SUMMER 2017

Department of Mechanical Engineering

NEWSLETTER

Shanti Education Society's

A G PATIL POLYTECHNIC INSTITUTE

In this issue

Find us....

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Welcome

I feel excited to introduce you to this new edition of newsletter of department .
The newsletter provides a medium for disseminating department's vision; mission and educational objectives along with news and information to our faculty in college and academic community of our discipline.
The objective of department is to prepare students for successful career in Industry, Research and Academics to meet the needs of growing technology. To fulfill this we provide opportunities for students to work as member of a team on multidisciplinary projects. Mechanical engineering department also provides opportunities in co curricular and extra curricular field. We promote student awareness for life-long learning.
I would like to conclude with the words of Thomas Friedman who has rightly opined ***"Opportunities are immense. It's just a question of identifying opportunities and making the best of them"***.

Best wishes and happy reading!

Mr. N.D. Mundhe.
Head of the Department

Vision

To provide technical knowledge to students in areas of Mechanical Engineering to meet the needs of industry, business and society.

Mission

1.To provide skilled professionals to the global industry
2.To educate and enhance students to be Entrepreneurs and Team leaders in the field of Engineering
3.To motivate students for research and innovation; aimed at well being of society

Program Educational Objectives (PEOs)

1.To develop ability to apply engineering knowledge, techniques and resources to solve Mechanical Engineering problems
2.To present themselves as responsible professionals with ethics
3.To inculcate ability to design and develop mechanical product and processes to meet the desired needs; considering public health, safety, cultural, social and environmental aspects

Academic Performance:

Third Year -

- Mr. Kulkarni Samarth Madhukar stood 1st with 87.82 %
- Mr. Jirage Rushikesh Mallinath Stood 2nd with 86.65 %
- Ms. Kulkarni Siddhi Sanjay Stood 3rd with 85.76 %

Second Year -

- Mr. Shaikh Amir Bandenavaj Stood 1st with 86.10 %
- Mr. Shaikh Aman Bandenavaj Stood 2nd with 85.53 %
- Ms. Sakhare Vandana Sunil Stood 3rd with 85.35 %

First Year -

- Mr. Palankar Guruprasad Ulhas Stood 1st with 93.5 %
- Mr. Khasnis Omkar Suresh Stood 2nd with 92.70 %
- Mr. Sayyad Mohasin Salim Stood 3rd with 89.06 %









CO Curricular and Extra Curricular Activities:

1. Mr. Amit Kshirsagar stood 1st in Engineering Talent Search (ETS) Exam Conducted by Sankalp Education Trust, Satara.
2. Ms. Vandana Sakhare got 27th rank in Engineering Talent Search (ETS) Exam.
3. Mr. Pavan Ande Got 1st Prize in CAD Expert Event of Accretion.
4. Ms. Vandana Sakhare stood 2nd in National Level Technical Paper Presentation called Annum also she got 2nd prize in CAD Expert competition of Accretion.
5. Ms. Radhika Adhatrao and Ms. Smita Birajdar got 2nd prize in Rangoli Competition held in College.
6. Mr. Adil Chiniwar and Ms.Vandana Sakhare got 1st prize in Debate in Diploma Youth Festival (DYF)
7. Mr. Shakir Shaikh got 3rd prize in Lathe Mania– a machining competition of Accretion.
8. Mr. Sohel Sayyed is the winner of 400 meter relay competition in Diploma Youth Festival (DYF)
9. Mr.Mangesh Dalve got 2nd prize in wrestling competition.

Got 2nd prize in CAD Expert

Accretion-CAD Expert

Accretion-Lathe Mania

Got 1st prize in CAD Expert

Annum-Paper Presentation

Annum-Paper Presentation

Inauguration-College Sports

Jagruti-Mehndi Competition

Master Talks:

1. "Recent trends in manufacturing process" by Mr. Sudhir Pulsule for third year students
2. "Modern Techniques in Production Management" by Mr. V.V. Mahajan for third year students
3. "Basics of Electrical Engineering" by Mr. S.A.Salgar for second year students
4. "Leadership" by Mr. Ganesh Shinde for third year students under students mentoring program.
5. "Job opportunity in Railway" by Mr.Basargi S.A. for third year students.

Guest Lecture-Inauguration

Leadership by Mr. Ganesh Shinde

Industrial Visits:

Third Year students visited the following industries.

1. Super Bright Electro-Plates, Hotgi Road MIDC, Solapur
2. Shree Industries, Hotgi Road MIDC, Solapur
3. Leena Engineering Works, Hotgi Road MIDC, Solapur
4. Chavan Motors, Akkalkot Road, Solapur

Along with these visits department has arranged an industrial tour to Naresh Engineering Group, Waluj MIDC, Aurangabad.

Visits for second year students were carried out to following industries

1. Shri Siddheshwar sugar factory, Hotgi Road, Solapur
2. Santkrupa Engineering, MIDC chincholi, Solapur
3. Varad Technocast, MIDC chincholi, Solapur
4. Om Pipe Industries, Hotgi Road MIDC, Solapur

Naresh Engineering Group-Aurangabad

Faculty Achievements:

Workshops/ Training Attended

1. Mr. Mundhe N.D. attended five days short term training program at Government Polytechnic, Nashik.
2. Mr. Mohite S. K. and Mr. Motgi R.S. attended three days industrial training at M/s Bosch Ltd., Pune.
3. Mr. Pinjar J.P. attended five days short term training program at NBN Sinhgad College, Solapur
4. Mr. Narote B.E. and Mr. Mulla J.G. attended three days industrial training at M/s. Nashik Enginnering Cluster, Nashik.
5. Mr. Mohite S. K. and Mr. Kulkarni G.M. attended one day industrial training at GNVS Institute of Management, Mumbai.
6. Mr. Jadhav C.P. and Mr. Ambigar V.G. attended three days industrial training at M/s Festo India Pvt. Ltd., Pune.

Other Achievements

1. Mr. Pinjar J. P. got Third prize in national level conference held at NBN Sinhgad, Solapur.
2. Mr. Mohite S. K., Mr. Motgi R.S., Mr. Dhalait J. G., Mr. Dawankar S. R., Mr. Ambigar V. G. and Mr. Patil N. P., published paper in Two National Level Conference held at AGPIT,Solapur.
3. Mr. Dhalait J. G. worked as an "Exam Controller" for MSBTE Winter Exam at VVP,Solapur.
4. Mr. Rathod S. B. worked as internal judge for technical paper presentation in Annum.
5. Mr. Kulkarni G. M. worked as a Coordinator for Entrepreneur awareness camp
6. Mr. Dhalait J. G. working as a Co-ordinator for Almanac-college magazine.

Mr. Mundhe N. D. working as a Stationery In-charge for college.

7. Mr. Narote B. E. worked as a convenor and Mr.Rathod S.B. worked as Chief co-ordinator for Accretion.
8. Mr. Pinjar J. P, Mr. Mulla J. G.,Mr. Ambigar V. G, Mr.Jadhav C. P. worked as a Coordinator for Accretion.
9. Mrs. Jhaveri D. A. Completed her M.E. (Manufacturing Process.)

Automatic Wall Spray Painting

Spray painting is the process where a liquid coating substance, usually paint, is changed into a mist or aerosol, in order to apply a coating onto an object or surface.

Wall painting is a repetitive, exhausting and hazardous process which makes it an ideal case for automation. Painting had been automated in automotive industry but not yet for the construction industry. There is a strong need for a machine that can move to paint interior walls of residential buildings. In this report, the wall painting machine is described consisting of a body that moves parallel to the walls and is fitted on base to give the lateral feed motion to cover the painting area. The objective is to satisfy the criteria of simplicity, low weight, low cost and fast painting time.

There are several different ways spray painting can be performed. Most spray painting is performed with the use of a spray gun. Spray guns use either a turbine or compressor to supply tiny particles of air. A volume of air flow with low pressure is used to form to reduce the coating to fine spray. Air Assisted Airless spray guns use air and fluid pressure to achieve atomization of the coating. Airless spray guns are operated by being connected to a high pressure pump which forces the paint out of the nozzle.

- **Spray Paint Unit Parts**

Highly-effective professional paint sprayer that saves you from the trouble of trays, that creates a lot of mess around along with a not-so-perfect coverage as well. Besides, you can save a lot of paint and money when you opt for electric spray painting machine.

1. Lead Screw:

A lead screw also known as a power screw or translation screw, is a screw used as a linkage in a machine to translate turning motion into linear motion.

2. Nut and Bolt:

Nuts are almost always used in conjunction with a mating bolt to fasten two or more parts together. The two partners are kept together by a combination of their threads' friction (with slight elastic deformation), a slight stretching of the bolt, and compression of the parts to be held together.

2. DC Motor:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical power into mechanical power.

- **Speed Control of DC Motor**

There are total two motions of the spray paint unit-

1. Horizontal movement
2. Vertical movement

Horizontal motion is controlled manually while the vertical motion of spray of gun is controlled using motor. Spray unit can be started or stopped using switch. By using above parameters spray painting on the wall is done.

Manufacturing processes such as bending, drilling, electric welding, turning etc. are used to manufacture project. Benefits such as fast application, one coat coverage, Smooth finish, free of brush/roller marks.

The conclusion of this project is that, this spray painting machine for wall is very useful for interior walls of buildings. This machine consists of automatic vertical movement which reduces efforts of human. The height of the machine can be increased so that it can adjust with the application. There are also some hazards associated with the spray painting, therefore with some safety precautions you can avoid that.

Therefore with proper use of this machine we can save our valuable time as well as the cost of painting.

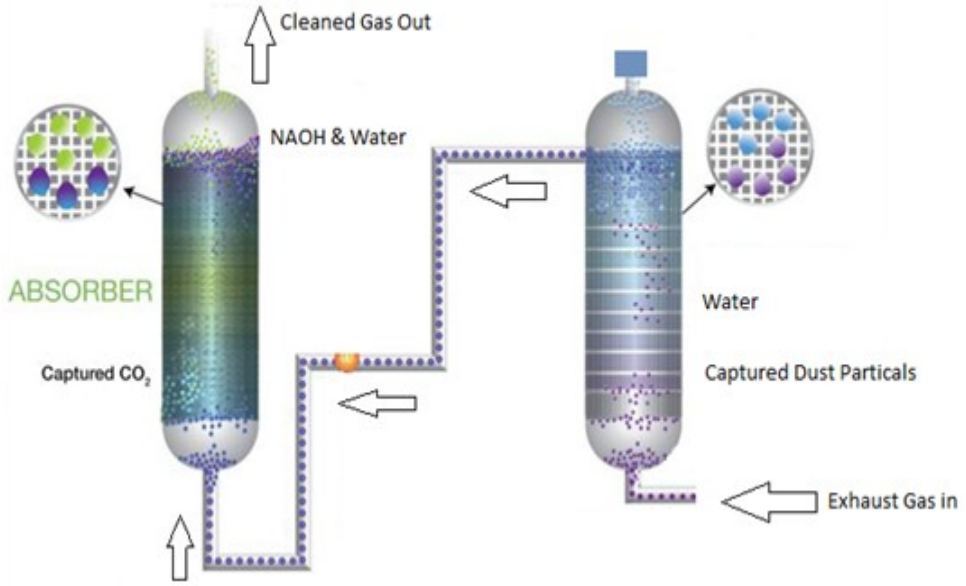
Aman Shaikh Amir Shaikh

Sahil Solapure Prashant Patil

Mr. Motgi R.S.

Exothermic Reaction ➡

Minimization of Pollutants of Exhaust Gas from High Traffic Area & Industrial Sector by Using Exothermic Reaction.

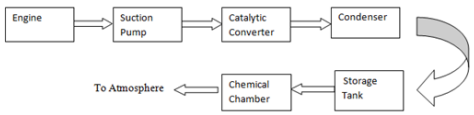


It is today undoubted that humans have to reduce their impact on the environment. IC engines, being the major power source in the transportation sector, plays an important role in the man-made emissions. So it is important to reduce the emissions that result from transportation, which are believed to be the main cause of global warming.

An important task in the development of internal combustion engines is the reduction of emissions. The main combustion products that are contained in engine exhaust gases are water vapor (H2O), carbon dioxide (CO2), nitrogen oxides (NOX), particulate matter (PM), hydrocarbons (HC) and carbon monoxide (CO). All of these, except for the water vapor, are considered environmentally harmful. CO2 is believed to be the main cause of global warming and therefore, emission has to be reduced. The two most problematic emissions in diesel engines are nitrogen oxides and soot particles. HC and CO emissions are quite low and can be removed fairly easy from the exhaust with the help of an oxidation catalyst.

The negative effect of automotive emissions does not affect only the person driving but also the others around them. Various greenhouse gases such as carbon dioxide, methane, nitrous oxide and other gases like chlorofluorocarbon (CFCs) are emitted. Which affect the global warming.

Working Principle:



- An I.C. engine is the first element of the model. Pollutants are released in the chamber by using suction pump.
- A catalytic converter inline converts harmful gases in harmless gases partially and supplies it to the condenser.
- In a condenser the temperature of polluted air is brought to the normal temperature and required pressure is maintained and outlet of condenser is further connected to chemical chamber where chemicals are stored.

The exhaust gas is allowed to pass into the inlet of the Catalytic Converter. Pressure gets reduced and velocity of the gas increases because of the conical section. The flowing exhaust gas is free to move in all directions inside the Catalytic Converter. The flowing gas passes over the trap which is fixed at the inner of the Catalytic Converter. Gas entering the perforated sheet mesh holes gets exposure to the zeolite pellets. The exposure of the exhaust gas is maximum by increased in size of the pellets. Zeolite pellets are highly porous and consistent matrix of zeolite that provides the adsorption of impurities.

Methodology:

- First we start the Exhaust Gas Analyzer and wait for 10 minutes. Then we start the engine. Put the EGA on test mode for 40 seconds. Put the gun of the EGA in the exhaust pipe. Then wait for 1 minute and take the readings on the screen of the EGA.
- After that connect the inlet of the Exhausted Pollutant Minimiser to the exhaust of the engine. After this the exhaust passes through the catalytic convertor
- And the exhaust is partially cleaned. Then the partially cleaned exhaust passes through the water for filtering purpose. And then that exhaust is passed through the ($NaOH + H_2O$) Sodium Hydroxide. Then it is passed through the baffle chamber and finally in the EGA for taking the readings.
- 7.5 litters of IM solution of caustic soda was prepared and poured in 30 litres of water to make 37.5 litters of 0.2M-solution of caustic soda that was poured into the reservoir tank at the base of the column. The gas flow control valves were closed. The liquid pump and the compressor were switched on and the flow of caustic soda through the column and the airflow were regulated to 3litres / min and 30 litters / min respectively.
- The pressure-regulating valve on the carbon dioxide cylinder was carefully opened and the flow of CO_2 to the column was 3 litters/min. Product samples were withdrawn after 30mins for analysis using titre metric method.

Conclusion:

Effort are taken to reduce CO2 emissions through Carbon capture mechanisms. Adsorption technique is followed to control the Carbon emissions from the exhaust gas. The solid adsorbent used in this work is Catalytic Converter, where it locks and holds the carbon molecules from the exhaust. The carbon capture by exothermic reaction is successively designed for automotive emission control. It is the first action taken from automobile sector for controlling CO_2 emission from the automobile exhaust and Industrial sector. The design model is analyzed for its fluid flow inside the system. The model derived has been seen to agree with experiment, which was conducted under unsteady state regime. Thus, the values of the carbon dioxide concentrations in caustic soda can be predicted if given initial NaOH concentration, volume of NaOH and flow rate. This naturally translates into the Na_2CO_3 formed.

Nikhil Honkhambe
Amit Kshirsagar
Saurabh Kshirsagar
Nagesh Koli
Chanbasu Kore

Mr. Mohite S.K.

Parental Warning System

Nearly 1.46 lakh youngsters in India died because of accidents due to over speeding. And nearly 400 road accidents happened per day due to over speeding.

Nowadays in India, due to over speeding, accidents are increasing day by day. The last year survey was that nearly 1.46 lakh youngsters in India died due to accidents due to over speeding. And nearly 400 road accidents happened per day due to over speeding.

So to reduce this percentage of accidents we have introduced "Parental Warning System". In this system, we have to set a speed limit, if this speed limit is exceeded by the driver then message is sent on the parents' mobile. This warning system will play very important role in order to avoid accidents due to over speeding.

We have prepared a working model. In this working model, we have used a speed sensor (shaft encoder), speed source, GSM Module and Arduino Mega board. Arduino mega board is like a brain of the system. The all programming is done in the Arduino mega board using Arduino software and C language. In this programming speed limit is set, format of the message which is to be sent on parents' mobile and also numbers of parents mobile on which message is to be sent.

The rotary element of our system rotates. A speed sensor (shaft encoder) is interfaced to the rotary element. When speed exceeds 60 then speed sensor detects it and sends indications to the Arduino Mega board. Already in board as coding is done hence they are burnt and further indications are given to GSM Module. GSM Module circuit is same as our mobile circuit. It consists of SIM card. Using this message is sent to parents' mobile.

It is not only useful for domestic purpose but also useful for commercial purpose. If OLA Cab agency owner install this system in their vehicles then they will have time to time information about their drivers' over speeding with date and time. Hence they will warn their drivers about their over speeding and also damages to the vehicles or owners' loss will be avoided. Also it can be used in school buses for safety purpose.

Also in future point of view we think that our system will play important role to maintain safety and discipline in the society. In future we can add also damp sensor to indicate accident of the rider, alcoholic sensor and GPS also to trace the path of the vehicle and to find the location of the vehicle.

Our project, "Parental Warning System" system was selected for DIPEX 2017. We got awesome response about our project. Everybody told us that it is very useful system in our daily life available in affordable price and user friendly also. We applied for the patent also. Some of the people suggested us to convert it into industrial product. Overall we got very positive response from the competition about the project.

Prasad Gramopadhye
Onkar Deshmukh
Vivek Chincholi
Sagar Bandgar
Adil Chiniwar

Mr. Dhalait J.G.

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COURSES OFFERED IN DIPLOMA ENGINEERING

Discipline	Intake Capacity	Duration of Course
Mechanical Engineering	180	3 years
Electronics and Telecom. Engineering	60	3 years
Civil Engineering	60	3 years
Computer Engineering	60	3 years
Total Intake	360