

Monday, November 21, 2022

Minimum Boiler Efficiency & New D.O.E Standards

Monday Morning Minutes | by Norm Hall, November 21, 2022

The United States Department of Energy (DOE) has some minimum efficiency standards which go into effect on January 10, 2023, for Commercial Packaged Boilers. What changes are required and how do they affect the engineer's selection and specifications?



What is a Commercial Packaged Boiler?

Before we look at the efficiency standard numbers it is important to understand the boiler affected by the standard. The following is taken from the [Appliance Standards Rulemakings and Notices](#) website:

The Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6317 establishes energy conservation standards and test procedures for commercial packaged boilers. The Code of Federal Regulations (CFR), defines the term “commercial packaged boiler” to mean a type of packaged **low pressure boiler** that is industrial equipment with a capacity (rated maximum input) of **300,000 Btu per hour (Btu/hr.) or more** which, to any significant extent, is distributed in commerce: (1) For heating or space conditioning applications in buildings; or (2) For service water heating in buildings but does not meet the definition of “hot water supply boiler” (as defined in 10 CFR 431).

The term “low pressure” refers to both steam and hot water boilers. The low-pressure steam rating is 15 PSIG maximum. The low-pressure hot water rating is 160 PSIG and 250°F maximum.

What are the Minimum Efficiency Standards?



The DOE energy standard notice can be reviewed here [Appliance Standards Rulemakings and Notices](#) . The final ruling link at [Regulations.gov](#) has the following table:

Table I.1—Energy Conservation Standards for Commercial Packaged Boilers

Equipment	Size category(input)	Energyconservationstandard *	Compliance date †
Small Gas-Fired Hot Water Commercial Packaged Boilers	≥300,000 Btu/h and ≤2,500,000 Btu/h	84.0% ET	January 10, 2023.
Large Gas-Fired Hot Water Commercial Packaged Boilers	>2,500,000 Btu/h and ≤10,000,000 Btu/h	85.0% EC	January 10, 2023.
Very Large Gas-Fired Hot Water Commercial Packaged Boilers	>10,000,000 Btu/h	82.0% EC	March 2, 2012.
Small Oil-Fired Hot Water Commercial Packaged Boilers	≥300,000 Btu/h and ≤2,500,000 Btu/h	87.0% ET	January 10, 2023.
Large Oil-Fired Hot Water Commercial Packaged Boilers	>2,500,000 Btu/h and ≤10,000,000 Btu/h	88.0% EC	January 10, 2023.
Very Large Oil-Fired Hot Water Commercial Packaged Boilers	>10,000,000 Btu/h	84.0% EC	March 2, 2012.
Small Gas-Fired Steam Commercial Packaged Boilers	≥300,000 Btu/h and ≤2,500,000 Btu/h	81.0% ET	January 10, 2023.
Large Gas-Fired Steam Commercial Packaged Boilers	>2,500,000 Btu/h and ≤10,000,000 Btu/h	82.0% ET	January 10, 2023.
Very Large Gas-Fired Steam Commercial Packaged Boilers **	>10,000,000 Btu/h	79.0% ET	March 2, 2012.
Small Oil-Fired Steam Commercial Packaged Boilers	≥300,000 Btu/h and ≤2,500,000 Btu/h	84.0% ET	January 10, 2023.
Large Oil-Fired Steam Commercial Packaged Boilers	>2,500,000 Btu/h and ≤10,000,000 Btu/h	85.0% ET	January 10, 2023.
Very Large Oil-Fired Steam Commercial Packaged Boilers	>10,000,000 Btu/h	81.0% ET	March 2, 2012.

The manufacturer of the boiler is responsible to make sure their boilers meet these efficiencies.

Where Might this Affect the Engineer the Most?

The condensing hot water boilers specified on commercial projects already meet these efficiency requirements. Some of the smaller packaged hot water boilers on larger residential new and replacement projects may be affected.

Boilers in the steam system will be affected. Those lower efficiency and lower cost small cast-iron low-pressure steam boilers must be changed. The newer higher efficiency replacements may require some piping changes. Some smaller firebox style boilers could be affected by this change depending on the manufacturer.

Most of the 3- and 4-pass horizontal firetube boilers should meet these new guidelines but check with the manufacturer prior to the specifying that low pressure steam boiler.

The engineer should make sure his or her specifications for steam and hot water boilers refer to the latest energy standards and not the previous 2009 or 2012 numbers.

What Could be Shipped to My Jobsite?

The manufacturer can produce their current designs through the January 23, 2023, cutoff date. If the pressure vessel has been tested and has received its ASME certification by January 10, 2023, the manufacturer or rep can still sell those lesser efficiency products after the January 10th date. None of the lower efficiency products can be manufactured after that date.

R.L. Deppmann boiler product manufacturers completed the required changes and are ready to meet the January 10, 2023, standard.