



## QUALIFICATION FILE

### <Assembly Process Sr. Technician – Laser Marking>

Short Term Training (STT)  Long Term Training (LTT)  Apprenticeship

Upskilling  Dual/Flexi Qualification  For ToT  For ToA

General  Multi-skill (MS)  Cross Sectoral (CS)  Future Skills  OEM

NCrF/NSQF Level: 5

Submitted By: Telecom Sector Skill Council

Telephone: 0124-4148029

Email: [tssc@tsscindia.com](mailto:tssc@tsscindia.com)

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### Section 1: Basic Details

1.	<b>Qualification Name</b>	Assembly Process Sr. Technician – Laser Marking																
2.	<b>Sector/s</b>	Telecom																
3.	<b>Type of Qualification:</b> <input checked="" type="checkbox"/> New <input type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	<b>NQR Code &amp; version of existing/previous qualification:</b> <i>(change to previous, once approved)</i>	<b>Qualification Name of existing/previous version:</b>															
4.	<b>a. OEM Name</b> <b>b. Qualification Name</b> <i>(Wherever applicable)</i>	NA																
5.	<b>National Qualification Register (NQR) Code &amp;Version</b> <i>(Will be issued after NSQC approval)</i>	QG-05-TL-02955-2024-V1-TSSC	<b>6. NCrf/NSQF Level:</b> 5															
7.	<b>Award (Certificate/Diploma/Advance Diploma/ Any Other</b> <i>(Wherever applicable specify multiple entry/exits also &amp; provide details in annexure)</i>	Certificate																
8.	<b>Brief Description of the Qualification</b>	The individual for this job role is tasked with operating laser machines to accurately etch identification marks on semiconductor wafers. The individual is also responsible to set up laser parameters, ensuring the precision of markings, and maintaining equipment. In addition, he also need to inspect marked wafers for quality and adherence to specifications, documenting the process and outcomes.																
9.	<b>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</b>	<b>a. Entry Qualification &amp; Relevant Experience:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">S. No.</th> <th style="width: 60%;">Academic/Skill Qualification (with Specialization - if applicable)</th> <th style="width: 30%;">Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Completed 2<sup>nd</sup> year of 3-year/4-year UG (Electronics/Telecom/IT)</td> <td>No experience</td> </tr> <tr> <td>2.</td> <td>Completed 2nd year of diploma (after 12th)</td> <td>No experience</td> </tr> <tr> <td>3.</td> <td>12<sup>th</sup> Grade Pass</td> <td>3-year relevant experience</td> </tr> <tr> <td>4.</td> <td>Previous relevant Qualification of NSQF Level 4.5</td> <td>1.5 year relevant experience</td> </tr> </tbody> </table> <b>b. Age:</b> 18 years		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1.	Completed 2 <sup>nd</sup> year of 3-year/4-year UG (Electronics/Telecom/IT)	No experience	2.	Completed 2nd year of diploma (after 12th)	No experience	3.	12 <sup>th</sup> Grade Pass	3-year relevant experience	4.	Previous relevant Qualification of NSQF Level 4.5	1.5 year relevant experience
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)																
1.	Completed 2 <sup>nd</sup> year of 3-year/4-year UG (Electronics/Telecom/IT)	No experience																
2.	Completed 2nd year of diploma (after 12th)	No experience																
3.	12 <sup>th</sup> Grade Pass	3-year relevant experience																
4.	Previous relevant Qualification of NSQF Level 4.5	1.5 year relevant experience																

10.	<b>Credits Assigned to this Qualification, Subject to Assessment</b> (as per National Credit Framework (NCrF))	18	<b>11. Common Cost Norm Category (I/II/III)</b> (wherever applicable): I																					
12.	<b>Any Licensing requirements for Undertaking Training on This Qualification</b> (wherever applicable)	N.A.																						
13.	<b>Training Duration by Modes of Training Delivery</b> (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1" data-bbox="954 349 2051 564"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>180</td> <td>210</td> <td>150</td> <td>-</td> <td>540</td> </tr> <tr> <td>Online</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(Refer Blended Learning Annexure for details)</p>					Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	180	210	150	-	540	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																			
Classroom (offline)	180	210	150	-	540																			
Online																								
14.	<b>Aligned to NCO/ISCO Code/s</b> (if no code is available mention the same)	NCO-2015-3522.9900																						
15.	<b>Progression path after attaining the qualification</b> (Please show Professional and Academic progression)	Assembly Process Supervisor – Wafer Dicing (Level-5.5)																						
16.	<b>Other Indian languages in which the Qualification &amp; Model Curriculum are being submitted</b>	Hindi																						
17.	<b>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No URLs of similar Qualifications:																						
18.	<b>Is the Job Role Amenable to Persons with Disability</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If “Yes”, specify applicable type of Disability:																						
19.	<b>How Participation of Women will be Encouraged</b>	Yes, The Assembly Process Sr. Technician – Laser Marking role is well-suited for women workers due to the emphasis on: <ul style="list-style-type: none"> <li>• <b>Dexterity and Attention to Detail:</b> This role requires careful handling of delicate wafers and meticulous attention to detail during inspection and testing procedures. Women are often recognized for possessing strong dexterity and a keen eye for detail, making them well-qualified for this aspect of the job.</li> <li>• <b>Analytic and Problem-Solving Skills:</b> The ability to analyze test data, identify potential issues, and follow established procedures to troubleshoot problems is crucial. Women excel in these areas, bringing valuable analytical and problem-solving skills to the role.</li> <li>• <b>Communication and Teamwork:</b> Effective communication and collaboration with engineers and other technicians are essential for success. Women are known for their strong communication skills and collaborative work style, making them valuable team players in this environment.</li> </ul>																						



## Section 2: Module Summary

### NOS/s of Qualifications

(In exceptional cases these could be described as components)

### Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

Th.-Theory Pr.-Practical OJT-On the Job Man.-Mandatory Training Rec.-Recommended Proj.-Project

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks						
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)	
1.	Operate Laser Marking Machine for Semiconductor Wafers	TEL/N7208	Core	5	5	30	90	30	-	150	40	50	-	10	100	25	
2.	Maintain Laser Marking Equipment	TEL/N7209	Core	5	5	30	60	60	-	150	30	60	-	10	100	25	
3.	Quality Assurance of Laser-Marked Semiconductor Wafers	TEL/N7210	Core	5	3	30	30	30	-	90	30	60	-	10	100	20	
4.	Document Laser Marking Process	TEL/N7211	Core	5	3	30	30	30	-	90	30	60	-	10	100	20	
5.	Employability Skills	DGT/VSQ/N0102	Non-core	3	2	60	-	-	-	60	20	30	-	-	50	10	
<b>Duration (in Hours) / Total Marks</b>						18	180	210	150	-	540	150	260	-	40	450	

### Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks						
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)	
1.																	
2.																	
<b>Duration (in Hours) / Total Marks</b>																	

Optional NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks				
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total
1.															
2.															
Duration (in Hours) / Total Marks															

Assessment - Minimum Qualifying Percentage

Please specify **any one** of the following:

**Minimum Pass Percentage – Aggregate at qualification level: 70%** (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)

**Minimum Pass Percentage – NOS/Module-wise: \_\_\_\_%** (Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)

Section 3: Training Related

1.	<b>Trainer’s Qualification and experience in the relevant sector (in years)</b> (as per NCVET guidelines)	3 years in Engineering Diploma in (Electronics/Telecom/IT) after 10th with 8years industrial relevant experience and 4 years of teaching experience OR Graduate (Electronics/Telecom/IT) with 4 years of industry relevant experience and 2 years of teaching experience
2.	<b>Master Trainer’s Qualification and experience in the relevant sector (in years)</b> (as per NCVET guidelines)	3 years in Engineering Diploma in after 10th (Electronics/Telecom/IT) with 13 years of industrial relevant experience. OR Graduate (Electronics/Telecom/IT) with 11 years of industry relevant experience.
3.	<b>Tools and Equipment Required for Training</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If “Yes”, details to be provided in Annexure)
4.	<b>In Case of Revised Qualification, Details of Any Upskilling Required for Trainer</b>	NA

### Section 4: Assessment Related

1.	<b>Assessor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in (Electronics/Telecom/IT) after 10th with 8 years industrial relevant experience OR Graduate (Electronics/Telecom/IT) with 4 years of industry relevant experience
2.	<b>Proctor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in (Electronics/Telecom/IT) after 10th with 8years industrial relevant experience OR Graduate (Electronics/Telecom/IT) with 4 years of industry relevant experience
3.	<b>Lead Assessor’s/Proctor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in after 10th (Electronics/Telecom/IT) with 13 years of industrial relevant experience. OR Graduate (Electronics/Telecom/IT) with 11 years of industry relevant experience.
4.	<b>Assessment Mode</b> <i>(Specify the assessment mode)</i>	Offline or Blended
5.	<b>Tools and Equipment Required for Assessment</b>	<input checked="" type="checkbox"/> Same as for training <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(details to be provided in Annexure-if it is different for Assessment)</i>

### Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	<b>Latest Skill Gap Study (not older than 2 years) (Yes/No):</b> Yes
2.	<b>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):</b> Yes
3.	<b>Government /Industry initiatives/ requirement (Yes/No):</b> Yes
4.	<b>Number of Industry validation provided:</b> 5
5.	<b>Estimated nos. of persons to be trained and employed:</b> 1000
6.	<b>Evidence of Concurrence/Consultation with Line Ministry/State Departments:</b> If “No”, why:

## Section 6: Annexure & Supporting Documents Check List

*Specify Annexure Name / Supporting document file name*

1.	<b>Annexure:</b> NCrF/NSQF level justification based on NCrF level/NSQF descriptors <i>(Mandatory)</i>	Yes
2.	<b>Annexure:</b> List of tools and equipment relevant for qualification <i>(Mandatory, except in case of online course)</i>	Yes
3.	<b>Annexure:</b> Detailed Assessment Criteria <i>(Mandatory)</i>	Yes
4.	<b>Annexure:</b> Assessment Strategy <i>(Mandatory)</i>	Yes
5.	<b>Annexure:</b> Blended Learning <i>(Mandatory, in case selected Mode of delivery is “Blended Learning”)</i>	Yes
6.	<b>Annexure:</b> Multiple Entry-Exit Details <i>(Mandatory, in case qualification has multiple Entry-Exit)</i>	Yes
7.	<b>Annexure:</b> Acronym and Glossary <i>(Optional)</i>	Yes
8.	<b>Supporting Document:</b> Model Curriculum <i>(Mandatory – Public view)</i>	Yes
9.	<b>Supporting Document:</b> Career Progression <i>(Mandatory - Public view)</i>	Yes
10.	<b>Supporting Document:</b> Occupational Map <i>(Mandatory)</i>	Yes
11.	<b>Supporting Document:</b> Assessment SOP <i>(Mandatory)</i>	Yes
12.	<b>Any other document you wish to submit:</b>	No

### Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
<b>Professional Theoretical Knowledge/Process</b>	<p>The role of an Assembly Process Sr. Technician - Laser Marking requires a strong theoretical background as well as practical expertise in laser marking technology, which involves:</p> <ul style="list-style-type: none"> <li>• In-depth understanding of various laser types, beam traits, and their interactions with materials.</li> <li>• Knowledge of how different materials such as semiconductors, metals, and plastics react to laser marking procedures.</li> <li>• Capability to decipher customer requirements and optimize laser parameters (power, pulse width, repetition rate) to ensure high-quality markings.</li> <li>• Familiarity with industry standards and quality control practices to ensure that the markings align with precise specifications.</li> <li>• Adherence to safety guidelines concerning laser operation, personal protective equipment (PPE) usage, and equipment maintenance.</li> </ul>	<p>The role of an Assembly Process Sr. Technician - Laser Marking requires a high level of comprehension and implementation of laser marking procedures while following strict theoretical frameworks and operational protocols. This involves in-depth familiarity with semiconductor materials, laser physics, and accurate calibration methods to meet precise marking requirements.</p> <p>Hence, the role aligns with NSQF level 5.</p>	<p>5</p>
<b>Professional and Technical Skills/ Expertise/ Professional Knowledge</b>	<p>The role requires specific technical abilities and knowledge, such as:</p> <ul style="list-style-type: none"> <li>• Ability to effectively operate laser marking machines, including initializing the system, calibrating, and adjusting parameters.</li> <li>• Skill to identify and resolve operational issues, make parameter adjustments, and conduct basic maintenance.</li> <li>• Proficiency in maintaining detailed records of operational parameters, troubleshooting steps, and quality control data.</li> <li>• Capability to inspect and assess laser-marked products according to quality standards, and address any deviations found.</li> <li>• Aptitude for analyzing data to enhance marking processes, making recommendations, and successfully implementing improvements.</li> </ul>	<p>Assembly Process Sr. Technician specializing in Laser Marking exhibits outstanding competence in operating advanced laser marking equipment and carrying out detailed processes with accuracy. The skill set encompasses high-level technical abilities in optimizing laser parameters, troubleshooting intricate equipment malfunctions, and performing thorough quality inspections.</p> <p>Hence, the role aligns with NSQF Level 5</p>	<p>5</p>

<p><b>Employment Readiness &amp; Entrepreneurship Skills &amp; Mind-set/Professional Skill</b></p>	<p>The role requires strong job readiness skills and a proactive attitude:</p> <ul style="list-style-type: none"> <li>• Successfully communicating with teams and supervisors to address issues, request clarification, and propose enhancements.</li> <li>• Proficiency in examining problems, suggesting resolutions, and implementing necessary actions independently or in a collaborative environment.</li> <li>• Adaptability to new technologies, evolving processes, and changing customer needs.</li> <li>• Taking the lead in acquiring new skills, enhancing knowledge, and participating in process improvement and team objectives.</li> <li>• Recognizing the business impact of quality and efficiency, and contributing to enhancing productivity and customer satisfaction.</li> </ul>	<p>Assembly Process Sr. Technician in Laser Marking displays high levels of job readiness by skillfully managing responsibilities, meeting deadlines, and working effectively in cross-functional teams. The individual is required to actively embrace a mindset of continuous improvement, adapting to technological advancements and industry changes. This level prioritizes entrepreneurial thinking, encouraging creative problem-solving, promoting efficiency, and driving organizational development through process optimization and improvement of product quality in laser marking operations. Hence, this role aligns with NSQF Level 5</p>	<p>5</p>
<p><b>Broad Learning Outcomes/Core Skill</b></p>	<p>The core skills developed in this role include:</p> <ul style="list-style-type: none"> <li>• Expertise in laser marking technology, encompassing setup, operation, and the ability to diagnose and resolve issues, as well as perform routine maintenance.</li> <li>• Ability to uphold strict product quality standards by meticulously examining products and adhering to specifications.</li> <li>• Dedication to ensuring a safe work environment by adhering to safety protocols and procedures.</li> <li>• Accurate documentation of operational data, troubleshooting activities, and quality control results.</li> <li>• Active participation in continuous learning and process improvement to boost efficiency and effectiveness.</li> </ul>	<p>Assembly Process Sr. Technician specializing in Laser Marking requires fundamental skills in advanced manufacturing methods, precision engineering, and quality assurance protocols. The individual has essential expertise in interpreting technical requirements, executing intricate procedures, and ensuring adherence to safety and environmental standards. Hence, this role aligns with NSQF Level 5.</p>	<p>5</p>
<p><b>Responsibility</b></p>	<p>Working as an Assembly Process Sr. Engineer - Laser Marking involves:</p> <ul style="list-style-type: none"> <li>• Ensuring that laser marking processes operate smoothly to minimize downtime and maximize throughput.</li> <li>• Maintaining strict adherence to quality standards for all marked products, promptly identifying and addressing any quality issues.</li> <li>• Taking personal and team safety seriously by following protocols and minimizing risks associated with laser operations.</li> </ul>	<p>Assembly Process Sr. Technician – Laser Marking has a significant role in carrying out precise laser marking processes within semiconductor manufacturing. The individual in this role is responsible for upholding strict quality standards and ensuring compliance with operational protocols, safety regulations, and environmental sustainability practices. The role responsibilities include proactive problem-solving, effective communication, and detailed documentation to maintain the organizational reputation and operational excellence in laser marking technologies.</p>	<p>5</p>

	<ul style="list-style-type: none"> <li>Effectively collaborating with colleagues, supervisors, and support teams to meet production goals and overcome challenges.</li> <li>Dedicating oneself to continuous skill development, staying current with technological advancements, and contributing to process improvements.</li> </ul>	Hence, this role aligns with NSQF Level 5.	
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### Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment  
**Batch Size: 30 Candidate**

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1.	PPE Kit		30
2.	Wafer thinning and lapping equipment (simulated or actual)		5
3	Measurement instruments (e.g., thickness gauge, profilometer)		5
4	Personal Protective Equipment (PPE) for cleanroom environment		30
5	Wafers (simulated or actual)		60
6	Abrasive materials (for simulated practice)		5
7	Slurry solution (for simulated practice)		5
8	Cleaning supplies		10
9	Standard Operating Procedures (SOPs) manuals		30
10	Visual inspection tools (e.g., flashlight, magnifying glass)		10
11	Cleaning supplies (e.g., wipes, cloths, specific cleaning solutions)		10
12	Simulator or non-functional laser marking equipment		5
13	Computer with access to system logs		5
14	Consumables (e.g., cleaning supplies, compressed air)		10
15	Documentation forms or electronic record keeping system		1
16	Lighting (task lamp)		10

17	Magnification tools (loupe, microscope)		10
18	Pen/pencil		30
19	Data recording sheets (or simulated software)		30
20	Non-functional laser marking equipment (for demonstrations)		5
21	Simulated wafers (for inspection practice)		60
22	Laser marking machine (or simulator)		5
23	Designated forms (or simulated electronic system) for data recording		30
24	Logbook (or simulated logbook)		30
25	Inspection tools		10
26	Soldering iron (or soldering station)		10
27	Solder		10
28	Solder paste (if applicable)		10
29	Stencil (if using solder paste)		10
30	Tweezers		30
31	Component cutters		10
32	Multimeter (or other test equipment)		10
33	ESD workstation (or grounding equipment)		10
34	Cleaning tools (e.g., flux cleaner, isopropyl alcohol)		10
35	Workbench with proper lighting		10

#### Classroom Aids

The aids required to conduct sessions in the classroom are:

- 1.
- 2.

### Annexure: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)

### Annexure: Training & Employment Details

**Training and Employment Projections:**

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
23-24	300		100		00	00
24-25	300		100		00	00
25-26	400		200		00	00

Data to be provided year-wise for next 3 years

**Training, Assessment, Certification, and Placement Data for previous versions of qualifications:**

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed

Applicable for revised qualifications only, data to be provided year-wise for past 3 years.

**List Schemes in which the previous version of Qualification was implemented: NA**

- 1.
- 2.

**Content availability for previous versions of qualifications: NA**

Participant Handbook  Facilitator Guide  Digital Content  Qualification Handbook  Any Other:

**Languages in which Content is available: NA**

## Annexure: Blended Learning

### Blended Learning Estimated Ratio & Recommended Tools: NA

Refer NCVET “Guidelines for Blended Learning for Vocational Education, Training & Skilling” available on:

<https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf>

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	<input type="checkbox"/> Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	<input type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	<input type="checkbox"/> Showing Practical Demonstrations to the learners		
4	<input type="checkbox"/> Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	<input type="checkbox"/> Tutorials/ Assignments/ Drill/ Practice		
6	<input type="checkbox"/> Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	<input type="checkbox"/> On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

## Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>TEL/N7208: Operate Laser Marking Machine for Semiconductor Wafers</b>	<i>Pre-Operation System Checks and Preparation</i>	8	12	-	3
	PC 1. power on the laser marking machine and associated equipment following SOPs	1	2	-	-
	PC 2. perform system initialization procedures as per manufacturer's instructions	1	2	-	1
	PC 3. load and align calibration target according to SOPs	1	2	-	1
	PC 4. conduct a test marking run to verify laser beam quality and system performance	2	2	-	-
	PC 5. verify proper functioning of safety interlocks and emergency stop buttons	1	1	-	-

PC 6. review and ensure the availability of required consumables (e.g., lenses, cleaning supplies)	1	1	-	-
PC 7. document pre-operation checks in the designated logbook	1	2	-	1
<i>Wafer Loading, Laser Parameter Setting, and Marking Execution</i>	<i>20</i>	<i>20</i>	<i>-</i>	<i>4</i>
PC 8. wear appropriate personal protective equipment (PPE) as per safety regulations (e.g., safety glasses, gloves)	1	1	-	
PC 9. prepare the designated loading area for the wafers, ensuring it's clean and free of contamination	1	1	-	
PC 10. carefully pick up a semiconductor wafer using appropriate handling tools (e.g., vacuum tweezers)	1	1	-	
PC 11. place the wafer on the designated loading stage of the laser marking machine, adhering to proper orientation and alignment as per SOPs	2	2	-	1
PC 12. secure the wafer in place using the machine's clamping mechanism	1	1	-	
PC 13. access and review customer specifications for marking details (e.g., mark depth, character size)	1	1	-	1
PC 14. identify appropriate settings for the specific material and marking requirements by referring to process reference documents (laser parameter tables)	1	1	-	-
PC 15. input or adjust laser parameters (power, pulse width, repetition rate) on the machine control panel	1	1	-	1
PC 16. perform a test marking on a sample wafer to verify the suitability of chosen parameters	2	2	-	-
PC 17. fine-tune parameters if necessary to achieve optimal marking quality within specification limits	1	1	-	-
PC 18. document the final laser parameters used for the specific marking job	1	1	-	-
PC 19. select the appropriate marking program on the machine control panel based on the customer specifications	2	1	-	-
PC 20. initiate the laser marking process for the loaded wafer	1	1	-	1
PC 21. monitor the marking process visually through the designated viewing window or using the machine's camera system (if available)	1	1	-	-
PC 22. ensure the laser beam accurately marks the intended location and produces clear, consistent identification marks that meet customer requirements	1	2	-	-

	PC 23. release the clamping mechanism and unload the wafer using proper handling techniques, after marking completion	1	1	-	-
	PC 24. place the marked wafer in the designated unloading area or designated container for further processing	1	1	-	-
	<i>In-Process Quality Control and Minor Troubleshooting</i>	<i>12</i>	<i>18</i>	<i>-</i>	<i>3</i>
	PC 25. observe the marking process for any deviations from expected outcomes (e.g., uneven marking depth, burning, cracking)	1	2	-	1
	PC 26. monitor real-time data displayed on the machine control panel (e.g., power output, focus position)	1	2	-	-
	PC 27. identify any variations in mark quality and promptly adjust laser parameters (within allowable range) to maintain consistent and acceptable marking results	1	3	-	1
	PC 28. document any adjustments made to laser parameters and the reason for the adjustments	1	2	-	-
	PC 29. recognize common warning signs of potential equipment malfunctions (e.g., abnormal noises, error messages)	2	2	-	-
	PC 30. consult the troubleshooting guide or SOPs for recommended corrective actions for minor operational issues	2	2	-	-
	PC 31. implement basic troubleshooting steps to resolve the issue (e.g., cleaning lenses, restarting software)	2	3	-	1
	PC 32. report any unresolved issues or suspected major malfunctions to designated personnel for further action	1	1	-	-
	PC 33. document the troubleshooting attempts made and the outcome in the maintenance log	1	1	-	-
	<b>Total Marks</b>	<b>40</b>	<b>50</b>		<b>10</b>
	<i>Perform Routine Maintenance on Laser Marking Machine</i>	<i>14</i>	<i>30</i>	<i>-</i>	<i>5</i>
<b>TEL/N7209: Maintain Laser Marking Equipment</b>	PC 1. conduct visual inspection to identify damage or leaks on the laser marking machine	1	2	-	1
	PC 2. clean the exterior surfaces of the machine using appropriate cleaning agents as per SOPs.	1	3	-	-
	PC 3. verify functionality of safety interlocks and emergency stop buttons	2	3	-	1
	PC 4. ensure proper laser beam alignment and focus using a designated target according to SOPs.	1	3	-	-
	PC 5. analyze system logs for error messages or unusual operating parameters	1	3	-	-

PC 6. perform cleaning of the laser marking machine's objective and focusing lenses (consider weekly or monthly based on usage)	2	4	-	1
PC 7. inspect the laser marking machine's exhaust system for proper airflow and filter condition (consider weekly or monthly based on usage)	1	3	-	1
PC 8. replenish consumables used in the marking process, such as cleaning supplies or compressed air	1	3	-	-
PC 9. backup system data and settings as per SOPs (consider weekly or monthly based on IT policy)	2	3	-	-
PC 10. document all completed maintenance tasks in the designated logbook, including the date and specific tasks performed	2	3	-	1
<i>Monitor Equipment Performance and Respond to Malfunctions</i>	<i>16</i>	<i>30</i>	<i>-</i>	<i>5</i>
PC 11. monitor the laser marking machine for abnormal noises, vibrations, or error messages during operation	2	3	-	1
PC 12. observe the marking process to identify deviations from expected outcomes (e.g., uneven marking depth, burning, flickering laser beam)	2	3	-	-
PC 13. recognize warning signs of potential equipment malfunctions identified in training or SOPs (e.g., unusual odor, excessive heat)	2	5	-	1
PC 14. upon identifying a major equipment malfunction: a. cease operation immediately and secure the work area b. document the observed malfunction details, including any error messages or symptoms c. report the major equipment malfunction to designated personnel (supervisor, maintenance technician) as per SOPs	3	4		1
PC 15. maintain a dedicated logbook or electronic record keeping system for documenting all maintenance activities	1	2	-	-
PC 16. record the date, time, and specific tasks performed for all maintenance procedures	1	3	-	-
PC 17. document any adjustments made during calibration or troubleshooting activities	2	3	-	-
PC 18. report details of identified malfunctions, troubleshooting steps taken, and actions to designated personnel	2	4	-	1
PC 19. ensure all records are completed accurately, legibly, and signed by the individual performing the maintenance	1	3	-	1
<b>Total Marks</b>	<b>30</b>	<b>60</b>	<b>-</b>	<b>10</b>

<b>TEL/N7210: Quality Assurance of Laser-Marked Semiconductor Wafers</b>	<i>Perform Quality Control Inspections of Laser-Marked Wafers</i>	<i>14</i>	<i>30</i>	-	<i>5</i>
	PC 1. obtain the relevant quality control specifications for laser-marked wafers	2	3	-	1
	PC 2. prepare the inspection workstation with appropriate lighting and magnification tools (e.g., microscope)	1	2	-	-
	PC 3. select a sample of laser-marked wafers according to the sampling plan defined in SOPs	1	2	-	1
	PC 4. systematically inspect each wafer for: a. clarity of the marking (absence of smudging, blurring) b. depth of the marking (meeting the specified depth range) c. uniformity of the marking (consistent across the entire wafer)	3	6	-	-
	PC 5. compare inspection results to the quality control specifications	1	4	-	1
	PC 6. document inspection findings for each wafer sample	1	2	-	-
	PC 7. identify wafers that do not meet the quality control specifications, based on the inspection results	2	4	-	1
	PC 8. clearly mark or flag defective wafers for easy identification	1	2	-	-
	PC 9. segregate defective wafers from the acceptable ones following designated procedures to prevent them from being processed further	1	3	-	-
	PC 10. document the quantity and nature of the defects identified in each segregated wafer	1	2	-	1
	<i>Manage Quality Control Data and Implement Improvements</i>	<i>16</i>	<i>30</i>	-	<i>5</i>
	PC 11. utilize designated forms or electronic systems to record inspection data, including: a. date and time of inspection b. lot ID or identification number of the wafers c. sample size inspected d. inspection results for each parameter (clarity, depth, uniformity) e. number and type of defects identified	2	3	-	1
	PC 12. maintain quality control records according to SOPs, ensuring proper filing and archiving procedures	1	2	-	-
PC 13. analyze inspection data to identify trends or recurring issues with marking quality	1	2	-	1	

	PC 14. prepare reports summarizing inspection findings and highlighting any deviations from the quality control specifications	1	2	-	-
	PC 15. report deviations from specifications to appropriate personnel (supervisor, quality control department) as per SOPs	1	2	-	-
	PC 16. investigate potential causes (e.g., laser power fluctuations, cleaning issues) for identified minor quality issues (within acceptable limits but approaching the threshold)	2	3	-	1
	PC 17. consult with relevant personnel (e.g., laser maintenance technician) to determine corrective actions	1	2	-	-
	PC 18. implement corrective actions (e.g., adjusting laser parameters, cleaning the marking system) following approved procedures	1	2	-	1
	PC 19. re-inspect the affected wafers to verify the effectiveness of the corrective actions	1	2	-	-
	PC 20. document the corrective actions taken and the results of the re-inspection	1	2	-	-
	PC 21. analyze historical quality control data to identify patterns or recurring issues with marking quality	1	2	-	-
	PC 22. research and investigate potential improvements to the laser marking process (e.g., optimizing laser parameters, implementing new cleaning techniques)	1	2	-	1
	PC 23. develop and document recommendations for process improvements with supporting data or justifications	1	2	-	-
	PC24. present recommendations to relevant personnel (supervisor, process engineering team) for consideration and potential implementation	1	2	-	-
	<b>Total Marks</b>	<b>30</b>	<b>60</b>	<b>-</b>	<b>10</b>
	<i>Capture Job Details &amp; Inspection Results</i>	<i>14</i>	<i>30</i>	<i>-</i>	<i>5</i>
<b>TEL/N7211: Document Laser Marking Process</b>	PC 1. record laser marking parameters (pulse width, repetition rate, power level, scan speed) for each job	2	4	-	1
	PC 2. document any changes made to settings during the marking process	1	3	-	-
	PC 3. utilize designated forms or electronic systems to store laser marking parameter data	2	4	-	1
	PC 4. record observations on clarity, depth, and uniformity of each inspected wafer	2	6	-	1

	PC 5. detect and record the nature and location of defects for rejected wafers	3	6	-	1
	PC 6. use designated forms or electronic systems to document inspection data	2	3	-	-
	PC 7. create reports for rejected wafers, specifying the defect and corrective actions taken (if applicable)	2	4	-	1
	<i>Track Machine Performance &amp; Maintain Records</i>	<i>16</i>	<i>30</i>	<i>-</i>	<i>5</i>
	PC 8. track uptime, cycle time, and throughput of the laser marking machine	2	4	-	1
	PC 9. record the start/end times and reasons for machine stoppages	2	5	-	-
	PC 10. identify trends or issues affecting the machine's performance	3	5	-	1
	PC 11. create reports summarizing machine performance, downtime events, and potential areas for improvement	1	4	-	-
	PC 12. adhere to established procedures for maintaining logbooks related to the laser marking process	2	3	-	1
	PC 13. document date, time, operator, job details, and any observations made during the laser marking process	2	3	-	-
	PC 14. use standardized abbreviations and terminology as defined in the SOPs for clear and concise logbook entries	2	3	-	1
	PC 15. regularly review and archive logbooks according to established procedures	2	3	-	1
	<b>Total Marks</b>	<b>30</b>	<b>60</b>	<b>-</b>	<b>10</b>
<b>DGT/VSQ/N0102: Employability Skills</b>	<i>Introduction to Employability Skills</i>	<i>1</i>	<i>1</i>	<i>-</i>	<i>-</i>
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	<i>Constitutional values – Citizenship</i>	<i>1</i>	<i>1</i>	<i>-</i>	<i>-</i>
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-	-

<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	1	2	-	-
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	1	2	-	-
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	3	4	-	-
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-
<i>Entrepreneurship</i>	2	3	-	-
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-

	<i>Customer Service</i>	<i>1</i>	<i>2</i>	-	-
	PC26. identify different types of customers	-	-	-	-
	PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
	PC28. follow appropriate hygiene and grooming standards	-	-	-	-
	<i>Getting ready for apprenticeship &amp; Jobs</i>	<i>2</i>	<i>3</i>	-	-
	PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
	PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
	PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
	PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
	PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
	<b>Total Marks</b>	<b>20</b>	<b>30</b>	-	-
	<b>Grand Total</b>	<b>160</b>	<b>250</b>	-	<b>40</b>

## Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

### 1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email.
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC.
- The 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 1 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 is for the unskilled & semi- skilled individuals, and level 4 and above are for the skilled, supervisor & higher management.
- An assessor must be ToA certified & the trainer must be ToT Certified.
- The 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.
- Center 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:

- A surprise visit to the assessment location.
- A 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.

### Annexure: Acronym and Glossary

#### Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

#### Glossary

Term	Description
<b>National Occupational Standards (NOS)</b>	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
<b>Qualification</b>	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
<b>Qualification File</b>	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
<b>Sector</b>	A grouping of professional activities on the basis of their main economic function, product, service or technology.
<b>Long Term Training</b>	Long-term skilling means any vocational training program undertaken for a year and above. <a href="https://ncvet.gov.in/sites/default/files/NCVET.pdf">https://ncvet.gov.in/sites/default/files/NCVET.pdf</a>