



NIRMA
UNIVERSITY

INSTITUTE OF TECHNOLOGY

No. : NU/IT/MECH/TIL/2018_09/11473

National Laboratory for Testing and Development of Thermal Insulations

A Project under the National Facilities in Engineering and Technology with Industrial Collaboration (NAFETIC) Scheme of AICTE

TEST CERTIFICATE

- Name of industry* : M/s Rivashaa Eco Design Solutions Pvt. Ltd.
3rd Floor, Royale Manor, Near Rangwala Tower, Law Garden,
Ellis Bridge, Ahmedabad - 380006, Gujarat, India
- Kind Attn:* **Mr. Udeet J Banker**, Director
- Test* : Determination of overall heat transfer coefficient
- Test method* : Calculated using reference data for inside and outside heat transfer coefficient and measured data of thermal conductivity (measured using ASTM C177 or ISO 8302) and wall thickness
- Specimen details* : Thermal Insulation Flooring Block
(Density : 608.377 kg/m³ ; thickness : 40 mm)
Thermal Insulation Flooring Block is a composite material made from Cement, Fly Ash and Expanded Clay Aggregate
Moisture content: Nil (Sample preheated at 70 °C in oven for 24 hours before testing for thermal conductivity)

Test Results :

Overall Heat Transfer Coefficient (U value)	2.6532 W/m ² K
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Note: Over all heat transfer coefficient (U) is calculated using below mentioned equation.

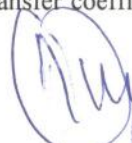
$$U = \frac{1}{\frac{1}{h_i} + \frac{\Delta x}{k} + \frac{1}{h_o}}$$

here h_i is inside heat transfer coefficient, Δx is thickness of material, k is thermal conductivity of material and h_o is outside heat transfer coefficient.

Using Guarded Hot Plate Method (ASTM C177 or ISO 8302) thermal conductivity is found as 0.1779 W/mK for 40 mm thick material. The value of inside heat transfer coefficient is taken as 9.26 W/m²K for horizontal position of surface assuming it is having non reflective surface properties. The value of outside heat transfer coefficient is taken as 22.7 for summer season when wind velocity is 3.4 m/s. The data of both heat transfer coefficient is taken from the table number 10, chapter 26, ASHRAE Hand Book Fundamentals, 2017.


Investigators


**Professor & Head,
Mechanical Engineering Department**


**Addl. Director
School of Engineering
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Date: 26/09/2018

Institute of Technology, Nirma University