Model Curriculum

QP Name: Winding Tenter
(Electives: Autoconer, Manual Cone Winding, Doubler Winding)

QP Code: TSC/Q0305

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

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Training Parameters

Sector	Textile
Sub-Sector	Spinning - Textiles
Occupation	Post Spinning Operations
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8151.1800
Minimum Educational Qualification and Experience	Basic Literacy & Numeracy with 0-6 months of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	19/02/2021
Next Review Date	19/02/2026
NSQC Approval Date	
QP Version	1.0
Model Curriculum Creation Date	19/02/2021
Model Curriculum Valid Up to Date	19/02/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	300 hours
Maximum Duration of the Course	700 hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner will be able to:

- Take charge and hand over the shift to the shift supervisor in the winding department.
- Replenish supply packages at winding machines.
- Perform knotting/splicing broken yarn at winding machines.
- Carry out finished package doffing and cleaning activities at winding machines.
- Maintain work area, tools, and machines as per guidelines.
- Follow greening and energy conservation activities as per guidelines.
- Describe the importance of health, safety, and security at the workplace.
- Communicate and work effectively in a team.
- Comply with organizational and industry standards.

Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**02:00**	**01:00**			**03:00**
Module 1: Introduction to spinning mill and objectives of winding machine	02:00	01:00			03:00
TSC/N0316: Carry out shift change activities in winding department Version 1.0 NSQF Level - 4	**03:00**	**14:00**			**17:00**
Module 2: Shift handover and takeover in winding department	03:00	14:00			17:00
TSC/N9015: Follow machine, safety and organizational guidelines in textile sector Version 1.0 NSQF Level - 4	**19:00**	**46:00**			**65:00**
Module 3: Maintaining the work area, tools, and machines	02:00	06:00			08:00
Module 4: Greening and energy conservation in the textile sector	02:00	06:00			08:00

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Module 5: Health, safety, and response to emergencies at the workplace	09:00	23:00			32:00
Module 6: Organizational standards and policies	06:00	11:00			17:00
TSC/N9016: Follow teamwork, adaptability, and communication guidelines in textile sector Version 1.0 NSQF Level - 4	**05:00**	**10:00**			**15:00**
Module 7: Teamwork, trust, and communication	03:00	07:00			10:00
Module 8: Adaptability	02:00	03:00			05:00
Total Duration	**29:00**	**71:00**			**100:00**

Elective Modules

The table lists the elective modules, their duration, and mode of delivery.

Elective 1: Winding Tenter – Autoconer

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
TSC/N0317: Carryout cop creeling, doffing and tenting responsibilities in autoconer department Version 1.0 NSQF Level - 4	**60:00**	**140:00**			**200:00**
Module 9: Operate the autoconer machine	07:00	21:00			28:00
Module 10: Perform cop creeling operation	09:00	27:00			36:00
Module 11: Mend red light malfunctions in the autoconer machine	06:00	17:00			23:00
Module 12: Carry out doffing operation	12:00	30:00			42:00
Module 13: Carry out other tenting activities in the autoconer department	15:00	25:00			40:00
Module 14: Perform cleaning activities in the	6:00	8:00			14:00

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
autoconer machine					
Module 15: Perform additional responsibilities while working with link-coner machine	5:00	12:00			17:00
Total Duration	**60:00**	**140:00**			**200:00**

Elective 2: Winding Tenter – Manual cone winding

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
TSC/N0318: Carryout cop replenishment, knotting, doffing and tenting responsibilities in manual cone winding department Version 1.0 NSQF Level - 4	**60:00**	**140:00**			**200:00**
Module 16: Operate manual cone winding machine and knotter or splicer	04:00	12:00			16:00
Module 17: Perform cop replenishments	12:00	28:00			40:00
Module 18: Join broken yarn in the manual cone winding	10:00	25:00			35:00
Module 19: Prepare for cone package doffing operation	07:00	13:00			20:00
Module 20: Carry out doffing operation in the manual cone winding	12:00	36:00			48:00
Module 21: Carry out cleaning and other tenting activities in the manual cone winding department	15:00	26:00			41:00
Total Duration	**60:00**	**140:00**			**200:00**

Elective 3: Winding Tenter – Doubler winding

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
TSC/N0319: Carryout cone replenishment, knotting, doffing and tenting responsibilities in doubler winding department Version 1.0 NSQF Level - 4	**60:00**	**140:00**			**200:00**
Module 22: Operate doubler winding machine and hand knotter	06:00	15:00			21:00
Module 23: Replenish supply packages in the doubler winding machine	12:00	24:00			36:00
Module 24: Knot broken ends in the doubler winding	11:00	24:00			35:00
Module25: Prepare for cheese doffing operation	05:00	10:00			15:00
Module 26: Carry out doffing operation in the doubler winding	12:00	35:00			47:00
Module 27: Carry out cleaning and other tenting activities in the doubler winding department	14:00	32:00			46:00
Total Duration	**60:00**	**140:00**			**200:00**

Module Details

Module 1: Introduction to spinning mills and the objectives of winding machine

Bridge Module

Terminal Outcomes:

- Discuss the role of spinning mills in the textile value chain.
- Discuss the process and product flow in the spinning mills.
- Discuss the functions of a winding machine.

Duration*: 02:00*	**Duration: *01:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the role of spinning mills in the textile value chain. • Discuss the raw material and final product flow in a typical spinning mill. • Describe the functions of the winding machine. • Classify the types of winding machines concerning technology and process.	• Label the part names of a winding machine in a winding machine poster.
Classroom Aids:	
Charts, Posters, Projector, Blackboard, parts of winding machine labelled, signboards, sample logbooks, and formats	
Tools, Equipment, and Other Requirements	
Intermediate and finished packages, process flow chart from blow room to finishing department, sample tools and accessories for winding machines, etc., Seating arrangement for 25 people.	

Module 2: Shift handover and takeover in a winding department

Mapped to TSC/N0316, v1.0

Terminal Outcomes:

- Describe the basics of staple yarn spinning.
- Explain the position of the winding operator in the hierarchy line and the type of role to play in a spinning mill.
- Discuss the rules and regulations of textile mills.
- Prepare and review shift log report and checklist.
- Demonstrate inspection of machines, materials, and accessories in the winding department.
- Calculate and prepare winding production record.

Duration: ***03:00***	**Duration**: ***14:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the basics of staple yarn spinning i.e., process flow, types of machines involved, material flow, types of fibres used, type of yarn produced, terms and definitions of the count, production, efficiency, machine speed, colour code, etc. • Define organizational hierarchy and describe the vertical link between superior and lower levels in an organization. • Describe the roles and responsibilities of winding tenter. • List out the rules and regulations followed in a spinning mill like shift timing and duration, limits of leave and holidays, etc. • Describe safety practices followed in the winding department. • Describe the process of shift handover and shift takeover and their significance. • Discuss the components of shift handover log report. • Discuss the quality requirements of raw materials, spares used in the winding department. • List the operational tools like knotter, waist bag, lapping cleaning knife, etc., required to carry out the tenting activities in the winding department. • Classify the count system followed in a spinning mill. • Discuss the possible waste generated in the winding department and the type of equipment used for collecting the wastes. • Discuss the method of identification of idle	• Prepare an organization chart depicting the various departments and roles involved in a spinning mill. • Demonstrate preparation of a sample log report of an outgoing shift and a checklist of incoming shift. • Demonstrate the process of taking supply and production stock. • Demonstrate inspection of the idle drums, knotter repair, machines with more ends down, the requirement of supply packages, crates, etc. • Demonstrate collection of the shift details from the previous shift operator. • Demonstrate the shift end activities like cleaning, check waste weight, disposal of waste collected, hand over knotter, etc. • Demonstrate calculation of shift production, amount of hard waste generated, and record in the register.

drums, winding faults, and methods to rectify the same. • Explain the importance of signal lamps, OHTC, humidification plant, 5S system, etc. at the winding department.	
Classroom Aids:	
Charts, Posters, Projector, Blackboard, parts of winding machine labelled, relevant charts, signboards, and Staple spinning machine range from Blow room to Winding machine in running condition.	
Tools, Equipment, and Other Requirements	
Waist bag, waste samples, samples of operational tools, calculator, sample logbooks, and production records, Seating arrangement for 25 people.	

Module 3: Maintaining the work area, tools, and machines

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Maintain the work area, tools, and machines in the winding department.
- Explain the objective of tools, PPE used in the winding department.

Duration: *02:00*	**Duration:** *06:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Differentiate various types of tools used for cleaning and maintenance. • Explain the objectives of each cleaning tool used in winding machine operation. • Discuss the significance of safe handling procedures of tools and equipment. • Brief the importance and written instructions on the allocated machines. • Discuss the significance of minimizing the wastage of material, effort, and time. • Prepare a draft schedule for cleaning and waste collection for the assigned job role. • List the available types of material handling equipment and handling methods used in the winding department. • Discuss the types and importance of PPE used in the winding department.	• Demonstrate the procedure to handle materials, tools, PPE, and machines. • Demonstrate identification of the appropriate tools and equipment for the respective job. • Demonstrate the scheduled cleaning of machines and equipment. • Demonstrate the inspection of machine guards.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Winding machines, ancillaries, material handling equipment, and tool kits of operational, cleaning maintenance activities, Seating arrangement for 25 people.	

Module 4: Greening and energy conservation in the textile sector

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Identify the recyclable, non-recyclable, and hazardous wastes in the winding department.
- Optimize usage of material and resources at the workplace.

Duration: *02:00*	**Duration:** *06:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the terms of pollution control, soil conservation, waste management, recycle, forest conservation, global warming, organic products, etc. • List the different sources of energy. • Discuss the impact of using non-biodegradable materials on the environment. • Evaluate the different ways to conserve energy in a textile factory. • Discuss the significance of conserving the environment and energy resources. • Discuss the significance of specified usage of resources at the work area.	• Demonstrate the segregation of recyclable, non-recyclable, hazardous wastes in the winding department. • Demonstrate the handling and storage of waste materials. • Demonstrate potential ways to reduce wastage and conserve energy in a textile factory.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
samples of organic cotton, video visuals on solar power, package materials-covers, bags, wrappers, box, etc., Seating arrangement for 25 people.	

Module 5: Health, safety, and response to emergencies at the workplace

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Perform first aid at the workplace.
- Follow fire safety protocol in case of fire emergencies in the Winding department.
- Recognize hazardous materials at workplace.

Duration: *09:00*	**Duration:** *23:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of safe handling procedures of tools and equipment. • Discuss the importance and standard procedure for materials. • Discuss the impacts hazards of unsafe workplace conditions and procedures in the textile industry (operational, environmental, personal, ergonomic, chemical, electric, fire) and methods to avoid hazards. • Distinguish between the various types of fire extinguishers. • Distinguish different types of alarms and their significance. • Differentiate the different items in a First Aid box. • Discuss the correct work posture and importance of ergonomics for the assigned job role.	• Demonstrate the identification of abnormal sounds emanating from faulty/worn-out machine parts. • Demonstrate classification of Personal Protective Equipment (PPEs) like body protectors, earplugs, nose masks, head cap, etc. as per guidelines. • Demonstrate handling of fire extinguishers. • Demonstrate the identification of emergency exits of the workplace and organization. • Demonstrate fire drills/evacuation method at workplace. • Demonstrate application of first aid procedures for injury/accidents in mock situations. • Demonstrate lifting of heavyweight materials as per the standard procedure.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
PPE, first aid kit, fire extinguishers, Winding machines, Seating arrangement for 25 people.	

Module 6: Organizational standards and policies

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Recognize the significance of organization policies, quality standards, rules, and regulations in Textile industries.
- Maintain a hygienic working atmosphere as per the protocol of the textile sector.

Duration: *06:00*	**Duration:** *11:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of following organizational standard procedures, quality standards, rules, codes, policies, and safety standards for the textile sector. • Discuss the need for organizational quality systems, 5S, ISO, SA, etc. following in the textile sector. • Brief the importance of following workwear standards, behavioural protocols, and etiquette in the textile sector. • Discuss the contents of the organization's formats and procedures for reporting production, defects, faults, material/tool requisition, and quality parameters and tasks completed for the assigned job.	• Demonstrate the systems like Quality circles, 5S, ISO, etc. in the routine work. • Demonstrate the steps to maintain a hygienic workplace.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
list of rules and regulations followed in the organization, list of industry standards i.e., performance indicators of mills, process, worker, etc., Seating arrangement for 25 people.	

Module 7: Teamwork, trust, and communication

Mapped to TSC/N9016, v1.0

Terminal Outcomes:

- Confirm to standard guidelines while working with the team.
- Communicate effectively with others at the workplace.

Duration: *03:00*	**Duration: *07:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of teamwork and following industry protocols at the workplace. • Explain the limits and responsibilities for the assigned duties in the textile sector. • Summarize emergency contact numbers, details of officials, reporting Protocols, and formats. • List hierarchy of communication and communication etiquettes in the textile sector.	• Apply methods of teamwork to complete/for a given task. • Prepare a sample shift performance report for an allotted task. • Demonstrate the use of appropriate verbal and non-verbal communication skills while interacting with others at the workplace.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Video visuals of basic communications and team working, models of communicating and team working area at your job, Seating arrangement for 25 people.	

Module 8: Adaptability

Mapped to TSC/N9016, v1.0

Terminal Outcomes:

- Operate at the various environment and different hierarchy levels for the assigned task.
- Create a work plan for the allotted task.

Duration: *02:00*	**Duration: *03:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of adaptability at the workplace with various levels of people. • Discuss the importance of developing adaptability skills. • Discuss the impacts of inadaptability at the workplace.	• Demonstrate the ability to work in a dynamic work environment by developing coping mechanisms, survival tactics, and traits of flexibility. • Create a sample backup work plan for the shortage of manpower, raw materials, etc.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Video visuals of adaptability with suitable examples, Seating arrangement for 25 people.	

Module 9: Operate the autoconer machine

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Stop and start auto coner machine and other individual units like drum, auto-doffer, empty tubes conveyor, cone conveyor, etc.
- Operate the auto coner machine as per the SOP.
- Perform other control switch operations such as reset drum after doffing, emergency switch functions, etc.
- Operate machine display panel, view and change process parameters.

Duration: ***07:00***	**Duration**: ***21:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the main parts of the autoconer machine and their function. • Describe different control switches/ buttons, signal lamps, and display board in the autoconer machine and their functions. • Explain basic electrical connections and drum drives used in the autoconer machine. • Discuss the SOP of operating the autoconer machine i.e., control switch operations of stop/start the machine, start/stop the drum, stop/start conveyor system, and machine display board operation.	• Demonstrate starting and stopping of autoconer machine, drum unit, empty tubes conveyor system, cone conveyor system, and auto-doffer unit. • Demonstrate the process of identification of malfunctions/warnings using the signal lamps in the autoconer machine. • Demonstrate the procedure of operating switches for red light malfunction, doffing, and other signal lamp operations. • Demonstrate the setting of parameters like count, range of drums per count, drum speed, production, efficiency, etc. in the control panel of the autoconer machine.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine, diagram of the passage of material in autoconer machine, Seating arrangement for 25 people.	

Module 10: Perform cop creeling operation

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Creel full cops and rejected good cops in the magazine at autoconer.
- Recognize the alarm for creeling requirements.
- Explain the SOP of creeling cops in the autoconer machine.
- Demonstrate the handling of cops, trolleys as per the SOP.

Duration: ***09:00***	**Duration**: ***27:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the cop feeding zone and their functions. • Discuss the material flow in the autoconer machine. • Describe terms of count, colour code, cop content, under winding length, breaks per lakh meter, etc. • Explain the relationship between cop content, machine speed, and yarn count. • Classify the types of cop defects and their impacts during the winding process. • Describe alarm cops and their implications on product quality. • Explain the procedure for handling crates and trolleys used for cop transport. • Discuss the SOP of the cop creeling operation.	• Demonstrate creeling full cops at autoconer. • Demonstrate cleaning and re-creeling of rejected cops at autoconer. • Demonstrate the use of yarn clearer alarms to identify the defective cops. • Demonstrate the recognition of right colour coded supply packages. • Demonstrate loading and unloading of cop crate at winder trolley.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine, cops, empties, cop crate, winder trolley, samples of defective cops, Seating arrangement for 25 people.	

Module 11: Mend red-light malfunctions in the autoconer machine

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Identify drum malfunctions using signal lamps.
- Rectify red light malfunctions and re-start drum.
- Explain the SOP of mending red-light malfunctions.

Duration: ***06:00***	**Duration**: ***17:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define red light malfunctions and their implications on machine efficiency. • Discuss the reasons for occurring red light malfunctions. • Explain why the malfunctions should be repaired immediately other than any job. • Describe the terms red light percentage, red light loss and repeaters percentage. • Discuss the SOP of mending red-light malfunctions. • Discuss the consequence of improper mending of red-light malfunctions.	• Demonstrate the use of signal lamps to identify malfunctions of the autoconer machine. • Demonstrate mending drum malfunctions as per the standard procedure.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine, Seating arrangement for 25 people.	

Module 12: Carry out doffing operation

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Describe the requirements of the doffing operation as per the SOP.
- Discuss the types of cone package defects and their causes.
- Demonstrate doffing process as per the SOP.

Duration: *12:00*	**Duration**: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the doffing zone and their function. • Describe the different parts of the auto-doffer unit. • Describe doffing and its elements like doffing, donning, gaiting, and tail-end winding. • Define doff length, cone weight, and tail end. • Define the relationship between count, doffing weight, and machine speed. • Discuss the requirements of under winding coils in the ring cop and tail end in the cone package. • Discuss different types of cone package defects and their causes. • Describe allowable limit for package weight variation and implications of more weight variations. • Discuss the SOP of doffing operation at auto coner machine.	• Demonstrate the use of signal of lamps to identify the drum whether the package is matured or not. • Demonstrate cone package doffing and drum gaiting. • Demonstrate tail end winding as per the standard guidelines. • Demonstrate checking cone weight and sort as per weight variation limit. • Demonstrate mending auto-doffing device malfunction. • Demonstrate preparation of empty cones and creel in reserve holder at auto coner machine.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine with/without auto-doffer, cone package, empty cones, weigh scale, cone trolley, Seating arrangement for 25 people.	

Module 13: Carryout other tenting activities in the autoconer department

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Discuss the requirements of following standard reporting formats.
- Discuss the impacts of wrong work practices in the autoconer department.
- Demonstrate other tenting activities like cleaning, removal of remnants, wax roll replacement, remove drum lapping.

Duration: ***15:00***	**Duration**: ***25:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the other tenting activities of the auto coner tenter. • Describe count change and its checklist. • Define the implications of the idle drums in the production line. • Discuss the benefits of segregating rejected cops and empty tubes. • Describe the terms of rejected cop percentage, half cops, remnants, hard waste percentage, production, and efficiency. • Explain the functions of OHTC and its significance in the winding department. • Explain the different format types for recording production, log report, stock, etc. • Discuss the requirement of wax roll in the autoconer machine. • Discuss the impacts of wrong work practice in the winding department.	• Demonstrate segregating rejected cops and empty cops. • Demonstrate count change activities i.e., wax roll change, empty cone change, feed parameters like count, speed, tension, etc at the display panel. • Demonstrate cleaning of drum lapping in the auto coner machine. • Demonstrate transportation of materials and tools such as empty paper cones, wax rolls, empty baskets, etc. as per the SOP. • Demonstrate the operation of OHTC like start, stop, forward, and backward movement.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment and Other Requirements	
Autoconer machine with sorting table, samples of rejected cops, wax rolls, Seating arrangement for 25 people.	

Module 14: Perform cleaning activities in the auto coner machine

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Discuss the importance of autoconer machine cleaning.
- Demonstrate the cleaning operation of the auto coner machine using compressed air as per the SOP.
- Demonstrate the collection of suction waste in the autoconer department.

Duration: ***06:00***	**Duration**: ***08:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the process of cleaning an autoconer machine and the need for cleaning it. • Discuss the cleaning activities and their schedule for the autoconer machine as per the SOP. • Describe the tools and equipment used for cleaning the autoconer machine and the procedure for handling tools. • Describe the 5s housekeeping system and how this system helps to maintain the autoconer department.	• Demonstrate cleaning of auto coner machine with compressed air as per the SOP. • Demonstrate inspection and cleaning of chock at yarn clearer using the prescribed tool. • Demonstrate cleaning of dust/ flies in the yarn passage. • Demonstrate collection of hard waste from the suction chamber of the autoconer machine and the OHTC.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine, air hose, samples of hard waste and OHTC waste, yarn clearer cleaning tool, drum lapping cleaning tool, Seating arrangement for 25 people.	

Module 15: Perform additional responsibilities while working with link coner machine

Mapped to TSC/N0317, v1.0

Terminal Outcomes:

- Discuss the objectives of the link coner mechanism.
- Discuss the importance of patrolling the machine.
- Demonstrate clearing of cop jam in the cop passage.

Duration: *05:00*	**Duration**: *12:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the advantages of the link coner mechanism. • Describe the link coner machine parts in the cop transport zone and their functions. • Discuss the additional responsibilities of autoconer tenter while working with the link coner machine. • Distinguish the difference between rejected cops and fresh cops feeding channels. • Describe the percentage of cops rejected at the link coner machine. • Discuss the SOP of patrolling link coner machine and clearing feed passage congestion.	• Demonstrate machine patrolling to identify drum malfunctions as per the SOP. • Demonstrate clearing the traffic congestion in cop passage. • Demonstrate feeding of rejected cops manually in the transport channel. • Demonstrate cleaning of remnant cops as per the SOP.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Autoconer machine with link-coner specialty, samples of cops and rejected cops, Seating arrangement for 25 people.	

Module 16: Operate manual cone winding machine and knotter or splicer

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Demonstrate manual cone winding machine operation as per the SOP.
- Operate hand knotter or splicer as per the SOP.

Duration: *04:00*	**Duration**: *12:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the function of a manual cone winding machine. • Distinguish between an autoconer and a manual cone winding machine. • Discuss the winding quality standards followed in the manual cone winding department. • Describe the main parts of the manual cone winding machine and their functions. • Describe different control switches in the machine and their operating procedure. • Explain basic electrical connections and motor/drum drives used in manual cone winding machines. • Describe hand knotter and explain its function. • Discuss the SOP of operating manual cone winding machine and knotter or splicer.	• Demonstrate starting and stopping of manual cone winding machine and empty tubes conveyor system. • Demonstrate knotting or splicing with sample yarns using a hand knotter or splicer as per the SOP. • Demonstrate attending to the malfunctions of the ribbon breaker device.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, Knotter or Splicer, Seating arrangement for 25 people.	

Module 17: Perform cop replenishments

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Demonstrate replenishments of supply package as per the SOP.
- Explain the SOP of replenishing the supply package in a manual cone winding machine.

Duration: *12:00*	**Duration**: *28:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the cop feeding and thread passage area and their functions. • Discuss the material flow in cone winding machine. • Define terms of count, colour code, cop content, under winding length, breaks per lakh meter, etc. • Discuss the colour code followed in the manual cone winding department. • Explain the relationship between cop content, machine speed, and yarn count. • Classify the types of cop defects and their impacts during the winding process. • Explain the procedure for handling crates and trolleys used for cop transport. • Discuss the SOP of changing cops at the manual cone winding machine. • Discuss the importance of maintaining standard and allowable weight variation in the final cone package.	• Demonstrate inspection of drums to identify the cop exhausts. • Demonstrate replenishment of supply package as per the standard procedure. • Demonstrate identification of supply packages using colour code. • Demonstrate loading and unloading of cop crate at winder trolley. • Demonstrate cleaning of remnant cops. • Demonstrate collection and storage of hard waste as per the SOP.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, knotter or splicer, samples of cops and empties, cop crate, winder trolley, samples of defective cops, Seating arrangement for 25 people.	

Module 18: Join broken yarn in the manual cone winding

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Explain the SOP of knotting or splicing broken yarn in a manual cone winding machine.
- Discuss the standard patrolling method followed in the manual cone department.
- Demonstrate knotting or splicing of broken yarn as per the SOP.

Duration: ***10:00***	**Duration**: ***25:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the drum stop motion and its functions. • Explain the causes for yarn breakages at manual cone winding machines and norms for breakage level. • Explain the need of giving priority to attend yarn breakages. • Define the terms of knotting, splicing strength, knot size, and false knot. • Discuss the requirements of quality knotting and splicing. • Discuss the SOP of attending broken yarn using knotter or splicer at manual cone winding machine. • Discuss the consequence of improper knotting and splicing of broken yarn.	• Demonstrate the standard method of patrolling the manual cone winding department as per the SOP. • Demonstrate knotting or splicing of broken yarn as per the standard work method.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, knotter or splicer, sample cops, Seating arrangement for 25 people.	

Module 19: Prepare for cone package doffing operation

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Demonstrate weighing of the cone package using the weighing scale.
- Demonstrate preparation of empty paper cones for doffing operation.

Duration: *07:00*	**Duration**: *13:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the manual winding zone and their function. • Explain the different methods for estimating the package weight. • Describe the process of package doffing. • Define the terms of doffing length, weight tolerance, cone weight, and tail end. • Discuss the cop weight and cone weight relationship to achieve standard package weight within tolerance. • Explain the importance of token and drum details in empty paper cones. • Explain the different types of cone package defects. • Discuss the SOP of checking cone weight. • Discuss the importance of using wax in the cone winding process.	• Demonstrate empty paper cones preparation. • Demonstrate setting tare weight at weigh scale. • Demonstrate validating the weight of the delivery package.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, samples of cone packages and empty cones, weighing scale, pen, label, record book, Seating arrangement for 25 people.	

Module 20: Carryout doffing operation in the manual cone winding

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Discuss the SOP of doffing the cone package in a manual winding machine.
- Demonstrate full cone doffing operation as per the SOP.
- Correct cone package weight to the standard level.

Duration: *12:00*	**Duration**: *36:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the checklist of doffing operation. • Brief the methodology for adjusting weight varied cone packages. • Define allowable limit for weight variation. • Discuss the causes for varying package weight. • Define tail end length at cone package and implications of inconsistent length in the tail end winding. • Explain the procedure for wrapping covers to cone packages and stacking them over the floor. • Discuss the requirements of quality package production. • Discuss the SOP of doffing operation with tail end winding. • Discuss the consequence of the wrong method of doffing.	• Demonstrate doffing cone package as per the standard procedure. • Demonstrate adjusting cone weight for less and more wound cone packages. • Demonstrate wrapping polyethylene cover to cone package. • Demonstrate loading and unloading of cone packages in the trolley as per the SOP. • Demonstrate stacking of cone packages on the specified area as per the SOP.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, Cones, empty cones, weighing scale, Polyethylene cover, cone trolley, Seating arrangement for 25 people.	

Module 21: Carry out cleaning and other tenting activities in the manual cone winding department

Mapped to TSC/N0318, v1.0

Terminal Outcomes:

- Explain the SOP of cleaning the manual cone winding machine.
- Demonstrate cleaning of different parts of the manual cone winding machine.
- Demonstrate other tenting activities in a manual cone winding machine.

Duration: *15:00*	**Duration**: *26:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the process of cleaning a manual cone winding machine and the need of cleaning it. • Discuss the different cleaning activities of manual cone winding machine and schedule of intervals. • Describe the tools and equipment used for machine cleaning and procedure for handling tools. • Define the terms of half cops, remnants, hard waste percentage, production, and efficiency. • Describe other tenting activities of the manual cone winding tenter. • Describe the process of count change and discuss the count change checklist. • Define idle drums and explain their implications. • Explain the functions of OHTC and its operating procedure at the manual cone winding department. • Explain the different format types for recording production, log report, stock, etc. • Describe 5s housekeeping system and discuss how this system helps to maintain the winding department tidy. • Discuss the SOP of cleaning and other tenting activities at the manual cone winding department.	• Demonstrate cleaning of manual cone winding machine with compressed air. • Demonstrate the cleaning of chock/flies at the thread path. • Demonstrate cleaning of drum lapping. • Demonstrate recognition of different types of malfunctions like yarn clearer ineffectiveness, ribbon breaker failure, cone holder lifting problems, bad alignment of thread path, knotter problem, etc. • Demonstrate filling of water at the wet splicer. • Demonstrate count change activities i.e. wax roll change, tension disc change, empty cone change, etc. • Demonstrate transporting required materials like empty paper cones, wax rolls, empty baskets, etc. • Demonstrate stopping and starting, forward/backward of OHTC. • Demonstrate collecting suction waste at the OHTC waste collection chamber.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Manual cone winding machine, wax rolls, air hose, samples of hard waste and OHTC waste, yarn clearer cleaning tool, drum lapping cleaning tool, Seating arrangement for 25 people.	

Module 22: Operate doubler winding machine and hand knotter

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Demonstrate stopping and starting of the doubler winding machine and the individual drum units.
- Operate hand knotter and making knots with parallel yarns.

Duration: *06:00*	**Duration**: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the objectives of the doubler winding process. • Distinguish the differences between conventional and modern doubler winding machines. • Describe the parts of the doubler winding machine and their functions. • Describe different control switches in the machine and their operating procedure. • Explain basic electrical connections and drum drives used in the doubler winding machine. • Explain the functions of a hand knotter. • Discuss the SOP of operating the doubler winding machine and hand knotter.	• Demonstrate starting and stopping of doubler winding machine. • Demonstrate operating individual drums using starting handle or control switches. • Demonstrate knotting with sample yarns using a hand knotter.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Doubler winding machine, hand Knotter, Seating arrangement for 25 people.	

Module 23: Replenish supply packages in the doubler winding machine

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Demonstrate replenishment of supply packages as per the SOP.
- Demonstrate collection of hard waste as per the SOP.

Duration: *12:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the creel and thread passage area and their functions. • Discuss the material flow in the doubler winding machine. • Describe terms of count, colour code, supply package weight, tail end, breaks per lakh meter, etc. • Explain the relationship between package content, machine speed, and yarn count. • Classify the types of cone package defects and their impacts during the doubler winding process. • Explain the procedure for handling trolleys used for cone transport. • Discuss the SOP of changing supply packages at doubler winding.	• Demonstrate changing supply package as per the standard procedure. • Demonstrate the use of colour code system to identify the correct supply packages. • Demonstrate cleaning of remnant cones. • Demonstrate loading, and unloading of cone packages at the trolley.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Doubler winding machine, hand knotter, samples of cones and empty cones, cone trolley, samples of defective cone packages, Seating arrangement for 25 people.	

Module 24: Knot broken ends at doubler winding machine

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Demonstrate identification of end breakages at the doubler winding machine.
- Demonstrate joining of broken ends using a knotter as per the SOP.
- Explain the standard method of patrolling the doubler winding department.
- Explain the SOP of knotting broken ends in the doubler winding machine.

Duration: *11:00*	**Duration**: *24:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the identification of drum stop motion and its function. • Discuss the causes for yarn breakages and quantify number of breakages per unit in the manual cone winding. • Explain the need for giving priority to attend the breakages. • Discuss the SOP for attending broken yarn using knotter in the doubler winding. • Discuss the consequence of improper knotting of broken yarn.	• Demonstrate patrolling of the allotted machines to identify the supply package exhausts. • Demonstrate the use of drum stop motion to identify the broken ends. • Demonstrate cleaning or dressing of single yarn at cheese package. • Demonstrate knotting of the broken end as per the standard procedure.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Doubler winding machine, hand knotter, samples of cheese and cone packages, Seating arrangement for 25 people.	

Module 25: Prepare for cheese doffing operation

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Demonstrate weighing of the package using a weighing scale.
- Demonstrate preparation of empty tubes for doffing operation.

Duration: *05:00*	**Duration**: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the machine parts in the winding zone and their function. • Explain the different methods for estimating the package weight. • Describe the process of package doffing and define the terms of doffing length, weight tolerance, cone and cheese package weight, density, and soft cheese package. • Discuss the different types of cheese package defects. • Discuss the SOP of checking cheese weight and preparing empty tubes.	• Demonstrate preparation of empty tubes. • Demonstrate setting of tare weight at weigh scale as per the SOP. • Demonstrate validating cheese package weight.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Doubler winding machine, samples of cheese package and empty tubes, weighing scale, Seating arrangement for 25 people.	

Module 26: Carryout doffing operation in the doubler winding

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Explain the SOP of doffing cheese package in a doubler winding machine as per the SOP.
- Demonstrate doffing operation in the doubler winding machine.

Duration: *12:00*	**Duration**: *35:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the requirements of doffing operation at doubler winding machine. • Describe the cycle time of doffing and discuss the relationship among cycle time, machine speed, and yarn count. • Explain the operating procedures of drum starting handle or control buttons. • Discuss the requirements of quality cheese package production at doubler winding machine. • Discuss the SOP of doffing in the doubler winding machine. • Discuss the consequence of the wrong method of doffing.	• Demonstrate cheese package doffing as per the standard procedure. • Demonstrate the use of starting handle or control buttons to re-start drums after doffing concerning machine type. • Demonstrate transporting, loading, and unloading of cheese packages in trolley. • Demonstrate arranging cheese packages in the rack.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Doubler winding machine, samples of cheese packages and empty tubes, cheese trolley, Seating arrangement for 25 people.	

Module 27: Carry out cleaning and other tenting activities in the doubler winding department

Mapped to TSC/N0319, v1.0

Terminal Outcomes:

- Explain the SOP of cleaning doubler winding machine.
- Clean different parts of the doubler winding machine.
- Perform other tenting activities of doubler winding tenter.

Duration: *14:00*	**Duration**: *32:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe machine cleaning and brief its objectives. • Discuss the different cleaning activities of the doubler winding machine and the schedule of intervals. • Describe the tools and equipment used for machine cleaning and procedure for handling tools. • Describe the other tenting activities of the doubler winding tenter. • Define the specific terms like machine production, machine efficiency, and hard waste percentage. • Explain the process of count change activity and discuss the count change checklist. • Define idle drum and explain its implications. • Explain the functions of OHTC and its operating procedure at the doubler winding department. • Explain the different format types for recording production, log report, stock, etc. • Describe the 5s housekeeping system and discuss how this system helps to maintain the winding department tidy. • Discuss the SOP of cleaning and other tenting activities at the doubler winding department. • Discuss the need for supporting the maintenance team. • Discuss the impacts of wrong work practices in the doubler winding department. • Discuss the objectives of using wax in the winding operation.	• Demonstrate cleaning of doubler winding machine with compressed air. • Demonstrate the cleaning of chock/flies at the thread path. • Demonstrate removal of drum lapping. • Detect different types of malfunctions like stop motion ineffectiveness, bad alignment of thread path, knotter problem, etc. • Demonstrate count change activities i.e., speed change, tension disc change, empty tube change, etc. • Demonstrate transporting required materials like empty tubes, empty baskets, etc. • Demonstrate stopping and starting, forward/backward of OHTC. • Demonstrate collecting suction waste at the OHTC waste collection chamber.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	

Tools, Equipment, and Other Requirements
Doubler winding machine, drum cleaning hook, tension washer, compressed air hose, calculator, production, record book, pen, Seating arrangement for 25 people.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Basic Literacy and Numeracy	NA	1	Spinning Production	4	Spinning Production	

Trainer Certification	
Domain Certification	**Platform Certification**
TSC/Q0305, v1.0 – Winding Tenter, Minimum pass percentage 80 percent.	MEP/Q2601, v1.0 – Trainer, Minimum pass percentage 80 percent.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Textiles	3	Spinning production			

Assessor Certification	
Domain Certification	**Platform Certification**
TSC/Q0305, v1.0 – Winding Tenter, Minimum pass percentage 80 percent.	MEP/Q2701, v1.0 – Assessor, Minimum pass percentage 80 percent.

Assessment Strategy

The overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.

a) The emphasis is on 'learn-by-doing' and practical demonstration of skills and knowledge based on the performance criteria.

b) The assessments papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performances and assessment criteria mentioned in the Qualification Packs.

c) The assessments papers are also checked for the various outcome-based parameters such as quality, time taken, tools & equipment requirement, etc.

d) The assessments are designed so as to assess maximum parts during the practical hands-on work. Duties and responsibility of Winding Tenter also assessed. The technical limitations at the training centres are taken care in theory and viva.

e) The assessment agencies are instructed to hire qualified and experienced assessors as per TSC's criteria who have integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments.

f) The assessment agencies are instructed to ideally have assessors with the right mix of industry experience, academia and these are detailed in Assessment Agency Protocol of TSC

g) The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to Assessment Framework, competency-based assessments, assessors guide etc. and they are assessed for Domain and assessment skills. Only those assessors who clears both the assessments with minimum 80 percentage marks in each are permitted to carry out assessments.

h) The assessors are provided with Assessors guide developed by the Subject Matter Expert of the Assessment Agency or by Textile SSC as per Assessment Framework. The Assessors guides are developed to ensure the maximum possible consistency/transparency in the assessment by different assessors and elaborate on the following:

1. Qualification Pack Structure.
2. Guidance for the assessors to conduct theory, practical and viva assessments.
3. Guidance for trainees to be given by assessor before the start of the assessments.
4. Guidance on assessment process, practical brief with step of operational practical observation checklist Attendance Sheet and mark sheet.
5. Viva guidance for uniformity and consistency across the batch.
6. Guidance on assessment evidence collection.

The assessment results are backed by evidence collected by assessors.

1. The assessors need to collect a copy of the attendance sheets for the training done under the scheme. The attendance sheets are signed and stamped by the in charge/ Head of the training centre.

2. The assessors need to verify the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same needs to be mentioned in the attendance sheet. In case of suspicion, the assessor should authenticate and cross verify trainee's credential in the enrolment form.

3. The assessors need to take a camera to click photograph of the trainees working on the job and giving theory exam as evidence.

4. The assessors also need to carry a Photo ID card.

5. The assessors also need to take the photographs as evidence from appropriate angles/sides of the final work piece/job submitted by the trainee.

6. The details on assessment framework are elaborated in Textile SSC protocol for accreditation of Assessment Agencies and Assessment Framework.

All accredited Assessment Agencies follow the "Textile SSC's protocol for accreditation of Assessment Agencies and Assessment Framework". Each NOS in the Qualification Pack (QP) will be assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Performances Criteria in the NOS will be assigned marks for theory or practical based on relative importance, criticality of function and training infrastructure.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedure
PPE	Personal Protective Equipment
QC	Quality Control
ISO	International Organization for Standardization
SA	Standards on Auditing