

E -Learning Course for Cotton Fiber Testing and Processing

Overview of the Course

This E-Learning Course is a team work training for Process Improvement and Cost Reductions for Spinning and Ginning Mills.

The course is divided into 2 Main Parts

Part One : Test Analyze and Solve existing Mill Problems

Part 2 Improve the process according to with new conceptions

Part One covers following main work plan.

1- Classification of the sample tested according to Itru Cotton Classification System

This section involved the suitability of the sample tested according to yarn in production as well as determining count range , yarn manufacturing types that could be carried out.

2- Yield Performance Analysis according to Fiber Properties

- a) Blow room
- b) Card
- c) Comber
- d) Ring

3- Waste Analysis and Performance of Blowroom ,Carding and Combing

4- Process Optimization Works with Existing Blend

- a) Blowroom to card
- b) Carding to Combing
- c) Combing to Ring Frame
- d) Recommendation for Process Improvement Work

5- Fabric Analysis

6- Mill Performance Analyzes

- a) Yarn quality Analyzes according to Fibre Properties at the ring frame delivery
- b) Production levels according to Fibre Properties at the ring frame delivery
- c) Processing and Spinning Ability of the blend

7- Potential Cost Reductions and Quality Improvement

- a) Recommendations and suggestions for existing situation
- b) New Test plans and working program
- c) Implementation of Work Plan

Part 2 Improve the process according to with new conceptions of

- a. Fibre Mix Selection according to Count, TPI and Process (Fibre Mix Selection Software)
- b. Making a New Mix for cost reduction and Quality Improvement
- c. Process the new Mix
- d. Control of Process and Machinery and Test Plans
- e. Process Improvement and Optimization works according to Test Plan
- f. Defect Analyzes of Knitted and Woven Fabrics.

2- Qualifications, Goals and Coarse Team Structure

This course is intended for the staff Quality Management in Spinning Mill for Process Improvement .Therefore, it is a team work. Hence, a Process Improvement Team should be formed to carry the tasks mentioned in this training and implementation for the work to be done.

Qualifications and certification will be given by the top level management of the each company according to performance of the team.

Materials Methods and Technical Requirements

In order to implement this training coarse Samples , Technical Data and Charts should be sent to Itru Group Ltd. The samples will be tested at ITRU Fibre Fabric Tester UAK-1 +. According to the test results of the samples tested implementation of the test results will be applied to existing mill conditions in relation to headings given as before.

Samples /Information	Amount/Technical Data/Chart	Unit
1	Type of cotton	
2	Raw Cotton	100 gram
3	Card Chute Feed	100 gram
4	Blow room waste	100 gram
5	Card under case waste	100 gram
6	Card Flat waste	100 gram
7	Card Sliver	5 meters
8	Comber Sliver	5 meters
9	Comber Noil	100 gram
10	Ring Frame delivery	100 gram
11	Knitted Fabric Sample 10x10 cm grey and dyed dark color	2 samples
12	Woven Fabric Sample 10x10 cm grey and dyed dark color	2 samples
13		

14	Yarn Count Nec Produced	
15	Yarn End use (hosiery or weaving)	
16	TPI(Turns per inch)	
17	Ring spindle speed (Rotor rpm)	
18	End breaks per 1000 spindle hour	
19	Yarn Mass Spectrograph 400 m/min 2,5 mins testing time	Spectrograph
20	Single values of 20 yarn evenness results (CV %,thin,thick,neps)	
21	Single values of 20 yarn strength results	
22	Total blow room waste %	
23	Total Carding waste %	
24	Combing Noil %	
25	Ring waste %	

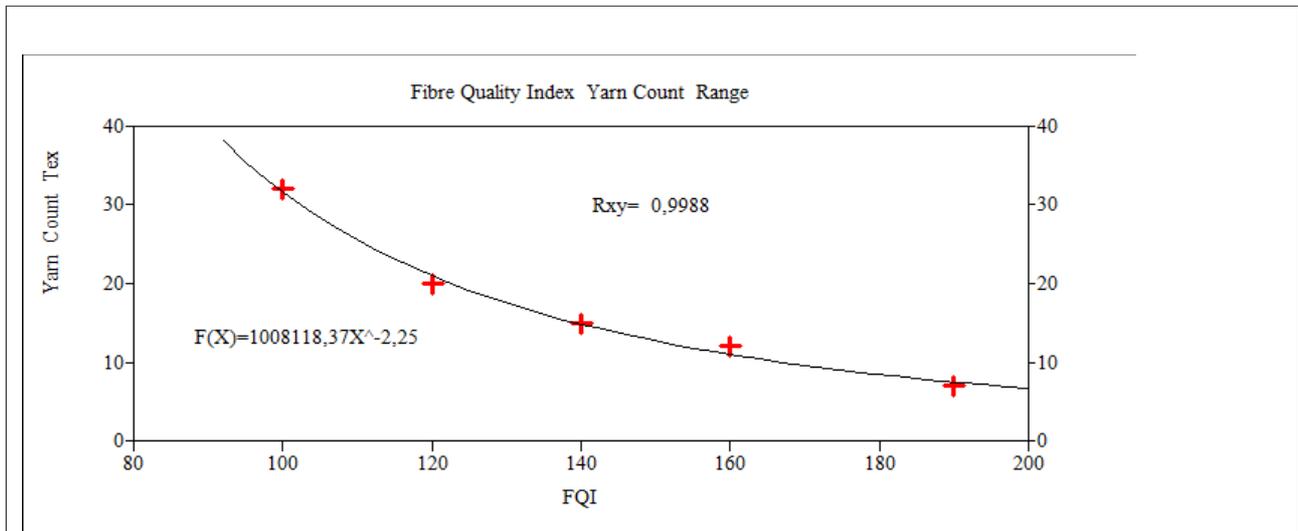
2- Coarse Content

1- Classification of the sample tested according to Itru Cotton Classification System and Processing Basics

This section involved the suitability of the sample tested according to yarn in production as well as determining count range , yarn manufacturing types that could be carried out.

The following Table Summarizes the Itru UAK- 1 + Cotton Classification System

<i>Variables</i>	<i>Standard</i>	<i>Class</i>								
Neps/Gram	<200	A	200-300	B	300-400	C	400-500	D	500>	E
YSI	11 - 15	E	15-20	D	20-22	C	22-26	B	>26	A
YEI	0-20	A	20-35	B	35-50	C	50-100	D	>100.	E
Presley g / tex	<15	E	15-20	D	20-22	C	22-25	B	>25	A
Maturity-FM2	<70	E	70-80	D	80 -90	C	90-100	B	100-120	A
NLC%	0-1	A	1 to 1.5	B	1.5 to 2.0	C	2.0 to 4	D	>4.	E
SFw%	5.<	A	5 to 8	B	8 to 10	C	10 to 14	D	>14	E
% Of Yellow Fibres	1	A	1/2	B	2.3.	C	3.4.	D	4.	E
Whiteness Index	90>	A	85> 90 <	B	80> 85 <	C	75 <80	D	<75	E
Mic	<3	A	3- 3.5 <	B	3.5- 4.5	C	4.5- 5.5	D	>5.5	E
Effective Length	34to38, 8	A	30-34	B	27-30	C	25-27	D	<25.5	E
FQI	>180	A	160-180	B	140-160	C	120-140	D	<120	E
Class (Lg)	Extra Long	A	Long	B	Medium to long	C	Medium	D	Short	E
Count Range (Tex)	7.	A	12.	B	15.	C	20	D	> 32	E



One can determine the count range to be spun according to correlation between FQI and Yarn Count shown above.

Yarn Strength Index (YSI) and Yarn Evenness Index (YEI) give information about the Yarns Strength and Total imperfections (thin, thick, neps) .

From these one can conclude about the over or under estimate of the cost of cotton. In other words Is the cotton selected for manufacturing certain type of yarn under or over estimated and how can this sample be evaluated in process?

This is predicting Yarn Quality Parameters according to Fiber Properties at the raw stock. However, yarn quality is determined by the Fiber Properties at the Ring Frame delivery. The main intention of this course is to improve fibre properties up to ring frame delivery. UAK-1 + predicts yarn quality from Fibre Properties . Yarn Process Engineering software make use of several testing devices to estimate yarn quality parameters from fibre properties at the ring frame front roller delivery.

Spinning Performance Index can then be calculated as the ratio of Fiber Properties at the ring frame delivery to the raw stock.

Cotton Sample Testing gives useful information about what can be done in processing to improve production levels and improve yarn quality for the existing raw stock.

This will depend upon the cotton type (roller gin, saw gin) and yarn manufacturing type(carded,combed, rotor or air-jet spinning) ,yarn end use and twist multiplier alpha

UAK-1 + Test results gives detailed information how to spin cotton sample tested and what measures could be taken in at various stages of processing ?

These could be summarized as :

Neps Distribution Analyses :

Fibre Fineness/Maturity and Immature Fibre Fraction Analyses:

Length Distribution Analyzes :

Non-Lint Content % and White Specks Analyzes

Visual Dyeing Analyzes

CV % of Fiber Straightness and Surface Damaged Fibre % Analyzes

Fibre Tensile Parameters Analyzes

Ultra Viola Test Analyzes

and these analyes compared with the actual processing parameters.

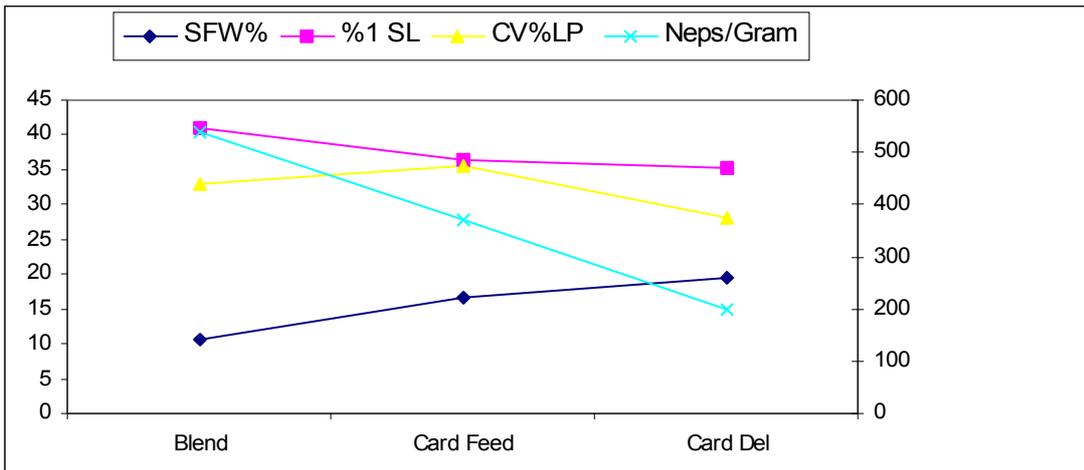
2- Yield Performance Analysis according to Fiber Properties

UAK-1 + provides scanned images of cotton fibres tested . These images also give extra information about the properties of fibers



Tearing of fibers before card entry caused by harsh cleaning in blow room .

- a) Blow room
- b) Card
- c) Comber
- d) Ring



CVLP % = CV % Fibre Straightness
 %1SL = %1 of Staple Fibre Length
 SFW % = Short Fibre Content % by Weight

Over straightening of fibres may lead to increase in short fibre content as shown above.

3- Waste Analysis and Performance of Blowroom ,Carding and Combing

4- Process Optimization Works with Existing Blend

- a) Blowroom to card
- b) Carding to Combing
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5- Fabric Analysis

6- Mill Performance Analyzes

- a) Yarn Process Engineering software is used Yarn quality Analyzes according to Fibre Properties at the ring frame delivery

YPE (Yarn Process Engineering) software make use of UAK-1 + test parameters, yarn mass spectrograph curve and yarn tensile properties to determine the expected yarn quality parameters such a thin places, thick places , total imperfections, RKM , RKM CV %

Whatever the fibre properties at the raw stock yarn quality is mainly determined by the fibre properties at ring frame front roller delivery. These are fibre length distribution values , short-fiber content % and fibre fineness in mtex. For that reason to improve yarn quality is mainly depend upon to improvement of these parameters.

YPE produces virtual yarn in 100,000 meter in length from the measured yarn mass CV % . and finds out number of thin, thick places for 1 km of yarn and these values are compared with actual values measured.

40/1 Combed	YPE-	Mill A	Status	Process
Total Unevenness	149	141	Normal	Combed-Ring
Strength grams	316	282	Investigated	Ring Technical Data
RKMCV%	8.9	9.9	Normal	
Mass% CV	13.57	13.74	Normal	
Thin places Normal Distribution Virtual Yarn	9	3	Very good	
Thick Places Normal Distribution Virtual Thread	16	48	Very High	Ring Technical Data
Fiber mtex YPE / UAK-1+	180	180	Normal	

YPE also estimates 2,5 and 50 % Fibre length values and fibre fineness in mtex from the spectrograph curve.

b) Production levels according to Fiber Properties at the ring frame delivery

Ring Spinning Performance Test is carried out to determine gram per spindle hour.

c) Processing and Spinning Ability of the blend

7- Potential Cost Reductions and Quality Improvement

a) Recommendations and suggestions for existing situation

b) New Test plans and working program

4-Teaching-training activities

The training and learning system is based upon the test results of UAK-1 + and other related test methods , Knowledge Based PC-Programs and process improvement work carried out in the mill. Therefore, knowledge will be gathered in relation to experiments that are conducted . The process improvement work is a continuous process .

The core of the system is Learning Path, which covers

a) Reading information related work plan and writing reports according to works carried out.

b) Defining mill problems and Action Plan

c) Solving Problems related to Action Plan

d) Evaluation of the test result

e) Submitting assignments to course administrator and further reading related documents from Wiki and prepare Home Works

f) Submitting questions and answers to Forum

g) Suggestions new subjects to main course to be included or excluded

5 -Support

This training course is a team training and implementation of Process Optimization Works for spinning Mills. Each team should have a team leader and discuss the problems and submit their questions to Forum and will be answered by the forum or course Administrator

6 - Human and Physical Resources

Practical mill samples applications.

7- Methods of Evaluation

This course has been intended to give training for Quality Management, Production Management and Maintenance Team.

A certification will be given to Mill Team according to improvements that are achieved.

Any candidate who can not complete the course for a given period of time automatically deleted from the course without any refunding . Any misuse of the system resources may lead to canceling of enrollment without any refunding and notification .

8- Course Enrollment Fees and Registration for Entrance

Requirements :Internet connection and familiarity with spread sheet software.

Ms-windows Operating System XP,Vista or Windows 7 , Open office ver 3.4.0 English version and Adobe Reader

Course Fee :

For companies = 420 USD per group (Each group has 1 to maximum 4 members)

Registration : [Click here for registration to Cotton Fiber Testing and Processing](#)

Validation of Registration : An e-mail will be send to you for validation of your registration including information about payment method.

Read before enrollment

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