

**VIDYAVARDHINI'S
NATIONAL CONFERENCE ON
TECHNICAL ADVANCEMENTS FOR
SOCIAL UPLIFTMENT
VNC - 2020 TASU
4TH APRIL, 2020**



Organized by:
**Vidyavardhini's College of
Engineering & Technology**
K.T. Marg, Vasai (W) - 401202
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About us:

Vidyavardhini means a Body committed to enhancement of Knowledge. Vidyavardhini was established as a registered society in 1970 by late Padmashri H. G. alias Bhausaheb Vartak for the noble cause of education in rural areas.

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai.

Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering in six branches.

Objective of VNC 2020 TASU

Technology has always been potential tool for simplifying the way we do things. Present time demands directing the technological advancements towards addressing societal challenges such as improving health care, education environment, sanitation, agriculture, smart city, etc., VNC 2020 TASU aims to provide an opportunity to researchers, academicians, Industrialist and students to interact and share their ideologies and contributions made for social upliftment with the aid of technological advancements.

Important Dates:

- Submission of full length paper
15th Feb 2020
- Paper Acceptance Notification
22nd Feb 2020
- Submission of Final Version of Paper
29th Feb 2020
- Registration Deadline
5th March 2020
- PPT Submission
20th March 2020
- Conference
4th April 2020

Registration Fee Details:

Category of Delegates / Authors	Indian Authors & Delegates (in INR)
Full Time Students (UG)	1,500.00
Teachers/ Research Scholars/ PG students	2,500.00
Industry	3,500.00

Call for paper

We welcome submission in following area

1. Sustainable Computing
 2. High Performance Computing
 3. High Speed Networking and Information Security
 4. Software Engineering and Emerging Technologies
 5. Mathematical, Experimental, Computational and AI, IoT Techniques in Mechanical Engg.
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 7. Renewable Energy Technologies
 8. Pollution control and Waste Management
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 10. Present geotechnical practices
 11. Present practices in construction management
 12. Recent developments in Instrumentation, control and automation
 13. Embedded Systems, IoT and VLSI Design
 14. Optical and Wireless Communication for NGN
 15. Antenna and Microwave Devices
- Any other relevant topics

Publication Information

Proceedings of VNC - 2020 TASU will be published with ISBN number

1. Selected Papers will be published in International Journal of Information Technology, Published by Springer Nature, ISSN: 2511-2104 (Print Version), ISSN: 2511-2112 (Electronic Version)
2. All papers will be published in IJERT, ISSN: 2278-0181

Paper Submission:

Paper submission should be made strictly via Easy Chair the submission link for VNC 2020 "TASU":

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***Best paper award
for each track***

To Improve the Thermal Performance of Heat Pipe in Evacuated Tube Solar Collector

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Abstract— This study evaluates the performance of Evacuated tube solar collector (ETSC) to meet a real residential hot water consumption pattern. During the charge cycle of ETSC, direct solar radiation only reaches to the exposed part of the tube, which results in uneven heating due to a lower energy input in the lower area. This can be prevented by using a reflector to concentrate the solar radiations on the lower area of the evacuated tubes, thereby raising the temperature of the heat pipe and the phase change material (PCM). Therefore, a polished thin aluminium sheet is used as reflector. The reflector sheet is being used is in a shape of compound curved reflector. It is customized, easy for fabrication and has a lower cost compared to other available reflectors. A comparison is being made between the efficiencies with the different mass flow rates of the working model of ETSC with and without the reflector under the same conditions.

Keywords—evacuated tube solar collector, reflector, phase change material, mass flow rate

1. INTRODUCTION

The consumption of conventional resources of energy is very high, so these resources are continuously depleting day by day. The development of renewable energy is important for the future to balance global energy resources as it is a never-ending resource. Among renewable energy sources, solar energy has a high potential, especially for use in heat production via solar thermal collectors. Solar collectors are devices that are used to harness the energy from the sun, convert the income solar radiation into useful heat energy, being the key element in solar energy utilization systems. The solar thermal collectors absorb the incident solar energy to heat up the running water through the tubes. Evacuated tube solar collectors (ETSC) are increasingly in use worldwide because of their high thermal efficiency and high working temperature. The evacuated tubular solar collector consists of glass vacuum sealed tubes. The conductive and convective losses are reduced by the presence of vacuum medium in ETSC. Bazri et al.,2019 [4] reports an analytical investigation of the new compact design of evacuated heat pipe solar water heater integrated with latent

heat storage tank. This device has a set of evacuated heat pipe solar collector (ETHPSC) arrays directly connected to a tank, which is filled by paraffin wax as the phase change materials (PCM).

a) Phase change material (PCM)

The materials in which energy is stored in a form of latent heat are called phase change materials (PCMs), since the heat exchange takes place in the PCM through the phase change from solid to liquid and vice versa. There are different types of PCMs concerning its organic or chemical base, melting temperature ranges, and reaction sensitivity with the other materials. Some studies were performed to investigate the effect of the PCM integration with the solar system's storage tank, or as a separate storage unit, on the system's performance. Among the PCMs, paraffins have certain desirable properties for thermal energy storage. Paraffins have a suitable melting point and relatively high latent heat (Zalba et al., 2003) [14]. Furthermore, paraffins are non-toxic and harmless to the environment. Therefore, they are often used as the PCM in thermal energy storage supplied with solar energy.

b) Concentrators

Energy output temperatures can be increased by decreasing the area from which heat losses occurs. This is done by employing concentrators to reflect and concentrate the solar radiation back to the absorbers. Concentrators can be reflectors or refractors, can be cylindrical or surfaces of revolution, can be continuous or segmented. There are two types concentrators: non imaging collectors with low concentration ratio and linear imaging collectors with intermediate concentration ratio. Concentrators can have concentration ratio from low values less than unity to high values of the order of 10^5 (John duffie et al.,2013) [3]. Concentrated solar power with parabolic trough allows obtaining a higher operating temperature (Olczak et al.,2016) [2].

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