

# Offshore

i n d u s t r y



## Far Samson

A 'TRENCH SETTING' DESIGN

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Forecast 2009-2013

HOW LONG WILL IT LAST?

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## EM Technology

DETECTING HYDROCARBONS

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SeaBats

HIGH RES SONAR SYSTEMS

# Kronios



## More Than the Sum of Parts

*Clean drinking water is essential on board ships and offshore installations. Five experienced companies, each with their own specialty, have joined forces in designing and installing turnkey potable water systems under the trade name of Kronios.*



Kronios was initiated in the summer of 2008 and is a joint venture between five companies: Hatenboer-Water, Minks Kunststoftechniek, Econosto, Georg Fischer and Kemper. Kronios is not a company in itself, but the trademark of a unique partnership between the five companies. Hatenboer-Water is one of the world's leading experts in the design and installation of total water production and treatment installations including related services. Minks on the other hand is a specialist in the design and installation of thermoplastic piping systems. Within Kronios, the thermoplastic pipes and fittings are being purchased from Swiss company Georg Fischer. Kemper of Germany produces valves and fittings for the prevention of legionella. Econosto is a wholesaler of valves and fittings who in turn purchases these products from Kemper and Georg Fischer. So when Kronios supplies a drinking water system, all five companies benefit. But eventually the clients are the main beneficiaries of the collaboration as they don't have to deal with many different companies and because they can be certain of the latest state-of-the-art technology that complies with even the strictest requirements. All parts applied by Kronios have Class approval from leading Classification Societies such as Lloyd's Register, Bureau Veritas, DNV, Germanischer Lloyd, ABS, etc.

## Complete Systems Engineering

The key objective of Kronios is: Always clean drinking water. Kronios provides complete systems engineering, from water production to the end user, and everything in between. Kronios designs and builds the entire potable water system on board ships, yachts, naval vessels or offshore installations and it only uses advanced water production techniques from Hatenboer-Water such as reversed osmosis or evaporation. The Kronios objective is to make sure that the quality of drinking water is kept high. This objective is achieved by:

- Complete systems engineering, a good design is the foundation of longevity.

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## Always clean drinking water.

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- Closely monitored construction of the entire drinking water system, from the water production to the consumers.
- Application of the best materials and state-of-the-art water technology.
- Increasing the reliability and the efficiency of the entire drinking water system by means of good risk management. This entails the compilation of risk inventories, the formulation of a management plan and keeping a logbook.



## WHO Standards

For some months now, the water quality on board ships and offshore installations has to meet the strict quality requirements as determined by the World Health Organization (WHO) in the Ship Sanitation Control Certificate (SSCC). The required standard for shipboard drinking water is now equal to the worldwide standards for water quality as determined by the WHO. Kronios has extensive experience in the production of clean drinking water and all the systems meet the WHO requirements.



## The Power of Collaboration



The partners behind Kronios have a combined experience of more than five hundred years in the preparation of drinking water and the related technical components, giving Kronios an extensive knowledge of water systems on board ships and offshore installations.

### Hatenboer-Water

Hatenboer-Water has a long history in the world of water. Its roots lie in the Rotterdam-based company Hatendoer-Neptunus which has been providing the shipping and industry in the port of Rotterdam with water since 1906.

### Minks Kunststoftechniek

Minks Kunststoftechniek, based in Rotterdam and IJmuiden, the Netherlands, has been building industrial and maritime processing installations out of plastic for more than thirty years. The company processes both thermoplastics (HDPE, PP, PVDF, ABS, PVC, etc.) and thermosetting plastics (GRF, GRE).

### Georg Fischer

Georg Fischer AG is a Swiss company, founded in 1806 in Schaffhausen. The company, with production sites and sales offices all over the world, is specialized in high quality plastic piping systems. Besides complete piping systems with (plastic) pipes, valves and fittings in the materials PVC-U, ABS, PVC-C, PE, PP, PVDF and PB the company also supplies measurement and control products, welding machines, glue and many different supporting

tools. The shipbuilding industry is one of the focus markets of Georg Fischer. Of course all the relevant piping products have the necessary shipbuilding certificates. The Dutch sales office is Georg Fischer N.V. and located in Epe.

### Econosto

The Econosto Group is an international group of technical wholesale companies with operations in Europe, the Middle East and Far East. Econosto is focused on the sale of engineering products for industries such as shipbuilding and repair, chemical and petrochemical, oil and gas, heating, ventilation and air conditioning, original equipment manufacturers, water management and power generation. The product range includes complete product lines, manufactured exclusively for and by Econosto.

### Kemper

The history of Kemper dates back to 1864 when Gebr. Kemper Metallwerke was founded in Germany. Today the company's three business units (valves, casting products and strips) offer a broad range of unique solutions based on non-ferrous metals.

- Sampling, laboratory analysis, advise and audits that will maintain the client's good name and reduce its liability.

Hatenboer-Water has an essential role in Kronios and is the main point of contact of Kronios. When Hatendoer-Water is approached to design a drinking water system, whether it concerns a new build or a refit, the company performs the risk analysis, it designs and it builds the installation. They will contact Minks for the design and construction of the piping for the installation.

## Significant Advantages

The piping is a crucial part of any potable water system. One can have the most advanced water production and treatment plant but if the piping system is not constructed according to the same high standards the risk of contamination is very high. Compared to copper and steel pipes, synthetic piping offers significant advantages:

- The extremely smooth surface on the inside of the piping prevents mineral scaling and the growth of bacteria.
- Synthetic piping has a high thermal insulation rating which in many cases reduces the need for additional thermal insulation resulting in a significant cost reduction.
- The pipes are built to resist high temperatures up to 95°C.

- The low flow resistance of synthetic piping allows the use of smaller diameters.
- No maintenance.
- Lower sound emission for application in comfort zones such as crew cabins.
- Synthetic pipes have an extremely long lifespan which lowers life-cycle costs. Minks guarantees the quality of its piping systems for ten years (the oldest known pipe system from Minks is over forty years old).
- The material is very flexible making it very suitable for yachts and offshore installations where space is limited.

Kronios doesn't only supply water systems for new build ships, but it also performs refits on existing ships. For example, Kronios recently replaced the entire potable water piping system of Heerema's heavy lift construction vessel Thialf. While the Thialf was en route from



*Piping is a crucial part of any potable water system.*

the Caribbean to Europe, the Kronios team worked around the clock to replace the old and corroded pipes by new synthetic piping. A total of nine kilometers of pipes was installed. To further improve the water quality on board,



Hatenboer-Water equipped the Thialf with an additional disinfection installation (UV and copper/silver ionization) next to the already existing watermakers and disinfection systems.

### Preventing Legionella

The legionella bacterium is one of the threats of safe drinking water. Legionella thrives in an environment with water temperatures between 25 and 45°C particularly if there is insufficient flow in the system. On ships for instance, one of the potential growth areas for legionella bacteria is the piping between the main waterline and the taps in, let's say the bathrooms. If a cabin has not been used for a while the water in this part of the system doesn't flow and legionella can develop, eventually infecting the entire drinking water system. Kronios uses the patented Venturi Flow Divider, developed by Kemper. Instead of installing a single pipe to the tap, two pipes are installed: a feed and return pipe. The venturi nozzle causes a pressure differential of 30 to 50 mbar in the main waterline whereby about 5% of the flow is rerouted to the taps via the feed pipe and back to the main waterline via the return pipe. The combination of a constant flow with the correct disinfection techniques makes the water system completely safe and legionella free.

### Killing Micro-Organisms

Disinfection means the killing of micro-organisms (bacteria and viruses) in water. Conventional disinfection techniques are UV disinfection and chemical disinfection by means of Hadex-dosing. UV is able to disinfect

large flows. It has no lasting downstream effect and it is therefore often used as first line of disinfection for bunker water or right at the hydrophore. Hadex is an approved disinfectant based on chlorine. It works fast and it has effect throughout the piping system. In high concentrations it can be used as a cleaning chemical, eradicating bio film.

The latest technique is disinfection by means of copper/silver ionization. Releasing copper/silver ions into the water offers significant benefits when it comes to preventing legionella. Once the ions are released into the water they are being circulated into the entire system. Copper/silver ions keep legionella bacteria away even when the circulation is not at best. One of the latest developments developed by Hatenoer-Water is distant monitoring of the copper/silver ion concentration in the water. Wherever the ship is located, Hatenoer-Water can immediately alarm the ship if any abnormalities are detected in the system and instructing the ship to take alternative precautions to safeguard the water quality.

Each disinfection method targets a specific possible contamination, therefore is a combination of the systems very suitable for high-risk conditions on board.

**i.** [www.kronios.com](http://www.kronios.com)

