

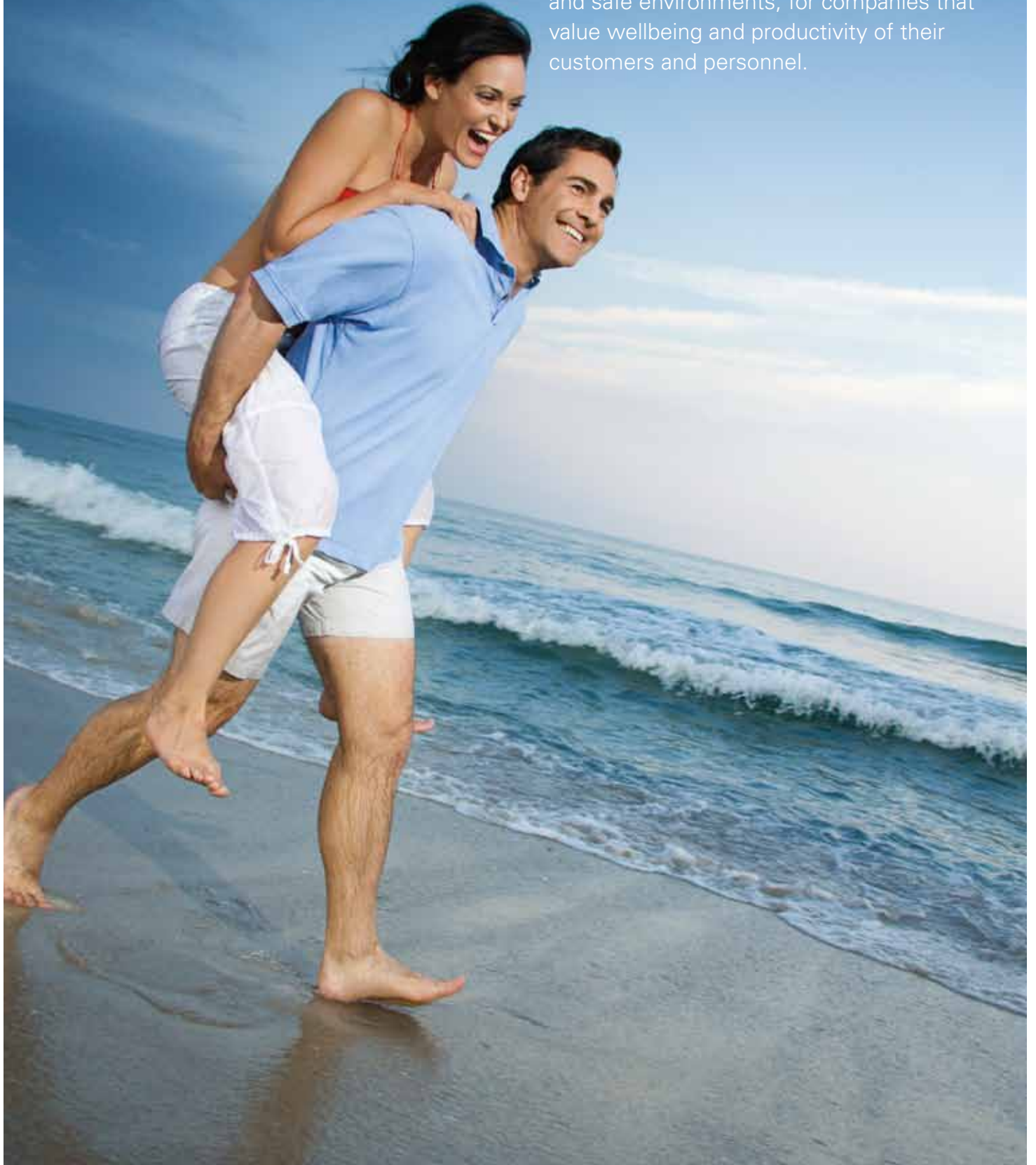
Halton Marine

– HVAC solutions for ships and ferries



Enabling Wellbeing

Halton is passionate about indoor environments. We offer business enhancing solutions for comfortable, energy-efficient and safe environments, for companies that value wellbeing and productivity of their customers and personnel.



Front cover photo: courtesy of MSC Cruises

Wellbeing, Safety and Energy Efficiency

A good indoor air quality in demanding conditions results from paying attention to many details and their successful adjustment. Why not to unleash the potential and see what we can achieve together. Create comfortable, productive and safe environments, and let Halton help you with industry leading solutions and services.

HVAC Dampers

The following pages introduce you to our main product groups for different types of ships. Whenever you have questions regarding a good indoor environment, don't hesitate to contact us! We are constantly striving to create new technological advantages and customer relationships that are mutually beneficial and lead to financially solid, reliable and long term partnerships.

Galley Ventilation



The Halton Scope

Cabin Ventilation

Droplet Separators and Outdoor louvres

Services

Halton HVAC dampers for all applications

Safety is the most important factor on board ships, where a fire could put people's life at risk unless necessary precautions are taken. Therefore it is essential that the equipment chosen to prevent fire progression within a ventilation ductwork is top-class. Because smoke and other toxic gases can be more dangerous than the fire itself, it is important that the fire dampers also prevent smoke from spreading. Halton is the manufacturer supplying smoke-tight fire dampers.

Halton Marine type-approved A0(A60) fire and gas dampers are widely used in different types of ships and Oil & Gas applications, where they are typically installed to prevent the spread of fire, smoke and gas between fire zones. The Halton FDB2 fire and gas damper patented blade structure, contain special seals that are effective up to 300 °C (572 °F) and thermally-activated graphite seals that expand when the heat rises to 150 °C (302 °F) in ductwork. These unique safety features ensure air tightness and low leakage of Halton FDB2 dampers.

Halton type-approved H0(H120) fire dampers are to be used in demanding applications, where it is necessary to ensure the maximum amount of time for people to react to possible fire, or risk of fire. Halton FEX dampers are to be installed, for example in the external walls of living areas, where fire could become life-threatening. Halton FEX dampers are developed to meet H-Class integrity.



Halton Marine shut-off and airflow control dampers are installed in the ventilation ducts where the dampers are used to control and balance the supply of fresh air for people to live and work in. When necessary, dampers can be used to shut-off the ventilation ducts (possible emergency situation). As a result of good airflow management, temperatures and air pressures are maintained at the required level.

Halton Marine non-return and pressure-relief dampers are used to prevent backflow and relieve pressure through ventilation ductwork. The opening pressure of BLD and BRD dampers can be individually adjusted.

Blast valves are designed for protection of ventilation systems against destructive blast forces. The HV series offers higher air flow capacity and increased level of safety, compared to most of the available products on the market, as well as flexibility for design of duct systems.

We offer

- H0(H120)-class fire dampers
- A0(A60)-class fire and gas dampers
- Non-return dampers
- Pressure-relief dampers
- Shut-off, balancing and gas dampers
- Blast valves

With

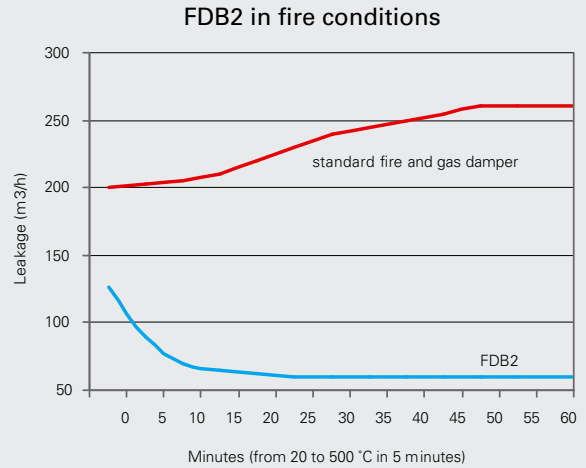
- Pneumatic, electrical, spring-actuated or mechanical operation systems
- A wide range of accessories for explosive atmospheres and special steels combined with structural flexibility
- ATEX approved products
- Product manufactured according to ISO 15138 standard
- Excellent quality recognized by the owners and the major classification societies worldwide



PERFORMANCE OF HALTON FDB2




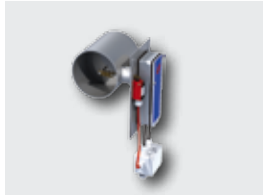
Halton FDB2 is the successor of FDB - the most widely sold marine fire damper in the world. Why do the owners want to secure their properties with FDB2?

- FDB2 is truly designed for fire. Tightness of FDB2 improves substantially under fire conditions. Typically, steel deformation during fire increase the damper leakage and allows the smoke and other toxic gases to spread out into the ductwork.
- Tightness in normal conditions meets - and is substantially better than ISO 15138 requirement of 300 m³/h/m² 2000 Pa for gas tight fire dampers.
- Closed FDB2 fire damper 1000x1000 fulfils the requirements of leakage class 3(EN 1751:1998).

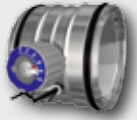


Arctic Test

FDB2, FEX, UTG, BRD dampers were tested for over three months in cold conditions (-35 °C.). The test results show that the dampers operated normally for the full duration of the test. After the Arctic test, dampers kept their performance level and the fire dampers were tested in fire conditions. The test chamber was set at 1000 °C. with a test pressure of 1000 Pa. The test results show that the cold conditions had no affect on fire damper operation.

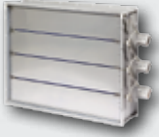
Dampers	Fire and gas dampers	Fire and gas dampers	Fire dampers	Fire and gas dampers
				
	FEX H0(H120)	FDB2 A0(A60)	FDL A0(A60)	FDD A0(A60)
Frame	AISI 316 L or AISI 316 L with painted frame	AISI 316 L or painted or galvanized steel	AISI 316 L or painted or galvanized steel	AISI 316 L or painted or galvanized steel
Frame thickness	3 or 3-5 mm	3 or 3-5 mm	3 or 3-5 mm	min. 3 mm
Blades	AISI 316 L	AISI 316 L or galvanized steel	AISI 316 L or galvanized or painted steel	AISI 316 L
Blade gaskets	with thermal expansion and special seals	with thermal expansion and special seals	without seals	thermal expansion and glass fibre seals
Sizes	from 100x100 to 1200x1200 mm at 1 mm intervals	from 100x100 to 1200x1600 mm at 1 mm intervals	from 100x100 to 1300x1200 at 1 mm intervals	ø 100, 125, 160, 250, 315 mm
Circular connection pieces	from 100 to 1250 mm	from 100 to 1250 mm	from 100 to 1250 mm	ø 100, 125, 160, 250, 315 mm
Modules possible	no	yes	case by case	no
Special flanges and drilling patterns available as an option	yes	yes	yes	yes
ATEX	available as an option	available as an option	available as an option	no
<p>All dampers with automatic electrical, pneumatic or spring actuated operation systems and fusible link. Special grades of stainless steel available on request. Halton Marine fire dampers are approved by most recognized classification societies worldwide. Please visit www.haltonmarine.com for valid fire damper certificates.</p>				

Adjustment and measurement units / PRA



Casing and blades galvanized steel. Circular connection 100...315 and 350...1000 mm. Adjustable cone and airflow measurement taps for differential pressure adjustment. Classification of casing leakage, EN 1751 Class C.

Non-return dampers / BLD and Pressure relief dampers / BRD



Frame material AISI 316 or galvanized or painted steel. Frame thickness 3 mm. Blades made of AISI 316 L or galvanized steel. Blades contain special seals. Sizes from 100x100 to 1200x1400 mm at 1 mm intervals. Circular connection pieces from 100 to 1250 mm. Modules possible. Note: special drilling patterns are available as an option. BRD dampers include counter weights. ATEX approval available as an option.

Blast valves / HV-Series



Material galvanized steel or AISI 316 L. Blast protection up to 1 bar, 14,5 Psi. Modular construction available for high airflows and large ducts. Fully maintenance free design. Minimum leakage on pass-through pressure and impulse. Minimum turbulence and pressure drop. The valve is designed to function within the operating temperature range of -40...+200 °C.

Blast valves / PV-KK-SM and PV-KK-SMX



Material galvanized steel or AISI 316 L. The PV-KK-SM-/SMX blast valves are designed for a maximum long duration blast load with 1.0 bar reflected peak pressure. Modular construction available. The valve is designed to function within the operating temperature range of -40...+200 °C.

Dampers	Balancing dampers	Shut-off, balancing and gas dampers	Balancing dampers	Shut-off, balancing and gas dampers
	UTK	UTT	UTP (thick model)	UTG (thick model)
Frame	AISI 316 L or galvanized steel	AISI 316 L or galvanized steel	AISI 316 L or galvanized or painted steel	AISI 316 L or galvanized or painted steel
Frame thickness	1 mm	1 mm	3 mm (standard) or 5 mm	3 mm (standard) or 5 mm
Blades	AISI 316 L or galvanized steel	AISI 316 L or galvanized steel	AISI 316 L or galvanized steel	AISI 316 L or galvanized steel
Blades	seals (tightness class 1)	insulated and with seals	without seals	with seals
Sizes	from 100x100 to 2400x2400 mm at 50 mm intervals (special sizes available)	from 100x100 to 2400x2400 mm at 50 mm intervals (special sizes available)	from 100x100 to 1200x1600 mm at 1 mm intervals. larger sizes with modular construction	from 100x100 to 1200x1600 mm at 1 mm intervals. larger sizes with modular construction
Circular connection pieces	from 100 to 1250 mm	from 100 to 1250 mm	from 100 to 1250 mm	from 100 to 1250 mm
Modules possible	yes	yes	yes	yes
Special drilling patterns available as an option	yes	yes	yes	yes
Operation principle	electrical, pneumatical or manual	electrical, pneumatical or manual	electrical, pneumatical or manual	electrical, pneumatical or manual
ATEX	available as an option	available as an option	available as an option	available as an option

Halton high-efficiency galley ventilation

Halton Marine is the leading suppliers of galley ventilation equipment for cruise ships.

Water wash system for hoods – the best choice for galleys running at peak performance

Halton Marine KWH and KWT water wash hoods are equipped with an automatic washing system that cleans the filters, UV-lamps and the exhaust plenum at the set time without a need to remove the filters and UV-lamps from the hood. Washing cycle is automated with a separate control cabinet that can be connected to several hoods. The Halton Marine water wash hoods are especially designed for high capacity utilization in marine and offshore applications where improved hygienic conditions, safety and reliability play an important role.

Jet Extraction System for the front cooking areas

Halton JES has been specifically designed for the front cooking areas or architectural cooking concepts integrating appliances with medium input power like grills, small charcoal grills, woks, heating plates etc.

Technological Advances

Halton Capture Jet Technology

– exhaust efficiency with reduced airflows

Halton Capture Jet prevents the heat and impurities produced by cooking appliances spreading to the work area. Compared to conventional exhaust-only hoods, **Capture Jet is up to 30% more efficient** and it reduces required airflows resulting in savings in weight, space and energy consumption. The Halton Capture Jet technology does not necessarily require a separate supply air duct. The Capture Jet Fan takes the required air from the galley. This also saves space as well as construction and operational costs.



UV-light technology

– the most efficient grease filtration technology

In the UV-light concept, most of the grease particles are first filtered with mechanical filtration. The mesh filter behind the KSA spreads and equalizes the airflow into the hood chamber. The remaining grease is then eliminated with UV-light technology, resulting in a clean exhaust ductwork. This helps to reduce a serious fire risk and expensive cleaning of the ducts.

The UV-light technology is an excellent choice not only for hoods in new-buildings but also for refurbishments as the equipment do not change the outer dimensions.

Halton M.A.R.V.E.L. – intelligent demand controlled ventilation system

Compared to traditional hoods, Halton M.A.R.V.E.L. system combined with Halton Capture Jet technology **can save up to 50% in galley ventilation energy consumption**. This contributes also to environmental respect. Read more on this award-winning technology on the next spread.

We offer

- Wide range of options for different applications
- Automatic galley water wash hoods, galley hoods, canopies, Jet Extraction Systems
- Control cabinets
- Certified wet chemical fire suppression systems
- Stainless steel diffusers
- UV-light technology – the most efficient grease filtration technology in the market. Improved fire safety
- Automatic washing function
- Capture Jet technology - enabling low airflow rates
- In-built certified fire damper in the exhaust connection according to SOLAS
- Construction according to USPHS
- Continuously welded construction in water wash hoods and condensate canopies
- M.A.R.V.E.L. demand based ventilation
- For new-buildings and refurbishments

With UV-light technology



Exhaust duct

Without UV-light technology



Exhaust duct



Hood damper



Hood damper





M.A.R.V.E.L. intelligent demand controlled ventilation system

Halton offers a unique system that can save significant amount of energy in galleys without comprising the comfort and functionality. Halton's patented method of Demand Control Ventilation called M.A.R.V.E.L. adjusts hood exhaust airflow based on cooking appliance status. This is done automatically and individually for each hood.

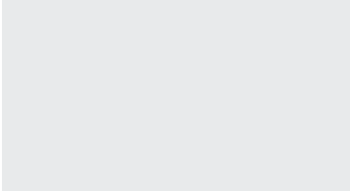




In traditional systems, the galley ventilation is maintained in a constant level. In the Halton system, the ventilation is based on varying the exhaust and supply air volumes according real needs. The system detects the status of cooking equipment by using sensors and algorithm designed for galley application. M.A.R.V.E.L. also provides comfortable conditions by supervising and maintaining humidity and temperature levels inside galley by adjusting Air-



Handling Unit as well as supply and exhaust fan.
The result of M.A.R.V.E.L. system is optimized energy consumption according to real needs.

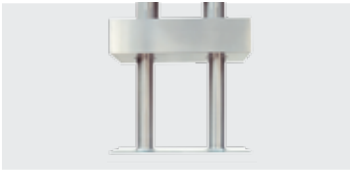
- Compared to traditional hoods, Halton M.A.R.V.E.L. system combined with Halton Capture Jet technology can save up to **50%** in galley ventilation energy consumption. This contributes also to environmental respect.
- Improved comfort and hygienic conditions by temperature and humidity control
- A possibility for a longer life-time of Air-Handling Units and less maintenance
- A possibility to communicate with other ship systems



	Hoods and canopies	Galley water wash hoods	Galley hoods without water wash	Capture Jet hoods	Condensate canopies
					
		KWT/KWH	KFM	KVI	KVM
Material		stainless steel AISI 304, AISI 316 L available as an option	stainless steel AISI 304, AISI 316 L available as an option	stainless steel AISI 304, AISI 316 L available as an option	stainless steel AISI 304, AISI 316 L available as an option
Continuously welded construction, manufacture according to USPHS		yes	yes	no	yes
Capture Jet		yes	as an option	yes	no
Supply air		KWT yes, KWH no	no	no	as an option
Airflow measurement tap		yes	yes	yes	no
Light fitting		yes	yes	yes	yes
Washing system		yes	no	no	no
Personal fresh air nozzle		no	no	as an option	no
Airflow control damper		yes	yes	yes	no
Fire damper or shut-off damper		as an option	as an option	as an option	as an option
Grease collection tray		as an option	yes	yes	no
Grease pipe with tap		no	no	as an option	no
Drain pipe		yes	as an option	as an option	no
KSA grease filters		yes	yes	yes	no
KSA + mesh filters		as an option	no	as an option	no
UV-light system		as an option	no	as an option	no
Fire suppression system		as an option	as an option	as an option	as an option
M.A.R.V.E.L.		as an option	as an option	as an option	as an option

PRODUCTS

Jet Extraction System, JES



Specifically designed for the front cooking areas or architectural cooking concepts integrating appliances with medium input power. Exhaust plenum manufactured of stainless steel. High-efficiency filters of stainless steel. Stainless steel tube, equipped with an aerodynamic nozzle, shaped to generate a high efficiency cyclonic suction effect. Tempered glass plate, thickness 10 mm. UV-light technology available as an option.

Filtration technology



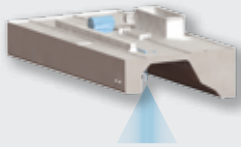
KSA multi-cyclone filters are manufactured of stainless steel. The UL-classified KSA filters can extract up to 95% of grease particles above 8 microns. The pressure loss over the extractor does not exceed 120 Pa at the flow rates calculated. Independent laboratory tests prove KSA to be the most efficient mechanical grease filter on the market. **The mesh filter** behind KSA spreads and equalizes the airflow into the hood chamber. This increases the filtration efficiency. The remaining grease is eliminated with ultraviolet-light technology.



UV-light system is the most efficient solution for hoods with medium to high utilization rate and for cooking processes producing all sizes of grease particles. UV-light technology breaks small grease particles into smaller molecular units. Ozone generated by the UVC lamps reacts with the solid and vaporised greases. The resulting substance will not stick to the ductwork or fans. When a hood is equipped with automatic washing system, UV-lamps are cleaned automatically at the set time without a need to remove the lamps from the hood.

Optional features

Wet chemical fire suppression system / K5-Galley



SOLAS requirement. Stainless steel construction. Electrically actuated. Real time monitoring. Audible and visible alarms. Direct integration to alarm system. Simple and compact design with Halton Marine galley hoods. No high pressure cartridges, mechanical pulleys, tensioning devices, levels or spring loaded plungers. (K5-Galley in the picture with galley hood)

Control cabinets / WR and C2W



WR control cabinets for intelligent operations. Casing material stainless steel AISI304. Continuously welded construction. Manufactured according to USPHS requirements. One serving 1 - 7 hood groups. Fully automatic washing cycle that is programmable for using different type of operation conditions. Embedded UV-control panel available as an option.



C2W control cabinets for intelligent operations. Casing material stainless steel. One control cabinet can manage up to 8 valves. Extension for up to 32 valves is available as an option. Fully automatic washing cycle. LCD touch panel as user interface.

Control panels / UCS



UCS control panel for UV-light technology. Independent operation for 1 - 12 hood modules. Indication for UV-lamp functionality, alarms and running hours. Small, user-friendly design that can be integrated in the hood surface or water wash control cabinet. Interface for handheld computer communication.

Touch panels / LCD



The touch panel interface has been developed to provide fast and simple approach of galley ventilation features. It can manage all Halton galley ventilation technologies such as UV-light technology, water wash system and demand based ventilation (M.A.R.V.E.L.). The touch panel displays individual hoods with clear pictures allowing the potential alarms or hood statuses to be displayed visually. The touch panel can manage up to 32 hoods (depending on the integrated technology).

Galley diffusers

Circular ceiling diffusers for galleys / TDM



Manufactured of stainless steel. For circular duct connections 100, 125, 160, 200, 250 and 315 mm. With solid, detachable front plate. Specifically designed for low spaces. Manufactured according USPSH requirements.

Low velocity ceiling diffusers for galleys / TCG



Manufactured of stainless steel. Rectangular connection of 302x152 mm. Special circular connections available. Low velocity air supply. Enables a potential saving on extract airflow quantity needed for a hood. Supports comfortable thermal and good acoustic conditions. Manufactured according to USPHS requirements.

Halton individual cabin ventilation

The Halton Marine cabin ventilation solution is a total air-condition package that is specifically designed for different types of cabins and other spaces that require a good air-conditioning. The package includes a VAV unit with plug-and-play functionality plus grilles, diffusers and valves. VAV unit with intelligent automation and room thermostat can operate as stand-alone units or in a network. A LON or Ethernet network enables that cabin units can be controlled, monitored and adjusted by supervision system.



FANCOIL UNITS

The Halton FCU is a vertical fancoil unit for air treatment and control that has been specifically designed for silent cabin comfort with sophisticated air treatment and control. The compact design and excellent performance levels makes Halton FCU easily adaptable for different type of projects.

CABIN UNITS

Halton pressure-independent cabin units support the most sophisticated indoor environment in cabins. The airflow is controlled and maintained individually in each cabin and thus sound levels and comfort are kept in a best possible level. The airflow and temperature are continuously measured so that the controller will cut off the reheat power below the minimum airflow. Halton Marine cabin ventilation equipment can operate on a LON or Ethernet network with a dedicated network adapter. Through intelligent network and pressure-independent operation systems it is possible to reach the best benefits of the Halton Energy Efficiency technology. Halton cabin units are also available without airflow measurement as pressure independent units.

The manually operated cabin units include reheater and control unit or just a manual damper (manual model) which both allow the manual adjustment of airflow quantity,

Choose diffusers and thermostats according to your needs and decor

The Halton Marine cabin ventilation solution also includes a wide selection of diffusers and room thermostats.

We offer

- Single- and double-duct cabin units (B15)
- Airflow units for large volumes with heating
- Low sound levels and pressure drop
- Cost-efficient commissioning due to plug-and-play technology
- Pressure-independent operation system
- Programmable VAV unit controllers
- Network solution opens numerous possibilities to include additional features in cabin units according to customers needs which can be operated, adjusted and controlled by supervision system
- Advanced energy efficiency solutions



Demand based cabin ventilation

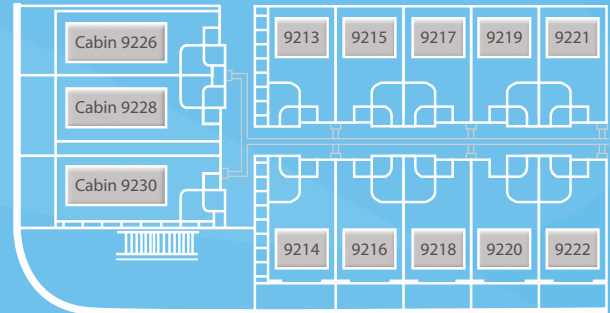
Connecting a Halton cabin ventilation system to a network offers many advantages:

- Savings in energy consumption
- A possibility to control, monitor and adjust cabin indoor climate centralized via network
- Improved passenger comfort
- Savings in troubleshooting time

In a network, selected cabin ventilation parameters can be managed through PC software or locally by using a PDA or a laptop computer. The network also enables optimization of the cabin ventilation system. Halton pressure-independent operation system working in a network enables the lowest energy consumption. It also gives a possibility to trace the history of each cabin on the PC, and even make the necessary adjustments without entering the cabin.

Advanced energy efficiency

One of the best benefits from the Owner's point of view is the active operation between AHU (Air Handling Unit) and terminal units. Data from terminal units is collected and calculated to control the AHU in two ways:



1. Adjusting the fan operation to optimal level

The AHU control calculator monitors and collects data of the terminal units, as well as functional details. Collected data enables the calculator to determine the pressure in front of each unit. Pressure data is used to optimize the fan operation, which cuts down the unnecessary energy consumption. All this is done without losing any comfort in the cabins.

2. Minimizing the need to cool down the air inside the AHU

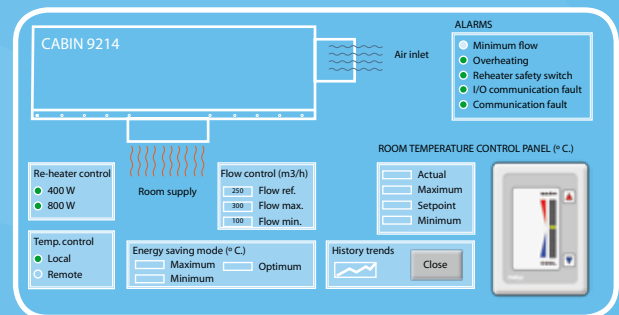
The AHU control calculator collects the re-heater information from each terminal unit. Based on the re-heater's utilization rates, AHU's chiller and heater valves are controlled to cut down unnecessary cooling and prevent unnecessary electrical heating inside the terminal unit. The supply air is kept actively on optimum temperature level together with humidity control. With Halton Marine advanced energy efficiency technology it is possible to save up to **35%** in cabin HVAC energy consumption.

LON and Ethernet networks

– For new-buildings and refurbishments

Halton Marine offers two different cabin ventilation network systems: LON and Ethernet. Halton's new network adapters are available for new-buildings as well as for refurbishments. Cabin ventilation products operating as stand-alone are easy to connect to a network simply by adding a LON or Ethernet network adapter.

LON network is one choice to build Halton Marine centralized cabin ventilation system. Network is normally built by ventilation systems, combining cabin units of each system together. These groups are connected to the centralized supervision system operating in PC software. Communication can be also managed in an Ethernet network or in a combination of both. An automatic Halton Marine LON node replacement software, running on supervision PC, enables easy maintenance of the LON network.



Ethernet network is another choice to build Halton Marine centralized cabin ventilation system.

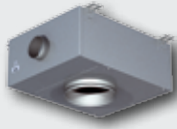
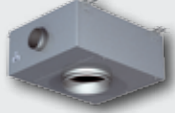
In principle the operations are the same in the both networks. In a LON network, node IDs are used for unit identification as in Ethernet network, where IP-addresses are used for the same thing. Network devices with with IP-addresses or node ID's can contain multiple exchangeable/readable parameters for adjusting cabin climate conditions. PC supervision software enables easy maintenance and monitoring of the system.

Halton Ethernet solution can be embedded to an existing Ethernet network built on board, which is normally used for other services such as IP-telephone, Internet, multimedia, IP-television etc.

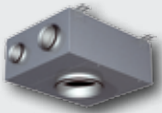
Fancoils / FCU



Casing galvanized steel. Mineral wool insulation. Silent and stepless fan operation. Electrical reheaters: 400W + 800W. Total measured cooling capacity: up to 1470 W. Airflow range from 150 - 500 m³/h. Quick water connections. Integrated electric connections. Air connections tailored according to customer needs.

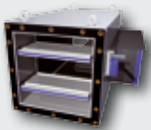
Cabin units and boxes	Single duct cabin units	Manual single duct cabin units	Multi-connection cabin units	Sound attenuator and balancing boxes
				
	HMF	HMM	HFR/M	HME
Casing material	galvanized steel	galvanized steel	galvanized steel	galvanized steel
Insulation	mineral wool, thickness 25 mm. MED approved	mineral wool, thickness 25 mm. MED approved	mineral wool, thickness 25 mm	mineral wool, thickness 25 mm. MED approved
Operation principle	automatic with pressure independent or dependent operation system.	manually operation. recommended to be used with TDM or TBM diffuser	automatic with pressure independent operation system	-
Reheater options	400W, 800W, 400W + 800W, 1200W, 1800W	400W, 800W, 1200W	400W, 800W, 400W + 800W, 1200W, 1800W	400W, 800W, 1200W
Operation pressure range	200...1000 Pa	50...1000 Pa	200...1000 Pa	0...200 Pa
Spigots (male or female)	inlet spigot D100...125 mm, outlet spigots D160...250 mm	inlet spigot D80...125 mm, outlet spigots D160...250 mm	inlet spigot D125...200 mm, outlet(s) spigots D125...200 mm (1-3 pcs)	inlet spigot D100...160 mm, outlet spigots D160...250 mm
Applicable to B-0 and B-15 installations	yes	yes	no need (not a terminal unit)	yes

Double duct cabin units / HMR



Casing galvanized steel. Mineral wool insulation, thickness 25 mm. MED approved. Automatic cabin unit with pressure independent operation system. Operation pressure range 200...1000 Pa. Spigots (male or female): inlet spigot D100/125 mm, outlet spigots D160...250 mm. Applicable to B-0 and B-15 installations.

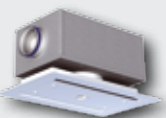
Airflow units for large air volumes / HML










Casing galvanized steel. Mineral wool insulation, thickness 50 mm. MED approved. Automatic CAV/VAV unit with pressure independent operation system. Electrical reheater options: 0,9...30kW. Operation pressure range 200...1000 Pa. Sizes from 200x200 to 1000x1000 mm. Larger sizes available on request. Circular connection pieces available from 200 mm to 1000 mm.





Two different cabin ventilation networks available: LON or Ethernet (or a combination of both). Can be also embedded into existing network. All needed components, such as routers, switches and repeaters available. Commissioning and start-up services available.






Manual single duct cabin units for small airflows / HMC



Casing galvanized steel. Mineral wool insulation, thickness 25 mm. MED approved. Manually operating cabin unit. Operation pressure 50...700 Pa. Spigots: inlet spigot D100 mm (male or female), outlet spigot D160 mm (female). Applicable to B-0 and B-15 installations. Specifically designed to be used together with TCL diffuser.

Room thermostats	LCDs	Background pictures	Push buttons	Rotating knobs
		Halton Marine offers one of the four different background pictures for LCD room thermostat as a standard. A customized background picture is available.		
Cabin temperature measurement	yes	   	yes	yes
Wireless service connection	yes		yes	case by case
Delivered with IC-Cable	yes		yes	yes
Temperature adjustment	by touch buttons		by push buttons	by rotating knob
Self diagnose function	yes		yes	no
LED intensity control and auto dimming	yes		yes	no
Display for actual and set point temperatures	yes		no	no
Time display	as an option		no	no
Delivered with IC-cable	yes, 7 m. as standard		yes, 7 m. as standard	yes, 7 m. as standard
Customized background picture	as an option		no	no
Customized labeling	no		as an option	as an option
Different colour options for front panel	yes		yes	yes

Diffusers	Architectural ceiling diffuser	Circular ceiling diffusers	Square ceiling diffusers	HMC cabin unit diffusers
				
	DLQ	TDM, TDM/P	TBM, TBM/P	TCL
Material	steel with epoxy paint finishing in RAL or NCS colour	steel with epoxy paint finishing in white RAL9010 as standard colour	steel with epoxy paint finishing in white RAL9010 as standard colour	steel with epoxy paint finishing in white RAL9010 as standard colour
Connections	D250 mm	D160, 200, 250 mm	D160, 200, 250 mm	D160 mm (male)
Construction	solid front panel. forms integral impression when installed in false ceiling	solid front plate (TDM) or perforated front plate (TDM/P)	solid front plate (TBM) or perforated front plate (TBM/P)	solid front plate. outer dimensions 470x275 mm
Manual knob	no	available as an option	available as an option	yes
Note	compatible with Halton Marine cabin units. to be installed in false ceiling (B-0, B-15)	compatible with Halton Marine cabin units	compatible with Halton Marine cabin units	specifically designed to be used together with HMC cabin unit. applicable to B-15 installations

Grilles AWE, AWU	Grilles WSD, WDD	Grille AGC	Grille WTS	Exhaust Valve URH
				
anodized or epoxy-painted with white as a standard colour	aluminium with different finishing available	aluminium with different finishing available	steel with epoxy-painted finishing	painted steel with white as a standard colour

Droplet separators to protect ventilation systems

Droplet separators are used to protect e.g. ventilation systems, air handling units, diesel engines and marine gas turbines. Weather conditions vary, no doubt about it, but even the calmest weather conditions contain salty spray particles on air. These particles and droplets must be removed.

Halton Marine droplet separators are designed for demanding applications such as marine, oil & gas, chemical, nuclear and paper industries, where reliability, easy installation and special design play an important role. Separator vanes are designed to restrict the passage of moisture, salt spray and rain water e.g. into HVAC systems or engine room intakes. Halton Marine droplet separators are used in a wide range of applications, where there are differences in wind speed and direction, levels of local turbulence, rate and droplet size, distribution of rainfall and surface water flow from the surrounding structure. Unique form of separator vanes enables high efficiency separation.

Halton Marine droplet separator DSH has been tested according to the EN13030 performance test for louvers subjected to simulated rain. The tests were made at the VTT Technical Research Centre of Finland, where the droplet separator reached A-Class results.



Halton DSH droplet separator is available in two different models: single stage model includes a droplet separator and a frame and two stage model includes a droplet separator, a frame and a filter. Net and mask louver are available for both models as an option.

Halton USM is an external louver for air exhausts. The louver is effective in preventing objects entering into the ductwork and can be also used in air intakes when droplet separation is not required.



Droplet separators / DSH

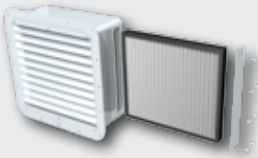


Stainless steel AISI 316 L with a painted finishing as an option or sea water resistant aluminium with a painted finishing (RAL9010 as standard). Construction: droplet separator and frame (single stage), droplet separator, frame and filter (two-stage). Net and mask louvre available as an option. High droplet and moisture efficiency, Class A results (EN 13030:2001), minimum pressure drop. Tailored sizes and designs according to customers' needs. Possibility to connect in conjunction with Halton Marine dampers.

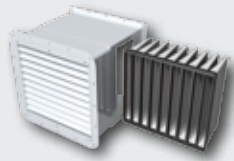
Droplet separators, DSH optional features



DSH with mask louvre provides aesthetic outlook.



Access hatch enables easy access to the filter from the side of the unit. (G4 filter in the picture).



F7 and F8 bag filters. The materials of the synthetic fine filters are high-quality and durable, progressive mounted synthetic fibres. The filters can be used in example for air purification of intake air. Halton filters are certified with ISO9001 and ISO14001 quality and environmental standards. The fine filters are also certified by Eurovent (EN779) standard.



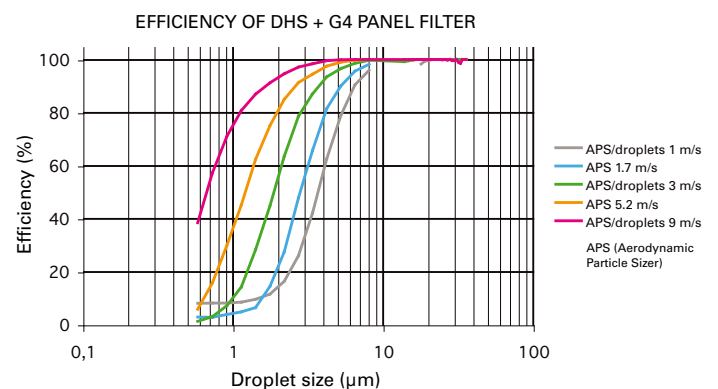
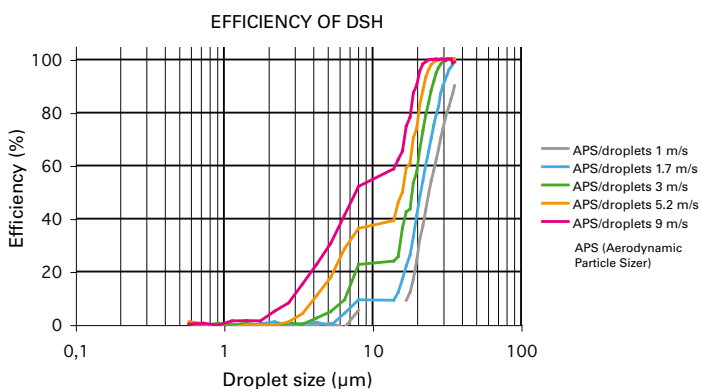
Halton droplet separator can be connected to Halton Marine dampers with or without a connection piece. In both cases the construction is modified to fit the damper. Connecting DSH together with a damper must be mentioned when ordering products. Combining Halton Marine droplet separator to a damper offers customers a compact solution for air intake that also saves space. The products are recommended to be connected together at Halton Marine factory.



DSH droplet separator for duct installation.

PERFORMANCE DATA

Fractional efficiencies of DSH droplet separator and a combination of droplet separator + G4 panel filter measured at the Independent Research Institute.



Outdoor louvres / USM



Material sea water resistant aluminium with painted finishing (white RAL9010 as standard colour) or galvanized steel or stainless steel AISI 316L. Frame thickness 3 mm as standard, blades 1 mm. For air exhaust or intake. Sizes from 150x150 to 1500x2400 mm at 1 mm intervals. Modular construction for larger sizes available. Non-standard dimensions and flange drilling available as an option. Can be fitted in conjunction with Halton Marine damper.



At your service

According to customers' needs

Halton Marine bases its business on flexibility, reliability and customer-orientation. Production emphasizes tailoring, which means that solutions are adapted for each customer's specific needs. Halton Marine supplies solutions not only for new-builds, but also for refurbishments of existing ones.

The comprehensive project management includes product design, delivery, commissioning and testing of product assemblies, plus a spare-part service. Training services of Halton Marine products and solutions are available through Halton Marine sales offices.

In addition to Halton Marine's own personnel, an extensive network of Halton Marine distributors and agents are at your service.

Certified Quality

In addition to ISO 9001, ISO 14001, quality and environmental management certificates, Halton Marine has committed itself to the Finnish Energy Efficiency Agreement that aims to optimise energy efficiency and use renewable energy sources. Halton Marine is also qualified by FPAL and the Achilles Joint Qualification System, for suppliers to the Oil & Gas industry.

Halton Marine offers

- Complete solution packages
- Flexible, high-tech production with short delivery times
- Product training and technical back-up for projects
- Global project support, complete technical and installation information
- Testing and simulation services from full-scale mock-ups, leakage tests, fire tests, shock tests to CFD simulation services
- Advanced distribution and logistics concept, just-in-time deliveries
- Well-established but flexible company offering long-term business relationships and after-sales service

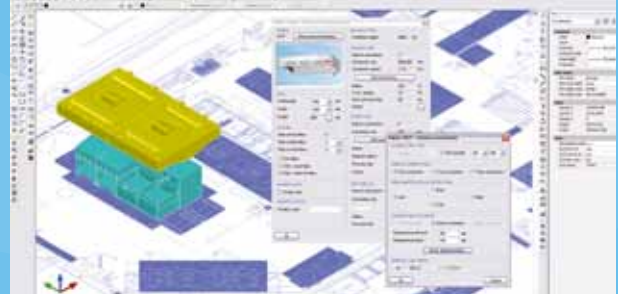
For galleys and cabins

- Commissioning services
- Design services
- User training of ventilation systems
- Maintenance services for galley UV-light technology
- UV-light technology for hoods as a retrofit installation
- Mock-up installations and verification tests

Galley ventilation design services

The Halton Marine services include a design and airflow calculations for a complete galley ventilation system with a functional design for different types of galleys and open kitchens.

Layout and equipment list from the customer enables Halton to select most suitable and efficient devices for supply and exhaust in galleys. When the best-matching devices are dimensioned and placed on customer layout, Halton Marine supplies a complete 3D view model to the customer. The 3D model can be easily integrated into the ship design drawings, which help co-ordination and integration on board.

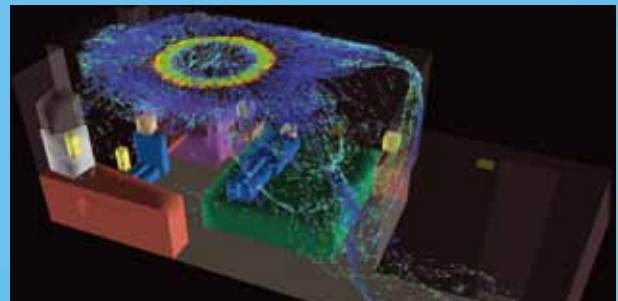


Cabin ventilation design services

Halton Marine offers a unique possibility to test and verify a wide range of air conditioning solutions for cabin ventilation.

Halton SEAVIEW with two cruise-ship cabins and connecting corridor, is a complete HVAC installation with extensive range of air-conditioning solutions and measurement devices. The installation consists of a fully automatic monitoring system for energy consumption, comfort and safety, by continuous measurement. The measurement laboratories that are located next to SEAVIEW, are an ideal place for sound generation, attenuation, air velocity and temperature measurements.

Halton also offers computational fluid dynamics (CFD) simulation services for optimizing the ventilation system functions. With CFD it is possible to simulate heat transfer, temperatures, velocities, and verify the comfort in the room.



HVAC dampers

Halton Marine fire dampers conform to leading classification societies worldwide. The technical quality



and proper functioning of Halton dampers, are tested in Halton's own facilities and, at regular intervals, in independent research institutes around the world.

Typical tests include: leakage tests, fire tests, shock tests and FAT (Factory Acceptance Test).

Structural flexibility, reliability, a wide range of accessories combined with global project support are a part of what Halton can offer.

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Halton Marine, one of the world's leading suppliers of marine HVAC, develops, manufactures and markets reliable, high-quality ventilation solutions specifically designed for marine, navy and offshore applications. Our know-how and expertise will support you at every stage of the build - from the design stage to indoor environment solutions and indoor environment management.

Halton Group specializes in indoor environment solutions, ranging from public and commercial buildings to foodservice facilities. Founded in Finland in 1969, Halton operates today in 23 countries around the world, with annual sales of €140 million and over 1100 employees. The company has production facilities in Canada, China, France, Finland, Germany, Hungary, Malaysia, Norway, United Kingdom and USA.