

## LG Chem NanoH<sub>2</sub>O™ RO Membranes

### Three-Year Prorated Limited Element Warranty

\_\_\_\_\_ (hereafter "Seller") provides a limited warranty to the original Buyer on the workmanship, materials, and performance of its reverse osmosis membrane elements, (hereinafter "Product"), subject to the following terms and conditions:

#### 1. Workmanship and Materials Limited Warranty

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Seller warrants that its new Products are free from defects in workmanship and materials. This limited warranty is effective for a period not exceeding twelve (12) months from the date of delivery to Buyer. Enforcement of this warranty is expressly conditioned on Buyer storing, installing, operating and maintaining Product in accordance with industry accepted good practices and Seller's written instructions provided in the Seller's Technical Manual, which may be reviewed and downloaded at [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/).

This warranty does not cover damage to Product caused by Buyer's failure to store, operate or maintain Product in accordance with accepted good practices and Seller's written instructions provided in the Seller's Technical Manual, which may be reviewed and downloaded at [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/).

#### 2. Performance Warranty

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##### A. Warranted Performance

- 1) Product is warranted to have an Initial Performance that meets the minimum permeate flow and salt rejection as specified on the respective Product Data Sheet. Product performance is determined under the test conditions specified on the Product Data Sheet. "Initial Performance" means train or system performance following system stabilization after start-up and commissioning of the system or train in which Product is installed.
- 2) Seller further warrants Product performance for three (3) years, as follows:
  - The salt passage, when Product is operated under standard test conditions found on Product Data sheet with the pressure required to give the initial rated permeate flow, will not exceed 1.4x the specified value as defined by the minimum salt rejection on the Product Data sheet; and
  - Normalized permeate flow will remain at or above 70% of the initial average rated permeate flow.

##### B. Effective Date and Term

This warranty becomes effective upon whichever of the below listed events occurs first:

- 1) First use; or
- 2) Three (3) months following the date of shipment from Seller's plant Cheongju, Chungcheongbuk-do to a location in the Korea, Japan or China; or
- 3) Six (6) months following shipment to any other destination.

“First Use” means the first time that feed water is introduced to Product. Buyer shall record the date of First Use and notify Seller of such date within thirty (30) days of the event. Failure to notify Seller of the First Use date may void this warranty.

### C. Warranty Conditions

This performance warranty is expressly conditioned on Buyer’s strict compliance with the following conditions. Failure to comply with any of the following conditions may result in damage to, or impaired performance of, Product and may void this warranty.

- 1) If the stability index of the RO concentrate is positive, a scale inhibitor compatible with Product and effective for carbonate scale control shall be dosed according to the scale inhibitor manufacturer’s recommendations. Seller has no liability for impaired Product performance due to scaling or damage resulting from the use of a non-compatible scale inhibitor. “Product feed water” means the feed water introduced to Product downstream of all pre-treatment and chemical addition.
- 2) Product feed water shall be adequately pre-treated to not exceed 1.0 N.T.U., and an S.D.I. of 5.0 for 100% of the operating time. In the event that N.T.U. or S.D.I. values exceed the above limits and as a result normalized permeate flow, differential pressure or salt passage deviates by more than 10%, Product shall be immediately taken out of service for cleaning to restore performance to the original values. Buyer’s failure to timely clean fouled Product may void this warranty.
- 3) At no time shall Product feed water exceed a temperature of 45 degrees C.
- 4) The Products must not be fouled by colloidal material, particulate matter, organic or inorganic foulant, precipitates or bacteria. To this end, if normalized element flow is less than 10 percent of the clean element’s flow, a clean-in-place should be undertaken and should follow LG Chem’s cleaning procedures (TB 113). In addition, the membrane must not be exposed to chemical oxidants (such as, but not limited to, chlorine, hypochlorite, ozone or permanganate), oil and grease compounds or any chemical which is known to, or subsequently shown to damage or impair Product performance.
- 5) Prior to installation, Product shall at all times be stored and maintained in compliance with Seller’s written instructions.
- 6) Buyer must keep the element hydrated at all times.
- 7) At no time shall Product be operated under conditions where the permeate pressure is greater than the feed pressure.
- 8) Product shall at no time be exposed to chemicals, including pretreatment and cleaning chemicals, which are not approved for use by Seller.
- 9) Buyer is responsible for cleaning the Products with approved, compatible cleaning chemicals or agents by the Seller. Buyer is instructed to clean Products with Seller’s cleaning procedure which can be downloaded at [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/) and can be found in Seller’s Technical Manual. The Buyer is responsible for the effects of non-compatible chemicals on Products; their use will void the warranty.
- 10) The system array, permeate recovery, instrumentation, pretreatment and cleaning chemicals used, design parameters and system components shall be consistent with good engineering practice and industry good practices. Seller reserves the right to review the system design as

a condition precedent to enforcement of this warranty. A review of the system design does not guarantee the system performance.

- 11) System flux shall not exceed the design value at any time.
- 12) For further information and additional restrictions on use, please refer to the Seller's Technical Manual which can be found at [www.lgwatersolutions.com](http://www.lgwatersolutions.com).

#### **D. Records**

- 1) As a condition precedent to enforcement of this warranty, Buyer shall routinely record and systematically maintain such data as is reasonably required for Seller to confirm that the conditions of this warranty have been satisfied. Such data shall be available to Seller on a reasonable basis and in the event a claim is initiated under this performance warranty. The minimum data and frequency of data logging required to satisfy this condition may be viewed and downloaded at [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/). Additionally, Buyer shall log all system or train operational events including, but not limited to, start-ups, shutdowns, pretreatment excursions, maintenance and cleanings.
- 2) Buyer's failure or refusal to satisfy the conditions of paragraph 2.D.1) immediately above, may result in Seller's rejection of a warranty claim and may void this warranty.

### **3. Remedies**

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#### **A. Workmanship and Materials**

Seller's sole obligation under this warranty is limited to the repair or, at Seller's sole option, the replacement of any Product or parts thereof which are returned freight prepaid to Seller and which, when examined by Seller are found to be defective under the terms of this limited warranty.

#### **B. Performance**

- 1) Seller's sole obligation under this warranty and Buyer's sole remedy for any breach of warranted performance, is limited to and shall be fully discharged by Seller repairing any defective Product, or replacing the same, at Seller's sole option, at the then current ex-works price, less a rebate credit of the same fraction of selling price as the unrealized fraction of the three-year prorated warranty period.
- 2) Product examined as part of a warranty claim and which are found to be performing as warranted will be returned to Buyer freight collect and a service charge of \$200 per element evaluated will be levied against Buyer. Seller's responsibility under this warranty is satisfied when the average performance of a shipment of Product is at or above its warranted rating.

### **4. Limitation on Liability**

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Seller's total liability shall not exceed the total value of the contract of sale under which Product was originally sold to Buyer, excluding the value of Product replaced due to faults in material and workmanship. Product replaced due to faults in material and workmanship will be warranted as new Product. The remedies in this Section 4 are expressly agreed to be exclusive by Buyer and Seller.

Expendable parts and components (e.g. o-rings) are not within the scope of this warranty.

### **5. Miscellaneous Provisions**

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#### **A. Filing a Warranty Claim**

All warranty claims must be filed in accordance with Seller's written procedures. Please refer to the "Returned Goods Authorization" form, which may be viewed and downloaded at [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/).

The Returned Goods Authorization form must be filed and sent to the Seller within thirty (30) days of problem occurrence or the claim is waived

#### **B. Assignment**

This warranty may not be assigned or transferred by the original Buyer without the express written consent of an authorized representative of Seller; such consent shall not be unreasonably withheld.

#### **C. Shipping, Insurance, Installation, Loss**

All costs of shipping, insurance, installation and risk of loss arising in connection with performance of this warranty shall be borne by Buyer. Replacement Product provided to discharge this remedy shall be shipped, ex-works Cheongju, Chungcheongbuk-do, Korea.

#### **D. Operating and Maintenance Instructions, Operator Training**

Seller has made available to Buyer appropriate operating and maintenance instructions, which may be viewed and downloaded at: [www.lgwatersolutions.com/](http://www.lgwatersolutions.com/). Operator and supervisor training services are available from Seller at additional cost.

#### **E. Governing Law**

This warranty shall be construed and enforced in accordance with the laws Korea, without reference to its conflict of laws principles. Any legal action or proceeding relating to this warranty shall be subject to the exclusive general jurisdiction of the Seoul Central District Court. This warranty shall not be governed by the U.N. convention & contracts for the international sale of goods, the application of which is expressly excluded.

### **6. Disclaimer**

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THE WARRANTIES PROVIDED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT, BE IT DUE TO A BREACH OF ANY WARRANTY HEREUNDER OR ANY OTHER THEORY OF LIABILITY OF ANY KIND, SHALL SELLER BE LIABLE FOR OR OBLIGATED IN ANY MANNER TO PAY CONSEQUENTIAL, INCIDENTAL, SPECIAL OR INDIRECT DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, PLANT DOWNTIME, OR THIRD PARTY CLAIMS AGAINST BUYER.

**FOR AND ON BEHALF OF:**

**Seller**

**Buyer**

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Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_