

Bespoke Design Solutions



1979 **40** 2019

Marine Exhaust Systems Noise & Vibration Control Environmental Protection



Pleasure Craft

Commercial

Superyacht

Bespoke Design Solutions

Consultation · Design · Manufacture · Support





Established in 1979, Halyard has developed an international reputation as market leaders for providing our clients with high quality, technically advanced equipment significantly reducing noise and vibration whilst protecting the environment. In recent times management of these issues, including emissions and overboard discharges, has become increasingly important both as regulations have tightened and as we all become more responsible for the impact we have on the environment and our surroundings.

Halyard is well placed to address these environmental and regulatory challenges. We specialise in both water-cooled and dry exhaust systems and as the distributor for Emigreen aftertreatment solutions can also provide DPF and SCR packages. We offer a wide range of standard and bespoke components, designed and manufactured by our in house teams, and our scope of supply covers individual components through to complete exhaust systems.

What ever your requirement, Halyard have experience of developing an exhaust solution. Be it water-cooled or dry; a complete new system with or without aftertreatment or replacement components, on all types of craft from large motor vessels or sailing yachts to bespoke tenders, to hovercraft and for new build or refit. As well as exhaust components, we are distributors for Wave International filtration products, Seatorque shaft systems, Siderise noise insulation materials and Aquadrive antivibration drive systems. Whatever the project, we will consult, design and specify products and systems optimised to meet the customer's requirements with a dedicated team managing each project from enquiry through to commissioning. All products are supported by Halyard and our distributor and dealer network.



Partnering with our Customers

Since being founded, Halyard has provided its customers with world class exhaust systems, service and support. This has led to a reputation for understanding our customers' needs and partnering with them to ensure the solution supplied is optimised for their application and service life requirements.

With in-house design and manufacturing, we have complete control over the entire process for our exhaust systems and components.

We manufacture exhaust dry sections, silencers, separators and water injection spray rings from specialist corrosion resistant alloys and stainless steels.

Specialist GRP silencers and separators are constructed from filament wound composite tube and bespoke exhaust hoses and bellows are made of either nitrile rubber or silicone, depending on the requirement and to Lloyd's approved construction methodologies.

The following outlines our partnering approach:

- Initially we consult with our customers in detail to understand their requirements and the project objectives
- Once these are established and agreed we design to this brief, creating detailed drawings and models for customer review and approval
- We then manufacture all applicable components within our own Halyard facilities and procure any necessary parts to complete the system
- Depending on the customer requirement, our services can extend to installation support, commissioning and sea trials with the relevant documentation and reports provided



Consultation



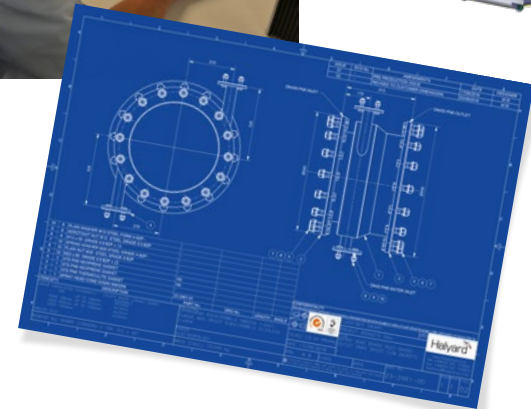
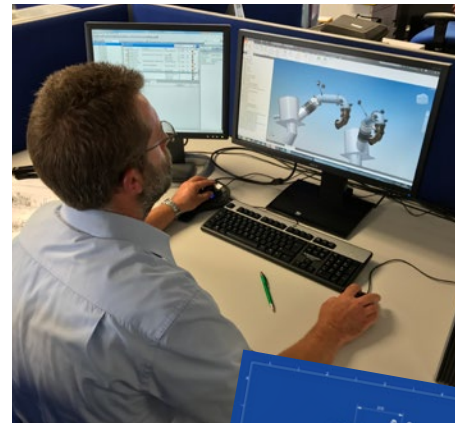
Understanding our customers' requirements and detailed specification is key to us developing the optimal final design. From the initial enquiry, the Halyard team work closely with our customers, listening and advising until everyone is satisfied that the design is agreed and budget requirement can be met within the project timescale.

The priorities of the owner; ship yard, yacht manager and designers are considered along with engine and generator installation and operational requirements; anticipated engine running hours and the Classification Society demands are all important inputs during this consultation stage to ensure they are all understood and met as the final specification and design emerges.

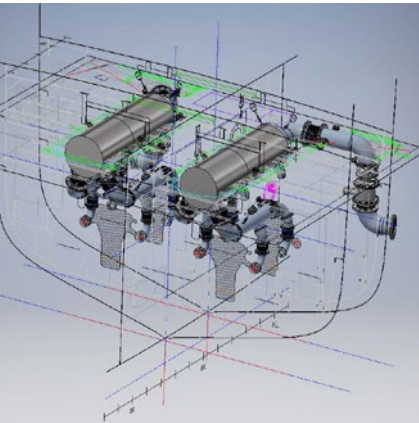
From this consultation we develop a timescale, a project plan, and a design brief for the required system.

This consultation process includes:

- Halyard scope of supply
- Identification of detailed system technical specification
- System space parameters
- Outlet positions and pipe runs
- Design, delivery, installation and launch schedules
- Vessel build / refit location
- Classification society requirements
- Customer team contacts
- Vessel and system inspection visits as necessary



Design & Manufacture



- All Halyard components are produced following ISO 9001:2015 processes, and ensuring Classification Society compliance as required

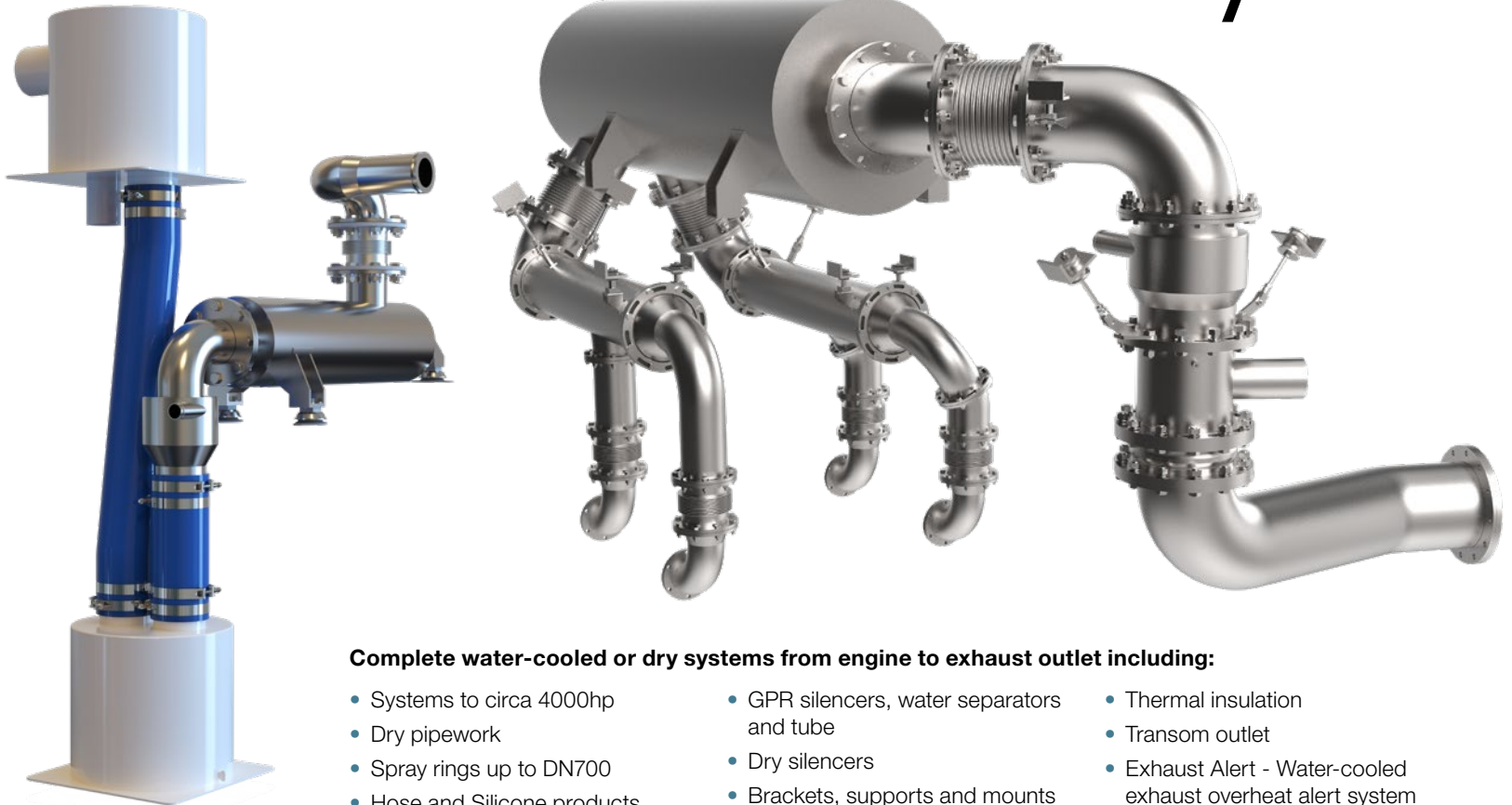


Following on from the consultation stage our team will begin to build the detailed system layout and the design of all associated components. We continue to liaise closely with the customer as questions emerge during this phase, be they engine related or vessel layout and systems considerations.

Agreement of the initial system layout is a key gateway in the process – a plan to which all parties commit and one which enables development of a specification against which the system design can be finalised, approved and manufactured.

The design and manufacturing stages include:

- System general arrangement 3D model
- Back pressures and safety considerations
- Silencer attenuation, and the way this fits to the overall objective
- Exhaust pipe runs
- Water injection spray ring design and positioning
- Water separation on generator systems
- Bypasses where below water outlets are involved
- Silencers, separators and connections
- Supports and mounts
- Bellows and hoses
- Thermal insulation
- SCR / DPF aftertreatment systems
- Customer approval
- Creation of manufacturing drawings
- Halyard in-house manufacture and procurement of all system components



Complete water-cooled or dry systems from engine to exhaust outlet including:

- Systems to circa 4000hp
- Dry pipework
- Spray rings up to DN700
- Hose and Silicone products
- GPR silencers, water separators and tube
- Dry silencers
- Brackets, supports and mounts
- Thermal insulation
- Transom outlet
- Exhaust Alert - Water-cooled exhaust overheat alert system

Seatorque Shaft Systems

Developed over twenty-five years and fitted as standard equipment to a growing number of globally recognised builders, the Seatorque 'BOSS' (Bolt On Shaft System) offers a multitude of noise and vibration, fuel consumption and delivered power benefits.

Features & Benefits

The enclosed shaft arrangement eliminates turbulence and drag, referred to as the 'Magnus Effect', so the water flow to the propeller is far less disturbed compared to a shaft spinning in open water. Inefficiency and drag created by cutlass bearings and shaft misalignment are also eliminated.

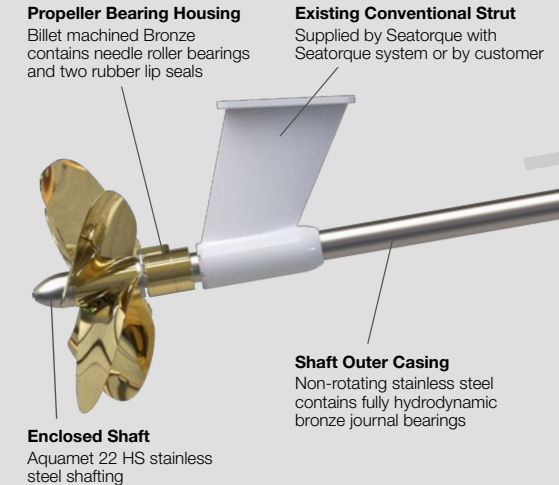
The system is completed with Cardan shafts connecting the 'BOSS' system to the transmission reducing the need for very accurate and time-consuming engine alignment. An oil reservoir located in the engine room allows easy monitoring of the oil level.

Conventional shaft installations rely on anti-vibration mounts to absorb engine and transmission vibration as well as propeller thrust. The 'BOSS' system removes the thrust from the mounts so they can then be optimised for absorption of engine vibration and torque, reducing the transmission of vibration into engine beds and the vessels structure.

The combination of taper and needle roller bearings, the non-rotating full-length shaft casing, the resiliently mounted thrust bearing and strut, and the optimised engine mounts all contribute to the very significant reduction of noise and vibration, typically over 50%

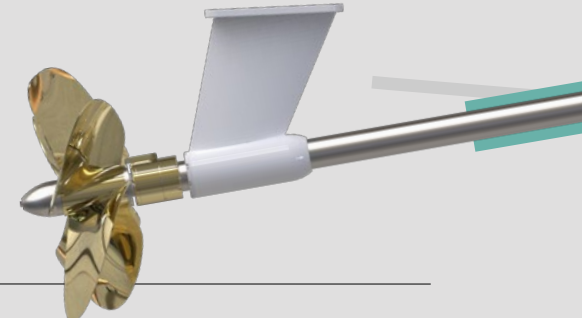
In addition, the reduction of mechanical losses to only 2%, thus providing valuable extra power for propulsion, and fuel consumption reductions in the region of 8%, as verified across a number of in-service case studies, are very valuable considerations when specifying your shaft system.

STM3 Enclosed Bolt-on-Shaft System



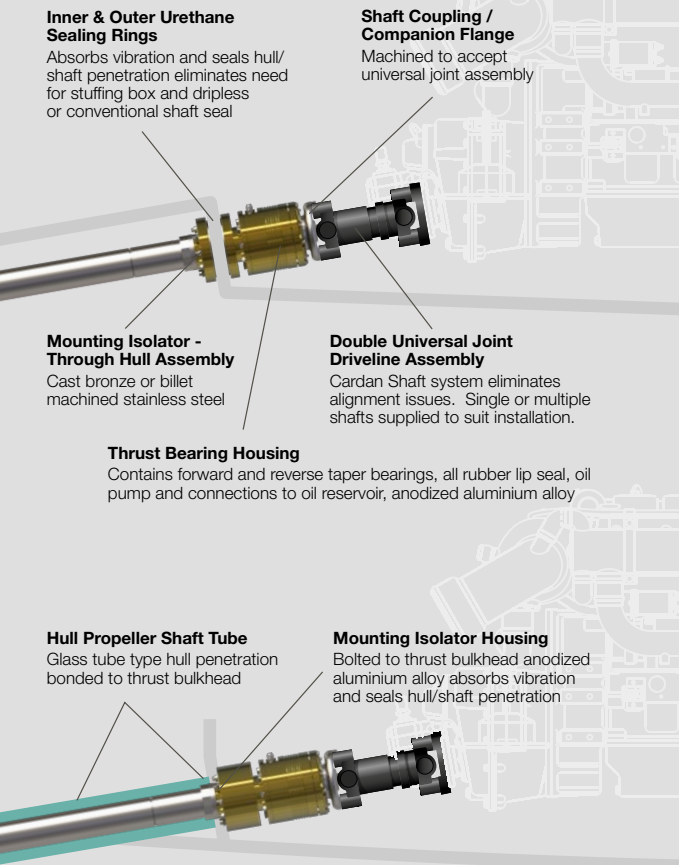
ST Series Tube Style System

This typical layout example mirrors the above STM3 system but is for through hull shaft tube systems.





Halyard



- The 'BOSS' is a self-contained shaft and thrust bearing assembly supplied as a complete unit from the transmission output coupling to the propeller shaft end
- An oil-filled stainless-steel tube, in which the propeller shaft rotates supported by roller bearings, hydrodynamic journal bearings, and thrust bearings reduces drag to an absolute minimum
- The thrust bearing housing, at the inboard end of the tube, bolts to the hull transferring thrust from the propellers to the vessel structure and not through the transmission and engine
- Flexible isolators located between the 'BOSS' system, the vessel's hull, and the strut absorb thrust loads as well as significantly reducing noise and vibration
- Significant reduction of noise and vibration from engines, shafts and propellers
- Alignment issues eradicated
- Reduced installation times
- Mechanical losses reduced to 2% total
- Up to 8% reduction in fuel consumption and increased delivered horse power
- Reduced underwater drag



Wave Filtration Systems

Wave MiniBOSS

MPEC 107(49) Certified bilge filter system giving effective control and prevention of oily bilge water discharge using Wavestream System 3 filters.

- MiniBOSS from Recovered Energy Inc., with Wavestream removes trace oils to less than 5 ppm, keeping within the IMO required 15 or 5 ppm levels
- IMO Certified Oil in Water Monitor with 18 month data logging, 2 models available
- Wave MiniBOSS 24 - 24V dc maximum flow rate 0.25m³/hr
- Wave MiniBOSS 110 - 110V ac maximum flow rate 0.50m³/hr
- Compact, light and easy to maintain with Wavestream high capacity cartridges



Wavebrite

Wavebrite discharge meets EU Council Directive concerning waste water treatment (91/271/EEC).

- Wavebrite removes the polluting components in grey/ waste water, significantly reducing pollution and protecting the environment
- Wavebrite has five main components with four stage waste water filtration; main Wavebrite module, pre-filters, pump, pump strainer and control
- Pump with automatic control, no holding tanks or pump out required
- The components are modular and can be located separately, connected by flexible hose for ease of installation
- Basic models have 15l/min maximum flow rate with an option to increase available on request
- The Wavebrite Grease Trap is a useful addition to any Wavebrite system when processing galley waste water. It removes food waste, fat and grease which helps prevent solids forming in the system and extends the life of the Wavebrite module and filter cartridges.



Wave range of filtration systems :

Wavestream bilge filter systems | **Wavebrite** waste water filter system | **Flostream** drinking water filter system

Prostream watermaker filter protection system | **Waveair** holding tank vent filter system | **Waveshine** wash & rinse system

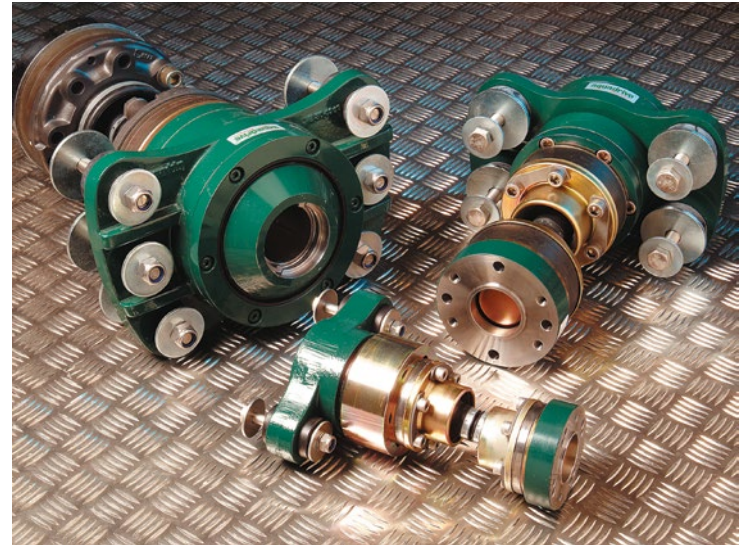
Aquadrive System



Aquadrive offers a wide range of models up to 1500hp to suit main yacht propulsion systems and vessel tenders.

The Aquadrive antivibration system will help you, and your crew, enjoy the peace and quiet of boating. By isolating the engine from the rest of your boat, noise and vibration are greatly reduced. Most installations result in a 50% or more reduction in interior noise and vibration. Aquadrive will also help to keep your driveline in good condition by minimising wear and tear on the transmission and mounts.

The propeller shaft is aligned to an Aquadrive thrust bearing, which absorbs the propeller thrust. A Constant Velocity (CV) shaft transmits engine power to the thrust bearing and propeller shaft. The CV shaft automatically adjusts to changes in the alignment between engine and thrust bearing and allows engine movements in every direction. Unlike standard installations, periodic realignment is not required. The use of softer engine mounts, which isolate engine vibration from the hull, completes the system. Aquadrive antivibration system creates the necessary conditions for a smooth running, quiet boat.



- Cabin & cockpit noise and vibration reduced by 50% or more
- Propeller thrust transmitted to the hull reducing load on transmission and engine mounts
- Improved isolation of the engine from the hull structure
- A range of shafts and engine mounts also available

aquadrive[®]
antivibration system

Service & Support



At Halyard we fully recognise the importance of aftermarket support, providing our customers with timely response to minimise any impact to their vessel operation.

Our products are supported by a comprehensive two-year global warranty as standard. Service support is provided by Halyard and our distributor and dealer network.

In addition to an extensive stock of standard products Halyard retain manufacturing drawings for all products supplied relating to each specific project. This guarantees the supply of identical replacement parts quickly and efficiently, without the need for the return of the original part.

Halyard aftermarket support includes:

- Email and telephone technical support
- Support with rapid replacements of components from our standard products stock
- Drawing archives giving us immediate access to manufacture bespoke components
- Field support and consultation services

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