

 <b>membranium.</b>	<b>Technical Service Bulletin</b>	Version: 2 Effective as of : 25.05.2016
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## Three-years limited warranty compliance terms for the reverse osmosis and nanofiltration spiral-wound membrane elements

**1. Customer's information**     *1.1. RM Nanotech provides three-years limited warranty for spiral-wound membrane elements series nanoRO, nanoNF.*

*1.2. RM Nanotech provides a limited warranty on the materials, workmanship, and performance of its spiral-wound reverse osmosis and nanofiltration elements<sup>1</sup>, provided the requirements of operating manual OM-2 are followed, and providing RM Nanotech's recommendations (as per published Technical service bulletins (TSB)) are followed as per the following provisions:*

**2. Limited warranty for storage**

2.2. Storage warranty period of wet membrane elements is 6 months from the date of delivery provided the membrane elements storage procedures are followed (see TSB 108).

Storage warranty period of wet membrane elements depending on temperature is provided in chart 1.

Storage temperature, °C	5-15	16-35	More than 35
Storage warranty period of wet membrane elements	6 months	3 months	1 month

Storage period of wet membrane elements shouldn't exceed 12 months if procedures described in TSB-108 are followed

2.3. Storage warranty period of dry membrane elements is 12 months from the date of delivery subject to follow membrane elements storage procedures described (see TSB-108).

Storage period of dry membrane elements shouldn't exceed 18 months if procedures described in TSB-108 were applied.

Storage warranty period of dry membrane elements depending on temperature is provided in chart 2.

Storage temperature, C	5-15	16-35	36-45	More than 45
Storage warranty period of dry membrane elements	12 months	6 months	3 month	1 month

<sup>1</sup> Elements used for removal of sulfates, for effluent waters cleaning as well as used in food and dairy industry are not covered by this warranty.

**3. Materials and workmanship limited warranty**

3.1. RM Nanotech warrants that its new reverse osmosis and nanofiltration spiral-wound elements are free from defects in materials and workmanship provided that such elements are operated upon and serviced as per operation manual OM-2 and recommendations set forth in TSBs 101-109 by RM Nanotech. RM Nanotech's obligation under this limited warranty is limited to the repair or, at RM Nanotech's specialists discretion, replacement of any element which, when examined by RM Nanotech, appears to be defective within the first three years of operation.

3.2. RM Nanotech warrants that the elements supplied to the Buyer have the initial minimum permeate flow and initial minimum salt rejection as specified in catalogues and performance passports of the elements. These parameters are determined under standard test conditions specified by RM Nanotech. Flow of each single element in a lot may vary +15%<sup>2</sup>. Nominal rejection of dry 1812, 2521, 2540 membrane elements is achieved after 100 hours of continuous operation on test solution. Nominal rejection of dry 4040 and 8040 membrane elements is achieved not later than 48 hours of continuous operation on test solution. Nominal rejection of wet 4040 and 8040 membrane elements is achieved not later than 2 hours of continuous operation on test solution.

**4. Limited Warranty compliance terms**

4.1. In case of following operation manual OM-2, recommendations on operation, start up and shut down of plants with spiral wound membrane elements (TSB-101) RM Nanotech warrants operation of its membrane elements within three years of starting operation provided that the elements have been put into operation not later than 6 months of the shipment.

4.2. Within the first three years of the membrane elements' operation RM Nanotech warrants that minimum permeate flow, when operated under standard conditions in accordance with operating manual, shall be at least 70 percent of the specified initial average flow. RM Nanotech also warrants that maximum salt passage will not exceed 35% of the initial value under standard test conditions.

*Three-year limited warranty will be null and void to follow one of the following conditions:*

**5. Operation within 3 years period of limited warranty**

5.1. Elements should be stored strictly in accordance with RM Nanotech instructions described in operational manual OM-2 and TSB 108.

5.2. The design parameters of the system (recovery, pressure, concentrate minimal drop, scale, temperature etc.) where elements are employed should meet the requirements specified in operational manual OM-2 and TSB 101, 102, 108, 109. RM Nanotech reserves the right to inspect Buyer's membrane system.

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<sup>2</sup> Variation of flow rate should be checked in respective specification or technical passport for the elements

5.3. Feed water quality, used reagents and operating conditions must correspond to the requirements set forth in operation manual OM-2 and TSB 101.

5.4. The elements' loading must be carried out strictly in accordance with RM Nanotech's directions set forth in operation manual OM-2 and TSB 109.

5.5. Chemical cleaning of elements must be carried out strictly in accordance with RM Nanotech's directions set forth in operation manual OM-2 and TSB 102. Buyer bears responsibility for the use of chemicals not recommended for operation with membrane elements.

5.6. Buyer's ignoring recommendations on operation of membrane elements may be a reason for refusing warranty obligations of the manufacturer.

## **6. Repair or replacement**

6.1. When a warranty case occurs RM Nanotech undertakes to repair the damaged membrane elements or, at RM Nanotech's decision, replace the membrane element with a new one. RM Nanotech reserves the right to test the alleged damaged elements and the reverse osmosis systems at the user's premises or to request Buyer to perform such tests and forward the results thereof to RM Nanotech. If the element failure is determined to be from cause other than those listed in warranty obligations, Buyer shall pay to RM Nanotech a fee of 50,000 rubbles plus direct expenses incurred by RM Nanotech's employees, in connection with any inspection and testing of such elements and systems at the Buyer's premises.

## **7. Warranty notice**

7.1. Refusal to provide to RM Nanotech a free access to the operational parameters of RM Nanotech membrane elements shall render all warranties, other than which covers materials and workmanship, null and void.

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