

Online Kaizen 2020
Textile Technology Department
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Final year students' online project review Kaizen 2020 was a grand success. Students of B.E. presented their projects on various subjects through an online platform like Google Duo and all project topics have a practical application, some projects have environmental and social impact.

Date: 6th and 7th April 2020

Online Platform: Google Duo

B.E. Final Year Projects - 13

Number of Student Participated: 61

Project 1

Project Title: Luminescent fabric for safety

Abstract: A total of 23100 pedestrians, cycle riders and night workers died in an accident in the last few years in India and most of the accidents occur during the night time due to poor visibility of a person in the dark. The luminescent fabric will glow at night so the vehicles can spot the pedestrians in the dark which will prevent the accidents. This fabric will help in decreasing the number of accidents and provide safety to pedestrians, cycle riders and night workers, etc.

Project 2

Project Title: Development of Hexagonal Cross-sectional woven Filter Fabric

Abstract: To develop the woven filter fabric with a hexagonal cross-section which provides more stability to the structure and hence increases the efficiency & durability of the filter. Following are the possible important outcomes: It can replace the conventional nonwoven filters where the filtration is harsh and requires more strength, It eliminates the structural instability of the woven structure with a circular cross-section, It provides easy engineering of porosity as per the requirements.

Project 3

Project Title: **Manufacturing Yarn from Plastic Bottles**

Abstract: It is proven that recycling plastic reduce air, water, and land pollution. Thus, buying products made from recycled plastic bottles indirectly help to create a sustainable living and environment. There is not much difference concerning quality or texture between the yarns made from recycled material and normally made yarn.

Project 4

Project Title: **To Desalinate the Sea Water through Nonwoven Polyamide Zeolite Mixed Matrix Membrane**

Abstract: The scarcity of freshwater resources is already critical in many arid regions of the world. Thus one of the methods to make seawater usable is “To Desalinate the Seawater”.In this project, we have coated the zeolite nano-particles on polyamide thin film structure, which generates the permeable surface. The coating was possible due to the Interfacial Polymerisation between MPD (meta phenylene diamine) and TMC (trimethyl chloride). The zeolite nanoparticles (0.5 wt.%) were dispersed in the organic TMC-hexane solution. The Zeolite coated membrane was cured in the oven for 5 min. at a temperature of 80°C.

Project 5

Project Title: **To study concept silicon coating and it's application**

Abstract: The objective of our project is to make a fabric that has all the desired properties such as UV Resistance, Fireproof, Nonskid in a single fabric. We have tried to solve the problem by a coating of Silicon. It is mostly available in liquid form. It has alternate atoms of oxygen and silicon. We have done it on Glass fiber fabric. Cotton fabric can also be used. The coating can be done by a knife or blade. Pressure and heat are applied from the bottom.

Project 6

Project Title: **Effect of Mixing in Final Yarn Quality**

Abstract: To improve the quality of yarn at a minimum cost of mixing because some of the reduced cost of mixing is a huge impact on mill profit. The solution is Defects in the length of the fiber can be removed by using fibers with greater strength. There are two ways to control the mixing quality using fiber properties. Determining the specification of mixing from the properties of individual fibers and also without considering the properties of yarns. Mixing

specification concerning index. This index is calculated taking into count each fiber's properties. And on top of that, any single characteristic of yarn can be known.

Project 7

Project Title: **Hygienic antibacterial socks**

Abstract: To find the socks which have antibacterial properties and it can also eliminate some problems like skin allergies, smell, excessive sweat, etc. The approach of the project is to find the solution with natural bamboo fiber which is eco-friendly and comfortable to wear. The collected information on the manufacturing of socks from raw material to the final product and also find the percentage of bamboo and spandex are used and which types of structure used in manufacturing. Made a Sample of 100% bamboo fibre and reduced the cost of the final product and increase the life spun of the product.

Project 8

Project Title: **Waterproof Fabric**

Abstract: This project investigates two different methods for fabric waterproofing. Where one is a wax coating the other is silicon coating over a fabric. Both methods use the same type of coating method. i.e. By using the pad-dry method. Waterproofing of different woven fabrics with a coating of silicone and wax was studied & comparative analysis made. Based on this some suggestions can be made. This study helps to determine the effective concentration & application of the Silicone mixture & wax to produce Waterproof fabric. An Excellent & durable Waterproof coating can be obtained by applying Silicone-Fluid over a fabric. Silicon coating is far superior to wax for many application areas thanks to its fastness properties, although it is a costlier process wax coating. Although wax coating gives good water resistance for temporary application.

Project 9

Project Title: **Solar-powered fabric**

Abstract: This SSIP funded project was mainly focusing on converting solar energy into electrical power using textile material. A lot many projects are there on such a theme. This project is quite different from the rest as it is a special type of fabric where there is a built-in light. This can be powered using solar panel. Such fabric can be used for many applications like a curtain, tent, parasols, defense, etc. In the current project, we have built a solar-powered tent fabric with a built-in light. The prototype sample fabric lights up the 5m LED lights by

generating 18.90 V from 1 solar panel of 300mm x 350mm x 17mm arranged on the fabric. This particular fabric can be used as night lights in the Tent. The idea behind this project is under the patent process.

Project 10

Project Title: Evaluation of mechanical properties of glass-jute reinforced hybrid composite

Abstract: To develop a hybrid Composite sheet of Jute-Glass fibre with polyester resin which can be used as a prefabricated cabin in various applications like hospital, office, shop, etc. and also to evaluate it's theoretical and experimental mechanical properties. The various forms of textile materials are widely used in various industrial applications as composite due to its high strength-to-weight ratio than metal composites. The prefabricated cabin normally made up of metallic material but to avoid corrosion and reduce the cost of the material. It's necessary to replace this material with textile composite material. This project deals with a hybrid composite of Glass-jute fibre with polyester resin as a matrix, to the developed prefabricated cabin. To improve thermal insulation, Polyurethane foam also used between two composite sheets to develop a sandwich structure of 20 mm thickness. By using standard simulation software like Auto-desk Helius composite design 2016, finding mechanical properties of a hybrid composite of the prefabricated cabin and then it will be compared with experimental data.

Project 11

Project Title: Size Adjustable Jacket

Abstract: The objective of this project is to manufacture a jacket which can be adjusted according to the wearer's size. Proper Fitting of garments for the customer is a very big issue. Many problems come across related to the size of garments because as country and brand vary the dimension and size also vary. Most of the time, customers don't get the perfect fitting of the cloth. To avoid this type of problem by making a garment having an inbuilt size adjustable device so that the user can vary the size of the garment as per their requirement. This project developed a size adjustable jacket by using Gear motors which can be incorporated at the shoulder and center backside of the jacket. A nylon loop – elastic material assemble with this gear motor. As button pressed, the motor will rotate and lace will get looped the motor and thus tighten the fabric and vice versa. Charging Pad is also used for charging the gear motors. This type of jacket can be used in various applications like Rider, Army, Sportsperson, Hiker, etc.

Project 12

Project Title: Nanofibers for improve filtration

Abstract: This project was mainly focusing on purifying simple water using nanofibers. A lot of projects are there on such a theme. This Project is quite different from rest as there is a special type of nanofibers coated on nonwoven fabric. The PA6 polymer solution is used for coating nonwoven fabric. The average diameter of PA6 fibers 84nm and material size < 1um. Three materials PP melt blown, Polyester viscose, nonwoven polypropylene were arranged in five layers to make a multilayer membrane. Such fabric can be used for many applications like water filtration, air filtration, mask making, gas turbine, dust collector, etc. This membrane can remove solid particles more than 0.2 microns and make the water suitable for drinking.

Project 13

Project Title: Study of shade variation in fabric and suggesting remedies thereof.

Abstract: This project primarily focuses on the concept of ring dyeing, its depth, and its significance concerning uniform ring dyeing. The measurement and control of the dyebath pH are very important in case of achieving a desired uniform ring dyeing effect. It was observed that on the decrease in pH of the dye bath for eg: from 13 to 11, the denim yarn progressively becomes more ring-dyed. The project also focuses on the continuous process of indigo dyeing of denim fabric. Again, the emphasis on the appropriate concentration of dyebath and the dipping time to ensure an even and optimal ring effect by dyeing in several passages. Increasing dye concentration assists in building up shade depth, but the use of too concentrated a dye bath is not effective for deep shades as it results in poor rubbing fastness and more reddish, duller shade. The mechanical parameters such as roller numbers and diameter, squeezing, dyeing speed, flow profile, etc. also influence on the dyestuff exchange and the dye bath stability. As shade variation is frequently occurring problems in ring dyeing, this atmosphere is essential to eliminate shade variation throughout the dyeing set and to be able to reproduce the same shade and dye quality on subsequent dye lots. The study of the various aspects was carried out and the samples were later collected from different batches and then compared with the standard shade. The instrumental assessment and visual analysis was carried out. Also, the issues related to Centre Selvedge Variation (CSV) were studied during the work. The analysis of the results was conducted and a few remedies suggested thereof.