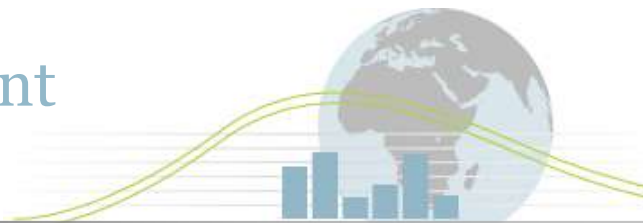


# 4E

## Mapping Document



Country:	USA
Technology:	Washing Machines
Sub Category:	Domestic top and front loaders

### Introduction

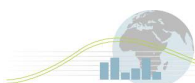
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

The summary definition for this product is:

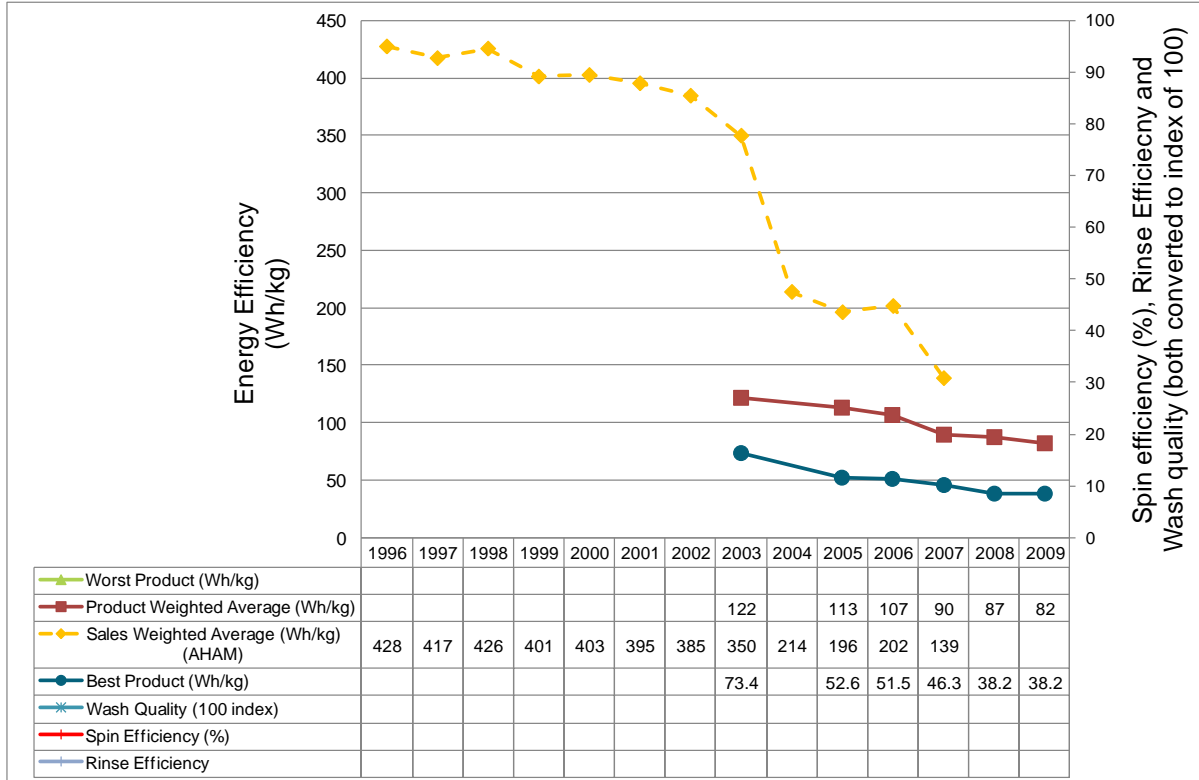
<p>Washing machines, defined as:  <i>'An appliance for cleaning and rinsing of textiles using water which is principally designed for use within a domestic environment. The appliance may draw water from a cold and/or hot water supply and may also have a means of extracting excess water from the textiles.'</i></p> <p>Data will be analysed for the following types of washing machine :</p>		
Technology	User intervention	All Types - Automatic, semi-automatic and manual
	Orientation	All Types - Horizontal (front loaders) and Vertical Plane (top loader)
	Configuration	All Types - Drum, Impeller, Agitator, Nutators Exclude all types of Washer/Dryer
	Coin/Card Operation	All Types
	Water intake	All Types - Hot fill/cold fill
	Spin Speed	All Speeds
Other variables	Capacity	Consider only units between 1Kg - 13kg (Use kWh/Kg as metric)

The detailed product definitions can be found at the Annex website:

<http://mappingandbenchmarking.iea-4e.org/matrix>



## Energy Efficiency of New Washing Machines



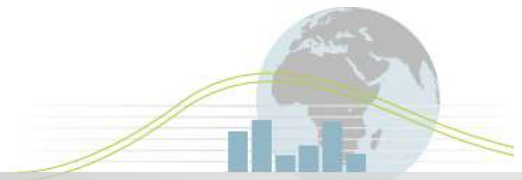
### Key notes on Graph (see notes section 1)

- Product weighted and best data is from the Energy Star<sup>1</sup> database of accredited products and therefore only cover the better performing products in the USA market. The ‘worst product’ from this data set is not representative and is therefore not plotted.
- Sales weighted data is technically “shipment weighted”<sup>2</sup> AHAM data for the entire US market. Data was provided for consumption in a standard cycle and for machine capacity in cubic feet. Load capacities have been converted to loads (kg) using the table which defines test loads in the US test methodology. The result was then used with the consumption data to calculate an efficiency figure.
- Energy Star data represents only a proportion of the total database due to various issues with data quality. Analysis was also undertaken on earlier years but insufficient entries were usable making the analysis unrepresentative of the dataset and these are therefore not presented here.

<sup>1</sup> For information on the Energy Star Programme for Clothes washers – see:

[http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product.showProductGroup&pgw\\_code=CW](http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW)

<sup>2</sup> Sales weighted data represents the average products sold to consumers in the market while shipment weighted data represents the average unit shipped by companies within the market. The former can therefore include imported products unlike the latter which will also include exported products. Sales weighted data is therefore a truer representation of the purchasing trends within a market.

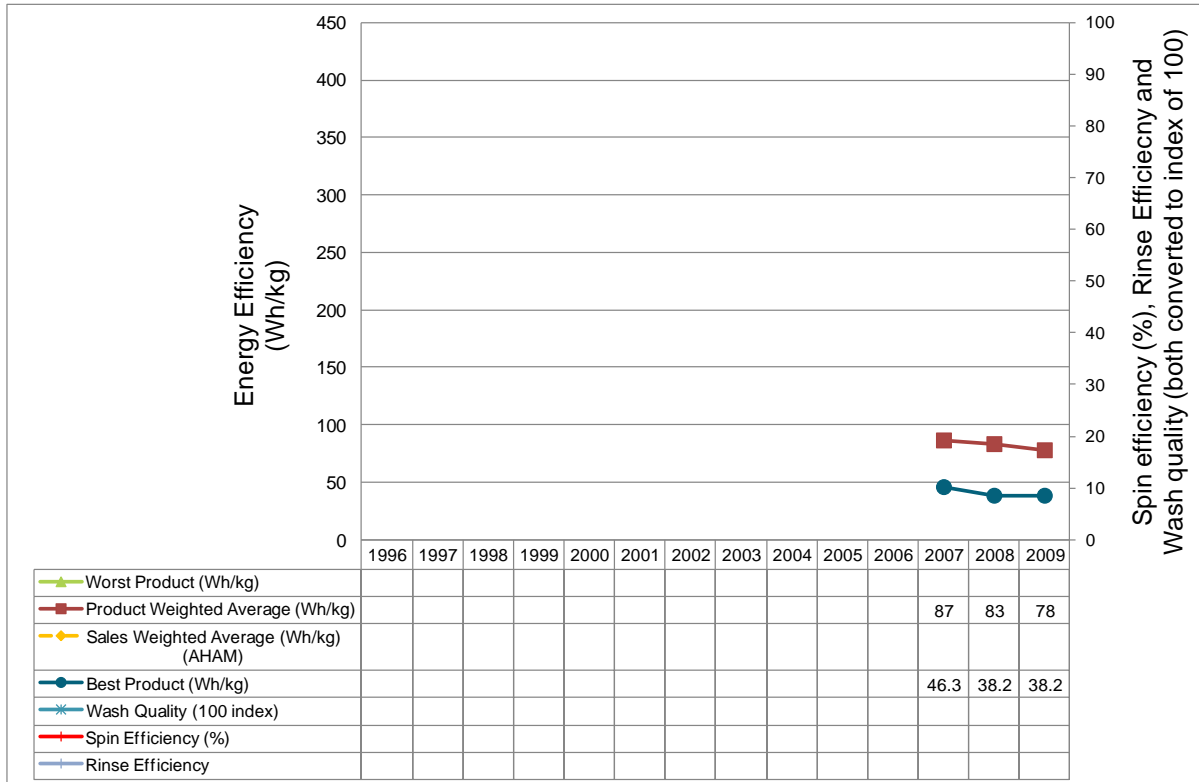


## Energy Efficiency of New Top Loader Washing Machines

Insufficient data was available to the mapping and benchmarking annex at the time of publication to produce this graphic.



## Energy Efficiency of New Front Loader Washing Machines USA Energy Star only

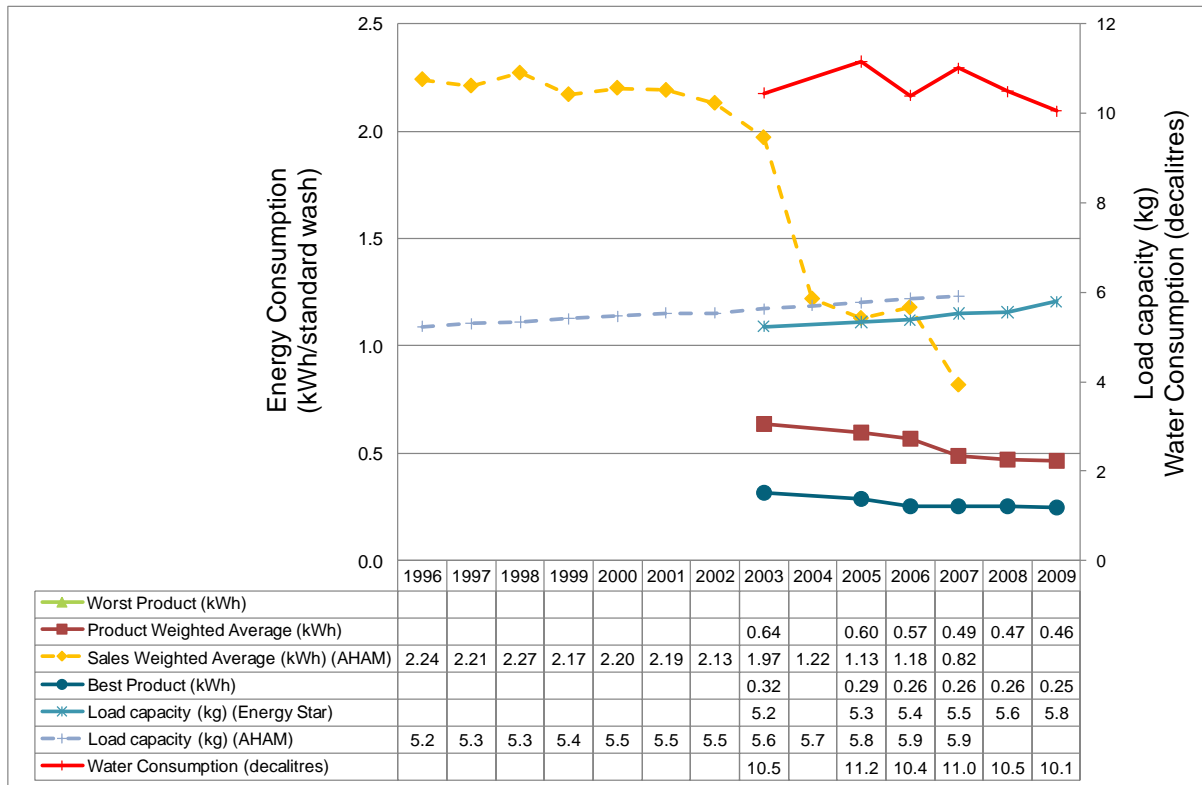


### Key notes on Graph (see notes section 1)

- Product weighted and best data is from the Energy Star<sup>3</sup> database of accredited products and therefore only cover the better performing products in the USA market. The 'worst product' from this data set is not representative and is therefore not plotted.
- Sales weighted data from AHAM separated by machine orientation was not available to the mapping and benchmarking annex at the time of publication.
- Energy Star data represents only a proportion of the total database due to various issues with data quality. Analysis was also undertaken on earlier years but insufficient entries were usable making the analysis unrepresentative of the dataset and these are therefore not presented here.

<sup>3</sup> For information on the Energy Star Programme for Clothes washers – see: [http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product.showProductGroup&pgw\\_code=CW](http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW)

## Energy Consumption of New Washing Machines



### Key notes on Graph (See notes section 2)

- Product weighted and best data is from the Energy Star<sup>4</sup> database of accredited products and therefore only cover the better performing products in the USA market. The ‘worst product’ from this data set is not representative and is therefore not plotted.
- Energy Star data represents only a proportion of the total database due to various issues with data quality. Analysis was also undertaken on earlier years but insufficient entries were usable making the analysis unrepresentative of the dataset and these are therefore not presented here.
- Sales weighted data is technically “shipment weighted”<sup>5</sup> AHAM data for the entire US market.
- Load capacities have been converted from Container Volumes (cubic feet) to loads (kg) using the table which defines test loads in the US test methodology.

<sup>4</sup> For information on the Energy Star Programme for Clothes washers – see:

[http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product.showProductGroup&pgw\\_code=CW](http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW)

<sup>5</sup> Sales weighted data represents the average products sold to consumers in the market while shipment weighted data represents the average unit shipped by companies within the market. The former can therefore include imported products unlike the latter which will also include exported products. Sales weighted data is therefore a truer representation of the purchasing trends within a market.

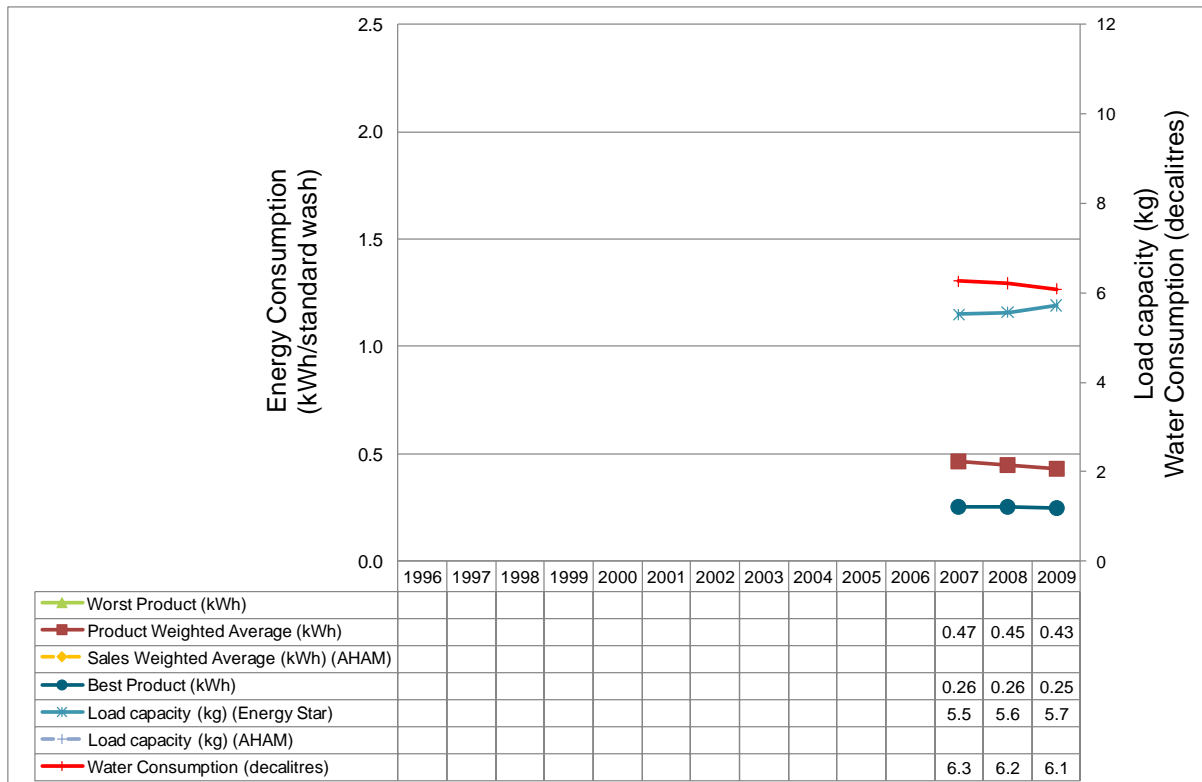


## Energy Consumption of New top loader Washing Machines

Insufficient data was available to the mapping and benchmarking annex at the time of publication to produce this graphic.



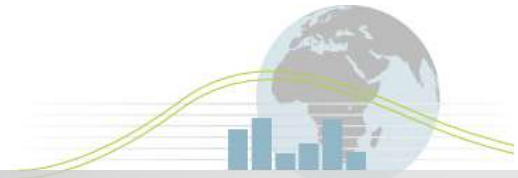
## Energy Consumption of New front loader Washing Machines USA Energy Star only



### Key notes on Graph (See notes section 2)

- Product weighted and best data is from the Energy Star<sup>6</sup> database of accredited products and therefore only cover the better performing products in the USA market. The 'worst product' from this data set is not representative and is therefore not plotted.
- Energy Star data represents only a proportion of the total database due to various issues with data quality. Analysis was also undertaken on earlier years but insufficient entries were usable making the analysis unrepresentative of the dataset and these are therefore not presented here.
- Load capacities have been converted from Container Volumes (cubic feet) to loads (kg) using the table which defines test loads in the US test methodology.
- Sales weighted data from AHAM separated by machine orientation was not available to the mapping and benchmarking annex at the time of publication.

<sup>6</sup> For information on the Energy Star Programme for Clothes washers – see: [http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product.showProductGroup&pgw\\_code=CW](http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW)



## Energy Efficiency in the Installed Washing Machines Stock USA

Data on the installed washing machines stock was not available to the mapping and benchmarking annex at the time of publication.







## Energy Consumption in the installed Washing Machines Stock USA

Data on the installed washing machines stock was not available to the mapping and benchmarking annex at the time of publication.



## Major Policy Interventions (See notes Section 5)

The USA has three primary federal policy interventions related to washing machines (referred to locally as residential clothes washers):

- **Minimum Energy Performance Standards (MEPS):** MEPS became effective for Washing Machines on May 14, 1994 and have been revised several times since. The most recent revision was undertaken as part of the 2007 the Energy Independence and Security Act of 2007 (EISA 2007)<sup>7</sup> with the new regulations becoming effective January 1. EISA 2007 also directed the Department of Energy to publish a final rule no later than December 31, 2011 to be effective for models beginning in January 2015.
- **EnergyGuide (Mandatory Labelling):** The USA has a mandatory requirement to display the EnergyGuide Label on all Washing Machines. In August, the design and content of the EnergyGuide label was revised and displays estimated yearly operating costs prominently for most appliance types. It aims to provide consumers with a clear context to compare the energy efficiency of different appliance models. It also will help consumers assess trade-offs between the energy costs of their appliances and other expenditures.
- **ENERGY STAR Voluntary Labelling:** ENERGY STAR is a Voluntary Labelling programme which seeks to help consumers identify higher performing products that meet a range of performance standards. Clothes washers originally qualified for the ENERGY STAR labelling in May, 1997. Clothes washers that have earned the ENERGY STAR label are 30% more efficient than non-qualified models and are more efficient than models that simply meet the federal minimum standard for energy efficiency.

In addition there are a large number of regional, state and local policy interventions by a large number of bodies. Such intervention range from state based MEPS through major procurement activities (eg utility DSM programmes), often driven by requirements in states such as California and/or based on Energy Star qualified products.

A very recent announcement regarding the future voluntary improvement of Appliances (including Washing Machines) has recently been made by AHAM and ACEEE. Limited details are available at the time of publication.

<sup>7</sup> Source: [http://www1.eere.energy.gov/buildings/appliance\\_standards/eisa2007.html](http://www1.eere.energy.gov/buildings/appliance_standards/eisa2007.html)





## Cultural Issues (See Notes Section 6)

Historically, the U.S. market for clothes washers has consisted of top-loading, vertical-axis washers with an agitator. In recent years, with the updating of new energy efficiency standards, manufacturers have started building and selling horizontal-axis or tumble washers in the U.S.

The introduction of more efficient clothes washers to the U.S. market may lead to greater similarities to European designs, but U.S. consumer preferences may temper this trend. Typically, clothes washers in the United States are relatively large, and most consumers have matching clothes dryers. Although 79 percent of U.S. households have a clothes washer, only 11 percent of those units are ENERGY STAR qualified.

U.S. Market Estimates:

- Top loading machines: 65% of the total installed base
- Front loading machines: 35% of the total installed base

The 19 years covered by the Residential Energy Consumption surveys (RECS) have seen continuous and large increases in appliance use in U.S. households; however, the installation average basis of clothes washers has remained about the same over these past 19 years (from 74% in 1978 to 79% in 2001). The 2001 RECS notes that the percent of housing units with clothes washers increases from 57 percent for the lowest income level to 94 percent for the highest income level.

According to Department of the Environment, the average number of washes per year per household in the U.S. is 392<sup>8</sup>.

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<sup>8</sup> Source: [http://www.energystar.gov/ia/partners/manuf\\_res/downloads/ClothesWasher\\_PRG.pdf](http://www.energystar.gov/ia/partners/manuf_res/downloads/ClothesWasher_PRG.pdf).



## Notes on data

### Section 1: Notes on New Product Efficiency

#### 1.1 Test methodologies and Performance Standards

##### 1.1.1 Regulatory Scope

The US Department of Energy (DOE) test procedure defined in 10 CFR 430, Subpart B<sup>9</sup>.

Regulations apply to:

- “Compact” type includes all household clothes washers with a tub capacity of less than 1.6 cu. ft. or 13 gallons of water.
- “Standard” type includes all household clothes washers with a tub capacity of 1.6 cu. ft. or 13 gallons of water or more.

Energy Star<sup>10</sup>, products are restricted to front and top loader clothes washers with capacities of greater than 1.6 ft<sup>3</sup>, and which have Adaptive Water Fill Control Systems (AWFCS), ie a system which automatically adjusts the amount of water used to wash a load based on the size and weight of the particular clothing load. Further, for Energy Star qualifications, MEF must be determined by the J1 test procedure<sup>11</sup>.

##### 1.1.2 Test methodology

Association of Home Appliance Manufacturers Performance Evaluation Procedure for Household Washers ANSI/AHAM HLW-1-2007<sup>12</sup>.

##### 1.1.3 Key Testing Parameters and Regulatory Requirements

### Summary of requirements

The first regulations for washing machines were issued on May 14, 1991 and set minimum performance standards which became effective on May 14, 1994 (refer Notes Section 5 on Policy below)

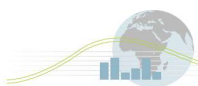
In January 2001 DOE published new standards for clothes washers, which took effect in two stages. The first stage, effective 2004, requires a 1.04 MEF<sup>13</sup> (Modified Energy Factor). In 2007, this rose to 1.26 MEF (the higher the MEF, the higher the efficiency).

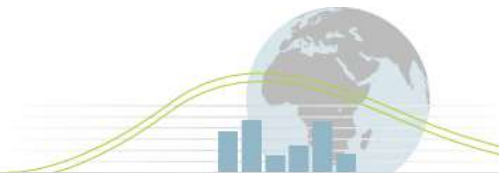
<sup>9</sup> For details pertaining to the temperature of feed water and wash/rinse water for the test cycle, and details of the test cycle itself (including characteristics/type of load and detergent, please see <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=c67796e2d2a23bdb78c6b0426d2a70bf&rgn=div9&view=text&node=10:3.0.1.4.16.2.9.6.11&idno=10>.

<sup>10</sup> [http://www.energystar.gov/index.cfm?c=clotheswash\\_pr\\_crit\\_clothes\\_washers](http://www.energystar.gov/index.cfm?c=clotheswash_pr_crit_clothes_washers)

<sup>11</sup> ENERGY STAR Program Requirements for Clothes Washers, Partner Commitments. Final Version 7 March 2008

<sup>12</sup> Available for purchase at <http://www.aham.org/ht/d/ProductDetails/sku/4045-110-140/from/714/pid/5132>.





In 2007, the Congress enacted H.R. 6, setting the first-ever minimum water efficiency requirements for clothes washers. (Minimum energy efficiency requirements were left unchanged from existing levels set by DOE which became effective in January 2007.)

The Energy Independence and Security Act (EISA)<sup>14</sup> of December 2007 revised energy conservation standards for residential clothes washers, effective January 1, 2011 which initiated a DOE rulemaking to amend energy conservation standards for residential clothes washers on September 21, 2009. Effective January 1st, 2011, residential clothes washers must be manufactured with a MEF of at least 1.26 and a water factor of 9.5 or less.

### Additional Energy Star Requirements

For compliance with ENERGY STAR, products must follow 10 CFR 430, Subpart B, **Appendix J1**. The J1 Appendix includes test provisions for machines with Adaptive Water Fill Control Systems (AWFCS). This control scheme determines automatically the amount of water used to wash a load based on the size and weight of the particular clothing load. MEF must be determined by the J1 test procedure<sup>15</sup>.

A summary of key recent and upcoming regulatory requirements is<sup>16</sup>:

	As of January 1, 2007	As of January 1, 2009	As of January 1, 2011
ENERGY STAR	MEF ≥ 1.72, WF ≤ 8.0	MEF ≥ 1.80, WF ≤ 7.5	MEF ≥ 2.0, WF ≤ 6.0
Federal Standard	1.04 MEF <sup>17</sup>	MEF ≥ 1.26	MEF ≥ 1.26, WF ≤ 9.5

<sup>13</sup> MEF: The present energy efficiency measure for all clothes washers. MEF is the quotient of the cubic foot capacity of the clothes container divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load. The units are cubic feet per kWh per cycle (ft<sup>3</sup>/kWh/cycle).

<sup>14</sup> [http://www1.eere.energy.gov/buildings/appliance\\_standards/eisa2007.html](http://www1.eere.energy.gov/buildings/appliance_standards/eisa2007.html)

<sup>15</sup> ENERGY STAR Program Requirements for Clothes Washers, Partner Commitments. Final Version 7 March 2008

<sup>16</sup> Source: Internal Document Supplied by US Energy Star : “Washing Machines\_Data Request\_Revision Including Wash Test Temperature and Orientation\_14 December 2009”

<sup>17</sup> Effective 2004.





## Summary Details of Testing Requirements

<b>Standard Number (test)</b>	<i>Appendix J1 to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Automatic and Semi-Automatic Clothes Washers (appendix J1 required for Energy Star Compliant Tests)</i>
<b>Standard Scope</b>	<i>Compact clothes washers with clothes container capacity of less than 1.6 ft<sup>3</sup> (45 L); Standard clothes washers with clothes container capacity of 1.6 ft<sup>3</sup> (45 L) or greater.</i>
<b>Voltage</b>	<i>120V 60Hz</i>
<b>Test Cycle</b>	<i>Variable depending on washer unit type, water and temperature control.</i>
<b>Load/Capacity</b>	<p><i>Capacity of unit defined by maximum amount of water that can be held in the "clothes container" (measured by sealing clothes container with plastic coating and filling with water)</i></p> <p><i>Maximum, minimum, and, when required, average test load sizes shall be determined using Table 5.1 and the clothes container capacity as measured in 3.1.1 through 3.1.5</i></p> <p><i>Table 2.8 defines the test load sizes, load make up and corresponding water fill settings which are to be used when measuring water and energy consumptions. (see table 2.8 in <a href="http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&amp;sid=c67796e2d2a23bdb78c6b0426d2a70bf&amp;rgn=div9&amp;view=text&amp;node=10:3.0.1.4.16.2.9.6.11&amp;idno=10">http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&amp;sid=c67796e2d2a23bdb78c6b0426d2a70bf&amp;rgn=div9&amp;view=text&amp;node=10:3.0.1.4.16.2.9.6.11&amp;idno=10</a>)</i></p>
<b>Water Supply</b>	<p><i>Clothes washers in which electrical energy consumption or water energy consumption are affected by the inlet water temperature. (For example, water heating clothes washers or clothes washers with thermostatically controlled water valves.). The temperature of the hot water supply at the water inlets shall not exceed 135 °F (57.2 °C) and the cold water supply at the water inlets shall not exceed 60 °F (15.6 °C).</i></p> <p><i>Clothes washers in which electrical energy consumption and water energy consumption are not affected by the inlet water temperature. The temperature of the hot water supply shall be maintained at 135 °F±5 °F (57.2 °C±2.8 °C) and the cold water supply shall be maintained at 60 °F±5 °F (15.6 °C±2.8 °C).</i></p>





<p><b>Water Test Temperature</b></p>	<p>Variable depending on washer unit type, water and temperature control. Typical tests uses (adjusted) average of a combination of temperatures</p>
<p><b>Energy Consumption per Cycle</b></p>	<p>The total clothes washer energy consumption per cycle, with such energy consumption expressed as the (adjusted) sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load.</p> <p>Consumption is typically averaged across a number of cycle types.</p>
<p><b>Cycle Efficiency</b></p>	<p>Modified Energy Factor (MEF) is the quotient of the cubic foot capacity of the clothes container divided by the total clothes washer energy consumption per cycle (ft<sup>3</sup>/kWh/cycle).</p> <p>Prior to 2004, Energy Factor (EF) used with differing derivation.</p>
<p><b>Measurement of Water Consumption</b></p>	<p>WF is the quotient of the total weighted per-cycle water consumption, divided by the capacity of the clothes washer.</p> <p>Total weighted per-cycle water consumption is variable depending on washer unit type, water and temperature control and is typically averaged across a number of cycle types.</p>
<p><b>Spin Extraction Ratio</b></p>	<p>Typically: <math>((\text{Weight of Test Load After Cycle} - \text{Weight of Bone Dry Test Load}) / \text{Weight of Bone Dry Test Load}) \times 100</math>, with slight modifications depending on unit type and wash temperatures. Maximum Load Capacity required for the test.</p> <p>Bone-dry means a condition of a load of test cloth which has been dried in a dryer at maximum temperature for a minimum of 10 minutes, removed and weighed before cool down, and then dried again for 10 minute periods until the final weight change of the load is 1 percent or less.</p>

## 1.2 Product Efficiency Graphic

### 1.2.1 Data Source

All data is from the Energy Star register except Sales weighted data which is supplied courtesy of the Association of Home Appliance Manufacturers (AHAM) report - Clothes Washers Energy Efficiency and Consumption Trends (6-2008).



### 1.2.2 Data Clarifications

#### Original Data Limitations

All Energy Star data is only representative of the products in the market that meet the current Energy Star criteria. Graphics are not therefore representative of the entire US market.

AHAM data is presented as provided which is in a consolidated form.

#### Proportion of data set excluded

The Energy Star data is published from the Archive database and required various entries to be removed for a number of reasons. A summary is provided in the table below:

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total entries in archived dataset	2501	2501	2501	2501	2501	2501	2501	2501	2501	2501	2501	2501	2501
Removed because entry had no qualification date	348	348	348	348	348	348	348	348	348	348	348	348	348
Removed because entry had not yet qualified or was no longer manufactured	1992	1981	1820	1703	1550	1345	1075	874	1356	1452	1274	1176	1110
Removed due to no Value for product MEF	0	0	0	0	500	659	668	666	114	0	0	0	0
Removed due to not meeting Energy Star criteria (EF or MEF)	157	165	314	422	24	47	143	608	338	283	521	521	540
Final number analysed	4	7	19	28	79	102	267	5	345	418	358	456	503
Final number analysed top loader	0	0	0	1	3	3	14	0	54	56	29	50	71
Final number analysed front loader	0	0	0	2	5	13	31	0	109	181	255	321	386

A minimum number of 200 entries were set to select which years for which the analysis of products would be presented.

### 1.2.3 Key calculations undertaken

Key calculations on data are as follows:

**Declared Unit Load Capacity:** Unit load capacity in kg is defined by local regulations and declared by manufacturers (Unit kg).

(Note: This capacity is defined using the mixture of materials defined in the local regulations which is not necessarily in line with the mixture of material used elsewhere (for local load mix, refer to Section 1.1 on “Notes on Data”).

**Model Energy Consumption:** Model Energy Consumption is the energy consumed by the unit to complete one wash cycle as defined by local test conditions (Unit: kWh/wash).

**Sales Weighted Energy Consumption of New Models:** Value calculated by [Sum of (Model Energy Consumption multiplied by sales volume of Model in year) for all Models] divided by [Sum of (sales volume of all Models in year)]. Unit kWh/wash.







**Model Weighted Consumption of New Models:** Value calculated by [Sum of (Model Energy Consumption for all models sold in year)] divided by [Sum of (Number of Models sold in year)]. Unit kWh/wash.

**Model Energy Efficiency:** Value calculated by dividing Model Energy Consumption by Declared Unit Load Capacity (kWh/Kg/Wash).

**Sales Weighted Energy Efficiency of New Models:** Value calculated by [Sum of (Derived Model Energy Efficiency multiplied by sales volume of Model in year) for all Models] divided by [Sum of sales volume of all Models in year]. Unit kWh/kg/Wash.

**Model Weighted Energy Efficiency of New Models:** Value calculated by [Sum of Model Energy Efficiency for all models sold in year] divided by [Number of Models sold in year]. Unit kWh/Kg/Wash.

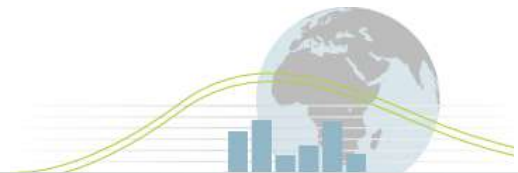
**Spin Efficiency:** The efficiency of removal of water from the test load as defined in local test conditions (refer to Section 1.1 on “Notes on Data”).

**Wash Quality:** The efficiency of cleansing of test load as defined in local test conditions (refer to Section 1.1 on “Notes on Data”).

**Rinse Efficiency:** The efficiency of removal of detergent, softener or other additive from the test load as defined in local test conditions (Unit: comparative percentage).

**Spin Speed:** The highest spin speed attainable by the unit (Unit: revolutions per minute – rpm).



**Section 2: Notes on Product Consumption****2.1 Test methodologies, Performance Standards and Labelling Requirements**

Refer to section 1.1

**2.2 Product Consumption Graphic**

Refer to section 1.2

**Section 3: Notes on the Efficiency and Consumption of Units in the Installed Stock**

None.

**Section 4: Notes on Consumption of Stock**

None.



## Section 5: Notes on Policy Interventions

### 5.1 Regulatory Requirements for Minimum Standards and EnergyGuide

#### 5.1.1 Statutory Authority

The Energy Policy and Conservation Act (42 U.S.C. 6291, et seq.) (title III) established the Energy Conservation Program for Consumer Products Other than Automobiles, covering major household appliances including residential clothes washers.

Later, the National Appliance Energy Conservation Act of 1987 amended EPCA by establishing energy conservation standards for residential clothes washers and requiring the U.S. Department of Energy (DOE) to consider amending standards in two subsequent rulemakings. The final Rule was published May 14, 1991 and set minimum performance standards which became effective on May 14, 1994

In November 1994, the US Department of Energy (DOE) restarted the second energy conservation standards rulemaking for clothes washers, and other household appliances, and again in November 1998. On January 12, 2001, DOE published a final rule revising the energy conservation standards, which became effective in two phases—January 1, 2004 and January 1, 2007.

In 2007, the Energy Independence and Security Act of 2007 (EISA 2007)<sup>18</sup> revised energy conservation standards for residential clothes washers, effective January 1, 2011 which initiated a DOE rulemaking to amend energy conservation standards for residential clothes washers on September 21, 2009. EISA 2007 also directed the DoE to publish a final rule no later than December 31, 2011 to be effective for models beginning in January 2015.

#### 5.1.2 Previous Federal Register Notices and Technical Support Documents<sup>19</sup>

- Energy Conservation Program for Consumer Products: Test Procedure for Clothes Washers Direct Final Rule and Proposed Rule, *Federal Register*, 68 FR 62198, October, 31, 2003
- Energy Conservation Program for Consumer Products: Test Procedure for Clothes Washers Notice of Proposed Rulemaking, *Federal Register*, 68 FR 62205, October 31, 2003
- Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards Final rule; Denial of reconsideration and completion of regulatory review, *Federal Register*, 66 FR 19714, April 17, 2001
- Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards Final Rule, *Federal Register*, 66 FR 3314, January 12, 2001

<sup>18</sup> Source: [http://www1.eere.energy.gov/buildings/appliance\\_standards/eisa2007.html](http://www1.eere.energy.gov/buildings/appliance_standards/eisa2007.html)

<sup>19</sup> Source: [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/clothes\\_washers.html](http://www1.eere.energy.gov/buildings/appliance_standards/residential/clothes_washers.html)



- Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards Notice of Proposed Rulemaking, *Federal Register*, 65 FR 59550, October 5, 2000
- Energy Efficiency Standards for Clothes Washers Technical Support Document, December 2000
- Energy Conservation Program for Consumer Products: Test Procedure for Clothes Washers and Reporting Requirements for Clothes Washers, Clothes Dryers, and Dishwashers Final Rule, *Federal Register*, 62 FR 45484, August 27, 1997

### 5.1.3 EnergyGuide (Mandatory Labelling)

The USA has a mandatory requirement to display the EnergyGuide Label on all Washing Machines.

The Federal Trade Commission announced in August, 2007 that it has concluded a two-year review of the FTC's Appliance Labelling Rule (16 C.F.R. Part 305) and, after substantial public comment and consumer research, has amended the Rule to improve the design and content of the EnergyGuide label required on most new appliances sold in the United States<sup>20</sup>. The yellow EnergyGuide label, familiar to most appliance shoppers, helps consumers compare the "operating costs" of competing models and aids them in identifying high-efficiency models that will reduce their energy use.

The new EnergyGuide label has a streamlined look and will display estimated yearly operating costs prominently for most appliance types. This estimated cost information, which will appear on the labels in dollars per year, will provide consumers with a clear context to compare the energy efficiency of different appliance models. It also will help consumers assess trade-offs between the energy costs of their appliances and other expenditures. The new EnergyGuide label design will continue to display energy consumption information (e.g., annual electricity use) as a secondary disclosure for most labelled products.

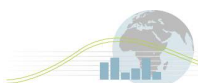
NOTE: The Energy Factor, Modified Energy Factor, or Water Factor may not appear on the EnergyGuide label<sup>21</sup>.

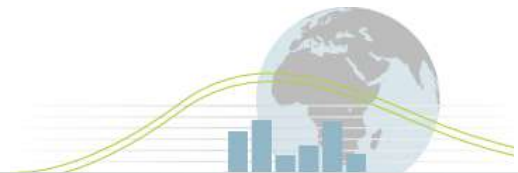
### 5.2 ENERGY STAR Voluntary Labelling

ENERGY STAR is a Voluntary Labelling programme which seeks to help consumers identify higher performing products that meet a range of performance standards. Clothes washers originally qualified for the ENERGY STAR labelling in May, 1997. Clothes washers that have earned the ENERGY STAR label are 30% more efficient than non-qualified models and are more efficient than models that simply meet the federal minimum standard for energy efficiency.

<sup>20</sup> <http://www.ftc.gov/os/2007/08/070807appliancerule.pdf>

<sup>21</sup> [http://www.energystar.gov/index.cfm?c=clotheswash.pr\\_crit\\_clothes\\_washers](http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers)





The proportion of Energy Star products sold (as a proportion of total sales) has been as follows (note change in qualification requirements in 2007 and that all figures may not have been calculated on a comparative basis)<sup>22</sup>:

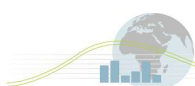
Year	Energy Star Qualified Products as Percentage of Total Sales
2002	16.30%
2003	23.07%
2004	27.23%
2005	36.45%
2006	37.93%
2007	41.62%
2008	23.70%

### 5.3 ENERGY STAR Voluntary Labelling

A very recent announcement regarding the future voluntary improvement of Appliances (including Washing Machines) has recently been made by AHAM and ACEEE. Limited details are available at the time of publication. For additional information refer to:

[http://campaign.constantcontact.com/render?v=001BVj8qibBdX2L\\_wAG\\_t0NC5fSZYwOHsMZd0tHiKB0z5Ofq9u8PhTAmFPMYHFdkg8VhxMNOOOIsjDw3Pugik9yQIJgM3MHXw6EqMlBoEludeGK24tupehr641ONK2zeFnMVnjAMY8UoCVs4PtcB4\\_15cjwAp3vsRvoePVODzmWNLu4QcvhyOnl1o5vwuCWk4CDNHXcjrpomA%3D](http://campaign.constantcontact.com/render?v=001BVj8qibBdX2L_wAG_t0NC5fSZYwOHsMZd0tHiKB0z5Ofq9u8PhTAmFPMYHFdkg8VhxMNOOOIsjDw3Pugik9yQIJgM3MHXw6EqMlBoEludeGK24tupehr641ONK2zeFnMVnjAMY8UoCVs4PtcB4_15cjwAp3vsRvoePVODzmWNLu4QcvhyOnl1o5vwuCWk4CDNHXcjrpomA%3D)

<sup>22</sup> [http://www.energystar.gov/index.cfm?c=manuf\\_res.pt\\_appliances#asd](http://www.energystar.gov/index.cfm?c=manuf_res.pt_appliances#asd)





## **Section 6: Notes on Cultural Issues**

No additional notes.

