



Model Curriculum

QP Name: Automotive Body Painting Technician

QP Code: ASC/Q3304

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 2.0

Automotive Skills Development Council | 153, Gr Floor, Okhla Industrial Area, Phase – III, Leela Building,
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Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Painting & Surface Treatment Operation
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7132.0203
Minimum Educational Qualification and Experience	10th Class + 1 year ITI with 3 years of experience OR 10th Class + 2 year ITI with 2 years of experience OR 12th Class with 2 Years of experience in auto sector OR Certificate-NSQF (Automotive Painting Operator Level 3) with 2 years of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	29/07/2021
Next Review Date	29/07/2026
NSQC Approval Date	29/07/2021
QP Version	2.0
Model Curriculum Creation Date	29/07/2021
Model Curriculum Valid Up to Date	29/07/2026
Model Curriculum Version	2.0
Minimum Duration of the Course	400 Hours 00 Minutes
Maximum Duration of the Course	400 Hours 00 Minutes

Program Overview

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

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Perform preparatory works such as identification of raw material, tools and equipment required for the pre-treatment and painting operations.
- Carry out body preparation and surface treatment processes on vehicle parts.
- Carry out sealing and painting operations on vehicle body parts.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module					
Module 1: Introduction to the role of an Automotive Painting Technician	8:00	0:00			8:00
ASC/N9803 – Organize work and resources (Manufacturing) NOS Version No. – 1.0 NSQF Level – 3	16:00	24:00			40:00
Module 2: Organize work and resources according to safety and conservation standards	16:00	24:00			40:00
ASC/N9802 – Interact effectively with colleagues, customers and others NOS Version No. – 1.0 NSQF Level - 3	12:00	20:00			32:00
Module 3: Communicate effectively and efficiently	12:00	20:00			32:00
ASC/N3309 – Perform pre-treatment and surface preparation process NOS Version No. – 2.0 NSQF Level - 4	40:00	72:00			112:00
Module 4: Perform pre-treatment and surface preparation process	40:00	72:00			112:00
ASC/N3310 – Perform sealing, painting and post-painting operations	68:00	140:00			208:00

NOS Version No. – 2.0					
NSQF Level - 4					
Module 5: Perform sealing, painting and post-painting operations	68:00	140:00			208:00
Total Duration	144:00	256:00			400:00

Module Details

Module 1: Introduction to the role of an Automotive Painting Technician

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Painting Technician.

Duration: <08:00>	Duration: <00:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the role and responsibilities of an Automotive Painting Technician. • Discuss the job opportunities of an Automotive Painting Technician in an automobile industry. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the standards and procedures involved in the different processes of vehicle body painting. 	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 2: Organize work and resources according to safety and conservation standards

Mapped to ASC/N9803, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.
- Apply conservation practices at the workplace.

Duration: <16:00>	Duration: <24:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the potential workplace related risks and hazards, their causes and preventions. • Identify PPE to be used at workplace. • Identify various warning signs used at the workplace. • Describe appropriate strategies to deal with emergencies and accidents at the workplace. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Discuss the importance of keeping work area clean and tidy. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities. • Discuss the ways of dealing with stress and anxiety. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Explain 5S guidelines at workplace. • List the various materials used at the workplace. • Explain organisational recommended procedure for storage of tools, equipment and material after completion of work. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal. 	<ul style="list-style-type: none"> • Apply appropriate safety practices to ensure safety of people at the workplace • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate the use of fire extinguisher. • Apply basic first aid procedure in case of emergencies. • Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Demonstrate how to evacuate the workplace in case of an emergency. • Demonstrate sorting of materials, tools and equipment and spare parts after completion of work. • Demonstrate the steps involved in storage of tools, equipment and material after completion of work. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water.

- List the different categories of waste for the purpose of segregation
- Differentiate between recyclable and non-recyclable waste
- State the importance of using appropriate colour dustbins for different types of waste.
- Discuss common practices for conserving electricity at workplace.
- Discuss the common sources of pollution and ways to minimize it.

Classroom Aids:

Whiteboard, marker pen, projector

Tools, Equipment and Other Requirements

- Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher
- Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit

Module 3: Communicate Effectively and Efficiently

Mapped to ASC/N9802, v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: <12:00>	Duration: <20:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the organizational structure for communicating with colleagues, seniors and others. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues. • State the procedure to receive work instructions and report problems to the supervisor. • List the various organizational policies and procedures to be followed at the workplace. • Describe different ways to rectify commonly occurring errors. • Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications. • Discuss the importance of PwD and gender sensitization. 	<ul style="list-style-type: none"> • Employ different means of communication depending upon the requirement while interacting with others. • Demonstrate using new ways to maintain good relationships with colleagues and supervisor. • Prepare a sample report to send the work status to the supervisor. • Demonstrate how to communicate with different genders and persons with disability (PwD) in a sensitive manner.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 4: Perform pre-treatment and surface preparation process

Mapped to ASC/N3309, v2.0

Terminal Outcomes:

- Identify tools and equipment required for pre-treatment process.
- Perform the steps to carry out pre-treatment process.

Duration: <40:00>	Duration: <72:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe pre-treatment and surface preparation standards and procedures followed in the company. • Discuss do's and don'ts of the pre-treatment and surface preparation process. • Discuss the information derived from the engineering drawing, work instructions and SOPs. • List the tools, equipment, accessories and materials required during pre-treatment and surface preparation work. • Describe the selection criteria of tools, equipment, accessories and materials required during pre-treatment and surface preparation work. • Summarise the steps to be performed for checking the tools, jigs, equipment, accessories and materials before use. • Discuss the necessary precautions to avoid any hazard and accident pre-treatment and surface preparation work. • Discuss ways of safe handling and use of pre-treatment and surface preparation materials and solvents. • Discuss the process of loading/unloading and placing the vehicle body parts on the designated place as per the work instructions. • List the steps to be performed for checking the components and parts of bath system, magnetic separator, oil separator, phosphate sludge (for phosphate dip process), heating system (heat exchanger) of Phosphate solution and spray nozzles. • List steps to be performed for checking the quality of water. • Discuss the importance of monitoring the pressure difference across filter 	<ul style="list-style-type: none"> • Demonstrate the standard operating procedure to use tools, equipment, accessories and materials required during pre-treatment and surface preparation work. • Show how to select the required tools, equipment, accessories and materials. • Apply appropriate ways to check the tools, jigs, equipment, accessories and materials before use. • Show how to identify loading points and locking points in the jig as per the job requirement. • Perform the steps of lifting and placing the vehicle body parts on the designated place manually or by using lifting tools. • Apply appropriate ways to check that vehicle body or parts are clean and free from wanted material or dust. • Apply appropriate ways to check the components and parts of bath system, magnetic separator, oil separator, phosphate sludge (for phosphate dip process), heating system (heat exchanger) of Phosphate solution and spray nozzles are in working condition as mentioned in SOP. • Perform steps to check that water is free from chlorine and other impurities, PH and conductivity is maintained as per norms. • Show how to check the bath temperature and record it as per SOP/work instruction. • Read the measurement gauges to monitor the pressure difference across filter (cartridge/strainer). • Show how to clean/ replace the filter (cartridge/strainer). • Demonstrate organizational specified procedure of all pre-treatment and surface preparation processes.

<p>(cartridge/strainer) and correcting them as per the requirements.</p> <ul style="list-style-type: none"> Describe process flow of pre-treatment and surface preparation processes i.e. prewash, hot water spray, pre-degreasing, degrease dip, Water rinse I spray & Water rinse II dip, Surface Conditioning, Phosphate dip, Water rinse III spray & Water rinse IV dip, ED Bath, Ultra Filtrate 1, 2 and 3, RCDM dip and Fresh DI spray process. Describe phosphate chemical transfer process from phosphate main tank to dump tank. Elaborate material Safety Data Sheet (MSDS) of bath and lab chemicals. Discuss the importance of maintaining bath pointage as per SOP/work instruction. State the importance of completing baking process within the stipulated time. Explain methods of inspecting the quality of parts after pre-treatment and surface preparation work. List the commonly occurring defects in the coated parts. Describe ways for checking the quality of phosphate coating and ED coating. Discuss ED coating parameters such as Dry Film Thickness (DFT), Gloss, Methyl Isobutyl Ketone (MIBK) rub test, etc. and their impact on output. List different methods for disposing off waste material and scrap. 	<ul style="list-style-type: none"> Show how to check the temperature of baking oven before starting of ED process. Apply appropriate ways to check the quality of phosphate coating and ED coating after phosphate process and ED process. Show how to remove any unwanted extra ED drops by using pressurised air as per SOP. Apply appropriate ways to check the ED coating parameters (Dry Film Thickness (DFT), Gloss, Methyl Isobutyl Ketone (MIBK) rub test, etc) and record data as per SOP. Perform steps to check that part is free from water break, dust and defects after final rinse. Demonstrate how to support the operator during unloading of the vehicle body or parts on skids for next process. Show how to dispose scrap or waste as per organisational guidelines.
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Classroom Aids:

Whiteboard, marker pen, projector

Tools, Equipment and Other Requirements

- PPT's, teaching aids
- Pre-treatment line consisting of degreasing phosphating & passivation facility, all type of chemicals for pre-treatment
- R.O & D.M Water
- Painting booth (4'x6'x10') approx with water screen facility, Paint Mixing Room, Inspection Booth With Sufficient Light (700 Lux)
- Painting Table, Paint Simulator
- Defective Parts With (Dust, Dry Flow)
- Samples Of Different Type Of Points i.e. Synthetic, Nc Parts & Pu Base Points
- Process Flow Charts Showing Pre-treatment Details & Parameters, Process Flow Charts Showing Painting Process & Parameters
- Paint transfer pump, spray gun, hose for spray gun, pressure gauges, paints, primers & thinners, viscosity, testing meter, stop watch, stirrer, paint container, sand paper of different grades, masking tapes, tool kit, air blow gun, vacuum machine, infrared drier, paint gun cleaning system, paint gun stand, sealant gun, paint mixing scale, digital weighing machine, tag

rag, hangers for holding components, baking oven, paint thickness tester, pencil for scratch resistance test, adhesion tester with tape (cutter, knife), salt spray tester, lab equipment beakers/pipette, conductivity meter

- **lifting devices:** hoists, cranes, bins, part trolleys, pallet trucks
- **Safety materials:** Fire extinguisher, leather safety gloves, aprons, safety glasses, helmet, safety shoe, booth mask, nose mask, cap for head and first-aid kit
- **Cleaning material:** Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Module 5: Perform sealing, painting and post-painting operations

Mapped to ASC/N3310, v2.0

Terminal Outcomes:

- Identify tools and equipment required for painting work.
- Perform the steps to carry out sealing and painting process.
- Perform the steps to carry out post-painting activities.

Duration: <68:00>	Duration: <140:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe painting standards and procedures followed in the company. • List the sealing and painting tools, equipment, accessories and materials required during work. • Describe the selection criteria of sealing and painting tools, equipment, accessories and materials required during work. • Summarise the steps to be performed for checking the tools, equipment, accessories and materials before use. • Discuss the information derived from the vehicle body drawing related to sealing and painting area including water leakage point. • Discuss the necessary precautions to avoid any hazard and accident sealing and painting work. • Discuss the importance of masking the vehicle parts. • List the steps to be performed for applying under body sealer (PVC) on floor area and stone guard coating (SGC) on vehicle part. • Describe wet film thickness (WFT) of under body sealing (PVC). • Describe operation of paint booth in automatic and manual mode. • Describe process flow of painting operations. • Describe the selection criteria of base colour and appropriate colorants as per the work requirements/ instructions. • Discuss how to mix the correct amount of paint material as per specified ratio. • Describe correct technique for efficient use of spray paint equipment. • Discuss importance of time gap or drying time between application of two coats of paints. 	<ul style="list-style-type: none"> • Demonstrate the standard operating procedure to use sealing and painting tools, equipment, accessories and materials required during painting work. • Show how to select the required sealing and painting tools, equipment, accessories and materials. • Apply appropriate ways to check the tools, equipment, accessories and materials before use. • Apply appropriate ways to check that vehicle body or parts are clean and free from wanted material or dust. • Show how to check the sealer gun pressure before starting sealing process. • Show how to apply the masking tape on area where sealing and painting application is not required. • Demonstrate organisational specified procedure of applying under body sealer (PVC) on floor area with drain caps as per SOP/work instruction. • Demonstrate organisational specified procedure of applying stone guard coating (SGC) on vehicle part as per SOP/work instruction. • Apply appropriate inspection methods for identifying the defects like sealer pin hole, sealer crack, no sealer, ED drop, dry film thickness of SGC etc. after sealing process. • Show how to check and record wet film thickness (WFT) of under body sealing (PVC). • Employ appropriate ways to repair the defects like sealer pin hole, sealer crack, no sealer, ED drop, dry film thickness of SGC. • Demonstrate organisational specified procedure of mixing paint material with

<ul style="list-style-type: none"> • State the importance of maintaining booth parameters during the painting process. • Discuss the tasks to be performed post-painting. • Summarise the commonly occurring defects in the painted parts. • Discuss the impact of defects on the quality of painted parts. • Explain the inspection methods for identifying the defects and checking the quality of painted parts as per the control plan. • Discuss the process of segregating, tagging and storing of damaged and ok workpieces and maintaining records of segregation as per organisational guidelines. • List different methods for disposing off waste material and scrap. 	<ul style="list-style-type: none"> additives as per the specified ratio. • Apply appropriate ways to check the paint viscosity. • Show how to add reducer/ thinner/ water to adjust viscosity of paint mix as per requirement. • Perform steps to prepare painting tools and material for painting job. • Show how to adjust air pressure and flow of paint gun as required for the job. • Demonstrate organizational specified procedure of applying primer and appropriate coats of paint on vehicle body parts. • Apply appropriate ways to check that paint coverage is uniform and there are no patches on the painted parts. • Apply appropriate inspection methods for identifying the defects and checking the quality of painted parts after painting process. • Prepare a sample inspection sheet and write defects in it as per SOP. • Employ appropriate ways to repair the defects on painted parts. • Show how to do final inspection of painted parts and put the stamp for final confirmation. • Show how to segregate, tag, store and record data of damaged and ok parts as per organisational guidelines. • Show how to remove the masking tape and clean the work area after completion of work. • Show how to dispose scrap or waste as per organisational guidelines.
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Classroom Aids:

Whiteboard, marker pen, projector

Tools, Equipment and Other Requirements

- PPT's, teaching aids
- Pre-treatment line consisting of degreasing phosphating & passivation facility, all type of chemicals for pre-treatment
- R.O & D.M Water
- Painting booth (4'x6'x10') approx with water screen facility, Paint Mixing Room, Inspection Booth With Sufficient Light (700 Lux)
- Painting Table, Paint Simulator
- Defective Parts With (Dust, Dry Flow)
- Samples Of Different Type Of Points i.e. Synthetic, Nc Parts & Pu Base Points
- Process Flow Charts Showing Pre-treatment Details & Parameters, Process Flow Charts Showing Painting Process & Parameters
- Paint transfer pump, spray gun, hose for spray gun, pressure gauges, paints, primers & thinners, viscosity, testing meter, stop watch, stirrer, paint container, sand paper of different

grades, masking tapes, tool kit, air blow gun, vacuum machine, infrared drier, paint gun cleaning system, paint gun stand, sealant gun, paint mixing scale, digital weighing machine, tag rag, hangers for holding components, baking oven, paint thickness tester, pencil for scratch resistance test, adhesion tester with tape (cutter, knife), salt spray tester, lab equipment beakers/pipette, conductivity meter

- **lifting devices:** hoists, cranes, bins, part trolleys, pallet trucks
- **Safety materials:** Fire extinguisher, leather safety gloves, aprons, safety glasses, helmet, safety shoe, booth mask, nose mask, cap for head and first-aid kit
- **Cleaning material:** Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Fitter	3	Painting	1	Painting	NA
ITI	Fitter	4	Painting	0	NA	NA
Diploma	Mechanical/ Automobile	2	Painting	1	Painting	NA
Diploma	Mechanical/ Automobile	3	Painting	0	NA	NA

Trainer Certification	
Domain Certification	Platform Certification
“Automotive Painting Technician, ASC/Q3304, version 2.0”. Minimum accepted score is 80%.	“Trainer, MEP/Q2601 v1.0” Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Fitter	4	Painting	1	Painting	NA
ITI	Fitter	5	Painting	0	NA	NA
Diploma	Mechanical/ Automobile	3	Painting	1	Painting	NA
Diploma	Mechanical/ Automobile	4	Painting	0	NA	NA

Assessor Certification	
Domain Certification	Platform Certification
“Automotive Painting Technician, ASC/Q3304, version 2.0”. Minimum accepted score is 80%.	“Assessor; MEP/Q2701 v1.0” Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:
 - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
 - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
 - Assessment agency deploys the ToA certified Assessor for executing the assessment
 - SSC monitors the assessment process & records
2. Testing Environment:
 - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
 - Check the duration of the training.
 - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
 - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
 - Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
 - Time-stamped & geotagged reporting of the assessor from assessment location
 - Centre photographs with signboards and scheme specific branding
 - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
 - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
 - Surprise visit to the assessment location
 - Random audit of the batch
 - Random audit of any candidate
6. Method for assessment documentation, archiving, and access
 - Hard copies of the documents are stored
 - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
 - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

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

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment