

## Test Report of Sanshin media (West-East GmbH)

Job Order No.:1702/EFL/R&D/B/WL/093, EFL/R&D/B/WP/17/02/61

Date: 23/02/2017

<b>Sample Description:</b>	Sanshin media (West-East GmbH): MAS-M, MAS-S, MAS-C, MAS-Z & ODM
<b>Quantity of Sample:</b>	5 nos. of Media
<b>Sample Submitted By:</b>	Dr. M. Sathish Kumar
<b>Date of Analysis started:</b>	15.02.2017
<b>Date of Analysis completed:</b>	23.02.2017
<b>Tested By:</b>	Shruthi D.P/ Balaji. R
<b>Condition of Sample when received:</b>	Intact

### Objective:

The objectives of this preliminary test are

- I. To check the Flow rate of the Media when we pack the 50 gm of each Media in Column.
- II. To check the reduction in pH, TDS, Total Hardness, Iron, Lead and Arsenic after passing 1 L of Input water (1 L) through Media (50 gm) packed in the Column.

### Test Procedure:

#### I. Test for pH, TDS & Total Hardness reduction:

- o 50 gm of Sanshin media (MAS-M, MAS-S, MAS-C, MAS-Z & ODM) was packed in the column individually.
- o Test water (Tap water; TDS is 554 mg/l) was allowed to pass through the column contains Media (MAS-M, MAS-S, MAS-C, MAS-Z & ODM) individually by adjusting the flow rate to 200 ml/min.
- o Input & Output water after passing 1 L of Test water through the Media was collected individually and tested for the below said parameters and tabulated (Table 1).

#### II. Test for Lead, Iron & Arsenic reduction:

##### i. Lead:

- o Test water contains 100 µg/l (ppb) of Lead was prepared in RO water.
- o The prepared test water was allowed to pass through the Media (MAS-M, MAS-S, MAS-C, MAS-Z & ODM) individually by adjusting the flow rate to 200 ml/min.
- o Input & Output was after passing 1 L of Test water through the Media was collected individually and tested for Lead and tabulated (Table 2).

##### ii. Iron:

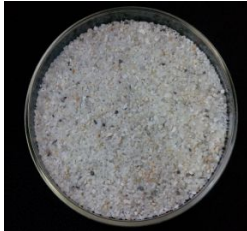
- o Test water contains 2 mg/l (ppm) of Lead was prepared in RO water.
- o The prepared test water was allowed to pass through the Media (MAS-M, MAS-S, MAS-C, MAS-Z & ODM) individually by adjusting the flow rate to 200 ml/min.
- o Input & Output was after passing 1 L of Test water through the Media was collected individually and tested for Iron and tabulated (Table 2).

##### iii. Arsenic (+5):

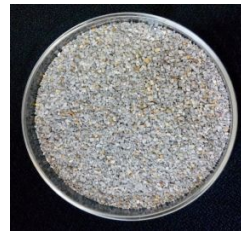
- o Test water contains 150 µg/l (ppb) of Arsenic (+5) was prepared in RO water.
- o The prepared test water was allowed to pass through the Media (MAS-M, MAS-S, MAS-C, MAS-Z & ODM) individually by adjusting the flow rate to 200 ml/min.
- o Input & Output was after passing 1 L of Test water through the Media was collected individually and tested for Arsenic (+5) and tabulated (Table 2).

**III. Test for Microbiological Efficacy:**

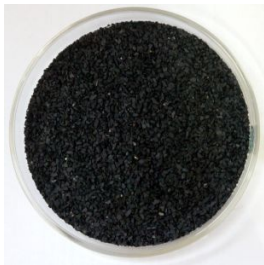
- Test water contains *E. coli* MTCC 068/ *MS<sub>2</sub> Phage* was prepared in RO water.
- The prepared test water was allowed to pass through the Media (**MAS-M, MAS-S, MAS-C, MAS-Z & ODM**) individually by adjusting the flow rate to 200 ml/min.
- Input & Output was after passing 1 L of Test water through the Media was collected individually and tested for Microbial Efficacy and tabulated (Table 3).



*Sanshin media MAS-M (Whitish)*



*Sanshin media MAS-S (Grey)*



*Sanshin media MAS-C(Black)*



*Sanshin media MAS-Z(Grey)*



*Sanshin media ODM(Light Salmon)*

**Test Method:**

S. No	Parameter	Protocol
1	Flow rate	In-house
2	pH	APHA 21st Edn. 4500- H+.
3	TDS	In-house
4	Total Hardness as CaCO <sub>3</sub>	APHA 21st Edn. 2340 C.
5	Lead <sup>§</sup>	-
6	Arsenic (+5) <sup>§</sup>	-
7	Iron <sup>§</sup>	-
8	<i>E. coli</i> MTCC 068	Membrane filtration technique (APHA)
9	<i>MS<sub>2</sub> Phage</i>	Double layer agar method (EPA 1602)

**Note:** <sup>§</sup> Water collected and gave it AWRTEL for Testing

**TEST DATA**

**Table 1: pH, TDS & Total Hardness Reduction**

S. No	Parameters	Input	MAS-M	MAS-S	MAS-C	MAS-Z	ODM
1	pH	8.1	8.3	7.7	8.3	8.3	7.6
2	Flow rate: ml/min	-	230	210	210	80 <sup>□</sup>	8 <sup>□</sup>
3	Total Dissolved Solids: mg/l	554	548	545	550	545	554
4	Total Hardness: mg/l	295	271	251	267	291	240

Note: <sup>□</sup> Since the media is like fine powder it is packed tightly inside the column and the flow rate is very less.

**Table 2: Lead, Iron & Arsenic Reduction**

S. No	Parameters	Input	MAS-M	MAS-S	MAS-C	MAS-Z	ODM
1	<sup>§</sup> Lead: µg/l	120.16	79.93	68.17	83.31	59.75	72.88
2	<sup>§</sup> Iron: mg/l	2.08	< 0.1	< 0.1	0.87	< 0.1	< 0.1
3	<sup>§</sup> Arsenic (+5): µg/l	150.33	71.07	136.85	112.49	101.88	188.09

Note: <sup>§</sup> Tested in AWRTEL

**Table 3: Microbial Efficacy**

Microbial reduction performance of Sanshin Media								
S. No	Test Organism Used	Media	Flow Rate : ml/min	Microbial Count			Log Reduction	% Reduction
				Input	Output			
					1ml	100ml		
1	<i>E. coli</i> MTCC068	MAS-M	230	2 X 10 <sup>4</sup> cfu/ml 6.3010 log	490 cfu/ml	TNTC	1.6109 log	97.5%
2		MAS-S	210		580 cfu/ml	TNTC	1.5376 log	97.1%
3		MAS-C	220		385 cfu/ml	TNTC	1.7156 log	98.0%
4		MAS-Z	80		29 cfu/ml	TNTC	2.8387 log	99.8%

5	<i>MS<sub>2</sub>Phage</i>	<i>MAS-M</i>	230	2 X 10 <sup>4</sup> pfu/ml 4.3010 log	TNTC	No log reduction	No % Reduction
6		<i>MAS-S</i>	210		TNTC	No log reduction	No % Reduction
7		<i>MAS-C</i>	220		TNTC	No log reduction	No % Reduction
8		<i>MAS-Z</i>	80		TNTC	No log reduction	No % Reduction

**Observation:**

- ◆ **Height of the media when packed in the column (50gm of each media is taken)**
  - MAS-M – 5.5cm
  - MAS-S – 10.0cm
  - MAS-C – 7.0cm
  - MAS-Z -5.5cm
  - ODM – 10cm
- ◆ Since the flow rate is 8 ml/min when the **ODM** media was packed, Microbial Efficacy was not tested.



**MAS-Z**



**ODM**

**Tested By**

**Shruthi D.P/Balaji R**  
Chemist/Microbiologist

**Reviewed & Approved By**

**Dr. Sathish Kumar**  
Technical Validation