



No. : NU/IT/MECH/TIL/2019_01/

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 : It is calculated using reference data for inside and outside heat transfer coefficient, measured data of thermal conductivity (measured using ASTM C177 or ISO 8302) and wall thickness

Specimen details : Expanded Clay Aggregate Cemented Mortar based Thermal Insulation
(Density : 750.37 kg/m³)
Moisture content: Nil (Sample preheated at 70 °C in oven for 24 hours before testing for thermal conductivity)

Test Results :

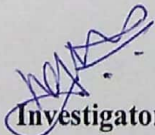
Overall Heat Transfer Coefficient (U value) 1.75 W/m²K

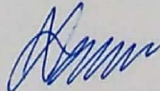
Note: Over all heat transfer coefficient (U) is calculated using below mentioned equation.

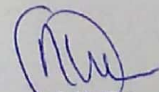

$$U = \frac{1}{\frac{1}{h_i} + \frac{\Delta x}{k} + \frac{1}{h_o}}$$

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 0.1188 W/mK for 50 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 W/m²K 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**


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School of Engineering
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