1. CAMPCO Chocolate Factory Puttur D. K

Project Title: Analysis of Briquette fired boiler at CAMPCO and suggestive methods for improving overall efficiency

Team members name:

Abijith G
Adarsha mayya S G
Chandrahasa
Jaikumar

Guide Name: Mr. Shyam Prasad

Abstract:

In this project, we will be analysing Briquette Fire tube boiler for two different types of efficiencies, which are direct and indirect. Among the two, the former is also known as 'input-output method', due to the fact that it needs only the useful output (steam) and the heat input (fuel) for evaluating the efficiency. Our aim is to further improve the efficiency of one of the machines at CAMPCO chocolate factory, Puttur. The efficiency is measured easily by measuring all the losses occurring in the boiler. The disadvantages of the direct method can be overcome by indirect method, which calculates the various heat losses associated with the boiler. The efficiency can be arrived by subtracting the heat loss fractions from ideal. By analysing the indirect efficiency, the nature of different losses can be understood. This helped us to suggest few methods for performance improvement.

2. Kaiga Power Plant:

Project Title: Case Study on Tube Failure in Shell and Tube Heat Exchanger

Team members name:

Ajay Mirashi
Ajey Damodar Naik
Chetan Naik
H T Tushar

Project Guide: Mr. Sunil B Lakkundi

Abstract:

This study mainly deals with the evaluation of various degradation mechanisms that heat exchangers are susceptible to with an aim of evaluating future requirements. A Heat exchanger is a device that uses the fluids to transfer heat from one medium to other. The main common types of fluid being air, oil, water or specialized coolant mixtures. The main problem occur in heat exchanger is tube failure. The root causes for the shell and tube heat exchanger are discussed in

this project, which are mainly corrosion, fouling, metal erosion, fatigue and vibration. From analyzing the various parameters corrosion and erosion has come out as the major failure mechanism which leading to the degradation of heat exchangers. The remedies are discussed for different failure mechanisms. Soap bubble test is carried out to check the tube failure in shell and tube heat exchanger. Microscopic examinations and energy dispersive spectroscopic analyses were carried out on the brass tube to understand the root cause of the failure. Microscopic examination of the tube cross sections revealed that the cracks initiated from the areas that suffered corrosion, thus because of dezincification crack occur which leads to tube failure.

3. HAL-Helicopter Division; Tooling department

Project Title: Implementation of Numerical Master Geometry in the Design of the Sub-Assembly Fixture for Interchangeability of parts

Team members name:

Manish B,
Rajath Mundody,
Sachin Kumar S
Shishir P

Project Guide: Mr. Naveen S P

Abstract:

In the recent past, Engineering industries have expanded in the field of aeronautics and this trend is continuing.The productions of the various aircrafts and helicopter components and assemblies have spread across the globe.In such a growing and expanding global aerospace industry demands development of new type of jigs and fixtures that has to be designed and fabricated for production. Jigs and fixtures have acquired a paramount importance and are becoming indispensable in Aircrafts industries.

Considering the criticality of process, quality, cost, time and availability of skilled labour, production tools are developed. Assembly of parts on helicopter is one of the critical processes in the manufacturing. Assembly of parts will be done using accurately drilled holes.

The existing method of manufacturing Sub-Assembly is by **Layout Method**. This was purelydependent on skill of operators and experience, which results in rejections of assemblies and long process time. To overcome the existing problem, a **Sub-Assembly Fixture is designed.**

This design is used to maintain the **outer corner of the helicopter with respect to NMG (Numerical Master Geometry)** using UG CAD software. By this design method a drill template or assembly tool is fabricated to reduce the process complexity,rejection part and reduce time.

This ensures the dimensional accuracy and repeatability and also eliminates skill operator and increases productivity.

4. Owari Precision Products (India) Pvt. Ltd

Project Title: Layout Optimization

Team members name:
Ushan B S
Minin J Maskaren
Neekshith K
Sumadesh D

Project Guide: Mr. Santosh Kunnur

Abstract:

Layout optimization is evolution of multiple layout scenario's in order to design the optimum layout, that reduces material handling cost, improve the throughput (output related to input) minimize the space requirement, reduce the time for the movement of raw material and lower energy bills. By studying the present layout of the industry that include problems in various areas like in storage, flow path, machining area etc, measures are taken to provide improvement and layout is remodified by considering this layout problem can be solved and the production will take place in an efficient manner. The problems identified is usually done by provided kaizens (continual improvement) and 5's. Its goal is to eliminate the non-value added activities, improve the quality, reduce cost by elimination rejections & provide safety for the operators.

The OPPI (Owari precise products co., ltd) plant mainly produce synchronized ring and shafts which is used in gear box. Shift fork and collor which is used in manual transmission.

5. L& T Construction Equipments, Bangalore

Project Title: Design of Robot Full Welding Fixture for Front Chassis of Wheel Loader.

Team Members:

Vaishak Bhandary
Sudeep N S

Viveka Upadhyaya
Mithun R Naik

Project Guide: Mr. Naveenakrishna P V

Abstract:

For the growing heavy industrial sectors, the demand for wheel loader of various capacities is increasing day by day. Therefore, the company must meet the demand through the available facilities so that the company has to sophisticate the manufacturing processes in the existing plant. Despite existing models in other companies being manufactured in the plant, there is a need and demand for different high capacity models. So it is necessary to develop a robot welding fixture to reduce the cycle time of front chassis welding.
Welding fixture is normally developed to hold and support the work piece. In this work an attempt has been made to develop, modify and generate concepts to mount the tack welded front chassis of the wheel loader onto a fixture to perform full welding using an automatic welding robot.
To develop fixture for welding front chassis of wheel loader, some of the concepts has to be analysed, such as orientation of chassis over the fixture, Degree of Freedom of robot arm and fixture bed. Initially some ideas are to be generated to develop the fixture by considering mentioned concepts. In the later part a conceptual design is made using Solid Edge and it is then analysed using HyperMesh for structural feasibility.
Techniques suggested that, this project helps in saving cycle time per job, also help in reducing man hours. After developing this fixture, we can save transportation cost and time, since the full welding of the assembly has been outsourced.

6. HMT Machine Tools limited Bangalore.

Project Title: Effect of hardening temperature and stabilisation on case hardened steel

Team Members

Srikanth P,
Sathyaram Rao B,
Sahana M,
Neha Chowdhary K

Project Guide: Mr. Satheesha Kumar K

Abstract:

Steels are the most common metals used in daily life. Low and medium carbon steels find vast application in industrial tools and machineries. The low relative cost and ease of machinability makes it the best metal to be used in day to day application in the Industry. The raw specimens of steel have relatively lower values of hardness, also lower resistance to natural wear resistance. On improving this factor, this metal becomes the best partner of most industrial applications. This project mainly deals with the steel material en353 (low carbon steel). This metal is selected

for the study and the properties of this specimen are analysed.As ourresearches are concerned, it is basically concentrate on "to study the effect of case hardening treatment on the structure and dimensional stability, which consists of carburizing process which is a case hardening process". The heat treatment process employed to improve the hardness of the selected materials is gas carburization. On completing the Heat Treatments process, the dimensional stability of the metal is analysed and compared with that of the raw specimen.

Project Title: Comparative Study Of Carburized En 3 & C-45 Steels For Wear And Corrosion Properties

Team Members:
Nikhil Choudhary P,
Shravan Sagar N,
Sujith Kumar N R,
Swasthik Narayan P

Project Guide: Mr. Puneeth N

Abstract:

The properties of metals and alloys can be changed by heating followed by cooling under definite conditions to make them suitable for specific applications. Carburization is a method of producing mild steel having tough inner core and hard outer surface. Three Heat Treatment process namely Quenching, Carburizing and Tempering were done. The mild steels are carburized at temperature range of 850 to 950 ^{o}C and then it is tempered at 200 ^{o}C for thirty minutes after that it is subjected for different kind of tests such as abrasive wear, hardness . The results indicated that the process of carburization greatly improves the mechanical and wear properties like hardness and wear resistance and these properties increases with increase in the carburization temperature but apart from this, the toughness property decreases and it is further decreases with increase in carburization temperature. The mild steel carburized at the temperature of 950 ^{o}C gives the best results for the mechanical and wear properties because at this temperature it gives the highest tensile strength, hardness and wear resistance, so it must be preferred for the required applications.

7. Veer-O-Metals Pvt. Ltd, Bengaluru

Project Title: Process flow analysis and optimization in Humming Bird project

Team Members:
Prajwal Rai ,
Tejaswi Ganapathi ,
Prashant Manjunath Achari
Prathik K ,

Project Guide: Mr. Naveen G J

Abstract:

Sheet metal forming is a secondary manufacturing process which involves various techniques such as shearing, punching, bending, jogging, welding, riveting and finally concludes with assembly operation. The input (raw material) is processed at various stages including secondary operations to obtain finished product / good (output). Total time for raw material to turn into useful product will be sum of individual time taken for all these metal forming processes. The time required for each of these processes depends upon complexity of the product, material flow, worker performance and mainly plant layout design. The project starts with determination of time required for complition of each process and overall time required for manufacturing particular product. Time and its management plays a vital role in shop floor activities. Thus, the main aim of the project is to suggest a better way of material movement which optimizes lead time of manufacturing a product.

8. Kennametal India, Bengaluru

Project Title: Sintering Shrinkage Prediction for Powder Compact Pressed in 200T Press

Team Members:

Shashwath Rai A

Sireesha Bangera

Ullas S

Yajnesh P

Project Guide: Mr. Naveen G J

Abstract:

Tungsten Carbide based hardmetal tools are manufactured through powder metallurgy route. This process starts with manufacturing of powder containing Tungsten Carbide (WC) and Cobalt (Co). Subsequently the powder is compacted to particular shape and size in a mechanical press using a die and two top and bottom punches. After pressing, the density of compact is typically 55-60% of theoretical density. To achieve 100% density, pressed compacts are sintered at a temperature above the eutectic temperature of the WC-Co alloy. During this process, compacts densifies by volumetric shrinking along all three axes. However the shrinkage is not uniform in all three axes and hence resulting in variation in dimensions after sintering. The main objective of this project is to develop correlation between theoretical and actual shrinkage during sintering and hence predict accurate dimensions after sintering. And also to optimize pressing conditions to get near net dimensions after sintering.

9. Bharat Fritz Werner LTD, Bangalore-22

Project Title: Process Planning And Tool Selection

Team Members:
Anthony Balraj P
B.K Benak Raj
Darshan D Mahale
Praveen Narayana C

Project Guide: Mr. Ashwith Kumar

Abstract:
A considerable amount of time is spent while loading a job to the machine. A lot of adjustments have to be done to the job before its machining begins. Clamps, angle plates, stoppers, blocks and other attachments are used for loading the component on to the machine which are called set up elements. This results in excessive job set up time, during which the machine is not under work. This results in the reduction of productivity of the machine. So these set up elements are grouped and they are provided with certain standards, so that it provides an ease to the operator to arrange them easily and quickly, thereby decreasing the extra wastage of time. Also the best suited methodology to avoid this problem is making use of the work holding fixtures. These will reduce the set up time for the component. These fixtures will also help in increasing the productivity of the workers who can do the job in an easier way.

There are a wide variety of tools that are used for machining of the component. These tools have different specifications and different operations intended for it. The operators have a tedious task of identifying the tools, inserts and specific attachments that are associated with them in case of any tool replacement due to any damage or accident. With an efficient tool database, it would be very beneficial for the operator to procure any tool's attachment in an instant negating all the time the operator has to spend searching for the right piece. This in turn has its impact on reducing the idle time leading to the saving of resources and increasing the profit.