

Model Curriculum

Modified Atmosphere Storage Technician

SECTOR: FOOD PROCESSING
**SUB-SECTOR: FRUIT & VEGETABLE, DAIRY PRODUCTS,
MEAT & POULTRY, FISH & SEAFOOD**
OCCUPATION: REFRIGERATION
REF ID: FIC/Q7003, V1.0
NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FOOD INDUSTRY CAPACITY AND SKILL INITIATIVE (FICSI)

for the

MODEL CURRICULUM

Complying to National Occupational Standards of

Job Role/ Qualification Pack: **Modified Atmosphere Storage Technician** QP No. **FIC/Q7003, NSQF Level 4**

Date of Issuance: 04 September, 2018

Valid up to: 30 June, 2019

* Valid up to the next review date of the Qualification Pack



Authorized Signatory
(Food Industry Capacity and Skill Initiative)

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Modified Atmosphere Storage Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Modified Atmosphere Storage Technician”, in the “Food Processing” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Modified Atmosphere Storage Technician		
Qualification Pack Name & Reference ID. ID	FIC/Q7003, v1.0		
Version No.	1.0	Version Update Date	04/09/2018
Pre-requisites to Training	Preferably Class 12/Certification in refrigeration and modified atmosphere storage and 2-3 years' experience in cold storage / modified atmosphere storage unit		
Training Outcomes	After completing this program, participants will be able to: <ul style="list-style-type: none"> • prepare and maintain work area and process machineries for storing in modified atmosphere, • store agricultural produce in modified atmosphere, • document and maintain records related to modified atmosphere storage, • apply food safety, hygiene and sanitation standards related to modified atmosphere storage. 		

Sr. No.	Module	Key Learning Outcomes	Equipment Required
6.	Food Safety, Hygiene and Sanitation for Storage Theory Duration (hh:mm) 15:00 Practical Duration (hh:mm) 35:00 Corresponding NOS Code FIC/N9003	<ul style="list-style-type: none"> State the importance of safety, hygiene and sanitation in the storage industry Apply personal hygiene practices by using of gloves, hairnet, mask, ear plug, goggles, shoes etc. Inspect raw material, ingredients and finished products to ensure safe food Apply GMP, GHP, HACCP and product recall practices List the various types of hazards Role play of hazard management techniques Analyze the quality of produce by smell, appearance, taste and take measures to prevent spoilage Demonstrate stock rotation based on FEFO/FIFO 	Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Covers, Sanitizer, Food Safety Manual ,Log Books etc.
7.	Professional and Core Skills Theory Duration (hh:mm) 04:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code Bridge Module	<ul style="list-style-type: none"> Undertake a self-assessment test to identify personal strengths and weaknesses Plan and schedule the work order and manage time effectively to complete the tasks assigned State the importance of decision making Identify potential problems and make sound and timely decision State the importance of listening 	
8.	IT Orientation Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 20:00 Corresponding NOS Code FIC/N7009	<ul style="list-style-type: none"> Identify parts of the computer Use the computer keyboard effectively to type Use ERP effectively to record day-to-day activities Use the word processor effectively Use the spreadsheet application effectively Use the computer to document day-to-day activities 	Computer/Laptop

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Total Duration 240:00 Theory Duration 84:00 Practical Duration 156:00	Unique Equipment Required: Refrigeration System, Converters, Scrubbers, Modified Atmosphere Generators, Exchanger-Diffusers, Analyzers, Thermostat, Humidity Meter, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual Food Safety Manual, Log Books, Computer/Laptop	

Grand Total Course Duration: **240Hours, 0 Minutes**

Recommend OJT Hours: **60Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by SSC: Food Industry Capacity and Skill Initiative)

Trainer Prerequisites for Job role: “Modified Atmosphere Storage Technician” mapped to Qualification Pack: “FIC/Q7003, v1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “FIC/Q7003”, Version 1.0
2	Personal Attributes	An aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned fields.
3	Minimum Educational Qualifications	<ul style="list-style-type: none"> Diploma/ITI in Refrigeration & Air-Conditioning with 3-4 years of hands on experience in a Cold Storage/Controlled Atmosphere Unit or B.Sc./B. Tech/BE in Agricultural Engineering/Refrigeration & Air-Conditioning or Food Process Engineering with 2-3 years of hands on experience in a Cold Storage/Controlled Atmosphere Unit or M.Sc./M. Tech./ME or PG Diploma in Agricultural Engineering/Refrigeration & Air Conditioning or Food Process Engineering with 1-2 years of hand on experience in a Cold Storage/Controlled Atmosphere Unit.
4a	Domain Certification	Certified for Job Role: “Modified atmosphere storage technician” mapped to QP: “FIC/Q7003 v1.0”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted score is 80 % as per FICSI guidelines.
5	Experience	<ul style="list-style-type: none"> Diploma/ITI in Refrigeration & Air-Conditioning with 3-4 years of hands on experience in a Cold Storage/Controlled Atmosphere Unit Or B.Sc./B. Tech/BE in Agricultural Engineering/Refrigeration & Air-Conditioning or Food Process Engineering with 2-3 years of hands on experience in a Cold Storage/Controlled Atmosphere Unit or M.Sc./M. Tech/ME or PG Diploma in Agricultural Engineering/Refrigeration & Air Conditioning or Food Process Engineering with 1-2 years of hand on experience in a Cold Storage/Controlled Atmosphere Unit.

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES	
Job Role	Modified Atmosphere Storage Technician
Qualification Pack	FIC/Q7003
Sector Skill Council	Food Processing

Guidelines for Assessment

- Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
- The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
 - Assessment will be conducted for all compulsory NOS, as well as the selected elective NOS/set of NOS.
- OR
- Assessment will be conducted for all compulsory NOS, as well as the selected optional NOS/set of NOS.
 - Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
 - Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
 - To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
 - In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

		Marks Allocation			
		Total Marks	Out Of	Theory	Skills Practical
1. FIC/N7007: (Prepare and maintain work area and storage equipments for modified atmosphere storage)	PC.1 Clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests	100	25	10	15
	PC2. Ensure that work area is safe and hygienic for food processing		10	3	7
	PC3. Dispose waste materials as per organisation standards and industry requirements		15	5	10
	PC4. Check the working and performance of all equipments used in storage facility such as refrigeration system, converters, scrubbers, modified atmosphere generators, exchangerdiffusers, analyzers, thermostat, humidity meter, etc.		15	5	10
	PC5. Clean the equipments used with recommended sanitizers following specifications and organisation standards		15	5	10
	PC6. Attend minor repairs/faults of all equipments, if required		5	2	3
	PC7. Set the equipments required		15	5	10
			100	35	65
2. FIC/N7008: (Store agricultural produce in modified atmosphere storage)	PC1. Read and understand the production order from the supervisor	100	2	1	1
	PC2. Check all the features of the storage facility		2	0.5	1.5
	PC3. Check the operation of the cooling equipment and ensure readiness		2	0.5	1.5
	PC4. Check the calibration of the equipments in the storage facility		3	1	2
	PC5. Check the temperature, air tightness and atmosphere levels		3	1	2
	PC6. Check the control parameters (like temperature, pressure, humidity etc)		3	1	2
	PC7. Report any malfunction to the supervisor		2	1	1
	PC8. Understand the suggested solutions and implement it immediately		2	1	1
	PC9. Arrange the produce to be loaded in the order of species, variety, geographical location/grown area, etc.		2	0.5	1.5
	PC10. Check the quantity of each produce		2	0.5	1.5
	PC11. Check the quality of the produce to be stored by checking the physical		2	1	1

	parameters like appearance, colour, maturity, ripeness, etc .				
	PC12.Check the packaging of produce by inspecting the packing materials, packaging conditions, labeling, label /tag details, etc.		2	1	1
	PC13.Check the storage parameters chart for storage requirements and control parameters		1	0.5	0.5
	PC14.Determine the storage requirements like temperature range, atmosphere, storage time at given temperatures, etc.		2	0.5	1.5
	PC15.Check the atmosphere gases (oxygen and carbon-di-oxide level) and temperature		3	1	2
	PC16.Start, set and check the equipments in modified atmosphere storage for parameters required for the produce		3	1	2
	PC17.Ensure the working and performance of all equipment in the storage facility		3	1	2
	PC18.Open the facility door, load the produce by stacking as per organisation standards, and close the airtight door		2	0.5	1.5
	PC19.Set the modified atmosphere storage facility settings as per specifications		3	1	2
	PC20.Cool the produce by setting the refrigeration system for suitable temperature as per specifications		2	0.5	1.5
	PC21.Maintain the temperature of the produce		2	0.5	1.5
	PC22.Monitor and maintain the temperature and record the temperature readings as per organisation standards		2	0.5	1.5
	PC23.Check the storage parameters chart for control parameters range for each type of produce		3	2	1
	PC24.Set the equipments for modified atmosphere storage parameters (by controlling gas levels such as oxygen, carbon-dioxide) for the produce as per specifications and standards of the organisation		10	3	7
	PC25.Check and ensure the required atmosphere (required oxygen and carbon-di-oxide level)has been achieved		5	2	3
	PC26.Maintain the modified atmosphere parameters		4	1	3
	PC27.Check the atmosphere parameters (temperature, relative humidity and		10	4	6

	gas composition) in regular intervals by reading the temperature gauge, relative humidity meter, pressure gauge, etc. As recommended by the organisation				
	PC28. Report to the supervisor in case of any deviation from standards		2	1	1
	PC29. Understand the recommended corrective action and implement immediately		4	1.5	2.5
	PC30. Record the control atmosphere parameters in the storage chart until the storage period as per organisation standards		4	1.5	2.5
	PC31. Terminate the modified atmosphere storage by opening the storage area and fanning out the excess carbon-dioxide and equilibrating oxygen content		8	2	6
			100	35	65
3. FIC/N7009: (Complete documentation and record keeping related to modified atmosphere storage)	PC1. Document and maintain records of all incoming produce to the storage facility such as type and varieties of produce, weight of produce, farmer/vendor details, grown area / geographical location, receiving date, quality parameters etc, as per organisation standards	100	10	6	4
	PC2. Document and maintain records of all outgoing produce from the storage facility such as type and varieties of produce stored, weight of produce, storage period, losses from incoming to outgoing period, quality of produce during outgoing time etc, as per company standards		5	3	2
	PC3. Maintain record on observations (if any) related to produce		5	3	2
	PC4. Load the details in ERP for future reference		5	3	2
	PC5. Verify the documents and track details in cases of concerns		10	6	4
	PC6. Document and maintain records of cold storage equipment details such as type of equipments, refrigerant type, refrigeration coil condition, performance and efficiency, cold storage parameters such as temperature, time, relative humidity for all produce as per organisation standards		15	9	6

	PC7. Maintain record on observations or deviations (if any)		10	6	4
	PC8. Load the details in ERP for future reference		5	3	2
	PC9. Verify the documents and track details in cases of concerns		5	3	2
	PC10. Document and maintain records of modified atmosphere storage details such as type and species of produce, weight of produce, temperature of produce, quality of produce stored, atmosphere gases before loading the storage facility, gases controlled, methods adopted for controlling the atmosphere, chemicals and gases used for controlling the storage atmosphere, storage period, quality and weight of produce after storage period etc as per organisation standards		10	6	4
	PC11. Maintain record on observations or deviations (if any)		10	6	4
	PC12. Load the details in ERP for future reference		5	3	2
	PC13. Verify the documents and track details in cases of concerns		5	3	2
			100	60	40
4. FIC/N9003: (Food safety, hygiene and sanitation for storage)	PC1. Comply with food safety and hygiene procedures followed in the organisation	100	5	2	3
	PC2. Ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, goggles, shoes, etc.		6	1	5
	PC3. Ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. For compliance to physical, chemical and microbiological parameters		5	2	3
	PC4. Pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations		10	4	6
	PC5. Clean, maintain and monitor food processing equipment periodically, using it only for the specified purpose		5	2	3
	PC6. Use safety equipment such as fire extinguisher, first aid kit and eyewash station when required		10	4	6
	PC7. Follow housekeeping practices by having designated area for materials/tools		5	2	3
	PC8. Follow industry standards such as		10	4	6

	GMP and HACCP and product recall process			
	PC9. Attend training on hazard management to understand types of hazards such as physical, chemical and biological hazards and measures to control and prevent them	5	1	4
	PC10. Identify, document and report problems such as rodents and pests to management	5	1	4
	PC11. Conduct workplace checklist audits before and after work to ensure safety and hygiene	5	1	4
	PC12. Document and maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system	4	1	3
	PC13. Determine the quality of produce using criteria such as smell, appearance, taste and take immediate measures to prevent spoilage	5	2	3
	PC14. Store different varieties of produce, chemicals, gases separately to prevent cross-contamination	5	2	3
	PC15. Label produce, chemicals, gases and store in designated storage areas according to safe food practices	5	2	3
	PC16. Follow stock rotation based of storage chemicals on first expiry first out (FEFO) / first in first out (FIFO)	10	4	6
		100	35	65