



## Management Summary

### *MS2-phage removal on Norit Filtrix Capfil Ultrafiltration Membrane - UFC M13 LE sp*

#### General

Three ultrafiltration membrane cartridges, containing Norit Filtrix Capfil Ultrafiltration Membranes type UFC M13 LE sp, were tested according to NSF Protocol P231 "Microbiological Water Purifiers" at Vitens Laboratories, Leeuwarden, The Netherlands. Tests were performed in order to show that the cartridges have a virus retention level of  $\geq \log 4$  required by NSF protocol P231.

#### Used methods

Testing was performed on three cartridges from March 26<sup>th</sup>, 2007 onward.

Tests were performed under test conditions as specified in NSF protocol P231.

The feed and filtrate samples taken from the challenge tests were analyzed by Vitens, Leeuwarden, The Netherlands.

Analysis of the samples was conducted within 24 hours after the testing.

Detection and enumeration of the *MS2 phages* was done according to ISO 10705-1:1995.

#### Test results

Filter	1	2	3	1	2	3
Log reduction	after 5 L suspension filtrated			mixed sample from 5 L		
Start test 0 L	3.9	5	5.3	3.8	4.5	4.7
After 500 L tap water	6.8	6.5	6.6	6.6	6.1	6.6
After 1000 L tap water	7.5	7.3	6.8	7.1	7.3	7.3
After 1500 L tap water	7.8	7	5.2	7.1	6.4	6.4
After 2000 L tap water	7.4	7.5	6.9	7.1	7.5	7.4

Note: The table above presents the results of the MS2 challenge experiments, using the data from the analytical report of Vitens. According to Protocol P321, Annex B, paragraph 3.5.3., ten percent of the sample pairs are allowed to fall below the requirement, while the geometric mean of all measured values must meet or exceed the requirements.

In this situation, two feed/filtrate samples are below log 4 reduction, however, the geometrical mean of the whole series is log 6.46 reduction, hence the data are acceptable.



## Management Summary

### *Klebsiella Terrigena* removal on Norit Filtrix Capfil Ultrafiltration Membrane - UFC M13 LE sp

#### General

Four ultrafiltration membrane cartridges, containing Norit Filtrix Capfil Ultrafiltration Membranes type UFC M13 LE sp, were tested according to NSF Protocol P231 "Microbiological Water Purifiers" at Vitens laboratories, Leeuwarden, The Netherlands.

Tests were performed in order to show that the cartridges have a bacterial retention level of  $\geq \log 6$  required by NSF protocol P231,

#### Used methods

Testing was performed on four cartridges from October 24<sup>th</sup>, 2007 onward.

Tests were performed under test conditions as specified in NSF protocol P231.

The feed and filtrate samples taken from the challenge tests were analyzed by Vitens, Leeuwarden, The Netherlands.

Analysis of the samples was conducted within 24 hours after the testing.

Detection and enumeration of the *Klebsiella Terrigena* (ATCC 33257) was done according to ISO 9308.

#### Test results

Filter	1	2	3	4	1	2	3	4
	after 5 L suspension filtrated				mixed sample from 5 L			
Start test 0 L	>6.1	>6.1	>6.1	>6.1	>6.1	>6.1	>6.1	>6.1
After 500 L tap water	>8.4	>8.3	>8.3	>8.4	>8.4	>8.3	>8.3	>8.4
After 1000 L tap water	>8.4	>8.3	>8.3	>8.2	>8.4	>8.3	>8.3	>8.2
After 1500 L tap water	>8.5	>8.5	>8.4	>8.4	>8.5	>8.5	>8.4	>8.4
After 2000 L tap water	>7.9	>7.5	>7.8	>8.1	>7.9	>7.5	>7.8	>8.1

Note: The table above presents the results of the *Klebsiella terrigena* challenge experiments, using the data from the analytical report of Vitens. The NSF Protocol P231 states a minimum reduction of log 6 on bacteria (Annex B, page 18).