

# TEST REPORT

Report No: AWRCL/PRTR/ 16493 /19-20

Date: 28.10.2019

CUSTOMER DETAILS	SAMPLE DETAILS	TEST DETAILS
<b>Name &amp; Address :</b>  <b>The Manager</b> <b>M/s Eureka Forbes</b> <b>Limited, R&amp;D Center</b> <b>Bangalore</b>	<b>Sample received: 18.09.2019</b>	<b>Method:</b> <b>As agreed</b> <b>between the</b> <b>Testing</b> <b>Laboratory and</b> <b>the customer</b>
	<b>Sample code no:- AWRCL/16493/19-20</b>	
	<b>Sample Description: Humidifier</b>	
	<b>Sample Quantity for Testing: 1 No.</b>	
	<b>Submitted by: M/s Eureka Forbes Limited, R&amp;D</b>	
	<b>Date of Analysis started : 04.10.2019</b>	
	<b>Date of Analysis Completed: 23.10.2019</b>	
	<b>Subcontract : Not Applicable</b>	
	<b>Sample condition when received : Intact</b>	

**EXECUTIVE SUMMARY:** One unit of Humidifier was tested for microbial reduction and re-growth of microorganisms like E. coli, Pseudomonas aeruginosa and naturally occurring microbes in degerming mode. It was found that the tested microorganisms were fully eliminated as there were no viable counts in the water spiked with test organism and subjected to degerming mode. Hence , for maximum safety, it is advisable that the product is run in Degerming mode for 30 min and later it can be run in Humidification mode. By doing so there will not be any chances of microbial contamination in to the environment due to the mist (moisture) delivered in the form humidification.

## TEST PRODUCT PICTURE



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We under take analytical job for water, food, biocidal resins, detergents & sanitizers and soil. We carry out performance evaluation of drinking water treatment units as per NSF/ANSI specifications. Based on performance we can arrange for certification from IAPMO – USA

**Note:**

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## TEST DATA

S.No	TEST PARAMETER	OBSERVATIONS & TEST FINDINGS	REMARKS
2	Water consumption per Hr	The capacity of water chamber is 950 ml. This was filled and the product was switched on in Humidity mode in a closed room of 12'x15' (feet) dimension. After 1 hr of operation the water remained in the chamber was 800ml. Hence 150 ml water is consumed in 1 hr duration.	The data reveals the frequency of re-filling the chamber with water. User can re-fill the chamber after every 6 hr of operation.
3	Measuring RH in a closed room of 12'X 15' (feet) room for 1 hr duration	Before switching ON the unit: 26.6 °C temperature 67% Humidity After switching ON the unit: 1 hr 26.0 °C temperature 76% Humidity No change in temperature in 1 hr 9% increase in Humidity in 1 hr	The user can adjust the humidity level in the room in which the humidifier is kept. Around 10% humidity can be raised when operated for 1 hr.
4	Spike Pseudomonas @ 10 <sup>2-3</sup> cfu/ml in the water and pour into the product. Inoculate on Citramide agar and incubate at 42°C/24 hr – 48 hr	Water was spiked and poured in to the unit. Total counts of Pseudomonas aeruginosa were enumerated as 6x 10 <sup>3</sup> cfu/ml Product was kept in degerming mode for 1 hr: Temperature of water was recorded as 75°C. The product was switched OFF and allowed to cool to room temperature and sample of water was collected and enumerated for test organism. No viable counts of Pseudomonas aeruginosa(PA)/ ml was found. % reduction: >99.983	The degerminated water will not have microorganisms when this water used to generate humidity from the product.

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S.No	TEST PARAMETER	OBSERVATIONS & TEST FINDINGS	REMARKS
4	Re-growth testing	The spiked water heated to 75 <sup>0</sup> C was left in the product itself and waited for 24 hr. Again samples were taken and processed further. <b>No viable counts of Pseudomonas aeruginosa / ml</b> <b>Hence no re-growth took place.</b>	The results suggested that no regrowth occurs and customer may use left out water for generating moist mist.
5	Spike E.Coli @ 10 <sup>2-3</sup> cfu/ml in the water and pour into the product.	Water was spiked and poured in to the unit. This water contained Total counts of E.Coli : 8 x 10 <sup>3</sup> cfu/ml. The unit was switched ON and kept in Degerming mode ON for 1 hr. Temperature of water was noticed to be 82 <sup>0</sup> C. The product was switched OFF and allowed to cool to room temperature and sample was collected. <b>No viable counts of E.Coli / ml</b> <b>% reduction: &gt;99.987</b>	The degerminated water will not have microorganisms when this water used to generate humidity from the product.
	Re-growth testing	The spiked water heated to 82 <sup>0</sup> C was left in the product itself and waited for 24 hr. Again samples were taken and processed further <b>No viable counts of E.Coli / ml</b> <b>Hence no re-growth took place.</b>	The results suggested that no regrowth occurs and customer may use left out water for generating moist mist.

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6	Naturally occurring bacteria in the water will be used for testing.	Water having naturally occurring Heterotrophic microbial counts @ $8 \times 10^3$ cfu/ml was filled in the product chamber. The product was switched ON in degerming mode for 1 hr. The temperature of water reached to 83°C. This water was allowed to cool to room temperature and analyzed for bacterial counts. <b>No viable Heterotrophic counts were detected in 1 ml.</b> <b>% reduction: 99.987</b>	The degerminated water will not have microorganisms when this water used to generate humidity from the product.
	Re-growth testing	The water heated to 83°C and cooled to room temperature was allowed to stagnate in the product for 24 hr. Sample was taken and analyzed. <b>No viable Heterotrophic counts were detected in 1 ml.</b> <b>Hence no re-growth took place.</b>	The results suggested that no regrowth occurs and customer may use left out water for generating moist mist.
7	Naturally occurring bacteria in the water used for testing.	In the Humidification mode, product was switched ON. After 30 min, water mist was collected on a sterile glass plate and the condensed water was analyzed for Total Plate count by taking 5cm x 5cm swab. Total Bacterial counts in RAW water were $6 \times 10^3$ cfu/ml No Bacterial counts in WATER MIST were found 1 ml <b>Hence no bacterial contamination happens through Humidity.</b>	The water mist generated by humidification did not have bacterial counts.

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S.No	TEST PARAMETER	OBSERVATIONS & TEST FINDINGS	REMARKS
8	In a closed chamber Humidify with Aspegillus niger spiked water and place a loaf of bread in the chamber	Initial counts of Aspergillus niger in tank were $2 \times 10^3$ cfu/ml. After Degerming for 30 min No viable counts of Aspergillus/ml were found. Hence no fungal contamination into air.	No fungal contamination into air
	Contamination through humidified mist	A Loaf of bread kept in a closed room. Product with spiked water was run in Humidity mode for 30 min. The contents were kept for 2 days. Loaf of bread did not show any Aspergillus growth.	No fungal contamination into air
9	Same test in Degerming mode	Loaf of bread in a closed room kept for 2 days did not show any Aspergillus growth in Degerming mode ( 30 min)	No fungal contamination into air



**Dr S.MURALIDHARA RAO**  
Head - Laboratory

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