R & D Projects – 2017-18

1. GOVERNMENT SPONSORED PROJECTS

1.1 Completed projects

(i) Project title : Development of fabric smoothness tester (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :

- To design the apparatus as per the requirement of the concept
- To take preliminary trials on the developed/fabricated apparatus to verify/optimize the suitability of design and to modify accordingly (if required)
- To analyze smoothness properties of various fabrics using newly developed/fabricated apparatus.
- Patent is filed.

Research Outcome :

- Design work completed.
- Verification of design and development of apparatus completed.
- Analysis of woven and knitted fabric is completed and results are compared with Kawabata system for verification.
- Patent has been filed.
- Project completed. Report preparation work is going on.

(ii) Project title : Development of electronic drape meter based on image analysis technique (Sponsored by Department of Science & Technology, Govt. of India)

Objectives :

- To develop an instrument to measure fabric drape using image analysis principle
- To measure the accuracy of the developed instrument.

Research Outcome :

- An electronic fabric drape tester has been developed which will remove human bias and reduce the testing time drastically.
- The results will be very much useful for the fabric processors, garment and home textile manufacturers and commercial testing laboratories.

Electronic drape meter based on image analysis technique

- Technology to manufacture NITRA Electronic Drape tester has been transferred to M/s. Dinu Technologies, Coimbatore.

(iii) Project title : Development of smart protective textiles for fire fighter, soldier and old-age people (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :
- To develop smart/intelligent textiles to be used by fire fighters and soldiers
- To develop smart textiles for old age people for continuously monitoring their health condition from distance.
- To assess the performance of those garments at laboratory level.
- To take field trial with real fighters, soldiers & old age people.

Research Outcome :
- Garment has been developed using conductive yarn.
- Logics for communication from heart rate and body temperature have been finalized.
- In-house trials of the system have been started.
- Fabric and conductive fibre has been identified.
- Garments have been stitched & laboratory trials were conducted.
- As per decision of 8th PAC Meeting dated 23.3.18, the project has been closed.

1.2 Ongoing projects

(i) Project title : Development of protective work wear for cement porters (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :
- To determine the magnitude of occupational health hazards among cement porters.
- To design and standardize dustproof and comfortable material such as gloves, socks and workwear for cement porters which can suit the climatic and working conditions.
- To evaluate effectiveness of the developed material in actual practice and standardization of test methods.

Progress of work :
- Fabric samples were developed after intensive survey of cement user/ manufacturers.
- Fabric dust proof property analyzer has been fabricated and a patent has been filed.
- Designing of work wear and verification work is in progress.

(ii) Project title : Development of multi layered flame & thermal resistant

fabric for fire-fighter clothing (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :

- To study existing fire fighter clothing/suit being used in India for their suitability related to safety and other physiochemical properties.
- To study fire fighter/clothing suit used in developed country for their safety and physiochemical properties.
- To identify gaps in the existing fire fighter suits being used in Indian fire fighters in comparison to fire fighter suits of developed country.
- Development of multilayered fabrics using various weaves structure, fibres composition and finishing applications in the manufacturing of fibre fighter suit.
- To evaluate multilayered fabrics for its performance for safety and other physiochemical properties as per standard.
- Development of fire fighter clothing/suit.

Progress of work :

- Fire fighter suits were procured and their physiochemical properties were evaluated.
- Gaps were identified.
- Development of multilayered fabric for fire fighter suit is under progress.
- Evaluation of developed material is going on simultaneously.
- Provisional patent has been filed for thermal layer.

(iii) Project title : New Approaches to Reduce Water Consumption in Textile Wet Processing (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :

- To conduct preliminary trials to test suitability for various dyes, used for textile material.
- Designing and fabrication of equipment for dyeing and standardization
- Conducting dyeing trial on various types of textile materials
- To compare dyed material out of new approach and conventional dyeing method in terms of quality and consumption of water.

Progress of work :

- Preliminary trials in various units are in progress.
- Designing work of equipment for dyeing is in progress.
- Various approaches of dyeing are being tested to conserve water.

(iv) Project title : Development of value added product from different

Fibres in Himalayan Region (Sponsored by Ministry of Textiles, Govt. of India)

Objectives :

- To standardize a method for extraction of fibers from Pine Needles, Indian Flax, Nettle etc.
- Development of machines for extraction of fibres.
- To produce yarn with pure fibres and blends by optimizing mechanical parameters
- To develop various kinds of fabric utilizing those yarns
- To develop final products i.e. or home textile using these fabrics

Progress of work :

- Cultivation of flax fibres has been done.
- Extraction of fibre from Pine leaves have been standardized.
- Analysis of the fibres are in progress.
- Machinery manufacturers has been identified & purchase process is in progress.
- A patent has been filed regarding extraction of textile grade fibre from pine needles.

2. IN-HOUSE PROJECTS

2.1 Completed Projects:

(i) Project title : Extraction of textile fibres from pine needle and development of various products from it.

Objectives :

- To develop a method for extraction of fibers from pine needles.
- To produce yarn with pure fibres and blends by optimising mechanical parameters.
- To develop various kinds of fabric utilising these yarns
- To develop final products i.e. home textile using these fabrics.

Research Outcome :

- Preliminary study on extraction of fibre from pine needle has been done.
- Extracted fibres are blended with other fibres for manufacturing of yarn.
- Few fabric samples were developed.
- The evaluation of these fabrics have been completed.
- This project has been converted in to the Ministry of Textiles sponsored project “Development of value added product from different fibres in Himalayan Region”.

(ii) Project title : Development of work wear for electroplating workers

Objectives :

- To study and analyze the work wear clothing of workers in the plating industry and comparing it with the recommended standards to identify gaps if any.
- To develop suitable fabric for work wear using various fibre compositions, weave structures and finishing treatments followed by analysis to understand whether the fabric is meeting the requirement as per recommended standards.
- To design and develop work wear clothing to meet the safety and comfort requirements of the workers.

Research Outcome :

- Two fabric samples were found to be qualifying all the requirements of electro-plating worker's work wear amongst twenty fabric samples, identified initially.
- Project has been completed.

(iii) Project title : Treatment of khadi cotton fabric with herbal extract for developing reusable baby diapers

Objectives :

- To test the physical and functional properties of Khadi cotton fabric.
- To treat this fabric with anti-odor, anti-microbial and mosquito repellent finishes obtained from herbal extracts.
- To test the effect of these natural finishes on functional properties of the Khadi cotton fabric.
- To use this Khadi cotton fabric to develop reusable diapers for babies.
- To test the durability of these natural finishes on Khadi cotton fabric when it is in use.

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Research Outcome :

- Microcapsules have been formed.
- Application of finishes on fabric using pad dry cure method has been done.
- Testing of finished fabrics have been completed.
- Out of identified 15 samples, one sample was found to be qualifying all the requirement of reusable baby diapers.
- Reusable baby diapers have been developed.
- Project has been completed.

(iv) Project title : A study on extraction and application of sugarcane fibres in textiles.

Objectives :

- To explore extraction of fibres from the sugarcane bagasse and develop pure and blended sugarcane yarns using natural man-made fibres.

Research Outcome :

- Fibres have been extracted & treated with various chemicals & enzymes to get finer & smooth fibres.
- Extracted fibres have been converted into yarn. Fabrics and other products have been developed.
- Evaluation of characteristics are completed.
- Few products have been developed which indicated that there is a potential of application of sugarcane fibre in textiles.
- Project has been completed.

2.2 Ongoing Projects:

(i) Project title : Investigation on process variables on functional properties of cotton/corn blended fabric.

Objectives :

- To have critical study of the properties of corn fibres.
- To produce yarn samples using corn fibres with different manufacturing process variables
- To produce fabric using yarn samples produced from corn fibres using different parameters
- To have detailed investigation on the behavior of the process variables on the functional characteristics of the fabric
- To apply statistical tools and prepare mathematical models for predicting the functional behavior of corn blended material

Progress of work :

- To process the corn / cotton blends rotor spinning system has been taken for the experiments.
- Following variables have been chosen for the experiments during yarn manufacturing:
  - Rotor speed
  - Blend proportion
  - Rotor diameter
  - Opening roller speed
- Yarn evenness, imperfection and tensile properties were measured and the impact was assessed with the change in the process variables.
- Preparation of fabric with the produced yarn is under progress.
- Assessment of fabric performance will be done in terms of functional characteristics such as flammability, abrasion resistance, air-permeability, antimicrobial properties etc.

(ii) Project title : Development of New born baby kit

Objectives :

- To develop product specifications for the Baby Towel, Baby Nappy, Baby inner , Baby Cap , Baby Socks and

Mother's gown.

Progress of work :
- Product and Market survey completed.

3. Recently Sanctioned Project

(i) Project title : Development of Air Cleaner Home Textiles to Reduce Indoor Air Pollution

Objectives :

- Understanding nature of air pollutions in the indoor places using primary and secondary data and preparing research design
- To evaluate various finishing chemicals/materials having characteristics to absorb/reduce air pollution
- To select suitable fabrics and apply selected finishing chemicals using various techniques
- To evaluate finished for various physico-chemical and performance properties.
- To take field trial of developed fabric in actual practice and modified, if required.

4. Proposed Projects

(i) Project title : Development of Improved Body Protector for Defence Forces

Sponsoring Agency : Ministry of Textiles, Govt. of India

Objectives :

- To study existing body protectors being used by Indian defence forces with respect to its suitability to protect them from various hazard like stabbing, impact and puncture.
- To evaluate the material to be used for various parts of body protector as per the requirement of para-military forces and Indian Climatic conditions
- To design and develop body protector for men and women paramilitary personnel.
- To evaluate body protector for its performance, for safety and other physiochemical properties as per existing defence standard
- To take field trial of developed body protector in actual practice and modified, if required.

(ii) Project title : Development of stab, impact and puncture testing instrument for body protector

Sponsoring Agency : Department of Science & Technology, Govt. of India

Objectives :

- To design the instrument as per the requirement
- To develop/fabricate the instrument as per design
- To take preliminary trials on the developed/fabricated apparatus to verify/optimize the suitability of design and if require to modify accordingly
- To analyse body protector samples for stab and impact resistant properties using newly developed/fabricated apparatus and verify the tested results with the same samples tested in the international laboratory