



Australian Government

Department of Education, Employment and Workplace Relations

FDFOP2057A Operate a membrane process

Revision Number: 1

FDFOP2057A Operate a membrane process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the skills and knowledge required to set up, operate, adjust and shut down a membrane process used to separate the components of solutions and suspensions.
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Application of the Unit

Application of the unit	This unit has application in a food production environment such as a dairy product production. It typically targets the production worker responsible for applying basic operating principles to the operation and monitoring of equipment used to separate solutions and suspensions. When batch or product changeover procedures are part of this work process, the procedures should be used to customise the application of this unit. Where more detailed changeovers are carried out unit FDFOP2011A Conduct routine maintenance should be considered.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare the membrane equipment and process for operation	1.1. Materials are confirmed and available to meet operating requirements 1.2. Cleaning and maintenance requirements and status are identified and confirmed 1.3. Machine components and related attachments are fitted and adjusted to meet operating requirements 1.4. Processing/operating parameters are entered as required to meet safety and production requirements 1.5. Equipment performance is checked and adjusted as required 1.6. Pre-start checks are carried out as required by workplace requirements
2. Operate and monitor the membrane process	2.1. The process is started and operated according to workplace procedures 2.2. Equipment is monitored to identify variation in operating conditions 2.3. Variation in equipment operation is identified and maintenance requirements are reported according to workplace reporting requirements 2.4. The process is monitored to confirm that specifications are met 2.5. Out-of-specification product/process outcomes are identified, rectified and/or reported to maintain the process within specification 2.6. The work area is maintained according to housekeeping standards 2.7. Work is conducted according to environmental guidelines 2.8. Workplace records are maintained according to workplace recording requirements
3. Shut down the membrane process	3.1. The appropriate shutdown and cleaning procedure is identified 3.2. The process is shut down according to workplace procedures 3.3. Maintenance requirements are identified and reported according to workplace reporting requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Ability to:

- Access workplace information to identify membrane processing requirements
- Select, fit and use personal protective clothing and/or equipment
- Confirm supply of necessary materials and services
- Conduct pre-start checks. This may involve inspecting equipment/membrane condition to identify any signs of wear; selecting appropriate settings and/or related parameters; cancelling isolation or lockouts as required; confirming that equipment such as pumps, valves and pipework are clean and correctly configured for membrane processing requirements; sensors and controls are correctly positioned; any scheduled maintenance has been carried out, and that all safety guards are in place and operational
- Start, operate, monitor and adjust membrane processing equipment to achieve required outcomes. This may include monitoring control points and conducting inspections as required to confirm process remains within specification. This may include monitoring:
 - temperatures
 - flow rates
 - total solids
 - pressure/vacuum
- Monitor supply and flow of materials to and from the membrane process
- Conduct run/batch changeovers
- Take corrective action in response to out-of-specification results
- Respond to and/or report equipment failure within level of responsibility
- Locate emergency stop functions on equipment
- Follow isolation and lock out/tag out procedures as required to take membrane processing and related equipment off-line in preparation for cleaning and/or maintenance within level of responsibility
- Follow procedures to clean membranes
- Complete workplace records as required
- Maintain work area to meet housekeeping standards
- Use process control systems according to enterprise procedures
- Conduct routine maintenance according to enterprise procedures
- Collect samples and conduct tests according to enterprise procedures
- Use oral communication skills / language competence to fulfil the job role as specified by the organisation including questioning, active listening, asking for clarification and seeking advice from supervisor

REQUIRED SKILLS AND KNOWLEDGE

- Work cooperatively within a culturally diverse workforce

Required knowledge

Knowledge of:

- Purpose and basic principles of membrane processing. This includes an understanding of the components of milk, particle size of each component and the effect on these components of membrane processing. It also includes an understanding of the methods used to achieve this outcome
- Basic operating principles of equipment. This may include an operational understanding of main equipment components, status and purpose of guards, equipment operating capacities and applications, and the purpose and location of sensors and related feedback instrumentation. It also includes an awareness of the material composition of membranes used in the workplace and related operating, cleaning and storage requirements
- The flow of the membrane process including the different processing streams and the effect of the membrane process outputs on downstream processes
- Quality characteristics required of the membrane processing outputs
- The effect of variation in raw material characteristics on membrane processing performance
- Operating requirements and parameters and corrective action required where operation is outside specified operating parameters. This includes an understanding of the effect of variation in processing parameters such as temperature, pressure, total solids and flow rates on membrane process performance
- Typical equipment faults and related causes. This includes recognition of signs and symptoms of faulty equipment and early warning signs of potential problems
- Techniques used to monitor membrane processing. This may include inspecting, measuring and testing as required by the process. It requires awareness of inspection or test points (control points) in the process and the related procedures and recording requirements
- Contamination/food safety risks associated with the process and related control measures
- Common causes of variation and corrective action required
- OHS hazards and controls. This includes awareness of the limitations of protective clothing and equipment relevant to the work process
- Requirements of different shutdowns as appropriate to membrane processing and workplace production requirements. This includes emergency and routine shutdowns and procedures to follow in the event of a power outage and shutdown
- Cleaning and sanitation requirements associated with changeovers
- Isolation, lock out and tag out procedures and responsibilities
- Procedures and responsibility for reporting production and performance information
- Environmental issues and controls relevant to membrane processing. This includes waste collection and handling procedures related to the process

REQUIRED SKILLS AND KNOWLEDGE

- Basic operating principles of process control where relevant. This includes the relationship between control panels and systems and the physical equipment
- Routine maintenance procedures where relevant
- Sampling and testing associated with process monitoring and control where relevant

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed. Competency in this unit must be achieved in accordance with food safety standards and regulations.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of ability to:

- conduct pre-start checks on machinery used for separation process
- start, operate, monitor and adjust process equipment to achieve required quality outcomes
- take corrective action in response to typical faults and inconsistencies
- complete workplace records as required
- apply safe work practices and identify OH&S hazards and controls
- safely shut down equipment
- apply food safety procedures to work practices

Context of and specific resources for assessment

Assessment must occur in a real or simulated workplace where the assessee has access to:

- personal protective clothing and equipment
- work procedures including advice on safe work practices, food safety, quality and environmental requirements, stock flow systems, production schedules, batch/recipe instructions
- information on equipment capacity and operating parameters
- production schedule and batch instructions
- specifications, control points and processing parameters
- membrane processing and related equipment and services
- materials required for membrane processing
- sampling schedules and test procedures and equipment as required
- documentation and recording requirements and procedures

EVIDENCE GUIDE	
	• cleaning and sanitation procedures, materials and equipment as required
Method of assessment	This unit should be assessed together with core units and other units of competence relevant to the function or work role. Examples could be: • FDFOP2030A Operate a process control interface • FDFOP2013A Apply sampling procedures • PMLTEST300B Perform basic tests • FDFOP2011A Conduct routine maintenance • FDFOP2003A Clean work area and in place equipment • FDFOP2004A Clean and sanitise equipment
Guidance information for assessment	To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Policies and procedures	Work is carried out according to company policies and procedures, regulatory and licensing requirements, legislative requirements, and industrial awards and agreements
Legislative requirements	Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes the Food Standards Code including labelling, weights and measures legislation; and legislation covering food safety, environmental management, occupational health and safety, anti-discrimination and equal opportunity
Workplace information	Workplace information may include Standard Operating Procedures (SOPs), specifications, production schedules and instructions, manufacturers' advice, standard forms and reports
Membrane modules	Membrane modules may be flat sheet (plate), spirally wound, hollow fibre, or tubular and may have a symmetrical, asymmetric or composite asymmetric structure. Related equipment typically includes pipework, valves and pumps, and refrigeration equipment
Shutdown procedures	Shutdown procedures may include cleaning. In some cases cleaning may be carried out by a dedicated cleaning crew
Operation of equipment and processes	Operation of equipment and processes may require the use of process control panels and systems
Services	Services are appropriate to the process to be operated. Typical examples include power, steam, water, vacuum, and compressed and

RANGE STATEMENT

	instrumentation air
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Unit Sector(s)

Unit sector	Operational
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		