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Water Tube Boiler and Fire Tube Boiler

Boiler Overview

There are many kinds of boilers, with different classifications and different statements. For example, according to fuel, boilers can be divided into coal fired boilers, biomass fired boilers, gas boilers, oil fired boilers, and waste heat boilers. According to the output medium, boilers can be divided into steam boilers, hot water boilers, and thermal oil boiler. According to the pressure, boilers can be divided into low-pressure boilers, medium-pressure boilers, and high-pressure boilers. **According to the form of the boiler body, boilers can be divided into water tube boilers, fire tube boilers, and water fire tube boilers. Most boilers are water tube boilers or fire tube boilers.** Water-fire-tube boilers Only one is the DZL series coal-fired boiler. After the fuel is burned, the high-temperature flue gas flows outside the tube, then enters the tube to transfer heat to the water in the furnace, and finally is discharged through the chimney. Now we briefly introduce water tube boilers and fire tube boilers.

Water Fire Tube Boilers

Fire Tube Boilers

Water Tube Boilers

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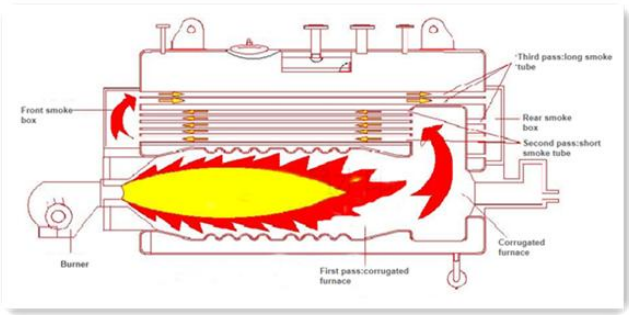
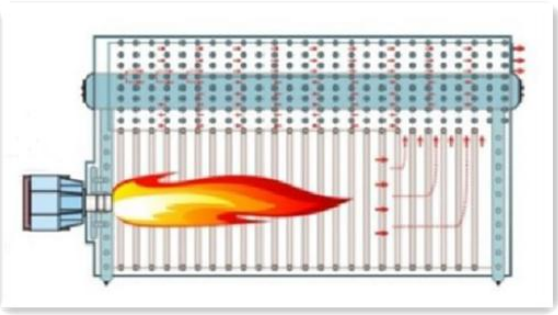
Fire Tube Boiler and Water Tube Boiler Introduction

There are two main types of boiler used in the industrial engineering world, these are the fire tube boiler and water tube boiler. As the name implies, the difference between the two boilers is where the gases of combustion and water are relative to the boiler tubes.



Fire Tube Boiler



Water Tube Boiler

High Temperature Flue Gas in Boilers Diagram

Water tube boilers have water in the tubes and gases of combustion outside of the tubes.

Fire tube boilers have gases of combustion within the tubes and water outside of the tubes.

Water tube boiler furnaces are surrounded by tubes（pipes）full of water, which allows a large amount of heat from combustion to be transferred to the tubes very quickly.

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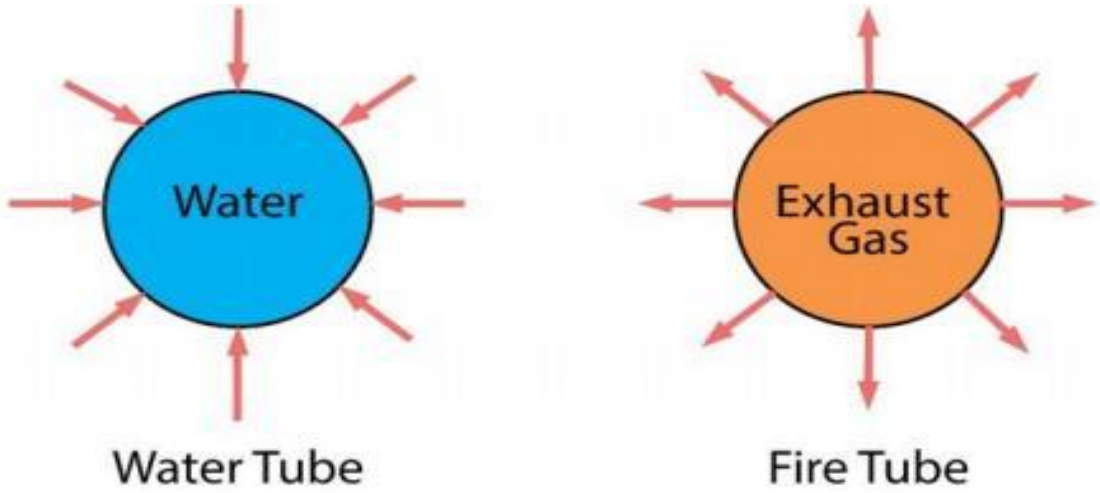
Fire tube boiler furnaces are usually inside the pressure vessel, but may also be external to the pressure vessel. Exhaust gases of combustion travel through tubes surrounded by water.



Direction of Heat Transfer

Almost all large industrial plants will have a boiler onsite. Most industrial plant boilers are of the fire tube design whilst water tube boilers are more favoured in the power generation industry. Large and very large steam capacity boilers are always water tube boilers.

Water Tube Boilers and Fire Tube Boilers Compared

A detailed overview of water tube and fire tube boilers is not possible within the confines of this course, but the below table highlights some of the main differences between the two designs.

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Water Tube Boilers	Fire Tube Boilers
Water in the tubes.	combustion gases in the tubes.
Combustion gases surrounding the tubes.	Water surrounding the tubes.
Maximum allowable working pressures （MAWP）in excess of 2,900 psi（200 bar）	Maximum allowable working pressure （MAWP）up to 362 psi（25 bar）.
very high steam generation rate.	comparatively low steam generation rate.
More efficient than a fire tube boiler （typically greater than 90%）.	Less efficient than a water tube boiler （typically 80-85%）.
Explosion risk is higher due to higher MAWP.	Explosion risk lower due to lower MAWP.
suitable for the power generation industry.	Not suitable for the power generation industry.

Water Tube and Fire Tube comparison

For a detailed look at fire tube and water tube boilers, please contact us with Email

Company Profile

CN Boiler has 26 years of supply and after-sales experience in boiler and boiler systems. In the selection of boiler and boiler accessories, we have rich experience. Choosing us will provide you with high-quality boilers,

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and present you with a cost-effective boiler system, you would have no concern about the operation and maintenance of the boiler in the running stage. CN boiler's goal is to reduce your costs and increase your profitability.