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Workshop Report

Institute-Industry Interface Workshop

on

Newly developed fabric flexural rigidity tester, yarn characterisation unit and fabric electrical insulation tester for technical textiles

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An Institute-Industry Interface Workshop was held on 12 February 2015 at National Institute of Research on Jute And Allied Fibre Technology (NIRJAFT), Kolkata 700 040 to present and promote three testing equipments, namely 'fabric flexural rigidity tester', 'yarn characterisation unit' and 'fabric electrical insulation tester',which are designed and developed by the joint effort of NIRJAFT, Kolkata and Indian Institute of Engineering Science and Technology (IIEST), Shibpur, Howrah in collaboration with M/s Tech (Style) India, Howrah with the assistance of Department of Science and Technology (DST), Ministry of Science and Technology, Govt. of India. The workshop was inaugurated by chief guest Prof. Ajoy Ray, Founder Director, IIEST, Shibpur & former Vice-Chancellor, Bengal Engineering and Science University, Howrah in presence of guest-of-honour Dr Subrata Gupta, Jute Commissioner Govt of India; Dr. Debasis Nag, Director, NIRJAFT and Dr B C Mitra, Ex-Director, NIRJAFT, Kolkata and dignitaries from academic institute and industries. In the welcome address, Dr D Nag has elaborated the importance and role of institute-industry interface workshop and mentioned that the concept has been coined by Indian Council of Agricultural Research, the Apex body of NIRJAFT and DST, Govt of India with the idea to get the first step of commercialisation, where any fruitful research or development will be showcased to beneficiaries or stakeholders to rectify the technologies as per the suggestions of experts and stakeholders. Dr S Gupta, the guest of honour, emphasised to develop the technologies according to users' desire and it should be simple to operate, with low manufacturing as well as maintenance cost, and compact. Moreover, measurement and standardisation of testing equipment should be précised and sometimes it should be portable to measure online or in the field. He congratulated the researchers for the development of present equipments and wished for the successful commercialisation. Dr A Ray, the Chief Guest, encouraged the joint effort in characterisation of yarn and fabric. With the quotation from Gurudev Rabindranath Tagore, he requested to use the natural materials. He pointed out the commendable jobs of the researchers which has not been reached to the people. He also requested to go to media if they do not come to us of their own. Dr Ray encouraged the developers of present equipments and suggested to collaborate with Indian Institute of Technology in future works. The inaugural programme was ended with the hearty vote of thanks by Dr Gautam Bose, Head, Mechanical Processing Division, NIRJAFT, Kolkata. Ninety-five delegates from twenty eight organisations (Teaching and research institutes, promotional bodies and industries) were present in the occasion.

The first presentation was given on 'Computerised Instrument of Fabric Flexural Rigidity Tester' by the Principal Investigator, Dr Surajit Sengupta, Principal Scientist, NIRJAFT Kolkata in association with Dr Sanjoy Debnath, Co-investigator, NIRJAFT, Dr Anindita Sengupta, Co-investigator, IIEST and Mr Tarun Kr Kundu, SRF. Dr. Sengupta elaborately discussed about flexural rigidity, its importance and need, the shortfall of existing measuring systems, principle of operation of developed instrument, specification/features, testing procedure with calibration, graphs, data, report and information

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available, accessories needed to test, precautions, maintenance and troubleshooting by operator. This instrument was developed with the collaboration of Tech (Style) India, Howrah, and then tagged with industry for future production on demand. The measuring unit was supplied with computer, printer, set up disk, and operating manual. He pointed out that this mechanised and computerised instrument is simple, user friendly, informative and of low cost. After discussion, the instrument was demonstrated to the stackholders.

The delegates from industry appreciated the endeavour and opined the modification in fabric clamping jaws to make the fabric mounting easier. They suggested some changes in report preparation, software as well as standardisation by more testing. They also opined that it is very much useful for semi-rigid technical textiles and attempt can be made to extend it on ropes, which will increase its versatility. Interest from one/two stakeholders will not make it cost effective. At least order of 5-10 equipments simultaneously can make the instrument economically viable.

The second presentation was given on 'Yarn Characterisation Unit' by Principal Investigator Dr Anindita Sengupta, Associate Professor, IIEST, Shibpur, Howrah in association with Dr Surajit Sengupta, Co-investigator, NIRJAFT, Dr Konika Das Bhattacharyya, Co-investigator, IIEST and Mr Subhasis Roy, SRF. At the outset, Dr. Anindita elaborated the specific properties/features that the developed system can monitor with dual sensing mechanism, and usefulness of dual sensing over single one. During discussion regarding the motivation for this particular development, she aptly mentioned the huge cost and fixed resolution along with dependence of responses with the change in ambience of the existing commercial one. With a brief comparison among principles of existing and newly developed instruments, Dr. Anindita clearly demonstrated the consecutive steps involved in using the equipment along with available responses. The same was displayed in video also. Irregularity and yarn faults are primarily detected in terms of diameter by the new instrument in contrary to that of mass. As the internationally accepted variability indices are in terms of mass, an attempt was made to convert diameter to mass with supplied tex value. But as per the suggestions coming from participating industries, diameter may be taken as basic variable for irregularity estimate. So, representation with respect to mass may be avoided for simplification. As image production is a slower process at least with existing camera and processor, some industries show their concern about high speed measurement, but the other way of sensing is not restricted by speed limitation, as explained by Dr Anindita. Persons from manufacturing sectors appreciated the good effort to have the CAD drawing and instruction manual. Initially, the instrument was run by 65 tex cotton. During demonstration, one participating industry showed interest on the result from jute. It was also tested successfully. One valuable suggestion, came from Hon'ble Jute Commissioner, was to use imaging for fibre orientation analysis. Some special features of the instrument like colour shade identification of the sample yarn and/or hairiness indices evaluation was also appreciated by some of the participants.

Dr Surajit Sengupta, Principal Investigator, presented the third equipment 'Fabric Electrical Insulation Tester' before the stakeholders. Dr Sanjoy Debnath and Mr Sujoy Das of NIRJAFT and Dr Anindita Sengupta of IIEST were also associated with this development. Dr. Sengupta elaborately discussed and demonstrated about the need of measuring electrical insulation, principle of operation of developed instrument, specification/features, testing procedure with calibration, accessories needed to test and precautions. The resistance value of sample is available in terms of Mohm in the LED display just by pressing a knob. It will also be tagged with industry for future production on demand. The measuring unit will be supplied with operating manual for reference. The instrument is simple, user friendly, informative and low cost.

The stakeholders present in the workshop showed a great interest on this equipment. They expressed that it is very much useful for those industries which are producing electrically insulating jackets, gloves, floor coverings, etc in addition to teaching and research institutes. The delegates from industry appreciated the endeavour and highlighted the versatility (applicable for a wide range of fabric). But before going to stakeholders, the process should be approved by BIS and norms for insulation value should be established internationally. Such type of interaction meet with stakeholders and widespread circulation of information via journals, seminars, etc may help to promote the instrument. The programme was ended with hope of successful commercialisation of both the equipments as desired by the stakeholders who have attended the workshop.