



QUALIFICATION FILE

Refractory Technician

☒ 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: 4

Submitted By:

Indian Iron and Steel Sector Skill Council (IISSSC)

Karigari Bhawan, 5th Floor,

Room No-509, Plot No-B/7,

Action Area-III, New Town,

Rajarhat, Kolkata-700160

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Section 1: Basic Details

1.	Qualification Name	Refractory Technician																						
2.	Sector/s	Iron and Steel																						
3.	Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)	Qualification Name of existing/previous version: Refractory Technician/ v1.0																					
4.	a. OEM Name b. Qualification Name (Wherever applicable)																							
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-04-IS-04236-2025-V1-IISSSC	6. NCrF/NSQF Level: 4																					
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other) (Wherever applicable specify multiple entry/exits also & provide details in annexure)	Certificate																						
8.	Brief Description of the Qualification	The individual in this role performs various activities and processes related to production of refractory by following organizational specified procedures and standards.																						
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <table border="1"> <thead> <tr> <th>S. No.</th> <th>Academic/Skill Qualification (with Specialization - if applicable)</th> <th>Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12th Grade Pass</td> <td></td> </tr> <tr> <td>2</td> <td>11th Grade Pass</td> <td>1.5 years experience in relevant field</td> </tr> <tr> <td>3</td> <td>10th grade pass with two years of NTC / NAC in Fitter, Machinist, Foundry</td> <td></td> </tr> <tr> <td>4</td> <td>10th Grade Pass or equivalent</td> <td>3 years experience in relevant field</td> </tr> <tr> <td>5</td> <td>9th grade pass</td> <td>4.5 years experience in relevant field</td> </tr> <tr> <td>6</td> <td>8th Grade Pass with 2-year NTC plus 1-Year NAC plus 1-Year CITS</td> <td></td> </tr> </tbody> </table> b. Age: 18 years		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	12th Grade Pass		2	11th Grade Pass	1.5 years experience in relevant field	3	10th grade pass with two years of NTC / NAC in Fitter, Machinist, Foundry		4	10th Grade Pass or equivalent	3 years experience in relevant field	5	9th grade pass	4.5 years experience in relevant field	6	8th Grade Pass with 2-year NTC plus 1-Year NAC plus 1-Year CITS	
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6	8th Grade Pass with 2-year NTC plus 1-Year NAC plus 1-Year CITS																							
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	15	11. Common Cost Norm Category (I/II/III) (wherever applicable): I																					

12.	Any Licensing requirements for Undertaking Training on This Qualification <i>(wherever applicable)</i>	NA																						
13.	Training Duration by Modes of Training Delivery <i>(Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</i>	☒ Offline ☐ Online ☐ Blended <table border="1"> <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>147:00</td> <td>243:00</td> <td>60:00</td> <td></td> <td>450</td> </tr> <tr> <td>Online</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <i>(Refer Blended Learning Annexure for details)</i>					Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	147:00	243:00	60:00		450	Online					
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Classroom (offline)	147:00	243:00	60:00		450																			
Online																								
14.	Aligned to NCO/ISCO Codes <i>(if no code is available mention the same)</i>	NCO-2015/7112.0300																						
15.	Progression path after attaining the qualification <i>(Please show Professional and Academic progression)</i>	Refractory making Supervisor Level - 5																						
16.	Other Indian languages in which the Qualification & Model Curriculum are being submitted	Hindi																						
17.	Is similar Qualification(s) available on NQR-if yes, justification for this qualification	☐ Yes ☒ No URLs of similar Qualifications:																						
18.	Is the Job Role Amenable to Persons with Disability	☐ Yes ☒ No If "Yes", specify applicable type of Disability:																						
19.	How Participation of Women will be Encouraged	No gender sensitization																						
20.	Are Greening/ Environment Sustainability Aspects Covered <i>(Specify the NOS/Module which covers it)</i>	☐ Yes ☒ No																						
21.	Is Qualification Suitable to be Offered in Schools/Colleges	Schools ☒ Yes ☐ No Colleges ☒ Yes ☐ No																						
22.	Name and Contact Details of Submitting / Awarding Body SPOC <i>(In case of CS or MS, provide details of both Lead AB & Supporting ABs)</i>	Name: Mr. Sushim Banerjee Email: ceo@iisscc.org/ sushim_banerjee@yahoo.com Contact No.: 033-23247559 Website: https://www.iisscc.org/																						
23.	Final Approval Date by NSQC: 08.05.2025	24. Validity Duration: 3 Years			25. Next Review Date: 08.05.2028																			

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/NSQF 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.	Use basic health and safety practices at the workplace	ISC/N0008, v2.0	Non-Core	2	2	25	35	00		60	45	105	00	00	150	10
2.	Prepare for refractory production	ISC/N1208, v1.0	Core	4	2	20	40	00		60	30	50	00	20	100	15
3.	Perform production of refractory	ISC/N1209, v1.0	Core	4	5	60	90	00		150	30	50	00	20	100	40
4.	Perform testing of refractory	ISC/N1210, v1.0	Core	4	3	30	60	00		90	30	50	00	20	100	25
5.	Employability Skills (30 Hours)	DGT/VSQ/N0101	Non-core	4	1	12	18	00		30	20	30	00	00	50	10
6.	OJT		Core	4	2			60		60						
Duration (in Hours) / Total Marks					15	147	243	60		450	155	285	00	60	500	100

Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/NSQF 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.																
Duration (in Hours) / Total Marks																

Optional NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/NSQF 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.																
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.	Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma (In relevant field) with 5 years of industry and 1 year of training experience in Refractory making Or B.Tech (In relevant field) with 3 years of industry and 1 year of training experience in Refractory making
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 6 years of industry and 2 years of training experience in Refractory making
3.	Tools and Equipment Required for Training	☐ Yes ☐ No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma (In relevant field) with 5 years of industry and 1 year of assessment experience in Refractory making Or
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		B.Tech (In relevant field) with 3 years of industry and 1 year of assessment experience in Refractory making
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 5 years of industry and 2 years of assessment experience in Refractory making
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 7 years of industry and 2 years of assessment experience in Refractory making
4.	Assessment Mode (Specify the assessment mode)	Offline
5.	Tools and Equipment Required for Assessment	☒ Same as for training ☐ Yes ☐ No (details to be provided in Annexure-if it is different for Assessment)

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	Latest Skill Gap Study (not older than 2 years) (Yes/No): Yes
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes
3.	Government /Industry initiatives/ requirement (Yes/No): Yes
4.	Number of Industry validation provided: 20
5.	Estimated nos. of persons to be trained and employed: 500
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: In progress If "No", why:

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	Annexure: NCrf/NSQF level justification based on NCrf level/NSQF descriptors (Mandatory)	Attached
2.	Annexure: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Attached
3.	Annexure: Detailed Assessment Criteria (Mandatory)	Attached
4.	Annexure: Assessment Strategy (Mandatory)	Attached

5.	Annexure: Blended Learning (Mandatory, in case selected Mode of delivery is "Blended Learning")	NA
6.	Annexure: Multiple Entry-Exit Details (Mandatory, in case qualification has multiple Entry-Exit)	Filled
7.	Annexure: Acronym and Glossary (Optional)	
8.	Supporting Document: Model Curriculum (Mandatory – Public view)	Attached
9.	Supporting Document: Career Progression (Mandatory - Public view)	Attached
10.	Supporting Document: Occupational Map (Mandatory)	Attached
11.	Supporting Document: Assessment SOP (Mandatory)	Attached
12.	Any other document you wish to submit:	

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
Professional Theoretical Knowledge/Process	Performs various activities and processes related to production of refractory by following organizational specified procedures and standards	Person may carry out a job which may require limited range of activities routine and predictable. This level 4	4
Professional and Technical Skills/ Expertise/ Professional Knowledge	- Raw material required - Machines and equipment required - Refractory production process - Use of machines and equipment - Parameter setting of machines - Testing of refractory	Basic facts, process and principle applied in trade of employment and hence is level 4.	4
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Attaching utmost importance to safety and housekeeping, maintenance and operations of refractory making unit	Demonstrate practical skill, routine and repetitive in narrow range of application and Hence this is level 4	4
Broad Learning Outcomes/Core Skill	Reading and writing; addition, subtraction; hygiene and environment.	Communication written and oral, with minimum required clarity, skill of basic arithmetic and algebraic principles. Hence this is level 4	4
Responsibility	Responsible for completing the repetitive assigned task, working under guidance of supervisor/senior technician	Under close supervision. Some responsibility for own work within defined limit and hence level 4	4

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Drawing tools: tools, drawing board, paper size, drafter, instrument box, pencil	As per requirement	5 Set
2	Sample refractory design, blue print	As per requirement	1 Set
3	Raw material: fireclay/bauxite/silica/lime/chromite	As per requirement	As per requirement
4	Binders (clay or cement)	As per requirement	As per requirement
5	Shaft kiln/rotary kiln	As per requirement	1
6	Sorters and screeners	As per requirement	1
7	Grinder/crusher	As per requirement	1
8	Conveyor system	As per requirement	1
9	Mixer blenders	As per requirement	1
10	Drying ovens/kilns	As per requirement	1
11	Hydraulic press	As per requirement	1
12	Electric furnace	As per requirement	1
13	Air coolers/cooling chambers	As per requirement	1
14	Thermal conductivity testers	As per requirement	5
15	Compression testing machines	As per requirement	5
16	Microscope	As per requirement	5
17	X-ray Diffraction (XRD)	As per requirement	5
18	PPE	As per requirement	30 Sets

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Whiteboard
2. Projector
3. Computer/Laptop
4. Chairs
5. Tables
6. Whiteboard marker

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)
1	ArcelorMittal Nippon Steel India Ltd.	Mr. Prakash Hegde	DGM	27 th km, Surat-Hazira Rd., Hazira, Surat 394270, Gujarat	9909901396	Prakash.hegde@amns.in	
2	IPS Contractors & Labour Suppliers	Mr. Tosif Shaikh	IPS Contractors	Pithampur Disst. Dhar (MP) 454775	9907590590	hr.ipscontractors@gmail.com	
3	Tata Steel Mining Ltd.	Mr. Ajay Kumar Singh	AGM-HR	Bhubaneswar, Odisha - 751015	9234511004	a.singh@tatasteelmining.com	
4	Tata Steel Ltd	Mr. Padmapal	Chief of Blast Furnaces	Mumbai	9234567561	Padma.pal@tatasteel.com	
5	Rourkela Steel Plant	Mr. H. Pati	GM	Rourkela - 769011	8895500593		
6	Super Pannel Pvt Ltd.	Mr. Ankit Kumar	Director	Mohan Nagar, Ghaziabad	9899991388	Director.superpanel@hotmail.com	
7	Tenacious Services Pvt Ltd.	Mr. Pankaj Kumar	VP	Najafgarh, New Delhi-110043	7763856257	Pankaj.kumar@tenacious.co.in	
8	Shri Om Automotive Products	Mr. Abhinav Jain	Managing Partner	Hissar Road, Rohtak-124001, Haryana	9729711099		
9	Sun Bright Manpower Solution Pvt Ltd.	Mr. Arun Kumar	Supervisor	Kolar Taluk Dist. 563133	7338463588	bangalore@sunbrightgroup.com	
10	Manpower Group Service India Pvt Ltd.	Mr. Durgesh Bhagariya	Head Branch Operation	Jasola, New Delhi-110025	9824054165	Durgesh.b@manpower.co.in	
11	Gauri Shankar Enterprises	Mr. Puneet Goyal	Prop.	Jalandhar, Punjab	9888288898		
12	SK Sales Company	Mr. Mohit Sood	Director	Jalandhar, Punjab	9872307801	sksalescompany@gmail.com	
13	S.S. Industries	Mr. Aikagra Aggarwal	Prop.	Jalandhar, Punjab	8054961300	aikagraaggarwal@yahoo.com	
14	Noble Products	Mr. R. P. Singh	Prop.	Jalandhar, Punjab	8532000039	39noblepro@gmail.com	
15	Surya Consultancy & Solutions	Mr. V. Ravi Kumar	Owner	Govindappa Building, Narasapura, Kolar - 563133	7338463588	Suryaconsultancy.solution@gmail.com	
16	Texmo Industries	Mr. C Manimaran	Asst. Mgr	Coimbatore - 641029	6610300	trm@texmo.net	

17	N. V. Enterprises	Mr. Amresh Kumar Tyagi	Owner	Thiruppathi, Valley, Hosur (TN) 635109	9944799610	Nthyagi2010@gmail.com	
18	TDS Placements & Services Pvt Ltd.	Mr. Joy Mitra	Manager	Chandigarh	8010154000	operation@tdsjob.com	
19	Race Cable Pvt Ltd.	Mr. Daleep Pandey	HR Head	Bhiwari, Rajasthan	9958477470	racecable@gmail.com	
20	Himanshu Projects Pvt. Ltd.	Mr. Rinku Kumar	Project Head	Ghaziabad, U.P.	9027740959	Hppt2007@gmail.com	

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
2023-24	500	350	200	140	50	35
2024-25	1000	700	400	280	100	70
2025-26	1500	1050	600	420	150	105

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:

- 1.
- 2.

Content availability for previous versions of qualifications:

☐ Participant Handbook ☐ Facilitator Guide ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available:

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

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	☒ Theory/ Lectures - Imparting theoretical and conceptual knowledge	• Books/ e-books • Presentations • Reference Material • Audio / Video Modules	40:60
2	☒ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	• Self-Learning Videos • Broadcasts • Mobile Learning • Curated Digital content	40:60
3	☒ Showing Practical Demonstrations to the learners	• Video Content • E-Resource library • AR/ VR/ XR	40:60
4	☒ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	• Training tools (tools list attached) • Video Play • Presentations	40:60
5	☒ Tutorials/ Assignments/ Drill/ Practice	• Online Question Bank • Mobile Quick test app • MCQ based tests	40:60
6	☒ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	• Assessment engine for Essays • Up-loadable file examinations • Mock test sessions	40:60
7	☒ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	• Online tests • Offline assessments	40:60

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
ISC/N0008: Use basic health and safety practices at the workplace	<i>Health and safety</i>	5	5	-	-
	PC1. Use protective clothing/equipment for specific tasks and work conditions Protective clothing includes: Leather or asbestos gloves Flame proof aprons Flame proof overalls buttoned to neck Cuff less (without folds) trousers Reinforced footwear Helmets/hard hats Cap and shoulder covers Ear defenders/plugs Safety boots Knee pads Particle masks Glasses/gloves/visors Equipment includes: Hand shields Machine guards Residual current devices Shields Dust sheets Respirator	5	5	-	-
	<i>Health and safety procedures</i>	15	40	-	-
	PC2. State the name and location of people responsible for health and safety in the workplace Various areas are listed below: On chemical containers Equipment Packages Inside buildings Open areas and public spaces, etc.	-	4	-	-
	PC3. State the names and location of documents that refer to health and safety in the workplace	-	1	-	-
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace Hazards include: Working with electrical and thermal tools and equipment Sharp edged and heavy tools Heated metals Oxyfuel and gas cylinders Welding radiation Surfaces: sharp, slippery, uneven, chipped, broken, etc. Substances: chemicals, gas, oxy-fuel, fumes, dust, etc. Physical: working at heights, large and heavy objects and machines, sharp and piercing objects, tools and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc. Electrical: power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.	5	5	-	-
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role Safe working practices include: Using protective clothing and equipment Putting up and reading safety signs Handle tools in the correct manner and store and maintain them properly Keep work area clear of clutter, spillage and unsafe object lying casually				

	While working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc. Safe lifting and carrying practices Use equipment that is working properly and is well maintained Take due measures for safety while working in confined places, trenches or at heights, etc. Including safety harness, fall arrestors, etc. Methods are: Training in health and safety procedures Using health and safety procedures Use of equipment and working practices (such as safe carrying procedures) Safety notices, advice Instruction from colleagues and supervisors	5	5	-	-
PC6.	State location of general health and safety equipment in the workplace	-	5	-	-
PC7.	Inspect for faults, set up and safely use steps and ladders in general use Faults : Corrosion of metal components Deterioration Splits and cracks timber components Imbalance Loose rungs Nuts or bolts, etc. Set up: Firm/level base Clip/lash down Leaning at the correct angle, etc.	-	5	-	-
PC8.	Work safely in and around trenches, elevated places and confined areas	-	4	-	-
PC9.	Lift heavy objects safely using correct procedures	-	4	-	-
PC10.	Apply good housekeeping practices at all times. Good housekeeping practices: Clean/tidy work areas Removal/disposal of waste products Protect surfaces	-	1	-	-
PC11.	Identify common hazard signs displayed in various areas	5	1	-	-
PC12.	Retrieve and/or point out documents that refer to health and safety in the workplace	-	5	-	-
	<i>Fire safety procedures</i>	10	15	-	-
PC13.	Use the various appropriate fire extinguishers on different types of fires correctly. Fire extinguishers: Sand Water Foam Co2 Dry powder Fires: Class A: Ordinary solid combustibles, e.g. wood, paper, cloth, plastic, charcoal etc. Class B: Flammable liquids and gases, e.g. gasoline, propane, diesel fuel, tar, cooking oil and similar substances Class C: Electrical equipment e.g. appliances, wiring, breaker panels etc.(these categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity) Class D: Combustible metals such as magnesium, titanium, and sodium(these fires burn at extremely high temperatures and require special suppression agents) Causes of fires: Heating of metal Spontaneous ignition Sparking,	5	5	-	-

	Electrical heating Loose fires (e.g. Smoking, welding, etc.) Chemical fires, etc.				
PC14.	Demonstrate rescue techniques applied during fire hazard	5	5	-	-
PC15.	Demonstrate good housekeeping in order to prevent fire hazards	-	1	-	-
PC16.	Demonstrate the correct use of a fire extinguisher	-	4	-	-
	<i>Emergencies, rescue and first-aid procedures</i>	15	45	-	-
PC17.	Demonstrate how to free a person from electrocution	-	5	-	-
PC18.	Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.	5	5	-	-
PC19.	Demonstrate basic techniques of bandaging	-	5	-	-
PC20.	Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments. few General health and safety equipment are mentioned below : Fire extinguishers First aid equipment Safety instruments and clothing Safety installations, e.g. Fire exits, exhaust fans etc.	5	5	-	-
PC21.	Perform and organize loss minimization or rescue activity during an accident in real or simulated environments	-	5	-	-
PC22.	Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases	-	5	-	-
PC23.	Demonstrate the artificial respiration and the CPR Process	-	5	-	-
PC24.	Participate in emergency procedures. Emergency procedures are: Raising alarm Safe/efficient evacuation Correct means of escape Correct assembly point Roll call Correct return to work	-	4	-	-
PC25.	Complete a written accident/incident report or dictate a report to another person, and send report to person responsible Incident Report should capture: Name Date/time of incident Date/time of report, Location Environment conditions Persons involved Sequence of events Injuries sustained Damage sustained Actions taken Witnesses Supervisor/manager notified Documents: Fire notices Accident reports Safety instructions for equipment and procedures Company notices and documents Legal documents (e.g. Government notices)Job titles: ISC/N0008: Use basic health and safety practices at the workplace Health and safety officer First aid officer Fire officer	5	5	-	-

	PC26. Demonstrate correct method to move injured people and others during an emergency	-	1	-	-
	Total Marks	45	105	-	-
ISC/N1208: Prepare for refractory production	<i>Identify work requirements</i>	9	12	-	5
	PC1. obtain the information, process parameters, refractory design and instructions from supervisor about the production	3	4	-	2
	PC2. read and interpret the drawing/work instructions/SOPs and plan the production activities based on it	3	4	-	1
	PC3. interpret information from sections, views and scale of measurement used in drawing of the machine	3	4	-	2
	<i>Prepare for production activities</i>	21	38	-	15
	PC4. select and arrange the right tools, equipment, and raw material as per the SOP and job requirements	6	5	-	3
	PC5. ensure that required quantity of raw material is available as per the production plan and job requirements	2	5	-	2
	PC6. test the raw material for purity and quality to ensure they meet the specifications needed for the final product	3	7	-	3
	PC7. ensure that the weight of aggregates, powders, additives and binders according to the proportion of the formula	2	5	-	2
	PC8. prepare the production line for production process	3	7	-	2
	PC9. ensure that all machines and equipment are working properly before starting the production process	3	6	-	2
	PC10. adhere to all safety norms (such as wearing protective gloves and shoes, etc.) in accordance with the international/ national and organisational standards	2	3	-	1
	Total Marks	30	50	-	20
	<i>Perform production process of refractory brick</i>	30	50	-	20
ISC/N1209: Perform production of refractory	PC1. firstly, perform calcination process by passing the refractory raw materials through shaft kiln/rotary kiln for removal of chemically bound (crystalline) water, to the volatilization of contaminants from a source material, thermal decomposition, and even phase changes	2	3	-	1
	PC2. maintain the temperature of the shaft kiln/rotary kiln as per the type of raw material used	1	1	-	-
	PC3. sort and screen the calcined raw materials by using sorters and screeners (Stationary, Vibratory, Rotary etc.)	1	2	-	1
	PC4. feed the calcined and sorted raw materials into grinder/crusher through conveyor system for sorting, crushing, fine grinding and screening the raw materials into fine powders or granules with a certain particle size composition for ingredients	2	4	-	2
	PC5. after grinding, prepare billets by performing batching, mixing, trapping and other processes, so that the ingredients are matched according to the	2	4	-	2

	weight of various materials and the proper proportion of the particle composition				
PC6.	set the mixers and their parameters as per the SOP	1	1	-	-
PC7.	fill the powdered raw material, additives, such as binders or fluxes etc. in mixers for mixing and kneading the material properly and enhancing its performance characteristics like strength, thermal stability, and workability	2	4	-	1
PC8.	ensure that the weight of aggregates, powders, additives and binders according to the proportion of the formula	1	1	-	-
PC9.	send the mixed material for forming process by using conveyors	1	1	-	1
PC10.	use appropriate forming techniques like pressing, casting, extrusion etc. to shape the mixed material into desired form	3	5	-	2
PC11.	monitor the forming process and maintain the process properties during the process	1	2	-	1
PC12.	perform drying process by using ovens or air-dried method depending on the material and product type to remove moisture from the formed material	2	3	-	1
PC13.	perform firing process by sending the dried products into a kiln, which is fired at high temperatures (typically between 1,200°C to 1,600°C or higher). This process leads to sintering, where particles bond together, enhancing the material's strength and thermal resistance	2	4	-	2
PC14.	carefully control the firing schedule and kiln temperature as specified in SOP to achieve the desired properties, including density and porosity.	1	2	-	1
PC15.	inspect the formed refractory bricks for any dropping, splitting, segregation, and dimensional mismatch	2	4	-	1
PC16.	reshape the defected bricks if required	1	2	-	1
PC17.	after firing, send the refractory materials for cooling process where they are cooled gradually to prevent cracking or thermal shock	2	3	-	1
PC18.	perform finishing processes, such as grinding, cutting, or surface treatment, to achieve specific dimensions or surface characteristics	2	3	-	1
PC19.	report any issues faced (if any) during the production process to the supervisor	1	1	-	1
	Total Marks	30	50	-	20
ISC/N1210: Perform testing of refractory	<i>Perform testing of refractory brick</i>	21	35	-	15
	PC1. check the refractory bricks for any defects by following SOP	3	5	-	2
	PC2. perform non-destructive and destructive testing of refractories to test their properties	5	8	-	3
	PC3. perform various tests i.e. Microstructural Analysis under Optical Microscope, PHASE Identification by X-Ray Diffractometer, Slag Corrosion Test and Spalling Resistance testing, CREEP under Compression, Thermo-Gravimetric Analysis, Reversible thermal Expansion, Hydration Resistance Test, Permeability Test etc. by following SOP	7	12	-	6
	PC4. segregate the defective and correct refractory bricks into different bins as per organisational guidelines and procedures	2	3	-	1

	PC5. carry out labelling and packaging of refractory bricks lot as per organisational guidelines and procedures	3	5	-	2
	PC6. send the final packaged refractory bricks lot for storage as per SOP	1	2	-	1
	<i>Perform post-production activities</i>	9	15	-	5
	PC7. clean and store all the tools and equipment after completion of work	2	3	-	1
	PC8. clean the work area after completion of work	2	3	-	1
	PC9. remove the tools and equipment being from the work site before handing over	1	2	-	1
	PC10. dispose waste material into the disposal area in accordance with the company's policies and environmental regulations	1	2	-	-
	PC11. inform supervisor and concerned person regarding the job completion	1	2	-	1
	PC12. update and maintain the log book with details of production output, material usage, lot number, batch number etc. to facilitate the traceability	2	3	-	1
	Total Marks	30	50	-	-
	<i>Introduction to Employability Skills</i>	1	1	-	-
DGT/VSQ/N0101 - Employability Skills (30 hours)	PC1. understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
	<i>Constitutional values – Citizenship</i>	1	1	-	-
	PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
	<i>Becoming a Professional in the 21st Century</i>	1	3	-	-
	PC3. explain 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	-	-
	PC4. speak with others using some basic English phrases or sentences	-	-	-	-
	<i>Communication Skills</i>	1	1	-	-
	PC5. follow good manners while communicating with others	-	-	-	-
	PC6. work collaboratively with others in a team	-	-	-	-
	<i>Diversity & Inclusion</i>	1	1	-	-
	PC7. communicate and behave appropriately with all genders and PwD	-	-	-	-
	PC8. report any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
	<i>Financial and Legal Literacy</i>	3	4	-	-
	PC9. use various financial products and services safely and securely	-	-	-	-
	PC10. calculate income, expenses, savings etc.	-	-	-	-
	PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
	<i>Essential Digital Skills</i>	4	6	-	-

PC12. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC13. use internet and social media platforms securely and safely	-	-	-	-
<i>Entrepreneurship</i>	3	5	-	-
PC14. identify and assess opportunities for potential business	-	-	-	-
PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-
<i>Customer Service</i>	2	2	-	-
PC16. identify different types of customers	-	-	-	-
PC17. identify customer needs and address them appropriately	-	-	-	-
PC18. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	1	3	-	-
PC19. create a basic biodata	-	-	-	-
PC20. search for suitable jobs and apply	-	-	-	-
PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
Total Marks	20	30	-	-
Grand Total	155	285		60

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.

Mention the detailed assessment strategy in the provided template.

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.
 - EAF 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 is 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

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
National Occupational Standards (NOS)	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.
Qualification	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
Qualification File	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.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf