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Dept of Mechanical Engg.  
Vidyavardhini's College of  
Engineering & Technology  
New Bar Road - 401202.

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# VNC - 2020 TASU

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



**Organized by:**  
Vidyavardhini's College of  
Engineering & Technology  
K.T. Marg, Vasar (W) - 401202  
Affiliated to University of Mumbai  
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Accredited by NAAC

**In Association With:**  
BJIT - BVICAM's International Journal of Informatic  
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ISSN: 2511-2112 (Electronic Version)  
IJERT - International Journal of Engineering  
Research & Technology ISSN: 2278-0181  
**Conference Website:** www.vcet.edu.in/vnc2020

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139\_Design, development of industrial flexible hopper feeding mechanism

### 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.

### 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.
  6. Industrial Engg., ERP, MRP, SCM
  7. Renewable Energy Technologies
  8. Pollution control and Waste Management
  9. Advances in Structural engineering
  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

### Important Dates:

- Submission of full length paper  
15<sup>TH</sup> Feb 2020
- Paper Acceptance Notification  
22<sup>ND</sup> Feb 2020
- Submission of Final Version of Paper  
29<sup>TH</sup> Feb 2020
- Registration Deadline  
5<sup>TH</sup> March 2020
- PPT Submission  
20<sup>TH</sup> March 2020
- Conference  
4<sup>TH</sup> 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

### 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":

[www.easychair.org/conferences/?conf=vnc2020](http://www.easychair.org/conferences/?conf=vnc2020)

### Download paper template from:

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**\*Best paper award  
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# Design, Development of Industrial Flexible Hopper Feeding Mechanism

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## Abstract

Technological advancements are taking place day-by-day and industrial growth has been the key aspect of development of any nation. In plastic injection moulding machine, the provision is to transfer powder raw material from ground to the hopper is not provided or the powder transfer can be done manually in machine. Many small scale industries has moulding machine where they have to fill the raw material at a height where a human efforts are needed which increases the production time rate, leads to increases the wastage of raw materials. Also limited space and hence the system cost increases. In this paper, design of flexible hopper feeding mechanism is made as per small scale industries need by considering the above constraints and accordingly, theoretical design calculations are made for cone design, mini hopper, material volume. The three different types of raw materials Polyvinylchloride, Polypropylene, and Polystyrene are selected and testing their total fill time, empty time, mass flow rate, and power consumption rate with respect to height in a design of industrial flexible hopper feeding mechanism.

**Keyword:** Plastic granules, Injection moulding machine, Dies.

## 1 Introduction

Technological advancements are taking place day-by-day. Industrial growth has been the key aspect of development of any nation. With increase in development there is an equivalent growth in the demand. This increase in demand forces the small-scale industry to increase the productivity in limited time. A survey of 6 small industries was conducted to get information about the problems due to this increase in demand. During the survey it was observed that material loss during production was common in most industry. Plastic granules (raw material) are the major aspect in any injection molding industry. Wasting of plastic granules is a major loss, since approximately 2kg of plastic is been wasted per day. This accounts for Rs.250/- day of the raw material. This chunk amount of capital cost for an industry is a

major loss, since that amount can be contributed to some other aspect of an industry. All this limitation motivated to make amends to make for the loss. Hence, the idea of making an automatic feeding machine was established, to reduce wastage of plastic granules and thereby, decreasing human labor and saving capital.

Therefore, to design industrial flexible hopper feeding mechanisms the following problems will be overcome by the machine as: i) Material can be feed to the main hopper of the machine from the ground quickly. ii) The setup is movable and compact, therefore the problem of space constrain is eliminated. iii) Requirement of multiple setup for different machine is eliminated as this machine will feed material to multiple machine. iv) Different types of powder can be transferred with the help of single machine. Flexible hopper feeding machine deals with replacement of standard human effort by automation. It deals with transfer of plastic granules by means of vacuum through a hose pipe to the mini hopper thereby into the main hopper. Detailed design of each and every component is given. The machines available in the market are quite costly. Therefore, an idea of making the machine cheap as well as resemble with each and every machine, thereby reducing human efforts. An automatic feeding systems available in the market to reduce the raw material wastage and save time. These systems are generally costly and their use is limited to one machine only as well as it occupies some space. Our main aim will be to solve this issue by manufacturing a system that is flexible as well as cost effective. Earlier industries used to fill the hopper manually by means of human labor. Technologies were not advanced during that period of time. Hence, man power was the driving force in the industry. As the advancements took place industries began to grow and productivity became the major goal of the industries. Man used to feed material by their power and granulated material was feed into the hopper. This resulted into wastage of plastic pellets as some quantity of material was been wasted [1]. Auto Feeding Hopper Loaders were used for filling the machine hopper with the required raw material without human intervention. The hopper loader consists of a vacuum pump, receiver vessel and an inlet for the tube. One end of the tube is connected to the receiving vessel which generally fits on top of the hopper and the other

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**VNC - 2020 TASU**  
**27<sup>th</sup> June, 2020**

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***Certificate of Participation***

This certificate is presented to  
**Vinay Dahyabhai Patel**

of  
**Vidyavardhini's College of Engineering and Technology, Vasai**

for presenting paper titled

**Design, Development of Industrial Flexible Hopper Feeding Mechanism**

in the Vidyavardhini's National conference 2020 "Technical Advancements for  
Social upliftments" organised by Vidyavardhini's College of Engineering and  
Technology, Vasai held on 27<sup>th</sup> June, 2020



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