Fin Stabilizers System

Fincantieri / Marine Systems and Components

Fin Stabilizers System

in the development of a wide range of stabilizers which can assure the highest percentages of roll reduction at designed speed, high reliability, minimum noise and vibration, limited drag in the water in order to achieve an high fuel saving.

Active Fin Stabilisation System technology - are able to ensure a dramatic roll reduction with the consequent advantages in terms of passengers and crew comfort; of ship stability; of course keeping; etc.

In case of severe sea conditions rolling can force a ship to deviate from the planned course to avoid the rough sea or bring it ahead, resulting in loss of time and money.

Besides, heavy rolling in naval vessels may cause the guns or the missiles to miss their target and prevent the landing

The Best System for Each Application

— Fincantieri stabilizer systems can meet any particular customer requirements as they are owner's preferences.

The Range of Fincantieri Stabilizer Systems includes:

• Retractable fin stabilizers (type SR)
  - with or without flaps;
  - with rigging-out: either "stern to bow" or "bow to stern"

• Fixed fin stabilizers (type SF)

• Sliding fin stabilizers (type SS)

• At anchor stabilizers (type SFZ)

Quality Assurance

— The Quality System implemented for the design and manufacturing of the Fincantieri stabilizer systems is in strict compliance with ISO 9001 standard.

Research and Development

— A team of engineers, working in close collaboration with universities and research companies, is in charge of the research and development activities. This team is composed of specialists in mechanical and structural design, hydrodynamics, control theory, electronics, and a wide range of related disciplines.

Results of the basic comparison between Fincantieri flapped and unflapped profiles are shown below. The comparison is based on measurements obtained in a cavitation tunnel test, which is a method used to study the flow of water around a structure in a controlled environment.

Profile Flapped

Profile Unflapped

Results of the basic comparison between Fincantieri unflapped and flapped profiles used for type SR retractable stabilizers and NACA coded profile, following cavitation tunnel tests.

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Fin Stabilizers System

Fincantieri has been one of the world's leading shipbuilding companies for over a century, with a long history of innovations in marine technology. The company's expertise in stabilizer systems is one of its many strengths, offering solutions for a wide range of vessels and applications.

**Research and Development**

A team of engineers, working in close collaboration with universities and research companies, are at the forefront of research and development. They are focused on creating the highest performance stabilizer systems, ensuring reliability, minimizing noise and vibration, and providing the lowest possible drag in water.

**Active Fin Stabilization System**

These systems are designed to ensure dramatic roll reduction, allowing for increased comfort of passengers and crew, improved stability of the ship, and maintaining weapons accuracy in naval vessels. Rolling can cause a vessel to deviate from its planned course, leading to potential safety issues and loss of time and money.

**Fin Stabilizers System**

The best system for each application is selected based on owner's preferences. The range of Fincantieri stabilizer systems includes:

- Retractable fin stabilizers (type SR)
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  - With rigging: either "stern to bow" or "bow to stern"
- Fixed fin stabilizers (type SF)
- Sliding fin stabilizers (type SS)
- At anchor stabilizers (type SFZ)

**Quality Assurance**

A Quality System implemented for the design and manufacturing of the Fincantieri Mechanical Products is certified with reference to ISO 9001 standard.

**Profile**

The performance of the stabilizers is ensured through rigorous testing in cavitation tunnels. The unflapped and flapped profiles used for type SR retractable stabilizers are compared with NACA coded profiles to ensure optimal performance.

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Fin Stabilizers System

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The Fin Stabilizers System

- A team of engineers, working in close collaboration with universities and research companies, is in charge of the research and development activities. Their goal is to reach the highest competitive level of performance of the system and, therefore, of customer satisfaction.

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- Anchor Stabilizers (type SFZ)
Hydrodynamics Advantage of Stern to Bow Opening Mode

This generation fin stabilizers are designed to groove with very low opening mode, therefore an improved efficiency is achieved. Moreover, the system is rated in compliance with the most restrictive existing standards.

When the system is activated there is a reduction of hull opening, this resulting in a more effective hull resistance (fuel consumption).

If a foreign object, such as a net or a cable, is pulled along there is a chance to retract the recess; astern the opening, this resulting in a more effective way of protecting the vessel from damage.

Hydrostatics Advantage of Bow to Stern Opening Mode

When the system is activated there is a reduction of hull opening, this resulting in a more effective way of protecting the vessel from damage.
### Design and Testing

- **Stabilizers** are designed to operate with stern to bow opening mode. Beneath the roll motion is detected by two sensors: a Rate Gyro and an Inclinometer. The signals are processed by the Fin Stabilizers Control System which is provided with a Ready to Install equipment on the fin box.

### Control System

- For the systems installed on board, the special electrical and hydraulic control systems are designed to ensure the maximum control effects, even in the most critical weather conditions. The systems are controlled and monitored by a Fin Stabilizers Control System, which is provided with the rigging in/out control - is essentially identical with the one designed in compliance with the most restrictive existing standards for this particular applications even at anchor. Moreover the plant is able to be tested by Fincantieri Mechanical Products Line and comply with the many Class Society requirements.

### Hydraulic Power Unit

- **Hydraulic Power Unit** is made up of a Hydraulic Unit of Power 2 several hydraulic power units, each one equipped with special double gaskets having hydrodinamic behaviour of the fin stabilizers systems are designed, manufactured, and meet Solas requirements. They are controlled and monitored by a Fin Stabilizers Control System which is provided with the rigging in/out control - is essentially identical with the one designed in compliance with the most restrictive existing standards for this particular applications even at anchor. Moreover the plant is able to be tested by Fincantieri Mechanical Products Line and comply with the many Class Society requirements.

### Hydrodynamic Advantage of Stern to Bow Opening Mode

- The system works independently from the ship’s speed in terms of hull resistance (fuel consumption).
- If the vessel hits foreign object, stern to bow opening results to be a safer solution, reducing the risk of hull plating damage by the foreign object such as a net or a cable are pulled along.
- Moreover if the vessel is equipped with stern to bow opening) this resulting in a more efficient hull design and minimum hull opening.

### Technical Details

- **Type SS**
  - **Size** 43.0 x 5.2
  - **Weight** 16.0 - 18.0 t
  - **Power** 14 - 22 kW
  - **Rotation** 14.0 - 30.0°
  - **Range** 2.0 - 20.0°
  - **System Mass** 16 - 18 t

- **Type SF**
  - **Size** 46.0 x 6.5
  - **Weight** 23 - 28 t
  - **Power** 22 - 30 kW
  - **Rotation** 35.0 - 45.0°
  - **Range** 2.0 - 20.0°
  - **System Mass** 23 - 28 t

- **Type SFZ**
  - **Size** 49.0 x 8.9
  - **Weight** 55 - 57 t
  - **Power** 37 - 45 kW
  - **Rotation** 35.0 - 45.0°
  - **Range** 3.0 - 6.0°
  - **System Mass** 55 - 57 t

### Fin Surface

- **SR Type**
  - **Size** 3.2 - 8.9 m²
  - **Weight** 1.5 - 4.5 t

- **SS Type**
  - **Size** 3.5 - 4.0 m²
  - **Weight** 1.6 - 2.0 t

- **SF Type**
  - **Size** 3.8 - 4.5 m²
  - **Weight** 1.8 - 2.4 t

### Cross Section

- **Cross Section**
  - **Depth** 1.5 - 3.0 m
  - **Width** 1.5 - 3.0 m
  - **Height** 1.5 - 3.0 m

### Components

- **Central Switch Box**
  - **Type** M/Y LOA (m) < 50
  - **Type** M/Y LOA (m) 50 - 60
  - **Type** M/Y LOA (m) 60 - 90
  - **Type** M/Y LOA (m) 90 - 150

- **Local Control Unit (Installed on fin box)**
  - **Type** M/Y LOA (m) 30 - 70
  - **Type** M/Y LOA (m) 70 - 100

- **3 Motor Switch Box (Installed on fin box)**
  - **Type** M/Y LOA (m) 100 - 150

- **1 Fin**
  - **Type** M/Y LOA (m) 100 - 150

- **5 Gravity Oil Tank**
  - **Type** M/Y LOA (m) 100 - 150

- **6 Main Control Unit**
  - **Type** M/Y LOA (m) 150 - 200

- **3 Motor Switch Box**
  - **Type** M/Y LOA (m) 150 - 200

- **2 HPU (Installed on fin box)**
  - **Type** M/Y LOA (m) 150 - 200

- **1 Fin**
  - **Type** M/Y LOA (m) 150 - 200

- **8 Bridge Control Panel**
  - **Type** M/Y LOA (m) 150 - 200

- **2 Local Control Unit (Installed on fin box)**
  - **Type** M/Y LOA (m) 150 - 200

- **6 Main Control Unit**
  - **Type** M/Y LOA (m) 150 - 200

- **3 Motor Switch Box**
  - **Type** M/Y LOA (m) 150 - 200

- **1 Fin**
  - **Type** M/Y LOA (m) 150 - 200
The stabiliser systems are the result of Fincantieri wide experience and meet all classification Society requirements. This particular solution leads to following advantages:

- Housing (crux casing), less turbulence is generated within.
- The recess; astern the.
- When the internal recesses are equipped with special double gaskets having.
- The many Classi.

Antifouling Sealing System

- Various types of the Anti fouling Sealing Units are available. Each one is designed and furnished with an Anti fouling Sealing Unit and is type tested in order to respect the following performance figures:
  - Inst a lled Electric Power x unit (kW) 15 –: 20 20 –: 30 30 –: 40 40 –: 65 65 –: 75
  - System Mass (t) * 3 –: 4 4 –: 9 11 11 –: 16 25 –: 40
  - Fin Surface (m²) each fin 1.3 –: 1.8 2 –: 4 4 –: 6 6 –: 12 13 –: 18
  - Fin span / fin cord (m) 1.3x1 1.8x1.4 2.7x2 4 x 6 4.5x3.7
  - Installed Electric Power x unit (kW) 15 –: 20 20 –: 30 30 –: 40 40 –: 65 65 –: 75
  - Complete System Mass (t) 16 –: 18 23 –: 28 55 –: 57 86 –: 99 139 –: 142 200 –: 205
  - Dimensions in order to compensate the hull opening.

Hydrodynamics Advantage of Stern to Bow Opening Mode

- One generation successful the stabiliser units are designed and furnished with unique opening mode to improve overall ship behaviour. High quality stainless steel.

- The tilting is activated by two double action cylinders acting as a.

- The standard control system - equipped with the rigging.

- Design and Testing

- The stabiliser systems are designed monolithic and compact, and meet the related stringent requirements.

- For further hydrodynamics performance a metal shield is installed on the.

- The external guides are made of very.

Control System

- The plant is controlled and monitored by a PLC based Main Control Unit, equipped with a Ship Log Interface, and can be interlocked with Bow

- A Rate Gyro and an Inclinometer.

- The System is provided with.

- The signals are processed by the.

- For this particular applications even at anchor. Moreover the plant is able to

- Installed onboard fast vessels, and are especially e.

- The SS stabilizers have been speci.

- The external bearings and sliding-blocks immersed in the water are made.

- The trajectory of the system. No displacement loss occurs due to the lack of recesses.

- The inside dimensions are reduced to a minimum, as well as the total weight.

- The designed form of.

- The hydraulic power is provided by two hydraulic power units, each one

- Designed and furnished with.

Hydraulic Power Unit

- For the flow and lifting an external hydraulic oil is required. The

- The stabilizing force is achieved and the hydraulic system can also run with the usual engine auxiliary system.

- Anti pollution Sealing System

- Various types of the Anti pollution Sealing Units are available. Each one is designed and furnished with an Anti pollution Sealing Unit and is type tested in order to respect the following performance figures:

- Friction loss in order to satisfy the high level of comfort (roll reduction) typically requested

- For the specific purpose of each stabilizer unit, different sealing materials of special self-lubricating material.

- The oil pressure is maintained at an appropriate level by

- External bearings and sliding-blocks immersed in the water are made.

- Drain - prevent sea water inlet and oil outlet.

- The oil pressure is maintained at an appropriate level by.

- The seals - through a dedicated

- The gaskets - through a dedicated

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- The oil pressure is maintained at an appropriate level by.
New generation Fin Stabilizers system are designed to operate with stern to bow opening mode. Bene cial advantages are obtained in terms of hull resistance (fuel consumption).

• For further hydrodynamic performance a metal shield is installed on the box hole. In case of foreign object such as a net or a cable are pulled along there is a chance to retract the stabilizers systems.

Hydrodynamic Advantage of Stern to Bow Opening Mode

- The hydrodynamic advantage due to the recess, resulting in a clearer work zone and is delivered to the client as a ready-to-install equipment.

- When is extended, incoming water isn’t a problem. The water is characterised by a NACA profile which helps in eliminating any turbulence.

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MP-03/14

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- Sliding fin stabilizers (type SS)
- Anchor stabilizers (type SFZ)

Research and Development

A team of engineers, working in close collaboration with universities and research companies, is in charge of the research and development activities. The research is aimed at the development of new technologies and improvements of existing systems, in order to meet the increasing needs of performance and reliability of stabilizers systems.

Quality Assurance

- The Quality System implemented for the design and manufacturing of Fincantieri Mechanical Products is certified with reference to ISO 9001 standard.

- Results of the basic comparison between Fincantieri unflapped and flapped profiles used for type SR retractable stabilizers and NACA coded profile, following cavitation tunnel tests.