requiring insulation, those areas of a storage tank, including hand holes and manholes, in its uninsulated or pre-insulated state, that do not have pipe penetrations or tank supports attached.

**Thermal efficiency** for an instantaneous water heater, a storage water heater or a hot water supply boiler means the ratio of the heat transferred to the water flowing through the water heater to the amount of energy consumed by the water heater as measured during the thermal efficiency test procedure prescribed in this subpart.

**Unfired hot water storage tank** means a tank used to store water that is heated externally, and that is industrial equipment.

**TEST PROCEDURES**


(a) The Department incorporates by reference the following test procedures into Subpart G of Part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the Department test procedures unless and until the Department amends its test procedures. The Department incorporates the material as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) Test procedure incorporated by reference. American National Standards Institute (ANSI) Standard: “Gas Water Heaters, Volume III, Storage Water Heaters with Input Ratings above 75,000 Btu per Hour, Circulating and Instantaneous, Z21.10.3-1998, CSA 4.3-M98, and its Addenda, ANSI Z21.10.3a-2000, CSA 4.3a-M10,” IBR approved for § 431.105. The Department is incorporating by reference the “Method of Test” subsections of sections 2.9 and 2.10 in ANSI Z21.10.3-1998, CSA 4.3-M98, and the sections referenced there, including sections 2.1.7, 2.3.3, 2.3.4, 2.30 and Figure 3.

(c) Availability of references—(1) Inspection of test procedures. The test procedures incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.


(2) Obtaining copies of Standards. Anyone can purchase a copy of the standard incorporated by reference from Global Engineering Documents, 15 Inverness Way West, Englewood, CO 80112, or http://global.ihs.com/, or http://webstore.ansi.org/ansidocstore/.

(d) Reference standards—(1) General. The standards listed in this paragraph are referred to in the Department test procedures in this subpart, but they are not incorporated by reference. These sources are given here for information and guidance.


§ 431.106 Uniform test method for the measurement of energy efficiency of commercial water heaters and hot water supply boilers (other than commercial heat pump water heaters).

(a) Scope. This section covers the test procedures you must follow if, pursuant to EPCA, you are measuring the
thermal efficiency or standby loss, or both, of a storage or instantaneous water heater or hot water supply boiler (other than a commercial heat pump water heater).

(b) Testing and Calculations. Determine the energy efficiency of each covered product by conducting the test procedure(s), set forth in the two rightmost columns of the following table, that apply to the energy efficiency descriptor(s) for that product:

<table>
<thead>
<tr>
<th>Product</th>
<th>Energy efficiency descriptor</th>
<th>Use test setup, equipment and procedures in sub-section labeled, &quot;Method of Test of&quot;</th>
<th>With these additional stipulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*</td>
<td>Thermal Efficiency ANSI Z21.10.3–1998, §2.9**</td>
<td>A. For all products, the duration of the standby loss test shall be until whichever of the following occurs first after you begin to measure the fuel and/or electric consumption: (1) The first cutout after 24 hours or (2) 48 hours, if the water heater is not in the heating mode at that time.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standby Loss ........ ANSI Z21.10.3–1998, §2.10**</td>
<td>B. For oil and gas products, the standby loss in Btu per hour must be calculated as follows: Sl (Btu per hour) = S (% per hour) × 8.25 (Btu/gal–F) × Measured Volume (gal) × 70 (degrees F).</td>
<td></td>
</tr>
<tr>
<td>Oil-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*</td>
<td>Thermal Efficiency ANSI Z21.10.3–1998, §2.9**</td>
<td>C. For oil-fired products, apply the following in conducting the thermal efficiency and standby loss tests: (1) Venting Requirements—Connect a vertical length of flue pipe to the flue gas outlet of sufficient height so as to meet the minimum draft specified by the manufacturer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standby Loss ........ ANSI Z21.10.3–1998, §2.10**</td>
<td>D. For electric products, apply the following in conducting the standby loss test: (1) Assume that the thermal efficiency (Et) of electric water heaters with immersed heating elements is 98 percent.</td>
<td></td>
</tr>
<tr>
<td>Electric Storage and Instantaneous Water Heaters.</td>
<td>Standby Loss ........ ANSI Z21.10.3–1998, §2.10**</td>
<td>(2) Maintain the electrical supply voltage to within ±5 percent of the center of the voltage range specified on the water heater nameplate.</td>
<td></td>
</tr>
</tbody>
</table>

* As to hot water supply boilers with a capacity of less than 10 gallons, these test methods become mandatory on October 21, 2005. Prior to that time, you may use for these products either (1) these test methods if you rate the product for thermal efficiency, or (2) the test methods in Subpart E if you rate the product for combustion efficiency as a commercial packaged boiler.

** Incorporated by reference, see §431.105.

§ 431.107 Uniform test method for the measurement of energy efficiency of commercial heat pump water heaters. [Reserved]