X-FLOW MEMSCAN
PREVENTIVE MEMBRANE LIFE SCAN

SERVICE LEAFLET

GENERAL INFORMATION

That membranes age over time is a fact; however the aging speed depends on many external factors such as plant settings, feed water quality and CEB frequency. The combination of these factors can even work as catalyst for increased aging.

FACT
You don't know exactly when membranes will fail

FACT
Your Plant has to perform

FACT
With MemScan you know where you stand

Knowing when your modules need to be replaced gives the possibility to implement a proper (phased) replacement plan and allocate budget timely.

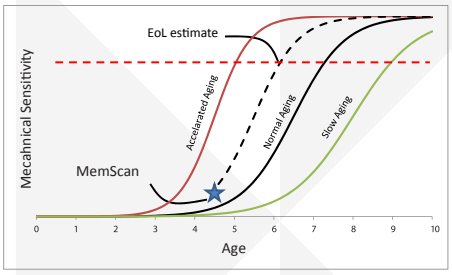
MEMSCAN

Performing a MemScan is first of all a preventive action. Monitoring the physical condition of the membranes gives you information on the residual lifetime and tells you when you need to act.

Next to the expected residual life, MemScan also helps in selecting the correct cleaning agents and tells you what is causing the damage to your membranes. Knowledge on fouling, the cause for damage or loss of performance can help with cleaning and preventing further damage and minimizes unnecessary plant stops and loss of production.

Performing a MemScan on a module is a destructive action. After a visual inspection and module integrity test, the research is performed on membrane level. Several fibres are tested on a variety of aspects such as permeability, strength and fouling. The test results are compared against the values known from the original batch tests.

MEMBRANE LIFETIME



The aging of membrane material is a complex phenomenon that depends on many factors. As the membrane material ages, it becomes more sensitive to mechanical forces that can result in membrane failures. The relation between the age and the mechanical sensitivity is described by an S-curve: most of the mechanical strength is lost in a short period preceding the end of the membrane life. MemScan combines a review of the membrane history with a measurement of the actual status in order to estimate the resulting lifetime expectation.

LIFE SCAN CHECK	LIFE SCAN RESULTS	LIFE SCAN ADVANTAGE
• Integrity • Permeability • Fouling • Scaling • Inner surface • Outer surface • Cross section • Compaction • Tensile strength • Collapse pressure • Burst pressure	• Residual lifetime expectation • Membrane failure risk • Damage causes • Cleaning advise • Elemental fouling detail	• Module status • No unnecessary downtime • Damage prevention • Effective cleaning • Reduced repair expenses

X-FLOW MEMSCAN
PREVENTIVE MEMBRANE LIFE SCAN

SERVICE LEAFLET

MEMSCAN STEPS

Insert investigation
The first step during the MemScan research is a general visual inspection on the complete module. The general state of the module casing is recorded and finally an integrity test is performed. Possible leaks are marked and checked later in the examination.

Membrane examination
For the membrane examination, the casing of the module is removed and several membranes are selected for a more detailed research. On membrane level, the permeability and mechanical strength are checked and compared with the original batch figures.

More detailed information on the membrane inner and outer surface is received with the SEM (Scanning Electron Microscopy) analysis. Fouling on element detail level is found with an EDX (Energy Dispersive X-ray) analysis.

Residual lifetime test
Another examination in the MemScan is the residual life expectancy test. This test uses the mechanical strength, the current age and the plant settings for indicating the expected lifetime. As every plant has its unique settings and treated water characteristics, this test requires additional data on the plant specifics. For this, your Pentair contact will fill out a data retrieval form for the required test input.

Cleaning Test
Optional to the basic MemScan, a cleaning test can be performed. In this test, several cleaning agents are tested for their cleaning capacity on the fouling found with the EDX analysis.

EDX ANALYSIS

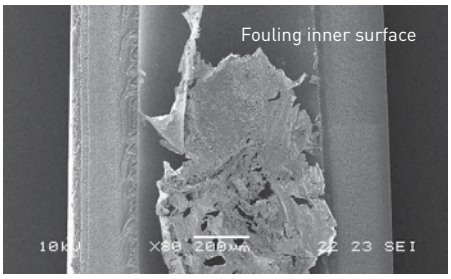
- EDX analysis (Energy Dispersive X-ray) is used to determine the elemental composition of the inner and outer surface of the membranes.
- In case of fouling or particles, the elemental composition of the fouling or particles can be identified.
- EDX-spectra from the inner and outer surface of used membranes is compared to EDX-spectra of **new membranes**. These spectra are taken before any cleaning performed at X-Flow.

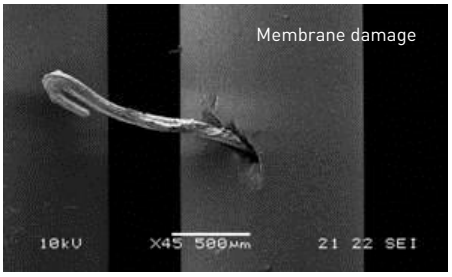
SEM ANALYSIS

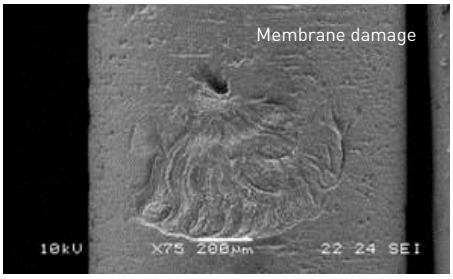
- SEM analysis (Scanning Electron Microscopy) is used to determine the morphology of:
  – Outer surface
  – Inner surface
  – Cross section
  – Recognize defects and fouling

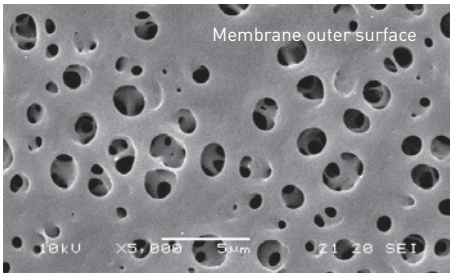
CLEANING TESTS

- Based on the results of the EDX analysis, several cleaning tests are performed on used membranes, for example
  – NaOCl
  – HCl
  – NaOH
  – NaOH with NaOCl
  – Citric acid
  – Commercial products









PENTAIR

X-FLOW BV
P.O. BOX 741, 7500 AS ENSCHEDE, NETHERLANDS WWW.X-FLOW.COM

All Pentair trademarks and logos are owned by Pentair, Inc. All other brand or product names are trademarks or registered marks of their respective owners.
Because we are continuously improving our products and services, Pentair reserves the right to change specifications without prior notice.
Pentair is an equal opportunity employer.
MEMSCAN E-5/12 © 2012 Pentair, Inc. All Rights Reserved.