



# FILMTEC Membranes

## A Comparison of Cellulose Acetate and FILMTEC FT30 Membranes

### Definition of Thin-Film Composite Membranes

The term “thin-film composite” describes the manner in which these reverse osmosis membranes are fabricated. Thin-film composite membranes usually consist of layers of dissimilar materials joined together to form a single membrane. This layered construction permits use of material combinations that optimize the performance and durability of the membrane. FILMTEC® FT30 membrane features a thin aromatic polyamide barrier layer on top of a thick microporous polysulfone sublayer. The bottom substrate is a nonwoven polyester support fabric.

### Definition of Cellulose Acetate Membranes

Cellulose acetate membranes are the oldest form of commercial RO membranes. They are available in diacetate and triacetate grades as well as blends of the two. Cellulose acetate membranes get their name not from their structure, but from the materials of fabrication. All commercial CA membranes are structurally classified as asymmetric membranes. The dense surface skin “membrane” and the thick supporting underlayer have the same composition, but are structurally dissimilar. These membranes are fabricated in a one-step process by casting a film or fiber from a solution of cellulose acetate and solvent.

#### Advantages of Thin-Film Composite Membranes

- Excellent hydrolytic resistance for greater membrane stability and membrane life.
- Superior rejection of salts.
- Superior organics rejection.
- Strong membrane structure for durability.
- Excellent membrane flux for higher productivity and lower pressures.
- Compaction-resistant sublayers.
- Wide operating pH range (2-11).
- Wide operating temperature range (0-45°C).

#### Disadvantages of Thin-Film Composite Membranes

- Limited tolerance to chlorine. Continuous chlorination causes attack on the polyamide barrier layer.
- *However, FILMTEC Membranes offer better tolerance than other brands of polyamide membranes.*

#### Advantages of Cellulose Acetate Membranes

- Low purchase cost.
- Tolerant of chlorine in feedwater.

#### Disadvantages of Cellulose Acetate Membranes

- Hydrolysis by acids and alkalies can lead to poor rejection.
- Membrane susceptibility to biodegradation, so a chlorine feed is often required.
- Inferior salt rejection.
- Narrow pH range (4-8).
- Narrow temperature limits (0-35°C).
- Subject to structural compaction and high operating pressures.
- Lower permeability requires higher pressures and resulting operating costs.

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## FILMTEC Membranes

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