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The universe is a vast space that includes exclusive physical systems. A physical system, also called thermodynamic system, makes it possible for heat, matter, work, and their exchanges to sustain, create, or lessen energy. The space engulfing the system, called surroundings or environment, may also alter the exchanges of elements in the system. Any machine or equipment is a good example of a thermodynamic system. Exchanges of elements take place to yield a desired output.

The boiler is a machine that best employs the concepts of thermodynamics. Its main function is to boil water and use it to disperse heat all over the system. It needs combustion or any heat source adequate to deliver the necessary heat to meet the system's demand. The machine itself or the elements in it do not directly consist of the system but the properties of those elements that make the exchanges possible. For example, the adjustments in water temperature when going through tubes influence the performance of a boiler.

The total energy being apportioned and shared all around the system is called enthalpy. Because of the environment, not all the enthalpy in a system can be used. A notable part of it is wasted. To strengthen the efficiency of a system, such as the boiler, enthalpy must be preserved. In a boiler, efficiency is measured by the volume of water heated with respect to the volume of fuel at a certain timeframe. If the heat formed through combustion boils the water filled in the boiler longer than the expected time, then the system is inefficient.

For that reason, the only way to strengthen the efficiency in a boiler is to speed up heating the same volume of water using the same fuel amount. At first, it looks unattainable since an increase in heat is expected without modifying the properties of any element present in the system. Unless an additional element is utilized, there is no chance of changing any rate. This is the reason why boiler designs today already contain a heat reclaimer or economizer.

An economizer in boiler is not necessarily a foreign element which comes from the environment of a boiler system. It is an additional component that works to preheat water before being replenished in the boiler. That way, the water is partly or already considerably heated before being actually heated in the boiler, thereby lowering fuel consumption.

A Boiler economizer does not utilize heat from the environment. It seizes the wasted steam and uses its enthalpy to preheat the water. Such a device reduces fuel consumption and waste production.

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