International Committee on Cotton Testing Methods (ICCTM)

# Progress Report 2014

Proceedings of the ICCTM Meeting in Bremen, March 18th, 2014

Bremen Cotton Exchange

Wachtstrasse 17-24, 28195 Bremen, Germany

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| Chair: | M.N. Vijayshankar, Recron, Malaysia (Chair ended in 2014) |
| Chair: | Axel Drieling, Faserinstitut Bremen e.V., Germany (elected 2014) |
| Vice Chair: | Mona Qaud, Uster Technologies AG, Switzerland (elected 2014) |

## Preface

The International Textile Manufacturers Federation (ITMF) is an international association for the world's textile industries, dedicated to keeping its world-wide membership constantly informed through surveys, studies and publications and through the organisation of annual conferences, participating in the evolution of the industries basic raw materials and their application, through specialised committees, with the overall objective of creating growth and prosperity in all aspects of industry.

The International Committee on Cotton Testing Methods (ICCTM) is a non-profit technical subcommittee of ITMF. The main function of the Committee is to encourage research and development for enhanced testing methods, to recognize suitable test methods, to identify reference test methods, to harmonize cotton testing results and to discuss testing related problems.

The mandates of the Committee are:

1. Encourage research into the basic science needed to develop commercially useful tests.
2. Encourage the development of enhanced testing methods.
3. Recognition of instruments and testing methods that are able to perform within allowable tolerances, and that achieve a result that correlates with a reference method.
4. Identification of reference methods.
5. Harmonize cotton testing results by means of
    a. proposition and support for the international standardization of test methods
    b. development of guidelines for testing
    c. technical evaluations using world-wide round tests.
6. Discussion of problems related to testing of cotton fibre properties and their relations to cotton processing.

## Introduction

Dr. Christian Schindler, Director General of the ITMF, welcomed the members and observers of the ITMF International Committee on Cotton Testing Methods in Bremen. About 40 people attended this year's meeting. He expressed his sincere thanks to the Fibre Institute Bremen

(FIBRE) as well as the Bremen Cotton Exchange, that this meeting could take place again in Bremen, after starting in the 1980s. He welcomed also the members of the ITMF Spinners Committee as well as the observers from the ICAC Task Forces. He informed the Committee that the current Chairman, Mr. Vijayshankar, sent his apologies for not being able to attend the meeting.

Dr. Schindler presented the agenda of the meeting, this time having again consecutive meetings. No changes were requested.

Interested parties are welcome to apply for membership at the ITMF by sending an email to secretariat@itmf.org.

The word was handed over to the Vice Chairman of the ICCTM, Mr. Axel Drieling, who also welcomed the participants and introduced the members of the Executive Committee. Since 2012, there are no specific task forces anymore, but one joint Executive Committee. Besides the Chairman, the ICCTM Executive Committee consists of:

- Mr Axel Drieling — Faserinstitut Bremen (FIBRE), Germany, contact: drieling@faserinstitut.de
- Dr. Stuart Gordon — CSIRO, Belmont, Australia, contact: stuart.gordon@csiro.au
- Dr. Jean-Paul Gourlot — CIRAD, Montpellier, France, contact: jean-paul.gourlot@cirad.fr
- Mr. Jimmy Knowlton — USDA AMS, Memphis, USA, contact: james.knowlton@ams.usda.gov
- Dr. Malgorzata Matusiak — Institute of Textile Architecture, Lodz, Poland, contact: malgorzata.matusiak@p.lodz.pl
- Ms. Mona Qaud — Uster Technologies, Uster, Switzerland, contact: mona.qaud@uster.com
- Mr. René van der Sluis — elected in 2014, CSIRO, Australia, contact: Rene.Vandersluijs@csiro.au

The Steering Committee comprises the following cotton / textile experts:

- Dr. Terry Townsend — ICAC, Washington, USA
- Mr. Andrew Macdonald — Spinners Committee, Brazil
- Mr. Darryl Earnest — USDA-AMS, Memphis, USA
- Mr. Christoph Färber — Trützschler, Germany
- Mr. Karsten Fröse — Bremer Baumwollbörse, Germany

Mr. Terry Townsend, as Chairman of the Steering Committee clarified the purpose of the Steering Committee. It would like to assist as well as give strategic guidance to the work of the ICCTM. If funds are required to conduct research in certain areas of interest to the Committee, they would assist in identifying possible resources. From their point of view the most important parameters for cotton testing are Length (especially SFI), followed by Neps and Maturity, Stickiness as 3rd parameter, and Color being 4th in the ranking of importance. They would appreciate if presentations given were summarized in advance, and discussions should be decision-oriented. A separate report of the Steering Committee prior to and after the ICCTM Plenary Meeting is available.

After presenting the items of the agenda, Mr. Drieling passed on the word to Ms. Mona Qaud who is coordinating the topics related to HVI.

## HVI Topics
**(Coordinated by Ms Mona Qaud: Uster Technologies, Switzerland)**

| Author | Theme / Topic |
|---|---|
| Chris Delhom, USDA-ARS SRRC | Understanding the role of fiber length in HVI measurement |
| James Knowlton, USDA-AMS, Memphis, TN | Update on auto-micronaire |
| Rene van der Sluijs CSIRO | Overview of the Australian Classing Sector |
| Axel Drieling FIBRE | Modifications in the ITMF-ICCTM / ICAC-CSITC Guideline on Instruments |

Chris Delhom from USDA, ARS showed a trial in which he evaluated the impact of length on the strength and elongation measurement. His findings were that the breaking of the clamp for strength takes place at different levels of lengths, thus taking into account the amount of fiber for breaking. The fiber elongation is apparently dependent on fiber length as well as on amount.

James Knowlton from USDA, AMS gave an update on the installed AutoMIC on their HVI 1000 instrumentation. The first units were acquired in 2012 and are a big leap into automation of the measurement. Specimens have now a wider range of 8- 15g for Micronaire to be tested. Some challenges had and have to be mastered, but the potential is that the testing volume can be increased and operator error minimized. USDA plans on to continue this implementation.

In this context Guntram Kugler mentioned that the influence of trash on Micronaire is an important topic to consider.

René van der Sluis, CSIRO Australia, presented an update on the Australian classing sector. There are 5 classing facilities throughout the country totaling 24 HVI instruments. Quality properties to be considered are Length, UI, Mic, Strength, Rd and +b. They do periodic tests to check on the performance and repeatability of the equipment. Their aim is to achieve a reproducibility of above 80% for retests. Another analysis is the comparison of the Australian instruments' performance in the CSITC Round Trials compared to the median of all participating instruments.

Axel Drieling mentioned that comparing the performance of the national HVI instruments to all participants is a good example that should be followed by all cotton producing countries. On Mike Watson's question, René mentioned that a national database for Australian cotton is not planned in short term.

The CSITC Task Force and the ITMF ICCTM are since 2012 jointly issuing the Guideline for Standardized Instrument Testing of Cotton. The reason for creating it was to have one central and comprehensive document, replacing the former ITMF HVI User Guide as well as including USDA and CSITC recommendations. Axel Drieling, Bremen Fibre Institute, collected proposals for modifications from 2012 to 2014 and presented them in the Committee. All changes were approved by the Committee, so that the new version 2.0 is now valid. The guideline will, thanks to ICAC, Cotton Incorporated and ABRAPA, be translated into French, Arab, Russian, Spanish, Portuguese and Chinese. The latest version of the guideline can be downloaded via www.CSITC.org or the ITMF website (www.itmf.org) or the ICAC website (www.icac.org).

## Length and Strength Topics
**(Coordinated by Mr Axel Drieling: Faserinstitut Bremen, Germany)**

| Author | Theme / Topic |
|---|---|
| Shouren Yang CSIRO, Australia | Elongation measurement |
| Eric Hequet FBRI, TX | Comments on importance of elongation and improvements in measurement |
| James Knowlton USDA-AMS, Memphis, TN | Reference methods and material for short fiber content |

### Elongation
Shouren Yang from CSIRO, Australia presented a new method for measuring the elongation of cotton, the Tensor Bundle Elongation measurement. It showed reasonably good correlation with singe fibre elongation (on Favimat). This correlation can be improved significantly when looking at specific single fibre elongation (elongation per fibre fineness) and at specific tensor bundle elongation (tensure bundle elongation per bundle fineness).

It was concluded that this is a very interesting approach and it should be continued looking at it.

Eric Hequet, FBRI, showed in his presentation the importance of cotton fibre elongation for predicting yarn properties; Yarn work to break can be improved by 50% by looking at fibre elongation. He noted that different HVI instruments resulted in different elongation results, but for the samples he looked at, the ranking between the samples was similar for all instruments. Hence he developed methods for calibrating HVI elongation measurement.

Hossein Ghorashi, Uster, commented that many challenges are given when testing fibre elongation. Whereas measuring very low length differences, a high crimp influence is given. It is important to correct elongation results for the instrument deflection. Additionally the brushing force is of greatest importance, so that the brushing force should be checked.

Summarizing, elongation is important for fibre processing and yarn properties and should be looked at. Improvements in bundle measurements are suitable for e.g. brushing and crimp. It will be interesting to look at specific elongation.

### Short Fibre Content
Asking for suitable definitions for short fibre content, Christian Färber explained that Short Fibre Content is important, but SFC and SFI are quite weak parameters. Lower Half Mean Length (LHML) might be more reproducible and hence better. When looking at the length limit, 12.7mm should be preferred to 16mm. Jimmy Rodgers and Leon Cui explained that LHML is more reproducible than SFI. Eric Hequet added that the full length distribution instead of the parameters is most important. Finally Hossein Ghorashi concluded that as the initial step, the actual fibre length distribution has to be measured.

James Knowlton, USDA-AMS, showed in his presentation that since the introduction of SFI calibration cotton reference results, the inter-laboratory variation in CSITC Round Trials was reduced from 20% in 2011 to 12% in 2013.

In a final discussion, Hossein Ghorashi mentioned that an introduction of LHML into the given instruments would be possible. LHML might be important because of the level, but would not reduce the variability. He proposed to start with few instruments to test for this new parameter.

Summarizing, Short Fibre Content is important for spinners. The basis for measuring it is to look at the actual measured length distribution instead of extracting it from long fibre results. The discussion of the short fibre length limit, 12.7 or 16mm, might be less important than a

relative parameter like LHML. It was agreed that it will be useful to introduce LHML in single instruments and to cooperate with defined spinning mills for seeing the benefit.

## Stickiness Topics
**(Coordinated by Dr. Jean-Paul Gourlot, CIRAD PERSYST LTC, Montpellier, France)**

| Author | Theme / Topic |
|---|---|
| Dr. Jean-Paul Gourlot CIRAD | International RT on stickiness in relation to spinning performance Presentation A & Presentation B |

Jean-Paul Gourlot explained that stickiness originates from various sources: vegetal parts, oil traces, waxes, plant sugars and insect sugars. The most important and problematic cause of stickiness is due to the entomological sugars from insects. Stickiness induces production and quality losses as sticky points remain in the material from fibers in the field to the textile processes. The behavior of contaminated fibers during processing is highly dependent upon the quantity and the type of the main sugars present in fibers in relation to the transformation machine types and settings as well as on the conditions of transformation.

Various techniques may be used to estimate a possible contamination of fibers by honeydew. The main goal of these measuring techniques is to 'predict' processing problems that could occur in the industry such as problems in quality and in productivity when using 'sticky' cottons. These techniques may be categorized in four categories: chemical methods for measuring sugar contents, physical, mechanical and thermo-mechanical techniques (mostly measuring stickiness contamination). No recognition of measurement technique has been asked this year.

An International Round-Test (RT) on Stickiness has been conducted by Jean-Paul Gourlot (CIRAD) using various testers and a range of cottons to check if all used measuring techniques are able to measure stickiness, and to check if their results are comparable to each others. First RT results were reported in the session and a report is available on the ITMF website. It was observed that the meanings of the results provided by the various measuring techniques are not equivalent, even though they intend to measure/predict the same phenomenon: stickiness. Additionally, differences in levels of readings, both within laboratories using the same technique and between techniques, were observed. This indicates a potential axis of improvement, which could be oriented toward a harmonization of the measurement of this cotton characteristic.

This study was organized also to measure the ability of the existing measuring techniques of stickiness to predict stickiness problems as observed in an extensive test in a micro-spinning mill. However, no information can be released at this point as data analysis is still ongoing; a second part of the report will be edited during 2014 and distributed among members when ready.

Future actions on this topic by the Committee could be to:

- Continue/finalize the study and submit reports to the Committee;
- Continue the search for a reliable measuring device; particular attention should be given when stickiness potential level is low for its un-foreseen consequences in spinning;
- Recheck old techniques for reconsidering the recognition of old instrument as reference and/or recommendation (true for every ICCTM topic);
- Evaluate the impact of various cropping systems onto stickiness (with low to high crop protection means);
- Try to make progress in the harmonization of the stickiness measurements results.

Reminder:

- KOTITI developed an ISO standard 12027-2012(E) for describing its technique (please get in touch with Dr. Joong-Sik Yang: js_yang@kotiti.re.kr ).
- Production, marketing and service of the SCT and H2SD (CEN_NF_14278-1&2, 2004) is available at PRODEV in Montpellier, France (please get in touch with Daniel Fuentes: contact@prodev-system.fr).

## Recognition Topics

| Author | Theme / Topic |
|---|---|
| | Recognition criteria and procedure |
| Daniella Messa, Mesdan, IT | Recognition – Aqualab |

Axel Drieling summarized that it was decided 4 years ago that the ICCTM will no longer recommend any test methods, but introduce a recognition of test instruments/methods, recognizing those newly developed instruments and methods that are beneficial for the cotton value added chain. Recognition does not mean that an instrument is superior to another, but that all information was delivered to the ICCTM and published, so that the Committee and the later instrument users can assess its usefulness and benefits.

Principally the following 3 distinct areas for recognition are agreed upon:
- Testing for spinning mill purpose (prototype recognition or full method recognition)
- Instrument cotton classification (currently not applied)
- Reference testing (currently not applied)

The background, the criteria, the information to be delivered and the procedure are stated in a separate file and are available on the ITMF-ICCTM-Website.

Currently two instruments have been recognized:
- Textechno Fibrotest
- Premier aQura 2

When asked about the impact of the recognition, Guntram Kugler from Textechno answered that currently not much impact can be noticed from customers' side. Nevertheless, it is beneficial to have collected all information and to provide this information to potential customers.

Stuart Gordon introduced to the next candidate for recognition, which is the Aqualab by Mesdan in Italy. With this instrument, the moisture content of cotton samples can be measured fast and reproducibly.

Daniella Messa from Mesdan presented all information that was collected for the recognition of the Aqualab. The moisture measurement is obtained through a measurement method based on microwave low power resonance technology with the resonance field characterized by specific parameters, dependent on the amount of water contained in the product. The measurement is fast and independent of the total fibre mass of the sample analyzed. The full presentation and the recognition text can be found on the ITMF.org website.

After some discussion and clarification, the Aqualab was recognized unanimously by the ICCTM. Nevertheless, it was stated that
- the recognition based on 3 instruments in one laboratory only should be reasoned in the recognition text.
- the Committee recommends Round Trials with other laboratories.
- the Committee recommends to do comparisons with the Karl Fischer Titration.

James Rodgers from USDA-ARS in New Orleans offered to support these activities.

Stuart Gordon explained that currently the recognition of the CottonScope is planned, but not formally asked for.

## Fineness / Maturity Topics
**(Coordinated by Dr. Stuart Gordon, CSIRO, Belmont, Australia)**

| Author | Theme / Topic |
|---|---|
| Dr. James Rodgers USDA-ARS SRRC, New Orleans, USA | Maturity result comparisons between different instruments |
| Hossein Ghorashi, Uster Technologies, USA | AFIS and HVI maturity measurement |
| Dr. Stuart Gordon, CSIRO, Australia | Review of Cottonscope tolerances for module averaging |
| Abeer Arafa, CRI Egypt | Maturity based on HVI results |

Four presentations were made on Fineness and Maturity.

Dr. James Rodgers from the USDA SRRC presented a selection of results on samples measured by Cottonscope, AFIS and HVI, and results where Cottonscope specimen size (mass) had been varied. Results from the different test methods showed a lack of sensitivity by the AFIS and HVI instruments in being able to measure the full range of MR values in a set of cottons. Comparisons between Cottonscope and AFIS for the FIN and MIC results reported were closer. In work with CSIRO, Dr Rodgers compared the sensitivity with which Cottonscope and AFIS reported the distribution of MR values in a sample. The work involved mixing set proportions of two cottons of different maturity. The Cottonscope instrument was able to show clear differences in the distributions of these mixes. In another work with CSIRO, the effect of specimen weight on Cottonscope results was examined. Specimen sizes ranging from 90 mg down to 10 mg were measured. The reason for this work is that only very small specimens from cotton breeding researchers are available and only Cottonscope is able to test these samples. Dr Rodgers showed a systematic bias in Cottonscope values associated with changed specimen mass that could be overcome by calibrating Cottonscope to a particular specimen mass.

Hossein Ghorashi from Uster Technologies reported on the history of the original AFIS and HVI MR calibrations and introduced a new calibration that improves the sensitivity of these instruments in measuring MR. The new calibration, based on Dr Eric Hequet's 104 reference cottons, have been applied to the HVI 1000 and the AFIS-PRO2. The new calibration showed improved sensitivity to the MR range in test samples and improved correlation with reference values. Mr Ghorashi's work provides an excellent remedy to the work reported at this meeting by Dr Rodgers on the poor sensitivity of MR measurements by AFIS and HVI.

Axel Drieling indicated that with a change of the maturity parameter in the given instruments it should be assured that the results based on the old definition should not be mixed up with the results based on a new definition. This should preferably be assured by giving a different parameter name.

Dr Stuart Gordon reported on work examining the number of Cottonscope samples required to be measured to achieve similar precision as HVI test values used in module averaging

regimes. For example, Australian classers test one in three bales and then apply the average of the tested bales to the untested samples in a module. Two bale runs of 600+ bales were tested. Dr Gordon showed that for these bale runs (clean, irrigated cotton) that only two test specimens (50 mg) per (bale) sample were required to achieve the precision in MIC and MR values measured by HVI. The precision of Cottonscope FIN results for these runs was similar to values previously reported by Dr Geoff Naylor et al of CSIRO for inter-laboratory trials of the Cottonscan, the FIN measuring technology before Cottonscope.

Prof. Mohamed Negm from the Cotton Research Institute in Giza, Egypt presented work on behalf of his colleague Dr Abeer Arafa. Dr Arafa has developed a software to convert HVI MIC and MR values to fibre cross-section values using accepted conversions reported by Lord and other workers. The converted values correlated very well with image analysis data.

## Neps and Trash Topics
**(Coordinated by James Knowlton, USDA-AMS, Memphis, USA)**

| Author | Theme / Topic |
|---|---|
| James Knowlton<br>USDA-AMS, Memphis<br>TN, USA | Progress Report on Leaf Grade by Instrument |
| Rene van der Sluijs<br>CSIRO | Extensive Review on Neps |
| Dr. James Rodgers,<br>USDA-ARS SCCR<br>New Orleans, USA | Preliminary results on new spectroscopic cotton trash measurements |
| Hossein Ghorashi Uster<br>Technologies, USA | Summary of non-lint content measurements |

James Knowlton from USDA, AMS gave a progress report on leaf grade by instrument. Since the 2011 U.S. cotton classification season, USDA has replaced the manual classer with the Uster HVI 1000 for determining leaf grade. The HVI trash measurements of Percent Area and Particle Count are used for making the leaf grade determination using a conversion table. HVI trash measurement reproducibility has improved over the years at USDA. Since 2006, Percent Area Reproducibility has increased from 81% to 86% while Particle Count Reproducibility has increased from 80% to 93%. The role of the cotton classer at USDA is now only to identify the existence of extraneous matter (bark, grass, seed-coat fragments, prep, etc.). Efforts are underway at USDA to develop instrumentation to identify extraneous matter. The concept is to utilize detailed image analysis over a large area of the cotton sample to provide extraneous matter identification as well as improved color and trash measurements.

Rene van der Sluijs from CSIRO in Australia discussed CSIRO's intentions of performing an extensive review on neps. Although neps have been identified as a major quality issue in cotton production and processing as far back as the late 1700s, no comprehensive review has been conducted on the formation, composition, measurement, consequences and ways to reduce the effects of neps. A major aim of this work is to compile a comprehensive review of the literature with the objective of publishing the review as a definitive review of cotton neps.

James Rodgers from USDA, ARS, SRRC gave some preliminary results on new spectroscopic cotton trash measurements. At present, most "high speed" rapid cotton trash measurements yield the total trash content, not the trash content by type. Several techniques are underway at SRRC to measure the type trash content by trash type, using near infrared (NIR), Fourier transform infrared (FTIR), and FTIR-imaging techniques. Field trash has been successfully identified, rapidly and accurately, using NIR techniques. Both NIR and FTIR techniques have been developed that accurately identify cotton and several botanical trash components. However, difficulties have been encountered when these methods were used on mixed systems (2 or more botanical trash types mixed with cotton). A NIR technique has been

developed to measure leaf trash and non-leaf trash, but further trash component separation by standard NIR and FTIR techniques has not been achieved at this time. A new technique, using chemical imaging with FTIR spectroscopy, shows much promise for botanical trash component identification, in which the distinct chemical signatures for each botanical trash component and cotton is obtained and imaged.

Hossein Ghorashi from Uster Technologies, Inc. discussed the need for direct trash measurements within the cotton industry. Examples include the China classing operation and markets wishing to trade cotton based on trash weight within the bale. Uster has developed a gravimetric based trash measurement instrument named the GT1000 with a trash-fiber separation efficiency greater than 90% with a single pass. The instrument is designed with a cycle time of 60-90 seconds for a 30 gram sample. Application of a high resolution camera with special imaging algorithms are used to further increase the accuracy of the measurement. The instrument is highly automated with no intervention by the operator in weighing and discarding trash. Test results show repeatability and reproducibility among three instruments over a 30 day period with SD of 0.35% and CV of 6.5%.

Summarizing, USDA was encouraged to continue its efforts to test extraneous matter like bark, grass and seed coat fragments with instruments. It was mentioned that more than just one level of image analysis is possible, specifically by looking at additional spectral information.

## Colour Topics
**(Coordinated by Dr. Malgorzata Matusiak, Institute of Textile Architecture, Lodz, Poland)**

| Author | Theme / Topic |
|---|---|
| Malgorzata Matusiak, ITA, Poland | Color measurement by DigiEye |
| J-P Gourlot, CIRAD Aboe-M, Lukonge-E | Within-bale variability study of color |
| James Rodgers, USDA-ARS SRRC | Within bale sample variation on color |

The discussion on colour related topics concerned two main aspects:

- alternative method of an instrumental colour measurement
- within-bale variability of colour

Małgorzata Matusiak from the Institute of Textile Architecture, Lodz University of Technology (Poland) presented the results of colour measurement by means of the DigiEye. The DigiEye is a computer controlled digital camera system for measuring colour and capturing high quality repeatable images. An image is captured by the calibrated digital camera, and next colour measurement of the object image is performed by the DigiEye software. Performed investigations showed that the results from the DigiEye are comparable with the colour HVI readings. However, in order to apply the DigiEye to cotton assessment and classification in the future, it is necessary to elaborate the procedure of sample preparation for the measurement.

Jean-Paul Gourlot from CIRAD (France) spoke about within and between bale variability of instrumental colour data. Measurements of cotton samples originated from 14 African countries indicated that the values of the SD for Rd results are in the range from 0.25 to 3.0, whereas for +b – from 0.15 to 0.65. The colour variability is much bigger for the saw ginned cottons than for the roller ginned.

Within-bale variability of colour has been also confirmed by the results presented by James Rodgers from the USDA-AMS (US). The values of SD and CV of the colour results from the HVI are significantly higher than the values of SD and CV of the L, a* and b* results from the spectrophotometer.

Both discussed topics seem to be important for precise cotton testing and they can be an object of further investigation.

## Additional Topics
**(Coordinated by Mrs Mona Qaud: Uster Technologies, Switzerland)**

| Author | Theme / Topic |
|---|---|
| Dr. Eric Hequet, TX | Improved predictability of spinning behaviour using HVI + AFIS |
| Dr. Souzan Sanad CRI, Egypt | Standard spinning tests used by CRI |
| Dr. Christian Schindler, ITMF | ITMF Cotton Contamination Survey (Presentation not held, but survey available on www.itmf.org) |

Dr. Eric Hequet of Texas Tech and Texas A&M shared a study, how breeders can improve the fiber properties. He selected 110 different bales with different cotton properties. Fiber quality was evaluated on AFIS, but also with HVI. He spun all fibers into –Ne30 ring yarns and evaluated the UT3 and UTR results. Then regression analysis was performed of the fiber and yarn properties. When only taking HVI values for the tensile properties the $r^2$ ranked 0.6 and 0.7 – but could improve up to 0.85 when taking also AFIS values into account. For the Yarn imperfections – the original values were at a level of 0.45- 0.65, and could improve up to 0.75 to 0.80 when taking also AFIS values into the equation.

He showed also the impact of Fineness on tensile properties, but also thin places – finer fiber diameter will lead to stronger yarn with less thin places. He suggested that breeders should not only consider HVI values for their optimizations of cotton selections, but add test results like from AFIS.

Dr. El-Sayed and Dr. Suzan Sanad showed their spinning tests which are done at their laboratory in Giza, Egypt. The tests were developed to evaluate different seeds for selection. The institute is using three phases for spinning, starting with 60 g on the microspinning and ending on 5kg of raw fiber on the ring or compact spinning technique. By this they give the breeder not only the fiber quality results, but predict also the outcome in the yarn for tensile properties, but also for the evenness and IPI. By this, varieties and their spinning performance be evaluated. In this manner thousands of samples (19.000) are evaluated each year.

Axel Drieling started a discussion on suitable climate conditions in laboratories. It is well known that the relative humidity has got a large impact on the measured cotton strength as well as length. Temperature is not influencing the measured strength as much, but is, when not kept constant, changing the relative humidity based on constant absolute moisture content in the air. As many laboratories in hot countries got difficulties in cooling down their laboratories to a constant level of 21 °C, it may be appropriate to allow testing at a higher temperature level, still keeping close temperature and humidity tolerances. This was given in the withdrawn ISO 20139, allowing 27°C for tropical regions, but is not included in ASTM 1776 or ISO 139.

In the discussion it got clear that much work will have to be done for moving into this direction.

- It has to be analysed, whether the cotton properties depend on the relative humidity, the absolute water content of the air or the moisture content of the fibres.
- It has to be assured that the test results for all properties stay on the same level.
- It has to be assured that the test result variation does not exceed the variation at 21°C / 65% humidity
- And in any case any change should not allow or seem to allow the laboratories to take less care on the climatic conditions in their rooms.

Finally it was decided that Axel will get into contact with voluntary laboratories for following up on that topic. USDA-AMS in Memphis, USDA-ARS in New Orleans and CIRAD mentioned their interest.

## Closing Plenary Meeting and Final Remarks

Dr. Christian Schindler informed the Committee that the current Chairman, Mr. Vijayshankar, had contacted him prior to the meeting apologising that he could not attend the meeting and that he would unfortunately not be available for another term as Chairman. Therefore, Mr. Schindler proposed Mr. Axel Drieling as a candidate for the position of Chairman and Ms. Mona Qaud for the position of Vice Chairwoman. Mr. Andrew Macdonald seconded this proposal. Mr. Drieling and Ms. Qaud were elected unanimously. Mr. Drieling stated that with Mr. Vijayshankar an important source from the spinners' community left the Executive Committee. Since the input from the spinners' side is and remains necessary also in the future he asked all Committee members and especially the Steering Committee members to provide the Committee with the necessary input from spinners.

Dr. Schindler proposed to re-elect all the members of the Steering Committee. Dr. Gourlot seconded this proposal. The re-election of all Steering Committee members was supported unanimously as well.

It was proposed by Mr. Drieling to include as an additional member of the Executive Committee, focussing on the new topic spinnability, Mr. René van der Sluis from CSIRO, Australia. This proposal was second by Andrew Macdonald. Mr. van der Sluis was elected unanimously.

Dr. Gourlot asked ITMF to make the proceedings including all presentations available to the public, as all members/presenters are interested in maximum impact. Dr. Schindler promised to do so by making everything available not only on the ITMF-ICCTM-website but also on the ITMF-website.

The next Plenary Meeting of the ICCTM is planned to take place again one day prior to the Bremen Conference in March 2016. The Committee and its Chairmen will be happy to see all interested people in 2016.

For the time up to the next meeting it was proposed to have more intense interaction between the Executive Committee and the Steering Committee by conducting joint meetings and regular telephone conferences.

Dr. Schindler thanked everyone for the fruitful discussions, the participants for their valid inputs, and the presenters for their contributions.

Dr. Schindler thanked Ms .Qaud and Mr. Drieling for their excellent preparation of the meeting and the coordinators of the different topics for their efforts.

Finally, he thanked the sponsors of the ICCTM-website from the cotton and instrument machinery industry. With a closing remark, relating to the CSITC Task Force meeting on the following morning, Wednesday (March 19th, 2015), the meeting was concluded.

A. Drieling and M. Qaud

P.S. A summary of the ICCTM meeting was presented by Ms Qaud during the International Cotton Conference Bremen on March 20th, 2014. The individual presentations of the meeting that are referred to in this Report can be downloaded from both websites, the ITMF-ICCTM and the general ITMF-website.

January 2015