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## Materials of Construction for Condensing Boilers and Water Heaters

Before we start discussing materials of construction, there is a point that we need to understand. Any boiler or water heater can and will condense if the return water temperature to the boiler is low enough. A big part of what makes condensing boilers and water heaters so special is that they utilize specific materials that can handle the condensation that occurs without damage.

### Single Stainless Steel Heat Exchanger

Many of the smaller (500MBH Input and less) condensing boilers utilize a single stainless steel heat exchanger. The [Laars Neotherm](#) is an example of this type of condensing boiler. The stainless steel heat exchanger gives the boiler a strong resistance to the acidic condensate.

### Dual Stainless Steel Heat Exchangers

This type of condensing boiler utilizes two heat exchangers. Both the primary and secondary heat exchangers utilize stainless steel. The [Aerco Benchmark](#) boilers are an example of this type of condensing boiler.

### Copper/Stainless Steel Heat Exchangers

The primary heat exchanger, which sees higher fluid temperatures, consists of copper tubes. The secondary heat exchanger, which sees the lower return fluid temperatures and condensate, consists of stainless steel tubes. The [Laars Rheos+](#) is an example of this boiler.

### Cast Aluminum

This boiler utilizes a cast aluminum heat exchanger to provide better heat transfer than stainless steel while keeping the corrosive resistance to the condensate. The [Aerco Modulex](#) is an example of this type of condensing boiler.

### Other Materials

Some materials you might see are impregnated stainless steel (very expensive) and cast iron (not recommended – condensate will quickly damage this cast iron).

There are many options out there when it comes to condensing boilers. Be sure that you know the materials that make up the boiler you choose. The life of your system depends upon it.

In next week's issue, we will discuss turndown ratios and what they mean for energy savings.

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