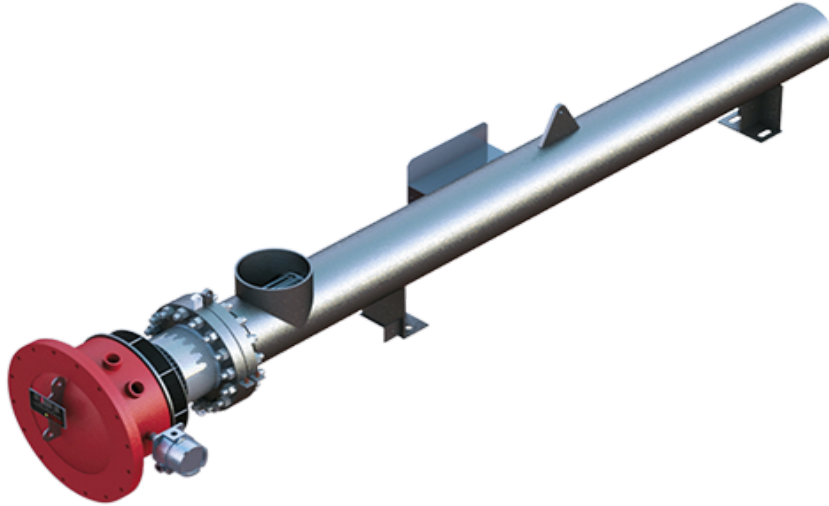


What is OPTIMAX®?

By: - August 21, 2020



(abcimg://optimax%20image)

[OPTIMAX®](#) ([/en/products/heaters/circulation-heaters/optimax-heat-exchanger](#)) is an advanced heat exchanger innovated by Watlow®. The specially engineered heat exchanger was developed by considering critical design criteria that optimize modern heat transfer processes.

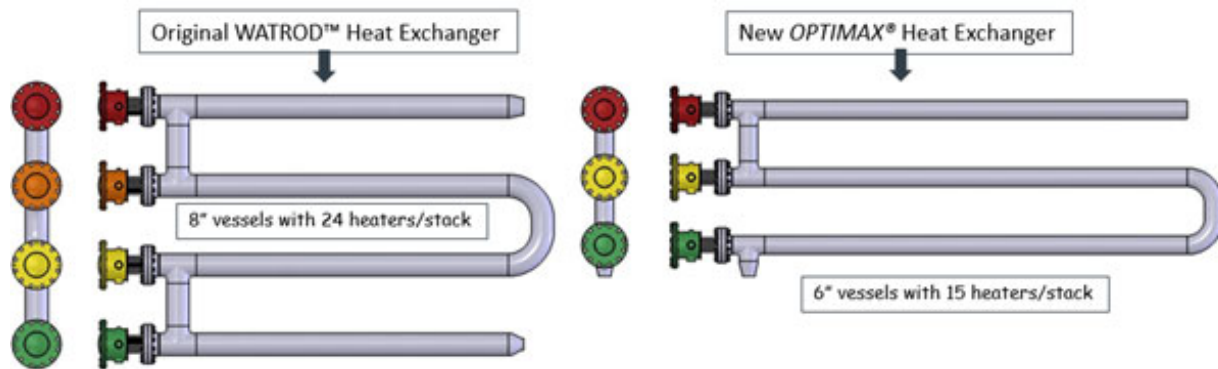
Heat exchangers are widely used across various industries for multiple purposes, including cooling and heating processes. Although there are multiple types of heat exchangers with their own set of configurations, they serve the same core function in exposing a heat source to a medium, which results in heat transfer.

A reliable and efficient heat transfer technology ensures thermal systems are maintained at optimal levels, while reducing the facility's energy consumption and space utilization. Additionally, system managers should consider the energy-sa_ ([/EditorPage.aspx?da=core&id=%7B7DE20C62-9F30-4A62-ACC9-EEE9631F9CD1%7D&ed=FIELD39310476279&vs&la=en&fld=%7B8314E12E-0635-479B-8DA0-FE987BC2A47A%7D&so&di=0&hdl=H39310476398&mo&pe=0&fbd=1#](#))ving process that reduces pollution levels. OPTIMAX optimizes heat exchange through predictive technology that redefines modern flow systems. Advanced heat exchangers such as OPTIMAX serve as crucial components in ([https://link.springer.com/chapter/10.1007/978-94-011-4593-0_5](#))[pollution prevention strategies](#) ([https://link.springer.com/chapter/10.1007/978-94-011-4593-0_5](#)) and global sustainability movements.

Advantages of OPTIMAX

The OPTIMAX system's core advantages lie in its enhanced fluid dynamics (EFD) and uniform film temperature (UFT). OPTIMAX heat exchangers are smaller and lighter than traditional industry alternatives due to rapid and effective heat transfer, which requires less space.

For a greater perspective, OPTIMAX technology can eliminate an entire heater bundle required in a stacked assembly.



([abcimg://optimax%20comparison](#))

Through comprehensive testing and engineering improvements, the Watlow team has acquired predictive thermal response equations that drive improved fluid dynamics in the OPTIMAX solution.

Enhanced fluid dynamics

EFD facilitates thermal transfers without compromising the integrity of vessels, heating elements and fluid. The OPTIMAX heat exchanger features a low pressure drop rate, which reduces the need for costly, larger pump installations and the heavier power consumption required to drive them.

Pressure drop is an essential factor in industrial flow systems, and the modified flow design of OPTIMAX is built with variable support bracing, which provides more predictable pressure drop. OPTIMAX also reduces the effects of non-recoverable pressure drops.

The product's advanced configuration avoids the need to install additional pressure or temperature compensation in the calculation of flow. Additionally, OPTIMAX's functional design accounts for a range of piping considerations such as corrosion and material friction. As such, OPTIMAX's leading pressure drop performance reduces footprint by as much as 50%, resulting in a significant reduction in capital expenditures.

Uniform film temperature (UFT)

OPTIMAX's integrated UFT components within its heating elements reduces heater film temperatures. This is combined with the EFD capabilities mentioned above resulting in accelerated heat transfer rates. These efficiencies can also prevent the formation of hot spots, which can result in fouling issues known to occur in many applications that include heat exchangers, due to poor circulation and fluid bypass.

Engineered components

OPTIMAX has a power duty range of up to three megawatts and tailored to unique requirements leveraging variable wattage technology. This technology continuously monitors and adjusts sheath temperatures across the length of the heater bundle to ensure temperature uniformity and optimal performance.

Variability of the sheath temperature is vital as watt density limitations imposed by some industry standards may artificially constrain heater designs, leading to more extensive, suboptimal designs. The OPTIMAX heat exchanger provides improved heat transfer rates with shorter vessel lengths or diameters. Our engineers can demonstrate how these designs can operate safely beyond outdated watt density standards due to significant improvements in heat transfer.

Backward compatibility

Watlow's OPTIMAX system can be designed for backward compatibility with existing equipment, enabling facilities to upgrade their thermal systems easily. Additionally, OPTIMAX is compatible with most major global standards, including CSA, IECEx, ASME, UL®, and PESO. Backward compatibility enables design engineers to administer an upgrade with minimum downtime.

A wide range of materials

The OPTIMAX heat exchanger is available in duplex stainless, nickel-chromium-iron-cobalt, nickel-chromium-iron, nickel-iron-chromium, nickel-molybdenum-chromium and austenitic stainless versions. The wide range of element materials provides customers with the ideal operating temperatures for their needs.

Improved accuracy

OPTIMAX provides improved accuracies in sheath temperatures, shell temperatures, flange temperatures and pressure drop calculations. The optimization enables users to maintain greater control over their thermal processes to yield optimal productivity.

Here is a closer look at its accuracy improvements.

Sheath temperatures

OPTIMAX provides more efficient heat transfer with a lower sheath temperature, which extends the life of heaters and other thermal transfer components.

Shell temperatures

OPTIMAX can reduce shell (or "skin") temperature, which is an essential variable in heat exchanger design as it can lead to fouling and premature corrosion concerns.

Flange temperatures

Lowered flange temperatures are also possible with OPTIMAX, reducing the required thickness, weight and cost of flanges in heat exchanger design.

These improvements have made the OPTIMAX system a preferred heat exchange solution for OEMs and design engineers when pressure drop and space limitations are paramount concerns.

OPTIMAX designs enable shorter bundle lengths, smaller diameter vessels and lighter overall systems that lower total investment.

A Watlow innovation

The OPTIMAX heat exchanger is a practical upgrade to traditional heat exchangers with its advanced EFD, optimized heat transfer capabilities, world-class pressure drop and compact dimensions. OPTIMAX is compatible with Watlow's

<https://www.watlow.com/products/controllers/control-panels/watconnect-control-panels>)WATCONNECT (<https://www.watlow.com/products/controllers/control-panels/watconnect-control-panels>)[®] control panel system that vertically integrates other Watlow quality products, such as heaters, sensors and controllers, into a complete thermal solution. Customers can look forward to reduced operating costs and consistent, high-performance thermal systems that suit a wide range of applications in many industries, including power generation, hydrocarbon refining and LNG, to name a few.

Watlow is a global leader of thermal solutions. Our OPTIMAX heat exchanger is the latest in a series of advanced heat transfer systems designed to optimize productivity. With over 40 years of industrial process heating experience, our specialized engineers can leverage a wide range of deep domain, industry experience to provide advanced thermal solutions.