



## FILMTEC Membranes

### Water Chemistry and Pretreatment: Scale Control

#### Preventive Cleaning

In some applications, scaling is controlled by preventive membrane cleaning. This allows the system to run without softening or dosage of chemicals. Typically, these systems operate at low recovery in the range of 25%, and the membrane elements are replaced after 1–2 years. Accordingly, these systems are mainly small single-element plants for potable water from tap water or seawater. The simplest way of cleaning is a forward flush at low pressure by opening the concentrate valve. Short cleaning intervals are more effective than long cleaning times (e.g., 30 seconds every 30 minutes).

Cleaning can also be carried out with cleaning chemicals as described in [Cleaning Chemicals \(Section 6.8\)](#). In batch processes like waste water treatment, cleaning the membranes after every batch is common practice.

The cleaning procedure, cleaning chemicals, and frequency of cleaning need to be determined and optimized case by case. Special care has to be taken not to allow a scaling layer to develop over time.

#### Adjustment of Operating Variables

When other scale-control methods do not work, the operating variables of the plant have to be adjusted in such a way that scaling will not occur. The precipitation of dissolved salts can be avoided by keeping their concentration below the solubility limit. This is accomplished by reducing the system recovery until the concentrate concentration is low enough.

Solubility depends also on temperature and pH. In the case of silica, increasing temperature and pH increases its solubility - see [Silica Scale Prevention \(Section 2.4.7\)](#). Silica is usually the only reason for considering adjustment of operating variables for scale control because these adjustments have economic drawbacks (energy consumption) or other scaling risks (CaCO<sub>3</sub> at high pH).

For small systems, a low recovery combined with a preventive cleaning program might be a convenient way to control scaling.

**FILMTEC™ Membranes**  
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