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TEXTILE WET PROCESSING



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COMPETENCY STANDARDS

National Vocational Certificate Level 2-3

Version 1 - November, 2019



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1. Introduction

The Textile industry is the largest manufacturing industry in Pakistan. Pakistan is the 8th largest exporter of textile commodities in Asia. Textile sector contributes 8.5% to the GDP of Pakistan. In addition, the sector employs about 45% of the total labor force in the country (and 38% of the manufacturing workers).

Dyeing is the application of dyes or pigments on textile materials such as fibers, yarns, and fabrics with the goal of achieving color with desired color fastness. Dyeing is normally done in a special solution containing dyes and particular chemical material. Dye molecules are fixed to the fibre by absorption, diffusion, or bonding with temperature and time being key controlling factors. The bond between dye molecule and fibre may be strong or weak, depending on the dye used. Dyeing and printing are different applications; in printing color is applied to a localized area with desired patterns and in dyeing it is applied to the entire textile.

In order to build the capacity of technical and vocational training institutes in Pakistan through provision of demand driven competencies-based trainings in textile sector the NAVTTC and TEVT Sector Support Program (TSSP) have joined hands together to develop qualifications for textile sector. These qualifications will not only build the capacity of existing workers of this sector but also support the youth to acquire skills best fit for employment in this sector. The benefits and impact of development of these qualifications will be on both demand and supply side.

Based upon this demand of industry these competency-based qualifications for “Textile Wet Processing - Dyeing Technologist” (exhaust, continuous and semi continuous dyeing machine operators, quality controllers, etc) are developed under National Vocational Qualification Framework (NVQF) (Level 2 to 3). The qualifications mainly cover competencies along with related knowledge and professional skills which are essential for getting a job or self-employed.

The National Vocational & Technical Training Commission (NAVTTTC) has approved the Qualification Development Committee (QDC). The QDC consists of experts from the relevant textile dyeing industries from different geographical locations across



Pakistan and academicians who were consulted during the development process to ensure input and ownership of all the stakeholders. The National Competency Standards could be used as a referral document for the development of curricula to be used by training institutions.

Textile Wet Processing – Dyeing Technologist curriculum will prepare trainees to efficiently operate all types of dyeing machines on the basis of exhaust, continuous and semi continuous dyeing methods. Graduates of this program may find employment in local and international dyeing industries and may establish their vital role in the economy of Pakistan.



2. Detail of National Vocational Certificate Levels

The detail of the competency standards included in this qualification are given below:

NATIONAL VOCATIONAL CERTIFICATE LEVEL 2, IN (TEXTILE SECTOR) “TEXTILE WET PROCESSING - DYEING MACHINE OPERATOR”

- Maintain Personal Health, Hygiene and Safety
- Demonstrate Basic Numeracy Skills
- Perform Winch Dyeing
- Perform Jigger Dyeing
- Perform Jet Dyeing
- Perform Pad batch Dyeing
- Perform Pad thermosol Dyeing
- Perform Pad steam Dyeing
- Perform Cone Dyeing
- Perform Rope Dyeing
- Perform Soft flow Dyeing
- Perform Garment Dyeing
- Perform Stenter Dyeing
- Dispose the Waste Materials
- Perform Basic Communication Skills

NATIONAL VOCATIONAL CERTIFICATE LEVEL 3, IN TEXTILE WET PROCESSING - DYEING TECHNOLOGIST”

- Follow Health and Safety Policies at Work
- Take measures to Reduce the Pollution
- Carryout Exhaust dyeing for woven fabrics
- Carryout Exhaust dyeing for knitted fabrics
- Carryout Semi-continuous dyeing
- Carryout Continuous dyeing
- Carry out laboratory testing of wet dyeing process
- Communicate at Work Place



3. Purpose of the Qualification

The purpose of the training is to provide skilled manpower to improve the existing capacity of textile dyeing sector. This training will provide the requisite skills to the trainees to operate different dyeing machines. It will enable the participants to meet the challenges in the field of dyeing industry. Further, to improve the skill level of the dyeing machine operators and prepare them for the dyeing industry to meet the market competition nationally and internationally.

The core purpose of this qualification is to produce employable dyeing technologists who could operate all machines used in dyeing industry according to national and international standards. In addition this qualification will prepare unemployed youth to get employment in textile dyeing sector.

4. Main Objectives of the Qualification

The Textile Wet Processing – Dyeing Technologist qualifications level 2-3 consists of theoretical and practical details required to operate related dyeing machines in dyeing industries. The main objectives of the qualification are as follows:

- Perform Winch Dyeing
- Perform Jigger Dyeing
- Perform Jet Dyeing
- Perform Pad batch Dyeing
- Perform Pad thermosol Dyeing
- Perform Pad steam Dyeing
- Perform Cone Dyeing
- Perform Rope Dyeing
- Perform Soft flow Dyeing
- Perform Garment Dyeing
- Perform Stenter Dyeing



- Follow Health and Safety Policies at Work
- Take measures to Reduce the Pollution
- Carryout Exhaust dyeing for woven fabrics
- Carryout Exhaust dyeing for knitted fabrics
- Carryout Semi-continuous dyeing
- Carryout Continuous dyeing
- Carry out laboratory testing of wet dyeing process
- Communicate at Work Place

5. Date of Validation

The level 2-3 of National vocational qualification on *Textile Wet Processing – Dyeing Technologist* has been validated by the Qualifications Development Committee (QDC) members on _____ and will remain in currency until **December 2021**.

6. Codes of Qualifications

The International Standard Classification of Education (ISCED) is a framework for assembling, compiling and analyzing cross-nationally comparable statistics on education and training. ISCED codes for these qualifications are assigned as follows:

ISCED Classification for Industrial Textile Garment Expert Level 2-3	
Code	Description
0723 TXT 03	National Vocational Certificate level 2,in (Textile Sector) “Textile Wet Processing – Dyeing Operator”
0723 TXT 04	National Vocational Certificate level 3,in (Textile Sector) “Textile Wet Processing – Dyeing Technologist”



7. Members of Qualification Development Committee

The following members participated in the Qualification development and validation process.

S#	Name	Designation	Organization	Role in QDC
1	Mr. Imran Raza	Principal	SMARTI, Karachi	QDC Chairman + OP + CS
2	Mr. Abid Hussain	Dyeing Manager	Popular Fabrics, Karachi.	OP + CS
3	Mr. M Moosa	Finishing Expert	Lucky Textile Mills	OP + CS
4	Mr. Muhammad Awais	Assistant Manager (R&D)	Alkaram Textile Mills	OP + CS
5	Engr. Abdul Waqar	Assistant Manager (QC)	Al Rahim Textile	OP + CS
6	Mr. Muhammad Naeem	Finishing Incharge	Kings Textile Mills	OP + CS
7	Ms, Ramesh Kumar	Lab Manager	Aqsa Dyestuff Industries	OP + CS
8	Mr. Amir	Assistant Manager	Lucky Textile Mills	OP + CS
9	Mr. Faisal Rasheed	Assistant Director (RPL)	AJK-TEVTA	OP + CS
10	Engr. Liaquat Ali Jamro	Director (A&T)	STEVTA	OP
11	Engr. Wazir Hussain	Consultant / Trainer	UNDP YEP	OP + CS
12	Mr. Afaque Ahmed	Consultant / Trainer	UNDP YEP	CS
13	Mr. Mohsin Ali	Coordinator Textile Engg.	National Textile University	OP + CS
14	Mr. Asif Ali	Lab Incharge (Wet process)	SMARTI	OP + CS
15	Mr. Javed Bahroz Khan	Supervisor	Al Karam Textile	OP + CS
16	Mr. Tariq Iqbal	Manager (Production)	Union Fabrics	OP + CS
17	Mr. Amir Malik	Sr. Production Manager	YTM	CS
18	Engr. Muhammad Akhtar	Assistant Manager	Mustaqeem Textiles	CS
19	Mr. Naveed	Supervisor	Al Karam Textile	OP + CS
20	Mr. Salman Shah	DD (Curriculum)	PTEVTA	CS
21	Mr. Younus Amin	Trainer	UNDP YEP	CS
22	Ms. Mehur-u-Nisa	Trainer	STEVTA	OP + CS
23	Engr. Prince Rajpal	DACUM Facilitator / Short Term Expert	GCT, SITE, Karachi	OP + CS



8. Entry Requirements

The entry for National Vocational Certificate level 2-3, in (Textile Sector) “Textile Wet Processing – Dyeing Technologist” are given below:

Title	Entry requirements
National Vocational Certificate level 2, in (Textile Sector) “Textile Wet Processing – Dyeing Machine Operator”	Entry for assessment for this qualification is open. However, entry into formal training institutes, based on this qualification may require skills and knowledge equivalent to minimum Middle (Grade 8).
National Vocational Certificate level 3, in (Textile Sector) “Textile Wet Processing – Dyeing Technologist”	Entry for assessment for this qualification is open. However entry into formal training institute for this qualification is person having National Vocational Certificate level 2, in (Textile Sector) “Textile Wet Processing – Dyeing Machine Operator” or Middle with Hands on experience.



9. Categorization and Levelling of the Competency Standards

Code	Name of Duty or (Module)	Level	Credit	Category
101200829	Maintain Personal Health, Hygiene and Safety	2	03	Functional
101200831	Demonstrate Basic Numeracy Skills	2	02	Generic
0723001090	Perform Winch Dyeing	2	06	Technical
0723001091	Perform Jigger Dyeing	2	06	Technical
0723001092	Perform Jet Dyeing	2	07	Technical
0723001093	Perform Pad batch Dyeing	2	07	Technical
0723001094	Perform Pad thermosol Dyeing	2	05	Technical
0723001095	Perform Pad steam Dyeing	2	05	Technical
0723001096	Perform Cone Dyeing	2	08	Technical
0723001097	Perform Rope Dyeing	2	08	Technical
0723001098	Perform Soft flow Dyeing	2	06	Technical
0723001099	Perform Garment Dyeing	2	07	Technical
0723001100	Perform Stenter Dyeing	2	04	Technical
101200830	Dispose the Waste Materials	2	03	Generic
073200592	Perform Basic Communication Skills	2	03	Generic
101200826	Follow Health and Safety Policies at Work	3	03	Functional
101200833	Take measures to Reduce the Pollution	3	03	Generic
0723001101	Carryout Exhaust dyeing for woven fabrics	3	08	Technical
0723001102	Carryout Exhaust dyeing for knitted fabrics	3	08	Technical
0723001103	Carryout Semi-continuous dyeing	3	08	Technical
0723001104	Carryout Continuous dyeing	3	08	Technical
0723001105	Carry out laboratory testing of wet dyeing process	3	24	Technical
101200834	Communicate at Work Place	3	03	Generic



10. Packaging of Qualifications

The National Vocational Qualifications have been packaged as detailed below:

<p>0723 TXT 04 “Textile Wet Processing – Dyeing Technologist” National Vocational Certificate level 3, in (Textile Sector)</p>	Follow Health and Safety Policies at Work
	Take measures to Reduce the Pollution
	Carryout Exhaust dyeing for woven fabrics
	Carryout Exhaust dyeing for knitted fabrics
	Carryout Semi-continuous dyeing
	Carryout Continuous dyeing
	Carry out laboratory testing of wet dyeing process
	Communicate at Work Place
<p>07230 TXT 03 “Textile Wet Processing – Dyeing Machine Operator” National Vocational Certificate level 2, in (Textile Sector)</p>	
	Maintain Personal Health, Hygiene and Safety
	Demonstrate Basic Numeracy Skills
	Perform Winch Dyeing
	Perform Jigger Dyeing
	Perform Jet Dyeing
	Perform Pad batch Dyeing
	Perform Pad thermosol Dyeing
	Perform Pad steam Dyeing
	Perform Cone Dyeing
	Perform Rope Dyeing
	Perform Soft flow Dyeing
	Perform Garment Dyeing
	Perform Stenter Dyeing
	Dispose the Waste Materials
Perform Basic Communication Skills	





11. Detail of Competency Standards

101200829 Maintain Personal Health, Hygiene and Safety

Overview:

This Competency Standard identifies the competencies required to protect/apply occupational Safety, Health and Environment at workplace according to the industry's approved guidelines, procedures and interpret environmental rules/regulations. Trainee will be expected to identify and use Personal Protective Equipment (PPE) according to the work place requirements. The underpinning knowledge regarding Observe Occupational Safety and Health (OSH) will be sufficient to provide the basis for the job at workplace.

Competency Units	Performance Criteria
CU-1. Identify Hazards at Workplace	<p>P1. Interpret work processes and procedures correctly to identify risk to Health, hygiene and safety at workplace</p> <p>P2. Recognize processes, tools, equipment and consumable materials that have the potential to cause harm</p> <p>P3. Prepare Report of the identified risk to Health, hygiene and safety</p>
CU-2. Apply Personal Protective and Safety Equipment (PPE)	<p>P1. Select personal protective equipment in terms of type and quantity according to work orders.</p> <p>P2. Wear, adjust, and maintain personal protective equipment to ensure correct fit and optimum protection in compliance with company procedures.</p> <p>P3. Ensure personal protective equipment is cleaned and stored in proper place.</p>
CU-3. Observe Occupational Safety and Health (OSH)	<p>P1. Maintain cleanliness and hygiene as per organizational policy</p> <p>P2. Comply with Health, hygiene and safety precautions before starting work</p> <p>P3. Follow organizational Health, hygiene and safety guidelines during work</p> <p>P4. Deal with resolvable problems according to prescribed procedures</p> <p>P5. Report un resolvable problems to immediate</p>



	supervisor
	P6. Place the tools equipment etc at their prescribed place after completion of work
CU-4. Dispose of hazardous Waste/materials	P1. Identify hazardous waste/ drug materials which needs to be disposed off P2. Collect hazardous or non-hazardous waste carefully from the designated area as per approved procedure P3. Use proper disposal hazardous containers for dispose-off hazardous waste as per procedure P4. Take necessary precautions like putting masks and gloves while disposing hazardous waste/ materials as per standard operating procedure

Knowledge and Understanding

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1:** Safety rules and regulations of organization
- K2:** List of Personal protection and safety Equipment
- K3:** Meaning of Safety signs and symbols
- K4:** Safety related Standard Operating Procedure/guidelines
- K5:** Waste disposal SOPs
- K6:** Best practices relating to clean work environment
- K7:** Best practices relating to safe work environment

Critical Evidence(s) Required

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

- Explain Health, hygiene and safety procedures/precautions
- Interpret Health, hygiene and safety signs and symbols
- Describe Techniques and methods to identify the risks of hazards at workplace
- Describe Techniques and methods to identify the risks of hazards at workplace
- Safety reporting procedures and documentation
- Use of Personal Protective Equipment
- First Aid treatment methods
- Identify possible hazards at workplace



List of Tools and Equipment

S. No.	Items
1.	Manual of organizational Safety rules and regulations
2.	Person protection and safety equipment
3.	Manual of Safety signs and symbols
4.	Waste disposal SOPs



101200831 Demonstrate Basic Numeracy Skills

Overview:

This module covers the skills and knowledge required to Apply basic Numeracy skills, Perform Measurement, Perform basic mathematical calculations and Calculate Area and Volume of aggregate

Competency Units	Performance Criteria
CU1. Apply basic Numeracy skills.	P1. Knowledge of basic principles of addition, subtraction, multiplication and division P2. Apply basic principles of addition P3. Apply basic principles of subtraction P4. Apply basic principles of multiplication P5. Apply basic principles of division
CU2. Perform Measurement	P1. Describe identification and working of measuring tools P2. Collect appropriate measuring tools P3. Identify inch foot and yard P4. Identify millimeter, centimeter and meter
CU3. Perform basic mathematical calculations	P1. Knowledge of Basic measuring units and its inter conversion P2. Perform addition P3. Perform subtraction P4. Perform multiplication P5. Perform division P6. Perform inter conversion of Measuring units P7. Record the results.
CU4. Calculate Area and Volume of aggregate	P1. Describe Area and Volume of materials P2. Calculate surface area P3. Calculate volume of materials

Knowledge & Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- Learn basic principles of addition, subtraction, multiplication and division
- Describe measuring tools
- Describe Basic measuring units and its inter conversion.
- Calculate Area and Volume



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform addition
- Perform subtraction
- Perform multiplication
- Perform division
- Record the results
- Inter convert measuring units.
- Calculate Area and Volume.



0723001090 Perform Winch Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating winch dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Winch dyeing	<p>P1. Interpret program sheet for operating jigger dyeing machine.</p> <p>P2. Clean and clear winch dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Winch dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load RFD (ready for dyeing / development) fabric on winch machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P4. Run winch dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload fabric for next process after completion the job.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Winch dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of winch dyeing machine.
- Identify types of fabric on the basis of fibre.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters according to jigger dyeing process requirement / program sheet.
- Run winch dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Fabric Drying Oven	1
•	Mug	5
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Textile Marker	5
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Winch Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")	5
•	Over lock machine	1
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	pH meter	1
•	TDS meter	1
•	pH stripes	1 packet
•	Light Box	1
•	Water	As per requirement
•	Direct dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color



•	Salt	50 kgs
•	Sodium Carbonate (Soda Ash)	25 Kgs
•	Formic Acid	
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg
•	Fixing Agents	1 kg
•	Sodium Hydroxide	2 kg
•	Cotton Fabric RFD (Knitted)	50 Kg
•	Cotton Towel RFD (Knitted)	40 Kg
•	Cotton Fabric RFD (Woven)	100 meters



0723001091 Perform Jigger Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating jigger dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Jigger dyeing	<p>P1. Interpret program sheet for operating jigger dyeing machine.</p> <p>P2. Clean and clear jigger dyeing machine as per check list.</p> <p>P3. Arrange material for jigger dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Jigger dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load RFD (ready for dyeing / development) fabric on jigger machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P4. Run jigger dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload fabric for next process after completion the job.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Jigger dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of jigger dyeing machine.
- Identify types of fabric on the basis of fibre.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters according to jigger dyeing process requirement / program sheet.
- Run jigger dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Fabric Drying Oven	1
•	Mug	5
•	Hydraulic device for fabric unloading	1
•	pH meter	1
•	TDS meter	1
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Textile Marker	5
•	pH stripes	1 packet
•	Light Box	1
•	Buckets	5
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Jigger Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")	5
•	Over lock machine	1
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Water	As per requirement



•	Direct dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color
•	Salt	50 kgs
•	Sodium Carbonate (Soda Ash)	25 Kgs
•	Formic Acid	
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg
•	Fixing Agents	1 kg
•	Sodium Hydroxide	2 kg
•	Cotton woven Fabric RFD (Ready for dyeing)	250 meters



0723001092 Perform Jet Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating jet dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Jet dyeing	<p>P1. Interpret program sheet for operating jet dyeing machine.</p> <p>P2. Clean and clear jet dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Jet dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load RFD (ready for dyeing / development) fabric on jet machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P4. Run jet dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload fabric for next process after completion the job.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Jet dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of jet dyeing machine.
- Identify types of fabric on the basis of fibre.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters according to jigger dyeing process requirement / program sheet.
- Run jet dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Fabric Drying Oven	1
•	Mug	5
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Textile Marker	5
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Jet Dyeing Machine (Pilot scale) (Capacity 15 Kg)	5
•	Over lock machine	1
•	Mini Boiler	1
•	Compressor	1
•	pH meter	1
•	TDS meter	1
•	pH stripes	1 packet
•	Light Box	1
•	Natural Gas for boiler	as per requirement
•	Water	As per requirement
•	Disperse dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color



•	Salt	50 kgs
•	Sodium Carbonate (Soda Ash)	25 Kgs
•	Formic Acid	1 Kg
•	Wetting Agents	1 kg
•	Acetic acid	1 Kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg
•	Dispersing Agents	1 kg
•	Sodium Hydro sulphite (Sodium dithionite)	2 Kg
•	Sodium Hydroxide	2 kg
•	Anti creasing agent	1 Kg
•	PC Fabric RFD (Woven)	100 meters
•	Cotton fabric RFD (Woven)	100 meters
•	Polyester fabric RFD (Woven)	100 meters
•	PC Fabric RFD (Knitted)	50 Kg
•	Cotton fabric RFD (Knitted)	50 Kg
•	Polyester fabric RFD (Knitted)	50 Kg



0723001093 Perform Pad batch dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Pad batch dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Pad batch dyeing	<p>P1. Interpret program sheet for operating Pad-batch dyeing machine.</p> <p>P2. Clean and clear Pad-batch dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Pad batch dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Apply Threading of feeding cloth as per requirement.</p> <p>P3. Stitch RFD (ready for dyeing / development) fabric with feeding cloth on pad batch machine for dyeing as per program sheet.</p> <p>P4. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P5. Run Pad-batch dyeing machine to start the dyeing process as per program sheet.</p> <p>P6. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P7. Wrap the batcher with polyethylene sheet to avoid fabric drying. .</p> <p>P8. Rotate the dyed fabric for 8 to 12 hours for dyes fixation.</p> <p>P9. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Pad batch dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production</p>



	register as per given format. . P3. Contact with supervisor for verification of production as per given format.
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of Pad batch dyeing machine.
- Determine principles of Pad batch dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Apply Threading of feeding cloth as per requirement.
- Run Pad batch dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Iron	1
•	Fabric Drying Oven (Microwave)	1
•	Mug	5
•	Batcher (A-frame)	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	PPEs	
	- Gloves	20
	- Goggles	20
	- Shoes	20
	- Mask	20
	- Apron	20
	- Safety Cap	20
•	Pad batch Dyeing Machine (Pilot scale) (machine width 1800 mm)	5
•	Over lock machine	1
•	Compressor	1
•	Jack	1
•	Polyethylene cover	1 Roll
•	Masking brown tape	5
•	Weighing balance	1
•	Water	As per requirement
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color
•	Salt	10 kgs
•	Sodium Carbonate (Soda Ash)	25 Kgs
•	Wetting Agents	1 kg
•	Sodium Silicate	1 kg



•	Anti-foam Agents	1 kg
•	Sodium Hydroxide (Caustic Soda)	2 kg
•	Cotton woven Fabric RFD	250 meters



0723001094 Perform Pad Thermosol Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Thermosol dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Pad Thermosol dyeing	<p>P1. Interpret program sheet for operating pad thermosol dyeing machine.</p> <p>P2. Clean and clear pad thermosol dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Pad Thermosol dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Apply Threading of feeding cloth as per requirement.</p> <p>P3. Stitch RFD (ready for dyeing / development) fabric with feeding cloth on pad thermosol machine for dyeing as per program sheet.</p> <p>P4. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P5. Run pad thermosol dyeing machine to start the dyeing process as per program sheet.</p> <p>P6. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P7. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Pad Thermosol dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of Pad thermosol dyeing machine.
- Determine principles of Pad thermosol dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Apply Threading of feeding cloth as per requirement.
- Set machine parameters as per dyeing process requirement / program sheet.
- Run pad thermosol dyeing machine to start the dyeing process as per program sheet.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Iron	1
•	Fabric Drying Oven	1
•	Mug	5
•	Textile Trolleys, batcher	5
•	Masking tape	5
•	Weighing balance	1
•	Jack	5
•	PPEs	
	- Gloves	20
	- Goggles	20
	- Shoes	20
	- Mask	20
	- Apron	20
	- Safety Cap	20
•	Pad thermosol Dyeing Machine (Pilot scale) (width 1800 mm)	5
•	Over lock machine	1
•	Thermal boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Water	As per requirement
•	Pigment, Vat, disperse dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color
•	Urea	50 kg
•	Sodium Carbonate (Soda Ash), sodium bicarbonate	25 Kg



•	Acetic acid	
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	dispersing agent	20 Kg
•	Anti-foam Agents	1 kg
•	Anti-migrate agent	20 Kg
•	Cotton woven Fabric RFD	250 meters
•	PC woven fabric	250 meters



0723001095 Perform Pad steam dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Pad steam dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Pad steam dyeing	<p>P1. Interpret program sheet for operating Pad steam dyeing machine.</p> <p>P2. Clean and clear Pad steam dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Pad steam dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Apply Threading of feeding cloth as per requirement.</p> <p>P3. Stitch RFD (ready for dyeing / development) fabric with feeding cloth on pad steam dyeing machine for dyeing as per program sheet.</p> <p>P4. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P5. Run pad steam dyeing machine to start the dyeing process as per program sheet.</p> <p>P6. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P7. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Pad steam dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production</p>



as per given format.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of Pad steam dyeing machine.
- Determine principles of Pad steam dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Apply Threading of feeding cloth as per requirement.
- Set machine parameters as per dyeing process requirement / program sheet.
- Run pad thermosol dyeing machine to start the dyeing process as per program sheet.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Mug	5
•	Textile Trolleys, batcher	5
•	Jack	1
•	Natural Gas for boiler	as per requirement
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Pad steam Dyeing Machine (Pilot scale) (width 1800 mm)	5
•	Over lock machine	1
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Water	as per requirement
•	Sulphur dyes, Vat (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color
•	Salt, acetic acid	50 kgs
•	Sodium Carbonate (Soda Ash)	25 kg
•	Sodium Hydro sulphite, H ₂ O ₂	1kg
•	Hydrogen peroxide	1 kg
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg



•	Sequestering Agent	1 kg
•	Washing-off Agents	1 kg
•	Anti-foam Agents	1 kg
•	Fixing Agents	1 kg
•	Sodium Hydroxide	2 kg
•	Cotton woven Fabric RFD	250 meters



0723001096 Perform Cone Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Cone dyeing machine for production of dyed cones / package / yarn according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Cone dyeing	<p>P1. Interpret program sheet for operating Cone dyeing machine.</p> <p>P2. Clean and clear Cone dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Cone dyeing machine for yarn dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load RFD (ready for dyeing / development) cones / package on Cone dyeing machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P4. Run Cone dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload Cones for next process after completion the job.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Cone dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of cone dyeing machine.
- Explain the cone / package / yarn dyeing concepts.
- Determine principles of cone dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters as per dyeing process requirement / program sheet.
- Run Cone dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Mug	5
•	Cone Carrier	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	PPEs - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap	20 20 20 20 20 20
•	Cone Dyeing Machine (Pilot scale) (Capacity 15 Kg)	5
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Water	as per requirement
•	Direct dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes, Vat, disperse (Yellow, Red, Blue)	1 kg for each color
•	Salt	50 kgs
•	Sodium Carbonate (Soda Ash)	25 Kgs
•	Formic Acid	
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg



•	Fixing Agents	1 kg
•	Sodium Hydroxide	2 kg
•	Cotton Cones of 2.25 lbs each (RFD- Ready for dyeing)	50



0723001097 Perform Rope Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating rope dyeing machine for production of dyed rope according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for rope dyeing	<p>P1. Interpret program sheet for operating rope dyeing machine.</p> <p>P2. Clean and clear rope dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate rope dyeing machine for rope dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Apply Threading of feeding cloth as per requirement.</p> <p>P3. Stitch RFD (ready for dyeing / development) ropes with feeding cloth on stenter dyeing machine for dyeing as per program sheet.</p> <p>P4. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P5. Run rope dyeing machine to start the dyeing process as per program sheet.</p> <p>P6. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P7. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for rope dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of rope dyeing machine.
- Determine principles of rope dyeing machine.
- Identify types of yarns / ropes on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Apply Threading of feeding cloth as per requirement.
- Stitch RFD (ready for dyeing / development) ropes with feeding cloth on stenter dyeing machine for dyeing as per program sheet.
- Set machine parameters as per dyeing process requirement / program sheet.
- Run rope dyeing machine to start the dyeing process as per program sheet.



LIST OF MACHINES, TOOLS AND EQUIPMENT

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Mug	5
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Rope Dyeing Machine (Pilot scale) (Capacity 40 ropes)	5
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Water	As per requirement
•	Indigo dyes	1 kg
•	suphur dyes (Yellow, Red, Blue)	1 kg for each color
•	Sodium hydrosulphite	1 kg
•	Hydrogen peroxide H ₂ O ₂	1 kg
•	Acetic acid	1 kg
•	Salt	50 kgs
•	Caustic soda	25 Kgs
•	Formic Acid	1 kg
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg



•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg
•	Sodium sulphite (where sulphur dye is there)	1 kg
•	Cotton yarn	250 cones



0723001098 Perform Soft flow dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Soft flow dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Soft flow dyeing	<p>P1. Interpret program sheet for operating jigger dyeing machine.</p> <p>P2. Clean and clear soft flow dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Soft flow dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load RFD (ready for dyeing / development) fabric on soft flow machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P4. Run soft flow dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload fabric for next process after completion the job.</p> <p>P8. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Soft flow dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of soft flow dyeing machine.
- Determine principles of soft flow dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters as per dyeing process requirement / program sheet.
- Run soft flow dyeing machine to start the dyeing process as per program sheet.
- Maintain quality parameters during process according to program sheet / protocol.



LIST OF MACHINES, TOOLS AND EQUIPMENT

Sr. #	Items	No. of items for 20 trainees
•	Scissors	20
•	Air dryer	1
•	Fabric Drying Oven	1
•	Mug	5
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Textile Marker	5
•	Sulphuric acid (also in jet)	1 bottle of 3.5 Kg
•	Weighing balance	1
•	PPEs <ul style="list-style-type: none"> - Gloves - Goggles - Shoes - Mask - Apron - Safety Cap 	20 20 20 20 20 20
•	Soft flow Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")	5
•	Over lock machine	1
•	Mini Boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per requirement
•	Water	as per requirement
•	Direct dyes (Yellow, Red, Blue)	1 kg for each color
•	Reactive dyes (Yellow, Red, Blue)	1 kg for each color
•	Disperse dyes (Yellow, Red, Blue)	1 kg for each color



•	Vat dyes (Yellow, Red, Blue)	1 kg for each color
•	Salt	50 kg
•	Sodium Carbonate (Soda Ash)	25 Kg
•	Formic Acid	
•	Wetting Agents	1 kg
•	Leveling Agents	1 kg
•	Sequestering Agent	1 kg
•	Washing-off Agents	1kg
•	Anti-foam Agents	1 kg
•	Fixing Agents	1 kg
•	Sodium Hydroxide, dispersing gent	2 kg
•	Cotton woven fabric (RFD- Ready for dyeing / development)	250 meters
•	Cotton knitted fabric (RFD- Ready for dyeing / development)	50 Kg
•	Towel fabric (RFD- Ready for dyeing / development)	50 Kg
•	Cotton denim fabric (RFD- Ready for dyeing / development)	50 kg



0723001099 Perform Garment Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating garment dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Garment dyeing	<p>P1. Interpret program sheet for operating jigger dyeing machine.</p> <p>P2. Clean and clear garment dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according with program sheet.</p>
CU2. Operate Garment dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Load ready for dyeing (RFD) garments on garment dyeing machine for dyeing as per program sheet.</p> <p>P3. Set machine parameters according to garment dyeing process requirement / program sheet.</p> <p>P4. Run garment dyeing machine to start the dyeing process as per program sheet.</p> <p>P5. Maintain quality during process according to program sheet.</p> <p>P6. Wash-off & Neutralize dyed fabric as per program sheet.</p> <p>P7. Unload garment for next process as per program sheet.</p> <p>P8. Apply mechanical drying through hydro extractor as per process requirement.</p> <p>P9. Dry processed garment through Tumble dryer as per process requirement.</p> <p>P10. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Garment	<p>P1. Record batch-wise production on production register as per given format.</p>



dyeing machine.	P2. Record stoppage time and running time on production register as per given format. . P3. Contact with supervisor for verification of production as per given format.
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of garment dyeing machine.
- Explain the cone / package / yarn dyeing concepts.
- Determine principles of garment dyeing machine.
- Identify garment types.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.
- Determine methods of drying especially by hydro extractor.
- Explain the tumble dry process.



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Set machine parameters according to garment dyeing process requirement / program sheet.
- Run garment dyeing machine to start the dyeing process as per program sheet.
- Maintain quality during process according to program sheet.
- Apply mechanical drying through hydro extractor as per process requirement.

LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Air dryer	1
•	Fabric Drying Oven	1
•	Mug	5
•	Textile Trolleys	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	Textile Marker	5
•	PPEs <ul style="list-style-type: none">- Gloves- Goggles- Shoes- Mask- Apron- Safety Cap	20 20 20 20 20 20
•	Garment Dyeing Machine (Pilot scale) (Capacity 15 Kg)	5
•	Mini Boiler	1



• Compressor	1
• Natural Gas for boiler	as per requirement
• pH meter	1
• TDS meter	1
• pH stripes	1 packet
• Light Box	1
• Hydro exactor	1
• Tumble dryer	1
• Water	As per requirement
• Direct dyes (Yellow, Red, Blue)	1 kg for each color
• Reactive dyes (Yellow, Red, Blue)	1 kg for each color
• Pigment (Yellow, Red, Blue)	1 kg
• Sulphur dyes (Yellow, Red, Blue, Black)	1 Kg each
• Salt	50 kgs
• Sodium Carbonate (Soda Ash)	25 Kgs
• Formic Acid	1 Kg
• Sodium Hydro sulphite	1 Kg
• Wetting Agents	1 kg
• Leveling Agents	1 kg
• Sequestering Agent	1 kg
• Washing-off Agents	1kg
• Anti-foam Agents	1 kg
• Fixing Agents	1 kg
• Sodium Hydroxide	10 kg
• Binder	10 Kg
• Hydrogen peroxide 35%	30 Kg
• Cotton Garment RFD (Knitted)	50 pcs
• Cotton Garment RFD (Woven)	100 pcs
• Denim Garment	100 pcs



0723001100 Perform Stenter Dyeing

Overview: This competency standard covers the skills and knowledge required to perform dyeing process by operating Stenter dyeing machine for production of dyed substrate according to required parameters.

Competency Units	Performance Criteria
CU1. Prepare workstation for Stenter dyeing	<p>P1. Interpret program sheet for operating Stenter dyeing machine.</p> <p>P2. Clean and clear Stenter dyeing machine as per check list.</p> <p>P3. Arrange material for dyeing process as per program sheet. .</p> <p>P4. Check and verify material and parameters according to program sheet.</p>
CU2. Operate Stenter dyeing machine for fabric dyeing	<p>P1. Follow safety precautions as per job requirement.</p> <p>P2. Apply Threading of feeding cloth as per requirement.</p> <p>P3. Stitch RFD (ready for dyeing / development) fabric with feeding cloth on stenter dyeing machine for dyeing as per program sheet.</p> <p>P4. Set machine parameters as per dyeing process requirement / program sheet.</p> <p>P5. Run stenter dyeing machine to start the dyeing process as per program sheet.</p> <p>P6. Maintain quality parameters during process according to program sheet / protocol.</p> <p>P7. Clean workstation after closing the job.</p>
CU3. Maintain Production Register for Stenter dyeing machine.	<p>P1. Record lot-wise production on production register as per given format.</p> <p>P2. Record running and stoppage time on production register as per given format. .</p> <p>P3. Contact with supervisor for verification of production as per given format.</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Explain the proper use of suitable PPEs
- Explain importance of Dyes, water and Chemicals with their proper uses.
- Explain the operating procedure of stenter dyeing machine.
- Determine principles of stenter dyeing machine.
- Identify types of fabric on the basis of fibre / construction.
- Describe the machine capacity and Parameters.
- Explain the importance of Liquor Ratio
- Determine the lab recipes
- Identify the dyeing defects.
- Identify fabric defects.
- Explain washing after dyeing.
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Apply Threading of feeding cloth as per requirement.
- Stitch RFD (ready for dyeing / development) fabric with feeding cloth on pad steam dyeing machine for dyeing as per program sheet.
- Set machine parameters as per dyeing process requirement / program sheet.
- Run jigger dyeing machine to start the dyeing process as per program sheet.



LIST OF MACHINES, TOOLS AND EQUIPMENT (for 20 trainees)

Sr. #	Items	No. of items
•	Scissors	20
•	Mug	5
•	Textile Trolleys, batcher, jack	5
•	Plastic Beaker 500 ml and 250 ml	5 each
•	Measuring Cylinder 1000 ml	5
•	Buckets	5
•	Glass Beaker 500 ml and 250 ml	5
•	Glass Rods	5
•	PPEs	
	- Gloves	20
	- Goggles	20
	- Shoes	20
	- Mask	20
	- Apron	20
	- Safety Cap	20
•	Stenter Dyeing Machine (Pilot scale) (width 1800 mm)	5
•	Over lock machine	1
•	Thermal boiler	1
•	Compressor	1
•	Natural Gas for boiler	as per reqt.
•	Water	as per reqt.
•	Pigments (Yellow, Red, Blue), Binder	1 kg for each
•	Fixing agent,	2 kg
•	Ant migrant Agent	2 kg
•	Softener	2 Kg
•	Wetting Agents	1 kg
•	Anti-foam Agents	1 kg
•	Fixing Agents	1 kg
•	Cotton woven Fabric RFD	250 meters
•	PC Woven Fabric RFD	250 meters
•	Denim Knitted Fabric RFD	50 kg
•	Denim Woven Fabric RFD	250 meters



101200830: N: Dispose the Waste Materials

Overview:

This unit involves the skills and knowledge required for disposing of Waste which can be a sanitary landfill or any other locally used method.

Competency Units	Performance Criteria
CU1. Characterize the final waste	P9. Understand the composition of waste. P10. Differentiate between Waste which remain at road sides or at producers P11. Identify whether separate pre-collection or collection has occurred
CU2. Dispose of the final waste	P1. Sort the waste P2. Shred the waste P3. Perform the baling process P4. Perform incineration (burning) or Land filling whichever is appropriate according to the type of waste.

Knowledge and Understanding:

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

K1:Composition of waste.

K2:Differences between Waste which remain at road sides or at producers

K3:Methods of collection of waste

K4:Methods of Sort the waste

K5:Methods of Shred the waste

K6:Methods of Perform the baling process

K7:How to Perform incineration(burning) or Land filling

K8:Which disposing method is appropriate for which type of waste



Critical Evidence (s) required:

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

- Explain the composition of waste.
- Differentiate between Waste which remain at road sides or at producers
- Identify whether separate pre-collection or collection has occurred
- Sort the waste
- Shred the waste
- Perform the baling process
- Perform incineration(burning) or Land filling whichever is appropriate according to the type of waste

Tools /Equipment/Manuals Required:

1. Available material on Processes used to Recycle plastics with a low energy input.
2. Available material on Processes used to Produce steel from ferrous metal
3. Available material on Methods of Transformation of biodegradable waste into compost and into biogas

Operation manual of biodigester

073200592 Perform Basic Communication

Overview:

This competency standard covers the skills and knowledge required to adopt effective Listening, Develop Nonverbal Communication, Develop verbal communication, Develop Confidence and Pick the right medium.

Competency Units	Performance Criteria
CU1. Work in Team	<p>P1. Treat team members with respect and maintain positive relationships to achieve common organizational goals</p> <p>P2. Listen to instructions carefully & comply with those instructions</p> <p>P3. Provide work related information to team members and identify interrelated work activities to avoid confusion</p> <p>P4. Adopt communication skills, appropriate to work activities and organizational/medical procedures</p> <p>P5. Identify problems and resolve them through discussion and mutual agreement</p>
CU2.Follow Supervisor's	<p>P1. Carefully listen and note down the instructions of Supervisor</p>



instructions	P2. Carry out the instructions of the supervisor P3. Report to the supervisor as per organizational SOPs
CU3.Demonstrate Basic IT Skills	P1. Create folders and files and learn major commands of operating system/windows P2. Type text and use major commands such as printing, editing, creating tables and graphs etc P3. Generate office reports using appropriate computer applications P4. Use internet for sending/receiving emails and connecting through social or other media



LEVEL-3

101200832 Ensure Health, Hygiene and Safety of other individuals at work

Overview:

This unit involves the skills and knowledge required for an individual to not only look after his own but also Health, hygiene and safety of others at work around him.

Competency Units	Performance Criteria
CU-1. Identify what can harm people in your workplace	P1: Check manufacturers' instructions or data sheets for chemicals and equipment P2: Look back at your accident and ill-health records P3: Identify any potential risk to other's Health, hygiene and safety. P4: Deal with resolvable problems according to prescribed procedures P5: Report un resolvable problems to immediate supervisor
CU-2. Identifying who might be harmed	P1: Check for workers with special needs P2: Check for people who might not be in the workplace all the time, such as visitors, contractors and maintenance workers P3: Take members of the public into account if they could be hurt by your activities P4: Consider how your work affects others P5: Ask your workers if there is anyone you may have missed
CU-3. Ensure health, hygiene and safety of individuals at work	P1: Comply the duties regarding Health, hygiene and safety P2: Support individuals at work to make sure that risks to their Health, hygiene and safety are managed

Skills and Knowledge:

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1:** Job description of individuals at work
- K2:** Analyzing accident records
- K3:** Analyzing ill health records
- K4:** Local laws and regulations on Health, hygiene and safety
- K5:** Standard operating procedures for Health, hygiene and safety
- K6:** The operations and activities typically undertaken in the workplace
- K7:** Possible health, hygiene and safety issues
- K8:** The types of Health, hygiene and safety control measures appropriate to the workplace
- K9:** The principles, content and format of workplace Health, hygiene and safety documentation



Critical Evidence (s) required:

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

- Explain responsibilities for Health, hygiene and safety
- Explain possible potential risks to other's Health, hygiene and safety.
- Explain methods to Deal with resolvable problems
- Prepare report of un resolvable problems
- Support individuals at work

Tools & Equipment Required:

1. Local laws and regulations on Health, hygiene and safety
2. Standard operating procedures for Health, hygiene and safety
3. Formats of reports

101200833 Take measures to Reduce the Pollution

Overview:

This unit involves the skills and knowledge required for Identifying current workplace resource use to minimize the effects of pollution at workplace and adjoining areas. This involves activities aimed at protecting the ecosystem through pollution prevention and waste minimization, etc in the areas of air, water and soil.

Competency Units	Performance Criteria
CU1. Ensure Efficiency	P1. Perform energy audit P2. Take steps to minimize energy wastage P3. Take steps to provide or increase natural lighting. P4. Minimize wastewater by using water conserving fixtures.
CU-2. Implement pollution reduction/ prevention, abatement & control (PAC) methods	P1: Determine the quantity of dispersion of pollutants due to the desired work/activity P2: Gather information regarding available choices of methods of performing required activity keeping in view maximum possible reduction of expected pollution/damage to environment. P3: Chose the best environment friendly method to perform the required activity. P4: Act for Erosion control



Knowledge and Understanding:

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1:** Methods of energy conservation
- K2:** Standards of environmental quality.
- K3:** Pollution reduction and prevention methods/ solutions.
- K4:** General knowledge of air emissions control technologies.
- K5:** Uses of various water conservation fixtures
- K6:** Methods of Erosion control

Critical Evidence (s) required:

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

- Perform energy audit
- Take steps to minimize energy wastage
- Identify steps to provide or increase natural lighting.
- Use water conserving fixtures
- Determine the quantity of dispersion of pollutants
- Collection of desired information.
- Act for Erosion control

Tools /Equipment/Manuals Required:

1. Manual of techniques of energy conservation
2. Manual of local Standards of environmental quality.
3. Manual of Pollution reduction and prevention methods/ solutions.
4. Manual of air emissions and control technologies.
5. Manual of water conservation fixtures
6. Manual of Methods of Erosion control



0723001101 Carry out Exhaust Dyeing for Woven Fabrics.

Overview: This competence standard covers the skills and knowledge required to perform the dyeing parameters for dyeing fabrics by the exhaustion process in accordance with the dyeing plan and to ensure color matching to the required quality standards.

Competency Units	Performance Criteria
<p>CU1. Follow Dyeing Plan for woven fabric dyeing by exhaust process</p>	<p>P1. Receive RFD (Ready for Dyeing) fabric for exhaust dyeing according to program sheet.</p> <p>P2. Receive shade standards for shade matching..</p> <p>P3. Arrange material for dyeing process as program sheet.</p> <p>P4. Interpret specs for exhaust dyeing process.</p>
<p>CU2. Perform exhaust dyeing for woven fabric</p>	<p>P1. Instruct exhaust dyeing machine operators for dyeing process according to given parameters.</p> <p>P2. Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.</p> <p>P3. Execute dyes and chemical preparation for exhaust dyeing at production level.</p> <p>P4. Set machine parameters for exhaust dyeing process.</p> <p>P5. Verify process parameters for dyeing as per dyeing plan.</p> <p>P6. Supervise safety precautions as per job requirement.</p>
<p>CU3. Identify shade by using shade matching method for woven fabrics</p>	<p>P1. Verify shade standards for shade matching.</p> <p>P2. Match shade as per standards and make corrections if required.</p> <p>P3. Execute production on set parameters according to program.</p> <p>P4. Arrange material for dyeing process as program</p>



	sheet.
CU4: Perform Dyeing	P1. Arrange material for dyeing process as program sheet. P2. Execute production on set parameters according to program.
CU5: Verify quality of woven fabric dyeing by exhaust process	P1. Verify quality parameters during production for matching with standards. P2. Inspect physically dyeing process to maintain quality & in-time production P3. Take corrective actions for any issues concerned with quality according to requirement.
CU6: Prepare production report for woven fabric dyeing by exhaust process	P1. Verify production register maintain by machine operators shift-wise. P2. Calculate and Record efficiency of every machine for evaluating machine production progress. P3. Prepare shift production report. P4. Prepare reports for faults occur during shift.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Identify types of exhaust machines and process
- Explain importance of Dyes, water and Chemicals with their proper uses.
- explain fabric behavior / construction, GSM
- explain the use of Pantone Book
- define importance of Liquor ratio
- Explain the function of dyes and chemicals
- Describe the principles of shade matching (Human Eye) explain Dyeing Recipes
- Explain the principles of Spectrophotometer for shade matching
- Determine the dyeing and machine parameters



- Explain preparation of dyes and chemicals
- define use of PPEs according to professional and safety regulation
- Explain how to calculate machine efficiency.
- Define the types of fabric faults
- Define the exhaust dyeing faults and their remedies
- Explain the importance of machine cleaning
- Explain machine troubleshooting.
- Explain how to interpret customers' given standards(Swatch)
- Explain how to interpret customers' given specifications.
- describe the dyeing plan
- Explain how to calculate chemicals and dyes calculations according to recipe

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.
- Inspect physically dyeing process to maintain quality & time.
- Match shade as per standards and make corrections if required.

LIST OF TOOLS AND EQUIPMENT

Sr. #	Items
•	Jigger Dyeing machine
•	Jet Dyeing machine
•	Winch Dyeing machine
•	Light Box
•	Spectrophotometer
•	Iron
•	Tape
•	Pantone book



•	Consistency cards for shade variation
•	Telephone
•	Computer
•	Printer
•	Office files (Stationary related items)



0723001102 Carry out Exhaust Dyeing for Knitted Fabrics.

Overview: This competency standard covers the skills and knowledge required to prepare and ensure dyeing parameters for knitted fabric dyeing by exhaust method according to dyeing plan with skills of shade matching under the required quality standards.

Competency Units	Performance Criteria
<p>CU1. Follow Dyeing Plan for knitted fabric dyeing by exhaust process</p>	<p>P1. Receive RFD Ready for Dyeing) fabric for exhaust dyeing according to program sheet.</p> <p>P2. Receive shade standards for shade matching..</p> <p>P3. Arrange material for dyeing process as program sheet.</p> <p>P4. Collect specs for exhaust dyeing process.</p>
<p>CU2. Prepare and ensure knitted fabric dyeing parameters for exhaust dyeing</p>	<p>P1. Instruct exhaust dyeing machine operators for dyeing process according to given parameters.</p> <p>P2. Calculate quantity of dyes and chemicals required according to recipe for production as per dyeing plan.</p> <p>P3. Execute dyes and chemical preparation for exhaust dyeing at production level.</p> <p>P4. Set machine parameters for exhaust dyeing process.</p> <p>P5. Verify process parameters for dyeing as per dyeing plan.</p> <p>P6. Supervise safety precautions as per job requirement.</p>
<p>CU3. Identify shade by using shade matching method for woven fabrics</p>	<p>P1. Verify shade standards for shade matching.</p> <p>P2. Match shade as per standards and make corrections if required.</p> <p>P3. Execute production on set parameters according to program.</p> <p>P4. Arrange material for dyeing process as program sheet.</p>
<p>CU4: Perform Dyeing</p>	<p>P1. Arrange material for dyeing process as program sheet.</p>



	P2. Execute production on set parameters according to program.
CU5: Verify quality of knitted fabric dyeing by exhaust process	P1. Verify quality parameters during production for matching with standards. P2. Inspect physically dyeing process to maintain quality & time. P3. Take corrective actions for any issues concerned with quality according to requirement.
CU6: Prepare production report for knitted fabric dyeing by exhaust process	P1. Verify production register maintain by machine operators shift-wise. P2. Calculate and Record efficiency of every machine for evaluating machine production progress for achieving target. P3. Calculate down time shift wise to verify productivity. P4. Prepare shift production report. P5. Prepare faults (machine and material) reports occurred during shift. P6. Prepare and issue job card for electrical and mechanical faults to concerned person for its remedies.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Describe proper use and handling of equipment
- Identify types of exhaust machines and process
- Explain importance of Dyes, water and Chemicals with their proper uses.
- explain fabric behavior / construction, GSM
- explain the use of Pantone Book
- define importance of Liquor ratio
- Explain the function of dyes and chemicals



- Describe the principles of shade matching (Human Eye)
- Determine Dyeing Recipes
- Explain the principles of Spectrophotometer for shade matching
- Determine the dyeing and machine parameters
- Explain preparation of dyes and chemicals
- define use of PPEs according to professional and safety regulation
- Explain how to calculate machine efficiency.
- Define the types of fabric faults
- Define the exhaust dyeing faults and their remedies
- Explain the importance of machine cleaning
- Explain machine troubleshooting.
- Explain how to interpret customers' given standards(Swatch)
- Explain how to interpret customers' given specifications.
- Describe the dyeing plan
- Explain how to calculate chemicals and dyes calculations according to recipe

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.
- Inspect physically dyeing process to maintain quality & time.
- Match shade as per standards and make corrections if required.

LIST OF TOOLS AND EQUIPMENT

Sr. #	Items
•	Soft flow dyeing machine
•	Winch dyeing machine
•	Light Box
•	Spectrophotometer
•	Iron
•	Tape



•	Pantone book
•	Consistency cards for shade variation
•	Telephone
•	Computer
•	Printer
•	Office files (Stationary related items)



0723001103 Carry out Semi-Continuous Dyeing

Overview: This competency standard covers the skills and knowledge required to prepare and ensure dyeing parameters for fabric dyeing by semi-continuous dyeing method according to dyeing plan with skills of shade matching under the required quality standards.

Competency Units	Performance Criteria
<p>CU1. Follow Dyeing Plan for semi-continuous dyeing</p>	<p>P1. Receive RFD (Ready for Dyeing) fabric for semi-continuous dyeing according to program sheet.</p> <p>P2. Receive shade standards for shade matching..</p> <p>P3. Arrange material for dyeing process as program sheet.</p> <p>P4. Collect specs for exhaust dyeing process.</p>
<p>CU2. Prepare and ensure dyeing parameters for semi-continuous dyeing</p>	<p>P1. Instruct semi-continuous dyeing machine operators for dyeing process according to given parameters.</p> <p>P2. Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.</p> <p>P3. Execute dyes and chemical preparation for semi-continuous dyeing at production level.</p> <p>P4. Set machine parameters for semi-continuous dyeing process.</p> <p>P5. Verify process parameters for dyeing as per dyeing plan.</p> <p>P6. Supervise safety precautions as per job requirement.</p>
<p>CU3. Identify shade by using shade matching method for semi-continuous dyeing</p>	<p>P1. Verify shade standards for shade matching.</p> <p>P2. Match shade as per standards and make corrections if required.</p> <p>P3. Execute production on set parameters according to program.</p> <p>P4. Arrange material for dyeing process as program sheet.</p>
<p>CU4: Perform Dyeing</p>	<p>P1. Arrange material for dyeing process as program sheet.</p> <p>P2. Execute production on set parameters according to program.</p>
<p>CU5: Verify quality for semi-continuous dyeing</p>	<p>P1. Verify quality parameters during production for matching with standards.</p>



process	P2. Inspect physically dyeing process to maintain quality & time management. P3. Take corrective actions for any issues concerned with quality according to requirement.
CU6: Prepare production report for semi-continuous dyeing process	P1. Verify production register maintain by machine operators shift-wise. P2. Calculate and Record efficiency of every machine for evaluating machine production progress. P3. Prepare shift production report. P4. Prepare reports for faults occur during shift.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Demonstrate proper use and handling of equipment
- Describe types of semi-continuous dyeing machines and process
- Demonstrate Knowledge of machine safety and chemical hazards
- Perform setting of Padder Pick-up %
- Demonstrate proper use of Dyes, water and Chemicals
- Identify the fabric behavior / construction, GSM
- Explain the use of the Pantone Book
- Explain the importance of Liquor ratio
- Explain the function of dyes and chemicals
- Explain the principles of shade matching (Human Eye)
- Determine Dyeing Recipes
- Explain the principles of Spectrophotometer for shade matching
- Determine the dyeing parameters
- Explain preparation of dyes and chemicals
- Explain fault finding and troubleshooting for machine.
- Perform efficiency calculations
- Identify types of fabric faults
- Explain semi-continuous dyeing faults and their remedies



- Explain the importance of machine cleaning
- Perform troubleshooting.
- Explain customers' given standards(Swatch)
- Explain customers' given specifications.
- apply dyeing plan
- Perform chemical and dyes calculations (L:R)

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.
- Inspect physically dyeing process to maintain quality & time.
- Match shade as per standards and make corrections if required.

LIST OF TOOLS AND EQUIPMENT

Sr. #	Items
•	Pad-batch dyeing machine
•	Light Box
•	Spectrophotometer
•	Iron
•	Tape
•	Pantone book
•	Consistency cards for shade variation
•	Telephone
•	Computer
•	Printer
•	Office files (Stationary related items)



0723001104 Carry out Continuous Dyeing

Overview: This competency standard covers the skills and knowledge required to prepare and ensure dyeing parameters for fabric dyeing by continuous dyeing method according to dyeing plan with skills of shade matching under the required quality standards.

Competency Units	Performance Criteria
CU1. Follow Dyeing Plan for continuous dyeing	P1. Receive RFD Ready for Dyeing) fabric for continuous dyeing according to program sheet. P2. Receive shade standards for shade matching. P3. Arrange material for dyeing process as program sheet. P4. Collect specs for continuous dyeing process.
CU2. Prepare and ensure dyeing parameters for continuous dyeing	P1. Instruct continuous dyeing machine operators for dyeing process according to given parameters. P2. Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan. P3. Execute dyes and chemical preparation for continuous dyeing at production level. P4. Set machine parameters for continuous dyeing process. P5. Verify process parameters for dyeing as per dyeing plan. P6. Supervise safety precautions as per job requirement.
CU3. Identify shade by using shade matching method for continuous dyeing	P1. Verify shade standards for shade matching. P2. Match shade as per standards and make corrections if required. P3. Execute production on set parameters according to program. P4. Arrange material for dyeing process as program sheet.
CU4: Perform Dyeing	P1. Arrange material for dyeing process as program sheet. P2. Execute production on set parameters according to program.



CU5: Verify quality for continuous dyeing process	P1. Verify quality parameters during production for matching with standards. P2. Inspect physically dyeing process to maintain quality & time. P3. Take corrective actions for any issues concerned with quality according to requirement.
CU6: Prepare production report for continuous dyeing process	P1. Verify production register maintain by machine operators shift-wise. P2. Calculate and Record efficiency of every machine for evaluating machine production progress. P3. Prepare shift production report. P4. Prepare reports for faults occur during shift.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Demonstrate proper use and handling of equipment
- Identify types of continuous dyeing machines and process
- perform dyeing process by respecting occupational and safety standards
- Demonstrate proper use of Dyes, water and Chemicals
- Determine fabric behavior / construction, GSM
- Explain the use of the Pantone Book
- Explain the importance of Liquor ratio
- Describe the function of dyes and chemicals
- Explain the principles of shade matching (Human Eye)
- Determine Dyeing Recipes
- Explain the principles of Spectrophotometer for shade matching
- Determine the dyeing parameters
- Describe the preparation of dyes and chemicals
- Demonstrate proper use of PPEs
- Perform efficiency calculations



- Identify types of fabric faults
- Identify continuous dyeing faults and their remedies
- Explain the importance of machine cleaning
- Explain fault finding and troubleshooting for machine.
- Explain customers' given standards(Swatch)
- Explain customers' given specifications.
- Apply dyeing plan
- Perform chemical and dyes calculations (L:R)

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Calculate amount of dyes and chemicals as per given in recipe for production as per dyeing plan.
- Inspect physically dyeing process to maintain quality & time.
- Match shade as per standards and make corrections if required.

LIST OF TOOLS AND EQUIPMENT

Sr. #	Items
•	Pad Steam Dyeing machine
•	Pad thermosol Dyeing machine
•	Light Box
•	Spectrophotometer
•	Iron
•	Tape
•	Pantone book
•	Consistency cards for shade variation
•	Telephone
•	Computer
•	Printer
•	Office files (Stationary related items)



0723001105 Carry out laboratory testing of dyeing process

Overview: This competency standard covers the skills and knowledge required to perform laboratory tests like pH, tensile strength, color fastness and shrinkage to maintain quality of dyed fabrics.

Competency Units	Performance Criteria
CU1. Select textile substrate sample	<p>P1. Select sample from marketing department for quality tests.</p> <p>P2. Select sample during production for testing purpose.</p>
CU2. Perform Physical lab testing	<p>P1. Calculate count of yarn as per given standard.</p> <p>P2. Identify construction of fabric according to required parameters.</p> <p>P3. Perform physical testing according to customers' requirement as follows:</p> <ul style="list-style-type: none"> • pH • Tear and tensile test • Seam slippage • Abrasion and Pilling test. • Snagging test • Sinking test (Absorbency) • TEGAWA test • Color fastness (light, water, perspiration, chlorine, rubbing, washing, saliva, PVC,) • Perform shrinkage test. • Perform shade matching • Perform blend ratio • count, construction and GSM • Perform Berger whiteness test • Perform Barium activity number test
CU3. Perform Chemical Testing	<p>P1. Perform chemical testing as per standard.</p> <p>P2. Check Water hardness through water hardness test</p> <p>P3. Perform sizing chemical test</p> <p>P4. Perform dyestuff testing as per standard</p>



	P5. Test dyes and chemicals batch-wise.
CU4: Verify final results	P1. Determine the evaluation criteria of the tests. P2. Evaluate the testing result according to the defined quality standards P3. I Settle machine and dyeing parameters according to quality testing results
CU5: Maintain Quality Records	P1. Record batch-wise testing reports (dyes and chemical) on daily basis. P2. Coordinate with concerned person regarding production batches. P3. Maintain record on daily basis.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore trainee must be able to:

- Explain the proper use and handling of equipment and chemicals.
- Describe the chemical hazards and non-hazards
- Explain the proper use of Dyes and Chemicals
- Define types of yarn and fabric and their construction
- Explain the function of Dyes and chemicals
- Describe testing at dyeing lab
- Explain testing standards by AATCC Manuals
- Explain testing standards by ISO manuals
- Explain testing standards by ASTM standards
- Explain the impact of humidity and temperature effects on lab testing.



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform physical testing according to customers' requirement
- Perform chemical testing as per standard.
- Perform dyestuff testing as per standard

LIST OF TOOLS AND EQUIPMENT

Sr. #	Items
•	Hydro extractor
•	Humidifier
•	Scissor
•	Manuals (AATCC, ISO, ASTM)
•	Pantone books
•	Multi fibre, Wash tech
•	Xenon Lamp
•	GSM Cutter
•	Pilling tester
•	PH meter
•	Baume' meter
•	TDS meter
•	Stop watch
•	Weighing scale (Electronic)
•	Beakers
•	Pipets
•	Pad steam
•	Pick glass
•	Magnifier glass
•	Light box (D65, TL84, CWF, UV,INCA)



•	Padder
•	Data color
•	Pad thermosol
•	Computer
•	Printer
•	Boiler
•	Burner
•	Flame tester
•	Glass rod
•	Stirrer (Magnate, stand type)
•	Conical flask
•	PPEs (lab coat)
•	Spatula
•	Crock meter
•	IR lamp
•	Fado meter (light fastness tester)
•	Pilling tester
•	Tumble dryer
•	Iron
•	Crock meter
•	Grey scale, tongue, pencil, marker, scale, T-square, Measuring tape,
•	Blue scale
•	Ph tester
•	Wash tech
•	IR dyeing machine
•	Filter paper
•	Washing machine
•	Tensile strength tester
•	GSM Cutter



101200834: H: Communicate at workplace

Overview:

This competency standard covers the skills and knowledge required to adopt effective Listening, Develop Nonverbal Communication, Develop verbal communication, Develop Confidence and Pick the right medium.

Competency Units	Performance Criteria
CU1. Communicate within the organization	P1. Communicate within a department. P2. Communication with other departments. P3. Use various media to communicate effectively. P4. Communicate verbally and non-verbally using professionalism
CU2. Communicate outside the organization	P1. Deal with vendors P2. Deal with clients/customers P3. Interact with other organisations. P5: P4. Use various media to communicate effectively

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Importance of intra and inter organizational communication
- Modes of communication
- Types of communication
- Basics of business communication

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Job sheet
- Office emails and coordination reports
- English Language certificate



12. Complete List of Tools and Equipment

S #	Item
1	Manual of organizational Safety rules and regulations
2	Person protection and safety equipment
3	Manual of Safety signs and symbols
4	Waste disposal SOPs
5	Scissors
6	Air dryer
7	Fabric Drying Oven
8	Mug
9	Textile Trolleys
10	Plastic Beaker 500 ml and 250 ml
11	Measuring Cylinder 1000 ml
12	Buckets
13	Glass Beaker 500 ml and 250 ml
14	Glass Rods
15	Textile Marker
16	PPEs <ul style="list-style-type: none">- Gloves- Goggles- Shoes- Mask- Apron- Safety Cap
17	Winch Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")
18	Over lock machine
19	Mini Boiler
20	Compressor
21	Natural Gas for boiler
22	pH meter
23	TDS meter
24	pH stripes
25	Light Box
26	Water
27	Direct dyes (Yellow, Red, Blue)
28	Reactive dyes (Yellow, Red, Blue)
29	Salt
30	Sodium Carbonate (Soda Ash)
31	Formic Acid



32	Wetting Agents
33	Leveling Agents
34	Sequestering Agent
35	Washing-off Agents
36	Anti-foam Agents
37	Fixing Agents
38	Sodium Hydroxide
39	Cotton Fabric RFD (Knitted)
40	Cotton Towel RFD (Knitted)
41	Cotton Fabric RFD (Woven)
42	Jigger Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")
43	Jet Dyeing Machine (Pilot scale) (Capacity 15 Kg)
44	Disperse dyes (Yellow, Red, Blue)
45	Acetic acid
46	Dispersing Agents
47	Sodium Hydro sulphite (Sodium dithionite)
48	Anti creasing agent
49	PC Fabric RFD (Woven)
50	Polyester fabric RFD (Knitted)
51	Batcher (A-frame)
52	Pad batch Dyeing Machine (Pilot scale) (machine width 1800 mm)
53	Jack
54	Polyethylene cover
55	Masking brown tape
56	Weighing balance
57	Sodium Silicate
58	Sodium Hydroxide (Caustic Soda)
59	Pad thermosol Dyeing Machine (Pilot scale) (width 1800 mm)
60	Thermal boiler
61	Pigment, Vat, disperse dyes (Yellow, Red, Blue)
62	Urea
63	Anti-migrate agent
64	Pad steam Dyeing Machine (Pilot scale) (width 1800 mm)
65	Sulphur dyes, Vat (Yellow, Red, Blue)
66	Hydrogen peroxide
67	Cone Dyeing Machine (Pilot scale) (Capacity 15 Kg)
68	Formic Acid
69	Cotton Cones of 2.25 lbs each (RFD- Ready for dyeing)
70	Rope Dyeing Machine (Pilot scale) (Capacity 40 ropes)
71	Indigo dyes



72	Cotton yarn
73	Sulphuric acid (also in jet)
74	Soft flow Dyeing Machine (Pilot scale) (Capacity 15 Kg and width 60")
75	Vat dyes (Yellow, Red, Blue)
76	Towel fabric (RFD- Ready for dyeing / development)
77	Cotton denim fabric (RFD- Ready for dyeing / development)
78	Hydro exactor
79	Tumble dryer
80	Pigment (Yellow, Red, Blue)
81	Binder
82	Cotton Garment RFD (Knitted)
83	Cotton Garment RFD (Woven)
84	Denim Garment
85	Stenter Dyeing Machine (Pilot scale) (width 1800 mm)
86	Denim Knitted Fabric RFD
87	Denim Woven Fabric RFD
88	Manual of techniques of energy conservation
89	Manual of local Standards of environmental quality.
90	Manual of Pollution reduction and prevention methods/ solutions.
91	Manual of air emissions and control technologies.
92	Manual of water conservation fixtures
93	Manual of Methods of Erosion control
94	Spectrophotometer
95	Tape
96	Pantone book
97	Consistency cards for shade variation
98	Telephone
99	Computer
100	Printer
101	Office files (Stationary related items)
102	Humidifier
103	Testing Manuals (AATCC, ISO, ASTM)
104	Multi fibre, Wash tech
105	Xenon Lamp
106	GSM Cutter
107	Pilling tester
108	PH meter
109	Baume' meter
110	TDS meter
111	Stop watch



112	Pad steam
113	Pick glass
114	Magnifier glass
115	Light box (D65, TL84, CWF, UV,INCA)
116	Padder
117	Data color
118	Pad thermosol
119	Burner
120	Flame tester
121	Stirrer (Magnate, stand type)
122	Conical flask
123	PPEs (lab coat)
124	Spatula
125	Crock meter
126	IR lamp
127	Fado meter (light fastness tester)
128	Pilling tester
129	Crock meter
130	Grey scale
131	Blue scale
132	Tongue
133	Pencil
134	Marker
135	Scale
136	T-square
137	Measuring tape
138	Wash tech
139	IR dyeing machine
140	Filter paper
141	Washing machine
142	Tensile strength tester
143	GSM Cutter

