



100%  
Stainless  
Steel

## Mastering the elements

AlfaNova – Fusion-bonded plate heat exchangers





# AlfaNova

## Extreme elements – extreme technology

From the extreme heat in our furnaces comes AlfaNova, the world's first 100% stainless steel plate heat exchanger. Extreme temperature and pressure fatigue conditions that would destroy a conventional brazed heat exchanger are no match for the rugged AlfaNova.

The secret is AlfaFusion, a unique bonding technology patented by Alfa Laval. Resulting in the world's first fusion-bonded plate heat exchanger, AlfaFusion has stunned specialists in the brazing field.

The compact, high-performance AlfaNova offers levels of hygiene and corrosion-resistance unmatched by any other brazed heat exchanger on the market today. It also has the muscle to replace large, heavy heat exchangers of other types in a wide range of applications.

Fusion-bonding is a new class of plate heat exchanger, available only from Alfa Laval.

**Extreme durability:** Years of research, development and testing have proven AlfaNova's durability. Increased mechanical strength gives AlfaNova higher mechanical and fatigue resistance than conventional brazed units.



## AlfaNova takes heat transfer technology to extremes



The 100% stainless steel AlfaNova offers an unmatched ratio of price to performance. It can replace large, heavy heat exchangers of other types in many applications.

**Presenting AlfaNova, the world's first 100% stainless steel plate heat exchanger – a major breakthrough in heat transfer technology.**

AlfaNova comprises a number of corrugated stainless steel plates, a frame plate, a pressure plate and connections - all in stainless steel of 316 type. All components are bonded together by AlfaFusion, a new technology patented by Alfa Laval. The result is the fusion-bonded plate heat exchanger, a new class of PHE offering extremely high mechanical strength. It is also hygienic, corrosion-resistant and fully recyclable.

### **A lot of muscle for your money**

The AlfaNova offers an unmatched ratio of price to performance. The unique pattern on the corrugated plates provides optimum heat transfer with low hold-up volumes. AlfaNova is also extremely compact in relation to its capacity, offering maximum flexibility for system builders integrating it into their solutions. The AlfaNova has the muscle to replace large, heavy heat exchangers of other types in many applications.

### **Unbeatable reliability**

Years of research and testing have confirmed AlfaNova's high mechanical strength and unbeatable reliability. The AlfaFusion technology creates a plate

heat exchanger with higher mechanical and thermal fatigue resistance than conventional brazed units. Its 100% stainless steel construction enables AlfaNova to withstand temperatures of up to 550°C (1,020°F).

### **Corrosion-resistant**

The AlfaNova's genuine stainless steel construction also ensures high resistance to corrosion. Thus, it represents a major breakthrough for refrigeration system builders using natural refrigerants such as ammonia. It is also the perfect choice for district heating installations in areas with corrosive water or other applications utilizing corrosive liquids.

### **Maximum purity**

Purity is the subject of increasingly stringent legislation in many countries. Applications affected are clean water chillers in refrigeration systems, tap water heating systems, and a long list of other hygienic areas.

For these applications, the 100% stainless steel AlfaNova, with its clean, hygienic heat transfer channels and high mechanical strength, will be the heat exchanger of the future, challenging other types of heat exchangers.



## The superior strength of AlfaFusion

The high-performance AlfaNova is based on a new bonding technology called AlfaFusion, patented by Alfa Laval. The process is so innovative, it has even taken brazing specialists by surprise. The AlfaNova fusion-bonded plate heat exchanger has the mechanical strength of a welded PHE!

AlfaFusion technology is based on Transient Liquid Phase (TLP) bonding, to join included components in plate heat exchangers. The principle for TLP bonding, is that stainless steel pieces in contact with each other and close to the melting point, bond together. The material in the joints therefore consists of material from the original pieces. Therefore, AlfaNova heat exchangers are made of 100% stainless steel.

### Exhaustive testing

To guarantee safety, reliability and durability, we subjected AlfaNova to exhaustive testing, both in our own labs and externally.

Det Norske Veritas (DNV) validated the production process. Grain growth in the material following heat treatment was investigated, and a micro-structure analysis was performed. A number of certification bodies conducted burst testing, confirming a burst pressure several times higher than design pressure.

At Alfa Laval we conducted extensive tests in our own laboratories. These included tests for pressure fatigue, thermal fatigue, heat transfer performance, and corrosion-resistance.

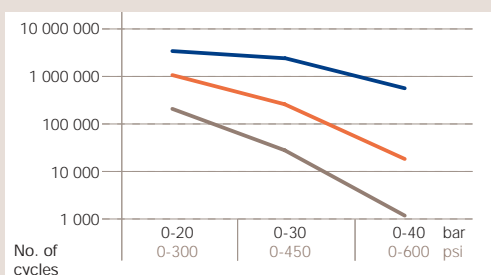
AlfaNova was tested in three different temperature and flow programmes and



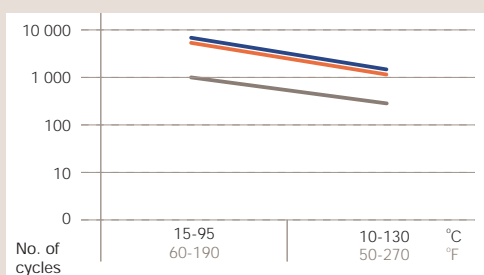
AlfaNova is the result of extensive research in the fields of materials and brazing technology.

long-term testing was carried out in various corrosive environments. We can now confirm that AlfaFusion is the technology of the future for plate heat exchangers. AlfaNova is the first fusion-bonded PHE. Fusion-bonding is a new class of plate heat exchangers available only from Alfa Laval.

### Pressure Fatigue



### Thermal Fatigue



Different types of plate heat exchangers were tested to compare pressure fatigue resistance and thermal fatigue resistance.

#### Legend

- AlfaNova
- Copper Brazed
- Nickel Brazed



**Extreme purity:** For clean water chillers, tap water heating systems, and other areas where hygiene is crucial, the genuine stainless steel AlfaNova is a new standard – the heat exchanger of the future.

## At the cutting edge of heat transfer technology



In refrigeration systems, AlfaNova is ideal for clean water chillers. Hermetically sealed and with a high level of corrosion-resistance, it is also a durable solution for ammonia chillers.

### Refrigeration and air conditioning

#### Ammonia chillers

With its high resistance to corrosion and fatigue, the hermetically sealed AlfaNova is an excellent heat exchanger for ammonia chillers. Its compact design allows the chiller to be downsized and the ammonia charge to be substantially reduced.

#### The main applications are:

- Ammonia compressor oil cooling (water cooled, DX or thermosiphon)
- Ammonia economizer
- Ammonia evaporator (DX or thermosiphon)
- Ammonia condenser
- Ammonia desuperheater and heat recovery
- Ammonia cascade

#### Absorption chillers

In absorption chillers, the 100% stainless steel AlfaNova is ideal for use with corrosive liquids, such as lithium bromide solutions. AlfaNova will be installed primarily as the high temperature regenerator.

#### Clean water chillers

AlfaNova's 100% stainless steel construction also makes it the preferred choice for chillers producing chilled water with specific demands on purity.

### Comfort heating

#### District heating

The fusion-bonded, genuine stainless steel AlfaNova will easily withstand the high temperatures and pressures that are common in district heating networks. Due to its high level of corrosion-resistance, AlfaNova is a major breakthrough for builders of modules for district heating substations in areas with corrosive water.

#### Tap water heating

The copper-free, stainless steel AlfaNova is the perfect solution for builders of tap water heating systems striving to comply with increasingly stringent hygiene legislation. In addition to ensuring a high heat transfer coefficient, the high turbulence in the channels between the plates minimizes the risk of scaling in hard water areas.

### Other applications

Suitable for gas applications and other high temperature duties, AlfaNova is also an efficient solution for industrial cooling, hydraulic oil cooling, corrosive fluid cooling, and many other heating and cooling duties in a wide range of industries.



Due to its high level of corrosion-resistance, AlfaNova is a major breakthrough for builders of modules for district heating substations in areas with corrosive water.



Containing no copper, AlfaNova is the solution of the future for builders of tap water heating systems striving to comply with increasingly stringent hygiene legislation.



### **Alfa Laval in brief**

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

### **How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com).