Dishwashers, Docket No. EERE-2014-BT-STD-0021		

This memo memorializes the meeting between the Association of Home Appliance Manufacturers (AHAM) and the Department of Energy (DOE) on July 8, 2015, for inclusion in the public docket on the Notice of Proposed Rulemaking (NOPR) for Energy Conservation Standards for Residential Dishwashers, Docket No. EERE-2014-BT-STD-0021; RIN 1904-AD24; 79 Fed. Reg. 76,142 (Dec. 19, 2014).

AHAM requested a meeting with DOE to present the results of some dishwasher performance testing members conducted in order to demonstrate ongoing concern that DOE's proposed standards for dishwashers will negatively impact performance. AHAM raised concern in our written comments, dated March 25, 2015, regarding several performance issues.[1] Specifically, AHAM argued that cycle length will unacceptably increase. Moreover, AHAM indicated that it is difficult, if not impossible, to assess DOE's proposed levels because there are few models on the market at that level. AHAM believed, and continues to believe, that the standards DOE proposed will negatively impact performance and, thus, drive use of more energy and water due to pre-rinsing, additional dishwasher cycles, etc. In addition, we argued in our comments that the ENERGY STAR test method, which is the method DOE used to assess the proposed standards' impact on performance in the NOPR analysis, is too variable to reliably determine that performance would not be negatively impacted at the proposed levels. In fact, our analysis demonstrated that DOE's proposed levels are just as likely to negatively impact performance as be neutral—Efficiency Level 3 performance may overlap with Efficiency Level 4 performance.

Since the submission of AHAM's written comments, AHAM and its members have been working to further understand the performance implications of DOE's proposed levels. In addition, it has come to our attention that Navigant is analyzing an additional Efficiency Level of 255 kWh/year and 3.1 gallons/cycle and, thus, we and members have been working to understand the performance implications of that level. Given the fact that the water level remains unchanged in the newly analyzed Efficiency Level (Efficiency Level 2.5), manufacturer knowledge of the consumer indicated that this level would not alleviate the performance

[1] To be clear, this ex parte filing supplements our written comments. AHAM continues to have the performance concerns described in our March 25, 2015 written comments.

concerns AHAM raised in our written comments. Accordingly, AHAM members have been investigating the extent of those concerns.

The proposed levels will negatively impact performance by making it more difficult for dishwashers to remove adhered soils and grease and will result in buildup over time. DOE's data did show a performance drop, but in the NOPR, DOE determined that there was not a performance problem at Efficiency Level 3. AHAM and its members were previously unable to qualitatively demonstrate performance concerns due to the lack of models on the market meeting DOE's proposed levels. But some members have since been able to modify existing dishwashers to perform at DOE's proposed levels.

AHAM organized and members performed investigative testing to demonstrate the impact DOE's proposed standards would have on dishwashers' ability to remove adhered soils and grease. Members conducted the ENERGY STAR performance test with slight variations. No scoring was performed—the results were reviewed qualitatively.

One set of testing focused on grease and buildup over time. Three dishwashers were tested:

1. 307 kWh/year; 4.1 gallons/cycle targeted;
2. 255 kWh/year; 3.1 gallons/cycle targeted; and
3. 234 kWh/year; 3.1 gallons/cycle targeted.

For this set of testing, eight place settings were used, four of which were soiled. Clear plates were used to better show the grease on the plates. The soils called for in the DOE test method were applied and a small amount of animal and vegetable fats were also applied. Three normal cycles were run without filter cleanout between runs. Figure 1 shows the items soiled per the requirements in the DOE test procedure using clear plates. Figure 2 shows the additional fat/grease loads.

Figure 1—DOE (AHAM DW-1) Soil Using Clear Plates

Figure 2—Additional Fat/Grease Load

AHAM displayed one place setting from each dishwasher after that place setting had run through the normal cycle three times. Photographs of those place settings are displayed below in Figures 3-5. DOE and Navigant were asked to consider whether, as consumers, they would eat off of the dishes or would serve friends/family from the dishes. As the pictures show (and is more evident when viewed in-person), there is some residue on the place setting cleaned in the 307 kWh/year dishwasher. But the 255 kWh/year and 234 kWh/year dishes contain significantly more greasy residue.

Figure 3—307 kWh/year Results

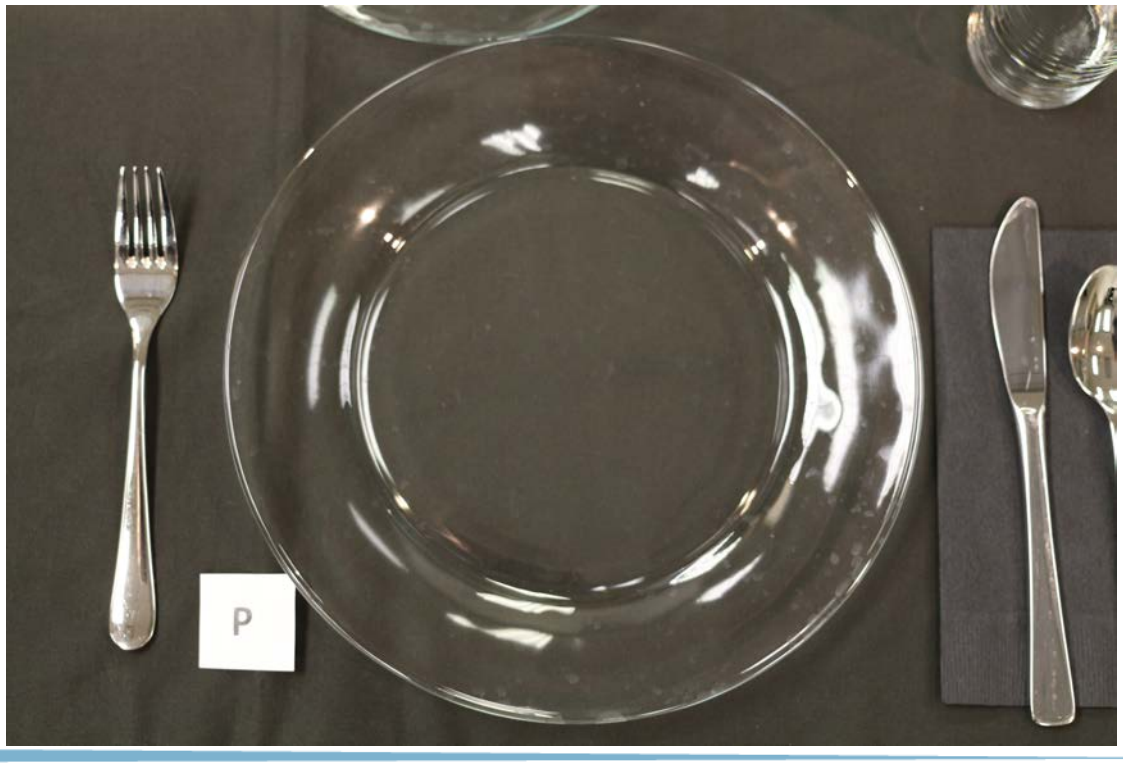


Figure 4—255 kWh/year Results

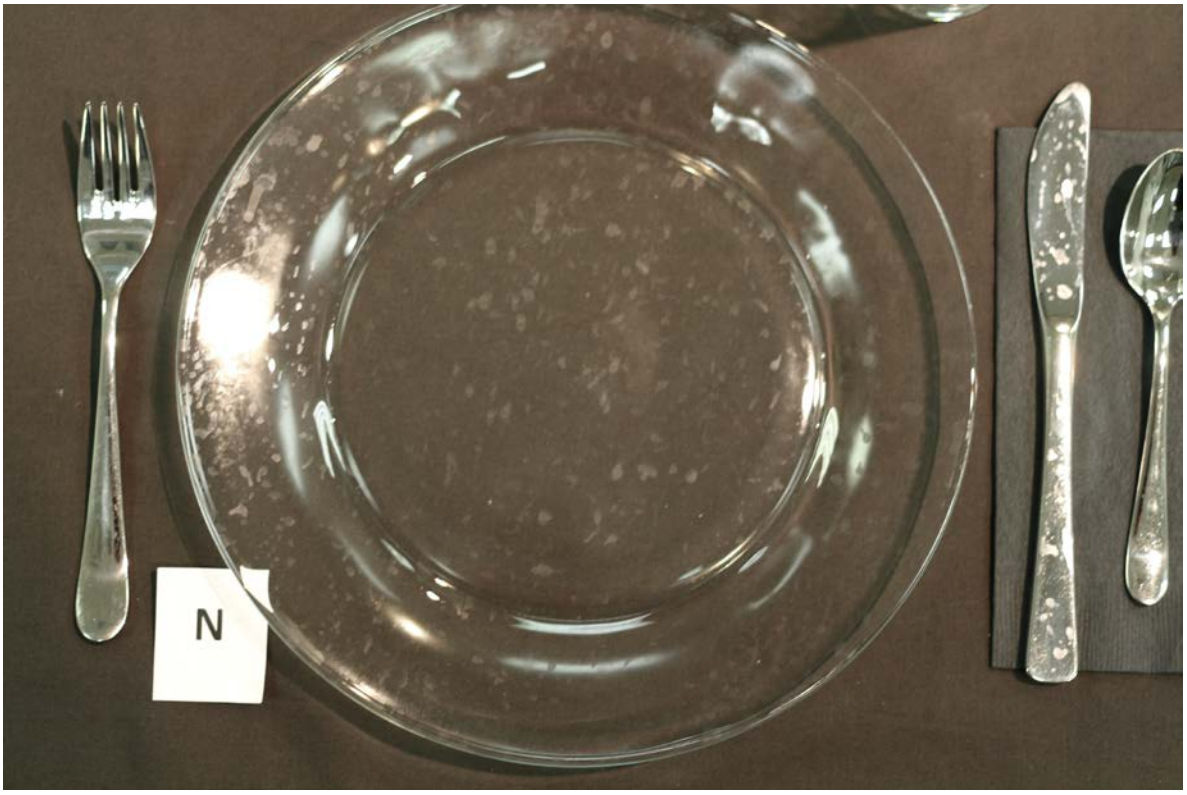
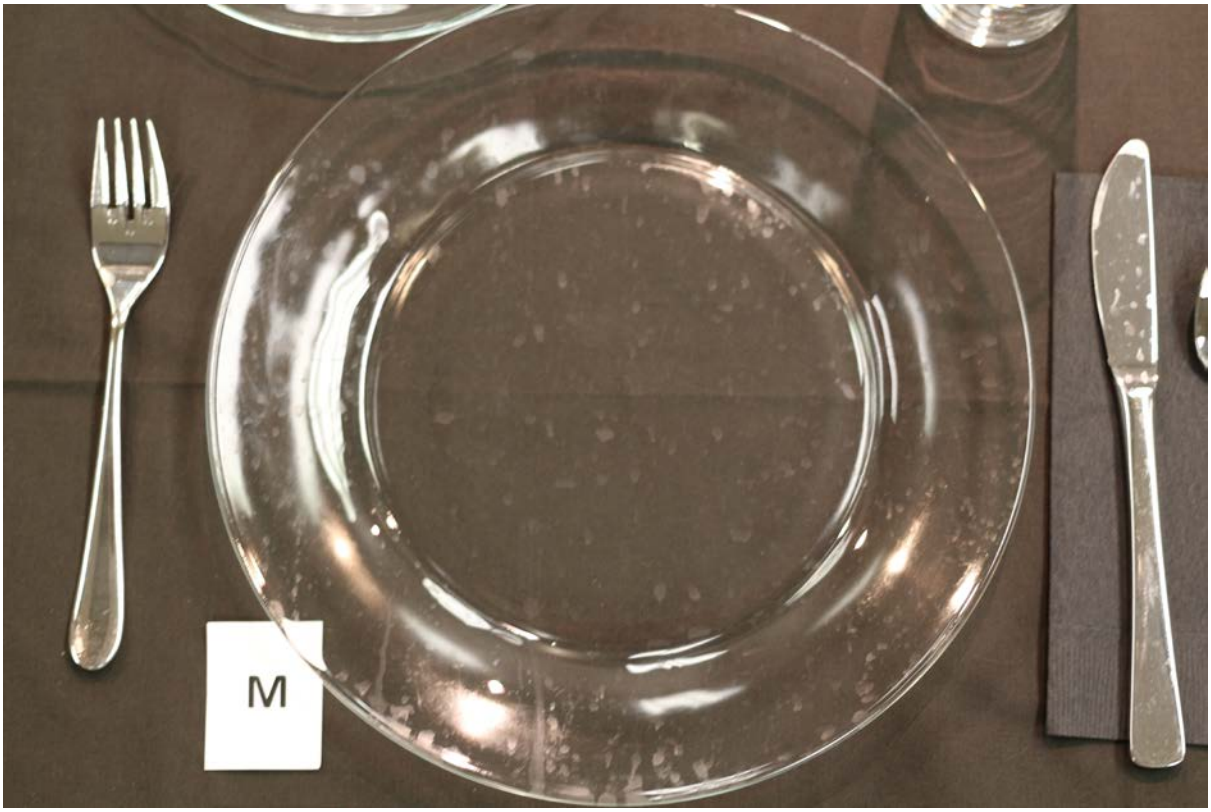


Figure 5—234 kWh/year Results



In order to provide a consumer perspective on the performance results, company employees not connected to the dishwasher product category and without knowledge of the objective were asked to examine the place settings. The participants answered questions regarding their level of acceptance of the cleaning performance of the three dishwashers. During the meeting with DOE, AHAM showed a video of the consumer feedback. That feedback is summarized in Table A.

Table A—Consumer Feedback, Grease and Buildup Testing

307 kWh/year	255 kWh/year	234 kWh/year
I would eat off of this	It seems dirty	I'm not going to eat off of that . . . You can see the grease on them
It just looks like water spots to me	It seems unsanitary	I would be bothered that I'm having to take the extra step to clean something when I'm paying for a machine that is supposed to clean them
I would probably bear with these	Not aesthetically pleasing	It's yucky
I don't think this is unacceptable	I wouldn't eat off of it because it's dirty / it looks like it has food film on it	Looks like it has grease / food still on it

This feedback shows that consumers generally accept performance of today's dishwashers, but some do have some concerns with performance—this is true across dishwasher brands. Conversely, consumer feedback on the proposed level and on Efficiency Level 2.5 was overwhelmingly negative. Consumers viewed the place settings that were "cleaned" in dishwashers using 255 kWh/year and 234 kWh/year as unsanitary and were not willing to eat off of them. In addition, when asked what they would do if their dishes looked like the sample place setting after a second or third wash, consumers responded that they would get a new dishwasher, that it was not normal for dishes to look like that, that they would call a repair person, and that they would find the results unacceptable and would be angry. When asked if they would accept the performance if the dishwasher cost less to run, consumers responded that performance is top of mind when they think of their dishwasher, not cost to operate. These responses are provided in further detail in the July 8, 2015 meeting slides attached as Appendix A.

The second set of investigative testing focused on adhered soils and particulates. Two standards levels were tested on two different units:

1. 307 kWh/year and 5.0 gallons/cycle targeted; and
2. 234 kWh/year and 3.1 gallons/cycle targeted.

For this set of testing, ten place settings were soiled according to the AHAM DW-1 soiling method. The soil in one bowl was replaced with adhered soil. The soil in one glass was replaced with a milk glass soiled according to IEC Standard 60436. The tomato juice glasses were replaced with buttermilk glasses from an NSF test procedure in one of the dishwashers. Photographs of the bowl with adhered soil and the IEC milk glass prior to the cycle being run are in Figures 6 and 7.

Figure 6—Bowl with Adhered Soil

Figure 7—IEC Milk Glass

AHAM displayed all of the dishes from one of the 307 kWh/year and 5.0 gallons/cycle dishwashers and one of the 234 kWh/year and 3.1 gallons/cycle dishwashers on the table. Photographs of those place settings are displayed below in Figures 8-13. DOE and Navigant were asked to consider whether, as consumers, they would eat off of the dishes or would serve friends/family from the dishes. As the pictures show (and is more evident when viewed in-person), there were some particles remaining on the dishes that were cleaned in the dishwasher that targeted 5.0 gallons/cycle (307 kWh/year). But the dishes that were "cleaned" in the dishwasher targeting 3.1 gallons/cycle (234 kWh/year) still looked dirty. Meeting participants responded with a chorus of "eww" and "gross" when the dishes that were "cleaned" in the 3.1 gallons/cycle (234 kWh/year) dishwasher were revealed.

Figure 8—307 kWh/year; 5.0 gallons/cycle

Figure 9—307 kWh/year; 5.0 gallons/cycle

Figure 11—234 kWh/year; 3.1 gallons/cycle

Figure 12—234 kWh/year; 3.1 gallons/cycle

Figure 13—234 kWh/year; 3.1 gallons/cycle

Although the dishes were dirty enough to speak for themselves, in order to provide a consumer perspective on the results, 16 consumers who were not connected to appliance retailers, repair stores, or manufacturers, were asked to review the results from both the current and proposed energy and water levels. The consumers were asked to describe what they saw, what they would do if their dishwasher provided those performance results, and whether they would use the dishes. AHAM showed a video of one of four focus groups asked these questions. The focus group responses are summarized below in Table B.

Table B—Consumer Feedback, Adhered Soils Testing

307 kWh/year and 5.0 gal/cycle	234 kWh/year and 3.1 gal/cycle
Pretty clean	Couldn't handle it
No water spots	Feel like I got "'punked"
Inefficient	Unsanitary
85% good	Unappetizing
Redo dirty ones	Not washed / not working
Caked on / stuck on / spotty	Everything was dirty
Acceptable	Dirty/filthy/gross/disgusting
Dull	How old is that dishwasher
Shiny	Not working
Residue / stained	Need a new dishwasher
Not clean/ not sanitized	Nasty / yuck
Not loaded correctly / overloaded	Hadn't run through dishwasher
Lots of capacity	Useless

Again, this feedback shows that consumers generally accept performance of today's dishwashers, but some do have some concerns with performance—this is true across dishwasher brands. But the results were overwhelmingly negative at the proposed level. Consumers indicated that the dishes from the 3.1 gallongs/cycle (234 kWh/year) dishwasher were unsanitary, unappetizing, filthy, and gross. Some even indicated that the dishwasher was useless or that it seemed to be old or not working. In fact, almost 70 percent of the consumers surveyed were somewhat, very, or extremely likely to serve family and friends from the dishwasher at the current standard level. <u>But not one person would serve family or friends from the dishwasher at the proposed levels</u>.

These performance tests and consumer studies demonstrate that performance will be negatively impacted by DOE's proposed energy conservation standards for residential dishwashers. In fact, AHAM believes that anything more stringent than the upcoming ENERGY STAR level of 270 kWh/year and 3.5 gallons/cycle for standard size dishwashers will negatively impact performance. As discussed above, manufacturers report, and consumer feedback shows, signals of consumer dissatisfaction even at less stringent levels, such as at today's standard.

Product performance is at the very essence of the bargain in EPCA between obtaining energy efficiency improvements while protecting consumers from being deprived of products that work

well and perform the desired function. This is not only meaningful to any understanding of technical feasibility, but is also explicitly a requirement for economic justification under 42 U.S.C. § 6295(o)(2)(B)(IV). DOE's authority to set standards is restricted in 42 U.S.C. § 6295(o)(4) if DOE finds that the standard "is likely to result in the unavailability in the United States in any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United Sates at the time of the Secretary's finding." AHAM's testing demonstrates that the performance of models at the proposed levels (and Efficiency Level 2.5) will be substantially different—worse—than performance of products available today. Accordingly, DOE must promulgate less stringent standards than those proposed in the proposed rule and, in no case, can go beyond the upcoming, already aggressive ENERGY STAR level.

The attendees at the meeting were as follows:

Ashley Armstrong, DOE
John Cymbalsky, DOE
Judith Reich, Navigant
Troy Watson, Navigant

Jennifer Cleary, AHAM
Rehan Ehsan, AHAM
Robert McArver, AHAM
Joseph McGuire, AHAM
Charles Samuels, Mintz Levin Cohn Ferris Glovsky and Popeo, P.C. (AHAM Counsel)

Karin Svantesson, Asko (phone)
Mike Edwards, BSH
Manfred Staebler, BSH
George Hawranko, Electrolux (phone)
Paul Richter, Electrolux (phone)
Kelley Kline, GE Appliances (phone)
Paul Newsom, GE Appliances
Steve Polinski, Miele
Jenni Chun, Samsung (phone)
Ravee Vaidhyanathan, Samsung
Tom Haft, Subzero Group, Inc. (phone)
Jim Pelkey, Subzero Group, Inc. (phone)
Brian Wylie, Subzero Group, Inc. (phone)
Nick Gillespie, Whirlpool (phone)
Wayne Klug, Whirlpool
Sean Southard, Whirlpool

Appendix A

Dishwasher Performance

AHAM Meeting with DOE

July 8, 2015

AHAM
ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

Leadership ▸ Knowledge ▸ Innovation

AHAM Performance Concerns—NOPR

- Could not fully assess proposed level because very few models on the market at that level
  - Drive use of more energy/water (pre-rinse, run dishwasher again, etc.)
- Cycle length will unacceptably increase
  - Shipment weighted average cycle time increased by 12% between EL 0 and EL 2 and 37% between EL 0 and EL 3

AHAM Performance Concerns

- ENERGY STAR test method too variable to reliably determine that performance would not be negatively impacted at the proposed levels
  - Just as likely to negatively impact performance as be neutral
  - EL 3 performance may overlap with EL 4 performance

Additional Analysis

- Navigant is analyzing an additional EL of 255 kWh/year and 3.1 gallons/cycle
  - Water level has not changed from EL 3
- Manufacturer knowledge of the consumer indicated that this level would not alleviate performance concerns

Performance Concerns

- Specific concerns:
  - Adhered soils
  - Grease
  - Buildup over time

- AHAM organized and members performed investigative testing to demonstrate these concerns
  - ENERGY STAR performance test/DW-1 with slight variations
  - No scoring—qualitative review of results

Investigative Testing

- One set of testing focused on grease and buildup over time
- 3 dishwashers tested
  - 307 kWh/year; 4.1 gal/cycle targeted
  - 255 kWh/year; 3.1 gal/cycle targeted
  - 234 kWh/year; 3.1 gal/cycle targeted
- 8 place settings; 4 soiled
  - Clear plates to better show grease on plates
  - DOE soil plus small amount of animal/vegetable fats
  - 3 DOE normal cycles without filter cleanout between runs

Place Settings—Before

DOE (AHAM DW-1) Soil using clear plates

Additional fat/grease load

Place Settings--After

- Place settings displayed on AHAM conference room table

- Consider:
  - As a consumer, would you eat off of these dishes?
  - As a consumer, would you serve your friends/family from these dishes?

Consumer Feedback

- Company employees not connected to dishwasher product category and without knowledge of the objective
- Participants examined the place settings and answered questions regarding level of acceptance regarding cleaning performance
- **Video**

Consumer Feedback

307 kWh/year	255 kWh/year	234 kWh/year
I would eat off of this	It seems dirty	I'm not going to eat off of that . . . You can see the grease on them
It just looks like water spots to me	It seems unsanitary	I would be bothered that I'm having to take the extra step to clean something when I'm paying for a machine that is supposed to clean them
I would probably bear with these	Not aesthetically pleasing	It's yucky
I don't think this is unacceptable	I wouldn't eat off of it because it's dirty / it looks like it has food film on it	Looks like it has grease / food still on it

Consumer Feedback

What if your dishes looked like this a 2nd or 3rd time?

- 255 kWh/yr
  - "If this were the usual result, I would probably get a new dishwasher"
  - "I would not be happy with that ... It's not normal for them to look like that"
- 234 kWh/yr
  - "I would call a repair person and hope it's still under warranty … If it's not under warranty, I would call the company and complain"
  - "It would make me angry"
  - "I would call the store saying it's not acceptable"

Consumer Feedback

Would you accept this performance if your dishwasher cost less to run?

- **307 kWh/yr**
  - "If this actually cost less, I could put up with this"
  - "I don't think about the cost of running the dishwasher … I think about the performance"
- **255 kWh/yr**
  - "You're talking about such a small amount of energy over a span of a year that it's not a factor"
  - "It would not be acceptable even if it were free"
  - "I would pay more per year to have my dishes coming out clean"
- **234 kWh/yr**
  - "Regardless of the cost, I would not want this dishwasher"
  - "The cost to run the dishwasher is immaterial … The performance would be disappointing"

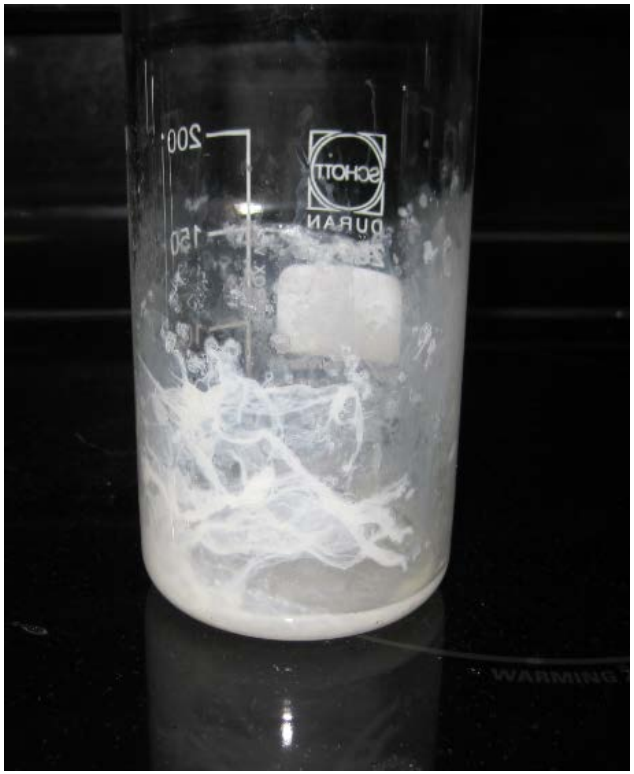
Investigative Testing

- Second set of testing focused on adhered soils and particulates
- Two levels tested on two different units
  - 307 kWh/year and 5.0 gal/cycle targeted
  - 234 kWh/year and 3.1 gal/cycle targeted
- AHAM DW-1, 10 place settings fully soiled
  - Replaced soil in one bowl with adhered soil
  - Replaced one glass with IEC milk glass
  - Replaced tomato juice glasses with buttermilk glasses from NSF procedure in one dishwasher

Place Settings—Before

Soils different from DW-1:

Bowl



IEC Milk Glass

Place Settings—After

- Place settings displayed on AHAM conference room table

- Consider:
  - As a consumer, would you eat off of these dishes?
  - As a consumer, would you serve your friends/family from these dishes?

Consumer Feedback

- 16 consumers reviewed results from both energy/water levels (current and proposed)
  - None employed by appliance retailers, repair stores, or manufacturers
- Asked to describe what they saw, what they would do, and whether they would use the dishes
- **Video**

Consumer Feedback

- Current DOE standards
  - Almost 70% were somewhat, very, or extremely likely to serve family and friends from the dishes
- 234 kWh/year; 3.1 gal/cycle
  - 100 % were not at all likely to serve family or friends from dishes

Consumer Feedback

Current Standard	234 kWh/year/3.1 gal/cycle
Pretty clean	Couldn’t handle it
No water spots	Feel like I got ‘punked
Inefficient	Unsanitary
85% good	Unappetizing
Redo dirty ones	Not washed / not working
Caked on / stuck on / spotty	Everything was dirty
Acceptable	Dirty/filthy/gross/disgusting
Dull	How old is that dishwasher
Shiny	Not working
Residue / stained	Need a new dishwasher
Not clean/ not sanitized	Nasty / yuck
Not loaded correctly / overloaded	Hadn’t run through dishwasher
Lots of capacity	Useless

Conclusion

- These tests and consumer surveys demonstrate the performance will be negatively impacted by the proposed and subsequently analyzed levels

- Any DOE standard level beyond the next ENERGY STAR level of 270 kWh/year and 3.5 gal/cycle for standard size dishwashers will negatively impact performance