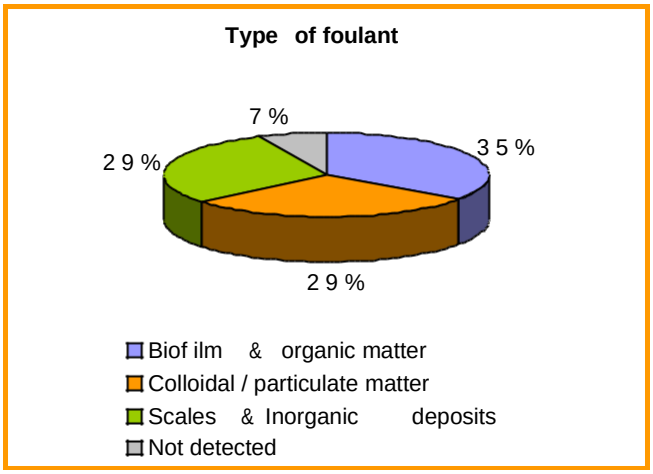
TECHNICAL MANUAL

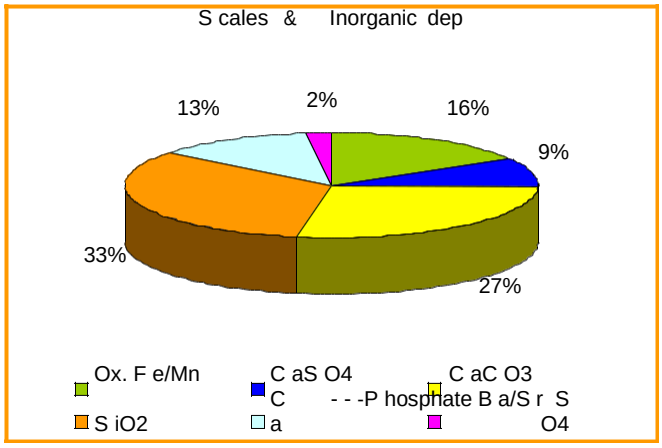
"RO MEMBRANES ANALYSIS"

MEMBRANES ANALYSIS

Even by following careful precautions, despite having an effective pre-treatment of the incoming water, a correct dosage of anti-precipitants and proper maintenance, you can incur over time in the reduction of the system performance, often due to the clogging of the membranes.

The causes of the problems can be multiple, both due to sudden and unpredictable variations in the optimal conditions in which the operation of the system is generally regulated, and to many types of variables that may intervene (appearance of microorganisms or algae, variations in pH and temperature, change in turbidity and water composition).





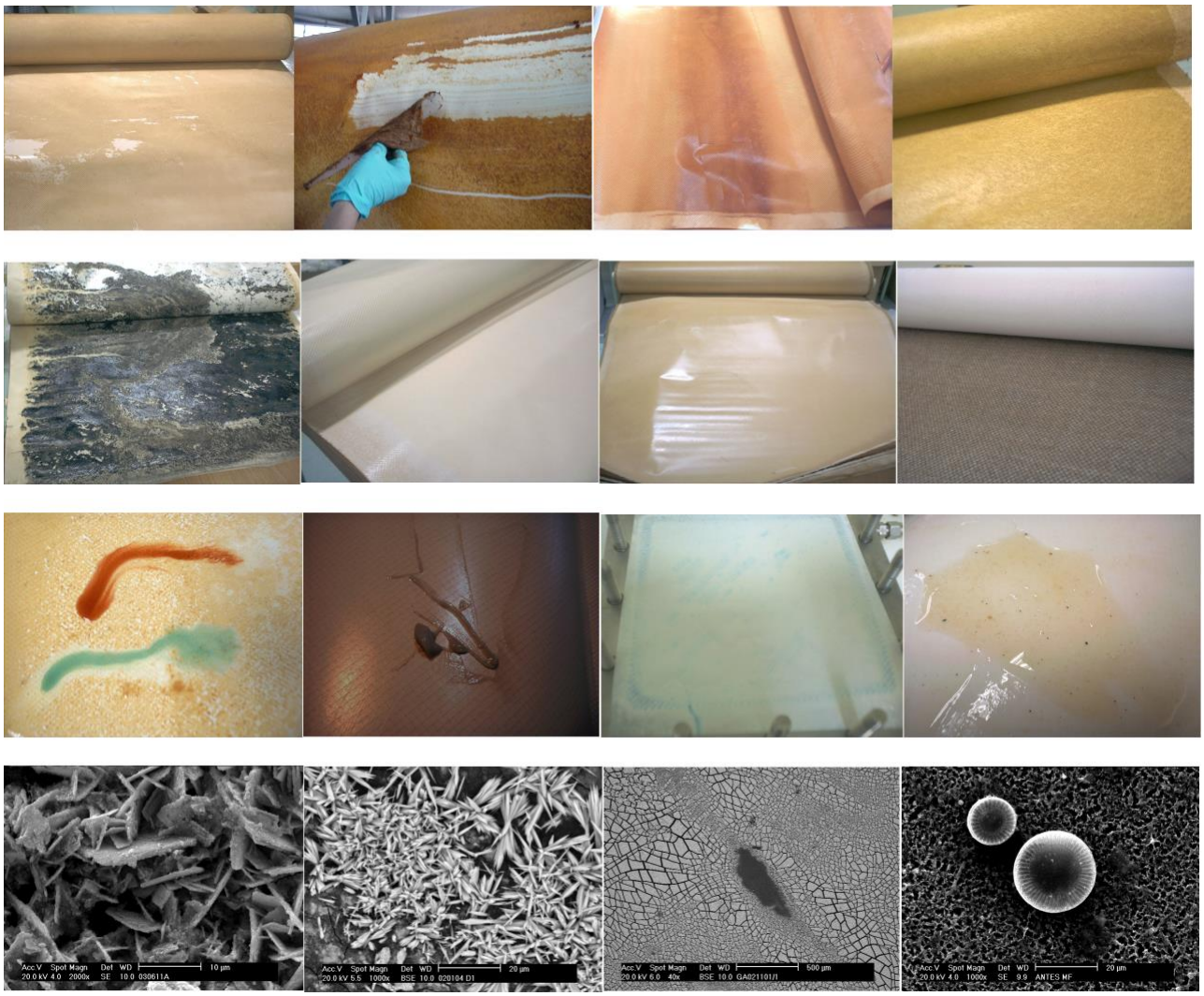
To monitor and possibly make changes to the system setting conditions, a very effective tool for solving problems is the analysis of the membranes.
This type of analytical technique is specifically designed to identify the causes of problems occurring on membranes in reverse osmosis (RO), nanofiltration (NF) and ultrafiltration (UF) systems.

Once the laboratory has received a significant sample of the membrane, it analyzes it using advanced techniques that allow to identify the type of deposit or dirt that led to the malfunction of the membrane and its replacement.

Autopsies include:

- **Identification of crystalline deposits or fouling agents**
- **Membrane characterization, salt rejection and flow**
- **Integrity and oxidation test**
- **Cleaning test, identification of the most suitable chemical product, dosage, contact time and pH for deposit removal**

The techniques used for membrane analysis range from simple laboratory analyses, which include the analysis of feed water or bacteriological tests, to the use of sophisticated instruments such as SEM-EDX electron microscopy, analysis by diffraction X-ray, IR spectroscopy and NMR magnetic resonance analysis.



The result obtained from this investigation on the membranes, combined with other information coming from the plant, such as the pre-treatment or the CIP (Cleaning In Place) program, is necessary to study new solutions for the correct use of chemicals and the correct application of CIP procedures, which can have a significant impact on the efficiency of the system, on the amount of water recovered and on energy savings.

The washing program

The choice of chemical products and the correct application of CIP (Cleaning In Place) procedures can have a significant impact on the frequency of cleaning, on the operating conditions and on the life of the membranes. Laboratory specifications are used to identify the type of deposit to be removed on the membranes, and individual tests are necessary to choose the most suitable product and the best operating conditions to achieve optimal removal.

Our team determines the most appropriate CIP cleaning program for your facility.

Feed water and pretreatment tests

Analyzes of more than 1000 membrane autopsies have shown that 50% of damage on the membranes comes from inadequate pretreatment. Our staff conducts on-site tests supported by the particle counter laboratory technique, which optimize the flocculant dosage in the filtration system.

Analysis of filter systems

For a complete and correct evaluation of the problems related to membranes, it is often particularly useful to perform the analysis of the filtering elements.

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