

(TT401) PROCESS & QUALITY MANAGEMENT IN TEXTILES

UNIT - I

Introduction to Process Control: Meaning, Applications to whole Textile Production from fibre to fabric – Process Parameters controlling production, quality – Introduction to quality control: Tools available, selection and interpretation.

PQC in Blow Room, Card & Draw Frame:

Raw Material Management: Importance, need of instrumental evaluation, traditional methods of cotton selection, importance of cost in raw material, cotton marketing, linear programming for mixing, bale management yarn engineering & raw material.

Blow Room: Control of mixing quality – control of yarn realization (Records and Accounting) – Control of waste and Waste extraction study - cleaning in Blow room (Individual and Overall cleaning efficiency of Blow room).

Card: Waste extraction at card, Nep study & control, Snap Study card.

Draw Frame: Breakage study, Stop motion checking, Use of NILO meter, Drafting rollers pressure checking (Carbon paper technique).

UNIT - II

PQC IN Comber, Simplex & Ring Frame:

Comber & Comber Preparatory: Significance & importance of good lap for comber, evaluation of comber performance, fractionating efficiency of comber, comber waste analysis, influence of various factors on combing performance-5 minute test, head wise and Overall waste at Comber.

Speed Frame: Breakage study at Simplex.

Ring Frame: Breakage study, Snap study, & Idle spindle study, Analysis of Snap efficiency and reasons for low snap efficiency.

Measurement and analysis of productivity means to improve productivity, control of yarn quality: count, strength and their variability, yarn unevenness and imperfections, yarn faults and package defects, implementation of process control in cotton spinning.

UNIT - III

PQC Winding, Warping & Pirn Winding:

Process & Quality Control in Winding: Scope, Optimizing of Yarn tensioning and clearing (settings for different kinds of yarns) Producing good package, Snap and breakage study, unwinding tension and optimum guide distance, Breakage and snap study in Auto coner (formats) Approach to control of productivity, Requirements of dye package.

Process & Quality Control in Warping: Scope, breakage study, Effort to minimize the breakage rate, quality of warper beams, breakage study in warping (norms), productivity, warping defects and remedies.

Process & Quality Control in Pirn Winding: Scope, GO-NOGO gauge, Minimizing the end breaks, improving the build of the yarn, control of speed, productivity - Pirn quality checking report.

UNIT - IV

PQC in Sizing & Loom Shed:

Process & Quality Control in Sizing: Scope, choice of size receive and measurement of size pick up, control in size preparation, Lappers study, breakage study, control of size pick up, controlling sizing conditions, stretch control in various zones, moisture control, Migratory behavior study (ATIRA technique) quality of sized beams, positive feed to sow box, productivity, Dead loss and its control, hard waste and its control, Testing of Size Ingredients, testing of sized yarn - Selection of reeds and healds, care of reeds, effect of reed parameters on weaving performance.

Approach to Process & Quality Control in Loom Shed: (Non- auto and Auto loom shed) scope, control of speed, breakage and snap study in loom shed, determination of labour allotment (ATIRA procedure) Norms for breakage rate, No. of looms/operative, control of efficiency (concept of calculated and expected efficiency), control of loom stoppages (due to warp and weft break, shuttle change etc.)

UNIT - V

Process & Quality Control in Chemical Processing: Scope, functions of control house, grey cloth inspection, Process control measures in Bleaching and mercerizing (method to estimate the concentration of caustic and silica in peroxide bleach, absorbency of bleached cloth, Cuprammonium fluidity, ash content, barium activity no. luster no. fastness of bleaching), Process control in dye house: parameters for process control in different forms of dyeing (yarn and fabric), test method to determine the caustic and Hydros conc. In vat dye liquor, Process control in Printing and Finishing: Scope, Approach to process control, test for the suitability of thickener in the print paste formation, iodine absorption test for the evaluation of degree of resign cross linking, fastness properties of dyed and printed goods to wash, light perspiration and water, Fastness to rubbing, hot press, Optimal brightness test for the uniformity of cross linking, assessment of degree of heat setting in polyester by lodine absorption method.

TEXT BOOKS:

1. Process and Quality Control in Spinning – ATIRA
2. Process and Quality Control in Weaving – ATIRA
3. V.A. Shenai, "Evaluation of Textile Chemicals", Sevak Publications, 1980.
4. "Hand Book of Textile Testing" – ISI Publication.
5. "Hand Book of Methods of Tests for Cotton Fibers, Yarns and Fabrics", Circot (CTRL).
6. "Tablets on Chemical Processing", TAI Publication.

REFERENCE BOOKS:

1. Dr. V. K. Kothari, "Testing & Quality Management", AFL Publication, 2006.
2. Mairio Bona, "Textile Quality Physical Method of Product & Process Control", COMMETT Program of EEC.
3. "Quality Control in Spinning" – SITRA Publication.
4. Monograph Series - BTRA.
5. Dr. K. R. Salhotra, "Process Control in Spinning", Institute of Textile Technology, 2002.
6. End Breaks in Ring Spinning – ATIRA
7. A. Barella, "Yarn Hairiness", Textile Progress, Vol 13, No 1, Textile Institute, 2006.