

obtained by sub-metering consumers that could establish the number of dishwasher cycles per year more accurately than surveys. (OOE, Public Hearing Tr. p. 124) Following the public hearing, DOE obtained the AWWA data and found: (1) That water use specific to dishwashers was not listed separately from other appliances and (2) that the study was not nationally representative. Later, in a written comment, OOE stated that further research into the data from AWWA on dishwasher cycles per year determined that the dishwasher data was combined with, and inseparable from, household lavatory and kitchen sink water use. As a result, OOE concluded "that the data and analysis presented by ADL at the October 22nd public hearing probably represents the best basis for establishing today's annual dishwasher use, in cycles per year." (OOE No. 36 at 2) As a result of DOE's own analysis and OOE's comment, the Department has decided not to use the AWWA data in this rulemaking.

AHAM commented that DOE should consider selecting 208 cycles per year, a value that exactly represents using a dishwasher four times per week (4 cycles per week \times 52 weeks = 208 cycles per year). It stated that since that number is reasonably close to DOE's proposal of 215, and still within the range of 200 to 233 supported by ADL research, the selection of 208 cycles per year would aid the consumer in understanding the content of the Federal Trade Commission's (FTC) EnergyGuide label. (AHAM No. 33 at 3) The OOE, however, stated that it concurred with the Department's proposed cycles-per-year estimate of 215, and found no issue in not using four cycles per week on EnergyGuide labels, in spite of the resulting mathematical difference between 208 and 215. It believed that the annual dollar cost difference of slightly more than a dollar, if consumers noticed it at all, would be a negligible difference. (OOE No. 36 at 2)

While the Department recognizes that the FTC generally rounds average use to an integer value and the number 208 would represent a perfect four wash cycles per week, the Department does not believe that the number of cycles per year should be selected on the basis of numerical alignment.

The best data available to DOE establishes a consumer use range from 200 to 233 cycles per year, and DOE proposed a midpoint in this range because "this range is appropriate but no definitive number within that range appears to be better than any other." 67 FR 56235. Comment was divided on the

best number to use in this range, but none of the comments offered any persuasive argument or analysis for adopting a number different from the one DOE had proposed. Therefore, DOE is retaining 215 cycles per year as the representative average number of use cycles per year. This number represents a significant drop from the current value of 264 cycles per year and is appropriate because it is based on an analysis of the best available data. Section 430.23(c) of subpart B of the test procedure now includes 215 as the value of "N", the representative average number of dishwasher cycles per year used in the formula for calculating the EAOC.

C. New Three-Level Test Procedure for Soil-Sensing Dishwashers

At the October 22nd public hearing and in the written comments DOE received, there was general agreement regarding the major components of the proposed procedure for testing soil-sensing dishwashers. The new test procedure adopts a three-level soil test based on the soils used in ANSI/AHAM DW-1. The energy factor for a soil-sensing dishwasher will be computed using a weighted average of the normal wash responses from testing the dishwasher three separate times with three soil levels: heavy, medium, and light. Those conducting the tests will measure and calculate the energy consumption responses for each of the three cycles (*i.e.*, sensor heavy, sensor medium, and sensor light for soil-sensing dishwashers) in the same way as the test procedure for non-soil-sensing dishwashers which uses clean dishes in the normal cycle. However, DOE will base the machine energy and water energy components for a soil-sensing dishwasher on a weighted average of the three energy consumption tests, according to the frequency with which consumers wash light, medium, and heavy loads. Thus, under sections 5.1.2, 5.2.2, and 5.3.2 of the test procedure, the energy factor will be a number computed from the three test cycles to represent the normal energy efficiency of the soil-sensing machine.

From available survey data, ADL determined the following distributions of typical soil levels for U.S. households using dishwashers: 5 percent heavy level of soil, 33 percent medium level of soil, and 62 percent light level of soil. (Review of Survey Data to Support Revisions to DOE's Dishwasher Test Procedure, December 18, 2001; ADL No. 25 at 8) The Department is using the distribution of these three soil level categories to establish the weighting factors, F , as follows: for the heavy response, $F_{hr} = 0.05$; for the medium

response, $F_{mr} = 0.33$; and for the light response, $F_{lr} = 0.62$. The resulting equation for the machine energy, M , for soil-sensing dishwashers is:

$$M = (M_{hr} \times F_{hr}) + (M_{mr} \times F_{mr}) + (M_{lr} \times F_{lr}).$$

The resulting equation for the amount of water used, V , for soil-sensing dishwashers is:

$$V = (V_{hr} \times F_{hr}) + (V_{mr} \times F_{mr}) + (V_{lr} \times F_{lr}).$$

AHAM submitted a written comment supporting the weighting factors for the three soil levels, stating that "the proposed test procedure aligns well with actual consumer practices." (AHAM No. 33 at 2) Along with supporting the soil weighting factors, the OOE also agreed with the Department's selection of the soils and soiling method specified for industry use in the ANSI/AHAM DW-1 standard, commenting that it is confident that AHAM's DW-1 test method is the best basis for a methodology that can deliver repeatable results for these models. (OOE No. 36 at 2)

Detergent and Rinse Agent

In addition to supporting the overall test methodology, commenters recommended two changes regarding the amount of detergent and rinse agent (also referred to as rinse additive or rinse aid) used in the proposed test. In its comment, Maytag Corporation suggested the Department reduce by at least half the amount of detergent which DOE specified in the September 2002 NOPR because of the smaller size of the test loads. The firm commented that the ANSI/AHAM DW-1 soiled dish load which industry uses as a performance test "is 10-12 place settings and the 0.5 percent detergent concentration that is stated in the ANSI/AHAM DW-1 test protocol is based on that amount of soil level. The detergent amount is to improve cleanliness not to impact energy consumption." (Maytag No. 32 at 1) AHAM also indicated that, because the soil levels in the DOE test procedure are so much smaller than the soil level in the original ANSI/AHAM DW-1 procedure, the amount of detergent stated in the September 2002 NOPR should be reduced accordingly: to one-half the amount of detergent used in the AHAM performance test. (AHAM No. 33 at 6) Maytag also stated, "Rinse additive should not be used in the test for the following reason. Rinse additive is usually released into the dishwasher in the last rinse before the heated dry [cycle] and is used to help improve drying and reduce spotting. It does not impact energy consumption of the dishwasher." (Maytag No. 32 at 1) The OOE commented that since the use of