



Energy Efficiency Benchmark for Fire Tube Boiler 2022

Background:

This Document identifies current technologies that is available in International Market and used in Factories in Bangladesh and recommends Alternative energy-efficient Fire tube boiler best suited to the country.

Purpose:

The purpose of this Document to identify Average Energy Efficiency Benchmark for Fire Tube Boiler, So that it can be used to know Current Energy Efficiency Level of this equipment .

Methodology:

The information on energy-efficient equipment specifications and costs is collected from both primary and secondary sources. The primary sources includes interviews, and Sales data of manufacturers or the association of the equipment manufacturers. The secondary sources of data is collected mainly from the website of the equipment manufacturers. In addition, various research reports, news articles, and similar previous studies by SREDA and other institutions will provide secondary data.

Scope:

This Document is deals with only Fire tube boiler used in industry sector.

Energy Efficiency Component:

No.	Item	Contents	Necessary data
1	Boiler efficiency by direct method	Total efficiency	Fuel volume, Feed water temperature, steam generated volume or feed water volume,
2	Boiler efficiency by indirect method	Exhaust heat loss	Fuel heat value, Oxygen content (%) in exhaust gas and exhaust gas temperature
3	Air ratio:	Combustion efficiency	Case 1: Oxygen content (%) in exhaust gas Case 2: Fuel volume and combustion air volume
4	Exhaust gas temperature:	Exhaust heat loss	Exhaust gas temperature

Number of Boiler in Bangladesh:

In Bangladesh Industrialization is taking place gradually. In total, there are more than 8000 boiler is running in the industry. Most of this Boiler is Fire tube boilers.

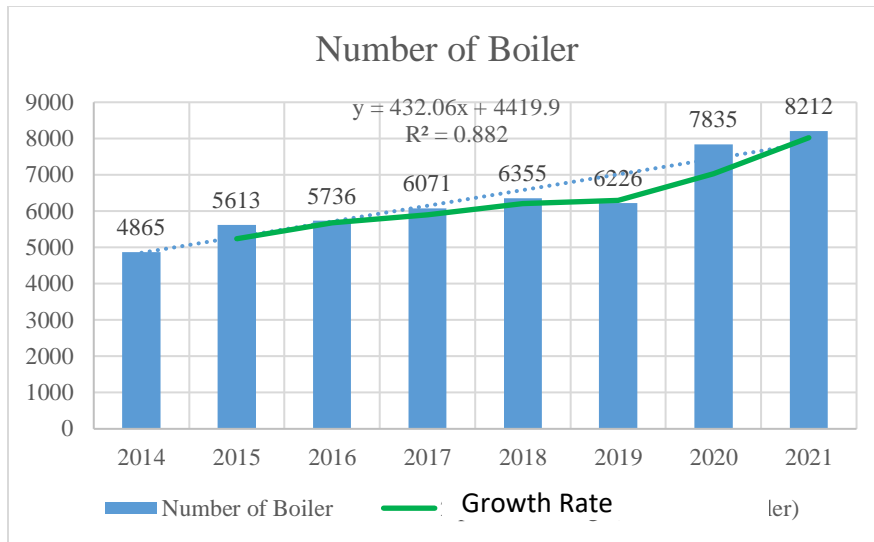


Figure: Number of Boiler Installed (source: Office of The Chief Inspector of Boilers)

In this perspective it has been seen that installation of boilers are increasing. Currently for taking gas connection for energy efficient boiler energy efficiency assessment must be done by Energy Auditors. Also, Petro Bangla suggested a thermal efficiency value 85% for efficient Boilers by an official letter on 24 February 2016 for all gas distribution utility. So, it may be taken that most of the boilers installed after 2016 are in thermal efficiency value of 85%.

Benchmark values of Energy Efficiency of Fire Tube Boilers in Bangladesh

As per Energy Efficiency rules 2016, Benchmark thermal efficiency value is 85%. There are some other benchmark which can be set as per below.

Class	Load ratio (%)	Standard air ratio				
		Solid fuel		Liquid fuel	Gas fuel	Blast furnace gas and other gas
		Fix bed	Fluidized bed			
Electric Power Plant	75-100			1.05 - 1.2	1.05 - 1.1	1.2
Steam volume: 30 ton/h and more	50-100	1.3 -1.45	1.2 - 1.45	1.1 -1.25	1.1 - 1.2	1.2 -1.3
Steam volume: 10 ton/h to 30ton/h or less	50 -100	1.3 -1.45	1.2 -1.45	1.15 - 1.3	1.15 - 1.3	
Steam volume: 5 ton/h to 10 ton/h or less	50- 100			1.2 - 1.3	1.2 - 1.3	
Steam volume: 5 ton/h or less	50 -100			1.2 - 1.3	1.2 - 1.3	

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