ISSN: 2320-5407
ISSN NO. 2320-5407
# International Journal of Advanced Research
**Publisher's Name: Jana Publication and Research LLP**
*www.journalijar.com*

## REVIEWER'S REPORT

Manuscript No.: IJAR-51950 Date: 29-05-2025

**Title: Experimental Study of Energy Storage and Recovery with Fluid Change: Application in a Cylindrical Enclosure Filled with a Porous Terracotta Medium at Thiki in the Thiès Region**

**Recommendation:**
Accept as it is……**YES……**
Accept after minor revision……
Accept after major revision ……
Do not accept (*Reasons below*) ……

| Rating | Excel. | Good | Fair | Poor |
|---|---|---|---|---|
| Originality | | | √ | |
| Techn. Quality | | √ | | |
| Clarity | | √ | | |
| Significance | | | √ | |

**Reviewer's Name:** Tahir Ahmad

**Reviewer's Decision about Paper:** **Recommended for Publication.**

**Comments** (*Use additional pages, if required*)
.

## *Reviewer's Comment / Report*

**Abstract:**
The abstract provides a clear and concise overview of the experimental study, focusing on energy storage and recovery using a porous terracotta medium. The location-specific detail adds contextual value to the research. The methodology is briefly but effectively presented, including the use of thermocouples and a thermal resistor for heat generation. The results underscore the thermal storage capacity of the material, aligning well with the study's objective of enhancing energy efficiency in the industrial sector. The abstract successfully sets the stage for the detailed findings that follow.

**Nomenclature:**
The inclusion of a nomenclature section is helpful for clarity, especially given the technical nature of the study. It is appropriately structured and provides definitions for all critical symbols and units, aiding in reader comprehension of the mathematical and physical analyses.

**Introduction:**
The introduction offers a solid historical and theoretical grounding in natural convection and its relevance to industrial applications. The reference to Bénard's experiments and Rayleigh's contributions situates the research in a historical framework. Furthermore, the linkage between rising energy demands,

ISSN: 2320-5407
International Journal of Advanced Research
Publisher's Name: Jana Publication and Research LLP
*www.journalijar.com*

**REVIEWER'S REPORT**

sustainability goals, and the role of thermal energy storage systems is well articulated. The section effectively transitions from global energy concerns to the specific context of the study in the Thiès region, aligning the research objectives with broader environmental and policy goals.

**Scientific and Technical Relevance:**
The study addresses a critical area of energy engineering—thermal energy storage in porous media. The use of locally sourced terracotta from Thiki contributes to the originality and sustainability of the approach. The experimental design, including the use of a thermal resistor and thermocouples connected to a data acquisition system, reflects methodological rigor. The investigation of temperature evolution and energy behavior over time aligns well with established scientific approaches in thermal system analysis.

**Experimental Insight:**
The choice of terracotta with a known porosity value (0.57) and its thermal behavior under controlled heating conditions presents a valuable contribution to the field. The cylindrical geometry and systematic placement of sensors provide comprehensive data for analysis. The findings contribute to the understanding of heat storage dynamics in porous materials and suggest promising applications for energy-efficient systems in similar climatic or regional contexts.

**Overall Evaluation:**
This paper presents a well-executed and contextually grounded experimental study with a clear application in energy efficiency and thermal storage. The integration of local materials, precise instrumentation, and a focus on sustainability enhance the study's relevance and impact. The introduction is well connected to the experimental goals, and the abstract appropriately encapsulates the essence of the research. The work constitutes a meaningful contribution to the field of thermal energy storage and sustainable engineering practices.