



Fluiten mechanical seals for the marine sector: utmost efficiency and respect for the environment

Fluiten is the Italian leader in the design and manufacture of mechanical seals for rotating shafts used in the chemical, oil, pharmaceutical and energy industries. It has been successful in the marine sector for several years with a seal developed for workboat propeller shafts used in the military and leisure sectors.

The company has created new safe innovative seals for propeller shafts. Special design stratagems stemming from several years of experiments have resulted in seals that solve the damaging effects of seal malfunction and prevent so-called catastrophic breakdowns.



The propeller shaft seal is a critical component on a boat since it performs the fundamental task of separating the inside of the boat from the sea where the rotating propeller shaft passes through the hull. Its critical nature stems both from the high rotational speed and size of the propeller shaft, which give rise to heat production between the seal surfaces, and from the speed of the hull through the water, which leads to undesirable vacuum problems in the seal area. The structure and materials chosen for the seal must ensure reliability over time and prevent catastrophic breakdowns, which would be dangerous, particularly on long range missions.



Fluiten engineering department

An equally important requirement is the total absence of lubricant. Fluiten seals are lubricated by the sea water itself, thus ruling out all risks of ecological damage. The front mechanical seal developed by Fluiten, based in Pero (Milan), meets all the required specifications and keeps power consumption to a minimum, thus preventing shaft wear and doing away with the routine adjustments alternative seals need.

Thanks to cooperation with the financial police and international Rodriquez Group Intermarine shipyard, Fluiten have met the strict military sector technical specifications laid down by the shipowner and final customer. Bigliani V, VI and VII patrol boats and Buratti boats sail in complete safety at up to forty knots with totally automatic control systems, thus ensuring high performance and full respect for the environment.

The seals Fluiten supplies to Gruppo Ferretti, the acknowledged world leader in yacht building, use similar technology to that developed for Intermarine and the financial police. Fluiten has designed seals in cooperation with Ferretti that guarantee extremely high technical performance and reliability without lubricants, which are harmful to the environment.

MU and MMS seals

MU and MMS mechanical seals, also called “pushers”, are seals where the contact between the surfaces is ensured by loaded springs and the pressure of the fluid withheld.

This is a distinctive feature of all Fluiten seals for 'critical' services. It prevents changes in pressure on seal surfaces over time, as occurs with elastomer bellow seals owing to inevitable ageing.

One of the peculiarities of these seals is the total absence of lubricant. Fluiten seals are lubricated by the water itself (fresh or salt according to the case), which is essential in order to avoid ecological damage. Thanks to the Fluiten Idrostop device, routine maintenance may be carried out with the boat in the water, whereas to maintain rubber bellow seals you have to dismantle the shaft.



MMS

The stationary seal ring antirotation device in Fluiten MU and MMS seals consists of four very strong couplings which withstand the run-out movements between the propeller shaft and the through-hull fitting and the friction between the seal rings. If the seal is temporarily run dry (without water) by accident, friction may reach high levels. In rubber bellow seals, the bellows themselves have to withstand these mechanical stresses. They tend to overheat when there is insufficient lubricant and their mechanical strength decreases.

Fluiten MU and MMS seals are the most suitable for preventing catastrophic breakdowns since any overheating which may be caused by dirt in the lubrication and cooling lines does not alter the mechanical strength of any of the components, even if foreign matter reaches the seal area or in the event of a positioning error during assembly.

Fluiten MU and MMS seals are easy to assemble correctly thanks to a system of positioners which preload the springs. This is an important advantage especially in the case of medium and large seals owing to the significant load needed for the contact between the seal rings and considering the limited room available in the bilge where the seal has to be located.

All the parts subject to wear in Fluiten MMS seals may be replaced with the boat in the water and without dismantling the propeller shaft. This can be done thanks to the sophisticated seal ring technology with controlled split.

Fluiten MU and MMS seals are hydraulically balanced, i.e. the hydraulic pressure which keeps the seal rings closed and the pressure which tends to open them are calculated so that the consequent positive pressure is kept to a minimum in order to reduce the absorption torque and therefore friction and overheating.

Every detail of Fluiten MU and MMS seals is taken care of owing to the extremely high technological level required considering the application. Sacrificial anodes inserted into the seal prevent the main components, such as the shaft, from corroding owing to stray currents.

Reliability, first and foremost

Fluiten provides seals for all types of vessel, with different motor-inverter configurations and different shaft dimensions. Their main characteristics are utmost strength and reliability, in order to prevent catastrophic breakdowns completely and rule out all possible consequent safety problems for seafarers.

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