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DEPARTMENT OF MECHANICAL ENGINEERING

Awarded
EXCELLENT
grade by
M.S.B.T.E.'s
E.A.M.C.
For AY 2016-17

JOBS WITH SMILE

K. E. Society's
Rajarambapu Institute of Technology,
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From the Editor's

Dear Readers, Greetings, a year has gone, a year full of devotion towards academics, a year expended to ensure a better future of our fellow students. The purpose of this articulation is to serve as a bulletin exhibiting various milestones surpassed by the department. Facts exhibited here are not dead statements but are a manifestation of Department's committed efforts towards the well being of our fellow students. As a editor I have put in my sincere efforts to elaborate Department's maneuvering throughout the year; I hope this initiative satisfies your intellectual pursuit & above all suggestions are always welcomed.

Thank you.

Prof. V. V. Jadhav

(Editor, Mechanical Engg. Dept.)

(Diploma 2nd Shift)

Department Vision

To become a center of excellence in the field of Mechanical Engineering, producing innovative and creative Mechanical Engineers to meet the ever changing industrial demands and social needs.

Department Mission

To transform the students and faculty of the department into highly motivated and cultured engineers, technologist and entrepreneurs who will contribute to uplift the society in collaboration with industry and academia.

Article of Faith

Programme Educational Objectives (PEOs)

PEO 1. Provide socially responsible, environment friendly solutions to Mechanical engineering related broad-based problems adapting professional ethics.

PEO 2. Adapt state-of-the-art Mechanical engineering broad-based technologies to work in multidisciplinary work environments.

PEO 3. Solve broad-based problems individually and as a team member communicating effectively in the world of work.

Program Outcomes (POs)

PO 1. Basic knowledge: Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad -based Mechanical engineering problems.

PO 2. Discipline knowledge: Apply Mechanical engineering knowledge to solve broad-based mechanical engi neering related problems.

PO 3. Experiments and practice: Plan to perform experiments and practices to use the results to solve broad-based Mechanical engineering problems.

PO 4. Engineering tools: Apply relevant Mechanical technologies and tools with an understanding of the limita tions.

PO 5. The engineer and society: Assess societal, health, safety, legal and cultural issues and the consequent re sponsibilities relevant to practice in field of Mechanical engineering.

PO 6. Environment and sustainability: Apply Mechanical engineering solutions also for sustainable development practices in societal and environmental contexts.

PO 7. Ethics: Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Mechanical engineering.

PO 8. Individual and team work: Function effectively as a leader and team member in diverse/ multidisciplinary teams.

PO 9. Communication: Communicate effectively in oral and written form.

PO 10. Life-long learning: Engage in independent and life-long learning activities in the context of technological changes also in the Mechanical engineering and allied industry.

Program Specific Outcomes (PSOs)

PSO 1. Modern Software Usage: Use latest Mechanical engineering related softwares for simple design, drafting, manufacturing, maintenance and documentation of mechanical engineering components and processes.

PSO 2. Equipment and Instruments: Maintain equipment and instruments related to Mechanical Engineering.

Department Activities

A number of programs like Guest Lectures, Industrial visits and training workshop from various Institutional, Organization and Industrial Experts in the field were organized by department for in-depth understanding of the subjects.

Expert's Talk

Guest Lecture on "Total Productive Maintenance" by Prof. R. S. Sargar

Guest lecture on Design of Machine Elements by Prof. M. B. Takare 2017.

Guest lecture on Industrial Management by Mr. I. J. Patil (Winning Edge Consultancy, Miraj)

Guest Lecture on "Industrial Automation" by Mr. Naresh Shingate

Guest Lecture on "Transistor" by Prof. S. M. Magdum (R.I.T, Rajaramnagar) .

Guest Lecture on "CAD - CAM" by Prof. P. S. Ghatage (R.I.T, Rajaramnagar).

Confluence with Industries

Industrial visit to R.S.S.K., Rajaramnagar.

Industrial Visit to Die-tech Engineering.

Industrial Visit to Apex Engineers

Industrial Visit to Die-tech Engineering.

Industrial Visit to Spectrum renewable energy Pvt. Ltd

Industrial Visit to Jagdish engineering works

Various Students Centered Activities

Welcome “ Freshers ”

Mechanical Department welcomed new faces of Diploma First Year & Direct Second Year Students. Academic Year 2016-2017.

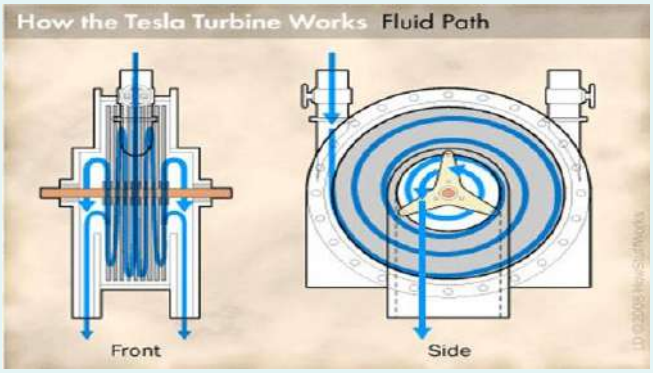
Student's Corner

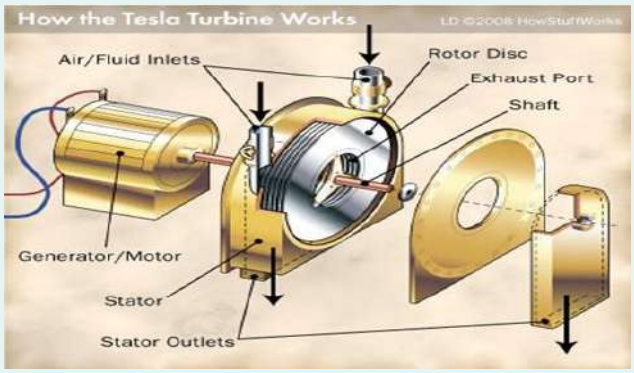
Tesla Turbine

Shubham J. Pardeshi
TY Mechanical
Roll No –4319

Introduction:- The job of any engine is to convert energy from a fuel source into mechanical energy. Whether the natural source is air, moving water, coal or petroleum, the input energy is a fluid. And by fluid we mean something very specific -- it's any substance that flows under an applied stress. Both gases and liquids, therefore, are fluids, which can be exemplified by water. As far as an engineer is concerned, liquid water and gaseous water, or steam, function as a fluid.

Construction: There are mainly 2 parts in the turbine (1) Rotor:- in the rotor it consists of series of smooth discs mounted on a shaft. Each disk is made with openings surrounding the shaft. These openings act as exhaust ports through which the fluid exits.? Washers are used as Spacers; the thickness of a washer is not to exceed 2 to 3 millimeters.(2) Stator:- The rotor assembly is housed within a cylindrical stator, or the stationary part of the turbine. Each end of the stator contains a bearing for the shaft. The stator also contains one or two inlets, into which nozzles are inserted, which allows the turbine to run either clockwise or counterclockwise. To make the turbine run, a high-pressure fluid enters the nozzles at the stator inlets. The fluid passes between the rotor disks and causes the rotor to spin. Eventually, the fluid exits through the exhaust ports in the center of the turbine





Working

1)As the fluid moves past each disk, adhesive forces cause the fluid molecules just above the metal surface to slow down and stick.

2)The molecules just above those at the surface slow down when they collide with the molecules sticking to the surface

3) These molecules in turn slow down the flow just above them.

4)The farther one moves away from the surface, the fewer the collisions affected by the object surface.

5)At the same time, viscous forces cause the molecules of the fluid to resist separation.

6)This generates a pulling force that is transmitted to the disk, causing the disk to move in the direction of the fluid.

Advantages:- Simple in construction. ,Pollution free. ,Low cost to produce and maintain ,Can be run on a vacuum

Disadvantage:- Low rotor torque .

Student's Corner

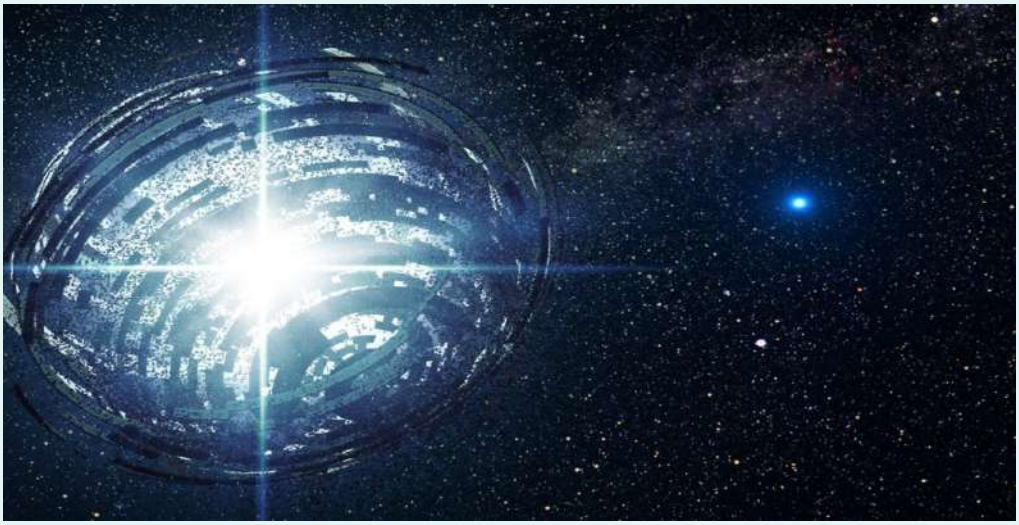
The Kardashev Scale

Nikita S. Patil
SY Mechanical
Roll No –4202

The 'Kardashev scale' was developed as a way of measuring a civilization's technological advancement based upon how much usable energy it has at its disposal. Many leading researchers believe that as the population grows and expands outwards its energy requirements will increase dramatically, what with the requirements of its various technological machines. Originally, the scale was created to classify Extraterrestral Civilizations in the event of contact and compare their technological advancement to that of humans and hence some very extreme criterias were defined for each type of civilization. As of now we aren't even a Type I Civilization.

HISTORY:

The Kardashev was created by a Russian astrophysicist known as Nicolai Kardashev In 1964, Kardashev came up with the idea that the status of a culture, as a whole, depends on two primary things: Energy and technology. He theorized that a civilization's technical advancement runs parallel to the amount of energy that the civilization is able to harness and manipulate. Essentially, the more energy that a society can produce, the more technologically advanced they are (this was originally just tied to energy available for communications, but has since been expanded).



In other words, according to this theory, a culture's development (in the very widest sense) is a product of energy and of technology: Through technology, energy is harnessed, and as social systems are expressions of this technology, the status of a culturerests upon (and is determined by) the amount of energy that is harnessed.

The scale has a number of different categories. In recent years, scientists have expanded this scale to measure hypothetical civilizations—civilizations thatare galactic, intergalactic, and even multiverse in nature.

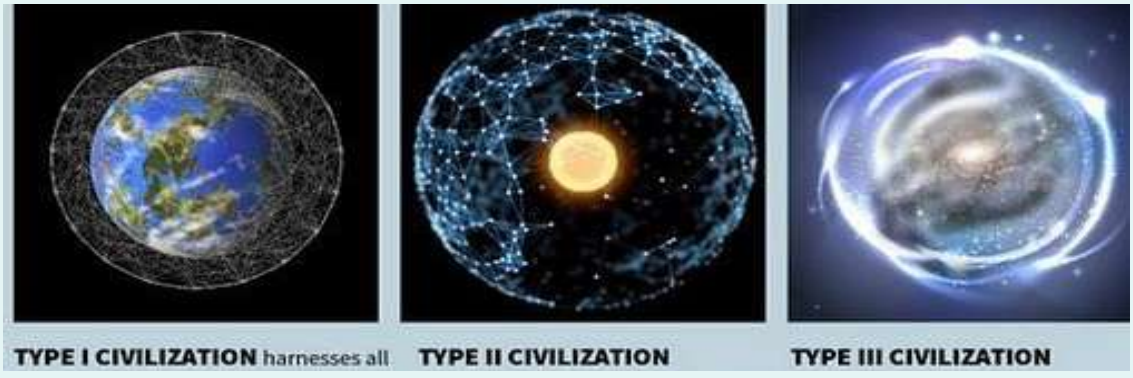
The discovery of Nuclear Power and space exploration, especially the moon landing of 1969 are huge milestones that stand as a testimony to humanity's advancement in technology. Yet we remain at the bottom of the Kardashev Scale.

Type 0- Subglobal Culture: This civilization extracts its energy and raw-materials from crude organic-based sources such as wood, coal, and oil. Any rockets utilized by such a civilization would necessarily depend on chemical propulsion. Since such travel is very slow, a civilization at this level would be (for the most part) confined to its home planet. Unfortunately, this is where humanity stands now.

Type I- Planetary Culture: This civilization would be capable of utilizing all available resources on their home planet, skillfully harnessing the energy output of an entire world (10^16 watts). With any luck, we will reach this stage in 100-200 years if we are able avoid catastrophic man-made or natural disasters. Large scale use of nuclear power and renewable sources of energy such as solar and hydroelectric power will be the primary sources of energy used by this civilization. Use of Anitmatter to produce energy might also be possible.

Type II- Stellar Culture: This civilization would be far more advanced than we are Such a society would be able to harnesses all the energy of its star .For example, this culture might resemble the Federation of Planets, as seen on Star Trek; or the civilization might be like a majority of the humanoids in the Mass Effect universe. This civilization would use the same means of energy production as that of a Type I Civilization but on a much larger scale. The construction of Dyson Spheres around a star to collect all or most of its radiated energy would be possible for this civilization

Type III- Galactic Culture: This civilization would be able to harnesses the energy output of a galaxy (about 10 billion times the energy output of a Type II civilization, and about 100,000 to 1 million years more advanced than we are). They would have colonized the galaxy itself, extracting energy from hundreds of billions of stars, traveling across interstellar space, and populating innumerable worlds. Such civilizations would have mastered interstellar travel and might use the same methods to produce energy as that of a Type II Civilization but applied to a number of galaxies which would greatly increase output. They will also most likely be able to generate energy from Black Holes and White Holes and also from Quasar emissions.



Type IV- Universal Culture: This civilization would be an intergalactic culture, spanning the breadth and width of the Universe. They would travel across the cosmos, commanding the power of a billion trillion suns. These societies would be capable of attempting projects of gargantuan, superhuman proportions, such as changing the structure of space-time or the deliberate slowing of entropy (or even its reversal) to achieve ultimate immortality. For humanity, such accomplishments might be forever beyond our reach.

Type V- Multiverse Culture: This civilization will have transcended their universe of origin. It would be capable of universe-scale manipulation. A civilization such as this would be home to beings of unimaginable power and ability.

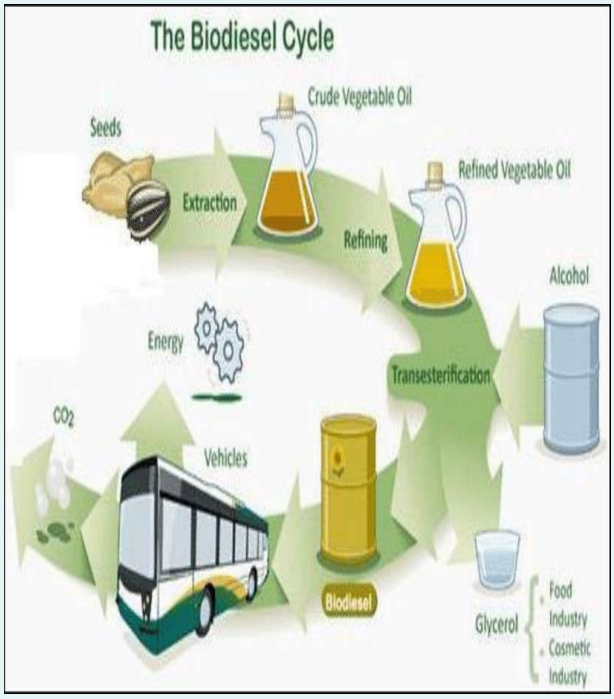
Student's Corner

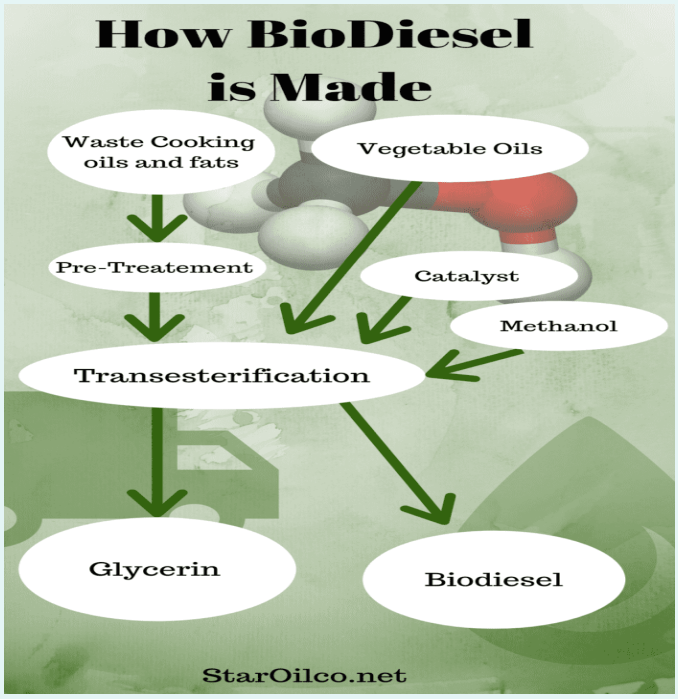
Bio Diesel

Shubham P. Gaikwad
SY Mechanical
Roll No –4234

Biodiesel fuel is a clean burning alternative fuel that conies from 100% renewable resources. One of the primary advantage of biodiesel is its renewability. As a renewable, domestic energy source, biodiesel can help reduce dependence on petroleum imports. It is considered the fuel of the future. Biodiesel is not a petroleum product, but can be mixed with petroleum diesel to produce a biodiesel blend that can be used in a variety of vehicles. Biodiesel fuel, can be used in it's unaltered form in unmodified diesel engines. This makes biodiesel one of the easiest alternative fuels to use. Biodiesel blends are denoted as "BXX" with "XX" representing the percentage of biodiesel contained in the blend. For example, B20 fuel is a blend of 20 percent biodiesel with 80 percent conventional diesel. B100 is pure biodiesel. Biodiesel is biodegradable and nontoxic.

Biodiesel is defined as the monoalkyl ester of fatty acids is made through a process called transesterification of vegetable oils and animal fats with short chain alcohols such as methanol and ethanol. Methanol often used due to it's economic advantage over ethanol. This process involves removing the glycerin from the vegetable oil or animal fat. During the process byproducts are left behind, including methyl esters and glycerin. Biodiesel is free from such substances as sulfur and aromatics which are found in traditional fuels. One of the best things about biodiesel fuel is as it is made from renewable sources which means it is safe for the environment and it does not produce the high emissions like traditional fuels. Therefore it does not cause harmful effects to the environment. The unique qualities ofbiodiesel makes it attractive unlike other alternative fuels. It has passed all the health effects testing requirements, unlike other alternative fuels. This means it meets the standards of the 1990 clean Air Act Amendments. Biodiesel is legally registered with the Environmental Protection Agency as a fuel that can be legally sold and distributed. Other alternative fuels can not be legally sold as motor fuel because they do not meet the EPA's fuel specifications.





Biodiesel refers to a vegetable oil – or animal fat-based diesel fuel consisting of long-chain alkyl (methyl, ethyl, or propyl) esters. Biodiesel can be used as a pure fuel or blended with petroleum in any percentage. Much of the world uses a system known as the "B" factor to state the amount of biodiesel in any fuel mix:

A)100% biodiesel is referred to as B100

B) 20% biodiesel, 80% petrodiesel is labeled B20

C)5% biodiesel, 95% petrodiesel is labeled B

D)2% biodiesel, 98% petrodiesel is labeled B2

Blends of 20% biodiesel and lower can be used in diesel equipment with no, or only minor modifications

Benefits of Biodiesel

a) Produced from Renewable Resources.

b) Can be Used in existing Diesel Engines.

c) Grown, Produced and Distributed Locally.

d) Biodegradable and Non-Toxic.

e) Better Fuel Economy.

f) Reductions in greenhouse gas emissions.

Current scenario of biofuel production in India

a) Currently, India's position in global biofuel map is not very prominent and contributes only 1% of the global production.

b) It will be estimated about 380 million liters of ethanol and 45 million liters of biodiesel production in recent years.

c) The Government of India has approved the “National policy of biofuels” (Ministry of New and Renewable Energy) on December 24, 2009. Since then, considerable advancements have taken place in the direction of cultivation, production and use of biofuels.

Out house Interactions by Department

M.O.U.s Signed by the Dept.

1. IFS Academy Chinchawad, Pune.
2. Bharat Forge, Mundhawa Pune.
3. Kalburgi Udyog, Ogaleawadi.
4. Harshada Enterprises, Virawade, Karad.
5. Kalburgi Stamping, Hajaramachi, Karad.
6. Maharashtra Centre for Enterprenurership Development (MCED) Aurangabad.
7. Dyandeep Education and Research Foundaion.
8. Extencore Solutions.
9. Micro Axis Auto & Engineering Centre, Yadrav Tal. Shiroli, Dist. Kolhapur.
10. Bharatiya Vidya Bhavans Sardar Patel College Of Engineering, Munshi Nagar, Andheri (West), Mumbai.
11. Global Talent Track Pvt. Ltd. Pune.
12. Kalyani infotech Solutions Ltd. Pune.
13. Modi Motors Agencies Pvt. Ltd. Mumbai.
14. SC Auto Pvt. Ltd. Mumbai.
15. Appolo Tyres Ltd, Gurgaon.
16. Altair Engineering, Banglore.
17. TATA Motors Ltd. Pimpri, Pune.

Research & Publication

Sr. No.	Name of the Faculty	Title of Publication
1.	Ms.K.S.Kulkarni	Design & Development of Mono leaf Spring by using Composite Material
2.	Mr. V. V. Jadhav	Design of a special purpose drilling machine
3.	Mr. N. C. Gaikwad	FEM Analysis of effect of Material & Geometrical parameters on Dynamic performance of Welded Joint
4.	Mr.V. B. Choudhari	Performance Investigation Of Phase Change Material in Heat Exchanger for Latent Cool Storage

Training/ Workshop/ Seminar / Conference attended by Faculty

Sr. No.	Name of the Faculty	Module description	Contributing Host
1.	Mr. V. B. Choudhari	Induction Training Program Phase - I at SGP, Atigre	MSBTE
2.	Mr.R.S.Mali	Energy management Systems in industries	MSBTE
3.	Ms. K. S.Kulkarni	MSBTE Industrial Training	Fiat Motors Pune
4.	Ms. S. M. Waghmare	Induction Training Program Phase - II at Marathwada Mitra Mandal Polytechnic , Pune	MSBTE
5.	Mr. J. J. Pharne	Energy Management System in Industries	Reliance Infra Ltd. Dahanu
6.	Mr. S. H. Patil	Industrial Training Program at Accurate Sales Pvt Ltd, Pune	Accurate Sales Pvt Ltd, Pune.
7.	Mr.A.P. Gaurvadkar	National Teachers Congress	MIT, Pune
8.	Mr. N.C. Gaikwad	Induction Phase -I & Accurate Sales Pvt. Ltd	MSBTE

OUR TOPPERS

A.Y 2016 -17

SECOND YEAR

1st	SHINDE SUJIT S.	83.11 %
2nd	PATIL NIKITA S.	78.56 %
3rd	JADHAV AJAY V.	74.22 %

THIRD YEAR

1st	PATIL SOURABH U.	93.35 %
2nd	MANE AKSHAY S.	88.41 %
3rd	PARDESHI SHUBHAM J.	83.94 %