



Developed to make a difference

**Alfa Laval Smit LNG/LPG inert gas systems**



# Experience the difference in your bottom line



Trusted by shipyards and ship owners alike, more than half the world's LNG and LPG fleet have a Smit inert gas system on board. Now with Smit LNG/LPG, Alfa Laval has launched the new generation of the world's most popular inert gas system — specifically developed for LNG and LPG applications.

From shipyard to ship owner to gas buyer, choosing an inert gas system has far-reaching consequences. Safety is, of course, the first purpose of an inert gas system. Yet with increasing demand, tighter delivery schedules, the constant need to optimize onboard footprints and numerous other factors, there are other issues to protect against, too.

That is why we have developed Smit LNG/LPG to make a deeper difference — right down to your bottom line.



## Pay for what you need

With the modular Alfa Laval Smit LNG/LPG, we have put all the experience of our decades developing inert gas systems into streamlining both the system and the installation process. The unique modular design means you will find a perfect fit for both vessel and budget — paying only for what you need. So you save on both time and costs.

## Experts nearby

Our new-generation inert gas system gives you the assurance of Alfa Laval's expert help close to you, whenever you need it. From faster quotation turnaround to local spare parts availability, you can count on response times that exceed expectations. Because we know every minute you have to wait costs you.

## Delivery on time, every time

Alfa Laval Smit LNG/LPG's unique design advantages, backed by Alfa Laval's unmatched quality and service, ensure you can operate as planned without costly delays. From timely installation to steadfast quality to speedy service at sea, rest assured we will help you meet your delivery deadlines. Every time.



1967

Smit Ovens, The Netherlands, delivered its first maritime inert gas system to the fishmeal ship M/V "Willem Barentsz". Willem Smit established the Smit companies in 1913.



1970s

Aalborg Industries KK (formerly Gadelius), Japan, became inert gas generator representatives for Smit Ovens in Japan, Taiwan and Korea.



1971

First inert gas system delivered for an LNG tanker.



1974

First inert gas system delivered for the off-shore market (FPSO).



1984

The first Combiner® (combined inert gas generator and flue gas inert gas system) developed.



1988

Own design of refrigerant cooling and adsorption drying system for LNG/LPG.



1990

First nitrogen generator delivered.



F O R S H I P Y A R D S A N D S H I P O W N E R S A N D G A S B U Y E R S

**The difference for shipyards**

- Modular system
  - faster and easier installation
  - pay only for what you need
  - smaller footprint
- Touch control for easy system optimization
- Local sales support for quick quotations
- Streamlined order handling
- Fast, on-time delivery
- Proven product with high demand
- In line with customer requests

**The difference for ship owners**

- Modular system
  - pay only for what you need
  - smaller footprint
- Touch control for easy system optimization
- High-quality, soot-free inert gas
- Service and spares anytime, anywhere
- User-friendly operation
- Easy inspection and maintenance
- Low total life cycle cost
- 24-hour customer assistance
- In-house training centre
- Proven reliability and durability
- Global after sales support network
- Touch control for quick, easy operation

**The difference for gas buyers**

- Increased reliability of LNG/LPG tankers arriving in harbour on time for delivery

*Alfa Laval has spent decades optimizing cargo safety under the Smit Gas™ name — setting the standard for inert gas generators and systems for the tanker industry. Today we are the market leader in the supply of maritime systems for inert gas production.*



**1994**  
Own design of inert gas compressor launched.



**2005**  
Introduction of own design of water chiller.



**2006**  
Smit Gas Systems BV acquired by Aalborg Industries A/S, Denmark. New company name: Aalborg Industries Inert Gas Systems B.V.



**2008**  
Dedicated inert gas systems service team established in South Korea.



**2009**  
Development of Smit GAS™ DGIN type inert gas generator using diesel exhaust gas after-treatment to generate saturated inert gas in a fuel saving manner.



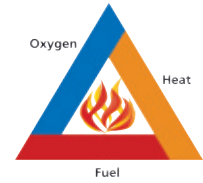
**2011**  
Alfa Laval acquires Aalborg Industries A/S.



**2014**  
Alfa Laval launches the next generation in the Smit Gas™ family: Alfa Laval Smit LNG/LPG.

# Smit LNG/LPG dry inert gas

The most complex inert gas systems are installed on LNG and LPG carriers, where very dry inert gas is required. Alfa Laval Smit LNG/LPG dry inert gas generators are part of a unique modular system consisting of four main components: generator, cooler, chiller and dryer unit. The cooler, which has gas contact surfaces of SUS 316 for lifetime service, takes up minimal space due to the low-temperature output of the generator. By using water as an intermittent heat transfer medium between chiller and cooler, we create a stable heat transfer under all load conditions. The dryer unit is redundant and provides additional security.



A fire needs heat, fuel and oxygen. Eliminating one component (for instance, replacing oxygen with inert gas) stops or prevents the risk of fire or explosion.

## Ultra-low oxygen levels

At the heart of almost every inert gas generator installation delivered by Alfa Laval is the unique Ultramizing® combustion system, assuring low-oxygen-level inert gas without any soot formation. Oil is atomized in an ultra-fine dispersion pattern with steam assist, resulting in reduced NOx output. The system utilizes a highly efficient, two-stage oil/air mixing technique which yields inert gas with 1% oxygen content possible and zero soot formation. Aside from safe combustion, the Ultramizing® burner design meets our strict requirement for low emissions, as well as excellent operation during its entire life cycle.



Conventional, strongly radiating, long oil flame producing soot.

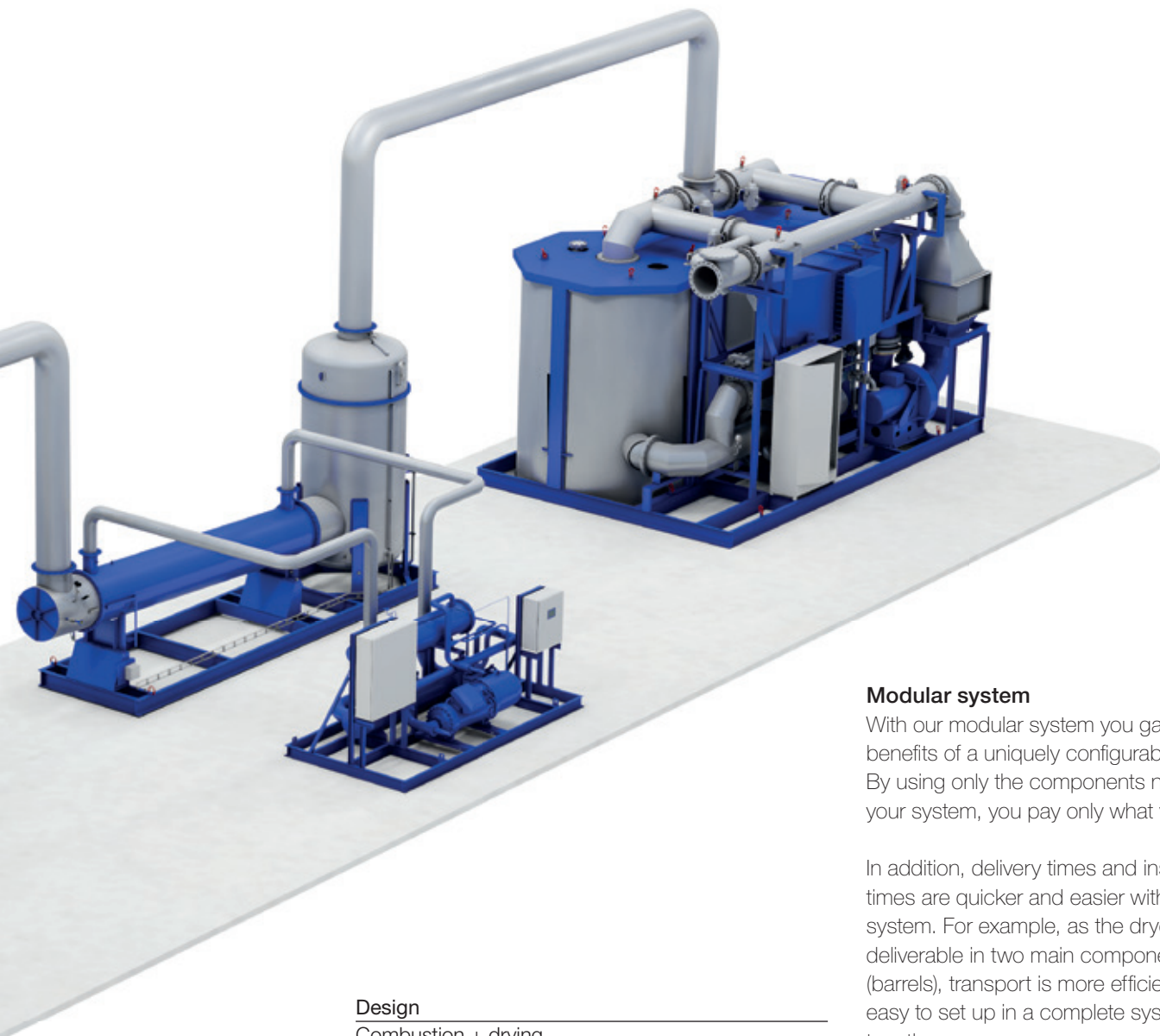


Bluish-transparent oil flame characteristic of the Ultramizing® combustion principle.

## Environmentally friendly cooling

Alfa Laval has developed cooling system for LNG and LPG carriers that uses a mere 10% of the usual quantity of Freon compared to previous models, and we have introduced the new, environmentally friendly Freon type (R-407C) into our chillers.

- Standard R407C ready for Clean Ship Notation requirements
- CLEANSHIP notation (GWP index <1890))



#### Design

Combustion + drying

#### Capacity range

3,000 – 25,000 m<sup>3</sup>/hr

#### Pressure

0.3 – 0.4 bar(g)

#### Fuel Type

DMA, DMB, DMZ

#### Typical dew point

-45°C after expansion to atmospheric

#### Typical gas composition

Oxygen	0.5 – 1.0 vol%
Carbon-dioxide	approx. 14 vol%
Carbon-oxide	max 100 ppm
Sulphur-oxides	max 10 ppm
Nitrogen	balance
Soot	0 (= complete absence)

#### Modular system

With our modular system you gain the benefits of a uniquely configurable system. By using only the components needed for your system, you pay only what you need.

In addition, delivery times and installation times are quicker and easier with a modular system. For example, as the dryer is deliverable in two main components (barrels), transport is more efficient and it is easy to set up in a complete system together.

#### Smaller footprint

The new modular Alfa Laval Smit LNG/LPG system is considerably smaller. And the horizontal installation allows for easy maintenance, although maintenance is seldom required.

#### Quick, easy touch control

Featuring the Alfa Laval 2Touch controller, the Alfa Laval Touch Control makes any aspect of the system available in just two touches of the screen. As well as offering a graphical overview of the system, it provides quick access to functions and data.

Using the comprehensive data at its disposal, Alfa Laval Touch Control ensures thorough system optimization. Naturally, it integrates seamlessly with other Alfa Laval automation systems and connects easily to ship control and communication.



# Experts always close at hand



With the largest installed base in the world for inert gas systems, Alfa Laval has always prioritized being near at hand for both sales and service. We have in-house know-how and resources to meet the day-to-day requirements for quotations and order handling, with exceptionally fast turnaround time.

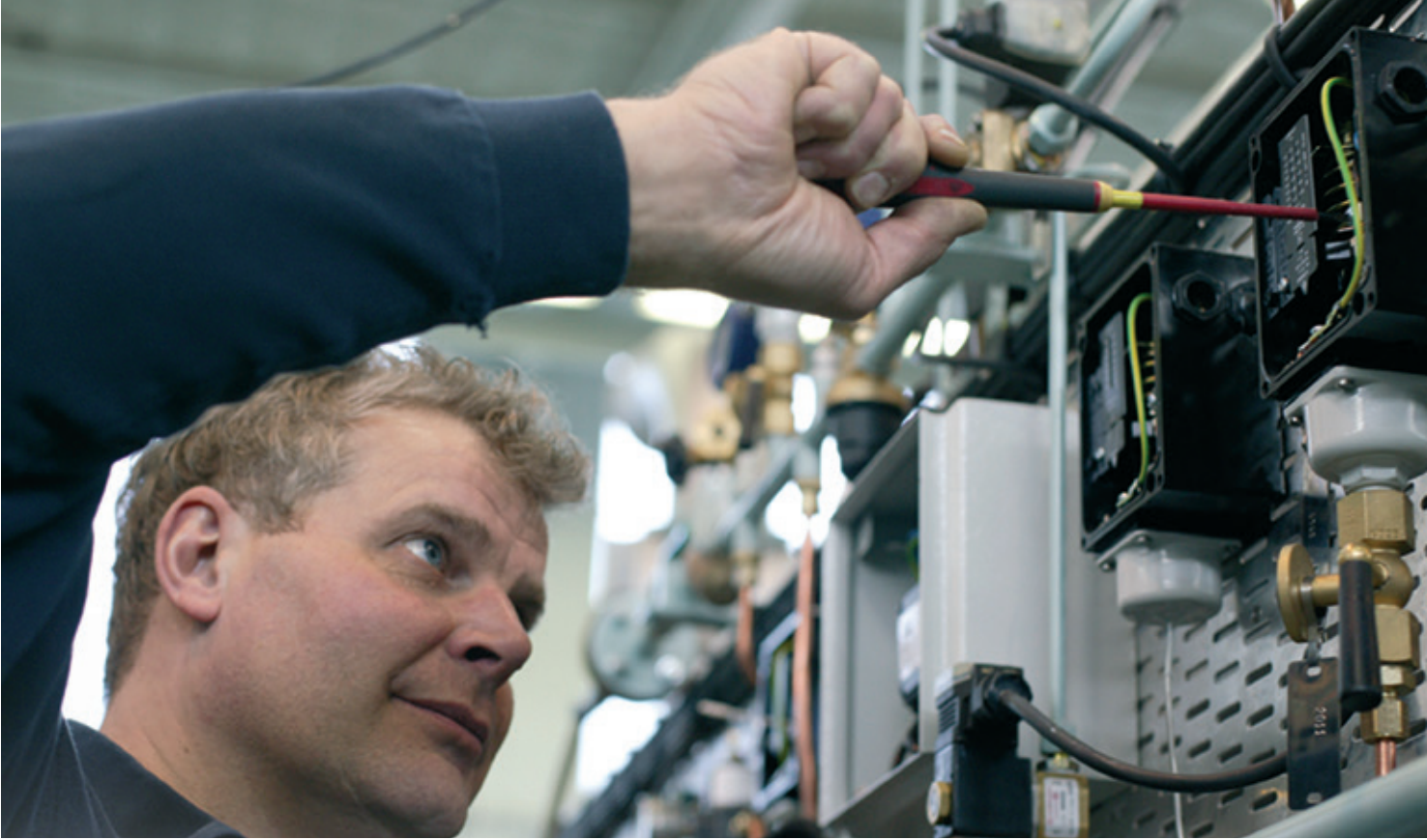
From the time we carry out commissioning of new inert gas systems and train the future operators in daily maintenance and safety features, Alfa Laval maintains close contact with ship owners and operators worldwide. Our Alfa Laval Service organization provides professional support and complete service wherever and whenever you need it. Alfa Laval supplies OEM spare parts and carries out inspections, service, repairs, retrofits and upgrades on our inert gas systems.

## **Maintenance contracts**

Alfa Laval has service and maintenance contracts with a number of customers. We have fully trained and licensed personnel and advanced testing equipment to go on board to help secure a safe and economical operation.

## **Training**

In the Netherlands, we offer in-house operator training. We can also provide training on board or at other customer-specified locations.



# Continuous innovation and development



Engineering and product development are the backbone of our company, which is why we have pioneered modular design in the new Alfa Laval Smit LNG/LPG. This allows tailored deliveries to shipyards to meet their building demands. All components are engineered by Alfa Laval and manufactured at an Alfa Laval production facility that meets our strict QA/QC standards, thereby safeguarding high product quality.

## Setting the industry standard

Since installing some of the world's first inert gas systems on oil tankers, we have remained in the forefront of innovation to set the industry standard. Our in-house research and development ensures a steady product portfolio development. For special development projects, we have a mutually beneficial cooperation with universities, classification societies and other knowledge centres to supplement our own technological capabilities and cover all analytical aspects.



Our inert gas systems can be tested for performance evaluation if required by specification. We also provide professional training for operators to further ensure system safety.

## 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)

