



Model Curriculum

QP Name: Cold Storage Technician

QP Code: FIC/Q7004

QP Version: 3.0

NSQF Level: 3

Model Curriculum Version: 3.0

Food Industry Capacity and Skill Initiative (FICSI)
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Training Parameters

Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Refrigeration
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO- 2015/7127.0100
Minimum Educational Qualification and Experience	1. Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 2. 8th grade pass with 1-year of relevant experience OR 3. 5th grade pass with 4 years of relevant experience OR 4. Ability to read and write with 5 years relevant experience OR 5. Previous relevant qualification of NSQF Level 2 with 1 years of relevant experience OR 6. Previous relevant qualification of NSQF Level 2.5 with 6 months of relevant experience
Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	18 years
Last Reviewed On	30/09/2021
Next Review Date	29/09/2024
NSQC Approval Date	30/09/2021
QP Version	3.0
Model Curriculum Creation Date	23/07/2021

Model Curriculum Valid Up to Date	29/09/2024
Model Curriculum Version	3.0
Minimum Duration of the Course	270 Hours
Maximum Duration of the Course	270 Hours

Program Overview

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

Training Outcomes

At the end of the program, the participants will be able to:

- Prepare work area for cold storage of food product.
- Handle cold storage facility.
- Perform documentation and record keeping related to cold storage.
- Demonstrate the maintenance of hygiene and sanitation related to cold storage of food product.

Compulsory Modules

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

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
FIC/N7010 Prepare and maintain work area and refrigeration requirements NOS Version No.: 1.0 NSQF Level: 4	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 1: Introduction to the Training Program and Overview of Food Processing Industry	04:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	04:00 Hours
Module 2: Prepare and maintain work area and refrigeration equipment	16:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	56:00 Hours
FIC/N7011 Handle cold storage facility for storing food NOS Version No.: 1.0 NSQF Level: 4	40:00 Hours	50:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours
Module 3: Handle cold storage facility for storing food	40:00 Hours	50:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours
FIC/N7012 Complete documentation and record keeping related to the cold storage facility NOS Version No.: 1.0 NSQF Level: 4	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 4: Complete documentation and record	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours

keeping related to the cold storage facility					
Module 5: IT Orientation	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
FIC/N9003 Food safety, hygiene and sanitation for storage NOS Version No.: 1.0 NSQF Level: 4	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Module 6: Food Safety, Hygiene and Sanitation	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
DGT/VSQ/N0101 Employability Skills NOS Version No.: 1.0 NSQF Level: 2	12:00 Hours	18:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Module 7: Employability skills	12:00 Hours	18:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Total Duration	102:00 Hours	168:00 Hours	00:00 Hours	00:00 Hours	270:00 Hours

Module Details

Module 1: Introduction to the training program and overview of food processing industry Mapped to FIC/N7010 v1.0

Terminal Outcomes:

- Discuss the roles and opportunities available for cold storage technician
- Explain food processing and its sub-sectors
- Discuss the current market and future trends of food processing sector

Duration: 04:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Define Food Processing. • List the various sub sectors of food processing industry. • Describe the roles & responsibilities of a cold storage technician • List the various units within a cold storage plant. 	
Classroom Aids:	
White board/Chart papers, marker.	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Prepare and maintain work area and refrigeration equipment

Mapped to FIC/N7010 v1.0

Terminal Outcomes:

- Discuss the tasks to be performed to prepare for cold storage.
- State the importance of maintaining tools and equipment effectively.

Duration: 16:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the materials and equipment used in the cleaning and maintenance of the work area. • State the common detergents and sanitizers used in cleaning work area and machineries • State the methods of cleaning and sanitization. • State the different types of maintenance procedures. 	<ul style="list-style-type: none"> • Demonstrate attending minor repairs and faults in process machineries. • Prepare the machines and tools required for production.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide, student handbook.	
Tools, Equipment and Other Requirements	
Compressor, Condenser, Evaporator, Fans, Sensors, Thermostat, Humidity Meter, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 3: Handle cold storage facility for storing food

Mapped to FIC/N7011 v1.0

Terminal Outcomes:

- Discuss about handling cold storage facility for storing food
- Demonstrate the standard practices followed for handling cold storage.

Duration: 40:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the various parts of the refrigeration system correctly. • Describe handling of cold storage system • Explain how to analyze the refrigerant used in the system. • List the control parameters required like the temperature range, atmosphere, storage time at a given temperature. 	<ul style="list-style-type: none"> • Carryout check if all the machineries are clean and in good working conditions. • Demonstrate the installation of refrigeration system. • Carryout a pre startup check. • Demonstrate the starting up of the refrigeration system. • Demonstrate the setting of machines according to control parameters. • Demonstrate the storing of food products. • Demonstrate the monitoring of machineries during storage. • Demonstrate the recording of parameters in storage chart until storage period. • Inspect, repair/replace refrigeration system and components. • Demonstrate how to maintain the entire system and its components.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
Compressor, Condenser, Evaporator, Fans, Sensors, Thermostat, Humidity Meter, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 4: Complete documentation and record keeping related to the cold storage facility

Mapped to FIC/N7012 v1.0

Terminal Outcomes:

- Document and maintain records related to cold storage facility.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the need for documenting and maintaining records of parameters for cold storage 	<ul style="list-style-type: none"> • Demonstrate the process of documenting records of fruits & vegetable storage plan and process parameters
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer’s guide and student handbook.	
Tools, Equipment and Other Requirements	
Food safety manual, Log Books.	

Module 5: IT Orientation

Mapped to FIC/N7012 v1.0

Terminal Outcomes:

- Demonstrate the effective use of data recording applications at the workplace.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the basic functionalities of the computer to perform day to day activities. • List the various applications used in recording information. • Describe ERP 	<ul style="list-style-type: none"> • Demonstrate the standard techniques used to operate a computer. • Show how to use an ERP software for recording information.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
NIL	

Module 6: Food Safety, Hygiene and Sanitation

Mapped to FIC/N9003 v1.0

Terminal Outcomes:

- Discuss the importance of health and safety at the workplace.
- Demonstrate the task to be performed for ensuring health and safety at the workplace.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of safety, hygiene and sanitation in the storage industry. • List the various types of hazards. • Explain GMP and GHP 	<ul style="list-style-type: none"> • 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. • Role play of hazard management techniques. • Demonstrate how to analyze the quality of produce by smell, appearance, taste and take measures to prevent spoilage. • Demonstrate stock rotation based on FEFO/FIFO.
Classroom Aids:	
Laptop, white board, marker, chart papers, projector, trainer's guide and student handbook.	
Tools, Equipment and Other Requirements	
Protective gloves, head caps, aprons, safety goggles, safety boots, mouth covers, sanitizer, food safety manual, logbooks etc.	

Module7: Employability skills

Mapped to DGT/VSQ/N0101, v 1.0

Terminal Outcomes:

- Describe the traits of individual at work place
- Demonstrate apply employability and entrepreneurship skills at work place

Duration: 12:00	Duration: 18:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the importance of Employability Skills in meeting the job requirements. • Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. • Discuss 21st century skills. • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. • Discuss the significance of reporting sexual harassment issues in time • Discuss the significance of using financial products and services safely and securely. • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws • Explain the importance of managing expenses, income, and savings. • Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely • Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges • Differentiate between types of customers 	<ul style="list-style-type: none"> • Show how to practice different environmentally sustainable practices • Use appropriate basic English sentences/phrases while speaking • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely • Create a biodata • Use various sources to search and apply for jobs

<ul style="list-style-type: none"> • Explain the significance of identifying customer needs and addressing them • Discuss the significance of maintaining hygiene and dressing appropriately • Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Discuss how to search and register for apprenticeship opportunities 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Computer/laptop.	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification <i><Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.></i>	Specialization <i><Specify the areas of specialization that are desirable.></i>	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
M.Sc/ M.Tech/ ME	Food Technology or Food Engineering	2	Food Industry	1	Training of Cold Storage Technician	
B.Sc or Graduate / B.Tech/ BE	Food technology/ Home Science	3	Food Industry	2	Training of Cold Storage Technician	
Diploma/Certificate course	Hotel management/ Food Science/ Home Science	4	Food Industry	2	Training of Cold Storage Technician	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Cold Storage Technician" mapped to QP: "FIC/Q7004 v3.0". Minimum accepted score is 80%	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.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification <i><Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.></i>	Specialization <i><Specify the areas of specialization that are desirable.></i>	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
M.Sc/M.Tech/ME	Food technology or food engineering	2	Food processing	1	Food processing	
B.Sc or graduate/B.Tech/BE	Food technology/ Home Science	3	Food processing	2	Food processing	
Diploma/Certificate course	Hotel management/ Food Science/ Home Science	4	Food processing	2	Food processing	

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Cold Storage Technician” mapped to QP: “FIC/Q7004 v3.0”. Minimum accepted score is 80%	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.

Assessment Strategy

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

Assessment will be based on the concept of Independent Assessors empanelled with Assessment Agencies, identified, selected, trained and certified on Assessment techniques. These assessors would be aligned to assess as per the laid down criteria.

Assessment Agency would conduct assessment only at the training centres of Training Partner or designated testing centers authorized by FICSI.

Ideally, the assessment will be a continuous process comprising of three distinct steps:

- A. Mid- term assessment
- B. Term / Final Assessment

Each National Occupational Standard (NOS) in the respective QPs will be assigned weightage. Therein each Performance Criteria in the NOS will be assigned marks for theory and / or practical based on relative importance and criticality of function.

This will facilitate preparation of question bank / paper sets for each of the QPs. Each of these papers sets / question bank so created by the Assessment Agency will be validated by the industry subject matter experts through FICSI, especially with regard to the practical test and the defined tolerances, finish, accuracy etc.

The following tools are proposed to be used for final assessment:

- i. Written Test: This will comprise of (i) True / False Statements (ii) Multiple Choice Questions (iii) Matching Type Questions. Online system for this will be preferred.
- ii. Practical Test: This will comprise a test job to be prepared as per project briefing following appropriate working steps, using necessary tools, equipment and instruments. Through observation it will be possible to ascertain candidate's aptitude, attention to details, quality consciousness etc. The end product will be measured against the pre-decided MCQ filled by the Assessor to gauge the level of his skill achievements.
- iii. Structured Interview: This tool will be used to assess the conceptual understanding and the behavioral aspects as regards the job role and the specific task at hand.

Glossary

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

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
HACCP	Hazard Analysis and Critical Control Points
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices