

# AN OVERVIEW REGARDING THE LABORATORY TESTING AND MEASURING EQUIPMENT – ITMA 2015

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**REZUMAT.** Această lucrare prezintă în ansamblu, participarea la cea de-a 17-a ediție a expoziției internaționale ITMA 2015, recunoscută la nivel mondial ca târg de utilaje textile, dar și ca platformă de resurse ale cunoașterii. O analiză mai detaliată are ca subiect domeniul „Testări de Laborator, Echipamente de măsurare și Accesorii”, stabilit de către organizatorii ITMA cu codificarea „Capitolul 11”. În timpul expoziției ITMA 2015, cei mai importanți producători de echipamente de testare s-au bucurat de oportunitatea de a împărtăși vizitatorilor (clienți, cercetători, profesori, studenți etc.) cunoștințele lor despre dezvoltarea echipamentelor de laborator, evidențind cele mai recente inovații ale lor în domeniul testării, dar și în serviciile de asistență tehnică, oferind soluții durabile pentru întregul lanț de furnizare. În ansamblu, expozanții au dovedit o implicare mai mare în problema sustenabilității, prin prezentarea în special a echipamentelor și sistemelor de testare noi sau îmbunătățite, ca soluții care să susțină clienții în atingerea /menținerea competitivității în domeniul de activitate.

**Cuvinte cheie:** ITMA, expoziție, textile, non-textile, testări de laborator, echipament de măsurare.

**ABSTRACT.** This paper reviews the overall attendance of exhibitors at the 17<sup>th</sup> edition of the world's global marketplace and sourcing platform ITMA 2015 (International Textile Machinery Achievements). Among others, will emphasize mainly the showcase for the topic “Laboratory Testing and Measuring Equipment and Accessories”, Chapter 11. During the ITMA 2015 exhibition, the testing equipment's leading manufacturers enjoyed the opportunity to share their knowledge on the laboratory equipments development, to highlight their latest innovations in testing and in customers' services, providing sustainable solution for the entire supply chain. Altogether, the exhibitors have revealed a greater involvement in the serious issue of sustainability, by showing mainly the new releases, the latest innovative and/or revised instruments/systems as supportive solutions for customers to advance in their competitiveness.

**Keywords:** ITMA, exhibition, textile, non-textile, laboratory testing, measuring equipment.

## 1. INTRODUCTION

The world's global marketplace and sourcing platform, ITMA (International Textile Machinery Achievements), is a showcase of integrated textile and garment-manufacturing technologies. Since 1951, every four years, this international exhibition covers the entire production chain with equipments for plant operations, research and innovation, fiber and yarn spinning, weaving, nonwovens production, winding and texturing, knitting and hosiery, garment, textile processing and logistics, finishing, dyestuffs and chemicals, software, and last but not least, *testing and measuring*.

As a platform for industry leaders and researchers from the textile field, ITMA 2015 in Milan was again similar to an increasingly integrated network, following the up-and-coming trends and innovation solutions, acquiring original knowledge and best

practices, establishing strategic relationships in the textile supply chain. For this platform, the input was the interest of exhibitors (networking of the key manufacturers) and the output was the benefits of the professional visitors (customers, engineers, teachers and students).

Charles Beauvain, President of CEMATEX (European Committee of Textile Machinery Manufacturers) launched the ITMA 2015 with the logo “*Master the Art of Sustainable Innovation*” and welcomed “*the leaders of the industry to source sustainable technologies and to share their expertise in this fundamental area*”.

## 2. GENERAL OVERVIEW ON ITMA 2015 KNOWLEDGE-SHARING PLATFORM

As a global knowledge-sharing platform, the exhibition ITMA 2015 was organized into 19 separate

chapters, which are the topics of the event, as technology/product/service categories – Table 1.

Table 1. ITMA 2015 knowledge-sharing platform [1]

Chapter	Categories
1	Machinery for spinning preparation, man-made fibre production, spinning, auxiliary machinery and accessories
2	Machinery for winding, texturing, twisting, auxiliary machinery and accessories
3	Machinery for web formation, bonding and finishing of nonwovens and felting, auxiliary machinery and accessories
4	Weaving preparatory machinery, weaving, tufting machinery, auxiliary machinery and accessories
5	Knitting and hosiery machinery, auxiliary machinery and accessories
6	Embroidery machinery, auxiliary machinery and accessories
7	Braiding machinery and accessories
8	Washing, bleaching, dyeing, drying, finishing, cutting, rolling and folding machinery, auxiliary machinery and accessories
9 ( new)	Printing machinery, digital printing machinery, auxiliary machinery and accessories
10	Garment making machinery, other textile processing machinery, auxiliary machinery and accessories
11	Laboratory testing and measuring equipment and accessories
12	Transport, handling, logistics, storing and packing equipment and accessories
13	Equipment for recycling, waste reduction and pollution prevention and accessories
14	Software for design, data monitoring, processing and integrated production
15	Equipment and products to ensure machinery and plant operations
16	Equipment and products to ensure machinery and plant operations
17	Services for the textile industry
19	Natural fibres, man-made fibres, technical fibres, natural yarns, synthetic yarns, technical yarns and recycled fibres and yarns

Compared to the ITMA 2011, the ITMA 2015 edition had improved figures: 200000 square meters exhibition space, 1691 exhibitors from more than 46 countries (1350 exhibitors from 45 countries), with 123000 guests as professional trade visitors, from over 147 countries (120000 guests from 138 countries).

The top countries to joined the exhibitors at ITMA 2015 were Italy (453 exhibitors), Germany (238 exhibitors), China (184 exhibitors) and India (158 exhibitors). According to the organizers, the top five sectors were dyeing and finishing (303 exhibitors), spinning (290 exhibitors), weaving (179 exhibitors), testing (160 exhibitors), knitting and hosiery (128 exhibitors) and printing (113 exhibitors). For this

reason, the first idea is that worldwide, the textile taken as a whole field is improving.

For the topic „Laboratory testing and measuring equipment and accessories” (Chapter 11), the organizers highlighted the participations of 160 exhibitors (including first-time exhibitors). By attending the ITMA 2015, exhibitors enjoyed the opportunity to share knowledge on the laboratory equipments development, and to highlight their latest innovations in testing and customers services. In the Table 2 are some participation details for the Chapter 11, according to the ITMA 2015 Catalog-General Regulations & Index of Products. Exhibitors’ staff provided to the customers and visitors the launching of new product innovations, interactive experiences with live products demonstrations and discussions on the maintenance and calibration requirements.

Table 2. Laboratory Testing and Measuring Equipment and Accessories. Participation details [1]

Products code	Products explanation	Number of exhibitors	Leading manufacturers
11.1	Devices for sample preparation	11	Lenzing Instruments Mesdan
11.2	Testing devices for textile machinery parts (for spinnerets, card clothing, etc.)	7	Lenzing Instruments SDL Atlas
11.3	Textile testing and measuring equipment for fibers and yarns	32	James Heal Lenzing Instruments Mesdan SDL Atlas Uster Technologies
11.4	Textile testing and measuring equipment for fabrics	37	Atlas James Heal Lenzing Instruments Mesdan SDL Atlas Thermetrics
11.5	Conditioning apparatus for laboratory	8	SDL Atlas
11.6	Hygroscopes	7	Mesdan
11.7	Colour measuring instruments	22	Lenzing Instruments Mesdan SDL Atlas
11.8	Equipment for textile chemistry	7	Lenzing Instruments SDL Atlas
11.9	Accessories for laboratory testing and measuring equipment	29	James Heal Lenzing Instruments Mesdan SDL Atlas

### 3. TESTING EQUIPMENT'S MANUFACTURERS-EXHIBITORS PORTFOLIOS

The testing equipment's leading manufacturers, with valuable achievements for textiles, industrial textile, and non-textile quality control, attended this international exhibition with new releases and the latest innovative and/or revised instruments/systems. Some of the best-known testing equipment's manufacturers are **Uster Technologies, SDL Atlas, James Heal, Lenzing Instruments, Atlas Material Testing Solutions, Thermetrics and Mesdan.**

#### 3.1. Uster Technologies

*Uster Technologies [2] is a leading company in the textile testing and quality control, involved in the development of the sustainable strategies of the quality control, pursuing the optimization of the profits for the entire spinning mill. Under the new logo "Managing a spinning mill with quality in mind", USTER launched at ITMA 2015 five new and improved systems, as following:*

*USTER® TESTER 6 – Total Testing Center:* By setting new standards in evenness testing, it works with greater accuracy and reliability than previous one (USTER®TESTER 5) with a specially developed sensor. By incorporating the USTER®QUALITY EXPERT management tool with its own knowledgeable Assistant Q support,, the new brand Total Testing Center was created, allowing spinners the customization of their own tailored quality network, the analysis and optimization of the spinning mill performance – Figure 1.



Fig. 1. USTER® TESTER 6 – The Total Testing Center /2/.

*USTER® TESTER 6-C800:* Specifically for the filament yarns, redefines evenness testing, with new digital capacitive sensor. In addition, the optical sensor OM counts interminglings per meter at a

testing speed of 800 m/min, as an important parameter for filament yarns and used to prevent variations in fabric appearance.

*USTER® JOSSI VISION SHIELD 2:* The system for the detection and elimination of natural and synthetic contamination, has new sensors and sophisticated image analysis transforming the fiber cleaning, into a complete waste management - Figure 2. It works by creating a "fingerprint" of a clean cotton tuft, and matching detections against this, to ensure that only contaminated cotton is being ejected.



Fig. 2. USTER® JOSSI VISION SHIELD 2 /2/

*USTER® SENTINEL:* The new ring spinning optimization system replaces the USTER® RING-DATA (the standard system for ring monitoring systems since 1979), assuring: **all important parameters in a single report, ultimate optimization with the Total Testing Center, personnel management, energy monitoring**, clear visuals highlight for breaks' reasons **and the USTER® ROVING STOP** that minimizes pneumafil waste – Figure 3.



Fig. 3. USTER® SENTINEL – the ring spinning optimization system /2/.

*USTER® QUANTUM 3:* is an anniversary edition (50 years since the first yarn clearer for automatic winding) and has new features for optimizing the yarn quality - Figure 4. These features include Smart Limits for clearing with automatic checks on the effect of splice distribution, Core Yarn Clearing with USTER® sensors that detect and cut the missing or misaligned

core component, color and shade variation detection and online hairiness measurement.



Fig. 4. USTER® QUANTUM 3 [2].

The USTER® SENTINEL and USTER® QUANTUM 3 are ready for connection with USTER® QUALITY EXPERT and also with all spinning processes, in combination with USTER® TESTER 6 measurements. Each new instrument connected to the network, assures features such as predictions of fabric appearance, pilling resistance and weaving performance.

### 3.2. SDL Atlas

SDL Atlas [3] as a leading supplier of textile testing equipment, laboratory products, consumables, and service for the fiber to garment industries, displayed at ITMA 2015 its latest instrument, CutPro Sample Shredder, and six innovative instruments (Fabric Touch Tester, Tinius-Olsen Universal, Moisture Management Tester, Sweating Guarded Hot Plate, Hydrostatic Head Tester, PowerTear High Energy Elmendorf).

FABRIC TOUCH TESTER is an innovative instrument capable of measuring the five parameters associated with fabric hand in a simple three-minute test: heat flux, temperature, pressure, friction, and displacement. The FTT measures in a single test, fabric thickness, compression, bending, shearing, surface friction and roughness, and thermal properties – Figure 5.



Fig. 5. FTT\_Fabric Touch Tester [3].



Fig. 6. Tinius-Olsen Universal testing equipment [3].



Fig. 9. Hydrostatic Head Tester [3].



Fig. 10. PowerTear High Energy Elmendorf [3].

TINIUS-OLSEN UNIVERSAL testing equipment assisted by TINIUS OLSEN SOFTWARE was redesigned to test a wide range of materials (including leather) for tension, compression, flexure and shear measurements – Figure 6.

MOISTURE MANAGEMENT TESTER, (MMT) 2nd generation: a valuable instrument for manufacturers in fabric's moisture control, with increased access area for testing larger samples and allowing easier cleaning of the sensors, with improved precision for testing porous samples and multi-language software – Figure 7.

SWEATING GUARDED HOT PLATE: simulates the heat and mass transfer processes that occur in contact with human skin, measuring the water vapors resistance and thermal resistance of the high performance and personal protective equipment (PPE) – Figure 8.



Fig. 7. Moisture Management Tester [3].



Fig. 8. Sweating Guarded Hot Plate [3].

HYDROSTATIC HEAD TESTER: accurately and rapidly determines the resistance of fabrics (coated, uncoated & non-woven) to water penetration under pressure, by means of dynamic and/or static test method - Figure 9.

POWERTEAR HIGH ENERGY ELMENDORF: innovative pendulum instrument is the most versatile tearing tester, redesigned to increase functionality, controlled and measured by a sophisticated micro-processor – Figure 10.

### 3.3. James Heal

**James Heal [4]** is one of the leading manufacturers of testing equipment for textile and non-textile materials and presented at Milan the latest models of the instruments ProMace, TruBurst, Titan and Martindale.

**PROMACE:** is the safest, most efficient and accurate snag tester used to determine rapidly the snagging resistance of special fabrics (robust apparel and home furnishing), designed with a vertical 2×2 configuration for saving over 50% of laboratory space. The ProMace is controlled via the UniController in the ProView Assessment Cabinet, located outside of the ProMace - Figure 11.



Fig. 11. ProMace, with Mace Snag Tester and the ProView Assessment Cabinet [4].

**TRUBURST:** the pneumatic bursting strength tester, with the TestWise Pro software, enabling an extensive variety of bursting strength and fatigue tests to be performed on textiles and a wide range of other materials (paper, plastics, food packaging and

aluminum foils, artificial skin and hernia patches, etc.) – Figure 12.

**TITAN<sup>5</sup> Universal Strength Tester:** the fifth generation, with a comprehensive range of tools and grips, assisted by the TestWise software to perform a wide array of tests (compression and puncture, strength testing, tear strength, stretch and recovery, seam slippage, security of attachments) on a wider range of product types and forms (Elastane, Velcro, leather products, etc.) – Figure 13.

**MARTINDALE ABRASION and PILLING TESTER,** for testing on a wide range of materials (textiles and non-textiles) like socks, gloves, nonwovens, carpets, leather and artificial leather for vehicle upholstery, wood, high-pressure laminates, painted surfaces. Available as different size models (Maxi – 9 stations, Midi – 5 stations and Mini – 2 stations) is also suitable for both wet and dry testing – Figure 14.



Fig. 12. TruBurst [4].

Fig. 13. TITAN<sup>5</sup> [4].



Fig. 14. Martindale Abrasion and Pilling Tester [4].

### 3.4. Lenzing Instruments

**Lenzing Instruments [5]**, part of the Textechno Group, a company with a wide range of equipment for staple fiber, filament and nonwovens testing, fabric, film and composites testing and on-line monitoring systems, presented a few of the latest top products:

**INVISPEC** is a monitoring system with **non-contact online scanning**, for optimum inspection of the aesthetical and physical defects on woven materials, composites **and other** materials (plastics, metal,

glass, carbon). Special illumination modules allow the strongly reflective materials to be inspected.

**PROMPT OLC** is a spinning finish sensor for online detection of yarns, with a new optical sensor for online color measurement of typical defects and yarn characteristics, small and curved objects in motion – Figure 15.

**RAPID 600 V:** a new instrument **designed for production control of filament yarns, with fully automated measurement of number and tenacity of interlaces / entanglements** – Figure 16.



Fig. 15. PROMPT OLC [5].



Fig. 16. RAPID 600 V [5].

DTI 600: an instrument with fully automated measurement of the draw tension and molecular orientation' regularity of filament yarn – Figure 17.

TST 510: an instrument with automated measurement of percent shrinkage and shrinkage force of filament and yarn, for 10 samples simultaneously – Figure 18.

Vibrodyn 400: a new version of an instrument for automated measurement of tenacity and elongation of single staple fibers – Figure 19.



Fig. 17. DTI 600 [5].



Fig. 18. TST 510 [5].



Fig. 19. Vibrodyn 400 [5].

### 3.5. Atlas Material Testing Solutions

*Atlas Material Testing Solutions* [6], as a global producer of light exposure and weathering testing instruments, presented at ITMA the instruments for accelerated light fastness and weathering testing that provides the simulation to a product's end-use environment.

XENOTEST® 440 is a highly versatile xenon-weathering instrument for a variety of materials, designed for fast and economical testing, with an array of options for global weathering and light fastness testing requirements – Figure 20.

CI3000+ WEATHER-OMETER® is a platform with advanced digital control systems, delivering accurate, reproducible and repeatable results for predicting service life. It is a valuable achievement for testing light fastness, in the textiles - paints - coatings and plastics industries – Figure 21.



Fig. 20. XENOTEST® 440, from Atlas Material Testing Technology [6].



Fig. 21. CI3000+ WEATHER-OMETER® [6].

The company showed at the ITMA 2015 their latest achievements: the Newton Sweating Thermal Manikin System, the SGHP-8.2 (“Skin Model”) / Sweating Guarded Hotplate and the Thermal Protection Test Device.

NEWTON THERMAL MANIKIN is a fully equipped thermal manikin system used worldwide for a broad range of clothing and environmental testing. Standard zone configurations include 20, 26, or 35-zone models, but Newton's thermal properties (for male body form) it can be customized for higher sensitivity, faster response and greater ambient range.

### 3.6. Thermetrics

*Thermetrics Thermetrics* [7] is a leading manufacturer of a wide range of advanced test instruments for evaluation of the thermal properties, thermal protection and thermal comfort of textiles, garments and dynamic thermal environments (automobile, truck and aircraft interiors).

Walking, breathing, physiological (human comfort) software, and female conversion accessories are completed – Figure 22.

SWEATING GUARDED HOTPLATE (SGHP-8.2) is presented by the manufacturer as the “*skin model*” and produces accurate, repeatable measurements of the thermal resistance and vapor permeability of textiles – Figure 23. The system includes the hotplate with variable speed airflow hood, gravity-fed fluid supply system, temperature and humidity control, and the ThermDAC control software.

THERMAL PROTECTIVE PERFORMANCE TEST DEVICE (TTP), or *Heat Transfer Performance (HTP)*, is a system for evaluating thermal protection by measuring the time elapsed for convective and radiant heat to penetrate through a composite fabric, resulting in damage to human skin – Figure 24.



Fig. 22. Newton Thermal Manikin [7].

### 3.7. Mesdan

MESDAN LAB [8] is a company dedicated to the development of Laboratory Quality Control



Fig. 23. Sweating Guarded Hotplate [7].



Fig. 24. Thermal Protective Performance Test Device [7].

## REFERENCES

- [1] <http://www.itma.com>
- [2] <http://www.uster.com>
- [3] <http://www.sdlatlas.com>

equipment, offering a wide range of testing equipment to perform control tests on fibres yarns, fabrics, technical textile and PPE (Personal Protective Equipment) in the laboratory or directly on the production floor.

However, at the ITMA 2015 exhibition, Mesdan displayed only some previous achievements.

## 4. CONCLUSIONS

ITMA 2015 held in Milan Italy, is the 17<sup>th</sup> edition of the world’s global marketplace and knowledge sourcing platform. This paper reviews the overall attendance of exhibitors at ITMA 2015, emphasizing mainly the showcase for the topic Laboratory Testing and Measuring Equipment and Accessories. The leading manufacturers of testing equipments with valuable achievements for textiles, industrial textile, and non-textile quality control, attended this international exhibition with new release, the latest innovative and/or revised instruments/systems.

As a specific tendency, most of the leading testing equipment manufacturers extended the product range by including the dedicated ones to the industrial textile and/or non-textiles. For accuracy, all of them acknowledged that their instruments were designed in accordance with the updated versions of the international test standards. Over the years, attendance at ITMA involved a constant approach of testing equipments’ manufacturers for innovation, development, versatility, competitiveness and now, for the sustainability of the entire supply chain. For this reason, the main idea is that worldwide, the entire textile field is improving.

- [4] <http://www.james-heal.co.uk>
- [5] <http://www.lenzing-instruments.com>
- [6] <http://atlas-mts.com>
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