# National Efficiency Standards and Specifications

for Residential and Commercial Water-Using Fixtures and Appliances

(Compiled from information provided by the Alliance for Water Efficiency, U.S. EPA Office of Water, U.S. Dept. of Energy, Energy Star, CEE, NRDC, and other sources)

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<tr>
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<tbody>
<tr>
<td><strong>Residential Toilets</strong> (Water Closets)</td>
<td>≤ 1.6 gpf(^1)</td>
<td><strong>Current Standard</strong></td>
<td><strong>Proposed/Future Standard</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 1.28 gpf/ 4.8 Lpf</td>
<td>informally proposed by efficiency advocates (tank-type only)</td>
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<tr>
<td></td>
<td></td>
<td>≤ 2.2 gpm at 60 psi(^2)</td>
<td>informally proposed by efficiency advocates</td>
</tr>
<tr>
<td><strong>Residential Lavatory (Bathroom) Faucets</strong></td>
<td>≤ 1.5 gpm/ 5.7 Lpm</td>
<td>informally proposed by efficiency advocates</td>
<td>WaterSense v.1.0: ≤ 1.5 gpm &amp; 0.8 gpm minimum at 20 psi</td>
</tr>
<tr>
<td><strong>Residential Kitchen Faucets</strong></td>
<td>≤ 2.2 gpm at 60 psi(^2)</td>
<td></td>
<td>WaterSense: No specification</td>
</tr>
<tr>
<td><strong>Residential Showerheads</strong></td>
<td>≤ 2.5 gpm at 80 psi</td>
<td></td>
<td>WaterSense v.1.0: ≤ 2.0 gpm with special spray force &amp; coverage requirements</td>
</tr>
</tbody>
</table>

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\(^1\) EPAct 1992 standard for toilets applies to both commercial and residential models.

\(^2\) EPAct 1992 standard for faucets applies to both commercial and residential models.

**Definitions**

- DOE: Department of Energy
- EPA: Environmental Protection Agency
- APF: Appliance Performance Factor
- gpf: gallons per flush
- gpm: gallons per minute
- Lpf: litres per flush
- MEF: Modified Energy Factor
- MaP: Maximum Performance
- kWh: kilowatt hour
- psi: pounds per square inch
- ft\(^3\): cubic feet
- MaP: Maximum Performance

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**Notes**

- www.map-testing.com
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<tbody>
<tr>
<td></td>
<td>Current Standard</td>
<td>Proposed/Future Requirements</td>
<td>Current Specification</td>
</tr>
<tr>
<td>Residential Clothes Washers</td>
<td>Top-loading standard models: MEF ≥ 1.29 ft³/kWh/cycle (after Jan 1, 2018, the MEF increases to 1.57) Integrated WF ≤ 8.4 gal/cycle/ft³ (NOTE: after Jan 1, 2018, the IWF decreases to 6.5)</td>
<td>Energy Star (DOE): Effective March 7, 2015 for 1.6 to 6.0 cubic feet Top-loading models (&gt; 2.5 cu. ft.): IMEF ≥ 2.06 ft³/kWh/cycle. Integrated WF ≤ 4.3 gal/cycle/ Front-loading models (&gt; 2.5 cu. ft.): IMEF ≥ 2.38 ft³/kWh/cycle Integrated WF ≤ 3.7 gal/cycle/ Compact models (≤ 2.5 cu. ft.): IMEF ≥ 2.07 ft³/kWh/cycle Integrated WF ≤ 4.2 gal/cycle/</td>
<td>Effective March 7, 2015 Tier 1: MEF ≥ 2.38 ft³/kWh/cycle; WF ≤ 3.7 gal/cycle/ft³ Tier 2: MEF ≥ 2.74 ft³/kWh/cycle; WF ≤ 3.2 gal/cycle/ft³ Tier 3: MEF ≥ 2.92 ft³/kWh/cycle; WF ≤ 3.2 gal/cycle/ft³</td>
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<td>Front-loading standard models: MEF ≥ 1.84 ft³/kWh/cycle Integrated WF ≤ 4.7 gal/cycle/Top-loading compact models: MEF ≥ 0.86 ft³/kWh/cycle (after Jan 1, 2018, the MEF increases to 1.15) Integrated WF ≤ 14.4 gal/cycle/ft³ (NOTE: after Jan 1, 2018, the IWF decreases to 12.0)</td>
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<td>Front-loading compact models: MEF ≥ 1.13 ft³/kWh/cycle Integrated WF ≤ 8.3 gal/cycle/Note: MEF measures energy consumption of the total laundry cycle (wash + dry). The higher the number, the greater the energy efficiency</td>
<td></td>
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</table>

DOE: Department of Energy
EPA: Environmental Protection Agency
WF: water factor
gal: gallons
ft³: cubic feet
kWh: kilowatt hour
MEF: modified energy factor
pounds per square inch
Lpf: Litres per flush
NAECA: National Appliance Energy Conservation Act
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|------------------------|-------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------|
| Standard Size and Compact Residential Dishwashers<sup>3</sup> | Final Rule of DOE, effective 5/30/2013:  
STANDARD Size Models:  
Energy: ≤ 307 kWh/year  
WF ≤ 5.0 gallons/cycle  
COMPACT Models:  
Energy: ≤ 222 kWh/yr  
WF ≤ 3.5 gallons/cycle | Energy Star  
Effective Jan 29, 2016  
STANDARD Size Models:  
Energy: ≤ 270 kWh/year  
WF ≤ 3.5 gallons/cycle  
COMPACT Models:  
Energy: ≤ 203 kWh/year  
WF ≤ 3.1 gallons/cycle | Effective Jan. 29, 2016  
Standard size models (8 place settings or more):  
270 max kWh/year;  
WF ≤ 3.5 gallons/cycle  
Compact size models (hold fewer than 8 place settings):  
203 max kWh/year;  
WF ≤ 3.1 gallons/cycle |

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<sup>3</sup> Standard models: capacity is greater than or equal to eight place settings and six serving pieces; Compact models: capacity is less than eight place settings and six serving pieces
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<tbody>
<tr>
<td>Commercial Toilets (Water Closets)</td>
<td>≤ 1.6 gpf⁴/6.0 Lpf</td>
<td>≤ 1.28 gpf - 4.8 Lpf</td>
<td>Tank-type toilets: WaterSense v.1.2 = ≤ 1.28 gpf (4.8L) with at least 350 gram bulk waste removal.</td>
</tr>
<tr>
<td></td>
<td>Except blow-out fixtures: ≤ 3.5-gpf/13 Lpf</td>
<td>Informally proposed by some efficiency advocates (tank-type only)</td>
<td>Flushometer valve/bowl combinations: WaterSense v.1.0 = ≤ 1.28 gpf (4.8L) with at least 350 gram bulk waste removal</td>
</tr>
<tr>
<td>Commercial Urinals</td>
<td>≤ 1.0 gpf</td>
<td>≤ 0.5 gpf - 1.9 Lpf</td>
<td>WaterSense v.1.0 – Flushing urinals only = ≤ 0.5 gpf/1.9Lpf</td>
</tr>
<tr>
<td>Commercial Faucets</td>
<td>ANSI Standard: Private (single-user) faucets, including residential within commercial bldg = ≤2.2 gpm @ 60 psi⁵</td>
<td></td>
<td>WaterSense:</td>
</tr>
<tr>
<td></td>
<td>All other commercial (except metering) per ANSI product standard and model plumbing codes = ≤0.5 gpm at 60 psi⁵</td>
<td></td>
<td>No specification</td>
</tr>
<tr>
<td></td>
<td>Metering (auto shut off) faucets</td>
<td>≤0.25 gallons per cycle⁶ (no maximum flow rate)</td>
<td></td>
</tr>
</tbody>
</table>

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⁴ EPAct 1992 standard for toilets applies to both commercial and residential models.

⁵ In addition to EPAct requirements, the American Society of Mechanical Engineers/Canadian Standards Association standard for public lavatory faucets is 0.5 gpm at 60 psi (ASME A112.18.1/CSA B125.1). This maximum has been incorporated into the national model plumbing codes for all except private applications, private being defined as residential, hotel guest rooms, and health care patient rooms. All other applications subject to the 0.5 gpm/1.9 Lpm flow rate maximum.

⁶ Metering faucets not subject to flow rate maximum, but rather to a flow volume maximum.

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DOE: Department of Energy  
EPA: Environmental Protection Agency  
NAECA: National Appliance Energy Conservation Act  
WF: water factor  
IWF: integrated water factor  
gal: gallons  
ft³: cubic feet  
gpm: gallons per minute  
psi: pounds per square inch  
Lpf: litres per flush  
kWh: kilowatt hour  
MEF: modified energy factor  
MaP: maximum performance  
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<tr>
<td>Commercial Clothes Washers</td>
<td>The following requirements are effective through December 31, 2017:</td>
<td>Energy Star: Effective March 7, 2015</td>
<td>Energy Star: Effective March 7, 2015</td>
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<tr>
<td></td>
<td>Top loading machine:</td>
<td>≥ 2.2 MEF and ≤ 4.5 Integrated WF gal/cycle/ft³</td>
<td>For both front and top loaders (NOTE: defined as a soft-mounted front or top loading machine for use in common area and coin-op laundries with capacity greater than 1.6 cubic feet and not a combo washer-dryer; does NOT include multi-load, high-volume machines used in on-premise or commercial laundries)</td>
</tr>
<tr>
<td></td>
<td>Front-loading machine:</td>
<td>≥ 2.0 MEF and WF ≤ 5.5 gal/cycle/ft³</td>
<td></td>
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<td>The following more rigorous requirements apply beginning January 28, 2018.</td>
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<tr>
<td></td>
<td>Top loading machine:</td>
<td>≥ 1.35 MEF and Integrated WF ≤ 8.8 gal/cycle/ft³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Front-loading machine:</td>
<td>≥ 2.0 MEF and Integrated WF ≤ 4.1 gal/cycle/ft³</td>
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# National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

(Compiled from information provided by the Alliance for Water Efficiency, U.S. EPA Office of Water, U.S. Dept. of Energy, Energy Star, CEE, NRDC, and other sources)

|------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------|
| Commercial Dishwashers       | No standard     |                             | Energy Star v.2.0 - Effective February 1, 2013:  
**Under Counter:**  
Hi Temp:  \( \leq 0.86 \) gal/rack;  \( \leq 0.5 \) kW;  
Lo Temp:  \( \leq 1.19 \) gal/rack;  \( \leq 0.5 \) kW  
**Stationary Single Tank Door:**  
Hi Temp:  \( \leq 0.89 \) gal/rack;  \( \leq 0.7 \) kW;  
Lo Temp:  \( \leq 1.18 \) gal/rack;  \( \leq 0.6 \) kW  
**Pot, Pan, and Utensil:**  
Hi Temp:  \( \leq 0.58 \) gal/rack;  \( \leq 1.2 \) kW;  
Lo Temp:  \( \leq 0.58 \) gal/rack;  \( \leq 1.0 \) kW  
**Single Tank Conveyor:**  
Hi Temp:  \( 0.70 \) gal/rack;  \( \leq 1.5 \) kW;  
Lo Temp:  \( 0.79 \) gal/rack;  \( \leq 1.5 \) kW  
**Multiple Tank Conveyor:**  
Hi Temp:  \( 0.54 \) gal/rack;  \( \leq 2.25 \) kW;  
Lo Temp:  \( 0.54 \) gal/rack;  \( \leq 2.0 \) kW  
**Single Tank Flight Type:**  
Requires formula for both hi and low temp machines:  
Gallons per hour (gph)  
\( \leq 2.97 \) times sf of belt + 55  
**Multiple Tank Flight Type:**  
Requires formula for both hi and low temp machines:  
Gph  \( \leq 4.96 \) times sf of belt +17 | Specification is 8+ years old and is no longer applicable | CEE waiting for final test methods before reviewing possible changes to their specifications |

NOTE: See full Energy Star requirements for definitions and details.
### National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

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<tr>
<td></td>
<td>Proposed/Future Standard</td>
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<tr>
<td>Automatic Commercial Ice Makers</td>
<td>Current requirements effective January 1, 2010 to January 27, 2018. More rigorous requirements apply beginning January 28, 2018. Energy and condenser water efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table)</td>
<td>Energy Star v.2.0: Energy efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling. Water use thresholds are as follows: Air-cooled batch type machines: Maximum water use of 20 gallons per 100 lbs. of ice. Air-cooled continuous-type machines: Maximum water use of 15 gallons per 100 lbs. of ice. NOTE: Water cooled machines excluded from Energy Star See link to additional information at end of this table.</td>
<td>Effective July 1, 2011 Energy and water (potable and condenser) standards are tiered and vary by equipment type on a sliding scale depending upon harvest rate and type of cooling. Current provisions are less rigorous than Energy Star. (see link to additional information at end of this table)</td>
</tr>
<tr>
<td>Commercial Pre-rinse Spray Valves (for food service applications – does not apply to other valve applications, e.g., cooling, wetting, facility cleaning, etc.)</td>
<td>Prior to January 28, 2019: Flow rate ≤ 1.6 gpm (no pressure specified; no performance requirement) January 28, 2019 and following: Class 1 (≤ 0.5 ozf) – ≤ 1.0 gpf Class 2 (&gt;0.5 &amp; ≤8.0 ozf) – ≤ 1.2 gpf Class 3 (&gt;8.0 ozf) – ≤ 1.28 gpf</td>
<td>WaterSense v.1.0: Flow rate ≤ 1.28 gpm (incorporates other key performance requirements)</td>
<td>No change to existing specification is planned</td>
</tr>
</tbody>
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7 Optional standards for other types of automatic ice makers are also authorized under EPAct 2005.

**Abbreviations:**
- DOE: Department of Energy
- EPA: Environmental Protection Agency
- DOE: Department of Energy
- IQP: integrated water factor
- gpf: gallons per flush
- kWh: kilowatt hour
- gpm: gallons per minute
- psi: pounds per square inch
- Lpf: Litres per flush
- ft³: cubic feet
- MEF: modified energy factor
- MaP: maximum performance
- NAEC: National Appliance Energy Conservation Act
### National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

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|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Commercial Steam Cookers\(^8\) | No standard | Energy Star (EPA)  
*Electric*: 50% cooking energy efficiency; idle rate 400–800 Watts  
*Gas*: 38% cooking energy efficiency; idle rate 6,250–12,500 British Thermal Units/hour  
NOTE: Energy Star has no specified water use factor | | Effective Sept. 1, 2010  
*Electric*: Same as Energy Star  
*Water Use Factor*: (for both electric and gas models):  
Tier 1A: \( \leq 15 \text{ gal/hr per compartment} \)  
Tier 1B: \( \leq 4 \text{ gal/hr per compartment} \) | |

\(^8\) Idle rate standards vary for 3-, 4-, 5-, and 6-pan commercial steam cooker models.

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**DOE**: Department of Energy  
**EPA**: Environmental Protection Agency  
**WF**: water factor  
**gpf**: gallons per flush  
**gpm**: gallons per minute  
**gal**: gallons  
**ft\(^3\)**: cubic feet  
**kWh**: kilowatt hour  
**psi**: pounds per square inch  
**Lpf**: litres per flush  
**NaECA**: National Appliance Energy Conservation Act  
**MaP**: maximum performance  

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Readers are encouraged to report any incorrect or updated information to the author, John Koeller: koeller@earthlink.net

Information/materials on EPAct 2005/NAECA & other standards:

Plumbing products:

Clothes Washers and Residential Dishwashers:

Automatic Commercial Ice Maker Standards:

Pre-rinse Spray Valves

Information/materials on Energy Star specifications:

Clothes Washers
https://www.energystar.gov/products/appliances/clothes_washers

Residential Dishwashers
https://www.energystar.gov/products/appliances/dishwashers

Commercial Dishwashers
https://www.energystar.gov/products/commercial_food_service_equipment/commercial_dishwashers

Automatic Commercial Ice Makers
https://www.energystar.gov/products/commercial_food_service_equipment/commercial_ice_makers

Commercial Steam Cookers
https://www.energystar.gov/products/commercial_food_service_equipment/commercial_steam_cookers
Information/materials on WaterSense specifications:

Water Closets (Toilets) – Tank-type
https://www3.epa.gov/watersense/products/toilets.html
https://www3.epa.gov/watersense/docs/Revised%20HET%20Specification_V1%202_060214_final508d.pdf

Water Closets (Toilets) – Flushometer valve-bowl combination type
https://www3.epa.gov/watersense/products/flushometer-valve-toilets.html
https://www3.epa.gov/watersense/docs/FinalFVHET_Specification_V1-0_508.pdf

Flushing Urinals
https://www3.epa.gov/watersense/products/urinals.html
https://www3.epa.gov/watersense/docs/urinal_finalspec508.pdf

Residential Bathroom Lavatory Faucets
https://www3.epa.gov/watersense/products/bathroom_sink_faucets.html
https://www3.epa.gov/watersense/docs/faucet_spec508.pdf

Residential Showerheads
https://www3.epa.gov/watersense/products/showerheads.html
https://www3.epa.gov/watersense/docs/showerheads_finalspec508.pdf

Commercial Pre-Rinse Spray Valves
https://www3.epa.gov/watersense/products/prsv.html

Information/materials on CEE specifications:

Residential Clothes Washers

Residential Dishwashers

Commercial, Family-Sized Clothes Washers

Commercial Ice-Makers
https://library.cee1.org/content/cee-high-efficiency-specifications-commercial-ice-machines/

Pre-rinse Spray Valves

Commercial Steam Cookers