

the new test procedure shall constitute the amended energy conservation standard for the applicable covered products. (42 U.S.C. 6293(e)(2))

Effective 180 days after DOE prescribes or establishes an amended or new test procedure for a covered product, no manufacturer, distributor, retailer, or private labeler may make any representation with respect to the energy use, efficiency, or cost of energy consumed by the product, unless the product has been tested in accordance with such amended or new DOE test procedure and the representation fairly discloses the results of that testing. (42 U.S.C. 6293(c)(2)) This restriction on representations will take effect 180 days after the January 1, 2004, effective date of this amended test procedure. A manufacturer, distributor, retailer, or private labeler may begin using the new test procedure to make representations with respect to the energy use, efficiency, or cost of energy consumed by the product beginning with the January 1, 2004, effective date of this rule.

B. Background

The U.S. government established the first federal test procedures for clothes washers in 1977. In the 1990's, concurrent with the development of new energy conservation standards for clothes washers, the Department of Energy began revising the clothes washer test procedure. The existing test procedure did not cover a number of innovative clothes washer technologies such as high spin speed and adaptive water fill control, and DOE published several proposals to address those innovations including one on December 22, 1993, (58 FR 67710) and another on March 23, 1995 (60 FR 15330). In its comments on the March 23, 1995, proposed rule, the Association of Home Appliance Manufacturers (AHAM) requested that DOE adopt an additional new test procedure that would capture current consumer habits that showed a reduction in the use of hot water and energy. AHAM proposed that DOE incorporate this test as part of the process of revising the clothes washer energy conservation standards, and that the test go into effect concurrently with the issuance of new standards.

On April 22, 1996, the Department issued a supplemental Notice of Proposed Rulemaking proposing such a new test procedure, appendix J1, as well as certain additional revisions to the currently applicable test procedure in appendix J to subpart B of 10 CFR part 430. (61 FR 17589). The supplemental notice requested comments on whether DOE should adopt the AHAM-

recommended test procedure with certain changes. The test procedure final rule published on August 27, 1997, adopted the AHAM recommendation. 62 FR 45484. Appendix J, the current test procedure, will expire on December 31, 2003. 66 FR 3313, 3330 (January 12, 2001). Appendix J1 is now informational but will become mandatory and replace appendix J when the energy conservation standards adopted on January 12, 2001, take effect on January 1, 2004.

A key difference between the appendix J and the appendix J1 test procedures is the basic energy efficiency descriptor. Appendix J specifies an energy efficiency descriptor called the energy factor (EF). The appendix J1 test procedure replaces the EF with an energy efficiency descriptor called the modified energy factor (MEF). In contrast with the previous EF descriptor which only calculated the energy use of the clothes washer itself, the MEF descriptor accounts for the remaining moisture content (RMC) of clothes leaving the clothes washer. In order to calculate the RMC, appendix J1 requires manufacturers to use a particular lot of standardized test cloth to simulate a washer load of clothes. Other substantive differences between the test procedures include using different water temperatures for testing and using test cloth loads for all classes of clothes washers in appendix J1, but not in appendix J.

As the Department proceeded with the standards rulemaking for clothes washers, DOE conducted tests on a number of clothes washers using the appendix J1 test procedure and shared the results with the manufacturers of the tested units. The manufacturers then indicated that some of the values for the RMC were higher than they would have expected from earlier test data. The Department investigated possible causes for the new test results being inconsistent with the values produced using the original lot of test cloth and summarized its findings in the DOE report, Development of a Standardized Energy Test Cloth for Measuring Remaining Moisture Content in a Residential Clothes Washer, May 2000. (Docket No. EE-RM-94-403, DOE, No. 200) To understand the effects of operating variables and cloth specifications, DOE decided to conduct additional laboratory tests to determine the RMC. To insure that the use of a specific manufacturer's product (clothes washer) would not influence or bias the test results in any way, the Department developed a test using an extractor to remove moisture content, instead of using a clothes washer. An extractor is

a centrifuge—basically a rotating basket that has a controllable speed to produce a variety of centrifugal forces. The centrifuge test used a variety of speeds to impose different centripetal accelerations on the test load. These accelerations are reported in terms of gravitation forces (g forces). DOE also soaked the cloth in a tub at a controlled temperature to approximate the agitated soak cycle provided by a typical washer. Thus, the additional laboratory tests DOE conducted closely resembled those specified in the clothes washer test procedure.

The extractor-based test examined RMC values at different g forces so that new batches of test cloth could be compared to the RMC values of a standard reference test cloth. This comparison provided the basis for developing a correction methodology whereby the test results using any new lot of cloth could be "corrected" back to the test values of the base reference lot of cloth. The Department derived the correction factor from measuring the deviation between a new production batch of test cloth and a standard reference test cloth. This deviation is measured as the root mean square (RMS) between the set of measured RMC values and the set of standard RMC values. If this absolute deviation is below 2 percent, then correction factors are unnecessary in MEF tests using that batch of cloth. If the absolute RMS difference between the cloth RMC values and standard RMC values is above 2 percent, then correction factors are necessary when using the cloth to test the MEF of a clothes washer. (10 CFR part 430, subpart B, appendix J1, section 2.6.5)

The correction factors currently are derived by fitting the data points into a straight line (a linear least squares fit) based on the set of RMC values for the new production lot compared to the baseline RMC values for data taken at 50, 200, and 350 spin g's, with warm (100 °F) and cold (60 °F) rinse water, and with spin times of 4 minutes and 15 minutes. The fit criteria for an acceptable new lot of test cloth is an RMS error term <2%. (10 CFR part 430, subpart B, appendix J1, section 2.6.6)

Using data from clothes washer manufacturers, the Department selected the range of test conditions (50–350 g's, warm and cold, 4 and 15 minutes) to bracket the actual conditions under which manufactured residential clothes washers operate and will be tested according to the appendix J1 test procedure. The 50–350 g range bounds the lower and upper levels of spin speeds in a typical clothes washer. The use of both warm and cold water