Faculty Achievement

		Name of Department	**Mechanical Engineering**		**Year 2021-22**	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Dr. Vinayak Hindurao Deokar	Resource Person	Resourse person in FDP on Avoiding plagiarism in research paper writing.	Mahatma Phule Krushi Vidyapith, rahuri.	10/02/2022 to 11/02/2022
2			Resource Person	Electric vehicles- the future technologies	Ashokrao Mane Polytechnic, Vadgaon.	10/02/2022 to 12/02/2022
3			Faculty Development Program	Introduction to NBA	Sanjeevan Engineering and Technology Institute, Panhala.	15/03/2022
4			Ph.D completed	Simulation modelling and experimental validation of solar photovoltaic operated water pumping and solar thermal drying system	Savitribai Phule Pne University	Sept. 2021
5	2021-22	Dr. Koli Gajanan Chandrashekhar	Faculty Develoment Program	Novel Nanostructured Mg based alloy for industrial and biomedical applications	ATAL academy, JAWAHARLAL NEHRU NEW COLLEGE OF ENGINEERING SHIMOGA	30/08/2021 to 03/09/2021
6			Book puplication	Fundamentals of Micor-electro mechanical systems(MEMS) & its applications	Scientific International Publishing House	4/8/2022
7			Journal paper Publication	Optimization and Prediction on the Mechanical Behavior of Granite Particle Reinforced Al6061 Matrix Composites Using Deer Hunting Optimization Based DNN	Spinger , Silicon	1/15/2022
8			Journal paper Publication	Design & Optimization of Hydraulic Cylinder	Mukta Shabda	February 2022
9			Patent Publication	A foldable Elecric Vehicle Chasis	NA	11/29/2021

10	2021-22	Mr. Ajit Ashok Katkar	Journal paper Publication	Design & Optimization of Hydraulic Cylinder	Mukta Shabda	February 2022
11			Patent Publication	A foldable Elecric Vehicle Chasis	NA	29/11/2021
12			FDP/STTP	Electrical & Electronic Systems for wind & solar	NITTTR, Chennai	04/10/2021 to 08/10/2021
13			FDP/STTP	MACHINE LEARNING APPLICATIONS IN MECHANICAL ENGINEERING	DR. J. J. MAGDUM COLLEGE OF ENGINEERING, JAYSINGPUR	14/02/2022 to 18/02/2022
14	2021-22	Mr. Vinod Vasantrao Vanmore	ATAL Faculty Develoment Program	Manufacturing: Hindsight To Foresight	Birla Institute of Technology and Science, Pilani(BITS Pilani).	16/07/2021 to 20/07/2021
15			ATAL Faculty Develoment Program	MEMS Technology &Microsensors	National Institute of Technology Meghalaya.	26/07/2021 to 30/07/2021
16			Faculty Development Programme	Innovations in Additive Manufacturing	Bharti Vidyapeet CoE Lavale,Pune (MS)	13/07/2021 to 17/07/2021
17			Faculty Development Programme	MACHINE LEARNING	Dr. J. J. Magdum College of Engineering, Jaysingpur, Maharashtra	24/01/2022 to 29/01/2022
18			Faculty Development Programme	Simulation Tools for Research	SIT, College of Engineering, Yadrav, Ichalkaranji.	08/02/2022 to 14/02/2022
19			Two week Interdisciplinary refresher course	Research Methodology and data Analysis	TLC Ramanujan college university of Delhi	21/03/2022 to 05/03/2022
20			Journal paper Publication	Analysis of CR4 Metal forming by deep drawing force	International Journal of Scientific Research in Engineering and Management (ISSN 2582-3930)05(9):1-9.	Sept. 2021
21			Faculty Develoment Program	Research Methodology, Research publications And patent Filing	SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING, YADRAV	20/09/2021 to 24/09/2021
22			International Conference	Numerical Study on Performance Evaluation of Multi- Tubular Sodium Alanate Hydride Reactor by Enhancing Heat and Mass Transfer Characteristics Using Nanofluids	26^{th} National & 4^{th} International ISHMT-ASTFE Heat Mass Transfer Conference (IHMTC-2021), IIT Madras, India	17/12/2021 to 20/12/2021

23	2021-22	Mr. Rahul Uday Urunkar	Reviwer for SCI Journal	Elsevier ScienceDirect	Applied Thermal Engineering	December 2021
24			Faculty Develoment Program	Simulation Tools for Research	SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING, YADRAV	08-02-2022 to14-02-2022
25			Faculty Develoment Program	Eco Friendly Engineering Concept & Trends	Vidyavardhini Institute Technology, Pal	13-02-2022 to 17-02-2022
26			International Conference	Effect of change in flow rate on performance parameters of shell and helical tube type heat exchanger	1st International Conference on Advances in Mechanical Engineering, Industrial Informatics and Management (AMEIIM-2022), NIT Raipur	25 -26/02/2022
27			Faculty Develoment Program	Future Pespective of Non- Conventional Renewable and Clean Energy Resources	Sanjeevan Engineering and Technology, Panhala	09/05/2022 to 13/05/2022
28	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Emerging Trends and Developments in Electric Vehicles	National Institute of Technology, Manipur	25/10/2021 to 29/10/2021
29			Short Term Training Program	Machine Learning Applications in Mechanical Engineering	Dr. J. J. Magdum College of Engineering, Jaysingpur	14/02/2022 to 18/02/2022
30			Faculty Develoment Program	Management of Intellectual Property Uncertainty in Designing and Manufacturing for Electrical Vehicle Systems	National Institute of Technology, Manipur	21/02/2022 to 25/02/2022
31			Faculty Develoment Program	Introduction to NBA	Sanjeevan Engineering & Technology Institute, Panhala	15/03/2022
32			Faculty Develoment Program	Future Perspective of Non-Conventional, Renewable & Clean Energy Resources	Sanjeevan Engineering & Technology Institute, Panhala	09/05/2022 to 13/05/2022
33			Faculty Develoment Program	Materials & Advanced Manufacturing	Yashoda Technical Campus, Satara	22/08/2022 to 26/08/2022
34	2021-22	Mr. Dhananjay Vasantrao Patil	Ph.D. Registration	Chemical synthesis of SnO2–Polymer nanocomposites for coating and study of anticorrosive properties of coated steel.	Shivaji university Kolhapur	Jan. 2022
35			Faculty Develoment Program	Future Prespective of Non- Conventional Renewable and Clean Energy Resources	Sanjeevan Engineering & Technology Institute, Panhala.	09/05/2022 to 13/05/2022
36			Faculty Develoment Program	A New ERA of Manufacturing : Challenges and Opportunities	D. Y. Patil College of Engineering & Technology (An Autonomous Institute), Kolhapur	25/07/2022 to 30/07/2022

37	2021-22	Mr. Praveen Shivaji Atigre	Faculty Develoment Program	Future Perspective of Non-Conventional, Renewable & Clean Energy Resources	Sanjeevan Engineering and Technology Institute, Panhala	9/05/2022 to 13/05/2022
38			AICTE-ISTE Approved Orientation / Refresher Program	Recent Advances in Materials Science and Engineering	SVERI's College of Engineering, Pandharpur	18/01/2022 to 24/01/2022
39	2021-22	Mr. Vikas Dhula Thorat	Faculty Develoment Program	Introduction to NBA	Sanjeevan Engineering & Technology Institute	15/03/2022

Faculty Achievement

		Name of Department	**Mechanical Engineering**		**Year 2021-22**	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Dr. Vinayak Hindurao Deokar	Resource Person	Resourse person in FDP on Avoiding plagiarism in research paper writing.	Mahatma Phule Krushi Vidyapith, rahuri.	10/02/2022 to 11/02/2022
2			Resource Person	Electric vehicles- the future technologies	Ashokrao Mane Polytechnic, Vadgaon.	10/02/2022 to 12/02/2022
3			Faculty Development Program	Introduction to NBA	Sanjeevan Engineering and Technology Institute, Panhala.	15/03/2022
4			Ph.D completed	Simulation modelling and experimental validation of solar photovoltaic operated water pumping and solar thermal drying system	Savitribai Phule Pne University	Sept. 2021

Shri. Balasaheb Mane Shikshan Prasarak Mandal's,

ASHOKRAO MANE POLYTECHNIC

Vathar Tarf Vadgaon, Tal.- Hatkanangle, Dist.- Kolhapur-416 112(Maharashtra)

Phone: **Principal**(0230)2407740, **Office**:(0230) 2407760 Fax: (0230)2407750

Website:amietv.org **Email**:ampolytechnicvathar@gmail.com

Department : **Automobile Engineering** Academic Year: **2021-2022**

INVITATION LETTER

Ref. No.:- AMP/AE/824/2021-22 Date: - 02/02/2022

To,

Dr. V. H. Devkar,

Department of Mechanical Engg.

SETI, Panhala.

Subject: **Invitation to be a resource person for One Week Online Faculty Development Program.**

Respected sir,

It is an immense pleasure that Department of Automobile Engineering at ASHOKRAO MANE POLYTECHNIC, Vathar tarf Vadgaon, is organizing one week online faculty development program on **"Electric Vehicles – The Future Technology"**, From 7th to 12th February 2022.As you are one of the known speakers of the topic your deliberation and participation will surely benefit the participants you are invited to deliver talk on the topic **"Future Technologies and scope of Renewable Energy" scheduled on 09th February 2022.**

Your talk will have one session, from**10.00 am to 12.00 Noon**. We believe those dates will suit you and we shall be greatly thankful if you could convey your acceptance at the earliest.

Your response will be highly appreciated in this regard.

With best Regards,

Yours Faithfully,

Programme Coordinator

Mr. S.B. Akiwate

Head, Automobile Engineering Department

Programme Convener

H.O.D.
Automobile Engineering Department
Ashokrao Mane Polytechnic
Vathar Tarf Vadgaon

Shri. Balasaheb Mane Shikshan Prasarak Mandal's,

ASHOKRAO MANE POLYTECHNIC

Vathar Tarf Vadgaon, Tal.- Hatkanangle, Dist.- Kolhapur-416 112(Maharashtra)

Phone: **Principal**(0230)2407740, **Office**:(0230) 2407760 Fax: (0230)2407750

Website:www.amietv.org **Email**:ampolytechnicvathar@gmail.com

Department : **Automobile Engineering** Academic Year: **2021-2022**

THANKS LETTER

Ref. No.:- AMP/AE/846/2021-22 Date: - 14/02/2022

To,

Dr. V. H. Devkar,

Department of Mechanical Engg.,

SETI, Panhala.

Subject: **Thanking you for delivering a session in One Week Online Faculty Development Program.**

Respected sir,

We express our thanks and gratitude for, you have delivered a session as a resource person on dated 9th Feb.2022 from 10.00am to 12.00noon to the participants, of one week online faculty development program on **"Electric Vehicles – The Future Technology"**, From 7th to 12th February 2022, Organized by Department of **Automobile Engineering , Ashokrao Mane Polytechnic, Vathar tarf Vadgaon.**

Sir, your session is greatfully appreciated and well received by the participants. We place on record our deep sense of appreciation and gratitude for having made yourself available as a resource person for the program. We look forward to your continued support in future also.

Thanking you,

Yours Faithfully,

Mr. S. B. Akiwate
Programme Coordinator

Head, Automobile Engineering Department

Programme Convener

H.O.D.
Automobile Engineering Department
Ashokrao Mane Polytechnic
Vathar Tarf Vadgaon

Gmail

vinay deokar <deokarvinay@gmail.com>

Invitation as a guest lecturer (online mode)

1 message

Manohar Dhadwad <manohar.mpkv@gmail.com>
To: deokarvinay@gmail.com

Thu, Feb 3, 2022 at 12:36 AM

Respected Sir,

Department of Agricultural Extension and Communication, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth (MPKV) Rahuri Dist. Ahmednagar, Maharashtra is organizing an online Orientation Training Course on **Avoiding Plagiarism in Academic Writing** under ICAR SC-SP component from **10th February to 11th February 2022.** Considering your vast experience in the field, we are inviting you as a resource person for delivering lectures during the series through **online mode only**. Please, find the enclosed invitation letter and brochure herewith.

Your acceptance will be highly appreciated and acknowledged for the same. The online lecture link and details will be sent at the appropriate time.

You are also requested to send following things through email in advance at least 2-3 days before your scheduled session: -

1) One page brief biodata for welcome introduction during the training session.

2) PowerPoint presentation & other study material for compiling and distributing it to the trainees.

3) Bank Details- Account Number, IFSC Code/crossed check

Thank You,

With Warm Regards.
Dr. Manohar B. Dhadwad (Ph.D. [Agri]-ICAR-IARI, New Delhi)
Assistant Professor,
Department of Agril. Extn. & Communication
Post Graduate Institute,
Mahatma Phule Agricultural University, Rahuri-413722
Dist. Ahmednagar, Maharashtra State (India)
Mobile Number-91-8411019985, 91-9422614032

3 attachments

- **Invitation letter Dr. Deokar.pdf** 438K
- **Sc-SP 22 Plagiarism Time table.pdf** 9K
- **21-22 Plagiarism Final Brochure.pdf** 200K

Holy-wood Academy's
॥ विद्यानां विद्या संजीवनी ॥

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

One Day Faculty Development Programme (FDP)

on

" INTRODUCTION TO NBA "

Certificate of Participation

This is certify that Prof. Dr. Deokar Vinayak Hindurao

form S.E.T.I Panhala

has participated in one day Faculty Development Programme on "Introduction to NBA" organized by IQAC Sanjeevan Engineering & Technology Institute, Panhala under lead college activity on 15/03/2022.

Coordinator
Dr. G. C. Koli

Principal
Dr. Mohan B. Vanarotti

Savitribai Phule Pune University

(formerly University of Pune)

We, the Chancellor, the Vice Chancellor and the Members of the Management Council and the Academic Council of the Savitribai Phule Pune University certify that

Deokar Vinayak Hindurao, Mother's Name : Sushila

having been examined and found duly qualified for the degree of

Doctor of Philosophy

(Mechanical Engineering)

The said degree has been conferred on him. In testimony where of is set the seal of the said University.

सावित्रीबाई फुले पुणे विद्यापीठ

(पूर्वीचे पुणे विद्यापीठ)

आम्ही, सावित्रीबाई फुले पुणे विद्यापीठाचे कुलपती, कुलगुरु आणि व्यवस्थापन परिषद व विद्या परिषद सदस्य, प्रमाणित करितो की,

देवकर विनायक हिंदुराव, आईचे नाव: सुशिला

विद्यावाचस्पती

(यांत्रिक अभियांत्रिकी)

पदवीस पात्र झाल्याबद्दल त्यांना ही पदवी प्रदान करण्यात येत आहे. याची साक्ष म्हणून विद्यापीठाची अधिकृत मुद्रा येथे अंकित करण्यात येत आहे.

Vice Chancellor

122nd Convocation (Summer)

S-EN23-03372

DTE Code : EN6315

॥ विद्यागं विद्या संजीवनी ॥
NAAC Accredited
AICTE ID : 1-8019451
AISHE Code : C-11165

HOLY-WOOD ACADEMY'S
SANJEEVAN
GROUP OF INSTITUTIONS, PANHALA
Sanjeevan Knowledge City, Somwar Peth-Injole, Panhala, Tal. Panhala, Dist. Kolhapur.
Pin- 416 201 (Maharashtra) Phone : 9146999500
Approved By AICTE, New Delhi Recognized by Govt. of Maharashtra, DTE, DOA
Permanent Affiliation by Dr. Babasaheb Ambedkar Technological University, Raigad
Affiliated to Shivaji University, Kolhapur., MSBTE, Mumbai.

Faculty Achievement

		Name of Department	Mechanical Engineering		Year 2021-22	
Sr. No.	year	Name of the Faculty	Event Name	Title	Journal/college/university Name	Date
1	2021-22	Dr. Koli Gajanan Chandrashekhar	Faculty Develoment Program	Novel Nanostructured Mg based alloy for industrial and biomedical	ATAL academy, JAWAHARLAL NEHRU NEW COLLEGE OF	30/08/2021 to 03/09/2021
2	2021-22	Dr. Koli Gajanan Chandrashekhar	Book puplication	Fundamentals of Micor-electro mechanical systems(MEMS) & its applications	Scientific International Publishing House	08/04/2022
3	2021-22	Dr. Koli Gajanan Chandrashekhar	Journal paper Publication	Optimization and Prediction on the Mechanical Behavior of Granite Particle Reinforced Al6061 Matrix Composites Using Deer Hunting Optimization Based DNN	Spinger , Silicon	15/01/2022
4	2022-23	Dr. Koli Gajanan Chandrashekhar	Journal paper Publication	Design & Optimization of Hydraulic Cylinder	Mukta Shabda	February 2022
5	2022-23	Dr. Koli Gajanan Chandrashekhar	Patent Publication	A foldable Elecric Vehicle Chasis	NA	29/11/2021

No: ATAL/2021/1628412943

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

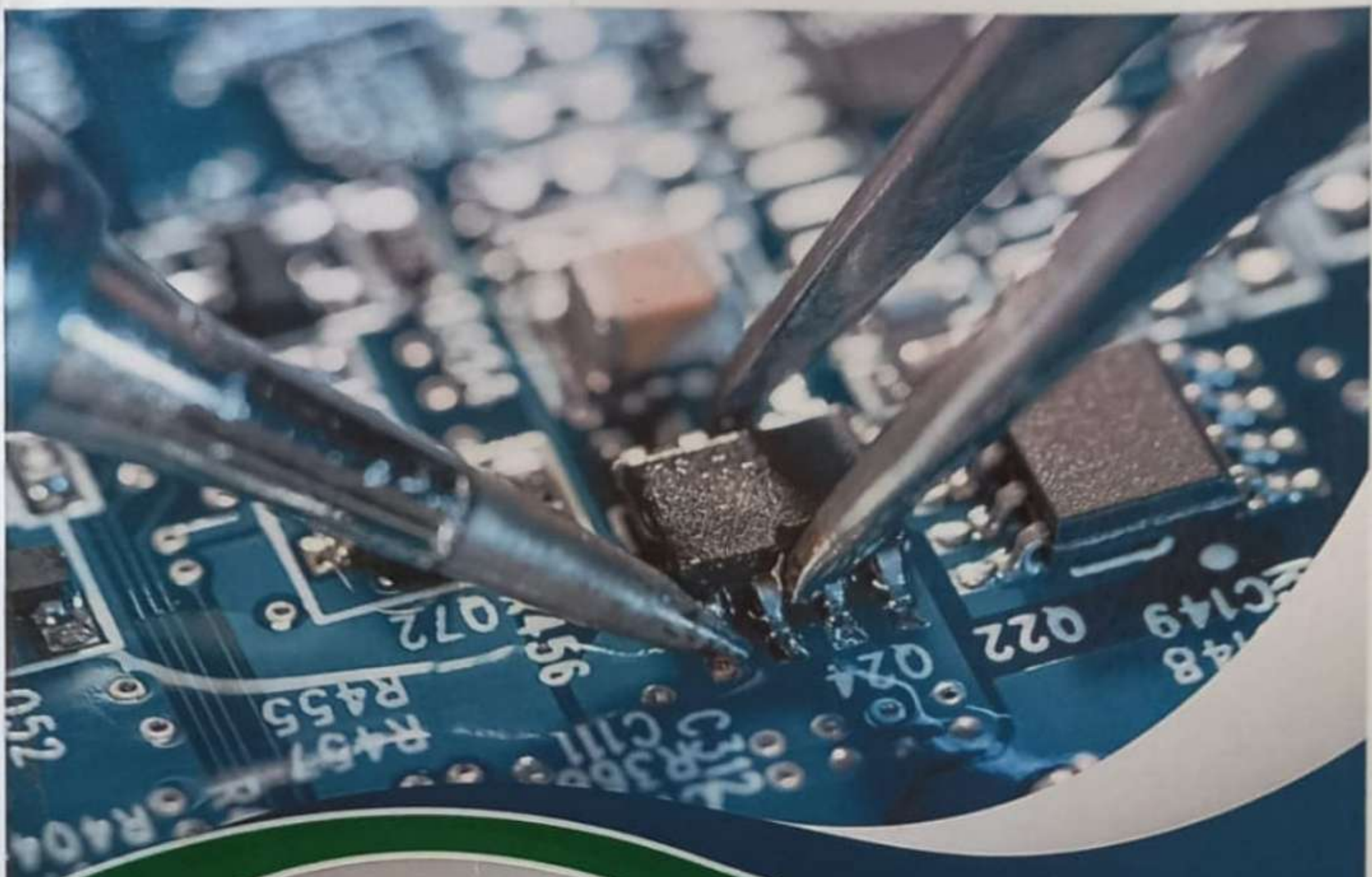
AICTE Training and Learning (ATAL) Academy

Certificate

This is certified that **Koli Gajanan Chandrashekhar**, **Assistant Professor** of **Sanjeevan Engineering & Technology Institute,Panhala** participated & completed successfully AICTE Training And Learning (ATAL) Academy **Online Elementary** FDP on "**Novel Nanostructured Mg based alloy for industrial and biomedical applications**" from **30/08/2021** to **03/09/2021** at **JAWAHARLAL NEHRU NEW COLLEGE OF ENGINEERING SHIMOGA**.

Advisor-I, ATAL Academy
Mamta Rani Agarwal

Coordinator



FUNDAMENTALS OF MICRO-ELECTRO MECHANICAL SYSTEMS (MEMS) AND ITS APPLICATIONS

Dr. GAJANAN CHANDRASHEKHAR KOLI

Dr. S.KARTHIK

Mr. MUNINATHAN K

Dr. ISMAIL KAKARAVADA

Silicon
https://doi.org/10.1007/s12633-021-01548-9

ORIGINAL PAPER

Optimization and Prediction on the Mechanical Behavior of Granite Particle Reinforced Al6061 Matrix Composites Using Deer Hunting Optimization Based DNN

Koli Gajanan Chandrashekhar[1] · D. P. Girish[2] · Katkar Ajit Ashok[1]

Received: 26 August 2021 / Accepted: 11 November 2021

Abstract
The enhancement in the mechanical characteristics of aluminum alloy is always an essential need for the development of industrial technologies. The work presented is focused on the development of Al6061 composite reinforced with granite particles using the stir casting technique at four different proportion rates such as 2%, 4%, 6%, and 8% of granite particles. The developed composites were subjected to heat treatment as per T6 temperature conditions for different aging time durations (1 to 9 h). The mechanical characteristics such as hardness, ultimate tensile strength, and yield strength analysis are performed for both the casted and heat-treated granite reinforced aluminum specimens. Deer hunting optimization (DHO) is used to optimize the better-reinforced aluminum alloy from the heat-treated and heat untreated specimens. Besides, the hybrid deep neural network (DNN) is used to predict the experimented mechanical characteristics and compared with other similar predicted neural networks. Such optimization and prediction behavior are performed in Matlab software. From the experimentation, the hardness is better for heat-treated Al6061 reinforced with 8% of granite particles, besides the yield and the ultimate tensile strength is optimal for 6% granite reinforced Al6061. The proposed DNN-DHO provides nearer values to the experimented mechanical characteristics with minimal error than the predicted outcomes of Particle swarm optimization (PSO) based DNN and DNN alone. The DNN-DHO predicted optimal mechanical characteristics are 68.45 BHN of hardness, 199.67 MPa of ultimate tensile strength, and 100.01 MPa of yield strength. From the overall findings, heat-treated Al6061 with 6% and 8% granite offers superior mechanical properties.

Keywords Aluminium metal matrix composites · Deer Hunting optimization (DHO) · Deep neural network (DNN) · Granite · And reinforcement

1 Introduction

Aluminum alloy-based metal matrix composites are more effective in several industrial applications because of their attractive mechanical, tribological, and physical properties [1]. Most of the engine components are made up of aluminum alloys such as engine cover, connecting rods, pistons, brakes, and cylinder liners, etc. due to their lightweight and good mechanical properties. However, the alloys of aluminum are known for their softness and high wear rate, which are undesirable for many applications. Keeping their disadvantages and increasingly demanding working conditions in mind, many researchers across the world are developing aluminum alloy-based metal matrix composites [2, 3]. Lightweight reinforcements like TiB_2, TiC, TiO_2, SiC, Si_3N_4, B_4C, Al_2O_3, and carbon-based nanomaterials are used to reinforce aluminum alloys to obtain high hardness and strength [4]. Most of these reinforcements are lightweight, capable of withstanding high temperature, possess high hardness, high compressive, and tensile strength values [5]. After the addition of these various reinforcements into their respective aluminum matrices, they resulted in a significant increase in hardness and strength values. Granite particles are also efficient reinforced materials for improving the mechanical activities of Al6061 alloy [6]. This is because of its toughness behavior and ability to withstand wear

✉ Koli Gajanan Chandrashekhar
gckoli@gmail.com

[1] Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala, MH, India

[2] Mechanical Engineering Department, Government Engineering College, Ramanagara, Karnataka, India

Design & Optimization of Hydraulic Cylinder

Prof. D. P. Dinde
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Dr. G. C. Koli
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Prof. A.A. Katkar
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Prof. N. B. Tharkar
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

ABSTRACT

The basic idea about hydraulic cylinder is it's a positive displacement, which converts the energy of a fluid into the kinetic energy of the moving piston. In other words we can say a hydraulic cylinder is a device which converts the energy of fluid which is in a pressure form into linear mechanical force and motion. Hydraulic cylinders get their power from pressurized oil. Hydraulic cylinders are frequently found in equipments and machinery, such as construction equipment (excavators, bull-dozers, and road graders) and material handling equipment (fork lift trucks, telescopic handlers, and lift gate). The relative product simplicity, long industrial experience with its use and the large number of manufacturing companies with strong competition reduce the design phase to some standard considerations and previous service experience is often the indirect validation of the design solution. There are two types of opportunities for our project work, first is to change dimensions of all parts of existing hydraulic cylinder & second is to change the material of cylinder. We decide to manufacturing hydraulic cylinder with optimization comparing with standard one & we optimized the hydraulic cylinder with design data as per operating pressure & load condition.

Keywords: *Hydraulic cylinder, plating, optimization*.

1. INTRODUCTION

The basic idea about hydraulic cylinder is it's a positive displacement, which converts the energy of a fluid into the kinetic energy of the moving piston. In other words we can say a hydraulic cylinder is a device which converts the energy of fluid which is in a pressure form into linear mechanical force and motion. Hydraulic cylinders get their power from pressurized oil. Hydraulic cylinders are frequently found in equipments and machinery, such as construction equipment (excavators, bull-dozers, and road graders) and material handling equipment (fork lift trucks, telescopic handlers, and lift gate.[1]

The relative product simplicity, long industrial experience with its use and the large number of manufacturing companies with strong competition reduce the design phase to some standard considerations and previous service experience is often the indirect validation of the design solution.[2]

Hydraulic Cylinders (also called linear hydraulic motors) are mechanical actuators that are used to give a linear force through a linear stroke. Hydraulic Cylinders are able to give pushing and pulling forces of many metric tons with only a simple hydraulic system .Very simple hydraulic cylinders are used in presses, here the cylinder consists of volume in a piece of iron with plunger pushed in it and sealed with a cover .By pumping hydraulic fluid in the volume, the plunger is pushed out with a force of plunger area pressure. [4]

ORIGINAL

मूल/No : 121603

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
डिजाइन के पंजीकरण का प्रमाणपत्र
CERTIFICATE OF REGISTRATION OF DESIGN

डिजाइन सं. / Design No.	:	353912-001
तारीख / Date	:	29/11/2021
पारस्परिकता तारीख / Reciprocity Date*	:	
देश / Country	:	

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **A FOLDABLE ELECTRIC VEHICLE CHASSIS** से संबंधित है, का पंजीकरण, श्रेणी **12-11** में 1.Dr. Vinayaka N 2. Dr. Barla Madhav 3.Dr. Koli Gajanan Chandrashekhar 4.Mr. Katkar Ajit Ashok के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class **12-11** in respect of the application of such design to **A FOLDABLE ELECTRIC VEHICLE CHASSIS** in the name of 1.Dr. Vinayaka N 2. Dr. Barla Madhav 3.Dr. Koli Gajanan Chandrashekhar 4.Mr. Katkar Ajit Ashok.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

निर्गमन की तारीख/Date of Issue : 23/12/2022

महानियंत्रक पेटेंट डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति देश के नाम पर की गई है। डिजाइन का सत्त्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

*The reciprocity date (if any) which has been allowed and the name of the country.Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years.This Certificate is not for use in legal proceedings or for obtaining registration abroad.

Faculty Achievement

		Name of Department	Mechanical Engineering		Year 2021-22	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Mr. Ajit Ashok Katkar	Journal paper Publication	Design & Optimization of Hydraulic Cylinder	Mukta Shabda	February 2022
2			Patent Publication	A foldable Elecric Vehicle Chasis	NA	29/11/2021
3			FDP/STTP	Electrical & Electronic Systems for wind & solar	NITTTR, Chennai	04/10/2021 to 08/10/2021
4			FDP/STTP	MACHINE LEARNING APPLICATIONS IN MECHANICAL ENGINEERING	DR. J. J. MAGDUM COLLEGE OF ENGINEERING, JAYSINGPUR	14/02/2022 to 18/02/2022

Design & Optimization of Hydraulic Cylinder

Prof. D. P. Dinde
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Dr. G. C. Koli
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Prof. A.A. Katkar
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

Prof. N. B. Tharkar
Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala

ABSTRACT

The basic idea about hydraulic cylinder is it's a positive displacement, which converts the energy of a fluid into the kinetic energy of the moving piston. In other words we can say a hydraulic cylinder is a device which converts the energy of fluid which is in a pressure form into linear mechanical force and motion. Hydraulic cylinders get their power from pressurized oil. Hydraulic cylinders are frequently found in equipments and machinery, such as construction equipment (excavators, bull-dozers, and road graders) and material handling equipment (fork lift trucks, telescopic handlers, and lift gate). The relative product simplicity, long industrial experience with its use and the large number of manufacturing companies with strong competition reduce the design phase to some standard considerations and previous service experience is often the indirect validation of the design solution. There are two types of opportunities for our project work, first is to change dimensions of all parts of existing hydraulic cylinder & second is to change the material of cylinder. We decide to manufacturing hydraulic cylinder with optimization comparing with standard one & we optimized the hydraulic cylinder with design data as per operating pressure & load condition.

Keywords: *Hydraulic cylinder, plating, optimization*.

1. INTRODUCTION

The basic idea about hydraulic cylinder is it's a positive displacement, which converts the energy of a fluid into the kinetic energy of the moving piston. In other words we can say a hydraulic cylinder is a device which converts the energy of fluid which is in a pressure form into linear mechanical force and motion. Hydraulic cylinders get their power from pressurized oil. Hydraulic cylinders are frequently found in equipments and machinery, such as construction equipment (excavators, bull-dozers, and road graders) and material handling equipment (fork lift trucks, telescopic handlers, and lift gate.[1]

The relative product simplicity, long industrial experience with its use and the large number of manufacturing companies with strong competition reduce the design phase to some standard considerations and previous service experience is often the indirect validation of the design solution.[2]

Hydraulic Cylinders (also called linear hydraulic motors) are mechanical actuators that are used to give a linear force through a linear stroke. Hydraulic Cylinders are able to give pushing and pulling forces of many metric tons with only a simple hydraulic system .Very simple hydraulic cylinders are used in presses, here the cylinder consists of volume in a piece of iron with plunger pushed in it and sealed with a cover .By pumping hydraulic fluid in the volume, the plunger is pushed out with a force of plunger area pressure. [4]

2. LITERATURE SURVEY

Marczewska , T. Bendnarek , H. Jakubczak, J. Rojek (2006) have described hydraulic cylinder design, oil ports fatigue and possible design modifications. And Fatigue analysis of hydraulic cylinder. The parts of hydraulic cylinder are analyzed. The cylinder has two oil ports. The material of the cylinder is steel St52. Material data are the same as those in the used in calculation. In this paper five critical zones determined in the experiment .The number of cycles to failure is obtained as intersection of the maximal stress with Wohler curve. Values of maximal stress in each of the zones and the number of cycles to failure, numerical solution is presented which makes it possible to adopt the different loading schemes of specific structure at hand for instance hydraulic cylinder, to specific Wohler curves characterizing fatigue resistance of the given material. The model used in this paper is based on particular application of the constitutive model [1].

Gianni Nicoletto, Tito Marinet (2011) have presented that the detail of the welded joint including important dimensions of the welded joint. The chamfered end of the cylinder is positioned axially with respect to the chamfered end of the end cap via a step shoulder. It is a standard weld design favoring easy barrel-cap relative positioning and a strong connection via multi-pass weld deposition. The threshold stress intensity factor also considered for residual strength assessments. The threshold stress intensity factor is known to depend on different parameters in addition to material strength, namely load ratio and crack length. Crack closure concepts are often invoked to explain the local mechanisms that hinder crack propagation by shielding the crack tip from full load effect. [2].

Antti Ylinen , Heikki Marjamäk, Jari Mäkinen (2014) have developed the three different types of analysis of a hydraulic cylinder force positions. In this paper researcher present three different numerical examples to show the performance of the proposed cylinder element. In first example we study the convergence of the computation in the initial state calculations. Results are presented for the both friction less as well as for frictional element. In the second example we consider lifting of a point mass initially resting at a static equilibrium state.A constant flow rate is prescribed to the plus chamber of the cylinder for a period of one second, after which the flow rate is immediately stopped and in this paper present model for a linear hydraulic actuator for multibody simulations. In dynamic analysis we end up a coupled problem where the chamber pressures are separate variables. [3].

V.I. Sanchugov, V.M. Reshetov, S.V. Turusin (2014) have present of Circuit diagram of hydro cylinder from point. He studied about the problem of development of innovative hydrodynamic technologies for cleaning of the unit internal cavities and hydro cylinders on the basis of non-steady (oscillating) liquid flow and gas-liquid cleaning with the use of low coefficient of gas compressibility is still a hot issue. Perspective way of intensification of unit cavity cleaning process is washing with pulsating single-phase flow of liquid. Existence of essential periodic components of pressure and flow of washing liquid considerably effects quality and duration of technological process. [4].

Shivasheesh kaushik (2013) have carried out the design and fabrication of a special purpose hydraulics press performing bending operation study paper in which described principle of hydraulics were explained scientifically by the seventeenth century scholars pascal and boyle. The law discovered by these two men regarding the effects of pressure and temperature on fluids and gases in confined areas form the basics of the principle of mechanical advantages; in other words, the "why and how " of hydraulics. He also described the propertied of different types of material suggest to select proper one for particular application for hydraulic cylinders [5].

Akshay Kamane (2015) carried out paper on Design of Hydraulic test setup to find the Endurance limit. In the present paper , then has designed a hydraulic setup based on a mechanism to carry out the continuous test of a verity of compression they has made use of simple piston & cylinder arrangement filled with oil . Firstly the cylinder is selected according to the amount of stress which requires to be generated over a wide range. The design a procedure for the piston becomes important since all other accrues like oil reservoir , vane pump , suction strainer seven variety of valves. So, overall it will be good option for a variety of sensors. So, overall it will be good option for a verity of application & be effective [6].

Jason E. Lindler (2003) has reported Design & Testing of hydraulic actuator. The paper describes design method logics for construction of an actuator that uses smart materials to provide hydraulic fluid power. In more general term, hydraulic or smart materials hydraulic actuation can be termed “Solid fluid hybrid actuation Energy sent to the smart material produces pressurized fluid. Then mechanical valves rectify the oscillating fluid pressure to create pressurized fluid flow. During the stroke of the solid state actuator the alternate output piston chamber is ported directly to the accumulator volume to allow the output piston to displace different volumes each chamber [7].

3. DESIGN OF OPTIMIZED HYDRAULIC CYLINDER

Every project has specific dimensions & every dimension value needs calculations as we have studied the different parts of the project. Now it's time to calculate the exact dimensions of the project.

3.1The Piston Rod

The piston rod is circular in shape & has length of 760 mm. The piston rod is made up of mild steel EN 9. The compressive stress of EN 9 mild steel is 407.7 MPa. Since the oil concentrates in the cylinder when pumped by pump. This oil creates pressure in the cylinder and as the piston is free to move in the cylinder, the whole pressure acts on the cross sections of the piston. In order to design hydraulic cylinder

3.2 Calculating Load Bearing Capacity of Piston Rod

In our case the pressure is applied by on one face of the piston while the other cross section of the piston faces the fixed wall. This means that the failure or breakage of piston rod will occur only due to excessive compressive stress developed in the piston rod. As we know that the maximum limit of compressive stress that a mild steel specimen can bear is 407.7 MPa. Since the diameter of the piston rod is 55 mm therefore we can lastly calculate the amount of maximum load which can be beard by the piston rod.

$$\sigma = \frac{F}{A}$$

Where,

D = Diameter of the piston rod,

σ = stress,

A = area of the piston rod.

But,

$$\text{Area} = \frac{\pi D^2}{4}$$

$$A = \frac{\pi \times (55)^2}{4}$$

$A = 2375.82 mm^2$

Yield stress (S_{yc}) = 407.9 N/mm^2

Assume Factor Of Safety = 3

$$\text{Stress } (\sigma) = \frac{S_{yc}}{\text{f.o.s}}$$

$$\sigma = \frac{407.9}{3}$$

Permisable Stress (σ) = 135.96 Mpa

Force (F) = stress x Area

= 135.66 x 2375.82

Force (F) = 322303.74 N

We know,

1 Kg force = 9.81 N

Force (F) = $\frac{322303.74}{9.81}$

F = 32854.611 Kg

Also we know,

1 Tone = 1000 kg.

F = 32.85 Tones

This means that 32.85 tones is that 32.85 tones is the last limit of our piston rod. But our aim is to design the hydraulic cylinder which can easily with stand with 15 to 20 tones. [11]

3.3 Calculating Inside Diameter

First to consider maximum force and operating pressure of cylinder

1) Maximum force =12 Tones

2) Operating pressure = 170 bar =17 mpa

So, Operating pressure = $\frac{\text{force}}{\text{Area}}$

Force = $\frac{IIDi^2}{4}$ x17

Force = 12 tones

We know,

1tones = 1000 kg

Force = 12000 kg.

Again, we know,

1 kg force = 9.81N

Force = 9.81 x 12000N

= 117.72 KN

= 117720 N

$Di^2 = \frac{4 \times 117720}{II \times 17}$

Di = 93.89 mm

Here, available internal standard size of diameter is 95 mm,Since the internal diameter of the barrel is 95 mm as per design. [11]

3.4 Calculating Outside Diameter

For calculating outside diameter of cylinder barrel/cylinder there are different equation on the basis of application of use

1) Lami's eq - for- one open end and one closed

2) Clavarion's eq - for cylinder with closed end made up of ductile material

In our project hydraulic cylinder is closed end and ductile material is used for cylinder. [11]

$$\frac{Do}{Di} = \frac{\sigma+(1-2u)pi}{\sigma-(1+u)pi}^{1/2}$$

Where,

σ_r = The radial stress

σ_c = The circumferential stress (Hoop Stress)

a and b = constants

r = radius

So, assume required data,

From above maximum force =12 KN

& operating pressure = 170 bar =17 mpa

Take ,

- Yield stress (S_{yc}) = 230 Mpa
- Assume Factor Of Safety = 2.5
- u =0.27

1. $\sigma b = \frac{230}{2.5}$

$= 92 \text{ N/mm}^2$

2. $\frac{Do}{Di} = \frac{\sigma+(1-2u)pi}{\sigma-(1+u)pi}^{1/2}$

$$= \frac{92+(1-0.27)17}{92-(1+0.27)17}^{1/2}$$

Di = 93.89 mm & Do = 109.8 mm

Here, standard pipe size like,

- Di (Internal diameter is available in following size)

i. 85

ii. 95

iii. 100

iv. 105

- Do (Outside diameter is available in following size)

v. 110

vi. 115

vii. 120

viii. 125

From above size we select nearest value of Di = 95 , Do = 110 mm

4.5 Thickness of the Barrel:

$$T = \frac{Di}{2}\left(\frac{\sigma+(1-2u)pi}{\sigma-(1+u)pi}\right)^{1/2} - 1 \quad \ldots.[11]$$

$$= \frac{95}{2}\left(\frac{\sigma+(1-2u)pi}{\sigma-(1+u)pi}\right)^{1/2} - 1$$

$$= 7.82 \text{ mm}$$

4. RESULTS AND DISCUSSION

We have studied about the hydraulic cylinder and its component such as cylinder barrel, Piston, Gland nut, Ram and it's material specification, By the study of load estimation formulae's, some considerations, we calculate dimensions of hydraulic cylinder, Also the estimation of weight & cost saved.

a) Dimensions' of existing cylinder:

Table (1): Dimensions of existing cylinder

Inner dia. of cylinder	100 mm
Outer dia. of cylinder	120 mm
Inner pressure of cylinder	14 Mpa at 12 Tonnes
Thickness of cylinder barrel	10 mm

b) Dimensions of the optimized cylinder:

Table (2): Dimensions of the optimized cylinder.

Inner dia. of cylinder	95 mm
Outer dia. of cylinder	110 mm
Inner pressure of cylinder	17 Mpa at 12 Tonnes
Thickness of cylinder barrel	7.5 mm

c) Weight reduction:

Table (3): Weight reduction

Parameter	Existing cylinder	Optimized cylinder
Total weight	72 kg.	65 kg.

.

5. CONCLUSION

From above information ,We conclude that the optimized cylinder is working satisfactory compare with the existing cylinder on the basis of pressure carrying capacity, force produced etc. Results show that we optimized the cylinder dimensions (thickness reduced from 10mm to 7.5mm). Also weight of the cylinder is reduced from 72 kg to 65 kg.
In future, the hydraulic cylinder will be modify by analyzing forces acting on each parts with the help of ANSYS software. The catalogue will be made as per required operating pressure and force which used for application. In future, further research work may be carried out on hydraulic cylinder make it compact with high efficiency .This hydraulic cylinder can be made more suitable for different application by adding of stop tube, cushioning, seals, and design of piston.

REFERENCES

1. Marczewska a, T. Bednarek a, A. Marczewski a,*, W. Sosnowski a, H. Jakubczak Rojek et.al "Practical fatigue analysis of hydraulic cylinders and some design Gianni recommendations" 7 July 2005.
2. Nicoletto , Tito Marin et.al "Failure of a heavy-duty hydraulic cylinder and its fatigue re-design'' Dept. of Industrial Engineering, University of Parma, 43100 Parma, Italy 2010.
3. V.I. Sanchugov*, V.M. Reshetov, S.V. Turusinet et.al "Main directions in improvement of hydraulic cylinders internal surface cleaning" Samara State Aerospace University, Moskovskoe shosse, 34, Samara, 443086, Russian Federation2014.
4. S.M.O. Tavaresa, N. Viriatoa, M. Vaza,b, P.M.S.T. de Castroa,b et al "Portugal Failure analysis of the rod of a hydraulic cylinder" XV Portuguese Conference on Fracture, PCF 2016, 10-12 February 2016, Paço de Arcos,
5. Antti Ylinen , Heikki Marjamäki , Jari Mäkinen et al "A hydraulic cylinder model for multibody simulations 2014.
6. Akshay Kamane (2015) carried out paper on "Design of Hydrulic test setup to find the Endurance limit"
7. Jason E. Lindler (2003) has reported Design & Testing of hydraulic Actuator
8. Mechanical design book .industrial press, 1993 material specification , page no.480,481

9. Design data book pressure vessel, page no 312-320.
10. V.I. Sanchugov*, V.M. Reshetov, S.V. Turusinet et.al "Main directions in improvement of hydraulic cylinders, basic circuit diagram of hydraulic drive , page no.165.
11. Volume 2 Design and manufacturing of hydraulic cylinders, Q.S. khan tanveer publications.
12. Sumo ding , hydraulic device handbook, Tata McGraw Hill Publication, 2nd Edition
13. Hydraulic cylinder design by S. K. Mondel, S. Chand Publications, 5th Edition.

ORIGINAL

मूल/No : 121603

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE

डिजाइन के पंजीकरण का प्रमाणपत्र
CERTIFICATE OF REGISTRATION OF DESIGN

डिजाइन सं. / Design No.	:	353912-001
तारीख / Date	:	29/11/2021
पारस्परिकता तारीख / Reciprocity Date*	:	
देश / Country	:	

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **A FOLDABLE ELECTRIC VEHICLE CHASSIS** से संबंधित है, का पंजीकरण, श्रेणी **12-11** में 1.Dr. Vinayaka N 2. Dr. Barla Madhav 3.Dr. Koli Gajanan Chandrashekhar 4.Mr. Katkar Ajit Ashok के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class **12-11** in respect of the application of such design to **A FOLDABLE ELECTRIC VEHICLE CHASSIS** in the name of 1.Dr. Vinayaka N 2. Dr. Barla Madhav 3.Dr. Koli Gajanan Chandrashekhar 4.Mr. Katkar Ajit Ashok.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।
In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

निर्गमन की तारीख/Date of Issue : 23/12/2022

महानियंत्रक पेटेंट-डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति देश के नाम पर की गई है। डिजाइन का सत्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

*The reciprocity date (if any) which has been allowed and the name of the country.Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years.This Certificate is not for use in legal proceedings or for obtaining registration abroad.

Certificate No. **2021/FDPOM-81/30**

National Institute of Technical Teachers Training and Research, Chennai

(Ministry of Education, Government of India)

Certificate of Participation

This is to certify that

KATKAR AJIT ASHOK

Assistant Professor in Mechanical Engineering
Sanjeevan Engineering & Technology Institute, Kolhapur, Maharashtra

Participated in the Online Training Programme on

"Electrical & Electronic Systems for wind & solar"

Conducted by this Institute from 04.10.2021 to 08.10.2021 (One Week)

CHENNAI

08.10.2021

Course Coordinator

Director

DR. J. J. MAGDUM TRUST'S

DR. J. J. MAGDUM COLLEGE OF ENGINEERING, JAYSINGPUR

Approved by AICTE, New Delhi, Recognized by Govt. of Maharashtra (D.T.E.) &
Affiliated to Shivaji University, Kolhapur

CERTIFICATE

of Participation

This is to certify that

Dr. AJIT Ashok Katkar

of

Sanjeevan Engineering and Technology

Has participated in

AICTE SPONSORED ONE WEEK ONLINE SHORT TERM TRAINING PROGRAMME (STTP)

On

"MACHINE LEARNING" APPLICATIONS IN MECHANICAL ENGINEERING"

Under AICTE Quality Improvement Scheme (AQIS)

Organized by

Department of Mechanical Engineering

and

Electronics & Telecommunication Engineering

Dr. J. J. Magdum College of Engineering, Jaysingpur, Maharashtra

from 14th to 18th February, 2022.

Prof. M. M. Kolap	Prof. V. J. Khot	Prof. S. M. Shaikh	Dr. Mrs. S. B. Patil	Dr. S. S. Admuthe
STTP Coordinator, Dept. of E&TC Engg.	STTP Coordinator, Dept. of Mechanical Engg.	Head, Dept. of Mechanical Engg.	I/C Principal STTP Coordinator	Campus Director

Faculty Achievement

		Name of Department	**Mechanical Engineering**		**Year 2021-22**	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Mr. Vinod Vasantrao Vanmore	ATAL Faculty Develoment Program	Manufacturing: Hindsight To Foresight	Birla Institute of Technology and Science, Pilani(BITS Pilani).	16/07/2021 to 20/07/2021
2			ATAL Faculty Develoment Program	MEMS Technology &Microsensors	National Institute of Technology Meghalaya.	26/07/2021 to 30/07/2021
3			Faculty Development Programme	Innovations in Additive Manufacturing	Bharti Vidyapeet CoE Lavale,Pune (MS)	13/07/2021 to 17/07/2021
4			Faculty Development Programme	MACHINE LEARNING	Dr. J. J. Magdum College of Engineering, Jaysingpur, Maharashtra	24/01/2022 to 29/01/2022
5			Faculty Development Programme	Simulation Tools for Research	SIT, College of Engineering, Yadrav, Ichalkaranji.	08/02/2022 to 14/02/2022
6			Two week Interdisciplinary refresher course	Research Methodology and data Analysis	TLC Ramanujan college university of Delhi	21/03/2022 to 05/03/2022
7			Journal paper Publication	Analysis of CR4 Metal forming by deep drawing force	International Journal of Scientific Research in Engineering and Management (ISSN 2582-3930)05(9):1-9.	Sept. 2021

No:ATAL/2021/1621835210

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training And Learning (ATAL) Academy

Certificate

This is certified that **Vinod Vasantrao Vanmore**, **Assistant Professor** of **Sanjeevan Engineering and Technology Institute (SETI, Panhala), Kolhapur** participated & completed successfully AICTE Training And Learning (ATAL) Academy **Online Elementary** FDP on "**MANUFACTURING: HINDSIGHT TO FORESIGHT**" from **2021-07-16** to **2021-07-20** at **Birla Institute of Technology and Science, Pilani (BITS Pilani)**.

Adviser-I, ATAL Academy

Coordinator

No: ATAL/2021/1624018806

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training and Learning (ATAL) Academy

Certificate

This is certified that **Vinod Vasantrao Vanmore**, **Assistant Professor** of **Sanjeevan Engineering and Technology Institute (SETI, Panhala), Kolhapur** participated & completed successfully AICTE Training And Learning (ATAL) Academy **Online Elementary** FDP on "**MEMS Technology & Microsensors**" from **26/07/2021** to **30/07/2021** at **National Institute of Technology Meghalaya**.

Advisor-I, ATAL Academy
Dr. Mamta Rani Agarwal

Coordinator

BHARATI VIDYAPEETH'S

College of Engineering

Lavale, Pune, (MS) India-412115

CERTIFICATE OF PARTICIPATION

This is certified that Vinod Vasantrao Vanmore of SANJEEVAN ENGINEERING AND TECHNOLOGY INSTITUTE, PANHALA, KOLHAPUR participated & completed successfully online Faculty Development Programme (FDP) on **"Innovations in Additive Manufacturing"** from 13/09/2021 to 17/09/2021

Organizer

Department of Mechanical Engineering, BVCoEL,
Pune (MS) India-412115

(Prof. A. B. Mane) FDP Co-Convener	*(Prof. S. N. Kadam)* FDP Co-Convener	*(Prof. S. R. Patil)* HoD Mech. BVCoEL, FDP Convener	*(Prof. Dr. R. N. Patil)* Principal BVCoEL, Pune

Dr. J. J. Magdum Trust's
Dr. J. J. Magdum College of Engineering, Jaysingpur
Approved by AICTE, New Delhi, Recognised by Govt. of Maharashtra (D.T.E.) &
Affiliated to Shivaji University, Kolhapur

CERTIFICATE

OF PARTICIPATION

This is to certify that

VINOD VASANTRAO VANMORE

Has participated in

KOLHAPUR-SANGLI SUB CHAPTER

AICTE sponsored One Week Online Short Term Training Program (STTP)

On

"MACHINE LEARNING"

Under AICTE Quality Improvement Scheme (AQIS)

Organized by

Department of Electronics and Telecommunication Engineering

Dr. J. J. Magdum College of Engineering, Jaysingpur, Maharashtra

from 24th to 29th January, 2022

Mr.M.M.Kolap	Mr.S.T.Jadhav	Dr.Mrs.S.B.Patil	Dr.S.S.Admuthe
STTP COORDINATOR	**H.O.D. E&TC**	**I/C PRINCIPAL & STTP COORDINATOR**	**CAMPUS DIRECTOR**

Certificate

This is to certify that ***Vinod Vasantrao Vanmore***

has successfully Completed ISTE approved One Week Faculty Development Programme on **"Simulation Tools for Research"** held during 08-02-2022 to 14-02-2022 organized by **Sharad Institute of Technology, College of Engineering, Yadrav, Ichalkaranji.**

Mr. A.L.Jamadar	Ms.P.D.Ghate	Dr. S. A.Khot	Mr. Anil Bagane
ISTE Secretary	**Dean, FDP**	**Principal**	**Executive Director**
SITCOE, Yadrav	**SITCOE, Yadrav**	**SITCOE, Yadrav**	**SITCOE, Yadrav**

Teaching Learning Centre, Ramanujan College
University of Delhi

under the aegis of
MINISTRY OF EDUCATION
PANDIT MADAN MOHAN MALAVIYA NATIONAL MISSION ON TEACHERS AND TEACHING
and
Indian Accounting Association, NCR Chapter.

This is to certify that

Vinod Vasantrao Vanmore

of
Sanjeevan Engineering & Technology Institute, Panhala, Kolhapur, Maharashtra.

has successfully completed
Two weeks Interdisciplinary Refresher Course on
"Research Methodology and Data Analysis"

from **21st February – 05th March, 2022**
With Grade **A+.**

Blockchain Hash: 0x966aa4bd55107d3c20f22fe1c0bda16d7d9397cb1585008c8b60638be221d91e

Prof. S.P. AGGARWAL
Principal & TLC Director
Ramanujan College
University of Delhi

Dr. J. L. Gupta
Member, University Court and
Finance Committee University of Delhi,
Secretary, IAA NCR Chapter

International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 09 | Sept - 2021 ISSN: 2582-3930

Analysis of CR4 Metal forming by deep drawing force

Mr.Avadhut S.Patil[1] ,Prof.V.V.Vanmore[2]
[1]*PG Student,Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute,Kolhapur, Panhala,India.*
[2]*Assistant Professor, Department of Mechanical Engineering, Sanjeevan Engineering & Technology Institute,Panhala,Kolhapur, India.*

Abstract*: *One of the method to form sheet metal components is deep drawing. In the deep drawing process they are used to make 3D parts from thin metal sheets. In the deep drawing process, there are some factors that affect the process called process that influence the deep drawing parameters. Lubrication, die corner radius, punch corner radius, punch force, material properties, material thickness, blank size, punch and die edge, punch speed, etc. Is the most important parameter.

Wrinkles and thinning of the material surface are the most common defects in parts. The edge of the die and the perforation radius are most affected in the deep drawing of the sheet. The friction between the punch, the cavity and the material is also affected by the formation of wrinkles. The force of the punch and the entrance of the punch thin the material. This article presents the deep drawing sheet metal forming analysis. Analysis tool Ansys is being used for the result of behavior. The main objective of this article is to find out theoretically the force required for deep drawing operations. The cup-shaped product was tested on a mechanical press. It also shows the machine capabilities required to meet production requirements. Taken from the company's life-size punch and die. Use these dimensions to generate a CAD model in CATIA. Convert the model to igs format and import it to Ansys. The force, deformation and defects required for part development can be obtained by simulation, such as breaks, wrinkles, etc. With this, it is easy to find part defects, material waste, and material deformation, die life, punch and die friction.

Keywords: ***Deep drawing,punchspeed and force,Ansys simulation, punchforce.etc*.**

1. Introduction

Deep drawing is a sheet metal forming process in which the mold is formed with the help of a punch. The metal in area of the sholder of the mold bears the stress. If an edge press is not used to control the material flow in the mold, wrinkles will occur. Material we used fordeep drawing is thick as possible as in the area where the metal loses contact with the punch. This process is used to produce metal objects. The height of these objects exceeds half of their diameter. First, the metal is by stretching around the plug also then moved into the mold. During this process, the punch deforms the blank under the clamp. The main problem in this industry is optimizing different process parameters to obtain a complete stuffed product with minimal defects. During the deep drawing process, the deep drawn parts will fail as wrinkles, cracks or breaks. The influence of the blank shape and the resistance of the support on wrinkles and fractures was studied. Increase, the fracture limit is determined currently process conditions. Method of BFHC were developing to improve formability and increase the achievable cup height. Wrinkle defect on the flange, which is caused by the bending of the blade due to excessive compressive stress. To define the limits of the deep drawing process, use folding and tearing. The objective has more variable that affect the deep drawing process, including properties of materials, design of dies, conditions of frictions, stretch ratio, BHFC, die corner radi and speeds, punch. The production of stamping parts is completed by a forming machine, and pressure is applied to the blank through a forming die. Understanding the force parameters of the deep drawing process enables technicians, molding process designers, and molding machine designers to determine the dimensions of the molding machine and mold components.

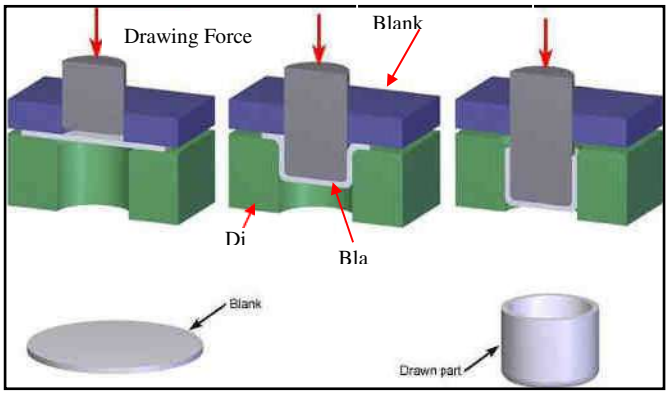


Fig1Draw Tool Nomenclature

DTE Code : EN6315

NAAC Accredited

AICTE ID : 1-8019451
AISHE Code : C-11165

HOLY-WOOD ACADEMY'S
SANJEEVAN
GROUP OF INSTITUTIONS, PANHALA
Sanjeevan Knowledge City, Somwar Peth-Injole, Panhala, Tal. Panhala, Dist. Kolhapur.
Pin- 416 201 (Maharashtra) Phone : 9146999500
Approved By AICTE, New Delhi Recognized by Govt. of Maharashtra, DTE, DOA
Permanent Affiliation by Dr. Babasaheb Ambedkar Technological University, Raigad
Affiliated to Shivaji University, Kolhapur., MSBTE, Mumbai.

Faculty Achievement

		Name of Department	**Mechanical Engineering**		**Year 2021-22**	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Mr. Rahul Uday Urunkar	Faculty Develoment Program	Research Methodology, Research publications And patent Filing	SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING, YADRAV	20/09/2021 to 24/09/2021
2			International Conference	Numerical Study on Performance Evaluation of Multi- Tubular Sodium Alanate Hydride Reactor by Enhancing Heat and Mass Transfer Characteristics Using Nanofluids	26th National & 4th International ISHMT-ASTFE Heat Mass Transfer Conference (IHMTC-2021), IIT Madras, India	17/12/2021 to 20/12/2021
3			Reviwer for SCI Journal	Elsevier ScienceDirect	Applied Thermal Engineering	December 2021
4			Faculty Develoment Program	Simulation Tools for Research	SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING, YADRAV	08-02-2022 to14-02-2022
5			Faculty Develoment Program	Eco Friendly Engineering Concept & Trends	Vidyavardhini Institute Technology, Pal	13-02-2022 to 17-02-2022
6			International Conference	Effect of change in flow rate on performance parameters of shell and helical tube type heat exchanger	1st International Conference on Advances in Mechanical Engineering, Industrial Informatics and Management (AMEIIM-2022), NIT Raipur	25 -26/02/2022
7			Faculty Develoment Program	Future Pespective of Non- Conventional Renewable and Clean Energy Resources	Sanjeevan Engineering and Technology, Panhala	09/05/2022 to 13/05/2022

Shree Shamrao Patil (Yadravkar) Educational & Charitable Trust's

SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING, YADRAV (ICHALKARANJI)

(An Autonomous Institute)

One Week Online Faculty Development Programme (FDP)

on

Research Methodology, Research Publication and Patent Filing

Approved by

IEEE BOMBAY SECTION | TECHNICAL & PROFESSIONAL ACTIVITIES COMMITTEE

IEEE Signal Processing Society PUNE CHAPTER

CERTIFICATE

This is to certify that,

Rahul Uday Urunkar

From *Sanjeevan Engineering and Technology Institute*

Attended an Online Faculty Development Programme (FDP) on "RESEARCH METHODOLOGY, RESEARCH PUBLICATIONS AND PATENT FILING" during 20th Sept – 24th Sept 2021 organized by Department of Electronics & Telecommunication Engineering, Sharad Institute of Technology College of Engineering, Yadrav (Ichalkaranji).

Mr. V.V. Khandare	Mr. M.A. Chimanna	Dr. Mr. S.T. Jadhav	Dr. Mr. S. A. Khot
FDP Coordinator	FDP Coordinator	H.O.D.- E&TC	Principal

Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference
December 17-20, 2021, IIT Madras, Chennai-600036, Tamil Nadu, India
IHMTC2021–665

Numerical Study on Performance Evaluation of Multi-Tubular Sodium Alanate Hydride Reactor by Enhancing Heat and Mass Transfer Characteristics Using Nanofluids

Rahul U. Urunkar[1], Sharad D. Patil [2]

[1,2]Department of Mechanical Engineering, RIT, Rajaramnagar, affiliated to Shivaji University, Kolhapur, Maharashtra-415414, India

ABSTRACT

Thermal effects occurred throughout the hydrogen sorption have a significant effect on the performance of metal hydride reactor for hydrogen storage. In this work, a numerical model of a multi-tubular sodium alanate hydride reactor is formed based on different governing equations using ANSYS Fluent for the process of hydrogen absorption. The model is validated by comparing its results with available results and observed a decent harmony with a deviance of less than 5%. For exchange of heat during sorption, oil is mostly used in hydride reactor. Since nanofluid has a greater heat exchange features, in this work the commonly used heat exchange fluid is replaced by the nanofluid and results are obtained. The CuO/HTF, Al_2O_3/HTF and MgO/HTF nanofluids are chosen and simulation results are presented. It is observed that CuO/HTF nanofluid with 5 vol.% concentration performed better than other selected nanofluids. The CuO/ HTF nanofluid improves the rate of heat transfer for hydride reactor up to 10% and the time for absorption of hydrogen is improved up to 14%. Thus it is beneficial to utilize the nanofluid as heat extraction fluid for the hydride reactor.

Keywords: Sodium alanate, Hydrogen, Hydride reactor, Nanofluid, Heat transfer

1. INTRODUCTION

The hydrogen is considered amongst the utmost remarkable energy carriers. Consequently, it could be enabled conversion of the present fossil fuel based energy economy in the direction of an imminent hydrogen based energy economy. On the other hand, the use of hydrogen as an energy carrier is constrained for the reason of the difficulties in transport and storage of hydrogen. At the current time, storage of hydrogen in the present form is the key problem facing by the researchers. Storage of hydrogen is reflected as a vital phase in direction of the so-called 'hydrogen economy' [1].

A number of alternative ways to store hydrogen are discovered in the past few years. It is possible to store the hydrogen in gas form at high compression pressure, liquid form at cryogenic temperature and solid form. Among these, storage of hydrogen in a solid form (i.e. metallic and complex hydrides) is regarded as the key favorable technique as compared to other methods. The hydrides are non-polluting, compacted, have great hydrogen storage ability, keep hydrogen for prolonged period, harmless and works on thermal (low grade) energy. But, its lower thermal conductivity bounds its usability [2]. High storage capacity is desirable for every hydrogen storage method. The performance of hydride reactor is significantly influenced by thermal effects appeared during the hydrogen sorption as well as the characteristics of the hydride bed for exchange of heat and mass. Additionally, slower sorption kinetics is a vital issue for the improvement of the metallic and complex hydrides [3].

2. LITERATURE REVIEW

Many investigators have studied execution of the hydride reactor by improving heat exchange features associated with hydride bed side by altering thermal characteristics, using various geometrical arrangements, using phase change material, doping various metals, adding nano materials etc.

Mellouli et al. [4] developed 3-D numerical model utilizing a heat exchange fluid pipe and noticed progress in the execution of the metal hydride reactor (MHR) under chosen operating condition and design set-up. In addition to usual cylindrical reactor, Gkanas et al. [5] did numerical analysis of rectangular cross-section MHR comprising AB_5 as well as novel AB_2 material with heat exchange tubes. The results of simulation indicated that AB_2 type hydride executed better under chosen operating set-up. Bhouri et al. [6] studied analytically as well as mathematically the possibility of double usage of a metal hydride tank for hydrogen storage and making of cold air throughout desorption. Mghari et al. [7] presented a 2-D numerical model of metal hydride occupied with $LaNi_5$ and revealed the influence of a phase change material on the rate of sorption as well as the hydrogen storage capacity. The experimental performance of large scale metal hydride tank occupied with $LaNi_{4.7}Al_{0.3}$ [8], and 3-D mathematical model of an industrial scale hydride tank comprising $LaNi_{4.7}Al_{0.3}$ [9] having many cooling tubes was analyzed and observed that rate of absorption relies on supply pressure and flow rate of heat exchange fluid.

Hydride tank occupied with $La_{0.9}Ce_{0.1}Ni_5$ was analyzed mathematically by Gupta and Sharma [10] for the process of hydrogen sorption. It was found that tank having interior Cu fins and exterior water cooling executed better. Karmakar et al. [11] executed both simulation as well as experimental analysis of MHR occupied with $LaNi_5$ alloy for heat exchange improvement and observed better outcomes with combined effect of water jacket and cooling tubes. In recent times,

DOI: 10.1615/IHMTC-2021.3950

Review for Applied Thermal Engineering - next steps

1 message

Applied Thermal Engineering <em@editorialmanager.com> Tue, Dec 14, 2021 at 10:45 AM
Reply-To: Applied Thermal Engineering <support@elsevier.com>
To: "Rahul U. Urunkar" <rahul.urunkar1991@gmail.com>

This is an automated message.
Manuscript number: ATE-D-21-05615
Numerical analysis of heat and mass transfer during hydrogen absorption in metal hydride beds with a novel peridynamic model
Yehui Cui; Zhilang Zhang; Xiangguo Zeng; Huaqin Kou

Dear Urunkar,

Thank you for agreeing to review the above referenced manuscript.

Timely reviews are of utmost importance to authors, therefore we would be grateful if you would please submit your review by Dec 28, 2021.

Please read the following instructions carefully before starting your evaluation: www.elsevier.com/reviewers/how-to-conduct-a-review

Please also note these important ethical guidelines all reviewers are asked to follow:

* You should treat the manuscript and your review as confidential. You must not share your review or information about the review process with anyone without the agreement of the editors and authors involved, even after publication. This also applies to other reviewers' "comments to author" which are shared with you on decision (and vice versa).

* If you suspect plagiarism, fraud or have other ethical concerns, please raise your suspicions with the editor, providing as much detail as possible.

* Any suggestion you make that the author include citations to your (or your associates') work must be for genuine scientific reasons and not with the intention of increasing your citation counts or enhancing the visibility of your work (or those of your associates).

To view the manuscript, please click here: https://www.editorialmanager.com/ate/l.asp?i=908744&l=14ECYLYO.

When you are ready to submit your review, you may access the submission record here https://www.editorialmanager.com/ate/l.asp?i=908745&l=JKMM3MSL. Please click on the "Submit Recommendation" link to enter your comments.

If, for any reason, the above link does not work, please log in as a reviewer at https://www.editorialmanager.com/ate/.

We look forward to receiving your review soon. Thank you in advance for your help in reviewing this manuscript.

Yours sincerely,
Gherhardt Ribatski
Subject Editor
Applied Thermal Engineering

More information and support
FAQ: How can I submit my review in Editorial Manager?
https://service.elsevier.com/app/answers/detail/a_id/28465/supporthub/publishing
You will find guidance and support on reviewing, as well as information including details of how Elsevier recognizes reviewers, on Elsevier's Reviewer Hub: https://www.elsevier.com/reviewers
FAQ: How can I reset a forgotten password?
https://service.elsevier.com/app/answers/detail/a_id/28452/supporthub/publishing/
For further assistance, please visit our customer service site: https://service.elsevier.com/app/home/supporthub/publishing/

Certificate

This is to certify that ***Rahul Uday Urunkar***

has successfully Completed ISTE approved One Week Faculty Development Programme on **"Simulation Tools for Research"** held during 08-02-2022 to 14-02-2022 organized by **Sharad Institute of Technology, College of Engineering, Yadrav, Ichalkaranji.**

Mr. A.L.Jamadar	Ms.P.D.Ghate	Dr. S. A.Khot	Mr. Anil Bagane
ISTE Secretary	**Dean, FDP**	**Principal**	**Executive Director**
SITCOE, Yadrav	**SITCOE, Yadrav**	**SITCOE, Yadrav**	**SITCOE, Yadrav**

I

Indian Society for Technical Education

Shaheed Jeet Singh Marg New Delhi – 110 016

CERTIFICATE

This is to certify that Mr/Ms. **URUNKAR RAHUL UDAY** has successfully completed ISTE approved Online/SF-STTP/FDP Programme on "**Eco Friendly Engineering: Concepts & Trends**" held during **13.02.2022** to **17.02.2022** organized by **Vidyavardhini Institute Technology, Pal (Gargoti), Kolhapur, Maharashtra**

Online/P-2021/3432

Executive Secretary

Effect of Change in Flow Rate on Performance Parameters of Shell and Helical Tube Type Heat Exchanger

Sachin K. Pisal[1, a)] Dhanpal Kamble[1, b)] Rahul U. Urunkar[2, c)]

[1]*Department of Mechanical Engineering, Vishwakarma Institute of Information Technology Pune- 411048, Maharashtra, India*
[2]*Department of Mechanical Engineering, Sanjeevan Engineering and Technology Institute, Panhala,416201 Maharashtra, India*
[a)] *Corresponding author: pisalautomobile@rediffmail.com*
[b)] *dhanpal.kamble@viit.ac.in*
[c)]*rahul.urunkar1991@gmail.com*

Abstract. In this paper performance investigation of shell and helical tube (volute pipe) type heat exchanger (interchanger) is presented. In this analysis different parameters affecting performance of heat interchanger such as fluid temperatures, overall heat flow coefficient, flow rate of fluid, heat flow rate, thermal conductivity, thermal efficiency, tube diameter, tube length, thickness of tube, effectiveness etc. are taken into considerations. The effect of change in flow rate on other performance parameters is studied for same geometrical configuration. The rate of mass flow of warm and cold fluid is varied between 1 LPM and 2 LPM and results are presented. As the mass moving rate of both fluid escalate the overall heat flow coefficient and actual heat flow coefficient value also rises. The Heat interchanger effectiveness is adversely altered by mass flow rate of both warm and cold fluid. The escalation in rate of mass flow lowers down the effectiveness approximately up to 16%. The experimental value of effectiveness of heat interchanger is less than one. All the experimental results have been validated based on value of heat interchanger effectiveness. The NTU value is also affected by rate of mass flow of warm and cold fluid. As rate of mass flow increases, the corresponding value of NTU deteriorates. The specific heat of warm fluid is greater than cold fluid.

INTRODUCTION

The shell and tube type of heat interchanger have wide scope for application such as process plant, heat recovery, air conditioning system as it offers the benefit of low pressure drop and high heat flow rate. Optimum design of heat interchanger can be obtained through changing geometry of heat interchanger. Because of compactness and high heat flow coefficient, volute pipes with circular cross sections are preferred in shell and tube type of heat interchanger [1,2]. As a result of the centrifugal force the fluid behavior in volute pipe is different than that in straight tube [3]. The centrifugal force generates secondary flow in the pipe. With volute pipe configuration heat flux and fluid flow study is of prime importance. Also with helical structure to tube heat flow rate can be enhanced.

For fluid flowing through volute pipe calculation of Dean Number is playing crucial role. The majority of research on volute pipe heat interchanger focuses on constant thermal flux and prescribed wall temperature boundary conditions [4,5]. The selection of material for tube is playing very important role while designing heat interchanger for an application [2]. The inlet temperature, mass flow rate of fluid, thermal resistance, properties and type of fluids, have great impact on heat flow rate and heat flow coefficient.

The impact of temperature, thermal conductivity, specific heat, density on performance of heat interchanger can be studied [6]. A well heat interchanger design is to attain high heat moving rate at low pumping power and less cost. The pressure drop across tube and fouling factor affects the heat flow rate through heat interchanger. The overall heat flow coefficient is depends on area of surface, heat flow rate, and temperature driving force [7,8]. The Log Mean Temperature Difference (LMTD) predicts the stringency of fouling resistance in shell and volute pipe heat interchanger. There is exponential relation between heat loss and fouling growth. Higher value of LMTD exacerbates heat loss [9,10,11].

In this paper performance investigation of shell and volute pipe type heat interchanger is presented. In this analysis different parameters affecting performance of heat interchanger such as fluid temperatures, overall heat flow coefficient, flow rate of fluid, heat flow rate, thermal conductivity, thermal efficiency, tube diameter, tube

Advances in Mechanical Engineering, Industrial Informatics and Management (AMEIIM2022)
AIP Conf. Proc. 3006, 020008-1–020008-7; https://doi.org/10.1063/5.0186184
Published by AIP Publishing. 978-0-7354-4794-3/$30.00

Indian Society for Technical Education

Shaheed Jeet Singh Marg New Delhi – 110 016

CERTIFICATE

This is to certify that Mr/Ms. **URUNKAR RAHUL UDAY** has successfully completed ISTE approved SF-STTP/FDP Programme on "**Future Perspective of Non-Conventional, Renewable and Clean Energy Resources**" held during **09.05.2022** to **13.05.2022** organized by **Sanjeevan Engineering and Technology, Kolhapur, Maharashtra**

P-2022/3854

Executive Secretary

Faculty Achievement

		Name of Department	Mechanical Engineering		Year 2021-22	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Emerging Trends and Developments in Electric Vehicles	National Institute of Technology, Manipur	25-10-2021 to 29-10-2021
2	2021-22	Mr. Deshmukh Sardar Balaso	Short Term Training Program	Machine Learning Applications in Mechanical Engineering	Dr. J. J. Magdum College of Engineering, Jaysingpur	14-02-2022 to 18-02-2022
3	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Management of Intellectual Property Uncertainty in Designing and Manufacturing for Electrical Vehicle Systems	National Institute of Technology, Manipur	21-02-2022 to 25-02-2022
4	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Introduction to NBA	Sanjeevan Engineering & Technology Institute, Panhala	15-03-2022
5	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Future Perspective of Non-Conventional, Renewable & Clean Energy Resources	Sanjeevan Engineering & Technology Institute, Panhala	09-05-2022 to 13-05-2022
6	2021-22	Mr. Deshmukh Sardar Balaso	Faculty Develoment Program	Materials & Advanced Manufacturing	Yashoda Technical Campus, Satara	22-08-2022 to 26-08-2022

No: ATAL/2021/1634106359

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi – 110 070

AICTE Training and Learning (ATAL) Academy

Certificate

This is certified that **Sardar Balaso Deshmukh**, **Assistant Professor** of **Sanjeevan Engineering & Technology Institute, Panhala** participated & completed successfully AICTE Training And Learning (ATAL) Academy **Online Elementary** FDP on "**Emerging Trends and Developments in Electric Vehicles**" from **25/10/2021** to **29/10/2021** at **NIT Manipur, Imphal, India**.

Advisor-I, ATAL Academy
Mamta Rani Agarwal

Coordinator

DR. J. J. MAGDUM TRUST'S

DR. J. J. MAGDUM COLLEGE OF ENGINEERING, JAYSINGPUR

Approved by AICTE, New Delhi, Recognized by Govt. of Maharashtra (D.T.E.) &
Affiliated to Shivaji University, Kolhapur

CERTIFICATE

of Participation

This is to certify that

Mr. Sardar Balaso Deshmukh

of

Sanjeevan Engineering & Technology Institute, Panhala

Has participated in

AICTE SPONSORED ONE WEEK ONLINE SHORT TERM TRAINING PROGRAMME (STTP)

On

"MACHINE LEARNING" APPLICATIONS IN MECHANICAL ENGINEERING"

Under AICTE Quality Improvement Scheme (AQIS)

Organized by

Department of Mechanical Engineering

and

Electronics & Telecommunication Engineering

Dr. J. J. Magdum College of Engineering, Jaysingpur, Maharashtra

from 14th to 18th February, 2022.

Prof. M. M. Kolap STTP Coordinator, Dept. of E&TC Engg.	**Prof. V. J. Khot** STTP Coordinator, Dept. of Mechanical Engg.	**Prof. S. M. Shaikh** Head, Dept. of Mechanical Engg.	**Dr. Mrs. S. B. Patil** I/C Principal STTP Coordinator	**Dr. S. S. Admuthe** Campus Director

NATIONAL INSTITUTE OF TECHNOLOGY MANIPUR

CERTIFICATE

OF APPRECIATION

Ref: NITMN/AICTE 21-22/FDP/2022-P017

This is certified that **MR. SARDAR BALASO DESHMUKH** of **Sanjeevan Engineering and Technology Institute, Panhala** has participated in AICTE sponsored one week Faculty Development Program (FDP) on "**Management of Intellectual Property Uncertainty in Designing and Manufacturing for Electric Vehicle Systems**" organized by Electrical Engineering Department, National Institute of Technology Manipur, held during 21st–25th Feb. 2022.

Dr. Kundan Kumar	Dr. Shuma Adhikari	Prof. (Dr.) Rajesh Kumar Bhushan
Coordinator, EED, NIT Manipur	**HoD, EED, NIT Manipur**	**Dean Academics, NIT Manipur**

Holy-wood Academy's
॥ विद्यानां विद्या संजीवनी ॥

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

One Day Faculty Development Programme (FDP)

on

" INTRODUCTION TO NBA "

Certificate of Participation

This is certify that Prof. Deshmukh Sardar Balaso

form S.E.T.I Panhala

has participated in one day Faculty Development Programme on "Introduction to NBA" organized by IQAC Sanjeevan Engineering & Technology Institute, Panhala under lead college activity on 15/03/2022.

Coordinator
Dr. G. C. Koli

Principal
Dr. Mohan B. Vanarotti

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

CERTIFICATE

This is to certify that *Prof. Sardar B. Deshmukh* of *Sanjeevan Engineering and Technology Institute, Panhala* has participated in ISTE approved One Week Online Faculty Development Programme (FDP) on "Future Perspective of Non-Conventional, Renewable & Clean Energy Resources" held during 9th to 13th May 2022 organized by Department of Mechanical Engineering of Sanjeevan Engineering and Technology Institute, Panhala.

Dr. A.A. Katkar	Prof. S.B. Deshmukh	Dr. Mohan B. Vanrotti
Coordinator	Coordinator & HOD	Principal

Indian Society for Technical Education

Shaheed Jeet Singh Marg New Delhi – 110 016

CERTIFICATE

This is to certify that Mr/Ms. **DESHMUKH SARDAR BALASO** has successfully completed ISTE approved SF-STTP/FDP Programme on "**Future Perspective of Non-Conventional, Renewable and Clean Energy Resources**" held during **09.05.2022** to **13.05.2022** organized by **Sanjeevan Engineering and Technology, Kolhapur, Maharashtra**

P-2022/3838

Executive Secretary

YASHODA SHIKSHAN PRASARK MANDAL'S

YASHODA TECHNICAL CAMPUS

SATARA-415011, MAHARASHTRA, INDIA

CERTIFICATE

OF PARTICIPATION

This is to certify that

Prof. Sardar Balaso Deshmukh

has successfully completed the One Week Faculty Development Program on "**Materials & Advanced Manufacturing**" held during **22/08/2022 to 26/08/2022,** organized by **Department of Mechanical Engineering, Faculty of Engineering, Yashoda Technical Campus, Satara, Maharashtra in association with ISTE, New Delhi.**

Mr. Anand S. Shivade
Co-ordinator

Dr. Tarang R. Shinde
Convener

Dr. Duradundi S. Badkar
Principal

DTE Code : EN6315

NAAC Accredited

AICTE ID : 1-8019451
AISHE Code : C-11165

HOLY-WOOD ACADEMY'S
SANJEEVAN
GROUP OF INSTITUTIONS, PANHALA
Sanjeevan Knowledge City, Somwar Peth-Injole, Panhala, Tal. Panhala, Dist. Kolhapur.
Pin- 416 201 (Maharashtra) Phone : 9146999500
❍ Approved By AICTE, New Delhi ❍ Recognized by Govt. of Maharashtra, DTE, DOA
❍ Permanent Affiliation by Dr. Babasaheb Ambedkar Technological University, Raigad
❍ Affiliated to Shivaji University, Kolhapur., MSBTE, Mumbai.

Faculty Achievement						
		Name of Department	Mechanical Engineering		Year 2021-22	
Sr. No.	year	Name of the Faculty	Event Name	Title	Journal/college/university Name	Date
1	2021-22	Mr. Dhananjay Vasantrao Patil	Ph.D. Registration	Chemical synthesis of SnO2–Polymer nanocomposites for coating and study of anticorrosive properties of coated steel.	Shivaji university Kolhapur	Jan. 2022
2			Faculty Develoment Program	Future Prespective of Non- Conventional Renewable and Clean Energy Resources	Sanjeevan Engineering & Technology Institute, Panhala.	09/05/2022 to 13/05/2022

SHIVAJI UNIVERSITY, KOLHAPUR - 416 004, MAHARASHTRA
PHONE : EPABX – (0231) 2609000,PGBUTR -2609296 / 9139
website: www.unishivaji.ac.in, Email - pgbutr@unishivaji.ac.in, pgbutr2@unishivaji.ac.in
शिवाजी विद्यापीठ, कोल्हापूर - ४१६ ००४,
महाराष्ट्र
दूरध्वनी - ईपीएबीएक्स - (०२३१) २६०९०००, पीजीबीयुटीआर - २६०९२९६ / ९१३९
website: www.unishivaji.ac.in, Email - pgbutr@unishivaji.ac.in, pgbutr2@unishivaji.ac.in

Estd. 1962
"A++" Accredited by NAAC(2021)
With CGPA 3.52

Ref. No. S.U./P.G.B.U.T.R./Ph.D./R.R.C./1011/3299 Date : 02 AUG 2023

To,
Shri. Patil Dhananjay Vasantrao,
A/p - Vadanage, Tal. Karveer,
Dist. Kolhapur.

Sub : Confirmation of admission to Ph.D. Degree Course.

Sir / Madam,

With reference to your application I am directed to inform you that you are hereby admitted to Ph.D. degree programme in **Mechanical Engineering** in the faculty of **Science and Technology**, w.e.f. **01-Jan-2022** under the guidance of **Dr. U. S. Bhapkar** on the following conditions.

i. You will have to pay the yearly fees as mentioned below from the date of admission.
ii. If you fail to pay the fees in month of **January** of every year the fine will be imposed as per University rules.

Sr. No.	Particulars	Regular Students & DRF	Form JRF/UGC Teacher Fellow/Full Time Teacher at Jr./Sr. College, Laboratory, Private & Govt. Organization Employed Persons
i)	Tuition Fee	Rs. 7405	Rs. 7405
ii)	Library Fee	Rs. 976	Rs. 1948
iii)	Internet fees	Rs. 1948	Rs. 1948
iv]	Medical Charges	Rs. 100	Rs. 100
v]	Student Development Kalyan Nidhi	Rs. 100	Rs. 100
vi]	Accident /Medical Help Fund Scheme	Rs. 20	Rs. 20
vii]	Youth Festival	Rs. 50	Rs. 50
	Total	Rs. 10599	Rs. 11571

Successful completion of M. Phil course / M. Phil theory course work / pre Ph.D. theory course work shall be pre-requisite for the submission of thesis as per R.R.D. 14. If you fail to pay the above fees within one month from the receipt of this letter, your admission will be automatically cancelled.

Yours faithfully,

Dy. Registrar

Copy to:
1. The Director, Department of Technology, Shivaji University, Kolhapur.
2. (Research Guide) – Dr. Udaysinh Shivaji Bhapkar,
   KIT's College of Engineering, Kolhapur.
3. The Director, Barr. Balasaheb Khardekar Knowledge Resource Centre, Shivaji University, Kolhapur.

The Approved title of your proposed research work is,

CHEMICAL SYNTHESIS OF SnO_2 - POLYMER NANOCOMPOSITES FOR COATING AND STUDY OF ANTICORROSIVE PROPERTIES OF COATED STEEL

[Note : The student should verify the title of thesis and communicate this office (within 15 days) for technical / typographical errors, if any]

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

CERTIFICATE

This is to certify that *Prof. Dhananjay Vasantrao Patil* of *Sanjeevan Engineering and Technology Institute, Panhala* has participated in ISTE approved One Week Online Faculty Development Programme (FDP) on "Future Perspective of Non-Conventional, Renewable & Clean Energy Resources" held during 9th to 13th May 2022 organized by Department of Mechanical Engineering of Sanjeevan Engineering and Technology Institute, Panhala.

Dr. A. A. Katkar	Prof. S. B. Deshmukh	Dr. Mohan B. Vanrotti
Coordinator	Coordinator & HOD	Principal

Faculty Achievement

		Name of Department	**Mechanical Engineering**		**Year 2021-22**	
Sr. No.	**year**	**Name of the Faculty**	**Event Name**	**Title**	**Journal/college/university Name**	**Date**
1	2021-22	Mr. Praveen Shivaji Atigre	Faculty Develoment Program	A New ERA of Manufacturing : Challenges and Opportunities	D. Y. Patil College of Engineering & Technology (An Autonomous Institute), Kolhapur	25/07/2022 to 30/07/2022
2			Faculty Develoment Program	Future Perspective of Non-Conventional, Renewable & Clean Energy Resources	Sanjeevan Engineering and Technology Institute, Panhala	9/05/2022 to 13/05/2022
3			AICTE-ISTE Approved Orientation / Refresher Program	Recent Advances in Materials Science and Engineering	SVERI's College of Engineering, Pandharpur	18/01/2022 to 24/01/2022

D Y PATIL
COLLEGE of
ENGINEERING & TECHNOLOGY
(AN AUTONOMOUS INSTITUTE)
KASABA BAWADA, KOLHAPUR

Certificate
OF PARTICIPATION

This Certificate is hereby awarded to

Prof. Praveen Shivaji Atigre

SETI Panhala

for proactively participating in the one week Online Faculty Development Program on
"A NEW ERA OF MANUFACTURING-CHALLENGES AND OPPORTUNITIES"
organized by **Department of Mechanical Engineering, D. Y. Patil College of Engineering and Technology (An Autonomous Institute)**, Kasaba Bawada, Kolhapur in association with Indian Society for Technical Education (ISTE) New Delhi, from Monday, 25th July 2022 to Saturday, 30th July 2022.

Dr. Sunil J. Raykar	Dr. Santosh D. Chede	Dr. Anilkumar Gupta
HOD Mechanical	Principal	Executive Director D.Y.P. Group Kolhapur

SANJEEVAN ENGINEERING & TECHNOLOGY INSTITUTE
॥ विद्यानां विद्या संजीवनी ॥

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

Holy-wood Academy's
॥ विद्यानां विद्या संजीवनी ॥

CERTIFICATE

This is to certify that *Prof. Praveen S. Atigre* of *Sanjeevan Engineering and Technology Institute Panhala* has participated in ISTE approved One Week Online Faculty Development Programme (FDP) on **"Future Perspective of Non-Conventional, Renewable & Clean Energy Resources"** held during 9th to 13th May 2022 organized by Department of Mechanical Engineering of Sanjeevan Engineering and Technology Institute, Panhala.

Dr. A.A. Katkar Coordinator	Prof. S.B. Deshmukh Coordinator & HOD	Dr. Mohan B. Vanrotti Principal

Certificate

This is to certify that ***MR. PRAVEEN SHIVAJI ATIGRE*** has successfully completed the AICTE-ISTE approved Orientation/Refresher Programme on ***"Recent Advances in Materials Science and Engineering"*** held during **18.01.2022** to **24.01.2022** organized by ***SVERI's College of Engineering, Pandharpur, Maharashtra.***

Director (FDC)
AICTE, ND

Executive Secretary
ISTE, ND

Program Coordinator
SVERI's CE, Pandharpur

Principal
SVERI's CE, Pandharpur

Faculty Achievement						
		Name of Department	Mechanical Engineering		Year 2021-22	
Sr. No.	year	Name of the Faculty	Event Name	Title	Journal/college/university Name	Date
1	2021-22	Mr. Vikas Dhula Thorat	Faculty Develoment Program	Introduction to NBA	Sanjeevan Engineering & Technology Institute	15/03/2022

Holy-wood Academy's
॥ विद्यानां विद्या संजीवनी ॥

SANJEEVAN

ENGINEERING & TECHNOLOGY INSTITUTE, PANHALA

(Degree, PG, & Diploma)

Approved by AICTE, New Delhi, Recognized by DTE, Affiliated to DBATU, Lonere & MSBTE

One Day Faculty Development Programme (FDP)

on

" INTRODUCTION TO NBA "

Certificate of Participation

This is certify that Prof. Thorat Vikas Dhula

form S.E.T.I Panhala

has participated in one day Faculty Development Programme on "Introduction to NBA" organized by IQAC Sanjeevan Engineering & Technology Institute, Panhala under lead college activity on 15/03/2022.

Coordinator
Dr. G. C. Koli

Principal
Dr. Mohan B. Vanarotti