



# SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

19, University Road, Delhi - 110007 (India)  
An ISO - 9001, 14001 & 45001 Certified Institute

Website : [www.shriraminstitute.org](http://www.shriraminstitute.org)  
E-mail id : [customercare@shriraminstitute.org](mailto:customercare@shriraminstitute.org)  
[qad@shriraminstitute.org](mailto:qad@shriraminstitute.org)

## TEST REPORT

NO : C1/0000299996

Issued To :

Client Code : (GANG01S4241)

SOVISHY INDIA PRIVATE LIMITED,

PLOT NO 11-15, D.K. ESTATE,

AMBAPURA ROAD, GIDC PHASE-3, CHHATRAL

GANDHI NAGAR

GUJARAT-382729

Kind Attn: RAHUL SAXENA

Date : 23-08-2022

Job No : 2206-1-451-1450

Booking No : RG2223/1/2845

Booking Date : 16-06-2022

Customer Ref No. : -

Customer Ref Dt. : 08-06-2022

Job No. : 2206-1-451-1450

### Sample details:

|                 |                                                                                        |
|-----------------|----------------------------------------------------------------------------------------|
| Test Item       | One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel |
| Product details | 120x60mm width and thickness 7-8mm                                                     |

### Result:

|    | Study                                         | Result                                     | Guideline used                     |
|----|-----------------------------------------------|--------------------------------------------|------------------------------------|
| 1. | Effect on Taste, Odour, Colour, and Turbidity | No Effects                                 | IS 14399 (Part-1): 1996            |
| 2. | Toxic Metals                                  | Below limit of Quantification              | IS 14399(Part-1): 1996             |
| 3. | In-vitro Cytotoxicity study                   | Non-cytotoxic                              | IS 14399 (Part-1): 1996            |
| 4. | Microbial growth testing                      | No Significant microbial activity recorded | IS: 14399 (P1 and 2) 1996, RA 2017 |

(Detailed report enclosed)

\*\*\*\*\*



AUTHORISED SIGNATORY  
EMPLOYEE CODE: (6096)

GC-01(Rev-05)

1/1

Note: The results relate only to the items tested / calibrated above.  
Scanned copies/photocopies or any other copies should be authenticated by reference to the original report

SR-C1 (Rev. 05)

Phone : 91-11-27000100, 27667267, 27667860

Fax : 91-11-27667207

See overleaf for terms & conditions.

# REPORT OF GRP PANEL TANK



## SUBMITTED TO:

Sovisy Solutions  
65, Shreeji Estate, Chhatral  
Gandhi Nagar  
Gujarat-382729

## SUBMITTED BY:

Shriram Institute for Industrial Research  
19, University Road, Delhi – 110007  
India



## CONTENTS:

| S.No. | Tests                                        | Pages |
|-------|----------------------------------------------|-------|
| 1     | Effect on Taste, Odour, Colour and Turbidity | 3-4   |
| 2     | Toxic Metal                                  | 5-6   |
| 3     | In-vitro cytotoxicity study                  | 7-18  |
| 4     | Microbial growth testing                     | 19-20 |



## **Effect on**

- **Taste**
- **Odour**
- **Colour**
- **Turbidity**







**SHRI RAM INSTITUTE FOR INDUSTRIAL RESEARCH**  
(A UNIT OF SHRI RAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION)

**CONFIDENTIAL**

**Date:** 16.06.2022

**Job No.**

: 2206-1-451-1450

**Sample details:**

|                 |                                                                                        |
|-----------------|----------------------------------------------------------------------------------------|
| Test Item       | One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel |
| Product details | 120x60mm width and thickness 7-8mm                                                     |

**Result:**

| Study                                         | Result                                                                                                                                                              | Guideline used          |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Effect on Taste, Odour, Colour, and Turbidity | No effect on taste, odour, colour, and turbidity on the extract prepared with the sample "Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel" | IS 14399 (Part-1): 1996 |

*Deepthi*  
Analyst 16/6/2022

*[Signature]*  
Group I/C 16/6/2022



# TOXIC METAL





## SHRI RAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A UNIT OF SHRI RAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION)

**CONFIDENTIAL**

Date: 03.08.2022

### Sample Particulars :

One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP), panel used in sectional water storage tanks was received from Toxicology lab.

### TEST RESULTS (On as received basis)

| S.No. | Parameter                           | Result                        | Limit of Detection | Protocol              |
|-------|-------------------------------------|-------------------------------|--------------------|-----------------------|
| 1.    | Barium (as Ba), $\mu\text{g/L}$     | Below limit of Quantification | 1                  | IS 14399(Part-1):1996 |
| 2.    | Beryllium (as Be), $\mu\text{g/L}$  | Below limit of Quantification | 1                  |                       |
| 3.    | Vanadium (as V), $\mu\text{g/L}$    | Below limit of Quantification | 1                  |                       |
| 4.    | Chromium (as Cr), $\mu\text{g/L}$   | Below limit of Quantification | 1                  |                       |
| 5.    | Manganese (as Mn), $\mu\text{g/L}$  | Below limit of Quantification | 1                  |                       |
| 6.    | Copper (as Cu), $\mu\text{g/L}$     | Below limit of Quantification | 1                  |                       |
| 7.    | Zinc (as Zn), $\mu\text{g/L}$       | Below limit of Quantification | 1                  |                       |
| 8.    | Cadmium (as Cd), $\mu\text{g/L}$    | Below limit of Quantification | 1                  |                       |
| 9.    | Silver (as Ag), $\mu\text{g/L}$     | Below limit of Quantification | 1                  |                       |
| 10.   | Molybdenum (as Mo), $\mu\text{g/L}$ | Below limit of Quantification | 1                  |                       |
| 11.   | Lead (as Pb), $\mu\text{g/L}$       | Below limit of Quantification | 1                  |                       |
| 12.   | Tin (as Sn), $\mu\text{g/L}$        | Below limit of Quantification | 1                  |                       |
| 13.   | Arsenic (as As), $\mu\text{g/L}$    | Below limit of Quantification | 1                  |                       |
| 14.   | Mercury (as Hg), $\mu\text{g/L}$    | Below limit of Quantification | 1                  |                       |
| 15.   | Selenium (as Se), $\mu\text{g/L}$   | Below limit of Quantification | 1                  |                       |

\*\*\*\*\*

D.O.R : 16.06.2022

D.O.C : 03.08.2022

J.O.No: 2206-2-451-1450

*Chaita*  
3/8/22  
Analyst



*Rishi*  
3/8/22  
Group I/C

# **IN-VITRO CYTOTOXICITY STUDY**





## TEST FACILITY



Toxicology Centre,  
Shriram Institute for Industrial Research  
19, University Road, Delhi- 110007  
India

## SPONSOR

Sovisy Solutions  
65, Shreeji Estate, Chhatral  
Gandhi Nagar  
Gujarat-382729

## CONFIDENTIAL

Report No.: C1/00002499996  
Date:23.08.2022

## STUDY TITLE

*In-vitro* Cytotoxicity Study with "One  
sample of Hot Press Moulded  
Thermosetting Glass Fibre Reinforced  
Resin (GRP) Panel"



## Table of Contents

| S.No. | Contents                                                             | Page No. |
|-------|----------------------------------------------------------------------|----------|
| 1.    | Title page                                                           | 8        |
| 2.    | Table of contents                                                    | 9        |
| 3.    | Summary                                                              | 10       |
| 4.    | Declaration Statement                                                | 11       |
| 5.    | Introduction                                                         | 12       |
| 6.    | Testing Guidelines                                                   | 12       |
| 7.    | Test Facility And Study Period                                       | 12       |
| 8.    | Archiving                                                            | 12       |
| 9.    | Experiment Design                                                    | 13-14    |
| 10.   | Experiment Procedure                                                 | 14-15    |
| 11.   | Evaluation                                                           | 15       |
| 12.   | Result                                                               | 16       |
| 13.   | Conclusion                                                           | 16       |
| 14.   | Records                                                              | 16       |
| 15.   | References                                                           | 16       |
| 16.   | Table-1Qualitative morphological grading of cytotoxicity of extracts | 17       |
| 17.   | Table 2-Observation of scores obtained                               | 18       |



## Summary

This study plan is designed for the assessment of the in-vitro cytotoxicity of the extract of "One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel" as per IS 14399 (Part-1):1996. The test item was sponsored by Sovisy Solutions.

This study specifies the qualitative assessment of cytotoxicity with 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel'. The extract of test item was prepared in duplicates using two separate test specimens. Control was used without dilution (100%) in replicates. Extracts of test item and control was incubated at  $37\pm1^{\circ}\text{C}$  in an incubator for 24 hours in a  $5\pm1\%$  carbon dioxide atmosphere.

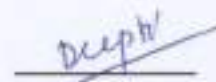
When the cells were 80% confluent in each culture plates, the growth media of the test item culture plates was replaced with extract of 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel'. Similarly, the growth media of control culture plates was replaced by extract of control. All the culture plates containing the experimental and control group was incubated at  $37\pm1^{\circ}\text{C}$  in an incubator for 24 hours in a  $5\pm1\%$  carbon dioxide atmosphere. At 24 hour, the culture plates were examined microscopically. A cytotoxicity effect was determined in accordance with table 1.

Under the condition of this study, the extract of 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' meets the requirement of the test. The study has been conducted as per IS 14399 (Part-1):1996.

The extract of test item "One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel" was found to be **Non-cytotoxic** when it was compared with control.

Approved By:

Ms. Deepti Uthaman  
(Study Director)

  
Signature

23/8/2022  
Date





## DECLARATION STATEMENT

The study entitled 'In-vitro cytotoxicity study with One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' was performed in accordance with the approved study plan and standard operating procedures of Toxicology Centre, Shriram Institute for Industrial Research.

We hereby attest the authenticity of the study and confirm that this report represents a true and accurate record of results obtained and shall not be reproduced except in full, without the written approval of the sponsor.

The study was conducted to meet the requirement of IS 14399 (Part-1):1996.

All original raw data including documentation, draft study plan, final signed study plan, study schedule, draft study report, a copy of the final study report and the representative test item will be retained in Toxicology Centre, Shriram Institute for Industrial Research. There were no known circumstances that may have affected the quality or integrity of the study. The sponsor is responsible for necessary evaluations of the test item concerning the chemical purity, identity, stability, expiry and other required data.

**Ms. Deepti Uthaman**

Study Director

Signature

Date

Quality Assurance Unit

Signature

Date

**Dr. Binu Bhat (Level II)**

Test Facility Management

Signature

Date



## **1. Introduction**

### **Purpose**

The purpose of this study was to evaluate the potential of the extract of 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' to cause cytotoxicity on vero cell lines.

## **2. Testing Guidelines**

IS 14399 (Part-1):1996

## **3. Test Facility and Study Period**

This study was conducted at the Toxicology centre, Shriram Institute for Industrial Research, Delhi, 110007

|                        |   |            |
|------------------------|---|------------|
| Study initiation date  | : | 16.06.2022 |
| Experiment start date  | : | 27.06.2022 |
| Date of exposure       | : | 28.06.2022 |
| Experiment termination | : | 29.06.2022 |
| Study completion date  | : | 23.08.2022 |

## **4. Archiving**

On completion of the study all raw data (Signed study plan, study schedule, observation sheet etc.) together with the copy of final report will be stored in the archives for five years. After the completion of this period sponsor consent will be sought to either extend the archive period or return the archived material to the sponsor or for the disposal of the material.





## 5. EXPERIMENTAL DESIGN

### 5.1 Details of Test Item

The details of the Test item "One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel" as per the Sponsor are:

|                 |                                                                                        |
|-----------------|----------------------------------------------------------------------------------------|
| Test Item       | One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel |
| Product details | 120x60mm width and thickness 7-8mm                                                     |

### 5.2 Sterility of Test Item

The test item was handled aseptically throughout the test procedure.

### 5.3 Test System Details

|                   |   |                                                    |
|-------------------|---|----------------------------------------------------|
| Cell Line         | : | Kidney cells                                       |
| Organism          | : | <i>Chlorocebus aethiops</i> (African green monkey) |
| Strain            | : | VERO                                               |
| Source            | : | N.C.C.S. PUNE                                      |
| Growth properties | : | Adherent                                           |
| Morphology        | : | Epithelial                                         |

### 5.4 Justification of the test system

The VERO cell lines were chosen as per the guideline IS 14399 (Part-1):1996 requirements for the conduction of cytotoxicity tests to find the effects of Hot press moulded thermosettings Glass fibre Reinforced resin (GRP) sectional water storage tanks on the quality of potable water.



### 5.5 Sample and Control Preparation

| Groups    | Article                                                                                | Extraction ratio                                                                                                                                                                                                                           |
|-----------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control   | HPLC Water                                                                             | Serum-supplemented DMEM was prepared with this tissue culture grade water adding all the essential salts, amino acids and antibiotics                                                                                                      |
| Test item | One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel | 12x6=72cm <sup>2</sup> test specimen was immersed in 325 ml of water for 24 hours in room temperature. Serum-supplemented DMEM was prepared with this extract containing water adding all the essential salts, amino acids and antibiotics |

### 5.6 Extraction vehicle

HPLC Water

### 5.7 Justification of the Extraction vehicle

The use of tissue culture grade water was preferred for extraction because of its ability to support cellular growth.

### 5.8 Extraction condition

The extraction was performed in sterile borosilicate glass container for 24 hours in accordance with IS 14399 (Part-1):1996.

## 6. EXPERIMENTAL PROCEDURE

### 6.1 Preparation of Cell Monolayer

The vero cell lines were maintained in DMEM medium containing 10% fetal bovine serum and 1% antibiotics (Penicillin-streptomycin). When the cells were nearly 80% confluent, media was aspirated from cell culture flask and the cells were rinsed with sterile phosphate buffer saline. 1.0 ml trypsin solution was added into the flask and incubated for 2 minutes at room temperature to detach the cells. After 2 minute 10 ml media was added immediately for neutralizing the effect of trypsin and centrifugation was done at 1500 rpm

for 10 minutes. The supernatant was discarded and the pellets were resuspended in 2.5 ml of fresh media. The cells were suspended by gently shaking the flask. The number of viable cells per ml of the suspension was determined by the use of the haemocytometer counting chamber together with the use of trypan blue. 1.0 ml cell suspension was transferred into each well of culture plates. The culture plates were kept at  $37 \pm 1^\circ \text{C}$  in an incubator containing  $5 \pm 1\%$  of carbon dioxide until a near 80% confluent cell monolayer was formed as observed by microscopic examination.

## 6.2 Method

When the cells were nearly 80% confluent, two replicates (T1 and T2) were prepared for test sample and control by replacing the culture media from the cultures with extracts of 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' and control.

All the culture plates containing the experimental groups and the control groups were kept at  $37 \pm 1^\circ \text{C}$  in an incubator for 24 hours in a  $5 \pm 1\%$  carbon dioxide atmosphere. After 24 hours, culture wells were examined microscopically and cytotoxicity was analyzed qualitatively based on Table-1.

## 6.3 Instruments used

1. Laminar Flow Hood (Instrument I.D.- SRI/TOX/CYTO/45)
2.  $\text{CO}_2$  Incubator (Instrument I.D.- SRI/TOX/CYTO/43)
3. Inverted Microscope (Instrument I.D.- SRI/TOX/CYTO/47)
4. Weighing Balance (Instrument I.D.- SRI/TOX/TSCO/01)
5. Refrigerator (Instrument I.D. - SRI/TOX/CYTO/15)
6. L-8C-BL Laboratory Centrifuge (Instrument I.D. - SRI/TOX/INST/28)





## 7. EVALUATION

The confluency of the monolayer was recorded as (+) if present and (-) if absent. Each culture well was evaluated for percent lysis and cellular characteristics using criteria described in Table - 1.

## 8. RESULT

The extract of test item "One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel" was found to be **Non-cytotoxic** when it was compared with control. The individual reactivity grades are shown in in Annexure C.

## 9. CONCLUSION

Under the condition of this study, the extract of 'One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' meets the requirement of the test. The study has been conducted as per IS 14399 (Part-1):1996.

## 10. RECORDS

On completion of the study all raw data (Signed study plan, study schedule, observation sheet etc.) together with the copy of final report shall be stored in the archives for five years. After the completion of this period sponsor's consent will be sought to either extend the archiving period or return the archived material to the sponsor for the disposal of the material.

## 11. REFERENCES

- IS 14399 (Part-1):1996
- ISO 10993 Part -5





**TABLE: 1**

**\*Qualitative morphological grading of cytotoxicity of extracts**

| <b>Grades</b> | <b>Reactivity</b> | <b>Conditions of all Cultures</b>                                                                                                                                    |
|---------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0             | None              | Discrete intracytoplasmatic granules; no cell lysis                                                                                                                  |
| 1             | Slight            | Less than or equal to 20% of the cells are round, loosely attached, and without intracytoplasmic granules; occasional lysed cells are present.                       |
| 2             | Mild              | Greater than 20% to less than or equal to 50% of the cells are round and devoid of intracytoplasmic granules; no extensive cell lysis and empty areas between cells. |
| 3             | Moderate          | Greater than 50% to less than 70% of the cell layers contain rounded cells or are lysed                                                                              |
| 4             | Severe            | Nearly complete destruction of the cell layers.                                                                                                                      |

\*As per ISO 10993 Part -5 guidelines.





**SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH**  
(A UNIT OF SHRIRAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION)  
**Toxicology Centre**

Date: 29.06.2022

Job Order No: 2206-1-451-1450

**Sample Particulars:** One sample of Hot Press Moulded Thermosetting Glass Fibre Reinforced Resin (GRP) Panel' of length 120x60mm width and thickness 7/8mm, was received.

Protocol: IS 14399 (Part-1):1996

**TEST RESULTS**

| Group   | Well | Confluent monolayer | Percent lysis | Grade | Reactivity |
|---------|------|---------------------|---------------|-------|------------|
| T1*     | A    | (+)                 | 0             | 0     | None       |
|         | B    | (+)                 | 0             | 0     | None       |
| T2      | A    | (+)                 | 0             | 0     | None       |
|         | B    | (+)                 | 0             | 0     | None       |
| Control | A    | (+)                 | 0             | 0     | None       |
|         | B    | (+)                 | 0             | 0     | None       |

(\*T1 & T2 are replicates of test item)

(+) = Present

(-) = Absent

Deepthi  
Analyst 29/6/2022



Group I/C 29/6/2022

# **MICROBIAL GROWTH TESTING**





**SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH**  
(A UNIT OF SHRIRAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION)  
Analytical Science Division Microbiology Laboratory

Date : 19.08.2022

Job Order No : 2206-1-451-1450

Sample Particulars : HOT PRESS MOULDED THERMOSETTING GLASS FIBRE REINFORCED RESIN (GRP) PANEL (120x60mm), Thickness: 7-8mm

Test : Microbial Growth Testing in HOT PRESS MOULDED THERMOSETTING GLASS FIBRE REINFORCED RESIN (GRP) PANEL (120x60mm), Thickness: 7-8mm

Protocol : IS 14399 (P 1 and 2) 1996, RA 2017

**TEST RESULTS**

| S. No. | TEST                                  | RESULT                                 |                      |                      | LIMIT                                        |
|--------|---------------------------------------|----------------------------------------|----------------------|----------------------|----------------------------------------------|
|        |                                       | 4 <sup>th</sup> week                   | 5 <sup>th</sup> week | 6 <sup>th</sup> week |                                              |
| 1.     | Total Bacterial Count at 37°C, cfu/ml | 43                                     | 55                   | 62                   | 100                                          |
| 2.     | Total Bacterial Count at 22°C, cfu/ml | 350                                    | 430                  | 540                  | 10,000                                       |
| 3.     | Coliform Count/100ml                  | Absent                                 | Absent               | Absent               | 0                                            |
| 4.     | Pseudomonas aeruginosa/100ml          | Absent                                 | Absent               | Absent               | 0                                            |
| 5.     | Fungal Count, cfu/ml                  | <1                                     | <1                   | <1                   | 100                                          |
| 6.     | Visual Microbial Observation          | No visible film on the sample observed |                      |                      | There shall be no visible film on the sample |

**Conclusion:** As all the above count are within prescribed requirement as per IS: 14399 (P1 and 2) 1996, RA 2017; the sample is not to have supported a significant microbial activity, hence sample passes the Microbial Growth Test.

*[Signature]*  
19/08/2022  
Analyst

\*\*\*\*\*



*[Signature]*  
19/08/2022  
Group I/C