

# Compact performance for the toughest demands



Alfa Laval DuroShell for marine thermal applications





# Keeping cool under pressure

Alfa Laval DuroShell is a plate-and-shell heat exchanger that provides an ideal solution for a wide range of demanding marine gas duties. In applications involving high pressure fluctuations and extreme temperatures, DuroShell provides a number of truly unique benefits:

## **Improved durability**

DuroShell offers impressive fatigue resistance thanks to features like the PowerPack™ distribution tubes, RollerCoaster™ plate pattern and special laser-welded construction.

## **Reduced total cost of ownership**

High thermal efficiency and low maintenance requirements mean that DuroShell has a long service life with far lower OPEX than conventional plate-and-shell designs.

## **Compact design**

With the ability of multipass on the shell and plate sides, the high-efficiency DuroShell has a lower weight and smaller footprint than conventional plate-and-shells.

## **Easy installation**

Unlike other plate-and-shells, DuroShell can operate with vertical or horizontal configuration in most applications. That means simpler – and more cost-effective – installation.

## **Low risk of fouling**

From the CutWing, RollerCoaster™ plates to the PowerPack™ distribution tubes, DuroShell is filled with unique designs that minimize fouling and ensure efficient thermal performance.

# Plate-and-shell made tougher

Alfa Laval DuroShell is unlike other heat exchangers, including other plate-and-shell designs. Specially engineered to withstand fatigue in duties with extreme pressure cycles or temperatures as low as  $-196^{\circ}\text{C}$ , DuroShell outperforms traditional heat exchangers even in the most demanding marine gas applications.



## **RollerCoaster™**

### **Robust and efficient performance**

Alfa Laval's patented RollerCoaster™ plate pattern optimizes thermal efficiency with increased turbulence to provide superior flow distribution and mechanical strength.



## **PowerPack™**

### **Optimized flow distribution and fatigue resistance**

DuroShell's PowerPack™ distribution tubes not only enable improved flow of the media across the heat transfer surface, they also reinforce the overall unit for unparalleled resistance to stress fatigue.



## **CutWing plates**

### **Less weight and added reliability**

Alfa Laval's unique CutWing plates enable multipass within the shell, making the unit more compact and easier to install, since no external piping is required.





## Taking heat exchange to the limits

DuroShell is a unique heat exchanger, outperforming traditional heat exchangers even in the most demanding marine gas applications.

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Temperature range: -196°C to 450°C\*

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Pressure tolerance: up to 100 bar\*

Marine approval for medium units: 65 bar

Marine approval for large units: 20 bar

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Connections sizes – shell side:

Medium: 50 – 300 mm

Large: 50 – 500 mm

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Connection sizes – tube side:

Medium: 80 mm

Large: 150 mm

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*\* Exact pressure and temperature tolerances will vary according to specific application. Please contact your Alfa Laval representative to learn more.*

# Quality that keeps on going

Alfa Laval DuroShell is specifically designed for self-sufficient performance. By getting the engineering right from the beginning, we create a solution that needs virtually no maintenance.

## **Improved durability**

Many plate-and-shell heat exchangers are presented as openable solutions, which might seem like an advantage. But while opening allows visual inspection and superficial cleaning, it also means risk.

Creating an openable plate-and-shell heat exchanger introduces design weaknesses that can lead to problems down the road. Even in lighter duties, an openable heat exchanger cannot offer the same fatigue resistance as a fully welded solution. Additionally they will never be able to match DuroShell when it comes to pressure or temperature performance.

## **Ensuring performance**

As a comprehensive supplier of process equipment, Alfa Laval has an equally comprehensive service offering. But when it comes to DuroShell, two services are all you need:

- Cleaning-In-Place (CIP) – CIP keeps it clean and maintains peak thermal performance
- Alfa Laval Performance Audit – Performance Audit checks the exact level of thermal efficiency and can be used to determine if any maintenance is needed, ensuring that your uptime is never at risk.

# Part of a complete gas portfolio

DuroShell is part of a complete portfolio of Alfa Laval heat exchangers for marine gas applications ranging from low-pressure to high-pressure duties. Each type merges compact design with the highest reliability and thermal efficiency.



## Alfa Laval AlfaNovaM

The Alfa Laval AlfaNovaM is a fusion-bonded plate heat exchanger made from 100% stainless steel. Due to its copper-free construction, it can be used with ammonia or any other refrigerant media.



## Alfa Laval printed circuit heat exchanger

The Alfa Laval printed circuit heat exchanger is a diffusion-bonded heat exchanger for gas applications with pressures over 300 bar, such as LNG vaporization in high-pressure fuel gas supply systems.



## Alfa Laval CBM

The Alfa Laval CBM is a copper-brazed and extremely compact heat exchanger. Due to its gasket-free design and wide performance range, it is used in a variety of applications in cargo and fuel gas systems, for example as an interstage cooler or gas heater.



## Alfa Laval semi-welded plate heat exchangers

In Alfa Laval semi-welded plate heat exchangers, one side is sealed with laser welds and the other with gaskets. This adds serviceability but allows the use of aggressive media and higher pressures than fully gasketed models. This means the heat exchangers can be used in refrigerant applications.





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