



Element Warranty

FILMTEC Membranes

FILMTEC™ Reverse Osmosis / Nanofiltration Element(s) Three-Year Prorated Limited Element Warranty

LIMITED WARRANTIES

FilmTec Corporation (“hereinafter FilmTec”) provides limited warranties covering the materials, workmanship and performance of its spiral-wound FILMTEC™ reverse osmosis / nanofiltration elements^{1,2} (“Element(s)”), when installed, operated and maintained by Customer in accordance with the terms and conditions set forth in the Warranty and in accordance with FilmTec’s published documentation. FilmTec has permitted the supplier (“Supplier”) of the Elements, to assign this warranty to the Customer, but the Customer sole remedy under this warranty shall be against the supplying entity and not against FilmTec, unless FilmTec is the supplying entity. By accepting this warranty, the Customer agrees to the terms set forth in this warranty. Supplier includes either FilmTec in the event that FilmTec is the supplier of Elements or an affiliate of FilmTec that is the supplier of Elements.

¹ Elements used in food or dairy applications, and sulfate removal are not covered by this warranty.

² Nanofiltration elements shall be tested on magnesium sulfate when determining salt passage.

Limited Materials and Workmanship Warranty (“Workmanship Warranty”)

Supplier warrants that the Element(s) are free from defects in materials and workmanship which might prevent the Element(s) to be installed, operated and maintained in accordance with FilmTec’s published literature. This Workmanship Warranty shall be effective during the period beginning on the date of delivery of the Elements and ending twelve (12) months after the date of delivery. This Workmanship Warranty shall be deemed void if Customer does not install, operate and maintain the Element(s) in accordance with the requirements set forth in the warranty and in FilmTec’s published specifications or fails to inform the Supplier of the defect within thirty (30) days from the date on which the defect is noticed or could have been noticed by Customer. Supplier’s obligation under this Workmanship Warranty is limited to the repair or, at Supplier’s discretion, replacement of any Element(s), which is determined by Supplier (as applicable) in its sole discretion, after examination, to be defective under this provision.

* FilmTec published literature and specifications mentioned in this **Three-Year Prorated Limited Element Warranty** include but are not limited to the FilmTec Technical Manual (Form No. 609-00071-0416), FilmTec Tech Facts (storage and shipping of new FILMTEC elements - Form No. 609-02103-0106, star-up of RO/NF installations - Form No. 609-02077-1004, Biofouling prevention - Form No. 609-02032-1004, Cleaning recommendations - Form No. 609-23010-0605 and Form No. 609-02090-1005, Scaling prevention - Form No. 609-02019-1004, Form No. 609-02018-1004, Form No. 609-02020-1004) and Product Specifications.

Limited Initial Performance Warranty (“Initial Performance Warranty”)

Supplier warrants that, after stabilization, the Element(s) will meet the initial minimum permeate flow and salt rejection under standard test conditions set forth in the specifications in Attachment A, until the first to occur of

- (a) the first thirty (30) days after the first day of Customer’s initial installation and use of any such Element(s) in Customer’s system
- (b) six (6) months after date of delivery of any such Element(s) to carrier at shipping point. This Initial Performance Warranty shall be deemed void if Customer does not notify Supplier in writing of the Element(s) failure within 30 days after the first day of operation.

Supplier’s sole obligation under this Initial Performance Warranty is expressly limited to the repair or, at Supplier’s discretion, replacement of any Element(s) that Supplier determines to be in breach of this Initial Performance Warranty upon Supplier’s inspection. Failure or refusal to disclose to Supplier the use and operating parameters of Elements in the event of failure of performance shall render the Initial Performance Warranties null and void.

Prorated Performance Limited Warranty (“3Yr Performance Warranty”)

Supplier warrants the performance of its elements for THREE (3) YEARS from whichever of the following events occurs first:

ELEMENT SHIPPED WET

- a. First use in system;
- b. Three (3) months following date of shipment from Minneapolis to a location in the United States, Puerto Rico, Canada, and Mexico; or
- c. Six (6) months following date of shipment to any other destination.

ELEMENTS SHIPPED DRY

- a. First use in system;
- b. Twelve (12) months following date of shipment.

Supplier warrants that the Element(s) will: (i) have a permeate flow of at least seventy percent (70%) of the average permeate flow specified in Attachment A; and (ii) have a maximum salt passage rate of no more than 1.35 x of the maximum salt passage rate specified in Attachment A. Please note that FilmTec’s Proprietary Software (ROSA, WAVE) calculates the salt passage based on the stabilized salt rejection and not based on the minimum salt rejection or maximum salt passage.

If Supplier determines that the claims are valid, Supplier’s sole obligation under this system performance warranty is expressly limited to, at Supplier’s discretion, credit 1/36 of the original purchase price of the element for each unused month of the warranty period toward the purchase of a replacement element at the current prevailing price.

**Conditions
Voiding the initial
performance
warranty
and the Three-Year
Limited
Performance
Warranty**

The THREE (3) year limited performance warranty and the limited initial performance warranty described above shall be null and void if any of the following conditions are not met:

- i) Customer does not record and maintain, according to Supplier instructions, the operational data according to Attachment B
- ii) Customer fails to provide Supplier with the operational data upon request
- iii) Customer does not install, operate and maintain the Element(s) in accordance with the specifications set forth in this warranty or in accordance with good engineering practices.
- iv) Customer fails to meet any of the following conditions pertaining to any Element(s) and the system in which any Element(s) is used:
 - a. The design parameters (array, recovery, etc.) plus instrumentation and other components of the system in which the Element(s) are employed shall be consistent with sound engineering practice. Customer will allow Supplier to review the system design upon Supplier's request.
 - b. Feedwater temperature must be less than 113°F (45°C) unless otherwise stated in the product data sheet of the element(s) (attachment A) or in this warranty document.
 - c. Feedwater SDI (15 min., 30 psi) must be less than 5.0.
 - d. Feedwater must not contain any colloidal sulphur.
 - e. Feedwater must not contain any oxidizing agents including, without limitation, chlorine, ozone or permanganate.
 - f. The Element(s) must not be exposed to pressure greater than 1,200 psi for seawater Element(s)s, 600 psi for brackish water Element(s)s and 300 psi for tap water Element(s)s, unless otherwise stated in the product specification or unless otherwise indicated in this warranty document.
 - g. Backpressure (where permeate static pressure exceeds reject static pressure) must not exceed 5 psi at any time.
 - h. Sequestrants (and other chemicals used in the system) must be compatible with the Element(s).
 - i. The Element(s) must not be exposed to a pH of less than 2.0 or more than 11.0 during continuous operation, or a pH of less than 1.0 or more than 13.0 during cleaning unless otherwise indicated in the product specifications or in this warranty document. If pH adjustment is required, chemicals that are compatible with the Element(s) must be used.
 - j. The Element(s) must be operationally protected against excessive hydraulic changes including, without limitation, water hammer, and rapid pressure swings.
 - k. The Element(s) must be maintained in a clean condition and must not be contaminated by particulate matter, colloidal or precipitated solids, or biological growth; if scaling or fouling should occur, or normalized Element(s) flow decline of 10 percent, cleaning procedures must be employed in accordance with the procedures published in a literature piece entitled "Cleaning Procedures for FILMTEC FT30 Element(s)" (Form No. 609-23010-403QRP).
 - l. The system design, operating and maintenance procedures must contain adequate provisions to ensure against contamination by particulate matter, colloidal or precipitated solids, or biological growth.
 - m. There must not be scaling caused by failure of the chemical dosing system or ineffective scale- control practices. (e.g., Ca, Ba, or Sr salts).
 - n. The brine-soluble silica must be less than 150 mg/l at 25°C.

- o. There must not be damage caused by chemical compounds (e.g. surfactants, solvents, soluble oils, free oils, lipids, and high molecular weight natural polymers).
- p. Element(s) must only be cleaned with compatible chemicals and must not be cleaned with nonionic or cationic surfactants, or any other chemical that is not compatible with the Element(s).
- q. Customer is responsible for providing the user with adequate system operating and maintenance manuals, operator and supervisor training; and ensuring user's ability to properly perform cleaning and other performance restoration and diagnostic procedures.
- r. Customer is responsible for ensuring that frequent, adequate system and subsystem performance data are normalized and routinely recorded in a systematic format regularly reviewed. Customer will make this data available to Supplier on a reasonable basis in the event a claim is made against Supplier pursuant to the performance warranty.
- s. Element(s) must be stored in accordance with FilmTec's published guidelines and specifications.
- t. Permeate and concentrate obtained from the first hour of operation must be discharged.
- u. Field preservation and cleaning of Element(s) must be done in accordance with FilmTec's published guidelines, provided to Customer by Supplier.
- v. Element(s) must be stored in accordance with FilmTec's published guidelines.
- w. Customer must keep Element(s) moist at all times after initial wetting.
- x. Supplier will have the final decision on Element(s) replacement, or repair necessary to maintain output quality and quantity.
- y. Customer's failure or refusal to disclose to Supplier the use and operating parameters of Elements in the event of failure of performance shall render this Performance Warranty null and void.
- z. Failure of the customer to notify Supplier in writing of the Element(s) failure within 30 days after first non-compliance with performance standards set forth herein.

In addition all the foregoing warranties do not cover and shall be null and void if any of the following conditions are not met:

- a) If Customer is not current on all payments due to Supplier, then this warranty is null and void.
- b) Accidental and/or external caused damages and damages caused by improper use are excluded from these warranties. Accidental and/or external caused damages and damages caused by improper use are damages caused by but not limited to operation and/or exposure of Element(s) to conditions, outside the instructions and conditions listed in FilmTec's product datasheets and specifications and in this warranty document. If there is any dispute with respect to the above, the Customer should provide evidence to Supplier.
- c) Expendable parts and components (e.g. o-rings) are specifically outside of this warranty
- d) Damage or malfunction arising from repairs, replacement(s) or substitution(s) not specifically authorized by Supplier are specifically outside of this warranty.
- e) Any defects or faults caused by, or resulting from, inaccurate or incomplete operating process information / process operating parameters, or work performed by the Customer or its authorized representative, are specifically excluded from these warranties.

- f) If Customer does not furnish adequate and competent operating, supervisory and maintenance staff, and necessary laboratory facilities with test equipment and personnel, then this warranty is null and void.
- g) Supplier understands that the Element(s) will be used as a part of a larger water or wastewater treatment process. Supplier must be given the opportunity, with a reasonable notice, to review engineering documents and attend testing and commissioning activities of all aspects of the water or wastewater treatment process which may affect membrane lifetime and performance, or this warranty is null and void. Neither a review of the engineering documents nor attendance of testing or commissioning nor the declining of the opportunity constitutes any responsibility for any aspect of the system.
- h) In the case where the Customer and user are separate parties, the Customer has sole and exclusive responsibility for making the user aware of its responsibility under the conditions of these warranties. Failure of the Customer to meet its respective obligations set forth in this Limited Warranty may invalidate these warranties.

Exclusive Remedy & Limitation of Liability

1. Customer's exclusive remedy for any breach of any warranty set forth above is expressly limited to and shall be fully discharged by, at Supplier discretion, Supplier repairing a defective element or, at Suppliers discretion, replacing same at the then selling price not including freight, duty and taxes.
2. LIABILITY FOR CONSEQUENTIAL, PUNITIVE, SPECIAL, EXEMPLARY OR INCIDENTAL DAMAGES IS EXCLUDED AND CUSTOMER ASSUMES ALL RISKS AND LIABILITIES RESULTING FROM THE USE OF THE ELEMENTS IN CONTRAVENTION OF THIS WARRANTY
3. Prior to issuing any refund or shipping any replacement of Element(s), Supplier reserves the right to test the alleged defective Element(s) and systems on user's or Customer's premises, or to request Customer to perform such inspections or tests and forward the results thereof to Supplier.
4. If Element(s) failure is determined by Supplier to be from any cause other than breach of warranty as set forth above, Customer shall pay to Supplier a fee of US\$1,000.00 per day, plus direct travel expenses incurred by Supplier's employees, in connection with any inspection and testing of such Element(s) and system on user's or Customer's premises.
5. Elements shipped to Supplier for warranty examination must be shipped freight prepaid. Elements examined as part of a warranty claim which are found to be performing as warranted will be returned to the Customer freight collect.
6. Failure or refusal by Customer to fully disclose to Supplier the use and operating parameters for the Element(s) as set forth in Attachment B, Mandatory Measurement and Recording of Operating Parameters, shall render all warranties other than that covering materials and workmanship null and void
7. Warranty of replacement Element(s) will be limited to the duration of this limited warranty.

Warranty Claim and Notice Procedures

Before returning any Element(s) to Supplier for warranty examination, Supplier must be contacted to obtain a service request number. Any Element(s) shipped to Supplier's facility without return documentation will be returned to shipper unopened, freight collected.

The following procedure shall be followed to determine warranty protection:

1. Customer shall send a written notice to Supplier within thirty (30) days of problem occurrence or the claim is waived.
2. Customer shall submit all relevant operating data requested by the Supplier.
3. Supplier will be provided a reasonable time to review the data and make initial recommendations in writing for further evaluation of the claim.
4. Customer will make all reasonable efforts to execute and implement the Supplier's recommendations and collect, record and submit all relevant data resulting from these recommendations.
5. In the event Supplier's initial recommendations do not address and solve the issues of the performance, the Customer will grant Supplier access to the system and a reasonable time to perform testing and evaluation of Element(s) conditions and performance.
6. In the event Supplier's recommendations address and solve the issues of the performance, the claim shall immediately be withdrawn and disposed.
7. In the case the Customer decides not to follow Supplier's recommendations then the performance claim will be withdrawn and disposed.

8. Any defective Element(s) shall be returned to the Supplier at the Customer expense if so requested by the Supplier in accordance to Supplier's return procedures.

Important Reminders

1. Formaldehyde is not recommended as preservation liquid and is not supported as a preservative for drinking water applications. The Element(s) must be in use for at least 24 hours of continuous operation before formaldehyde is used as a biocide. If such Element(s) are exposed to formaldehyde before this period, a severe loss in flux may result.
2. The use of Element(s) 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.

Attachments

Attachment A, Element(s) Specifications

Attachment B, Mandatory Measurement and Recording of Operating Parameters

DOW FILMTEC™

Membranes

Contact Dow Water & Process

Solutions:

North America: 1-800-447-4369
Latin America: (+55) 11-5188-9222
Europe: +800-3-694-6367
Italy: +800-783-825
South Africa: +0800 99 5078
Pacific: +800 7776 7776
China: +400 880 0780

Governing Law

This limited warranty agreement shall be governed by and constructed in accordance with the laws of the State of Michigan, including the Uniform Commercial Code as in effect in Michigan, without regard to conflict of laws provisions.

Non-assignment

The rights and duties under this limited warranty agreement are not assignable or transferable by either party without the other's written consent, except that Customer hereby consents to FilmTec's/Supplier's potential future assignment of some or all of Supplier's obligations hereunder to any affiliate of Supplier without further notice to Customer.

<http://www.dowwaterandprocess.com>

READ, UNDERSTOOD AND AGREED

SUPPLYING ENTITY

By: _____

Name: _____

Title: _____

Date: _____

Customer

By: _____

Name: _____

Title: _____

Date: _____

Attachment A

FilmTec Corporation's Published Data Sheet Specifications

Attachment B

FILMTEC Membranes

Mandatory Measurement and Recording of Operating Parameters

From the effective date of the Initial Performance Warranty and 3Yr Performance Warranty the following items shall be accurately recorded by continuous on-line recording equipment, and/or by manual measurement and recording at least once per operator shift, **for each train**:

(a) Continuous on-line recording

- i) Raw and acidified feedwater pH value
- ii) Conductivity of feedwater and permeate
- iii) Feedwater residual chlorine concentration.
- iv) Feedwater pressure.
- v) Combined total permeate flow rate and conductivity.
- vi) Acid dosing rate (if used).
- vii) Antiscalant dosing rate.
- viii) Feedwater temperature.
- ix) Permeate Pressure
- x) Differential pressure between feed and concentrate (dp)

If the system consists of more than one stage or more than one pass, in addition to the parameters listed above, the following parameters will be required as well for each individual stage of every pass:

- xi) Feed Pressure, Permeate pressure and dp.
- xii) Feed and permeate conductivity
- xiii) Feed and permeate flow

(b) Manual measurement / lab testing and recording at least one (1) time per day

- i) All items of continuous recording listed above.
- ii) Feed water Silt Density Index, SDI (15min, 30psi).
- iii) Recovery rate.
- iv) Train flow balance (total feed, concentrate and permeate).
- v) Train mass balance (total feed, concentrate and permeate).
- vi) Train chloride ion balance (total feed, concentrate and permeate).

(c) laboratory measurement and recording at least once per month

- i) total dissolved solids of feedwater, brine and permeate
- ii) complete feedwater analysis for the constituents listed in the water analysis.

(d) calibration check of all sensors of continuous recording shall be done at least once per month.

Customer shall document and maintain the data in a systematic and presentable format, and shall make the data available to Supplier at Supplier's request.