Exploring the benefits of stainless steel

With advances in heating and hot water products, stainless steel has become a popular choice. As specialists in stainless steel and home of the tank-in-tank concept, we explore some of the key factors driving this trend.

KEY BENEFITS

DURABLE

CORROSION RESISTANT

EXCEPTIONAL HEAT TRANSFER

WHAT IS STAINLESS STEEL?

Stainless steel is a generic name for more than 150 carbon alloys that have a minimum of 10.5 chromium. Chromium makes stainless steel corrosion-resistant by oxidizing quickly, forming a thin layer on the metal surface that protects the underlying metal from corrosion. With this thin passive film completely covering the metal surface, the metal is passivized, and the risk of corrosion is greatly reduced.

The most commonly used grades of stainless steel employed in hot water generators are 304, 316(L) and duplex which have a higher level of corrosion resistance and the ability to shape and form the metal into tanks and detailed heat exchangers.

THE BATTLE AGAINST CORROSION

When it comes to dedicated water heaters and hot water stores for domestic hot water, corrosion is the enemy, particularly wet corrosion. Wet corrosion occurs through an electrochemical oxidation reaction that requires the presence of oxygen. For example, steel interacts with water and oxygen to form hydrated iron (III) oxide–rust, which will eventually cause structural damage, resulting in costly maintenance and repair, unless otherwise prevented. Our range of corrosion-resistant stainless steel hot water cylinders and condensing water heaters with tank-in-tank technology, such as the WaterMaster Evo are designed to reduce maintenance and increase system lifespan due to the choice of material used within these products.

FACTORS DRIVING PERFORMANCE

- Performance
- Total life cycle
- Cost

WHAT IS TANK-IN-TANK TECHNOLOGY?

Tank-in-tank is a technology that is focused on the efficient production of hot water. Manufactured from stainless steel, the wall of the inner DHW tank acts as a heat exchanger between the primary circuit, which is connected to the boiler, and the DHW storage tank. Thanks to the exceptional heat transfer and high storage temperature of the tank-in-tank system, the volume of hot water stored can be reduced. This gives a more compact water heater design and reduces static heat losses via the exterior walls: both attributes combine to cut initial investment as you can choose a smaller cylinder and reduce operating expenses.

As the inner DHW tank of the system is made of stainless steel, no anode protection is required to prevent surface corrosion. Furthermore, no contamination, leakage or sludging occurs. Featuring a corrugated design to significantly reduce scale build up, this design also means that scale naturally falls from the surface when it expands and contracts in line with temperature rises and falls. This is a particularly important factor to consider in hard water areas, where the high calcium content of the water can result in calcium carbonate deposits on tank and heat exchanger surfaces.

EXCEPTIONAL HEAT TRANSFER

Like dedicated water heaters and DHW storage vessels, when it comes to condensing boilers used for heating, materials are also best selected for their heat performance properties. As the heat exchanger plays a key role in maximizing effective and reliable heat transfer, this component must be made from a robust material. Here, the EVO S wall hung boiler range ticks all the boxes.

Featuring high-grade stainless-steel technology, EVO S offers resistance against corrosion resulting in first class performance.

Frequently confronted with minerals, oxygen, chemicals and sediment, not to mention high temperatures, thermal stress and flue gas condensate, stainless steel is, without doubt, a strong, durable contender that can withstand water and fire side attacks and ultimately extend service life. Also, due to their composition of corrosion-resistant alloys, stainless steel products often have a longer warranty such as our market-leading five-year warranty.

Often assumed to be more expensive than some of the other materials traditionally used, such as copper, aluminium and steel, when you look at the bigger picture and consider total life cycle costs, stainless steel is often the least expensive option.

Lastly, compared with other commonly used materials, stainless steel has relatively low embodied carbon, which contributes to longevity and should be considered within the whole life carbon impact assessment.

Contact a member of our expert team today to discuss your next project requirements.

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EXCELLENCE IN HOT WATER