



## FILMTEC Membranes

### Troubleshooting: Membrane Element Evaluation

#### Membrane Analysis

The morphology of deposits is determined with a stereo and standard light microscope or a scanning electron microscope (**SEM**).

Information about the chemical elements contained in the membrane or its fouling/scaling layer is obtained from Energy Dispersive X-Ray Fluorescence (**EDXRF**) Spectroscopy. Samples of the membrane "as is" and of the cleaned and rinsed membrane, and of the isolated and dried foulant/scalant can be analyzed by EDXRF. The result gives a semi-quantitative composition of chemical elements of the membrane and the foulants. This method can also furnish evidence of halogen damage to the membrane. Typical elements found are Ca, Ba, Sr, S (scaling), Fe, Si, Pb, Zn (colloidal fouling) and Cl, Br, I (oxidation damage). However, purely organic fouling and biofouling can not be detected by this method.

**ICP** (Inductively Coupled Plasma Emission Spectroscopy) is being used to quantitatively determine metals and silica on the membrane surface.

Impurities which have been organically bound to the membrane surface can be identified with **ESCA** testing (Electron Spectroscopy for Chemical Analysis). This test is predominantly used to identify the source of oxidation.

**Plate and Frame Testing** is performed after the destructive autopsy. Round coupons are cut from the membrane of the autopsied element and placed in a plate and frame apparatus. The coupons can be cleaned or treated with different chemicals. The performance of the different plates with the differently treated membrane samples can be compared against control coupons.

Slimy deposits or foulants from the membrane surface may be scraped off and then **microbiological test** be done on these samples. The microbiological test would reveal the presence of bacteria and the kind of bacteria present which may in turn allow to devise an anti-biofouling strategy.

**FILMTEC™ Membranes**  
For more information about FILMTEC  
membranes, call the Dow Liquid  
Separations business:

North America: 1-800-447-4369  
Latin America: (+55) 11-5188-9222  
Europe: (+32) 3-450-2240  
Pacific (ex. China): +800-7776-7776  
China: +10-800-600-0015  
<http://www.filmtec.com>

Notice: The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system.

Notice: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

