

Qualification Pack



Cold Storage Technician

QP Code: FIC/Q7004

Version: 2.0

NSQF Level: 3

Food Industry Capacity & Skill Initiative || Shriram Bharatiya Kala kendra, 3rd floor, 1, Copernicus Marg, Mandi House, New Delhi
Delhi 110001

Qualification Pack

Contents

FIC/Q7004: Cold Storage Technician	3
<i>Brief Job Description</i>	3
Applicable National Occupational Standards (NOS)	3
<i>Compulsory NOS</i>	3
<i>Qualification Pack (QP) Parameters</i>	3
FIC/N7010: Prepare and maintain work area and refrigeration equipments	5
FIC/N7011: Handle cold storage facility for storing food	10
FIC/N7012: Complete documentation and record keeping related to the cold storage facility	20
FIC/N9003: Food safety, hygiene and sanitation for storage	26
Assessment Guidelines and Weightage	31
<i>Assessment Guidelines</i>	31
<i>Assessment Weightage</i>	32
Acronyms	33
Glossary	34

Qualification Pack

FIC/Q7004: Cold Storage Technician

Brief Job Description

A Cold Storage Technician is responsible for handling installation of refrigeration system and components, refrigerant charging and storage of food in the cold storage room by maintaining storage parameters such as temperature and relative humidity in food processing units.

Personal Attributes

A Cold Storage Technician must have the ability to plan, organize, prioritize, calculate and handle pressure. The individual must have a mechanical aptitude and must possess reading, writing and communication skills. In addition, the individual must have stamina and professional hygiene.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [FIC/N7010: Prepare and maintain work area and refrigeration equipments](#)
2. [FIC/N7011: Handle cold storage facility for storing food](#)
3. [FIC/N7012: Complete documentation and record keeping related to the cold storage facility](#)
4. [FIC/N9003: Food safety, hygiene and sanitation for storage](#)

Qualification Pack (QP) Parameters

Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Refrigeration, Utilities and Maintenance
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2004/NIL

Qualification Pack

Minimum Educational Qualification & Experience	12th Class (Science Stream) OR 10th Class (and 2 years course in relevant stream) OR 10th Class with 2 Years of experience relevant experience OR 10th Class + I.T.I (2 years in relevant stream)
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	1. Installation of refrigeration unit 2. Maintenance of refrigeration equipments and components 3. Designing and construction of cold storage facility 4. Various refrigeration techniques 5. GMP 6. HACCP 7. QMS 8. Computer basics and ERP 9. Training in Food Safety Standards and Regulations (as per FSSAI) (Mandatory)
Minimum Job Entry Age	18 Years
Last Reviewed On	30/09/2021
Next Review Date	30/07/2024
Deactivation Date	30/07/2024
NSQC Approval Date	30/09/2021
Version	2.0
Reference code on NQR	2021/FI/FICSI/04570
NQR Version	1

Qualification Pack

FIC/N7010: Prepare and maintain work area and refrigeration equipments

Description

This OS unit is about preparing work area for hygiene and safety, ensuring performance and maintenance of refrigeration equipments and components as per the specifications and standards of the organization.

Elements and Performance Criteria

Prepare and maintain work area for refrigeration

To be competent, the user/individual on the job must be able to:

- PC1.** clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests
- PC2.** ensure that the work area is safe and hygienic for food processing
- PC3.** dispose waste materials as per defined SOPs and industry requirements

Prepare and maintain refrigeration equipments

To be competent, the user/individual on the job must be able to:

- PC4.** check the working and performance of all equipments used in storage facility such as compressor, condenser, evaporator, fans, sensors, thermostat, humidity meter, etc.
- PC5.** clean the equipments used with approved sanitizers following SOP
- PC6.** attend minor repairs/faults of all equipments, if required

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organization standards, process standards and procedures followed in the organisation
- KU2.** types of products produced by the organisation
- KU3.** code of business conduct
- KU4.** dress code to be followed
- KU5.** job responsibilities/duties and standard operating procedures
- KU6.** internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution
- KU7.** provision of wages, working hours and accident compensation as per organisation policy
- KU8.** food safety and hygiene standards followed
- KU9.** types of chemicals, materials and equipment required for the cleaning and maintenance
- KU10.** cleaning process to disinfect equipment/ tools
- KU11.** supplier/manufacturers instructions related to cleaning and maintenance
- KU12.** calibration procedure and method for equipments handled
- KU13.** knowledge of food safety standards and regulations (as per FSSAI)

Qualification Pack

- KU14.** knowledge of legal regulations pertaining to work place such as health and safety, recommended dosage for use of sanitizers, control of substances hazardous to health, handling/storage/ disposal/ cautions of use of sanitizers and disinfectants, fire precautions, occurrences, hygiene practice, disposal of waste, environmental protection, etc

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note the information communicated by the supervisor
- GS2.** note the details of food stored, storage parameters and provide necessary information to fill the storage chart
- GS3.** note the details of the refrigeration system and components, maintenance and service reports
- GS4.** note down observations (if any) related to the storage
- GS5.** write information documents to internal departments/ internal teams
- GS6.** note down the data for erp or as required by the organization
- GS7.** read and interpret design, drawings and construction of the storage facility
- GS8.** read and interpret the storage methods and conditions for storing all types of food
- GS9.** read and interpret storage parameters for storing various food
- GS10.** read equipment manuals and storage documents to understand the equipments operation and storage requirement
- GS11.** read internal information documents sent by internal teams
- GS12.** discuss task lists, schedules and activities with the supervisor
- GS13.** effectively communicate with the team members
- GS14.** question the supervisor in order to understand the nature of the problem and to clarify queries
- GS15.** attentively listen and comprehend the information given by the speaker
- GS16.** communicate clearly with the supervisor and cross department team on the issues faced during storage process
- GS17.** analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue
- GS18.** handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
- GS19.** plan and organize the work order and jobs received from the supervisor
- GS20.** plan and prioritize the work based on the instructions received from the supervisor
- GS21.** plan to utilise time and equipment's effectively
- GS22.** organize all process/ equipment manuals so as to access information easily
- GS23.** support the supervisor in scheduling tasks for helper(s)
- GS24.** understand customer requirements and their priority and respond as per their needs
- GS25.** support supervisor in solving problems by detailing out problems
- GS26.** discuss the possible solutions with the supervisor for problem solving



Qualification Pack

- GS27.** apply domain information about maintenance processes and technical knowledge about tools and equipment
- GS28.** use common sense and make judgments on day to day basis
- GS29.** use reasoning skills to identify and resolve basic problems
- GS30.** use intuition to detect any potential problems which could arise during operations
- GS31.** use acquired knowledge of the process for identifying and handling issues

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare and maintain work area for refrigeration</i>	18	32	-	-
PC1. clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests	10	15	-	-
PC2. ensure that the work area is safe and hygienic for food processing	3	7	-	-
PC3. dispose waste materials as per defined SOPs and industry requirements	5	10	-	-
<i>Prepare and maintain refrigeration equipments</i>	17	33	-	-
PC4. check the working and performance of all equipments used in storage facility such as compressor, condenser, evaporator, fans, sensors, thermostat, humidity meter, etc.	7	8	-	-
PC5. clean the equipments used with approved sanitizers following SOP	5	15	-	-
PC6. attend minor repairs/faults of all equipments, if required	5	10	-	-
NOS Total	35	65	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N7010
NOS Name	Prepare and maintain work area and refrigeration equipments
Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Refrigeration
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/09/2021
Next Review Date	30/07/2024
Deactivation Date	30/07/2024
NSQC Clearance Date	30/09/2021

Qualification Pack

FIC/N7011: Handle cold storage facility for storing food

Description

This unit is about handling refrigeration system and components and storing food in cold storage room/chamber while maintaining storage parameters, as per the specifications and standards of the organization.

Elements and Performance Criteria

Installation of refrigeration unit

To be competent, the user/individual on the job must be able to:

- PC1.** interpret technical drawings, inspect the location for setting up refrigeration unit, install condensing unit, mount evaporation coil evaporator
- PC2.** install piping following industry refrigeration guidelines and applicable codes to ensure proper operation of the refrigeration system, check all wiring connections
- PC3.** calculate the number of temperature sensors required for the cold storage facility, identify location to place the sensors and place in relevant locations within the cold storage facility to obtain precise reading
- PC4.** charge refrigerant from supply tank to compressor determining charging level through weight and sight glass indication
- PC5.** perform pre-start up checks by verifying sufficient refrigerant is charged, electrical connections are tight, wiring and piping are properly routed and secured, compressor mounting bolts are proper, fan motors and mounting brackets are tight, condensing unit base and evaporator coil are properly secured

Start up of refrigeration system

To be competent, the user/individual on the job must be able to:

- PC6.** start the refrigeration system and check the compressor discharge and suction pressures to ensure they are in the normal operating range, check the liquid line sight glass for proper refrigerant charge, monitor the compressor oil level and add oil if necessary to maintain required level
- PC7.** check the voltage and amperage at the compressor terminals, check the piping and electrical connections for vibration
- PC8.** check fans on the evaporator coil and condensing unit (for air-cooled condenser) to ensure they are operational and turning in the correct direction, check cooling tower (for water-cooled condenser), ensure there is no refrigerant leakag
- PC9.** set the defrost control/timer clock to required time and verify the defrost initiation settings, set temperature control to desired temperature range
- PC10.** check the functioning and performance of sensors and temperature measuring device

Storage of food in cold storage room

To be competent, the user/individual on the job must be able to:

- PC11.** read and understand the work order from the supervisor
- PC12.** check all the features of the cold storage facility, operation of the cooling equipment and ensure readiness
- PC13.** calibrate temperature and humidity measuring instruments of the storage facility

Qualification Pack

- PC14.** receive food for storage, check the quality of product to be stored in cold storage facility through physical parameters, check the packaging of the product
- PC15.** adjust controls to set storage parameters such as temperature and humidity required for the food of the cold storage room/chamber following the storage parameter chart, check readings to ensure set storage parameters has reached or make required adjustments or set controls in the plc and monitor system (in case of computerized cold storage units)
- PC16.** weigh and check the temperature of food, transfer it to the cold storage room and load in the racks either manually or using forklift following SOP
- PC17.** check the temperature in cold storage room between the cartons on a pallet or between packages inside a carton to ensure proper air circulation
- PC18.** observe temperature and humidity and adjusts controls to maintain storage parameters during the entire storage period
- PC19.** check temperature of air and stored food periodically for conformance to specifications and standards
- PC20.** inspect the storage products periodically for decay, mold growth, sprouting, shriveling, etc
- PC21.** unload stored product immediately after specified storage period and check temperature and weight
- PC22.** check the quality of the food from the storage facility through product temperature, and check for shriveling of agricultural produce, freezer burns, mold growth, deterioration, etc
- PC23.** report any malfunction to the supervisor and implement the suggested corrective action immediately

Inspect, repair/replace refrigeration systems and components

To be competent, the user/individual on the job must be able to:

- PC24.** conduct periodic inspection of refrigeration system and components for correct operation, observe operating condition and need for repair or adjustment
- PC25.** detect refrigerant leak through system pressure, temperature, recharge volume liquid level etc, to repair recover refrigerant, inspect, rectify and recharge the refrigerant
- PC26.** identify malfunction of components, dismantle, repair and replace faulty components
- PC27.** reassemble components, test for correct operation, charge system with correct refrigerant, ensure correct operation of the equipment
- PC28.** ensure equipment is running efficiently and the required operating conditions are maintained in the cold store chambers for operational requirements

Maintenance of refrigeration system and components

To be competent, the user/individual on the job must be able to:

- PC29.** ensure periodic maintenance of refrigeration system and components following SOP
- PC30.** check the evaporators for ice accumulation/proper defrosting, wash evaporator coils to remove dust and foreign materials drawn into the fins
- PC31.** check evaporator and condenser fan blades for fractures, clean the fan blades, replace worn blades and tighten the fan set screws, lubricate fan motors, replace fan motor if required
- PC32.** check for the operation of defrost controls, ensure defrost heaters are in the correct position for maximum heat transfer to the evaporator coil, check the voltage at each heater terminal and ensure heater terminals are in good condition
- PC33.** remove foreign materials from the drain pan, check the drain line heater (in case of maintaining freezing temperature)

Qualification Pack

- PC34.** in compressor unit, replace worn condenser motor, check all electrical components and replace damaged wirings and tighten all electrical connections, check and ensure functioning of pressure controls and safety controls, check oil level, ensure working of solenoid valves, check operation of cold room temperature thermostat and clean condenser periodically
- PC35.** check condition of refrigerant line insulation and replace if necessary, check refrigerant level in the system, ensure no refrigerant leak

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** types of refrigerants and the procedure to handle them
- KU2.** methods to calibrate the testing equipments and equipments in the storage facility
- KU3.** types of food that can be stored in cold storage and their storage parameters
- KU4.** control parameters and parameter range for cold storage of various types of food
- KU5.** methods to control temperature and humidity in cold storage facility
- KU6.** methods and procedure to monitor the storage process
- KU7.** methods and procedure to monitor and control the cooling process of the stored food
- KU8.** methods to examine the operation of the cold storage facility
- KU9.** specifications and procedure for checking performance of refrigeration components
- KU10.** procedure for loading, storing and unloading various types of food in the cold storage facility
- KU11.** procedure for charging refrigerant in the refrigeration system
- KU12.** procedure for identifying faults, selecting replacement parts and servicing
- KU13.** procedure and sequence for performing preventative maintenance of cold storage system and its components
- KU14.** procedure for dismantling, repairing, reassembling and testing components
- KU15.** supplier/manufacturers instructions related to cold storage facility and components
- KU16.** basic mathematics
- KU17.** calculation of refrigerant required for the storage area
- KU18.** risks associated with working in extreme temperature conditions and control measures
- KU19.** quality parameters, basic food microbiology and quality assessment based on physical parameters
- KU20.** food safety and hygiene
- KU21.** GMP
- KU22.** HACCP
- KU23.** organization standards, process standards and procedures followed in the organisation
- KU24.** types of products produced by the organisation
- KU25.** code of business conduct
- KU26.** dress code to be followed
- KU27.** job responsibilities/duties and standard operating procedures
- KU28.** internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution

Qualification Pack

- KU29.** provision of wages, working hours and accident compensation as per organisation policy
- KU30.** food safety and hygiene standards followed
- KU31.** refrigeration principles, techniques and practices
- KU32.** interpreting drawings and diagrams of cold storage system and facility
- KU33.** components of refrigeration system and their installation

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note the information communicated by the supervisor
- GS2.** note the details of food stored, storage parameters and provide necessary information to fill the storage chart
- GS3.** note the details of the refrigeration system and components, maintenance and service reports
- GS4.** note down observations (if any) related to the storage
- GS5.** write information documents to internal departments/ internal teams
- GS6.** note down the data for erp or as required by the organization
- GS7.** read and interpret design, drawings and construction of the storage facility
- GS8.** read and interpret the storage methods and conditions for storing all types of food
- GS9.** read and interpret storage parameters for storing various food
- GS10.** read equipment manuals and storage documents to understand the equipments operation and storage requirement
- GS11.** read internal information documents sent by internal teams
- GS12.** discuss task lists, schedules and activities with the supervisor
- GS13.** effectively communicate with the team members
- GS14.** question the supervisor in order to understand the nature of the problem and to clarify queries
- GS15.** attentively listen and comprehend the information given by the speaker
- GS16.** communicate clearly with the supervisor and cross department team on the issues faced during storage process
- GS17.** analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue
- GS18.** handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
- GS19.** plan and organize the work order and jobs received from the supervisor
- GS20.** plan and prioritize the work based on the instructions received from the supervisor
- GS21.** plan to utilise time and equipment's effectively
- GS22.** organize all process/ equipment manuals so as to access information easily
- GS23.** support the supervisor in scheduling tasks for helper(s)
- GS24.** understand customer requirements and their priority and respond as per their needs
- GS25.** support supervisor in solving problems by detailing out problems



Qualification Pack

- GS26.** discuss the possible solutions with the supervisor for problem solving
- GS27.** apply domain information about maintenance processes and technical knowledge about tools and equipment
- GS28.** use common sense and make judgments on day to day basis
- GS29.** use reasoning skills to identify and resolve basic problems
- GS30.** use intuition to detect any potential problems which could arise during operations
- GS31.** use acquired knowledge of the process for identifying and handling issues

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Installation of refrigeration unit</i>	5	10	-	-
PC1. interpret technical drawings, inspect the location for setting up refrigeration unit, install condensing unit, mount evaporation coil evaporator	1	2	-	-
PC2. install piping following industry refrigeration guidelines and applicable codes to ensure proper operation of the refrigeration system, check all wiring connections	1	2	-	-
PC3. calculate the number of temperature sensors required for the cold storage facility, identify location to place the sensors and place in relevant locations within the cold storage facility to obtain precise reading	1	2	-	-
PC4. charge refrigerant from supply tank to compressor determining charging level through weight and sight glass indication	1	2	-	-
PC5. perform pre-start up checks by verifying sufficient refrigerant is charged, electrical connections are tight, wiring and piping are properly routed and secured, compressor mounting bolts are proper, fan motors and mounting brackets are tight, condensing unit base and evaporator coil are properly secured	1	2	-	-
<i>Start up of refrigeration system</i>	5	10	-	-
PC6. start the refrigeration system and check the compressor discharge and suction pressures to ensure they are in the normal operating range, check the liquid line sight glass for proper refrigerant charge, monitor the compressor oil level and add oil if necessary to maintain required level	1	2	-	-
PC7. check the voltage and amperage at the compressor terminals, check the piping and electrical connections for vibration	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. check fans on the evaporator coil and condensing unit (for air-cooled condenser) to ensure they are operational and turning in the correct direction, check cooling tower (for water-cooled condenser), ensure there is no refrigerant leakag	1	2	-	-
PC9. set the defrost control/timer clock to required time and verify the defrost initiation settings, set temperature control to desired temperature range	1	2	-	-
PC10. check the functioning and performance of sensors and temperature measuring device	1	2	-	-
<i>Storage of food in cold storage room</i>	15	25	-	-
PC11. read and understand the work order from the supervisor	1	2	-	-
PC12. check all the features of the cold storage facility, operation of the cooling equipment and ensure readiness	1	2	-	-
PC13. calibrate temperature and humidity measuring instruments of the storage facility	1	2	-	-
PC14. receive food for storage, check the quality of product to be stored in cold storage facility through physical parameters, check the packaging of the product	1.5	1.5	-	-
PC15. adjust controls to set storage parameters such as temperature and humidity required for the food of the cold storage room/chamber following the storage parameter chart, check readings to ensure set storage parameters has reached or make required adjustments or set controls in the plc and monitor system (in case of computerized cold storage units)	2	3	-	-
PC16. weigh and check the temperature of food, transfer it to the cold storage room and load in the racks either manually or using forklift following SOP	1	2	-	-
PC17. check the temperature in cold storage room between the cartons on a pallet or between packages inside a carton to ensure proper air circulation	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. observe temperature and humidity and adjusts controls to maintain storage parameters during the entire storage period	1	2	-	-
PC19. check temperature of air and stored food periodically for conformance to specifications and standards	1	2	-	-
PC20. inspect the storage products periodically for decay, mold growth, sprouting, shriveling, etc	1	2	-	-
PC21. unload stored product immediately after specified storage period and check temperature and weight	1	2	-	-
PC22. check the quality of the food from the storage facility through product temperature, and check for shriveling of agricultural produce, freezer burns, mold growth, deterioration, etc	1.5	1.5	-	-
PC23. report any malfunction to the supervisor and implement the suggested corrective action immediately	1	1	-	-
<i>Inspect, repair/replace refrigeration systems and components</i>	5.5	9.5	-	-
PC24. conduct periodic inspection of refrigeration system and components for correct operation, observe operating condition and need for repair or adjustment	1	2	-	-
PC25. detect refrigerant leak through system pressure, temperature, recharge volume liquid level etc, to repair recover refrigerant, inspect, rectify and recharge the refrigerant	1	2	-	-
PC26. identify malfunction of components, dismantle, repair and replace faulty components	1	2	-	-
PC27. reassemble components, test for correct operation, charge system with correct refrigerant, ensure correct operation of the equipment	1	2	-	-
PC28. ensure equipment is running efficiently and the required operating conditions are maintained in the cold store chambers for operational requirements	1.5	1.5	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintenance of refrigeration system and components</i>	4.5	10.5	-	-
PC29. ensure periodic maintenance of refrigeration system and components following SOP	0.5	0.5	-	-
PC30. check the evaporators for ice accumulation/proper defrosting, wash evaporator coils to remove dust and foreign materials drawn into the fins	0.5	1.5	-	-
PC31. check evaporator and condenser fan blades for fractures, clean the fan blades, replace worn blades and tighten the fan set screws, lubricate fan motors, replace fan motor if required	0.5	1.5	-	-
PC32. check for the operation of defrost controls, ensure defrost heaters are in the correct position for maximum heat transfer to the evaporator coil, check the voltage at each heater terminal and ensure heater terminals are in good condition	0.5	1.5	-	-
PC33. remove foreign materials from the drain pan, check the drain line heater (in case of maintaining freezing temperature)	0.5	0.5	-	-
PC34. in compressor unit, replace worn condenser motor, check all electrical components and replace damaged wirings and tighten all electrical connections, check and ensure functioning of pressure controls and safety controls, check oil level, ensure working of solenoid valves, check operation of cold room temperature thermostat and clean condenser periodically	1	3	-	-
PC35. check condition of refrigerant line insulation and replace if necessary, check refrigerant level in the system, ensure no refrigerant leak	1	2	-	-
NOS Total	35	65	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N7011
NOS Name	Handle cold storage facility for storing food
Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Refrigeration
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/09/2021
Next Review Date	30/07/2024
Deactivation Date	30/07/2024
NSQC Clearance Date	30/09/2021

Qualification Pack

FIC/N7012: Complete documentation and record keeping related to the cold storage facility

Description

This unit is about documenting and maintaining records of food stored in the cold storage facility, storage parameters, maintenance of refrigeration system and components of cold storage facility.

Elements and Performance Criteria

Document and maintain records of stored food in the cold storage facility

To be competent, the user/individual on the job must be able to:

- PC1.** document and maintain records of all incoming food to the storage room/facility, types and varieties of food, weight of food, farmer/vendor details, grown area / geographical location, receiving date, label details such as date of manufacture, date of expiry, quality parameters, date of loading in cold storage facility, intended storage period, outgoing date, type of packaging, loading pattern, storage location within the cold storage unit, etc. following SOP
- PC2.** document and maintain records of all outgoing food from the cold storage facility such as type and varieties of food, weight of food, actual storage period, losses from incoming to outgoing period, quality of food during unloading from cold storage unit, packaging condition, etc. following SOP
- PC3.** maintain record of observations (if any) related to storage
- PC4.** load the details in ERP system for future reference
- PC5.** verify the documents and track details in cases of concerns

Document and maintain records of storage parameters

To be competent, the user/individual on the job must be able to:

- PC6.** document and maintain records of parameters such as temperature, relative humidity of the food before loading in the cold storage facility, during storage period and during unloading from the storage facility for each food stored following SOP
- PC7.** document and maintain records of parameters such as temperature, relative humidity of the cold storage room/facility before loading, during storage and during unloading following SOP
- PC8.** maintain record of observations or deviations (if any) related to storage parameters
- PC9.** load the details in ERP system for future reference
- PC10.** verify the documents and track details in cases of concerns

Document and maintain records of maintenance of refrigeration system

To be competent, the user/individual on the job must be able to:

- PC11.** document and maintain records of the technical drawings of cold storage room/chamber, refrigeration system and components, electrical lines, etc.
- PC12.** document and maintain records of refrigeration system such as type of refrigeration unit, type of refrigerant, quantity of refrigerant used, cooling system followed, component details such as type of compressor, condenser, evaporator, fans etc following SOP
- PC13.** document and maintain records of operating conditions of cold storage room by recording temperature of food and air in the cold storage room/chamber, compressor pressure, ice formation etc

Qualification Pack

- PC14.** document and maintain records of preventive maintenance, routine checks, inspections, faults identified, repairs, replacements, refrigerant leak, recharge, quantity and kind (new, reused or recycled etc of refrigeration system and components following SOP
- PC15.** maintain record of observations or deviations (if any)
- PC16.** load the details in erp system followed by the organisation for future reference
- PC17.** verify the documents and track details in cases of concerns

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organization standards, process standards and procedures followed in the organisation
- KU2.** types of products produced by the organisation
- KU3.** code of business conduct
- KU4.** dress code to be followed
- KU5.** job responsibilities/duties and standard operating procedures
- KU6.** internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution
- KU7.** provision of wages, working hours and accident compensation as per organisation policy
- KU8.** food safety and hygiene standards followed
- KU9.** documentation system followed in the organization like, loading and unloading chart, storage chart, storage parameter chart, refrigeration system and components report etc
- KU10.** details to be recorded and maintained on food stored in cold storage facility
- KU11.** details to be recorded and maintained on preventive maintenance , routine checks, service, repairs, replacements, etc
- KU12.** methods to document and maintain records on observations (if any) related storage process
- KU13.** methods to track back the record from incoming to outgoing produce for storage
- KU14.** basic computer knowledge
- KU15.** entering the details in ERP system followed by the organisation

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note the information communicated by the supervisor
- GS2.** note the details of food stored, storage parameters and provide necessary information to fill the storage chart
- GS3.** note the details of the refrigeration system and components, maintenance and service reports
- GS4.** note down observations (if any) related to the storage
- GS5.** write information documents to internal departments/ internal teams
- GS6.** note down the data for ERP or as required by the organization
- GS7.** read and interpret design, drawings and construction of the storage facility

Qualification Pack

- GS8.** read and interpret the storage methods and conditions for storing all types of food
- GS9.** read and interpret storage parameters for storing various food
- GS10.** read equipment manuals and storage documents to understand the equipments operation and storage requirement
- GS11.** read internal information documents sent by internal teams
- GS12.** discuss task lists, schedules and activities with the supervisor
- GS13.** effectively communicate with the team members
- GS14.** question the supervisor in order to understand the nature of the problem and to clarify queries
- GS15.** attentively listen and comprehend the information given by the speaker
- GS16.** communicate clearly with the supervisor and cross department team on the issues faced during storage process
- GS17.** analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue
- GS18.** handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
- GS19.** plan and organize the work order and jobs received from the supervisor
- GS20.** plan and prioritize the work based on the instructions received from the supervisor
- GS21.** plan to utilise time and equipment's effectively
- GS22.** organize all process/ equipment manuals so as to access information easily
- GS23.** support the supervisor in scheduling tasks for helper(s)
- GS24.** understand customer requirements and their priority and respond as per their needs
- GS25.** support supervisor in solving problems by detailing out problems
- GS26.** discuss the possible solutions with the supervisor for problem solving
- GS27.** apply domain information about maintenance processes and technical knowledge about tools and equipment
- GS28.** use common sense and make judgments on day to day basis
- GS29.** use reasoning skills to identify and resolve basic problems
- GS30.** use intuition to detect any potential problems which could arise during operations
- GS31.** use acquired knowledge of the process for identifying and handling issues

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Document and maintain records of stored food in the cold storage facility</i>	21	14	-	-
PC1. document and maintain records of all incoming food to the storage room/facility, types and varieties of food, weight of food, farmer/vendor details, grown area / geographical location, receiving date, label details such as date of manufacture, date of expiry, quality parameters, date of loading in cold storage facility, intended storage period, outgoing date, type of packaging, loading pattern, storage location within the cold storage unit, etc. following SOP	6	4	-	-
PC2. document and maintain records of all outgoing food from the cold storage facility such as type and varieties of food, weight of food, actual storage period, losses from incoming to outgoing period, quality of food during unloading from cold storage unit, packaging condition, etc. following SOP	3	2	-	-
PC3. maintain record of observations (if any) related to storage	3	2	-	-
PC4. load the details in ERP system for future reference	3	2	-	-
PC5. verify the documents and track details in cases of concerns	6	4	-	-
<i>Document and maintain records of storage parameters</i>	24	16	-	-
PC6. document and maintain records of parameters such as temperature, relative humidity of the food before loading in the cold storage facility, during storage period and during unloading from the storage facility for each food stored following SOP	9	6	-	-
PC7. document and maintain records of parameters such as temperature, relative humidity of the cold storage room/facility before loading, during storage and during unloading following SOP	6	4	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. maintain record of observations or deviations (if any) related to storage parameters	3	2	-	-
PC9. load the details in ERP system for future reference	3	2	-	-
PC10. verify the documents and track details in cases of concerns	3	2	-	-
<i>Document and maintain records of maintenance of refrigeration system</i>	15	10	-	-
PC11. document and maintain records of the technical drawings of cold storage room/chamber, refrigeration system and components, electrical lines, etc.	2	1	-	-
PC12. document and maintain records of refrigeration system such as type of refrigeration unit, type of refrigerant, quantity of refrigerant used, cooling system followed, component details such as type of compressor, condenser, evaporator, fans etc following SOP	4	3	-	-
PC13. document and maintain records of operating conditions of cold storage room by recording temperature of food and air in the cold storage room/chamber, compressor pressure, ice formation etc	3	2	-	-
PC14. document and maintain records of preventive maintenance, routine checks, inspections, faults identified, repairs, replacements, refrigerant leak, recharge, quantity and kind (new, reused or recycled etc of refrigeration system and components following SOP	2.5	1.5	-	-
PC15. maintain record of observations or deviations (if any)	1.5	1	-	-
PC16. load the details in erp system followed by the organisation for future reference	1.5	1	-	-
PC17. verify the documents and track details in cases of concerns	0.5	0.5	-	-
NOS Total	60	40	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N7012
NOS Name	Complete documentation and record keeping related to the cold storage facility
Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Refrigeration
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/09/2021
Next Review Date	30/07/2024
Deactivation Date	30/07/2024
NSQC Clearance Date	30/09/2021

Qualification Pack

FIC/N9003: Food safety, hygiene and sanitation for storage

Description

This OS unit is about maintaining food safety, hygiene and sanitation in work area and processing unit for storage.

Elements and Performance Criteria

Perform safety and sanitation related functions for storage

To be competent, the user/individual on the job must be able to:

- PC1.** comply with food safety and hygiene procedures followed in the organisation
- PC2.** ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, goggles, shoes, etc.
- PC3.** ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters
- PC4.** pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations
- PC5.** clean, maintain and monitor food processing equipment periodically, using it only for the specified purpose
- PC6.** use safety equipment such as fire extinguisher, first aid kit and eye-wash station when required
- PC7.** follow housekeeping practices by having designated area for materials/tools
- PC8.** follow industry standards such as 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
- PC10.** identify, document and report problems such as rodents and pests to management
- PC11.** conduct workplace checklist audits before and after work to ensure safety and hygiene
- PC12.** document and maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system

Applying food safety practices for storage

To be competent, the user/individual on the job must be able to:

- PC13.** determine the quality of produce using criteria such as smell, appearance, taste and take immediate measures to prevent spoilage
- PC14.** store different varieties of produce, chemicals, gases separately to prevent cross-contamination
- PC15.** label produce, chemicals, gases and store in designated storage areas according to safe food practices
- PC16.** follow stock rotation based of storage chemicals on first expiry first out (FEFO) / first in first out (FIFO)

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

Qualification Pack

- KU1.** organization standards, process standards and procedures followed in the organisation
- KU2.** types of products produced by the organisation
- KU3.** code of business conduct
- KU4.** dress code to be followed
- KU5.** job responsibilities/duties and standard operating procedures
- KU6.** internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution
- KU7.** provision of wages, working hours and accident compensation as per organisation policy
- KU8.** food safety and hygiene standards followed
- KU9.** possible physical, chemical and biological hazards and methods of prevention of various hazards
- KU10.** personal hygiene requirement
- KU11.** different types of sanitizers used for storage area and equipments and the procedure to use
- KU12.** food laws and regulations
- KU13.** quality parameters and quality assessment based on physical parameters, basic food microbiology
- KU14.** labelling/marketing requirements for produce, chemicals, gases and storing in designated area
- KU15.** cleaning and sanitation of equipments and work area
- KU16.** CIP & COP methods and procedures
- KU17.** storage norms for produce, chemicals, gases etc
- KU18.** stock rotation based on first-in-first-out (FIFO)/first-expiry-first-out (FEFO)
- KU19.** maintain safety check lists for all equipments and follow the checklist
- KU20.** GHP
- KU21.** GMP
- KU22.** HACCP

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note the information communicated by the supervisor
- GS2.** note the details of food stored, storage parameters and provide necessary information to fill the storage chart
- GS3.** note the details of the refrigeration system and components, maintenance and service reports
- GS4.** note down observations (if any) related to the storage
- GS5.** write information documents to internal departments/ internal teams
- GS6.** note down the data for ERP or as required by the organization
- GS7.** read and interpret the storage methods and conditions for storing all types of food
- GS8.** read and interpret storage parameters for storing various food
- GS9.** read equipment manuals and storage documents to understand the equipments operation and storage requirement

Qualification Pack

- GS10.** read internal information documents sent by internal teams
- GS11.** discuss task lists, schedules and activities with the supervisor
- GS12.** effectively communicate with the team members
- GS13.** question the supervisor in order to understand the nature of the problem and to clarify queries
- GS14.** attentively listen and comprehend the information given by the speaker
- GS15.** communicate clearly with the supervisor and cross department team on the issues faced during storage process
- GS16.** analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue
- GS17.** handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
- GS18.** plan and organize the work order and jobs received from the supervisor
- GS19.** organize raw materials and packaging materials required for all products following the instruction provided by the supervisor
- GS20.** plan and prioritize the work based on the instructions received from the supervisor
- GS21.** plan to utilise time and equipment's effectively
- GS22.** organize all process/ equipment manuals so as to access information easily
- GS23.** support the supervisor in scheduling tasks for helper(s)
- GS24.** understand customer requirements and their priority and respond as per their needs
- GS25.** support supervisor in solving problems by detailing out problems
- GS26.** discuss the possible solutions with the supervisor for problem solving
- GS27.** apply domain information about maintenance processes and technical knowledge about tools and equipment
- GS28.** use common sense and make judgments on day to day basis
- GS29.** use reasoning skills to identify and resolve basic problems
- GS30.** use intuition to detect any potential problems which could arise during operations
- GS31.** use acquired knowledge of the process for identifying and handling issues

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform safety and sanitation related functions for storage</i>	25	50	-	-
PC1. comply with food safety and hygiene procedures followed in the organisation	2	3	-	-
PC2. ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, goggles, shoes, etc.	1	5	-	-
PC3. ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters	2	3	-	-
PC4. pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations	4	6	-	-
PC5. clean, maintain and monitor food processing equipment periodically, using it only for the specified purpose	2	3	-	-
PC6. use safety equipment such as fire extinguisher, first aid kit and eye-wash station when required	4	6	-	-
PC7. follow housekeeping practices by having designated area for materials/tools	2	3	-	-
PC8. follow industry standards such as gmp and haccp and product recall process	4	6	-	-
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	1	4	-	-
PC10. identify, document and report problems such as rodents and pests to management	1	4	-	-
PC11. conduct workplace checklist audits before and after work to ensure safety and hygiene	1	4	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. document and maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system	1	3	-	-
<i>Applying food safety practices for storage</i>	10	15	-	-
PC13. determine the quality of produce using criteria such as smell, appearance, taste and take immediate measures to prevent spoilage	2	3	-	-
PC14. store different varieties of produce, chemicals, gases separately to prevent cross-contamination	2	3	-	-
PC15. label produce, chemicals, gases and store in designated storage areas according to safe food practices	2	3	-	-
PC16. follow stock rotation based of storage chemicals on first expiry first out (FEFO) / first in first out (FIFO)	4	6	-	-
NOS Total	35	65	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9003
NOS Name	Food safety, hygiene and sanitation for storage
Sector	Food Processing
Sub-Sector	Fruits and Vegetables, Dairy Products, Meat and Poultry, Fish and Sea Food
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/09/2021
Next Review Date	30/07/2024
Deactivation Date	30/07/2024
NSQC Clearance Date	30/09/2021

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass %

Qualification Pack

aggregate for the QP.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

(**Please note:** Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FIC/N7010.Prepare and maintain work area and refrigeration equipments	35	65	-	-	100	20
FIC/N7011.Handle cold storage facility for storing food	35	65	-	-	100	30
FIC/N7012.Complete documentation and record keeping related to the cold storage facility	60	40	-	-	100	20
FIC/N9003.Food safety, hygiene and sanitation for storage	35	65	-	-	100	30
Total	165	235	-	-	400	100

Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
CIP	Clean In Place
COP	Clean Out Of Place
ERP	Enterprise Resource Planning
FIFO	First In First Out
FEFO	First Expiry First Out
FSSAI	Food Safety and Standards Authority of India
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices
HACCP	Hazard Analysis and Critical Control Point

Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Qualification Pack

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.