COMPANY INTRODUCTION

Heinen & Hopman is a reliable partner in the global maritime sector, offering top quality products and service in the field of climate control (HVAC & Refrigeration). The no-nonsense and entrepreneurial character of the founders who established the company in 1965 is still one of the main cornerstones of Heinen & Hopman. We support our clients using our knowledge and experience by realising the best possible climate control solutions; either fully customised or with varying degrees of standardisation. Like our clients, we are continuously active on a global scale to ensure that we can always be of service. We are also constantly searching for sustainable innovations as we aim for the best and very latest solutions in collaboration with our clients. Heinen & Hopman is critically aware that a company’s greatest asset is its employees – it is they who represent the added value of our business. Our goal is to continue to expand in the global market for maritime climate control solutions in a future-proof way.

In short, you can rely on Heinen & Hopman to deploy the know-how and expertise required to solve any heating, ventilation, air conditioning and refrigeration issue onboard ships. We see complexity as a challenge, no matter where your vessel may be.

OPERATING GLOBALLY

Global networking is crucial in every line of business and the shipping industry is certainly no exception. Being able to offer the highest quality of service and products to our clients at all times and in all places is of enormous importance to us. This is why Heinen & Hopman aims to keep expanding our network and know-how and ensure we are exactly where our clients need us to be.
INTRODUCTION

Using computational fluid dynamics (CFD) technology, we can finely tune your HVAC installation to meet specific requirements before even mounting a single piece of equipment onboard your ship. CFD enables us to realistically simulate air flows within the project space in advance. As a result, we can accurately predict where deficiencies in the HVAC system may occur, such as drafts, high pressure drop, hot spots, poor air distribution and air contamination. This allows us to optimise the HVAC system’s design and ensure comfort and effectiveness – before actual installation work begins.

The simulations account for all kinds of factors that influence air flows and temperatures. They help create finely tuned designs even for installations in very complex spaces, such as engine rooms, data centers or public spaces. CFD considers everything from the influence of sunlight to the layout of the rooms, the placement of air vents and heat sources, resulting in a comfort analysis, thermal analysis and/or system validation. The goal is to figure out the best air circulation solutions for the specific project space.

BENEFITS

- Avoid problems before they even occur;
- Save time and costs during the design and installation;
- Reduce costs for prototyping by carrying out virtual testing;
- Reduce costs for real-time testing by testing virtual mock-up;
- Optimized performance of the HVAC system;
- Visualizing HVAC, seeing is understanding and believing;
- Most of all: peace of mind.
APPLICATION

Cargo Hold Ventilation
Heinen & Hopman is involved in the design and built of world’s largest container vessels. Mechanical ventilation is used to provide each reefer container with a certain amount of fresh air. For one of the projects we’ve worked on, the mechanical ventilation trunks were reduced in size in order to stack and carry as much containers as possible. To ensure that the mechanical ventilation would still be capable to supply the required air amount through the trunks, the pressure loss has been calculated.

In addition a thermal analysis has been elaborated to determine the increased fresh air temperatures due to on deck reefer containers. Also the intake air temperatures of each reefer container in the hold have been simulated. This to avoid decay of cargo due to malfunction of the container coolers because the maximum intake temperatures were exceeded. A CFD analysis is a perfect tool in this case to validate the design of the mechanical ventilation system.

Engine Room Ventilation and Cooling
Heinen & Hopman is involved in the design and build of the most luxurious yachts. On the outside the yacht looks spectacular. However in one case – during the design process of the engine room – a flaw was detected in the geometry of the ventilation shafts. An engineer found out that there is a possibility that – due to the limited space available – the supply and exhaust fan cannot overcome the pressure losses in the shafts, and therefore jeopardize the airflow and cooling of the engine room.

Another example of a situation wherein a CFD analysis was the only way to get more insight in this challenge.

For another engine room, an engineer doubted if the selected insulation for exhaust pipes would be sufficient to prevent the outside surface temperature from exceeding the maximum required value. Because the exhaust pipes were an important part of the total heat load, a thermal analysis of the entire engine room with local coolers was elaborated. One of the results were the air velocities and temperatures along the surfaces of the different exhaust pipes, with which an insulation type could be selected. In addition hot spots in the engine room were indicated, which led to more insight and therefore a few small design changes.

Contaminant Removal
In the zodiac store of a cruise vessel, the gasoline stored in the fuel tanks caused concerns regarding safety. The possibility that the total content of a fuel tank spills out on the deck and the vapor might form an explosive mixture with the air has been simulated. In this CFD analysis it has been checked whether there are regions of stagnant air in the Zodiac Store where gasoline vapor can accumulate and whether the amount of fuel vapor remains at safe levels throughout the Zodiac Store during summer-and winter conditions.

Beside technical spaces, the Heinen & Hopman CFD service has been an added value in a variety of applications, like accommodations, theaters, wheelhouses, galleys, infirmaries etc. No matter what vessel type or size, a CFD analysis is the perfect tool to validate your HVAC design, to troubleshoot HVAC problems and to optimize system performance.

Don’t hesitate to contact us for more information about our service options. We are eager to explain the possibilities for your vessel or structure.

Scan the QR-code or visit heinenhopman.com
WHY A CFD ANALYSIS?

CFD is a well-established technology in many industries. Investing in virtual CFD analyses will save you from large costs in real live testing and validation. Moreover, potential high expenses for adapting the HVAC system on-site after installation are avoided. Additionally, getting a CFD analysis in an early stage of the HVAC design process, will generate a huge beneficial insight and will help you determine the optimal air flow in every single space. These insights can save you loads of money and have been proven to be a valuable, powerful and innovative service to optimise the HVAC design, resulting in increased comfort and effectiveness.

A CFD analysis can be very useful in the following situations:
1. Validating your HVAC design before installation;
2. Troubleshooting HVAC problems;
3. Optimising system or component performance.

TYPES OF ANALYSES

1. Flow analysis
   With this simulation you can expect e.g.:
   • Gas or liquid flow patterns
   • Gas or liquid velocity

2. Pressure analysis
   With this simulation you can expect in addition to the flow analyses e.g.:
   • Absolute and relative pressure development through the system
   • Pressure loss over the total systems and its internal components

3. Thermal analysis
   With this simulation you can expect in addition to the pressure analyses e.g.:
   • Heat transfer of objects or surfaces
   • Heat transfer by radiation, conduction and convection
   • Room temperatures
   • Hot-spot, cold-spot detection

4. Comfort/ air quality analysis. With this simulation you can expect e.g.:
   • Local Air Changes Index (LACI)
   • Local Mean Age (LMA)
   • Tracing of High Gas Concentrations
   • Contaminant Removal Effectiveness (CRE)
   • Local Air Quality Index (LAQI)

WHY HEINEN & HOPMAN?

With more than 50 years of ever-expanding knowledge in the field of HVAC design, implementation and maintenance, we are well capable and equipped with the knowledge and tools to provide reliable analyses and advice.

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Scan the QR-code or visit heinenhopman.com
Do you require more information about our services or would you like to know more about our CFD analyses? I am keen to help you further!

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