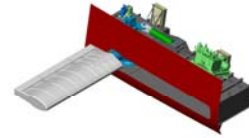
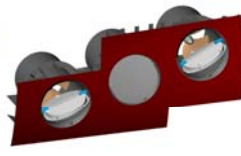
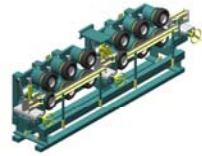




**Marine  
Department**

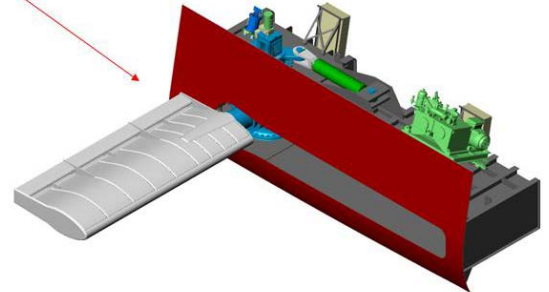


**Engineering for Marine Equipment**



**Ship stabilization systems**

# FOLDING FINS ANTI-ROLL STABILIZER



## SAFIR

### HISTORICAL RECORD OF THE "SAFIR" CONCEPT

Active folding fin stabilizers have been developed by the FL Marine Department (previously ACH Engineering) since 1978. These fins have been fitted to various types of ships (cruise liners, ferries, ro-ro, passenger vessels, container vessels, military frigates and aircraft carriers) and have proved to be efficient and reliable.

After more than 30 years of use, the follow-up on the first installed systems is still underway.

To meet the new requirements of the market, FL Marine is always improving its systems with several new concepts, such as new fin profiles (Alpha Fin patented profile), lift control or new optimized system structures.

Standard fin areas ranging from 2.4 m<sup>2</sup> up to 20 m<sup>2</sup> are available for both merchant and military vessels. For other sizes, please contact us.

The main targets for the new design are to reduce costs with easier production, less maintenance and improved reliability. Our systems are optimized to aid shipyard installation.

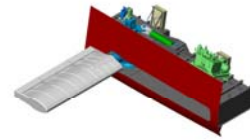
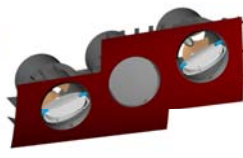
### MAIN FEATURES AND ADVANTAGES OF THE "SAFIR" CONCEPT

The Alpha Fin profile is optimized to reduce operating costs with less maintenance than other profiles, because there is no hinged flap and a better drag coefficient, which reduces fuel consumption and minimizes speed loss while stabilizing. The better lift coefficient reduces fin area for the same stabilization efficiency and lower stabilizer dimensions and weight.

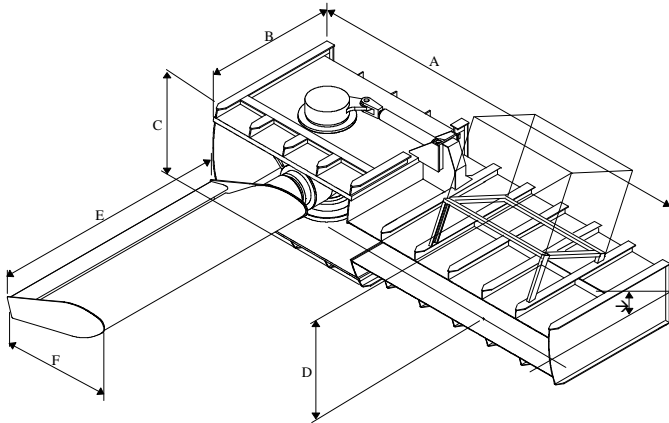
Our systems are packaged with a hydraulic power unit, hull frame and local control unit. They are piped, wired and tested in factory and are ready to be welded to the vessel hull.

Our stabilizers are featured with a real-time computerized system with constant self-checking to ensure correct operations. Our systems can be adapted to our customers' standards.

We use as much standard equipment as possible in order to facilitate the replacement of parts.



**MAIN CHARACTERISTICS AND DIMENSIONS OF THE "SAFIR" RANGE**



TYPE	FIN AREA	MECHANISM						WEIGHT
		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	
3R	2.4	3,800	1,850	1,650	1,750	2,100	1,140	12
	3.5	4,800				3,050		13.5
5R	4.4	4,700	2,150	1,900	2,000	2,700	1,630	17
	6.3	5,870				3,870		19
7R	5.8	5,320	2,300	2,000	2,200	3,120	1,860	22
	8.3	6,660				4,460		24
9R	7.3	6,000	2,585	2,000	2,350	3,500	2,090	30
	10.4	7,480				4,980		33
11R	9.2	6,870	2,700	2,200	2,350	3,920	2,350	38
	13.0	8,480				5,330		42
13R	10.8	7,240	2,850	2,400	2,350	4,240	2,550	51
	15.5	9,080				6,080		56
16R	13.3	8,000	3,350	2,500	2,650	4,700	2,830	62
	19.1	10,050				6,750		67
20R	16.7	8,980	3,650	2,900	3,000	5,280	3,160	77
	24.0	11,300				7,600		83

Dimensions are for information only. They may change slightly as a function of ship features, speed and efficiency needed.

**NOTES**

- (1) Weights indicated in the table are given per fin box and do not include the hydraulic power units and electric equipment but include the hull plate. Weights may be adjusted in compliance with the ship's hull enforcement.
- (2) For large vessels, two pairs of fins can be used.

