



Final Year Project Showcase for Batch-2016

Department of Textile Engineering Textile Sciences Program		
1	Project Idea	Development of Electrospinning Device
2	Process	Proposed project is based on horizontal configuration of the electrospinning device with an adjustable distance range between collector and ejector. The device involves the placement of the polymeric solution ejector (a pipette) in a horizontal direction. Additionally, instead of a syringe pump a pipette containing a needle is utilized in the project. In pipette the solution is coming out of the needle tip by means of gravity. Moreover, a high voltage power supply is used, due to which the surface of polymeric solution drop gains an electric charge. This polymeric drop experiences two electrostatic forces during the nanofiber fabrication process: Coulomb's force generated due to electric field and an electrostatic repulsion created between the surface charges. The presence of these forces results in the drop formation which extends into a conical shape referred to as Taylor's cone. As the field strength amplifies, fluid surface tension gets overpowered by the electrostatic force, the result of which is an electrically charged jet. Furthermore, an oppositely charged collector either a vertical plate or a rotary drum may be used as web collector. Rotary drum collector is used in the device to achieve large number of aligned fibers onto the collector.
3	Outcome	Nanofibers will be produced as output from the developed device.
4	Evidences (Theoretical Basis)	
5	Competitive Advantage or Unique Selling Proposition (Cost Reduction, Process improvement, Attainment of any SDG (Sustainable Development Goal), increase of market share or capturing new market or having superior performance over competitor. In summary, any striking aspect of the project which compels industry to invest in FYP or purchase it. Some detail description is required in terms of how, why when what. You can select one or more from following dropdown and delete rest of them)	
a	Process Improvement which leads to superior product or cost reduction, efficiency	The device is syringe less & needle based. Both of these combined features help overcome the problem of low production and limitation in terms of solvent usage associated with syringe based and needle less electrospinning device. So, the proposed project helps in improving the electrospinning process efficiency.



	improvement of whole process (e.g. What is issue is current process and what improvement you suggests)									
b	Expanding of Market share (e.g. how it expand and what is problem with current market)	The concept of electrospinning to produce nanofibers is very rare in Pakistan So, we developed a lab scale device for the production of nanofibers. Pakistan isn't currently making nanofibers on its own.								
c	Capture new market (e.g. Niche market or unaddressed segment)	The project targets the niche market.								
d	Any Environmental Aspect (e.g. carbon reduction, energy efficient etc.)	It's environmental friendly.								
e	Any Other Aspect	It's helpful for industries as well as students.								
6	Target Market (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about user of the product, process or service	Electrospun nanofibers exhibit a wide range of application in composite nonwoven structures. Moreover, due to their small fiber diameter and porous structure they have high level of applications in the field of filtration, reinforcement in composite materials, tissue engineering, protective material, agriculture, energy, bio-medical, technical textiles and many others. The target market would be the industries as well as students. The industries may utilize the device for protective textiles, for making nano-filtration membranes etc. Whereas students can benefit in terms of being able to analyze and study the structure of nanofibers closely.								
7	Department	Textile Engineering Department								
8	Team Members (Names & Roll No.)	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Yumna Mobin Ahmed (PGL)</td> <td style="width: 50%;">TS-16010</td> </tr> <tr> <td>Aneeqa Safder</td> <td>TS-16034</td> </tr> <tr> <td>Syeda Javeria Waquar</td> <td>TS-16036</td> </tr> <tr> <td>S Abdul Wahab</td> <td>TS-16051</td> </tr> </table>	Yumna Mobin Ahmed (PGL)	TS-16010	Aneeqa Safder	TS-16034	Syeda Javeria Waquar	TS-16036	S Abdul Wahab	TS-16051
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9	Supervisor Name	Dr. Muhammad Owais Raza Siddiqui (orazas@neduet.edu.pk)								

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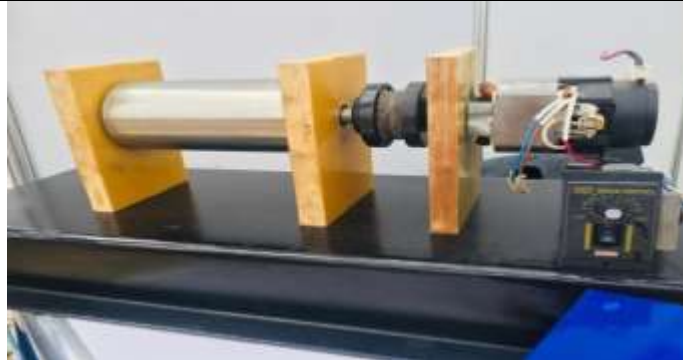


Figure 1: Collector Drum



Figure 2: Pipette holder



Figure 3: Pipettes



Figure 4: High voltage power supply