



Project acronym: LabTV

Project title: e-Learning WebTV for Textile Testing Laboratory

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Training Course Curriculum

Version 2.0

05/10/2011

VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	CITEVE	06/01/2011	Steering Committee	10/01/2011	<i>Non applicable</i>
2.0	CITEVE	03/10/2011	Steering Committee	05/10/2011	Updated due to text revision

Textile and Clothing Sector, European Analyze.

Textile & Clothing Sector in Europe Economic Analyze

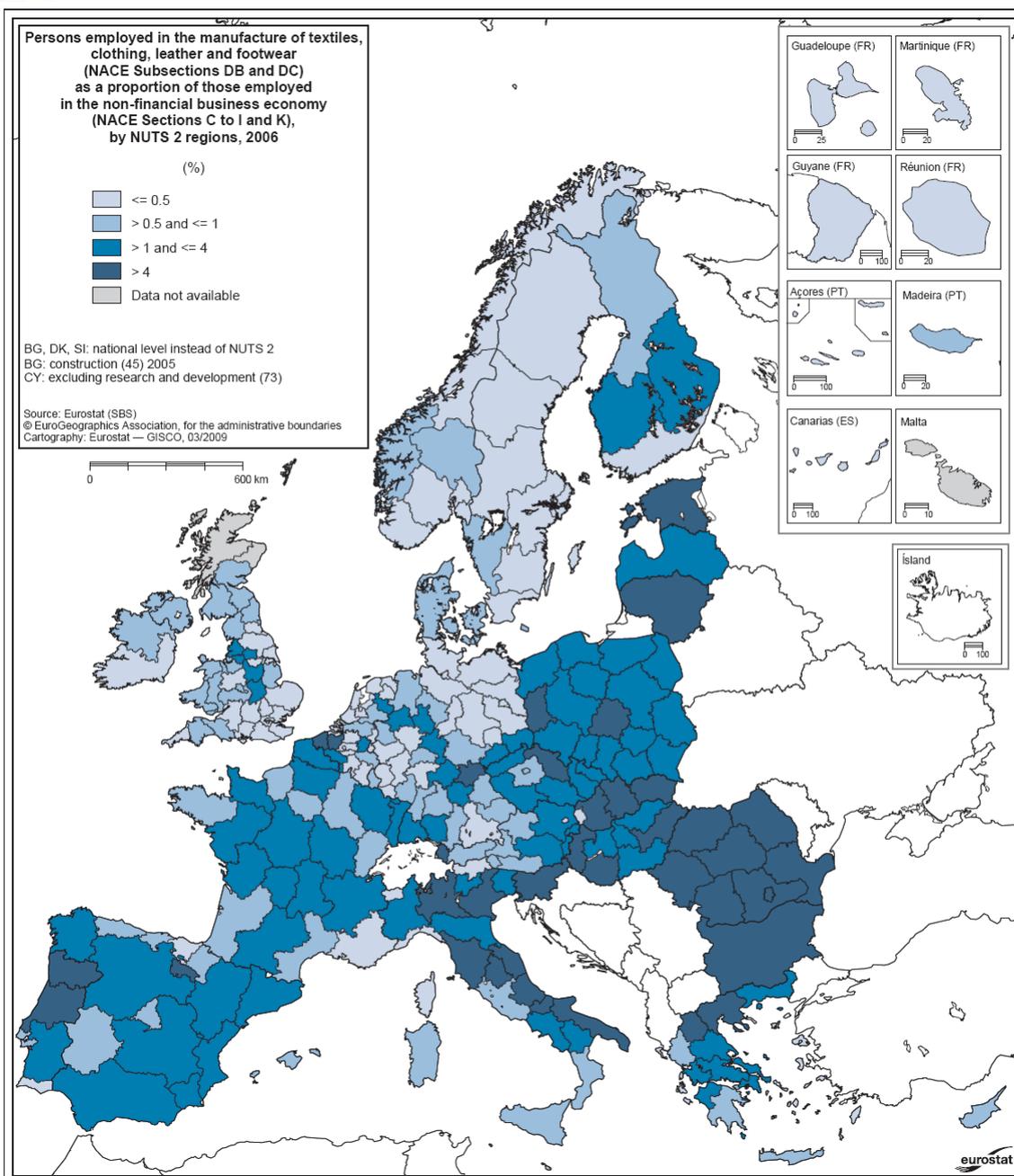
According to the European Commission, there were just over 267.0 thousand enterprises in the Member States for which the manufacture of textiles, clothing and leather was their main activity in 2006.

This economy sector was larger in terms of employment than in terms of its value added generated; about 3.0 million people were employed in the sector, corresponding to 2.3 % of the EU-27's non-financial business economy workforce, whereas the EUR 64.7 billion of value added corresponded to 1.1 % of the total value added generated across the non-financial business economy in 2006.

The largest activity within the sector was the manufacture of textiles, which accounted for a little under one half (46.3 %) of sectoral value added in 2006. Just over one third (34.7 %) of value added was generated by the EU-27's manufacture of clothing, with the remainder (18.4 %) being generated by leather manufacturing.

Italy was the principal textiles, clothing and leather manufacturing Member State, generating EUR 21.8 billion of value added, which was the equivalent of one third (33.6 %) of EU-27 value added in this sector in 2006. The other main textiles, clothing and leather manufacturing Member States within the EU-27 were Germany (accounting for 12.1 % of the EU-27's value added), France (11.6 %), Spain (9.2 %) and the United Kingdom (7.8 %). Of these five Member States, only Italy was specialised in the manufacture of textiles, clothing and leather; as this sector contributed 3.4 % of the value added generated in its non-financial business economy, three times the average contribution recorded across the EU-27 in 2006. However, this measure of specialisation was even stronger in Romania and Bulgaria. In Romania, the textiles, clothing and leather manufacturing sector contributed 5.3 % to the value added generated across its non-financial business economy in 2005; in Bulgaria this proportion was 4.7 %.

This relative specialisation was also clear in terms of employment. There were a number of regions in Romania where between 8 % and 15 % of the non-financial business economy workforce were employed in the textiles, clothing and leather manufacturing sector. The most specialised region (at the level of detail shown in the map) was Norte in Portugal, however, where about one in every five (18.3 %) persons employed in the non-financial business economy worked in textiles, clothing and leather manufacturing. There was also high specialisation of textiles, clothing and leather manufacturing in many regions of Italy, as well as across Slovenia, Estonia, Lithuania and Bulgaria.



Source: Eurostat (SBS)

Figure 1: Manufacture of textiles and textile products; manufacture of leather and leather products. Persons employed in the manufacture of textiles, clothing, leather and footwear as a proportion of those employed in the non-financial business economy (%), 2006.

The textiles and clothing manufacturing subsector and the leather manufacturing subsector were the only industrial subsections that employed more women than men across the EU-27 in 2007. Indeed, women accounted for a little more than two thirds (69.4 %) of the textiles, clothing and leather manufacturing workforce as a whole, which was about twice the average share (35.1 %) across the EU-27's non financial business economy and even more than the industrial average (30.1 %). With the exception of Belgium and the Netherlands among the

Member States for which data are available, women provided a majority of the workforce within the sector. In the Baltic Member States, Bulgaria, Hungary and Romania, women represented between eight and nine in every ten workers in the textiles, clothing and leather manufacturing sector.

Given the high proportion of women employed in the textiles, clothing and leather manufacturing sector of the EU-27, it is perhaps surprising that the proportion of workers engaged on a part-time basis was as low as 8.2 % in 2007, as it is often a characteristic that activities with a high proportion of women in the workforce are associated with high part-time employment rates. Indeed, part-time workers in the textiles, clothing and leather manufacturing sector were much less common than across the non-financial business economy, where they represented 14.3 % of the workforce.

Another key feature of the workforce was that the proportion of those aged under 30 in the EU-27's textiles, clothing and leather manufacturing sector (18.4 %) was much lower than the average across the non-financial business economy (24.3 %) in 2007. The relative difference between the two was made up for in workers aged between 30 and 49 years of age, the proportions of those workers aged 50 years or over being almost identical. The relative absence of young workers in the textiles, clothing and leather manufacturing sector was most acute in Greece, Latvia and the Netherlands, where they represented about a third of the equivalent share of workers aged under 30 across their respective non-financial business economies. Other countries where this characteristic was particularly pronounced included Slovenia, Estonia, Poland and Austria. Indeed, among those Member States for whom data are available, it was only in Romania that the share of young workers in this sector was higher than that across its non-financial business economy in 2007. In contrast, the proportion of workers in the textiles, clothing and leather manufacturing sector aged 50 or over was particularly high in Cyprus (63.6 %), especially when compared against the average (25.2 %) across the whole of its non-financial business economy.

Content:

To proceed to the basic characterization of woven and knitted fabrics are: fiber composition, characteristics of the yarns (count and twist), weave diagram, texture (number of yarns and runs per cm or number of columns and courses per cm), width, weight per meter square, thick, indicating the state (at the end of the loom, prepared, dyed, printed, finished) can also indicate some "defects" such as bias and waist.

We can analyze different mechanical resistances in textile structures, eg tensile strength where usually determines the strength and breaking elongation, although it can also be assessed entire curva carga-alongamento. Dynamometers are used to constant elongation rate. For this test there are two methods: strip and "grab". Both assays can be made dry and wet. The tests of tensile strength and tear are normally made in the weft direction and in the warp direction. Not appropriate for knitwear.

In the burst strenght, the multidirectional tests are mainly used for knitwear. It is made in a pneumatic bursting.

Regards the abrasion resistance is made measurement of wear of tissues by friction. They use various devices of different severity: Martindale rubbing fabric against fabric, or appliances with burrs with sandpaper and flexometer (friction and flexion simultaneous). The evaluation of resistance may be done in various forms: number of cycles to rupture, mass loss, loss of tensile strength, abnormal physical appearance (including color). Regarding resistance to formation of pilling, under action of friction can form agglomerates of fibres. For this test can be done by various appliances different severity. The evaluation is normally done by assessing the appearance and can be compared with photographic standards. Use if the scale 5-1 with 5 as absence of surface changes.

In this project were also worked out some quality control tests on the behavior of tissues to various agents, related to the use and application of specific finishes. Like for example the air permeability which is based on flow measurement air passing perpendicularly to a tissue, in certain conditions of area, pressure and time. This is an essay particularly important for fabrics for airbag and for industrial filtration. Also the water permeability, which can distinguish between: hydrophilicity and wetting, especially to assess the quality of preparation, and hydrophobicity – for finishing evaluation.

One of the essential characteristics to the quality of a fabric is its dimensional stability to according to several requests, either in further processing (sewing) in either in the use of cleaning and conservation.

As for the Colour Fastness have been subjected to study such as their resistance to various agents. The tests of Colour Fastness may involve: evaluation of color change, assessment of staining (white fabrics submitted simultaneously to the test).

Objectives

Global Objective

The purpose of this course is to prepare the trainees to have theoretical and practical knowledge which will allow their integration in a laboratory of textile quality control, as well as to recognize the obtained results in another area.

Specific Objectives

- To recognize the general principles to testing/standardization.
- To recognize the standards of textile tests.
- To recognize the requirements to accredited tests.
- To perform quality control tests, according to the standards.
- To recognize the process to perform analysis and/or physical and chemical tests in textile products, according to the most suitable analytical methods, assuring the results reliability and respecting the standards;
- To control the textile material in all transformation conditions.

Target Group

The main target group of the course are all the agents related to textile and clothing industry, namely companies and workers, students and universities, research centres, machinery and chemical products manufacturers, etc., especially in the following points:

- In the industrial companies workers, training can contribute to the increasing of the textile quality control and consequently increase their competitiveness;
- In the universities and technological schools, because this is a skills development programme with obvious advantages for trainees specialization;
- For the machinery products manufacturers, because it can promote a better knowledge of the quality control tests inherent to the textile processes and consequently at the commercial level as it can advise and/or give technical support to their clients.

Timetable

25 hours

Form of Organization

Self-Learning; Blended Learning; Distance Learning

Evaluation

Continuous assessment: Performed during the visualization of the videos and when developing the work and activities associated. It is intended that during each video the trainee perform an exercise, covering the various subjects addressed in order to test the outcomes of learning.

Competences

- To recognize quality management systems;
- To identify standards applicable to the textile substrate;
- To use techniques to prepare the samples and solutions to perform the physical-chemical analysis and respective estimation;
- To analyze technical specifications concerning the analysis and physical-chemical tests of textile products;

- To identify different types of equipment, tools, products and substances suitable to perform the analysis and physical-chemical tests of textile products;
- To use sampling techniques for analysis;
- To use methods and techniques to prepare solutions and reagents;
- To use techniques of preparation, measurement and weighting of products for analysis;
- To use equipments and tools used in the physical-chemical tests of textile products;
- To use techniques and procedures of registration of data and results of analysis and tests;
- To use techniques to do reports concerning the performed analysis and tests and the results assessment of the analysis and tests.

Programmatic Contents

Module	Unit	Activities
Integration Module		Consult the Reference of the Quality Control Laboratory Course and Integration in Virtual Learning Environment
Total: 3 hours	Framework of the course Virtual Learning Environment	To enroll in the Virtual Learning Environment
Module 1	Unit 1.1 - Colour fastness to domestic and commercial laundering according to EN ISO 105-C06: 2010	
Colour Fastness	Unit 1.2 - Colour fastness to domestic and commercial laundering according to EN ISO 105-C08: 2010	
Total: 6 hours	Unit 1.3 - Colour fastness to domestic and commercial laundering. Oxidative bleach response using a non-phosphate reference detergent incorporating a low temperature bleach activator according to EN ISO 105-C09: 2003	Study
	Unit 1.4 - Colour fastness to dry cleaning using perchloroethylene solvent according to EN ISO 105-D01: 2010	Participation session synchronous (chat)
	Unit 1.5 - Colour fastness to water according to EN ISO 105-E01:2010	Participation session asynchronous (discussion forum)
	Unit 1.6 - Colour fastness to chlorinated water (swimming-pool water) according to EN ISO 105-E03:2010	
	Unit 1.7 - Determination colour fastness. Colour fastness to perspiration according to EN ISO 105 - E04: 2010	
	Unit 1.8 - Determination of colour differences of textile fabrics according to ISO 105-J03:2009	
	Unit 1.9 - Colour fastness to rubbing according to EN ISO 105-X12: 2002	
Module 2	Unit 1.1 - Determination of maximum force using the	Study

Strength properties Total: 2 hours	grab method according to EN ISO 13934-2: 1999 Unit 1.2 - Tear properties of fabrics. Determination of tear force using ballistic pendulum method (Elmendorf)- according to ISO 13937-1: 2000 Unit 1.3 - Determination of tear force of trousers-shaped test specimens (Single tear method) according to EN ISO 13937-2:2000 Unit 1.4 - Pneumatic method for determination of bursting strength and bursting distension according to EN ISO 13938-2:1999 Unit 1.5 - Determination of the elasticity of fabrics by strip tests method according to EN 14704-1:2005	Participation session asynchronous (discussion forum)
Module 3 Comfort Total: 3 hours	Unit 1.1 - Determination of the permeability of fabrics to air according to EN ISO 9237: 1995 Unit 1.2 - Determination of resistance to water penetration of fabrics according to EN 20811:1992 (ISO 811:1981)	Study Participation session asynchronous (discussion forum)
Module 4 Characterization Total: 3 hours	Unit 1.1 - Determination of linear density (mass per unit length) by the skein method according to ISO 2060:1994 Unit 1.2 - Determination of twist in yarns by direct counting method according to EN ISO 2061:2010 Unit 1.3 - Determination of mass per unit area using small samples according EN 12127: 1997 Unit 1.4 - Determination of stitch length and yarn linear density in weft knitted fabrics according to EN 14970: 2006	Study Participation session synchronous (chat) Participation session asynchronous (discussion forum)
Módulo 5 Resistance to pilling and abrasion Total: 2 horas	Unit 1.1 - Determination of fabric propensity to surface fuzzing and to pilling. Part 1: Pilling box method according to ISO 12945-1: 2000 Unit 1.2 - Determination of fabric propensity to surface fuzzing and to pilling. Part 2: Modified Martindale method according to ISO 12945-2: 2000 Unit 1.3 - Determination of abrasion resistance of fabrics by Martindale method. Determination of specimen breakdown. EN ISO 12947-2: 1999	Study Participation session asynchronous (discussion forum)
Módulo 6 Dimensional stability and spirality Total: 3 horas	Unit 1.1 - Determination of dimensional change in washing and drying according to EN ISO 5077: 2008 Unit 1.2 - Determination of percentage change of wale spirality change in knitted garments after laundering according to ISO 16322-1:2005	Study Participation session synchronous (chat) Participation session asynchronous (discussion forum)
Evaluation Module Total: 3 horas	Final Assessment Test Evaluation of training	Final Evaluation of the Action