Lamont Boiler: Definition, Parts, Working, Applications, Advantages, Disadvantages [With PDF]

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Lamont Boiler is a water tube boiler and It is a high-pressure boiler.

The other different types of water tube boiler: Benson boiler, Stirling boiler, Babcock and Wilcox boiler, Yarrow boiler and Loeffler boiler.

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Lamont Boiler Definition:

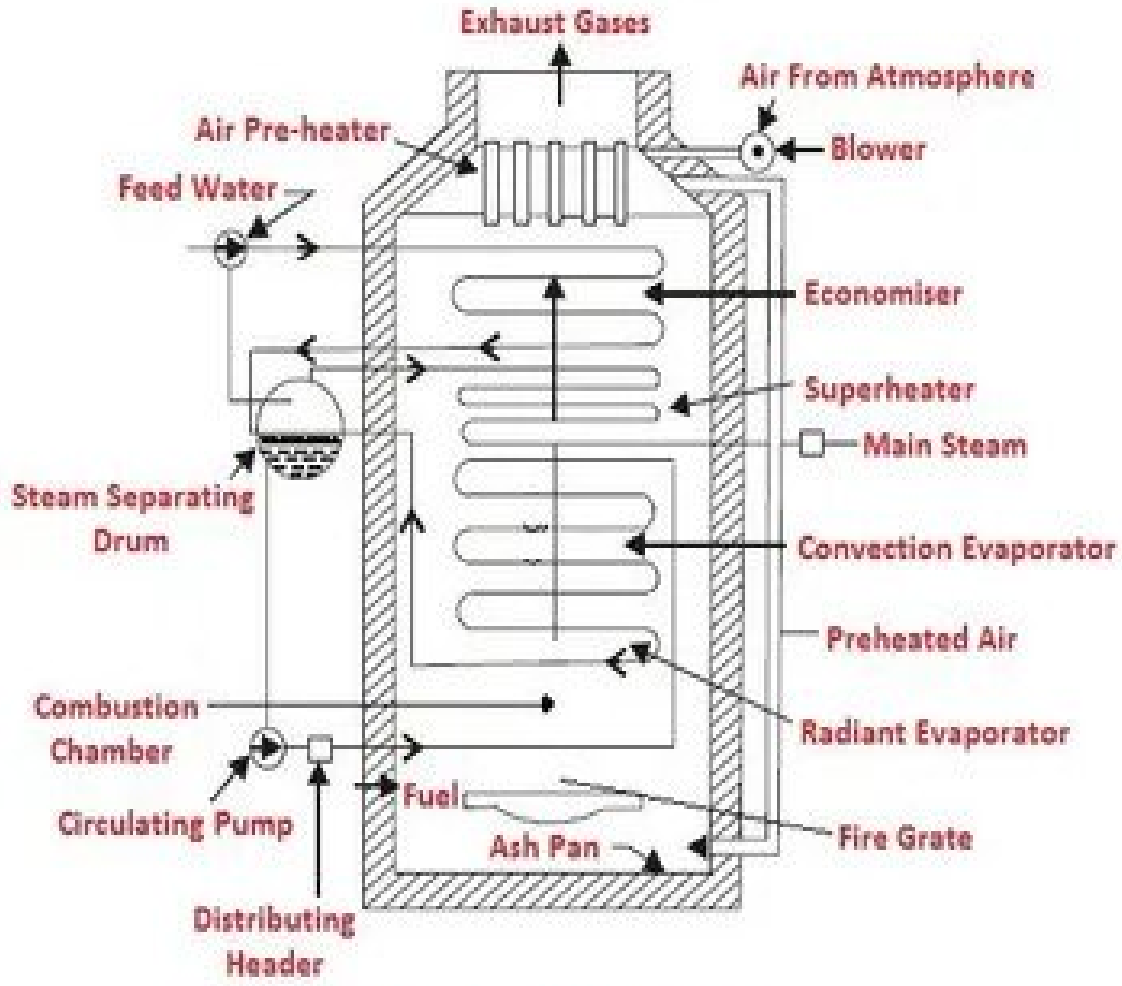
LaMont boiler is a high pressure forced circulation water-tube boiler in which water is circulated through an external pump through long closely spaced tubes of small diameter.

The pump is employed in order to have adequate and positive circulation in steam and hot water boilers.

Parts or Construction of Lamont Boiler:

A Lamont Boiler consists of several parts like:

- *Economizer*
- *Centrifugal Pump*
- *Evaporator Tube*
- *Grate*
- *Furnace*
- *Superheater*
- *Water Steam Separator Drum*
- *Air Preheater*



Economizer:

Economizer use to preheat the water by using the remaining heat of the combustion gases.

The feed water first supplied to the economizer before entering the boiler.

Economizer is a device that is used to increases boiler efficiency.

Centrifugal pump:

The Lamont boiler is a force convection boiler. So a centrifugal pump is used to circulate water inside the boiler.

This pump is driven by a steam turbine. The steam for the turbine is taken by the boiler.

Evaporator tube:

The evaporator tube or can say water tubes are situated at the furnace wall which increases the heating surface of the boiler.

This is also at the upside and downside of the furnace and other equipment.

The main function of these tubes to evaporate water into steam.

This also cools down the furnace wall.

Grate:

The space in the furnace where the fuel is burned is called grate.

It is placed at the bottom side of the furnace.

Furnace:

In the Lamont boiler vertical furnace is used.

The main function of the furnace is to burn the fuel.

Superheater:

The steam generated by the evaporator tube is saturated steam.

If it directly used in the steam turbine can cause corrosion.

So the saturated steam sends to the upper heater, where it can increase the temperature of the steam.

Water Steam Separator Drum:

The steam separator is situated outside of the boiler.

The mixture of water and steam from the evaporator tube sends it to the steam separator, where it separates the stem and sends it to the superheater.

The remaining water again sends to the economizer.

Air Preheater:

The main function to preheat air before entering into the furnace.

Air preheater is a device that increases the efficiency of the boiler.

Working Principle of Lamont Boiler:

Lamont boiler works on the principle of forced circulation of water within the boiler with the help of the **centrifugal pump**.

It's working totally depends upon the pump. The centrifugal pump circulates the mixture of steam and water through the small diameter tubes of the boiler.

A feed pump forces the water into the economizer where the temperature of water increases.

This water forced into the evaporator tube by using a centrifugal pump driven by the steam turbine. Water passes 10 – 15 times into the evaporator tube.

The mixture of saturated steam and water is formed inside the tube. This mixture sends to the steam separator drum which is outside the boiler.

Steam from the separator sends to the superheater, where the saturated steam converts into superheated steam.

The water again sends to the economizer where it again passes by the evaporator tubes.

The air from the air preheater enters into the furnace where fuel burn.

The flue gases first heat the evaporator tube then passes by the superheater.

These gases form the superheater again use to preheat the air into air preheater before exhausting into the atmosphere.

This working pressure of this boiler is above 170 bar and have the steam generation capacity of about 50000 kg/hour at temperature 773 K.

Applications of Lamont Boiler:

Boilers are mostly used in power plants where steam turbines are used for the generation of electricity.

Advantages of Lamont Boiler:

These are some advantages of Lamont Boiler:

1. *Lamont boiler can generate a high amount of steam.*
2. *It is easy to start its operation.*
3. *The construction design of the Lamont boiler is very simple and easy to understand.*
4. *This boiler can reassemble with the natural circulation boiler and*
5. *it has a high heat transfer rate.*
6. *It is flexible in design.*

Disadvantages of Lamont Boiler:

*The main disadvantages are **Bubble formation** on a surface of the tube reduces the heat transfer rate. For this reason a little problem with the total amount of steam generation.*

So this is all about Lamont boiler I hope you understand well, feel free to share your doubts or thoughts regarding this article in the comment section, I will love to hear from you! Cheers!

Is Lamont Boiler a water tube boiler or Fire-tube boiler?

It is a water tube boiler.

What are the applications of boilers?

It can be used for heating, cooling, cleaning, humidification, etc. in production processes, and can also be used for power generation.
It can also be used in the textile industry, paper industry, food processing industry, building materials, metal smelting, heating engineering, etc.

What are the different types of water tube boiler?

1. Babcock and Wilcox Boiler
2. Lamont Boiler.
3. Loeffler Boiler.
4. Yarrow Boiler.
5. Benson Boiler
6. Lamont Boiler

At what pressure Lamont Boiler works?

It works above 170 bar.

References:

- https://www.sciencedirect.com/topics/engineering/boiler
- https://wbboilers.gov.in/faq