

It should be noted that this Annex is a supplement with photos of the NK002 operating instructions. It does not replace it. It is a guide to perform the bubble test, dismantling and reassembly of a Kleansep™ module. The following described operations are carried out by our qualified staff on our site Salindres.

For this illustration, we take photos of a K19 module and some of the K138 module.

### A. Clean – Security instructions

Before working on the modules, it is highly advisable, at least to a pre-wash rinse + or, preferably, a thorough cleaning.

Personals protectives equipments are compulsory:



**Wear safety shoes**



**Wear protective clothing**



**Wear thermal gloves**

### B. Environmental instructions

#### 1. Waste Management

Waste is to be sorted in accordance with the site.

#### 2. Water

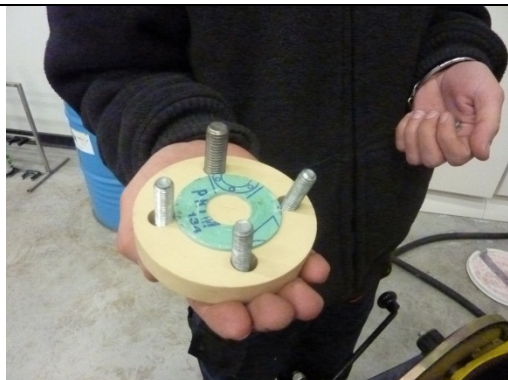
Be sure to close the water taps after use.

### C. Bubble test

This is to check the mechanical integrity of the membranes and the sealing of the gasket and the housing.  
Need softened water and oil-free compressed air.

If difficulties arise, seek advice from ORELIS ENVIRONNEMENT or its representatives.

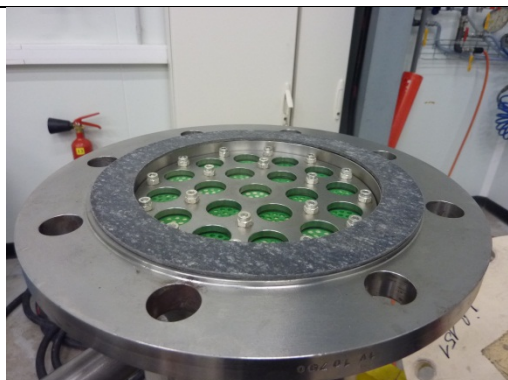
Step C



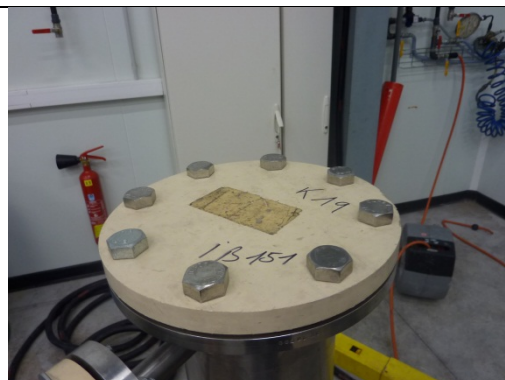
1. Prepare the appropriate side seal packaging permeate + 1 gasket



2. Put it on the module, bolt and screw



3. Retentate side: put the gasket



4. Put the tape packaging retentate Bolt and screw

5. Return the module and place it on the floor fill the water permeate module side,

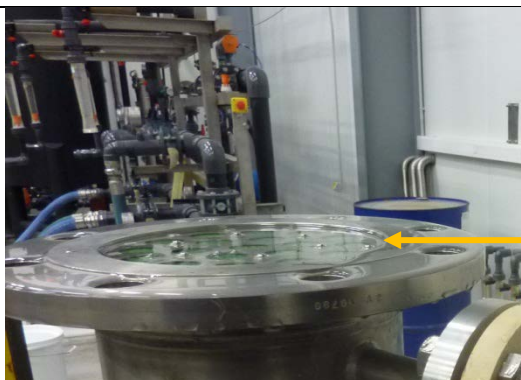
6. When the water begins to flow through the permeate side, turn off the water supply



7. Block permeate side with air connection and screw tape



8. Make up the water until the level no longer fall



9. When water is flush with the top of the module, turn off the water supply



10. Put air supply on the tape

11. Open the air valve and maintain 300 mbar for 1 min

12. Visually inspect the surface of the water,  
During the first 10 seconds or so, a continuous stream of "bubbles" coming from inside the tubes or channels of membranes, appears and stops, this is normal

13. Continue to visually inspect the surface of the water,  
Refer to the following table to determine compliance of the module. Make the corrections to rectify the problem if any.

14. Then proceed to the bubble test across the module, repeating steps §C.1 à §C.13

Results	Corrections
😊 The water surface is smooth	The module is compliant to the side
😊 Small bubbles appear at the sealing of the membrane	The module is compliant to the side NB : Sealing can be green or gray.
😬 A bubble passage between seal and membrane	Means a failure to the clamping => remedy the torque screwdriver set to 5 Nm (see §E85) and then resume the step §C.11
😡 The water flows through a weld or by a hole in the housing	The housing is corroded, the module does not comply. The bubble test stops, Purge water of module of its water module Seek advice from ORELIS ENVIRONNEMENT or its representatives.
😡 A "geyser" bubbles into the module	The leak comes from a membrane, the module does not comply, The bubble test stops, Purge water of module of its water module Go to step D. <b>Dismantling of the module</b> , gaskets if they are new will be reused, even the new nuts are thrown (single use)

**If after dismantling and assembly of the module, the bubble test is still not conclusive:** Seek advice from ORELIS ENVIRONNEMENT or its representatives.

15. The module is deemed to comply if the statement is 😊 2 retentate sides (top and bottom)



16. View of conformity Module

### 17. Bubble test procedure is finished

Cut the air, make sure the water valve is closed.  
Disconnect the air connection, remove the tapes connecting, storing tools and components in a practical way to facilitate the next intervention.  
Promote the flow of water towards drains before replacing the module installation.



### D. Dismantling of the module

#### Step D



18. Unscrew all the nuts starting with the periphery



19. Collect ALL nuts and throw out (see §B.1)



20. Place the extractor against the tightening plate on the module



21. Place slides over the membrane and tightening the top bolt holding the bottom nut, the blades move apart in a circle against the tightening plate



22. Then screw the top nut holding the top bolt (to raise the spreader)



23. The lifting, the tightening plate remains attached, remove the extractor  
Unlocking the tightening plate



24. Put back the tightening plate and put the nuts in the center to hold, hand screwing



25. Proceed to the complete reversal of the module, adjust the height of the machine if necessary





26. The module is now returned

27. Repeat steps from \$D.18 to \$D.23

28. Then go to the step \$D.29



29. Remove the tightening plate



30. Take a curved tool in its end and the slide between the module and the seal



31. Catch the gasket and pull



32. Pull the ring until he comes here gasket used  
Discard the gasket if turned on installation, keep it if it is not the case



33. Gasket removed



34. Put your hands under the module and push the membranes up



35. Module bottom view



36. Top view, the membranes are mounted



37. Take the membranes carefully, and one by one out of the module and inspect  
Clean all healthy membranes with water and rub with a clean cloth

38. Visual inspection of each membrane, three cases are possible:

**1st case :** If the membrane is cracked or chipped but not broken, => throw out (see §B1)

**2nd case :** If the membrane is slit throughout its length and if it appears that the pieces could be projected at the time of breakage

**3rd case :** If the membrane is broken into several pieces, they could cause damage not visible on the surrounding membranes

=> in these two cases it is best to discard the "complete crown" of the membranes that surround the damaged membrane

If in doubt seek advice from ORELIS ENVIRONNEMENT or its representatives.



39. Make healthy membranes in fingerprints

40. Repeat steps §D37 à §D39 until the last membrane



## Step D



41. Return the module, loosen the nuts



42. Remove the tightening plate and discard the gasket if turned on installation, keep it if this is not the case



43. Clean the housing with water jet in and dry with a cloth



44. Also clean 2 tightening plates

## E. Assembly of the module

## Step E



45. Enter the end of the tape measure in the central hole of the module



46. The highlight on the other side by the same central hole, and then reassemble the meter for that clings to the bottom of the bottom plate





47. Take the measurement at the top outer edge of the plate, in this case = 116.3 cm and the note on notebook



48. Take the used or new membranes and measure (per batch), in this case = 117.7 cm, note on notebook  
In the case of a recharge: all membranes are replaced  
In the case of a repair: only deteriorated membranes are replaced



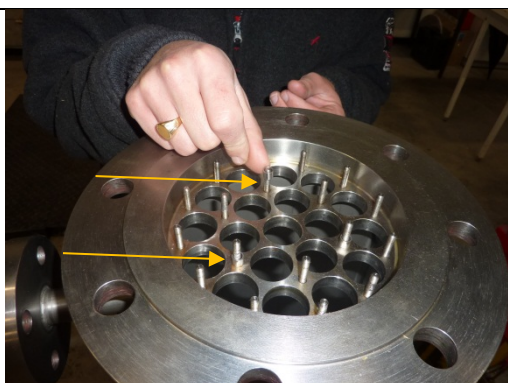
49. Note the batch numbers of new membranes on notebook



50. To calculate the height of the spacer, the following calculation :

$(\text{membrane} - \text{Module length}) \div 2 = \text{height spacer}$   
In this case : 0.7 cm

Ensure with a vernier caliper that spacer is chosen to this dimension.



51. For the K03, put his mounting spacer  
For K07, K19, K37 modules : put 3 spacers on the studs to have a plan for timing the tightening plate  
For K99 and K138 modules: put 5 spacers on the studs to have a plan for timing the tightening plate



52. Put the tightening plate  
**UPSIDE DOWN** for K03, K07 , K19 , K37 modules  
**PUT IN PLACE** for K99 and K138 modules



**53. Tightening nuts "IN CONTACT"**

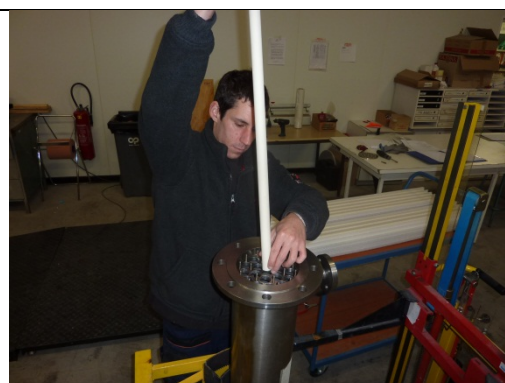
Do not over tighten, crushing hazard spacers. This operation only keeps the tightening plate in position for mounting membranes.



**54. Return the module**



**55. Clean the side the housing**



**56. Put the first membrane always starting from the center**



**57. Support the membrane in the module**



K138

**58. Make sure it is in good location looking down through the holes**



K19

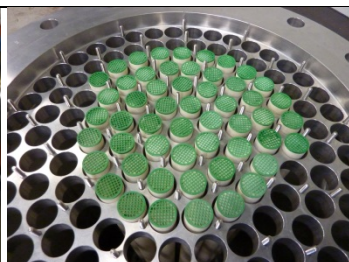


K19



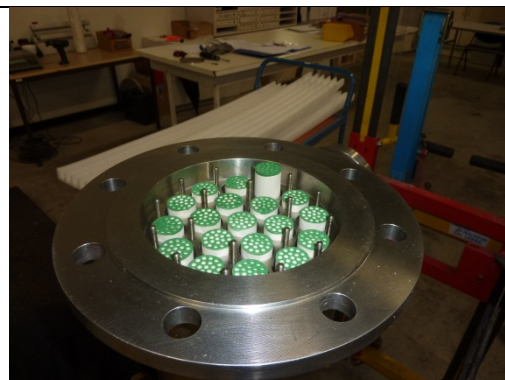


K19



K138

59. Continue the implementation of the module's center to the periphery of the membranes



60. The last membrane is tricky to set up, then put the membrane and leave it in stop down on the tightening plate



61. Put your hand under the module and assist the descent of the membrane into the slot



62. Top view well positioned membranes



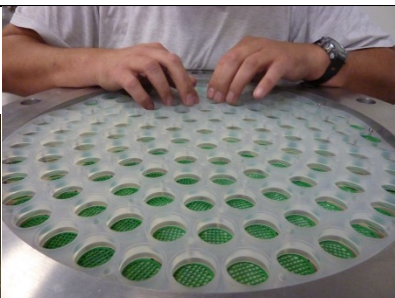
63. Introduce the new gasket



64. Slowly depress the gasket for all "skirts" marry monoliths without roll up, then pressing hard on the gasket toward the center



K19 EPDM



K138 SILICON

65. Gasket positioned correctly



66. Place the tightening plate in place (concerns all modules)





67. Hand tighten all new nuts



68. Screw CROSS 5 Nm with a torque screwdriver or a torque driver starting from the inside and ending with the periphery



69. Return the module



70. Loosen the tightening plate, remove it and remove the spacers

71. Repeat steps from §E.63 to §E.68  
Assembly of the gasket, the tightening plate and nuts (single use)

Then go to step §E.72.



72. Return the module



73. Screw CROSS 5 Nm with a torque screwdriver or a torque driver starting from the inside and ending with the periphery



74. The module assembly is complete

75. Go to steps §C. Bubble test

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