

ISO 9000 - CONSEQUENCES FOR COTTON QUALITY DETERMINATION

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Abstract

Automation of cotton processing in textile industry and increasing production speed will consequently straighten the importance of raw material quality, in our case raw cotton. Already today in spinning more than 60 % of the yarn price is determined by the cotton price. In the same way , more than 50 % of the quality value of the yarn is determined by the raw cotton quality parameters related to processing (for example spinning) parameters

Changes of quality demands will also be a consequence of usage of ISO 9000 ff and ISO 14 040 standards (Ecological Balance Sheet) in textile companies. Informations on ecological quality parameters will have to be delivered directly by the producer in the same way as it has been already done by HVI -testing in USA referring to technological parameters. In the near future ecological informations will have to be given to the processing industry in order to fulfill the future demands of the consumer , who decides on usage of cotton or man made fibers in textiles.

Introduction

QUALITY MANAGEMENT AND QUALITY ASSURANCE STANDARDS -GUIDELINES FOR SELECTION AND USE, the headline of ISO -Standard 9000 and following indicates the scope and way to a series of international industrial standards, which are going to change production strategies in textile industry in the next decade , as it was already the case in other leading industries.

Just opposite to traditional testing, **quality management (QM)** includes strategic planning, allocation of resources and other systematic activities for quality. Beginning with marketing research and product development, QM goes on with operations research and evaluation of logistics .

Informations from raw material to all processing stages and up to the final product are necessary. Furthermore, recycling and finally deposit of remaining waste has to be taken into consideration.

First steps to quality management are standards ISO 9001 to ISO 9004, quality systems and models for quality assurance in design, development, production, installation,

final inspection and test . In addition, ISO standards 10 011 to 10 014 describe the way to quality assurance of measurement tools.

Calibration of instruments and testing procedures is an essential part of quality assurance and has to be based on reproducible physical properties in order to get acceptable tolerances of testing results.

The most crucial point of textile testing in general is control of laboratory conditions, temperature and relative humidity, which has to be within standard limits , 65 % R. H. + - 2 %, consequently + - 1 degree centigrade, otherwise certification will fail. Changes of 1 % humidity in cotton fibres results in changes of about 1 % in strength for example! Probably direct humidity control of cotton test samples will be necessary in future .

The big German car manufacturers, Mercedes-Benz and BMW, have integrated QUALITY MANAGEMENT into their and their suppliers production strategy. For example textiles for car interior like seats or for car drivers security like airbags and life - belts have to be certified according to necessary quality limits already by the supplier. The supplier has to guarantee for the quality of the product. Re-testing at the customers premises is no longer necessary.

The same procedure will be used to introduce ISO 14 040 ff, the ecological balance sheet, in companies. Besides technological parameters, ecological informations will have to be supplied together with the raw material.

Future Changes Of Cotton Quality Determination

Step by step HVI - testing has been accepted by the mills for raw cotton testing world wide, faster as people could believe ten years ago. Also step-by-step on a long term basis, HVI testing will be integrated into the qualification and marketing systems of the main cotton producing countries as it was demonstrated by USDA.

New countries, like Usbekistan for example, announced plans to establish HVI - cotton qualification systems during the next five years. Cotton merchants and shippers will have to deliver certified cotton bales to many customers. Not only technological informations like strength, length, etc., later on followed by maturity and honeydew will be available, but on the long term basis also ecological data to confirm certified ecological quality will be necessary .

ISO 14 040, the description of demands for an ecological balance sheet for companies, shows the way into the future. The producer of the raw material, the cotton producer will have to deliver for example data on "freeness from insecticides and pesticides" to the processing industry in order to fulfill the demands of the consumer. As an example you could take the already well defined test- values used for "OEKO - TEX" in Europe .

OEKO - TEX Standard 100 is a normative Standard, published by the International Association for Research and Testing in the field of textile ecology. This standard specifies the general conditions to mark textiles.

The OEKO - TEX mark “Confidence in Textiles - passed for harmful substances to Oeko -Tex Standard 100” indicates that the marked product fulfills the conditions specified in this standard, for example for baby clothing , after the conditions specified in table 1 (parts of OEKO - TEX Standard). At the moment, the tolerance limits are in ranges, for which normal controlled cotton production would deliver acceptable test values. But this could change in the future.

This will not only be true for difficult markets like Europe but in the future also for the biggest market on our earth, Far East. Quality of cotton fabrics and quick response to fashion trends will determine the possibilities for EXPORTS of cotton goods into the big consumer markets Northern America (NAFTA) and Europe (EEC).

Already today, east asian countries including China are processing one third of the worlds cotton production and about half of the total exported cotton world - wide. Asian textile mills are going to produce more high quality fine yarns and fabrics in order to enhance their export possibilities.

Noteworthy the consumer, the customer decides upon quality and fashion demands! Cotton’s ongoing fight against its main competitor, man made fibers, will also have to be supported by quality aspects and especially ecological quality .

Let us notice what B. Matsumo , Director of Cotton Traders Association of Japan said : “..... **This promising desire to produce higher quality products to satisfy the rising standard of quality demanded by the market coupled with the urge for improved plant efficiency, has made the asian mills more conscious of cotton quality. Apart from the traditional quality requirements , there is also an increased awareness of the problems related to neps , honeydew and contamination It would be fair to say that there are no more price markets in Asia where you could sell price instead of quality”.**

Changes In Technological Testing

Of course , HVI - technology itself has to undergo also several changes. Maturity and honeydew will have to be included into measurements. Strength measurements will have to be reliable enough for marketing purposes. Consequently humidity control of samples will be necessary. Trash measurements have to be more reliable and probably true color measurements will be introduced. May be testing procedures for neps have also to be integrated into HVI - testing procedures. For the time being,

acceptance of HVI by trade and consequently by the signatory associations to the universal cotton standards agreement is the essential step into the next century.

We all know that today outside US very few cotton bales are sold based on HVI measurements. So for the time being and the next five to ten years at least, cotton bales will have to be re - tested in the mills or in testing laboratories. HVI - tests have to be quick enough to be used for immediate bale management. Progress in sample conditioning including rapid conditioning to obtain better, more reliable and much quicker humidity and temperature consistency will be necessary , especially for cotton strength determination.

In addition, textile machinery manufacturers like Trützschler Schlafhorst and Rieter have started to integrate on - line measurements of cotton quality properties into their cards, drawing frames and spinning machines. Quality has to be produced. Therefore, after input control of raw cotton, process control in the mill is also necessary, including controlling of costs. Substantial developments in computer and sensor technology as well as in data processing, for example by neuronal networks and fuzzy logic systems will help to manage quality and cost optimized production in textile industry.

In Reutlingen, Southern Germany, an up-to-date Cotton Quality Laboratory including state of the art systems like AFIS, HVI, MDTA and QUICKSPIN has been established recently to focus on new developments related to ISO 9000 ff. and ISO 14040 ff. demands to support textile manufacturers in Europe on their way to quality and ecological oriented production . Its close connection to the STEINBEIS TECHNOLOGY TRANSFER CENTER of Baden - Württemberg enables direct industrial application of actual research results in industry.

Table 1

LIMITS FOR CONTENTS IN BABY - CLOTHING (OEKO - TEX 100)	
PH - Value	4.8 - 7.5
Free HCHO	20 ppm
(Method Gas Chromatography)	
Pesticides (accumulated) (max. 0,5 mg / kg cotton = 500 yg / kg cotton)	0,5 ppm
Pentachlorphenol	0.05 ppm
Amine	not detectable
Metallic residues	
Hg	0.02 ppm
Cu	5,0 ppm
Cr	1 ppm
Co	1 ppm
Ni	1 ppm
As , Pb , Cd , Zn in similar ranges	(0,2 ppm)
no flame protection agents	
no biocide applications to textiles	
no chlororganic residues allowed	