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JSC “RM Nanotech’s” customers handout for correct matching of the membrane elements and their installation in pressure vessels

1. General provisions

1. Technical service bulletin (TSB-109) applies for reverse osmosis spiral wound membrane elements nanoRO series produced in accordance with TOR 2292-010-67318131-2012.

2. Technical service Bulletin sets up the rules of right choosing of the membrane elements and installation in pressure vessels.

3. While replacement of foreign manufactured membrane elements with analogues made by JSC “RM Nanotech” the following matching parameters are to be observed:

- Minimal rejection rate of JSC “RM Nanotech” analogue of the membrane element shouldn’t be less than minimal rate of the declared rejection of the membrane elements in operation;
- Nominal flow rate of JSC “RM Nanotech” analogue of the membrane element should correspond or to be within the limits +20% -20% of the declared nominal rate of the membrane elements in operation;
- Test conditions of JSC “RM Nanotech” membrane elements should match with test conditions of the membrane elements in operation;
- External sizes of JSC “RM Nanotech” membrane elements should match with sizes of membrane elements in operation;
- Size of core tube should match (for 8040 elements – internal diameter of core tube, for all others – external diameter of core tube).

4. To replace used membrane elements with new ones it’s required to discharge reverse osmosis unit and to wash scrupulously all piping and pressure vessels. To check integrity of end caps (vessel head-membrane element) and integrity of O-rings. If required to install new end caps or replace O-rings with new ones.

5. Along with the shipment JSC “RM Nanotech” provides to its customers specification passports which contain the following data:

- model of membrane element;
- serial number;
- rejection rate (minimal/nominal and factual)
- flow rate (minimal/nominal and factual)

6. When loading JSC “RM Nanotech’s” membrane elements into pressure vessel please pay attention to the factual flow rates of the membrane elements specified in the passport. JSC “RM Nanotech’s” specialists of Center of technical support recommend to load elements with lower flow rate at the beginning of pressure vessel (from feed channel side) and elements with higher flow rate at the end of pressure vessel. Such arrangement of the membrane elements will allow to have the most optimal permeate output from each membrane element installed in the reverse osmosis unit.

7. ELEMENTS LOADING IN PRESSURE VESSEL

7.1. Prepare pressure vessel prior to installation you should remove dust, oil remains, and metal grit and spray it with clean water.

7.2. Unpack the element. Make sure that sealing rubbers are in place and there're no mechanical damages.

7.3. Unpack interconnector which is used for series connection of the membrane elements loading in multi-elements pressure vessels. Interconnector is not used for the loading into single-element pressure vessel.

7.4. Lubricate interconnector O-ring seals and brine seals with glycerin. Use of oil based lubricants (for example silicone) can cause damage of the membrane element.

7.5 Put interconnector into permeate tube of membrane element to the max.

7.6 Carefully and without too much efforts to load element in the pressure vessel ensuring tightness between element and wall of the vessel. Membrane elements should be loaded followed by the direction of the arrow showed on the sticker (if there's no an arrow on the sticker, elements should be loaded from the back side of sealing rubbers)

7.7. You can load successively from 1 up to 3 shrink film wrapped or tape wrapped elements in pressure vessel ("F" and "T" at the end of element identification) and from 1 up to 8 elements reinforced with fiber glass ("C" at the end of element identification). Meanwhile the core tubes are connected with interconnectors which are supplied with each element.

7.8. Prepare interconnectors and special endcaps which connect core tubes of the lead and tail elements with vessel end caps. ***Please note! It's forbidden to use interconnectors as endcaps. This can cause feed water leak into permeate and result in membrane element destruction.***

7.9 Lubricate adapter endcaps sealing rubbers and vessel end plates with glycerin. Install endcaps in vessel and fix it. Tightness between endcaps and permeate tube as well as between endcaps and vessel is provided by the O-rings.

7.10 While loading it's required to write down elements serial numbers as well as vessel number and element's arrangement number in pressure vessel.

7.11 After correct loading of membrane elements into pressure vessel of the reverse osmosis unit it's required to fill it out with water and verify its sealing capacity.

8. At the first launch an element should be washed from the preservatives for at least 1 hour.

9. In order to prevent destruction of the elements the following should be observed:

- Do not allow excessive feed pressure and feed flow above the levels indicated in the specification
- Avoid hydraulic hammer during start-up, operation and shut down of the reverse osmosis systems.
- Take measures for protection of the membrane elements from the back pressure on the permeate side. The pressure on the permeate side under no circumstances must exceed pressure at the feed of the membrane element. Filter valve should be open during launch of the system.
- During start-up of the reverse osmosis system the feed pressure must be increased up to the operating level gradually within 30-60 second (at the max. rate of 0,1 MPa/sec)
- Take measures for prevention of membrane elements' operation in dead-end mode without concentrate discharge.
- Feed water, permeate and concentrate tests should be conducted during operation.
- Need to follow guidance on using permeate (filtrate) and concentrate valves (check OM-2 and TSB-101).

10. Determine operational parameters on flow, pressure and recovery in accordance with technical datasheet and operational manual OM-2.

11. To register initial data of flow, pressure and recovery in the filed book.

For any additional information regarding installation and support service of the JSC “RM Nanotech’s” products please contact:

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