



February 24, 2022

Ms. Ga-Young Park
Product Manager for Appliances
Environmental Protection Agency
ENERGY STAR Products Program
1200 Pennsylvania Avenue, NW
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Re: Whirlpool Supplemental Comments to AHAM - ENERGY STAR Dishwashers Version 7.0 Draft 2 Specification

Dear Ms. Park:

Thank you for the opportunity to comment on the Environmental Protection Agency's (EPA) Draft 2 Version 7.0 ENERGY STAR Dishwasher Specification, published on January 6, 2022.

Whirlpool Corporation (NYSE: WHR) is committed to being the best global kitchen and laundry company, in constant pursuit of improving life at home. In an increasingly digital world, the company is driving purposeful innovation to meet the evolving needs of consumers through its iconic brand portfolio, including *Whirlpool*, *KitchenAid*, *Maytag*, *Consul*, *Brastemp*, *Amana*, *Bauknecht*, *JennAir*, *Indesit* and *Yummly*. In 2021, the company reported approximately \$22 billion in annual sales, 69,000 employees and 54 manufacturing and technology research centers. Additional information about the company can be found at WhirlpoolCorp.com.

Whirlpool Corporation (Whirlpool) has recently announced a global commitment to reaching net-zero emissions in our plants and operations by 2030. Additionally, Whirlpool has already committed to achieving a 20% reduction in emissions linked to the use of its products across the globe by 2030, compared to 2016 levels. This is to say that Whirlpool continues to strongly believe in the mission and goals of DOE, and specifically with the appliance and equipment standards program. We look forward to many more years of continued partnership and collaboration between EPA and Whirlpool in improving appliance efficiency and reducing the emissions associated with use of appliances.

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As a very active member of the Association of Home Appliance Manufacturers (AHAM), Whirlpool has worked closely with them in the development of the industry comments they submitted (under separate cover) on this draft specification. **Please be advised that we support and echo the AHAM positions, particularly that the ENERGY STAR program must be based on the foundation of data from the Department of Energy appliance standards program, including incremental manufacturing costs, technology options, savings analysis, and payback periods. We continue to strongly agree with AHAM that EPA should sunset the ENERGY STAR specification for dishwashers, and that the resources of EPA and its stakeholders are better directed towards increasing dishwasher ownership and promoting optimal use. We also do not agree with EPA's proposal to use the minimum cleaning index for assessing and validating acceptable dishwasher wash performance. Finally, we believe that it is too premature for EPA to eliminate any credits for connectivity.** Our below comments expand on AHAM's comments and provide additional detail or data to reinforce our industry positions; as well as to comment on areas where AHAM cannot comment.

Thank you again for your consideration and we look forward to continued discussion on this topic.

Best regards,

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**Whirlpool Corporation Supplemental Comments to AHAM
ENERGY STAR Version 7.0 Draft 2 Dishwashers Specification
February 24, 2022**

We reiterate our comments from the Draft 1 Version 7.0 specification that a program sunset is the only correct decision and pathway for EPA to take for dishwashers. The energy and water usage of dishwashers has already been reduced by over 50% over the last 25 years, when considering the cumulative impact of ENERGY STAR and U.S. Department of Energy (DOE) energy conservation standards. This success story should be celebrated, while acknowledging that future opportunities for energy and water savings are extremely limited, that there is no reasonable payback period from ENERGY STAR for most consumers, and that product performance may be compromised at higher efficiency levels.

In our previous Draft 1 comments, we highlighted the fact that we already use all available technology options that are technologically-feasible and cost-effective to meet existing DOE and ENERGY STAR standards. There are no new technology options available to meet the Version 7.0 proposal that are feasible without significant cost and/or performance compromises. Plastic tub models are also potentially at risk of not being able to meet a Version 7.0 specification, which may put ENERGY STAR dishwashers out of reach for many low-income households.

We provided EPA with data and conclusions from our 2015 investigative performance testing, which signaled that an amended specification will impede our ability to effectively clean dishes in a consumer-acceptable manner. Detergent effectiveness is another potential issue, as low-end detergents, in particular, may struggle to clean well with lower water temperatures and fewer water exchanges in dishwashers meeting more stringent requirements.

We also cited significant and still unaddressed concerns that we have with EPA's proposal to use a minimum cleaning index requirement in this specification. This includes repeatability and reproducibility issues leading to significant unresolved variation in the test. Repeatability issues show up as run-to-run variation in a single lab, as a technician/grader may grade the same soil level on a dish differently between runs, or multiple technicians in a single lab grade dishes differently. Reproducibility shows up as lab-to-lab variation where technicians in different labs produce different scores. It is not appropriate for EPA (or DOE) to use any test method with unresolved variation on this magnitude.

Further, our data shows that there is very poor correlation between actual consumer satisfaction and the scores generated under this test method, largely based on the AHAM wash performance standard. In data recently submitted to DOE for the Notice of Proposed Rulemaking (NOPR) on the dishwashers test procedures, we provided real-world consumer wash satisfaction data compared to lab-tested scores from the AHAM dishwasher performance standard (AHAM-DW-1-2010, which was recently revised as DW-2-2020). A model with a score of around 50 has nearly equivalent consumer wash satisfaction as models with scores of 90 or more.

This AHAM wash performance test was never developed to closely predict consumer satisfaction. It was developed to compare the redeposition of soils between models, and intended for manufacturer internal use, instead of being developed as a regulated performance metric. Simply put, it is an invalid metric entirely if it is intended to convey any level of real-world consumer satisfaction with wash performance in dishwashers. So DOE and EPA cannot use this minimum cleaning index requirement as any guarantee that wash performance will be preserved under any amended standard or specification.

There are other performance measures that EPA must also evaluate in the context of an amended specification. Improving energy and water efficiency, and wash performance under an invalid metric of the cleaning performance index, may mean that performance in other areas may be compromised, including drying performance, noise, and cycle time. In particular, we estimate that cycle times may need to increase by 20-40 minutes to compensate for lower water temperatures and water levels. This will push cycle times for many dishwashers past 3 hours, which could be problematic for consumers, who may be unable to immediately unload the dishwasher after the completion of the cycle. Additionally, drying performance concerns already exist for many consumers on today's dishwashers, and this may become a more pronounced problem with a new specification. This will be particularly true for consumers who will be unable to immediately unload their dishwasher at the completion of the cycle. We will expand more on this point below.

Very importantly, we also notice significant differences in the data and analysis used by DOE and by EPA. In the recent standards preliminary analysis and preliminary Technical Support Document (TSD), which was published on January 24, 2022 (87 FR 3450). DOE published data that appears to directly contradict the data presented by EPA for the Draft 1 Version 7.0 proposal. EPA needs to reconcile these differences and ultimately accept the major conclusion drawn from the DOE data; that there is no reasonable consumer payback period for dishwashers meeting a Version 7.0 specification. It is not acceptable for EPA to conveniently ignore this data from DOE and the conclusions that can be drawn from it. As EPA knows well, DOE is a partner U.S. government agency for ENERGY STAR, and has a wealth of experience on appliance standards and test procedures.

We hope that EPA takes the only right action for consumers and agrees to sunset the dishwasher program from ENERGY STAR. A decision to move forward with Version 7.0 may create performance issues for consumers (despite any minimum cleaning index requirement), may result in additional energy and water usage as consumers compensate for possible poor performance, and will directly contradict the data and findings from DOE's recently published analysis. A decision to move forward ultimately hurts consumers, and may produce irreparable damage to the ENERGY STAR brand, as consumers could lose their long-standing trust in the brand.

Of course, we still welcome efforts to continue to deliver energy- and water-savings from dishwashers, where they exist. There are still significant, energy, and water savings available to consumers from improving ownership and optimal use of dishwashers. In our comments to the Draft 1 proposal, we cite that approximately 33% of U.S. households still hand wash their dishes, and that this wastes about 400% more water and 50% more energy than using a dishwasher. There are another 33% of households that do not use a dishwasher they already own or pre-rinse dishes before using their dishwasher. So only about one-third of households are using a dishwasher regularly and optimally, without pre-rinsing. About 160 billion gallons of water per year could be saved just from this opportunity to promote ownership and optimal use. The savings here are exponentially greater than any savings that could be delivered from a possible Version 7.0 specification. We hope to collaborate with EPA and other stakeholders to explore this opportunity further.

Drying Performance

We remain concerned about the impacts of a Version 7.0 specification on non-cleaning performance metrics, like drying performance. We expect a net negative impact on drying performance from a new specification. In an effort to preserve wash performance for consumers under lower energy and water levels, manufacturers may be forced to make difficult decisions about compromising elsewhere on the dishwasher.

We understand very well that a certain level of energy usage is needed for good drying performance. As the total allowable energy usage under ENERGY STAR is lowered with a new specification, the total percentage of energy needed for good drying performance compared to overall energy increases. As

much as half or more of the total energy usage of a dishwasher would be needed just to deliver this drying performance. However, we may only have slightly over a third of the total allowable energy usage to dedicate to drying performance after about two-third of total allowable energy usage is allocated to the core function of cleaning performance.

The technology options that exist to save energy during drying, including door opening systems and condenser drying, have worse initial drying performance than heated and fan-assisted vent drying systems. For those consumers used to unloading their dishwasher soon after a cycle ends, they may be displeased with this drying performance. From our research, we understand that overall satisfaction with dry performance declines when any dishes are still wet at the end of the cycle. Dissatisfaction is particularly impacted when 50% or more of the dishes are still wet.

We already cite drying performance as a challenge for manufacturers, as a majority of consumers have a neutral or negative sentiment of drying performance, and do not believe that their dishwasher completely dries the dishes every cycle. As we evaluate these other technology options that save energy during the drying phase that would be needed for Version 7.0, we estimate that consumer satisfaction with drying performance will decline even further. This is an unacceptable outcome for us and our consumers to experience degraded performance with an ENERGY STAR-certified appliance. Consumers may lose trust in their appliance, our brands, and the ENERGY STAR brand.

DOE Data & Analysis

A few weeks after EPA published the Draft 2 Version 7.0 specification, DOE published a preliminary analysis and TSD for possible amended energy conservation standards. Fortunately for EPA and its stakeholders, this gives another level of data and analysis as a Version 7.0 specification is considered. However, much of the data and conclusions that can be drawn from it directly contradict the decision made by EPA after the Draft 1 specification to move forward with an amended Version 7.0 specification. Given that this data comes from the regulatory authority for appliance standards and test procedures, EPA must account for this newly-available data in their analysis for any possible Version 7.0 specification. Any data that EPA gathered for the Draft 1 data package must be immediately amended or replaced with this data from DOE, and EPA must reevaluate how this will impact their own analysis and the decision to proceed with a Version 7.0 specification. While it would be convenient, it would not be appropriate for EPA to ignore and contradict data coming from another U.S. government agency, and would cause many stakeholders to lose trust in EPA as an institution. Of course, DOE's data and analysis may change through the rulemaking process, but we do not expect possible minor changes to impact the conclusions that could be drawn from it.

As EPA is aware, DOE considers a number of possible efficiency levels (ELs) in their preliminary analysis. These are levels that are analyzed for possible cost and savings under amended standards. EL 3 corresponds to the Draft 2 Version 7.0 levels, while EL 1 equals current ENERGY STAR Version 6.0 levels. DOE estimates an incremental manufacturing cost of \$71 to improve a dishwasher from current DOE standard levels to EL 3. This is still \$53 when considering the incremental cost between EL 1 and EL 3. EPA's estimated *consumer purchase cost* increase from the Draft 1 data package is about \$48. This would include any manufacturer and retailer markups, so DOE's estimate of a consumer purchase cost increase would be even higher with these markups applied.

The energy savings estimated by EPA in the Draft 1 data package also appear to be overstated when considering the recently-updated cycles/year assumptions from DOE's proposed test procedure amendments. More recently available consumer data supports lowering the cycles per year from the current 215 to an updated 184. This change produces less energy and water savings from a possible amended specification. Comparing baseline to EL 3, DOE estimates only 53 kWh/yr of energy savings available. Using a more accurate comparison of EL 1 to EL 3, as nearly all dishwashers on the market today are ENERGY STAR-certified, only produces an energy savings of 25 kWh/yr. Even though these

updated cycles per yr won't take effect until the amended Appendix C2 test procedure compliance date, EPA should recognize this updated consumer usage data, and update their savings analysis appropriately to better reflect savings that consumers may experience in the real world.

When considering life-cycle cost savings, EPA estimated about a \$190 lifetime savings for consumers purchasing a dishwasher meeting the Version 7.0 specification. On the other hand, DOE estimates this as an estimated \$35 cost to consumers. DOE estimates that there would be no life-cycle cost savings for consumers with dishwashers meeting the proposed Version 7.0 specification.

This, of course, leads to an estimated consumer payback period when evaluating the savings compared to possible increased costs. EPA estimated 3.7 years payback for consumers in the Draft 1 data package. DOE, however, estimates 12.9 years when comparing baseline levels to EL 3. This, as EPA knows, is beyond the lifetime of a dishwasher used in their analysis (12 years). EPA has historically cited a 3-5 year target payback period for products when developing new specifications. This would be well beyond this target and even beyond the life of the product. This means that most consumers would *never* recoup the investment needed to purchase a dishwasher meeting ENERGY STAR Version 7.0. Not surprisingly, DOE estimates that about 77% of consumers analyzed would experience a net cost from standards set at EL 3, which would include a majority of low-income consumers.

It would be wholly inappropriate for EPA to ignore these facts and data presented by DOE and proceed with a Version 7.0 specification. Not only does DOE have more updated data, as this was released in 2022 compared to EPA's Draft 1 data package released in early 2020, but DOE has more data available to them. DOE conducts product teardowns, estimates incremental costs for technology options needed to meet possible ELs, and they utilize advanced economic modeling. EPA's method to estimate the retail price difference is not accurate, as many stakeholders have commented to EPA in the past. DOE's estimated incremental manufacturing cost, which doesn't have manufacturer and retailer markups applied, alone outweighs EPA's estimated retail price difference. EPA must also see from DOE's data that many consumers purchasing a dishwasher meeting the proposed Draft 2 Version 7.0 will experience a net cost. This would include many low- and middle-class consumers, who may not have an affordable plastic tub dishwasher option. Finally, the payback period is well beyond the acceptable limits established historically by EPA, and it means that most consumers will never recoup their investment towards purchasing an ENERGY STAR-certified dishwasher.

Conclusion

We appreciate the opportunity to provide comments on this notice. We agree with the comments submitted by AHAM on this draft specification, as highlighted above. We again commend and agree with EPA's desire to find energy and water savings from the dishwasher category. However, developing a Version 7.0 specification is not the appropriate action to take. Incremental energy and water savings may lead to significant product performance issues, including cleaning and drying performance. We also see that EPA's data directly contradicts the data recently published by DOE on the energy conservation standards. EPA cannot accept these contradictions, and must reconcile these differences and update their analysis and conclusions based on this new data.

Instead, we recommend sunsetting the dishwasher category from ENERGY STAR and focus our collective efforts and resources on improving dishwasher ownership and promoting optimal usage. The negligible savings from an amended Version 7.0 specification pale in comparison to this enormous opportunity.